The Lao People's Democratic Republic
Ministry of Natural Resources and Environment

Preliminary Integrated Water Resources Management Action Plan 2026-2030 for the Lao PDR

Review of IWRM Action Plan 2021-2025 and recommendations for the IWRM Action Plan 2026-2030

May 2025

CREWS CLIMATE RISK & EARLY WARNING SYSTEMS

WORLD METEOROLOGICAL ORGANIZATION

Global Water Partnership Southeast Asia
Lao PDR Water Partnership

Preface

This Preliminary Integrated Water Resources Management (IWRM) Action Plan 2026-2030 for the Lao PDR was developed with support from the Climate Risk and Early Warning System (CREWS) initiative, through collaboration between the World Meteorological Organization (WMO) and the Global Water Partnership (GWP).

The plan was prepared using the methodological approach of the **IWRM Action Planning Framework,** under Stage 2 of the SDG 6 IWRM Support Programme. Technical review and quality assurance were provided by the SDG 6 IWRM Support Programme team, particularly from the UNEP-DHI Centre on Water and Environment and GWP.

The **SDG 6 IWRM Support Programme** assists governments and other stakeholders in designing and implementing country-led responses to SDG indicator 6.5.1 - the degree of implementation of IWRM. This serves as an entry point to accelerate progress, not only toward SDG 6 but also other water-related and broader development goals, in line with their national priorities. The IWRM Action Planning Framework is a practical guide designed to support countries in accelerating progress on water-related targets.

SDG 6 IWRM Support Programme

Assists goverments and other stakeholders in

Assisting countries to identify the country's main water and climate-related challenges by bringing together stakeholders to monitor progress towards SDG 6.5.1

Assisting countries and stakeholders to develop IWRM Action Plans to address the identified challenges

Accessing implementation support for the Action Plans

UN environment programme | UNEP-DHI Centre on Water and Environment | Global Water Partnership | Cap-Net

Foreword

Water is a cornerstone of sustainable development, essential to public health, the vitality of ecosystems, and the prosperity of economies. As water-related challenges intensify—driven by climate change, population growth, and increasing demands—Integrated Water Resources Management (IWRM) has become a critical framework for guiding the equitable, efficient, and sustainable use of water resources.

In the Lao People's Democratic Republic (Lao PDR), the approval of the Vision to 2040 and the National Strategy on Water and Water Resources Management and Utilization to 2030 by the National Assembly on July 18, 2023, provided a foundation for national efforts in water governance. In line with this, the 2021–2025 IWRM Action Plan was implemented by relevant ministries, departments, and sectors. By the end of 2024, significant progress had been made, including the development of legal instruments and technical guidelines to strengthen the management of surface water, groundwater, water quantity and quality, and water-related ecosystems. The formulation of integrated river basin management plans for large river basins, groundwater management plans, and wetland management plans stands as a key milestone in fostering cross-sectoral integration and coordination.

Despite these accomplishments, several challenges remain—particularly in areas requiring enhanced inter-agency coordination, the establishment of sustainable financial mechanisms, and improved climate resilience. These gaps must be addressed to ensure the long-term success of IWRM implementation.

The Preliminary IWRM Action Plan 2026–2030 represents a pivotal step in advancing national policies, strengthening institutional collaboration, and building resilience within the water sector. Building upon the achievements of past strategies, it aligns with global commitments such as the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction. This document not only evaluates progress under the 2021–2025 plan but also identifies key priorities for continued implementation through 2030.

This publication has been developed through close collaboration among national and regional stakeholders, including the Ministry of Natural Resources and Environment, line ministries, river basin organizations, and development partners. It offers a practical action plan for the next five years, outlining strategic actions, implementation arrangements, and financial mechanisms to support IWRM across Lao PDR.

Foreword

The Department of Water Resources, Ministry of Natural Resources and Environment, as the lead coordinating agency, extends its sincere gratitude to all stakeholders and partners who actively participated in consultations and contributed valuable insights and information.

We believe this plan will serve as a guiding tool not only for policymakers and water managers but also for communities and development partners who are instrumental to its success. Through coordinated action and shared responsibility, we can ensure that water resources are managed sustainably for current and future generations.

We also welcome ongoing cooperation with international organizations, NGOs, the private sector, and other partners who may wish to support the development or implementation of the IWRM Action Plan 2026–2030. With broad stakeholder engagement, Lao PDR will continue making progress toward fulfilling its commitments under SDG 6 through effective IWRM implementation.

Mr. Oudomsack Philavong
Director General
Department of Water Resources
Ministry of Natural Resources and Environment

Acknowledgement

The development of the Preliminary Integrated Water Resources Management Action Plan 2026-2030 for Lao PDR was made possible through the collaborative efforts of numerous individuals, institutions, and organizations. We extend our deepest gratitude to all who contributed their expertise, resources, and time to this critical initiative.

First and foremost, we acknowledge the leadership and guidance of the Department of Water Resources (DWR) under the Ministry of Natural Resources and Environment (MoNRE) for the unwavering commitment to advance Integrated Water Resources Management (IWRM) in Lao PDR. Special thanks to Mr. Oudomsack Philavong, Director General, Department of Water Resources, Ministry of Natural Resources and Environment, Lao PDR, the technical teams from the Department of Water Resources (DWR) and GWP-Lao: Phonexay Simmalavong and Sengphasouk Xayavong from Lao Water Partnership and Rattykone Sayasane, National Expert on IWRM in Lao PDR, whose technical expertise and commitment were critical in drafting and shaping the content of this report.

We extend our sincere appreciation to the Global Water Partnership – Southeast Asia (GWP-SEA) and the World Meteorological Organization (WMO) through the CREWS project, for their financial and technical support, which was instrumental in completing this document.

We gratefully acknowledge the support of all relevant government agencies (MONRE: Department of Disaster Management and Climate Change, Department of Meteorology and Hydrology, Department of Environment, Department of Forestry, Department of Land Administration; Ministry of Agriculture and Forestry - Department of Irrigation, Ministry of Public Health – Department of Hygiene and Prevention, Ministry of Public Work and Transportation - Department of Water Supply, Department of Water Way and Department of Urban Planning and Housing, Ministry of Labour and Social Welfare, Ministry of Information, Ministry of Industry and Commerce, National University of Laos – Faculty of Water Resources, Lao National Mekong Committee Secretariat, National Agriculture and Forestry Research Institute) ; international organizations ((Food and Agriculture Organization (FAO), Asian Disaster Preparedness Center (ADPC), World Bank, Asian Development Bank (ADB), and United Nations Development Programme (UNDP)) and private sector partners for their engagement throughout the development of this document.

We also wish to express our heartfelt gratitude to Robert Stefanski, Nakul Prasad and Jason Watkins (WMO), Jochen Luther (WMO Regional Asia Pacific), Louise Desrainy (GWP-SEA), Colin Herron (GWP Headquarter Secretariat in Sweden), and Paul Glennie (UNEP-DHI Centre on Water and Environment) for their thorough review and valuable input during the revision process.

Cover Image: Surreal landscape by the Song river at Vang Vieng, Laos
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Executive summary

The Integrated Water Resources Management (IWRM) approach has been introduced and promoted in the Lao People's Democratic Republic (Lao PDR) since 1998. The government of Lao PDR has made substantial investments in water infrastructure and in the development of laws and regulations to ensure the sustainable management and protection of its water resources. The Ministry of Natural Resources and Environment (MONRE) plays a central role in implementing IWRM principles, working in close coordination with line ministries, international organizations, and other key stakeholders.

Significant progress in IWRM implementation has been observed, particularly following the major amendments to the Law on Water and Water Resources in 2017, and the subsequent endorsement in July 2023 of the vision to 2040 and the National Strategy on Water and Water Resources Management and Utilization to 2030.

This document serves as a preliminary evaluation and monitoring report on the implementation of the IWRM Action Plan 2021-2025, developed in alignment with the 2040 Vision and 2030 Strategy on water and water resources utilization and management of the Lao PDR. It was prepared through extensive consultations with stakeholders from MONRE and various line ministries, including two multi-stakeholder workshops conducted in 2024.

As of 2024, notable progress has been achieved, with many activities either completed or on track to be completed by 2025. Of the 83 activities outlined across eight strategic goals, 27 have been completed, 44 are on track, and 12 are delayed or not yet started.

Major accomplishments include the development of legal instruments, agreements, and technical guidelines for the management of surface and groundwater resources, as well as water quantity, quality, and related ecosystems. Furthermore, river basin management plans for large river basins have been formulated and are under implementation. It is anticipated that provincial and district authorities will take the lead in developing plans for medium- and small-sized river basins, as outlined in the revised Water Law.

Despite this progress, some challenges remain. These include limited financial and human resources, insufficient coordination mechanisms among line ministries and between central and local authorities, and weak enforcement of existing legal and policy frameworks (from central to local level).

The Integrated Water Resources Management Action Plan 2026-2030 must address these outstanding issues. Key recommendations include enhancing inter-agency coordination, improving legislative development and dissemination, strengthening financial mechanisms, building institutional and human capacity, and promoting the development of climate-resilient infrastructure.

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Abbreviations and Acronyms

ADB = Asian Development Bank

ASEAN = The Association of Southeast Asian Nations

DONRE = District Office of Natural Resources and Environment

DWR = Department of Water Resources

Gov = Government of Lao PDR

GWP = Global Water Partnership

Ha = Hectare

IWRM = Integrated Water Resources Management

Km^2 = Square kilometer

Lao PDR = Lao People's Democratic Republic

NUoL = National University of Laos

M^3/d = Cubit meter per day

MAF = Ministry of Agriculture and Forestry

MEM = Ministry of Energy and Mines

MICT = Ministry of Information, Culture and Tourism

MoFA = Ministry of Foreign Affairs

MONRE = Ministry of Natural Resources and Environment

MOH = Ministry of Health

MPI = Ministry of Planning and Investment

MPWT = Ministry of Public Works and Transportation

MRC = Mekong River Commission

PEMSEA = Partnerships in Environmental Management for the Seas of East Asia

PONRE = Provincial Office of Natural Resources and Environment

PM = Prime Minister

RBMP = River Basin Management Plan

SDG = Sustainable Development Goal

WMO = World Meteorological Organization

1. Introduction

High angle view of Mekong river, the border between Laos and Thailand
Source: www.shutterstock.com

1.1 Background

The Climate Risk and Early Warning Systems (CREWS) project, entitled *"Reinforcing the capacities of meteorological and hydrological services and enhancing the early warning systems in Cambodia and Lao People's Democratic Republic (PDR)"* for 2021-2025, is supported by the World Meteorological Organization (WMO), the UN Office for Disaster Risk Reduction (UNDRR), and the World Bank (WB).

Under the framework of the CREWS Cambodia and Lao PDR project, WMO and the Global Water Partnership – Southeast Asia (GWP-SEA) are collaborating with the Ministry of Water Resources and Meteorology (MOWRAM) in Cambodia, and the Ministry of Natural Resources and Environment (MONRE) in Lao PDR, to support the development of Integrated Water Resources Management (IWRM) strategies and drought policies.

In Lao PDR, the Vision to 2040 and the Strategy on Water and Water Resources Utilization and Management to 2030, endorsed by the National Assembly on 18 July 2023, are currently being used as the foundation for guiding IWRM implementation until 2030.

To assess the current status of the IWRM Action Plan, a preliminary evaluation of the 2021–2025 Action Plan is necessary. However, no formal evaluation mechanisms currently exist, and the availability of implementation data depends on multiple ministries and agencies.

As no consolidated documentation was found on the progress or evaluation of the 2021-2025 Action Plan, the development of the 2026-2030 Action Plan aims to continue the implementation of the endorsed strategy. It builds on previous achievements, addresses ongoing challenges and incorporates new indicators identified through a multi-stakeholder consultation process.

1.2 Main goals and objectives of the action plan

The primary goal of this document is to support the accelerated implementation of Integrated Water Resources Management (IWRM) in the Lao PDR , with the aim of advancing progress on priority issues that align with relevant Sustainable Development Goals (SDG) targets and broader water-related objectives. Informed by feedback from the multidisciplinary technical working group, this policy document serves as a background assessment to identify the progress of the current IWRM Action Plan (2021 – 2025) and to provide recommendation for the forthcoming Integrated Water Resources Management Action Plan (2026-2030).

In line with the Government of Lao PDR's overarching objectives for water resources management, the current IWRM action plan (2021-2025) aims to:

- Establish a coordination mechanism to ensure efficient and effective river basin management.
- Develop comprehensive policies, legislation and guidelines as a complete system to serve in the implementation of river basin management.
- Formulate a river basin management plan that is green and sustainable across all implementation phase.
- Design a financial mechanism to support the execution of river basin management plans.
- Strengthen capacity among water resources personnel at both central and local levels to effectively implement river basin management plan to achieve the goals.
- Raise public awareness, integrate gender roles and promote public participation in sustainable river basin management.

The overall objective of this Preliminary IWRM Action Plan 2026 - 2030 is to define actionable and implementable activities that will guide the continued implementations of IWRM in Lao PDR, in accordance with the approved national strategy and previously stated goals. This document will also address key technical requirements and offer recommendations to policymakers and decision-makers to facilitate the necessary steps for effective implementation.

The specific objectives are to:

- Review progress achieved under the current Action Plan (2021–2025).
- Identify strategic priorities and focus areas for 2026 to 2030, aligned with the national vision towards 2040 and the strategy on water and water resources utilization and management 2030.
- Define priority solution areas and objectives, highlighting their relevance to SDG Target 6.5 on IWRM, other SDG 6 targets and broader water-related goals; and
- Serve as a foundational document to inform consultations and the development of the forthcoming IWRM Action Plan for 2026-2030.

1.3 Process of the formulation/development of this Action Plan

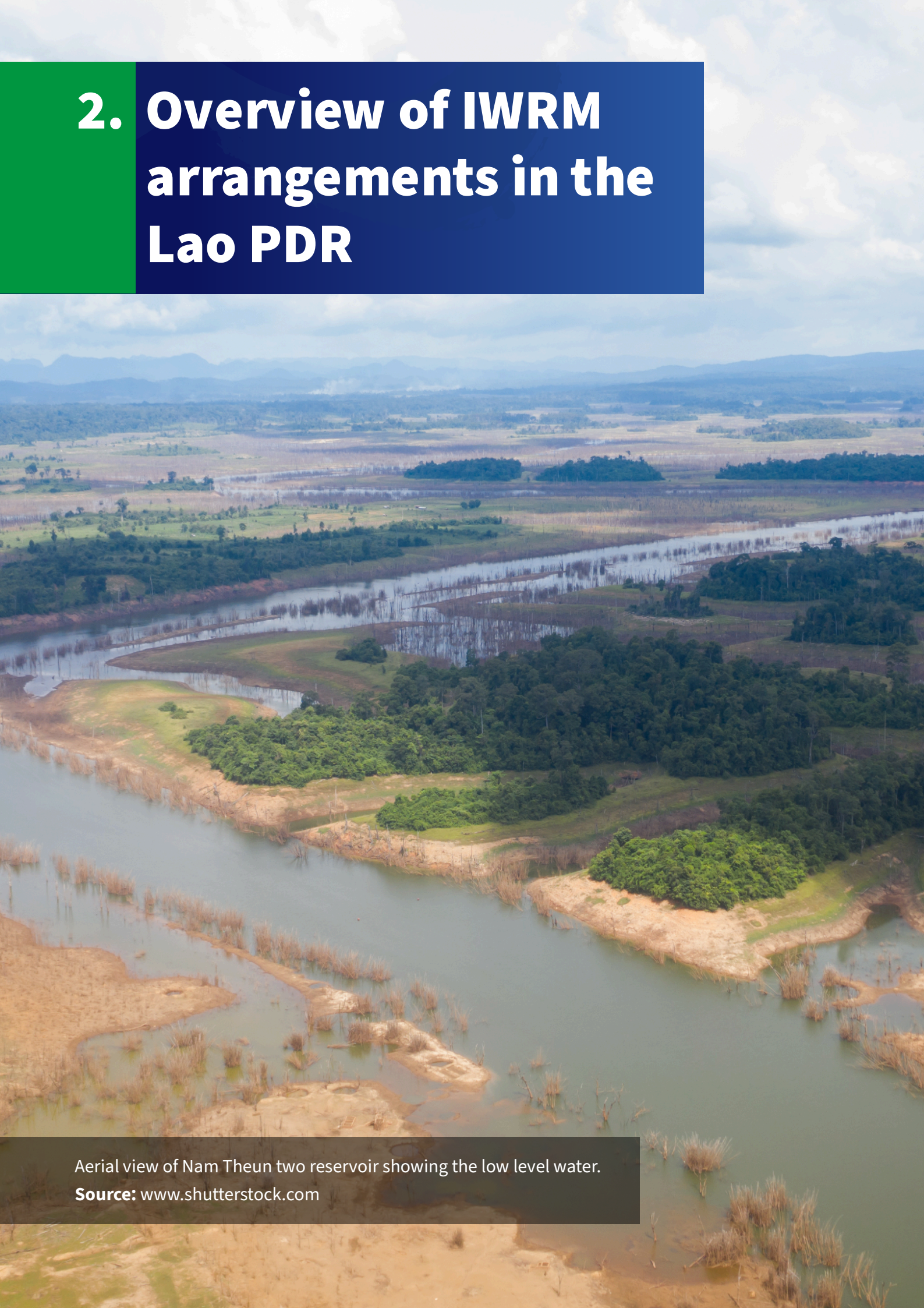
The development of this IWRM action plan followed the methodology outlined by the SDG 6 Integrated Water Resources Management Support Programme (Annex 1). In line with the guidance provided by the Programme, the process is structured around three stages: (i) identification of the key IWRM challenges, (ii) formulation of the IWRM action plan, and (iii) implementation of proposed solutions.

Given that the challenges, solution strategies and indicators were already defined under the nationally endorsed Vision towards 2040 and the Strategy on Water and Water Resources Utilization and Management 2030 – alongside the 2021-2025 IWRM Action Plan - this document primarily focuses on stage 2: reviewing and formulating a new IWRM Action Plan for the period 2026-2030.

The development process for this Action Plan applied a participatory approach, engaging relevant line ministries, government agencies and representatives from the private sector. Key activities undertaken during the formulation process included:

1. **Kick-off Meeting with Key Ministries** – Presentation of the project scope and activity plan under the CREWS project for the development of the IWRM Action Plan (May 2024);
2. **IWRM Stakeholder Mapping** (May 2024)
3. **Desktop Study and Preparation of an Outline for the IWRM Document** (June 2024)
4. **First multi-stakeholder consultation workshop** to present the desktop study result and outline of IWRM Document: July 2024
5. **Development of the First Draft Background Assessment and Recommendations for the IWRM Action Plan for (2026-2030)** (July – November 2024)
6. **Second Multi-Stakeholder Consultation Workshop** - Present the 1st draft of background assessment and recommendations for IWRM Action Plan for 2026-2030 (November 2024)
7. **Revision of Finalization of the Second Draft of the Background assessment and recommendations for IWRM Action Plan for 2026-2030 (2nd draft)** (January 2025)
8. **Endorsement of the IWRM Document** by Director-General of the Department of Water Resources: (May 2025)
9. **Launching of this IWRM Action Plan (2026 – 2030)** (June 2025)

2. Overview of IWRM arrangements in the Lao PDR



Aerial view of Nam Theun two reservoir showing the low level water.
Source: www.shutterstock.com

2.1 Water Resources in the Lao PDR and Key Challenges

The Lao People's Democratic Republic (Lao PDR) is a landlocked country with a total area of approximately 236,800 square kilometres, of which around 90% lies within the Mekong River Basin. The country is endowed with abundant and diverse natural resources, particularly water. The total average annual surface water availability in the Lao PDR is estimated 272 cubic kilometres, making it the country with the highest per capita water availability in Asia.

Due to its geographical and hydrological characteristic, the Lao PDR possesses significant potential for hydropower generation and irrigation development. However, in recent years, the country has encountered growing challenges in water and water resources management, driven largely by rapid economic growth and infrastructure developments.

Based on experience in water resources management, the key issues and challenges currently facing the Lao PDR are summarized as follows.

1. **Ineffective coordination mechanisms** between water resources management and user sectors, as well as between the government agencies and the project development sectors. This includes limited participation in water resources management planning processes and inadequate sharing of essential data and information.
2. **Lack of accurate and comprehensive water resource data,** including hydrological, meteorological, water quality, and groundwater data. Existing data are often fragmented across various sectors; and data exchange and input are not conducted systematically.
3. **Declining water quantity and deteriorating water quality.** Although the Lao PDR remains rich in natural resources, there is a noticeable downward trend in the availability and quality of these resources. This decline threatens livelihood, the economy, and broader societal well-being. Contributing factors include weak regulatory frameworks and law enforcement, particularly in relation to deforestation in upstream area, untreated wastewater discharge, the use of chemical fertilisers in agriculture, and river diversion;
4. I**neffective groundwater management,** due to limited technical capacity and insufficient knowledge among responsible personnel. Groundwater studies and management plans remains scarce;

1. **Water infrastructures** have not yet been fully used, especially for multipurpose use such as flood and drought management, water supply, irrigation, fisheries, tourism, and electricity generation. Additionally, some infrastructure is not resilient to the impacts of climate change.
2. **Lack of a sustainable financial mechanism.** While there is some financial support from international donors, it is limited. Mechanism such as water use fees, payment for ecosystem services, and polluter-pays principles have not yet been fully implemented;
3. **Insufficient human resources and low public awareness** related to water resources management. Capacity building and trainings programs for government staff are needed, and active participation from stakeholders and line-ministries remains limited;
4. **Limited regional and international cooperation** on water resources management. Transboundary river basin management has not yet been implemented in certain areas.

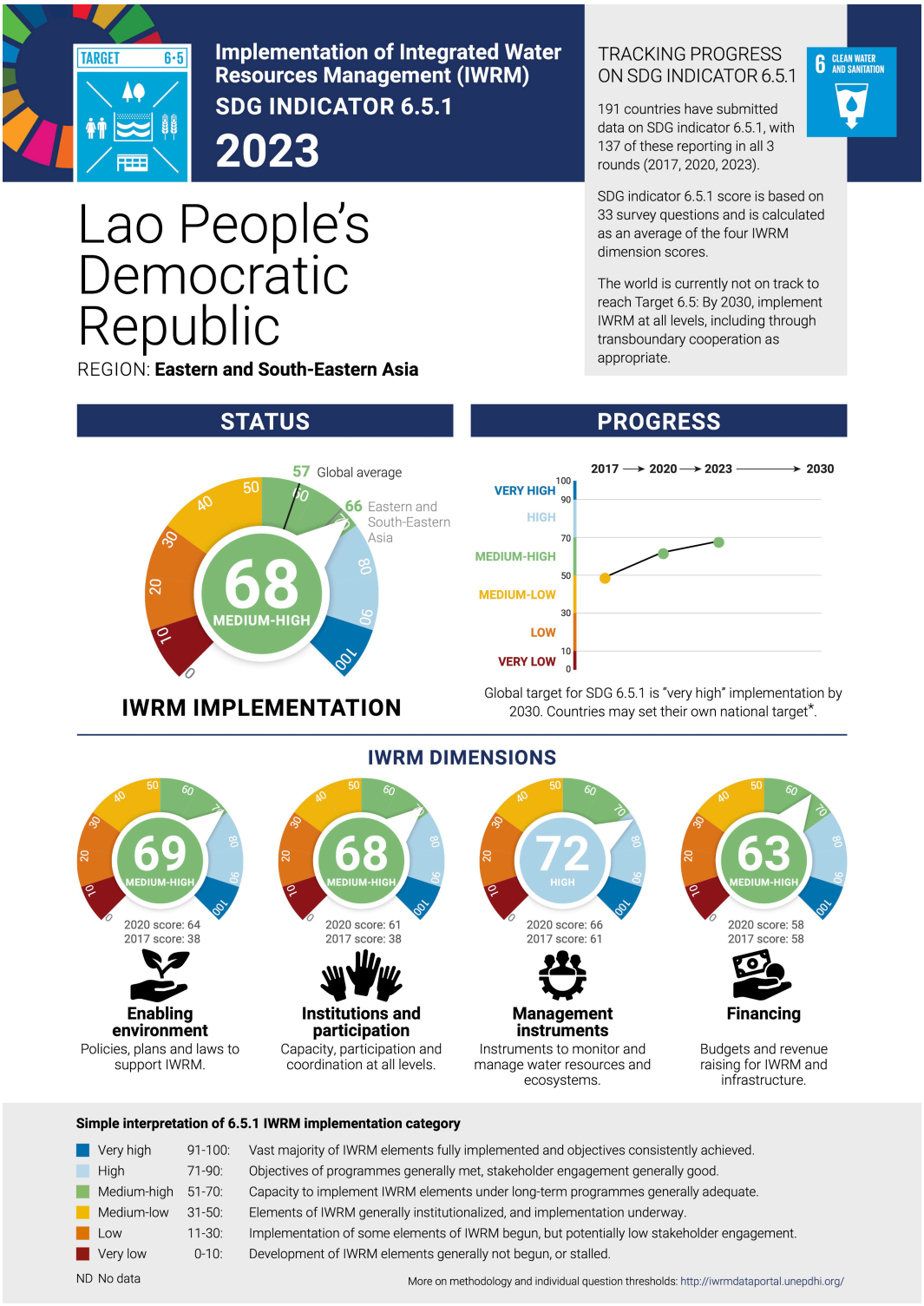


Figure 1. *Status of country report on the IWRM implementation (Source: IWRM data portal tracking SDG 6.5.1)*

Lao PDR has demonstrated sustained commitment to the implementation of IWRM, with continuous efforts toward improvement. As shown in Figure 1, the country achieved an average SGG 6.5.1 score of 68 (classified as medium-high) in 2023 across the four IWRM dimensions. This represents a steady increase from a medium-low score of 49 in 2017 and a medium-high score of 62 in 2020.

2.2 Relevant legal framework in the Lao PDR

In 1996, the first Law on Water and Water Resources was promulgated and endorsed by the National Assembly of the Lao PDR. This law established the general principles for the development, management, and utilization of water and water resources in the country. It classified water catchments into three types: main river catchments, tributary catchments and branch catchments.

Concurrently, the Government has established the Sciences, Technology and Environment Authority (STEA), which formed the Water Resources Coordination Committee to coordinate with the Ministry of Agriculture and Forestry (MAF), as well as with provincial and district authorities particularly regarding the management of the Nam Ngum catchment.

In 2002, the MAF convened a national meeting in Vientiane with representatives from the agriculture and forestry sector. Following this meeting, local authorities were designated to take part in catchment management at the district and provincial levels. This initiative aimed to ensure the sustainable management and utilization of water catchments. At the same time, the MAF promoted policies supporting integrated development, management, and use of water and water resources. However, the actual implementation faced significant challenges due to limited human resources, weak legal frameworks, and inadequate technical tools at both central and local levels.

In 2008, the Water Resources and Environment Authority (WREA) was formed, and this body was established separately from the previous Sciences, Technology and Environment Authority. Under the leadership and proposed by the Party Committee of the Water Resources and Environment, the Government endorsed the formation of the River Basin Committee Secretariat, and selected Nam Ngum and Nam Theun-Kading River Basins as piloted projects for integrated river basin management in accordance with the decree No. 293/PM. The River Basin Committee Secretariat was housed on site, with its mandate equivalent to the department, and has its organisation structure, vehicles and budget available to support its functions under the umbrella of the Water Resources and Environment Authority. The personnel of this Secretariat are the government officials from the Water Resources and Environment Authority and relevant provincial Water Resources and Environment Department.

In 2011, the Ministry of Natural Resources and Environment (MONRE) was established through the merger of several institutions: the Water Resources and Environment Authority, the National Land Management Authority, the Geology Department (formerly under the Ministry of Energy and Mines), and the Forest Conservation Division of the Department of Forestry (formerly under MAF). Within MONRE, the Department of Water Resources (DWR) became the lead agency for implementing Integrated Water Resources Management (IWRM) in Lao PDR.

In 2017, the Law on Water and Water Resources was revised to incorporate the principles of integrated river basin management as the foundation for the development, management, and utilization of water resources. The revised law redefined river basins based on size and geographic complexity, drawing from past experience. It classifies river basins into three categories:

1. **Large basins:** Mekong tributaries or other rivers outside the Mekong River Basin with an area greater than 4,000 km^2.
2. **Medium basins:** Mekong tributaries or other rivers outside the Mekong River Basin with an area between 1,000 and 4,000 km^2.
3. **Small basins:** Mekong tributaries or other rivers outside the Mekong River Basin with an area of less than 1,000 km^2.

In total, Lao PDR comprises 14 large-, 19 medium-, and 29 small- river basins.

In addition, this revised law clearly defined the roles and responsibilities of relevant sectors and local authorities at each administrative level to ensure effective participation in river basin management nationwide, as outlined below:

- The Ministry of Natural Resources and Environment (MONRE) is responsible for managing large river basins, including any transboundary basins shared by at least two countries or two provinces.
- The Provincial Natural Resources and Environment Department (PONRE) is responsible for medium-sized basins located entirely within their respective provincial boundaries.
- The District Natural Resources and Environment Office (DONRE) is responsible for small basins located within the boundaries of their respective districts or towns.

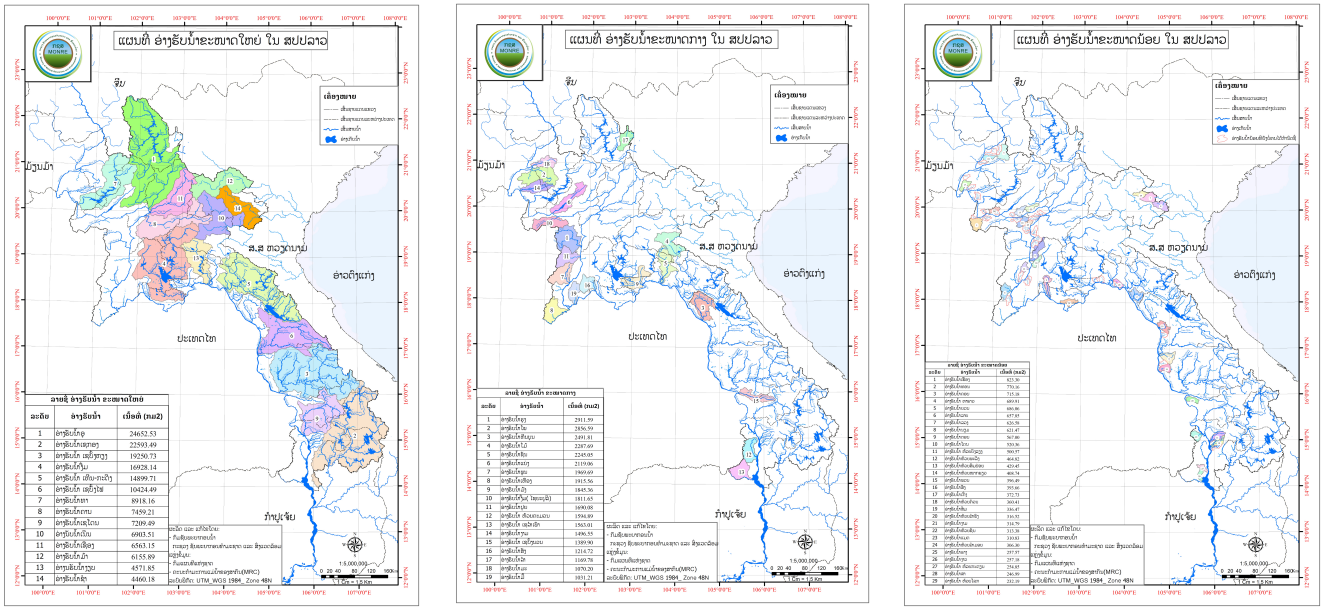


Figure 2. *Maps of defined large, medium, and small river basins in the Lao PDR*

This institutional restructuring of the water resources sector and accompanying regulatory development demonstrate the Government's commitment to the sustainable development, management, and use of water resources. The goal is to achieve optimal outcomes while conserving water resources and maintaining environmental sustainability to support national development and the livelihoods of the Lao people. To meet long-term water management needs, it is essential to develop a comprehensive national water resources action plan.

2.3 Approach for water and water resources management in the Lao PDR

Water management has played a critical role in initiating and sustaining economic growth as well as in advancing human development. The development of water resources presents both opportunities and challenges for the transformation of the Lao PDR's economy. Water policy plays an essential role in a progressive economic development strategy, with demonstrated benefits in poverty reduction, gender equity and social inclusion.

Despite facing multiple challenges, a development strategy grounded in an Integrated Water Resources Management (IWRM) framework offers strong potential for aligning economic transition with the sustainable conservation of the water resources.

Effective water planning requires the establishment of a robust institutional framework, along with the social and technical capacities necessary to implement agreed-upon strategies. These strategies must be developed through participatory and transparent decision-making processes—an institutional foundation that is already being actively strengthened.

Water resource development can make a significant contribution to economic growth and socio-economic progress throughout entire river basins. However, such decisions must be carefully coordinated to prevent conflicts among competing water use priorities - both at a national level, between water users, and at an international level. Moreover, this coordination is essential to ensure that the long-term benefits of economic development are equitably distributed and environmentally sustainable.

Classification	Area
Large River Basin	> 4,000 km^2
Medium River Basin	1,000-4,000 km^2
Small River Basin	< 1,000 km^2

Classification	Area
MONRE	Large River Basins, trans-boundary river basin shared by at least two countries or two provinces
PONRE	Medium River Basins
DONRE	Small River Basins

Water Use Type	Small	Medium	Large
Livelihood Activities	Drinking water, subsistence agriculture	-	-
Electricity (Reservoir)	Drinking water, subsistence agriculture	Volume 1-2 mcm Area 100-1,50 0ha	Volume >2 mcm Area > 1,500 ha
Irrigation (abstraction)	<1,500 m^3/d	1,500 – 150,000 m^3/d	>150,000 m^3/d
Industry (abstraction)	-	15-1,500 m^3/d	-
Mining (abstraction)	-	-	> 1,000 m^3/d
Groundwater (abstraction)	<20 m^3/d (no permit required)	20-50 m^3/d (permit required)	>50 m^3/d (permit required)

Figure 3. *Defined river basins, management organizations, and water use sectors from the revised law on water and water resources*

The implementation of the Vision to 2040 and the Strategy for the Management and Utilization of National Water Resources to 2030 is guided by the following core principles:

1. Alignment with national socio-economic development plans across all phases, as well as with the vision and strategic priorities of the natural resources and environment sector;
2. River basin management conducted in a coordinated and integrated manner across relevant sectors and governance levels;
3. Protection, restoration, and utilization of water resources in an environmentally sustainable and climate-resilient manner;
4. Inclusive participation of individuals, legal entities, and organizations at all relevant stages of planning and implementation;
5. Promotion of bilateral, regional, and international cooperation in the management and use of water and water resources.

In accordance with the revised Water Law (Section 2), the river basin serves as the fundamental unit for managing water and water resources in Lao PDR. This approach follows the principles of Integrated River Basin Management (IRBM) and Integrated Water Resources Management (IWRM), considering the specific characteristics, challenges, and needs of each basin. It emphasizes the involvement of key stakeholders throughout the processes of dialogue, planning, and implementation. Consequently, the development of IWRM/IRBM plans for all 62 river basins is essential for guiding future water resources management and implementation efforts.

2.4 Relevant cooperation mechanisms

By signing the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin in 1995, the governments of Cambodia, Lao PDR, Thailand and Vietnam committed to jointly managing the basin's water resources and coordinating decisions related to their use for economic development. To facilitate this cooperation, the Mekong River Commission (MRC) was established in 1996, China and Myanmar joined the framework as dialogue partners, marking the beginning of a broader regional cooperation initiative under a shared framework.

Since the signing of the 1995 Mekong agreement, a significant milestone was reached in 2010 when the member countries developed a common understanding of both the opportunities and risks associated with national water resources development plans. This led to the adoption of an **Integrated Water Resources Management (IWRM)-based Basin Development Strategy** for the Lower Mekong Basin. The strategy rests on three key foundations: (1) the identification of strategic priorities to optimize development opportunities while minimizing uncertainties and associated risks; (2) a collective commitment to establish basin-wide environmental and social objectives along with baseline indicators to guide and evaluate future developments; and (3) recognition of the critical importance of strengthened basin governance, particularly through comprehensive institutional, technical, organizational, and human resource capacity development for sustainable basin management.

With the institutional framework in place, international cooperation serves as a vital instrument for harmonizing national water development plans, transforming potential areas of conflict into opportunities for mutual benefit. Progress has been made in translating regional priorities into national basin development plans. In the case of Lao PDR, such efforts have been further integrated into national economic development strategies.

Basin level water planning facilitates the evaluation of various development options based on social costs and benefits, moving beyond purely private or sectoral interests. In the Mekong region, examples have demonstrated that hydropower developments in the upper basin, particularly in China, can be adapted to ensure adequate dry season flows. These adaptations support projected consumptive water demands in the lower basin over the next two decades while maintaining essential baseline flow conditions.

Besides the Mekong Agreement, Lao PDR also implements its water resources cooperation with its neighbouring countries through Lancang-Mekong Cooperation, ASEAN cooperation, and other cooperations with international organizations such as GWP, PEMSEA and so on.

2.5 Stakeholders and roles

The implementation of IWRM in Lao PDR is overseen by MONRE with cross-cutting cooperation of other line-ministries as in Figure 4.

Within MONRE, there are several departments involved in various aspects of water resources management including the Department of Water Resources (DWR), Department of Environment (DOE), Department of Climate Change Management (DCCM), Department of Meteorology and Hydrology (DMH), Lao National Mekong River Committee Secretariat (LNMCS), and Natural Resources and Environment Statistic and Research Institute (NRESRI). Among these departments, the DWR plays a central role in formulating water policy and legislation, as well as promoting IWRM stakeholder participation in IWRM processes.

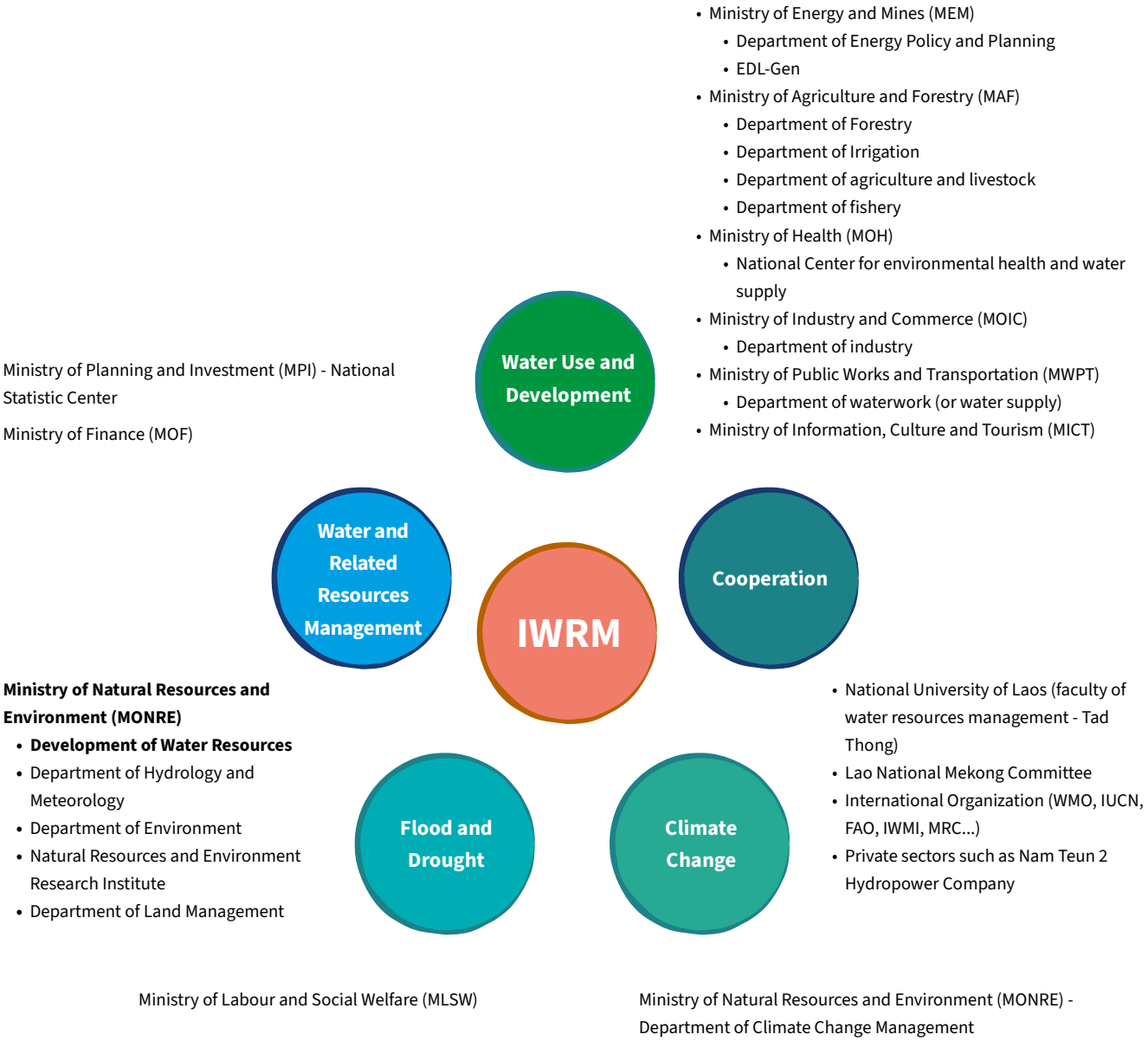


Figure 4. *Key stakeholders in IWRM in the Lao PDR*

In addition to central-level institutions, water resource management in Lao PDR is supported by line agencies at the subnational level. The Provincial Natural Resources and Environment Department (PONRE), through its Water Resources Section, is responsible for promoting public awareness and implementing IWRM activities at the provincial level. At the district level, District Natural Resources and Environment Office (DONRE) consisting of the Water Resources Unit, represents the lowest tier of governmental organization directly involved in engaging communities and stakeholders in water resource management.

The ASEAN Analysis Report on IWRM Stakeholder Participation and Awareness Raising (2020) provided an assessment of key IWRM stakeholders in Laos, including their levels of their interest, influence, and participation in water resources management. These stakeholders include government line agencies, hydropower developers, industrial facilities, research institutes, international organizations, and local communities.

Stakeholder interest levels ranged from *low to very high*. Local communities - such as farmers and fishermen – exhibited lower willingness to engage in IWRM processes, whereas international organizations, NGOs, and research institutes presented very high willingness to get involved. The level of influence also varied, from Medium to Very High. Hydropower dams and key government agencies such as MONRE, MAF, MEM, and MPWT were found to have significant actions, roles, and decisions over water resources management. In contrast, research institutes and NGOs generally had more limited influence on governance processes in Lao PDR.

The level of influence also varied, from Medium to Very High. Hydropower dams and key government agencies such as MONRE, MAF, MEM, and MPWT were found to have significant actions, roles, and decisions over water resources management. In contrast, research institutes and NGOs generally had more limited influence on governance processes in Lao PDR.

In terms of participation, water-related government agencies - including MONRE, MAF, MEM, and Ministry of Public Health (MOPH) – have shown strong collaboration in IWRM implementation, particularly in joint planning and decision-making on key water-related issues. However, some stakeholders, such as local communities and NGOs have primarily been consulted rather than actively involved in decision-making, as summarized in Table 1.

Table 1. *Key IWRM stakeholders and their involvements in the Lao PDR*

No.	Key Stakeholders	Exposure Level	Interest	Influence	Participation
1	Ministry of Natural Resources and Environment (MONRE) Leading Agency	MONRE is the focal point and lead agency for the management and planning of water resources. MONRE is responsible for: • Policy/planning/regulation research, development, • dissemination & implementation • Facilitate engagement & collaboration with other sector agencies • Establish standards (water quality standards, min. flow, • sustainable groundwater yield) & water reserved areas • Promote and support strategic environmental • assessments • Permits & licensing, including monitoring & inspection • External & international cooperation • Summarize & report on status/progress of IWRM	5	5	5
2	Ministry of Agriculture and Forest (MAF)	MAF is responsible for managing water and water resources that are used for irrigation, fishery, agriculture production, forest and upstream water by coordinating with MONRE	4	5	5
3	Ministry of Energy and Mines (MEM)	MEM is responsible for managing water and water resources that are used for hydropower and mining process by coordinating with MONRE	4	5	5
4	Ministry of Public Work and Transport (MPWT)	MPWT is responsible for managing water and water resources that are used for producing and distributing water supply, navigation, water transport, bank erosion protection, sewer planning and water treatment system within urban areas by coordinating with MONRE	4	5	4

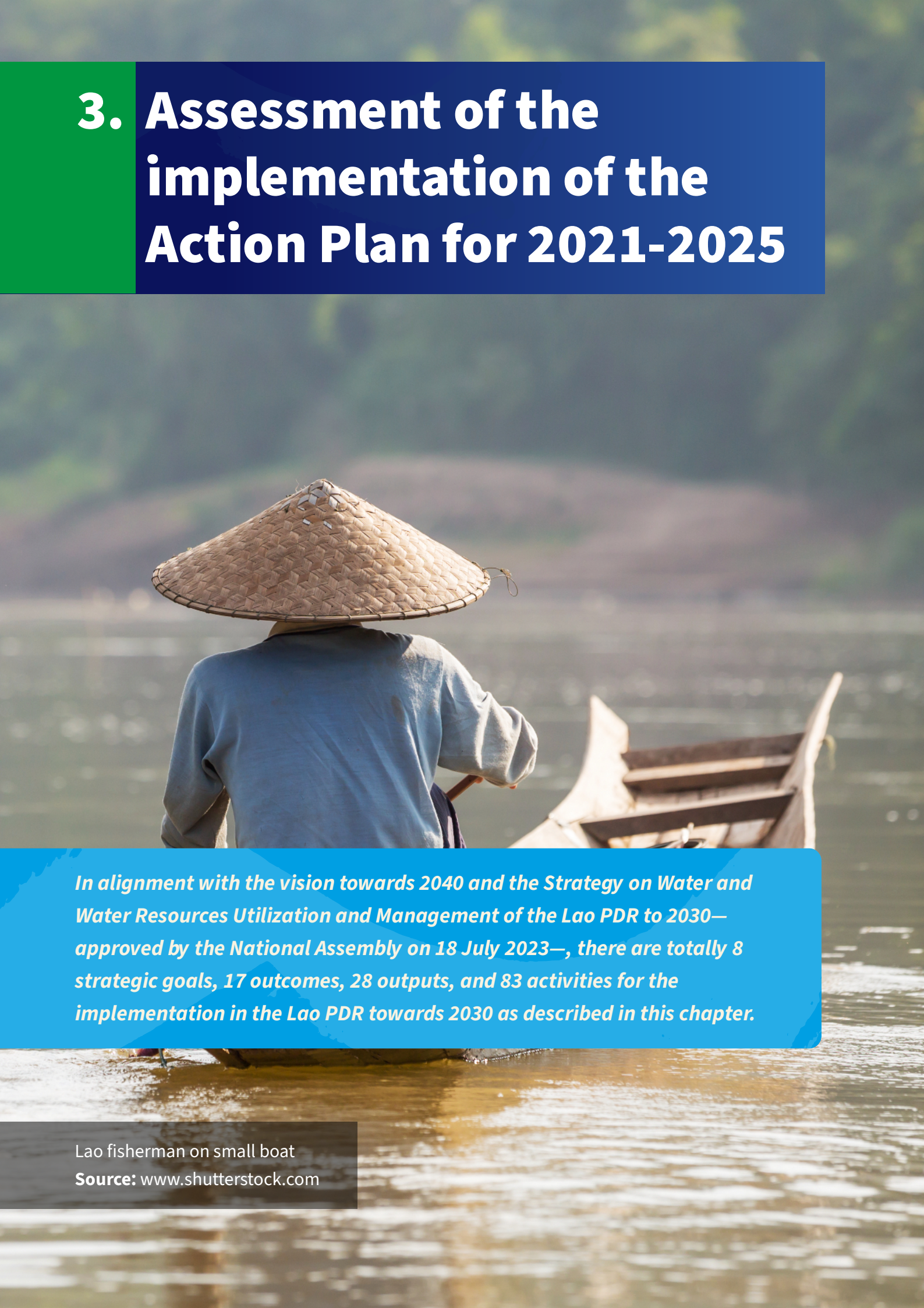
No.	Key Stakeholders	Exposure Level	Interest	Influence	Participation
5	Ministry of Industry and Commerce (MOIC)	MOIC is responsible for managing water and water resources that are used for favoring industry by MONRE	4	4	4
6	Ministry of Health (MOH)	MOH is responsible for managing water and water resources that are used for health treatment, health recovering, inspection of the quality of water resources for consumption, supply clean water to people in the rural areas, monitor the quality of drinking water and clean water by coordinating with MONRE	4	5	5
7	Ministry of Information, Culture, and Tourism (MICT)	MOICT is responsible for managing water and water resources that are used for natural tourism/natural attractions by coordinating with MONRE	3	3	3
8	Ministry of Education and Sports (MOES)	MOES is responsible for managing water and water resources that are used for sports, learning-teaching, education curriculum development, research study, scientific experiment by coordinating with MONRE	3	3	3
9	Hydropower dam developers	Regulating rivers and contributing to watershed management	3	5	4
10	Water supply companies	Extract water from rivers and aquifers for urban water supply	5	4	4
11	Mining companies	Water use for mining processing and wastewater treatment	4	4	3
12	Industrial factories	Water use for operation and production processing and wastewater treatment	3	4	3
13	Farmers	Water use for agriculture	2	4	3

No.	Key Stakeholders	Exposure Level	Interest	Influence	Participation
14	Fishes	Water use for fishing	2	3	3
15	Research institutes/ universities	Conducting scientific research on water related topics and producing water students and professionals	5	3	4
16	NGOs, International Organizations	Financial and technical support	5	3	3

Remarks:
Levels of interest and influence 1=very low, 2=low, 3=medium, 4=high, 5=very high
Level of participation: 1= no participation, 2=Inform, 3=Consult, 4=Involve, 5=Collaborate

It is noted that the key implementers/stakeholders were already identified for the IWRM Action Plan 2021-2025. However, broader stakeholder engagement should be considered in the implementation of the IWRM Action Plan in 2026-2030.

3. Assessment of the implementation of the Action Plan for 2021-2025



In alignment with the vision towards 2040 and the Strategy on Water and Water Resources Utilization and Management of the Lao PDR to 2030—approved by the National Assembly on 18 July 2023—, there are totally 8 strategic goals, 17 outcomes, 28 outputs, and 83 activities for the implementation in the Lao PDR towards 2030 as described in this chapter.

Lao fisherman on small boat
Source: www.shutterstock.com

3.1 Achievements, progress, and pending issues

A preliminary assessment was conducted using the indicators defined for each activity under the strategic goal in the approved Action Plan for 2021-2025. An exception is Strategic Goal VIII, which lacks specific indicators and is largely dependent on the actual implementation of cooperative actions. The key findings for each strategic goal are summarized below, with a detailed assessment provided in EG.

Strategic Goal I: Integrated River Basin Management

This goal focuses on the process of managing and developing water and water resources, land, forests and other resources within the river basin to be carried out harmoniously, proportionally and closely coordinated to ensure the sustainability of the quantity and quality of water and water resources. It aims to maximize the benefits of resource use through integrated approaches. Strategic Goal 1 includes 2 outcomes; 3 outputs and 11 activities as follows:

Outcome 1: Develop a legislation, technical guidelines and coordination mechanisms related to river basin management in a comprehensive and implementable manner	
Output 1: Develop a legislation, technical guidelines and coordination mechanism	
Activity 1: Develop and update legislation on river basin management	Completed
Activity 2: Develop a technical guideline for developing a river basin management plan	Completed
Activity 3: Develop a technical guideline for developing a catchment management plan for the development project	Completed
Activity 4: Disseminate legislation and technical guidelines for water and water resources management	Completed
Activity 5: Review and create a coordination mechanism for the integrated river basin management	delayed but can be completed
Activity 6: Organize an annual consultation meeting on integrated water resource management	On track
Outcome 2: Develop and implement river basin management plans	
Output 1: Formulate the state of basin reports/river basin profiles	
Activity 1: Formulate the state of basin reports/river basin profiles	On track
Output 2: Develop the River Basin Management Plans (RBMPs) for the river basins of the Lao PDR	
Activity 1: Develop the RBMPs for the large-sized river basins	On track
Activity 2: Develop the RBMPs for the medium-sized river basins	On track
Activity 3: Develop the RBMPs for the small-sized river basins	not yet started
Activity 4: Encourage the project developers to develop and implement the catchment management plan of the hydropower project in accordance with the river basin management plan	On track

Strategic Goal 1 focuses on developing legal frameworks and guidelines for water resource management, along with integrated river basin management plans (RBMPs), as detailed in Annex 5. Led by MONRE, significant progress has been made, with legal instruments enacted and RBMPs endorsed for 12 major basins, and two more under development.

RBMPs provide the foundation for water resource implementation. They include data on basin characteristics—such as hydrology, meteorology, water quantity and quality, and surface and groundwater assessments. Each plan also outlines targeted actions for issues like data management, flood and drought mitigation, water allocation and quality, reforestation, wetland protection, groundwater management, and capacity building.

In addition to the achievements to date, the Department of Water Resources (DWR) has outlined the following key activities for implementation in 2025:

- Implement integrated river basin management plans for 12 large river basins.
- Finalize and seek ministerial approval from the Minister of MONRE for the remaining two large river basin plans (Nam Ma and Nam Neun).
- Develop an agreement on flood, drought, and drainage management.
- Develop and implement a master plan for an integrated water resources management (IWRM) demonstration site in the Nam Po watershed, Vang Vieng District, Vientiane Province.
- Continue disseminating the Law on Water and Water Resources and associated legislation to strengthen water resource management.
- Improve the coordination mechanism with the 21 dam projects that have signed the catchment management plan to give financial contributions for river basin management.
- Encourage provincial authorities to establish a coordinating committee for river basin management. Completion is anticipated in provinces that meet the necessary conditions, especially Oudomxay, Luang Namtha, Bokeo, Khammouan, Luang Prabang, Savannakhet and Champasak.
- Facilitate and assist the provincial governments to develop medium-sized river basin management plans and get approval from the provincial governors for Nam Mo (Saysomboun and Xieng Khouang Provinces), Nam Houng (Xayabouly Province), Nam Pui (Xayabouly Province), Sebangnouan (Salavan and Savannakhet Provinces), Nam Beng (Oudomxay Province), Nam Pha (Luangnamtha and Bokeo Provinces), Nam Ngam (Bokeo and Luangnamtha Provinces)), Selamphao (Champasak Province), Nam Mi (Vientiane Province), Nam Heuong (Xayabouly Province), Nam Mang (Bolikhamxay, Saysomboun and Vientiane Provinces), Nam Kamouan (Champasak Province), Nam Sang (Vientiane Capital and Vientiane Province), Nam Lam (Phongsaly Province), Nam Ma (Luangnamtha Province)

Two pending issues remain:

- Activity 5 (Outcome 1, Output 1): Reviewing and establishing a coordination mechanism for the integrated river basin management, which appears to be delayed but may be potentially completed in 2025;
- Activity 3 (Outcome 2, Output 2): The development of RBMPs for small river basins is not currently planned for implementation by District Natural Resources and Environment Offices (DONRE), due to capacity limitations and the need for support from MONRE.

In summary, based on the defined the indicators and timelines, three activities have been completed, six activities are on track, two activities are delayed or yet to begin. To meet the strategic goal's targets, MONRE should prioritize addressing two pending activities.

Strategic Goal II: Management of data-information systems and assessment of water and water resources

Strategic Goal II focuses on enhancing and expanding the existing monitoring network for water, water resources and environmental conditions. It aims to consolidate and analyze data-information on meteorology, hydrology, wetlands, water quantity and quality, water use, land use and overall environmental condition within river basins. Additionally, it emphasize the effective and evaluation of water and water resources. The strategic goal II comprises two outcomes; three outputs and seven activities as outlined below:

Outcome 1: Develop a modern and accessible data-information system for water and water resources at both national and local levels, with a focus on ease access and dissemination.	
Output 1: Improve and expand water and water resource monitoring stations, including survey work, data collection and recording.	
Activity 1: Improve and manage the data-information system of water and water resources by ensuring that all parties have access to such data-information such as gender equality	On track
Activity 2: Expand meteorological and hydrological stations	On track
Activity 3: Survey, collect and record information on water quantity, water quality, water use, wetlands and peatlands throughout the country	On track
Output 2: Disseminate data-information on water and water resources	
Activity 1: Disseminate data-information on water and water resources throughout the country	On track
Outcome 2: Determine the current and future amount of water in the river basin	
Output 1: Assess water and water resources	
Activity 1: Assess the amount of water and water resources in the river basin	On track
Activity 2: Assess the quantity, quality of water and water resources in river basins that are not tributaries of the Mekong River, such as Nam Ma, Nam Neun, Nam Sam and others	On track
Activity 3: Develop a technical guideline/ on water quantity assessment	Completed

The Water and Water Resources Information System of Laos (or Lao-WIS), developed with the support of the International Office for Water and funded by the Loire-Bretagne and Rhine-Meuse Water Agencies, serves as the primary data and information platform for water and water resources management in the Lao PDR. The system consolidates sector-specific datasets related to water resources and is managed by the Department of Water Resources (DWR). The server infrastructure is stored together with other hydrometeorological systems within the Department of Meteorology and Hydrology (DMH). The DWR is responsible for the ongoing survey, collection and inventory of water and water resources information nationwide and regularly updates the Lao-WIS which is accessible at http://laowis.monre.gov.la/en/.

Moreover, the Agreement No. 1182/MONRE on the management of water and water resources related data and information was issued on 27 June 2024; The DWR is currently engaged in the dissemination and implementation of this agreement.

Beyond Lao-WIS, the hydrometeorological monitoring network and associated systems are being expanded and upgraded by the DMH, with financial and technical support from a range of development partners, including Korea, Japan, China, USAID, AusAID, the World Bank, ADB, and the Mekong River Commission (MRC), with summary as follows:

1. WMO VCP project
    - DMH Lao PDR has been connected as one GTS terminal to RTH Bangkok with dedicated leased line of 64 kbps speed.
    - Since its establishment in 1988 through the support of WMO VCP, the stand-alone message switching runs on Linux OS.
    - Only synoptic and climatological data are collected manually from domestic stations, then input into the GTS message switching PC in TAC, then transmitted manually.

1. JICA project
    - 1 C-band Doppler Radar.
    - 1 Ground Receiving Satellite (Himawari-8).
    - Upgrading GTS.
    - 18 Automatic Weather Stations.
    - 8 Automatic Water Level Stations.

1. Korean projects
    - KOICA-KMA: Ground Receiving Satellite (COMS-1), TOS.
    - NDMI: Establishment of Flood Early Warning System in the Lao PDR: 4 districts of 3 provinces.
    - KICT-KEITI: Master Plan on Flood Forecasting and Early Warning in the Lao PDR.
    - Weather Pia: Master Plan on Hydro-met Modernization in the Lao PDR.

1. Chinese projects
    - CMA: FY Satellite, CMACast, Weather Studio.
    - Changjiang Water Resources Commission, Ministry of Water Resources: Establishment of 1 National Water Resources Data Information Center with 17 Automatic Water Level stations and 34 Automatic rainfall stations.
    - China Earthquake Administration: Establishment of 1 National Earthquake Information Center.

1. Asia Development Bank (ADB), World Bank (WB), MRC and FAO projects
    - Modernize the hydro-met system in the Lao PDR by rehabilitating, upgrading and new installation of hydro-met stations (as Table 2), as well as construct national early warning center.
    - System Integration.

Table 2: *Hydro-met stations under the support of various donors*

	ADB project	WB project	FAO project	MRC
Automatic Weather Station	8 stations	66 stations	15 stations	0
Automatic Water Level Station	18 stations	59 stations	0	17 stations
Automatic Rainfall Station	0	47 stations	0	0

In September 2024, the Department of Meteorology and Hydrology launched the *Drought and Flood Trigger Methodology for Anticipatory Action in the Lao PDR*, with support from the Food and Agriculture Organization of the United Nations (FAO), which is the first-ever in Lao PDR to utilize modern technology, specifically artificial intelligence (AI) - to monitor and anticipate potential disasters. The methodology focuses particularly on forecasting drought events in advance, with the aim of mitigating their impact on the agricultural sector.

In terms of water assessment, several modelling studies provide valuable insights into water availability and usage across the country. These include outputs from modelling reports produced by NRERI-MONRE under a World Bank-supported project, analytical results from the MRC Council Study, findings from a joint Lao–Vietnamese initiative under an IUCN project, and the Rapid Initial Assessment of the State of Water Resources in the Lao PDR, conducted by eWater.

Collectively, these resources offer comprehensive basin-level overviews of water availability and utilization in 14 key river basins throughout the Lao PDR..

In summary, based on the defined indicators and timelines, one activity has been completed and six are currently on track. As such, this strategic goal is on course to be fully achieved according to the proposed indicators.

Strategic Goal III: Protection and restoration of water and water resources

Strategic goal III focuses on the protection of the natural resources within the catchment areas to ensure their abundance, enhance local livelihoods of the people in the catchment area, and conserve biodiversity that is important at the regional and international level. This goal contributes to economic, social and environmental development in a green and sustainable manner. At the same time, it also promotes the restoration of forests, ecosystems, and habitats to safeguard local aquatic species and populations. This strategic goal comprises of four outcomes, five outputs and fifteen activities, as outlined below:

Outcome 1: Abundant river basins are protected and degraded river basins are restored	
Output 1: Define criteria for catchments that are still rich or degraded	
Activity 1: Identify the catchment criteria that are still abundant or degraded	not yet started
Activity 2: Identify conservation zones for water and water resources	not yet started
Outcome 2: High-value wetland is protected	
Output 1: Protect wetland and peatland	
Activity 1: Develop and update legislation on the management of wetlands and peatlands	Completed
Activity 2: Develop and implement a management plan for wetland, peatland, including areas near the Ramsar sites	On track
Activity 3: Determine boundaries of protected areas and land use areas around wetlands according to the Ramsar Convention	Completed
Activity 4: Mark and install signs on the wetlands	Completed
Activity 5: Encourage and promote activities to improve the living conditions of the people in the wetland	On track
Outcome 3: Restore forests in the river basin and riverside areas	
Output 1: Manage the protection and restoration of forests in the river basin and riverside areas	
Activity 1: Survey and identify forest protection areas in the river basin and riverside areas	On track
Activity 2: Develop and implement a management plan to protect and restore forests in the river basin and riverside areas	On track
Outcome 4: Restore water and water resources	
Output 1: Manage the river flow to protect the environment	
Activity 1: Develop a technical guideline for determining minimum flow	Completed
Activity 2: Study and determine the minimum flow	On track
Output 2: Water pollution is controlled	
Activity 1: Investigate sources of water pollution and assess water quality	On track
Activity 2: Develop and improve wastewater treatment systems including promoting the use of treated water for reuse	On track
Activity 3: Develop and implement a plan to control water pollution, such as from urban, industrial and mining sources	On track
Activity 4: Develop regulations on water pollution control	Completed

Under MONRE, there have been significant achievements against the defined indicators in the 2021-2025 Action Plan. These include the issuance of key legislative instruments such as the decree on the river basins and reservoirs management, the decree on wetlands, the agreement on the conservation zone for water and water resources, the agreement on water quality management and wastewater release, and the technical guideline for determining minimum flow in a river basin.

Further progress is reflected in 2024-2025 workplan, which includes:

- Development of a national strategy for wetland management;
- Finalization of the agreement on determining minimum flow in river basins;
- Continued implementation of the master plan for the national demonstration park for integrated water resources management (IWRM) in Nam Po, Vang Vieng District, Vientiane Province;
- Development and implementation of a demonstration site for IWRM in the southern region;
- Dissemination and implementation of the agreement on water resource conservation zones (2025);
- Dissemination and implementation of the agreement on water quality management and wastewater discharge (2025);
- Dissemination and implementation of the agreement and technical guidelines on minimum flow determination (2025);
- Dissemination of the agreement on flood, drought, and drainage management (2025);
- Dissemination of the wetlands decree (2025);
- Dissemination of the national wetland management strategy (2025);
- Water quality monitoring, risk assessment, and inspections in various river basins (2025).

Forest restoration and protection are also included in the river basin management plan. However, implementation under the Ministry of Agriculture and Forestry (MAF) has encountered significant challenges. These include limited law enforcement capacity on forestry policies and strategies, increasing pressure on sustainable forest use and insufficient livelihood alternatives for rural ethnic communities. Although the national forest cover target is set at 70% by 2025, the current coverage remains at 62%. Deforestation and forest degradation continue due to weak policy frameworks, high market demand for timber and agricultural products, and limited community involvement in forest management. In response, MAF has prioritized the enforcement of Decree No. 11/PM, issued by the Prime Minister's Office, to address widespread violations of forestry laws. The decree emphasizes forest protection by discouraging agricultural encroachment and illegal logging.

Regarding wetland management, Lao PDR is home to extensive wetland, with major areas located in Savannakhet, Champasak, and Vientiane Capital. Among these, Beung Kiet Ngong and Xe Champhone are designated Ramsar sites. The wetlands decree (No. 350/Gov) was developed and endorsed by the government of the Lao PDR on 13 November 2023, followed by the development and approval of two Ramsar site management plans for Beung Kiet Ngong and Xe Champhone in 2023. However, similar management plans are still needed for other key wetlands such as That Luang, Siphadone, and Nam Theun.

Water pollution control is another critical component of this strategic goal. The government of the Lao PDR places strong emphasis on regulating community wastewater discharge into rivers. A comprehensive framework of laws, regulations, and technical guidelines governs pollution control across sectors. Domestic wastewater, which is high in COD, nutrients, and faecal coliforms, is the leading source of surface water pollution. Agricultural runoff contributes diffuse pollution through excessive use of fertilizer and pesticide. Industrial wastewater varies significantly depending on inputs and processes, but commonly contains heavy metals, oil, and grease.

All individuals, legal entities, and organizations with a business operating license are required to obtain environmental permits and comply with water use and wastewater discharge regulations. Despite this, many industries discharge untreated wastewater directly into surface waters such as ponds and rivers. Most ponds lack proper lining, allowing contaminants to leach into groundwater. While large industries such as Beer Lao, Coca-Cola, Sun Paper, and some mining operations operate treatment facilities, small factories have ponds for industrial effluent disposal but often lack adequate infrastructure.

There have been notable advancements in wastewater treatment and management project. For instance, the Decentralized Wastewater Treatment Solutions (DEWATS) system was introduced through ADB-financed projects led by Department of Water Supply within the Ministry of Public Works and Transport to provide cost-effective and sustainable infrastructure and sanitation systems in the Lao PDR. Another significant project is the Wastewater and Solid Waste Treatment Capacity Building Project for City Environment Improvement in Laos, which began operations in Pakse City, Champasak, in 2024. Funded by KOICA and the Global Green Growth Institute (GGGI) with an investment of USD 2.1 million, the project constructed four decentralized wastewater treatment plants and one city-level excrement treatment facility. With a total treatment capacity of 770 cubic meters per day, the system is expected to benefit approximately 9,000 residents. The government aims to replicate this model in other cities to meet the national target of treating at least 50% of urban and community wastewater by 2030.

In summary, based on the indicators and timelines, six activities under this strategic goal have been completed, six are on track, one is delayed and partially completed, and two have not yet started. Therefore, MONRE must prioritize the delayed activity related to wetland management, along with the two pending activities:

1. *Identification of catchment areas that are still abundant or degraded (Outcome 1, Output 1, Activity 1);*
2. *Identification of conservation zones for water and water resources (Outcome 1, Output 1, Activity 2).*

Focusing on these areas is essential to ensure full achievement of this strategic goal.

Strategic Goal IV: Groundwater Management

Strategic Goal IV aims to protect and restore groundwater resources to ensure their long-term abundance, particularly for communities located far from surface water sources. This goal contributes to sustainable socio-economic development and environmental conservation in alignment with green growth principles. It encompasses one outcome, three outputs, and ten activities, as outlined below.

Outcome 1: Ensure effective groundwater management and utilization	
Output 1: Develop and improve legislation related to groundwater	
Activity 1: Issue water use permission for the use of groundwater	On track
Activity 2: Develop and improve legislation on groundwater management	Completed
Activity 3: Develop a technical guideline for groundwater management	not yet started
Output 2: Study, survey data and develop a groundwater management plan	
Activity 1: Survey, collect data and register groundwater throughout the country	On track
Activity 2: Identify risk zones for groundwater quantity and quality	not yet started
Activity 3: Develop a report on the groundwater profile in Lao PDR	Completed
Activity 4: Develop and implement a groundwater management plan	On track
Output 3: Manage the use of groundwater	
Activity 1: Monitor and inspect drilling of groundwater services throughout the country	On track
Activity 2: Make an inventory for a list of operators of groundwater drilling services at nation level	On track
Activity 3: Monitor and evaluate the use of groundwater throughout the country	On track

Key achievements to date include the issuance of the Agreement on Water Use (No. 6118/MONRE, dated 29 November 2022), which encompasses provisions for groundwater use and management, and the completion of the National Groundwater Profile in July 2023. In addition, groundwater management plans have been developed for six provinces—exceeding the original indicator target of four provinces.

In 2025, the Department of Water Resources (DWR), under MONRE, will continue to implement and support the following initiatives:

- Dissemination and implementation of the 2022 Water Use Agreement (including groundwater provisions) and the 2019 Groundwater Management Agreement;
- Technical assistance to Provincial and District Offices of Natural Resources and Environment (PONRE and DONRE) for implementing groundwater management plans in six provinces: Sekong, Vientiane Capital, Savannakhet, Salavan, Vientiane Province, and Champasak;
- Support for PONREs in developing draft groundwater management plans in Xieng Khouang, Houaphan, Xaysomboun, Luang Prabang, Bolikhamxay, and Khammouane provinces

In summary, based on the defined indicators and timelines, two activities have been completed, six are currently on track, and two have not yet been initiated. To ensure full achievement of this strategic goal, MONRE must prioritize the following pending activities:

1. ***Development of a technical guideline for groundwater management (Outcome 1, Output 1, Activity 3);***
2. ***Identification of risk zones for groundwater quantity and quality (Outcome 1, Output 2, Activity 2).***

Strategic Goal V: Development of infrastructure related to water use to cope with climate change

Strategic Goal V focuses on the development and improvement of water-related infrastructure to enhance its efficiency, multifunctionality, and climate resilience. The objective is to ensure long-term, sustainable access to water for various purposes—including domestic use, agriculture, livestock, energy, industry, transportation, education, healthcare, and tourism—while supporting food security, mitigating the impacts of floods and droughts, and maximizing societal and national benefits. A key emphasis is also placed on ensuring equitable access to clean, sufficient, and affordable water to promote public health and reduce poverty.

This goal comprises four outcomes, seven outputs, and 23 associated activities, as detailed below:

Outcome 1: Infrastructure related to water use is improved and used efficiently and effectively	
Output 1: Improve the irrigation system to be more efficient	
Activity 1: Assess the effectiveness of the existing irrigation system	not yet started
Activity 2: Improve the irrigation system to be able to use water efficiently	On track
Output 2: Study the feasibility of using the water in the reservoir for multiple purposes	
Activity 1: Study the possibilities and options for using water reservoirs for many purposes such as consumption, industry, energy, transportation, tourism, irrigation, etc	not yet started
Activity 2: Develop a plan to use the water in the reservoir for multiple purposes	Completed
Activity 3: Develop a model to allocate the use of water in the reservoir for multiple purposes	Completed
Activity 4: Develop a network to exchange information and discuss between hydropower dams across the country and the public and private sectors in water management and water use plans for each dam	On track
Output 3: Manage the use of groundwater	
Activity 1: Develop regulations on urban drainage management	not yet started
Activity 2: Promote community participation in urban drainage	not yet started
Outcome 2: Ensure the use of infrastructure related water for a sustainability	
Output 1: Design and build infrastructures to be suitable and resistant to climate change that may occur in the future	
Activity 1: Assess the risk and vulnerability of the water infrastructure to climate change with the aim of improving the infrastructure	Completed
Activity 2: Training for provinces and districts to assess the risk and vulnerability of water infrastructure to climate change to improve such infrastructure	Completed

Output 2: Design dams and manage reservoirs to ensure safety	
Activity 1: Assess flood and drought risk in the downstream of the reservoir, including flood-drought risk identification and mapping	Completed
Activity 2: Check the safety of the reservoir of the dam	On track
Activity 3: Develop dam safety standards	Completed
Activity 4: Establish a National Water Management Center	Completed
Activity 5: Establish an early warning center	Completed
Outcome 3: Infrastructure that provides clean water has been developed and improved so that people can use it widely	
Output 1: Create and implement a water supply infrastructure investment plan	
Activity 1: Survey, collect data and assess water shortages and suitable areas for building water supply infrastructure in urban and rural areas	Completed
Activity 2: Develop and implement an investment plan for water storage infrastructure and water supply in urban and rural areas	On track
Activity 3: Develop a manual of technical standards for the construction of small-scale water infrastructure	On track
Activity 4: Encourage the relevant sector to provide water to the people	On track
Outcome 4: Water use is managed and monitored	
Output 1: Manage and monitor water use	
Activity 1: Develop and improve regulations on water use	Completed
Activity 2: Allocate the use of water in the river basin	On track
Activity 3: Develop a plan of water use and water use permission for medium and large water use sectors and business units	On track
Activity 4: Issue water use permission and monitor water use	On track

This strategic goal is contributed by the implementation of various line-ministries, including MONRE, MAF, MPWT, and MEM, with support from development partners and stakeholders.

Energy Sector

For the energy sector, the guidelines for the dam safety in Laos was available in 2018 under the support from World Bank through Entura and Asian Institute of Technology (AIT). In addition, The Dam Safety and Institutional Assistance in Lao PDR (DSTIA) project, funded by the Swiss Agency for Development and Cooperation (2022–2026) and implemented by Helvetas in partnership with MEM, aligns with the Law on Dam Safety (2022) and supports Lao PDR's goal of sustainable, safe hydropower development as outlined in the 9th National Socio-Economic Development Plan (2021–2025) and MEM's five-year plan.

For the energy sector, the guidelines for the dam safety in Laos was available in 2018 under the support from World Bank through Entura and Asian Institute of Technology (AIT). In addition, The Dam Safety and Institutional Assistance in Lao PDR (DSTIA) project, funded by the Swiss Agency for Development and Cooperation (2022–2026) and implemented by Helvetas in partnership with MEM, aligns with the Law on Dam Safety (2022) and supports Lao PDR's goal of sustainable, safe hydropower development as outlined in the 9th National Socio-Economic Development Plan (2021–2025) and MEM's five-year plan.

In addition to the efforts of the Government of the Lao PDR, the *MRC's Preliminary Design Guidance for Proposed Mainstream Dams in the Lower Mekong River Basin (PDG)* was updated in 2022 to support the dam design, including the safety consideration. In addition, a joint project between the MRC and the U.S. Army Corps of Engineers (USACE) has been launched to promote institutional knowledge sharing on dam safety and risk management. This initiative, which combines meetings, consultations, workshops, and training sessions, will be implemented from 2024 to 2026. It aims to enhance the efficiency and effectiveness of the MRC's risk management portfolio through capacity building and direct technical assistance.

In the context of multi-purposes for reservoirs, the study of the possibilities and options is still not available neither from MEM nor from MONRE. However, some large dams such as Xayaburi, Nam Ngum 1, and Nam Theun 2 have served as multi-purpose operations, not only for energy production but also for water supply, and flood and drought mitigation. While some hydropower project data is publicly available on the EDL-Gen website, more detailed information is shared internally among line ministries, particularly between MEM and MONRE, to improve water management at both the reservoir and river levels. However, this collaboration and data-sharing practice should be further strengthened in the future.

Agricultural and Irrigation Sector

In agricultural and irrigation sector, a national assessment of irrigation system efficiency is lacking, with the last update from the MRC's 2018 database. However, there are some projects on the improvement of irrigation systems such as the projects in the three central provinces of Vientiane Capital, Bolikhamxay and Khammouane supported by the Asian Development Bank (ADB), which support the Government to implement the National Water Management Strategy and Action Plan 2030, the Agriculture Development Strategy to 2025 and Vision to the Year 2030, and the National Nutrition Strategy to 2025. The government recognizes that floods and drought must be addressed concurrently to increase water supply for crop diversification, limit the destructive impact of flooding and to ultimately improve nutrition. The Agricultural Development Strategy to 2025 and Vision to 2030 prioritizes irrigation development to support the production of both wet and dry season crops. The flood and drought mitigation and management project under the lead of the department of irrigation, MAF, starting from 2024 will (i) invest in flood protection works; (ii) invest in irrigation scheme modernization; (iii) develop climate resilient cropping systems that will strengthen food security and improve farm household incomes; (iv) reduce the impact of climate variability through access to timely and concise information for decision-making; and (v) improve the nutrition awareness of farming communities.

Water Transport Infrastructure

Infrastructure development includes rehabilitation and maintenance and facilities of water transport along the Mekong and Meuang rivers in the vicinity of borders including river ports, navigation canal and riverbanks protection. The Development plan and improvement of ports related to navigation canal along the Mekong River objective is to accommodate 300-500 tons cargo ships. Progress includes:

- Completion of 5 riverbank protection projects in total 3.38 km.
- Construction of 5 riverbank protection projects along the Mekong at Champasak, Vientiane capital, Xay district, Pakkading district and other urban areas.
- Projects for the riverbank protection construction, which was completed in 2023, there are 3 projects, total length 7.74km.

For outcome 4, DWR-MONRE is working on

- Develop technical guidelines for issuing water use permission.
- Review and recommend the development of water use management plans and issue water use licenses for various water development projects.
- Issue licenses for the establishment of water and water resource consulting service companies.

Water Supply Sector

Regarding the water supply activity, several projects are implemented by the MPWT, including:

- Water supply and sanitation sector project under the support of ADB (2013-2023)
- Infrastructure Resilience Project to climate change and disasters resilience in remote areas and towns of Lao PDR in 2017-2023 under the support of the UN-Habitat water supply plants expansion project in Vientiane Capital and Luang Prabang by JICA in 2019-2024.

This project improved the performance of provincial water utilities and expanded access to safe piped water supply and sanitation for urban residents in small towns in Lao PDR. The project also contributed to the government's urban sector targets - 90% coverage for piped water supply and 100% coverage for sanitation by 2030 by improving sector coordination and policy implementation in corporatization, improving nonrevenue water management and expanding water supply in provincial towns, developing new water supply systems in small towns, enhancing community action in urban water supply and sanitation and strengthening capacity for project implementation and operation and maintenance.

The cross-cutting works among concerned line-ministries are also with climate change vulnerability and resilience. The national strategy on climate change towards 2030 with the decree No. 98/PM, was endorsed on 24 February 2023, which provides outlines for actions, projects/activities to deal with climate change in various dimensions and the implementation of its strategy will also contribute to the implementation of the strategy on water resources management and IWRM Action Plan. Some capacity building activities are provided by MONRE, MPWT, and MAF for the governmental officials at central and local levels regarding the assessment of infrastructure and climate change resilience topics.

In summary, out of 23 activities under this strategic goals, 10 activities have been completed, 9 activities are currently on track, and 4 activities have not yet started. The pending activities includes:

- ***Assessment of irrigation system effectiveness (Outcome 1, Output 1, Activity 1 – ministry of forestry and agriculture),***
- ***Feasibility study for multi-purpose reservoir use (Outcome 1, Output 2, Activity 1 – ministry of energy and mines),***
- ***Development of urban flood drainage regulations and community engagement (Outcome 1, Output 3, Activities 1 and 2 – ministry of public works and transport).***

To fully achieve the strategic goal, the responsible ministries must initiate and continue implementation in the upcoming action plan cycle.

Strategic Goal VI: Creating a financial mechanism

Strategic Goal VI aims to establish a financial mechanism that supports water and water resource management. It focuses on researching and developing mechanisms to generate and allocate revenue from various sources—such as water usage fees, royalties, pollution and rehabilitation fees, and ecosystem service charges—as well as mobilizing funding from domestic and international sources. This strategic goal comprises one outcome, one output, and three activities, as outlined below:

Outcome 1: A sustainable financial mechanism to serve in water and water resource management and ensure the sustainability of river basin management planning	
Output 1: Strengthen and develop a sustainable financial mechanism	
Activity 1: Develop a sustainable financial mechanism for water and water resources management	delayed but can be completed
Activity 2: Research and Develop legislation on water use fees, penalty on the damage to water and water resources and ecosystem costs	Completed
Activity 3: Monitor the implementation of the collection of water obligations	On track

MONRE, in collaboration with relevant ministries, is working to enhance fiscal revenue collection by strengthening the technical revenue base of the natural resources and environment sector. This includes improving the management and collection of fees and service charges—particularly those related to water use permits, wastewater discharge from industrial and residential sources, aviation information services, and establishing a land transaction service unit to generate revenue.

In alignment with key regulatory frameworks, including:

In alignment with key regulatory frameworks, including:

- Presidential Decree on Fees and Service Charges No. 002/PM (dated 17 June 2021),
- Agreement on Water Quality Management and Wastewater Discharge No. 1430/MONRE (dated 7 July 2023),
- Agreement on River Basin Management No. 0957/MONRE (dated 16 May 2023), and
- Action Plan for Improving Technical Revenue Management Mechanisms No. 5065/MONRE (dated 30 September 2022),

The MONRE is working with other line-ministries on various tasks as below:

- Develop guidelines for collecting wastewater release fees from industrial plants and guidelines for collecting wastewater release fees from households.
- Improve the mechanism of monitoring budget obligations, monitoring the implementation of environmental management plans and river basin management plans of investment projects into a complete system.
- Create environmental obligation notices for 190-300 companies.
- Coordinate to notify the total amount of water reservoir management obligations for 9 hydropower projects.
- Focus on solving the leakage of fiscal revenue collection, setting the collection mechanism and regulations to be transparent and appropriate to the actual behavior.
- Develop guidelines for the collection of income, fees and service charges in accordance with the Decree 002/PM.
- Raise the effectiveness of the management of expenses related to many tasks and take serious measures to save costs by developing guidelines on determining budget expenditures for catchment management plans of hydropower projects.

In summary, according to the defined indicators and timelines, one activity has been completed, one is on track, and one is delayed (originally targeted for 2023). However, the delayed activity is expected to be completed by 2025. Therefore, this strategic goal remains achievable within the proposed timeframe.

Strategic Goal VII: Human Resource Development

This strategic goal focuses on enhancing integrated water catchment management, information systems, groundwater management, the protection and restoration of water and water resources, infrastructure development related to water, and international cooperation. It aims to build the capacity of relevant stakeholders at both central and local levels, enabling them to become experts in specific fields. The goal also emphasizes awareness-building and encouraging public participation through coordinated implementation with various partners.

This strategic goal includes **2 outcomes, 3 outputs,** and **9 activities**, as outlined below:

Outcome 1: Staff at the central and local levels have a higher capacity to manage water and water resources	
Output 1: Assess and develop a personnel development plan in water management and water resources	
Activity 1: Assess the capacity of central and local personnel in water management and water resources	Completed
Activity 2: Develop a personnel development plan in water management and water resources	Completed
Output 2: Strengthen the capacity in water management and water resources	
Activity 1: Provide trainings on water and water resources management such as river basin management planning, water resource assessment, flood and drought management, groundwater management, water quality management and wetland and peatland management	Completed
Activity 2: Integrate and develop a water and water resources management curriculum for teaching and learning at each academic level such as primary, secondary, college and university	Completed
Activity 3: Promote research on various topics related to water and water resources	On track
Activity 4: Integrate gender roles in water and water resources management	On track
Outcome 2: Society and communities are aware with the participation in water and water resources management	
Output 1: Raise awareness and promote the participation of society in management, protection, development and restoration of water and water resources	
Activity 1: Disseminate the importance of wetlands, peatlands and wetlands according to the Ramsar Convention	On track
Activity 2: Raise awareness and disseminate the work of water and water resources management to all parts of society and people	On track
Activity 3: Celebrate National Water Day, World Water Day, World Wetland Day, World Peatland Day and other important days every year	On track

This strategic goal aligns with the MONRE personnel workplan, particularly in capacity building for staff at both national and local levels, and in public awareness-raising. Capacity development has been incorporated into the approved river basin and groundwater management plans.

The water resource management curriculum has been mainstreamed into higher education in Laos, particularly at the Faculty of Water Resources. Broader topics related to the environment and climate change have been integrated into the Faculty of Environmental Science.

The activities under this strategic goal are expected to continue as part of routine implementation in the **2026–2030 Action Plan.**

In summary, according to the indicators and timelines, there are 4 activities completed, 5 activities on track. Therefore, this strategic goal can be completed based on the proposed indicators.

Strategic Goal VIII: International cooperation

This strategic goal focuses on enhancing cooperation with foreign countries, regional and international organizations, and implementing international conventions and agreements related to the management and use of water and water resources to which the Lao PDR is a party.

This strategic goal includes **1 outcome**, **3 outputs,** and **5 activities**, as outlined below:

Outcome 1: Cooperate more with riparian countries, regional and international organizations on water and water resources management	
Output 1: Bilateral cooperation with neighboring, regional and international countries with potential in water and water resources management	
Activity 1: Cooperate with countries and international organizations in managing water resources	On track
Output 2: Implement international conventions and agreements related to water management and water resources	
Activity 1: Study and research on the participation in international conventions and agreements on water and water resources	On track
Activity 2: Implement international conventions and agreements such as the Mekong Agreement 1995, the Ramsar Convention, the Biodiversity Convention	On track
Output 3: Cooperate the management of transboundary river basins	
Activity 1: Assess the river flow of transboundary river basins of Sekong, Nam Ma, Nam Neun and Nam Sam	On track
Activity 2: Manage transboundary river basins such as Mekong, Sekong, Nam Ma, Nam Sam, Nam Neun and Nam Nua	On track

Currently, there are no specific performance indicators assigned to this strategic goal. However, the activities are guided by routine mandates and international commitments of the Government of the Lao PDR, including cooperation within frameworks such as ASEAN, MRC, LMC, WMO, GWP, PEMSEA, and bilateral partnerships. These activities are expected to continue under the 2026–2030 Action Plan.

In summary, all 5 activities are currently on track, indicating that this strategic goal is progressing well and can be considered achievable based on the intended outcomes.

3.2. Outlook of Implementation Progress and Challenges

Based on the assessment of strategic goals outlined in the previous section, the overall implementation progress of the IWRM Action Plan 2021–2025 is summarized in table below.

Table 3. *Summary of implementation status*

Strategic Goal#	Total Activities	Completed	On track	Pending (Delayed/Not yet started)
Strategic Goal I	11	3	6	2
Strategic Goal II	7	1	6	0
Strategic Goal III	15	6	6	3
Strategic Goal IV	10	2	6	2
Strategic Goal V	23	10	9	4
Strategic Goal VI	3	1	1	1
Strategic Goal VII	9	4	5	0
Strategic Goal VIII	5	0	5	0
Total	**83**	**27**	**44**	**12**

Detailed assessment of each activity of the Action Plan 2021-2025 can be found in Annex 4.

Key Implementation Challenges

Despite substantial progress in several strategic areas, the implementation of the IWRM Action Plan has faced multiple challenges, including:

- **Lack of an initial coordination mechanism** among relevant line ministries. Although a technical working group was established in late 2024, the absence of such a mechanism from the outset hindered cross-ministerial understanding and ownership of the Action Plan, limiting effective implementation.
- **Insufficient budget allocation,** especially at the local level. Many activities depend on cooperation and support from international development partners. Moreover, significant currency inflation since 2022 has increased the estimated costs—potentially doubling them—while national budget availability remains limited. Information related to the budget required for IWRM implementation are mentioned in the Action Plan 2021 – 2025.
- **Limited local capacity** to independently develop River Basin Management Plans (RBMPs). A shortage of skilled personnel and adequate facilities at both central and local levels continues to affect the quality and pace of IWRM implementation.
- **Inadequate dissemination of legal instruments** such as the revised Water Law, related regulations, and guidelines. As a result of budget limitations, awareness and understanding among local authorities and major water users remain low, leading to weak enforcement and inconsistent application.
- **Rising operational and maintenance costs** for telemetric hydrometeorological stations, which are vital for river monitoring, forecasting, and early warning systems. While expansion of such systems is a priority, sustainability of their operations is increasingly challenging.
- **Ongoing deforestation and forest degradation,** particularly in several provinces, pose a persistent threat. Effective enforcement of Decree No. 11/PM (dated 21 July 2023) is essential. Forest and land use management are critical to reducing the impact of disasters such as floods and droughts. Implementation of the national land use master plan is, therefore, of high importance.
- **Delays in the preparation and approval of river basin and groundwater management plans** during the 2021–2025 period. Many of these plans will require updating post-2025. In addition, due to implementation occurring at provincial and district levels, it is challenging to monitor progress without a clear monitoring and evaluation framework.

4. Recommendations for the Action Plan for 2026-2030

Picture Don Klang, Muang Phuong, Laos
Source: www.shutterstock.com

Based on the scope of the current strategy and the implementation progress of the 2021–2025 Action Plan, the next phase (2026–2030) should prioritize the completion of pending activities, particularly those under the responsibility of MONRE and its associated line ministries. In addition, several key recommendations have been identified to strengthen the upcoming Action Plan, as summarized in **Table 4** below:

Table 4. *Recommendations for the Action Plan 2026-2030*

Strategic Goal	Possible Key Works for Next Action Plan
Strategic Goal I: Integrated River Basin Management	• **Continue disseminating** legislation and technical guidelines on water resources management to **local authorities**, including **central and local governments** and the **private sector**, in collaboration with **MICT**. Engage **national academic institutions** to support public awareness on land and environmental issues. • **Develop and implement** river basin profiles and **RBMPs** for **medium- and small-sized basins,** with responsibility at **provincial and district levels**. Develop and implement the river basin profiles and RBMPs for remaining medium- and small-sized river basins as the responsibilities of provincial and district levels. • **Implement and update** the RBMPs for 14 large river basins every five years, as per the Water Law. • **Strengthen coordination mechanisms** among **line ministries** and the **private sector** for monitoring and evaluation. A regular meeting, at least one time per year, should be organized to report the sectoral progress and discuss on the implementation of the Action Plan. This can be integrated into the existing sub-sector working group meeting for water resources. In addition, the coordination between central and local authorities must be strengthened.
Strategic Goal II: Management of data-information systems and assessment of water and water resources	• **Upgrade the Lao-WIS** into a **comprehensive modern system** for **water balance, water use registration, water allocation, and water permitting,** to assist the implementation of water resources management nationwide. • The integration of various servers of hydrometeorological stations should be made with the **enhancement of the monitoring and forecasting tools**. In connection, the ongoing enhancement of forecasting tools in the MRC (short, medium and long terms) will provide the opportunity for Laos, as its member country, to make use of the upgraded forecasting platform in the national level. • Continue to **maintain** the existing stations and **expand** new stations as the plan. • **Apply the modelling tools for the water assessment** with various development and **climate change scenarios** to support the management and planning in a particular river basin considering **flood and drought risk areas.**

Strategic Goal	Possible Key Works for Next Action Plan
Strategic Goal III: Protection and restoration of water and water resources	• Continue to **develop and implement the wetland management plans** in the remaining sites. • Continue to **restore and protect forests in upper watershed and riverside** in a river basin including the implementation of the **carbon credit activities.** • Determine the **minimum flow for downstream** of the development projects and other significant environmental areas. • **Monitor and prevent water pollution.**
Strategic Goal IV: Groundwater Management	• Continue to **develop and implement the groundwater management plans** in other provinces. • Continue to collect the **data and information of groundwater users** and provide the permission with **regular monitoring** on the uses.
Strategic Goal V: Development of infrastructure related to water use to cope with climate change	• **Collaborate** with **line ministries** to implement the **Climate Change Strategy to 2030**, focusing on **risk assessments, water supply, and multi-purpose reservoirs.** • **Integrate actions** from the **Climate Change Strategy, IWRM Vision 2040**, and **Water Resources Strategy 2030** into the next Action Plan. • **Implement** the **Early Warning for All (EW4All) Roadmap 2024–2027**, led by **DMH-MONRE**, to support **early warning systems.**
Strategic Goal VI: Creating a financial mechanism	• Funds for the implementation of this Action Plan and water resources management in the Lao PDR is still a main challenge. **Development of a clear financial mechanism for IWRM implementation** is urgently needed, **focusing on the approach and methodology for collecting, using and managing budgets from various financial sources**, such as governmental budget, contributions from international organizations, fees received from the developers and main water users, and penalties.
Strategic Goal VII: Human Resource Development	• Provide more training to **the central and local authorities** for relevant topics related to water resources management. • Enhance the **knowledge and capacity** of government staff and private sectors at central and local levels for accessing global funds such as GEF, GCF and others to support the implementation of IWRM related activities. • **Integrate IWRM curriculum** into the academy at primary, high school and so on. • PONRE and DONRE are the root-implementors for the river basin plans at all scales. Hence, **capacity building focusing on water assessments, management and planning for officials in district** and provincial levels is essential for planning and managing medium- and small-sized river basins as well as the groundwater management plans. • **Engage more stakeholders** in the implementation of the **Action Plan, especially for the public awareness and academic** areas.
Strategic Goal VIII: International cooperation	While no specific actions are proposed, efforts should enhance cooperation with international organizations through knowledge exchange and joint IWRM initiatives.

Considering the implementation progress and the recommendations outlined above, the formulation of the Action Plan for 2026–2030 should be accompanied by a robust monitoring and evaluation framework. This framework should include clear indicators, data validation sources and reporting requirements to support the effective tracking of implementation. Progress against the plan should be reviewed during the regular coordination meetings referenced earlier.

To improve monitoring and evaluation, measurable and specific indicators—such as quantified targets and concrete deliverables—should be established for each activity. Additionally, clearer identification of responsible implementers at both the central and local levels will enhance accountability and execution. It is also recommended that a risk assessment and risk management plan be integrated into the development of the next Action Plan to proactively address potential challenges.

In addition, for a new Action Plan 2026-2030, GWP suggests considering the guidelines from the Stage 2 process of the SDG 6 IWRM Support Programme, that can be accessed at: https://www.gwp.org/en/sdg6support/iwrm-support/stage-2-formulating-responses/stage-2-support/.

For the financial aspect, the development of innovative finance schemes, such as blue (or green) bonds, Water Funds, performance-based payments, or even less innovative schemes like water replenishment projects with the private sector, payment for environmental services, or others should be explored. A wide range of tools and case studies on such financing schemes are available on the IWRM Action Hub (see https://iwrmactionhub.org/). Additionally, insights from the Learning Journey on Financing for Water Security may offer valuable guidance (see Finance for water security through an IWRM approach).

In the design and implementation of the 2026-2030 Action Plan, it is important that partnerships are explored with relevant stakeholders and development partners, including the United Nations Country Teams (UNCTs) in the context of the United Nations Sustainable Development Framework (UNSDCF), to harness synergies and avoid trade-offs across various initiatives.

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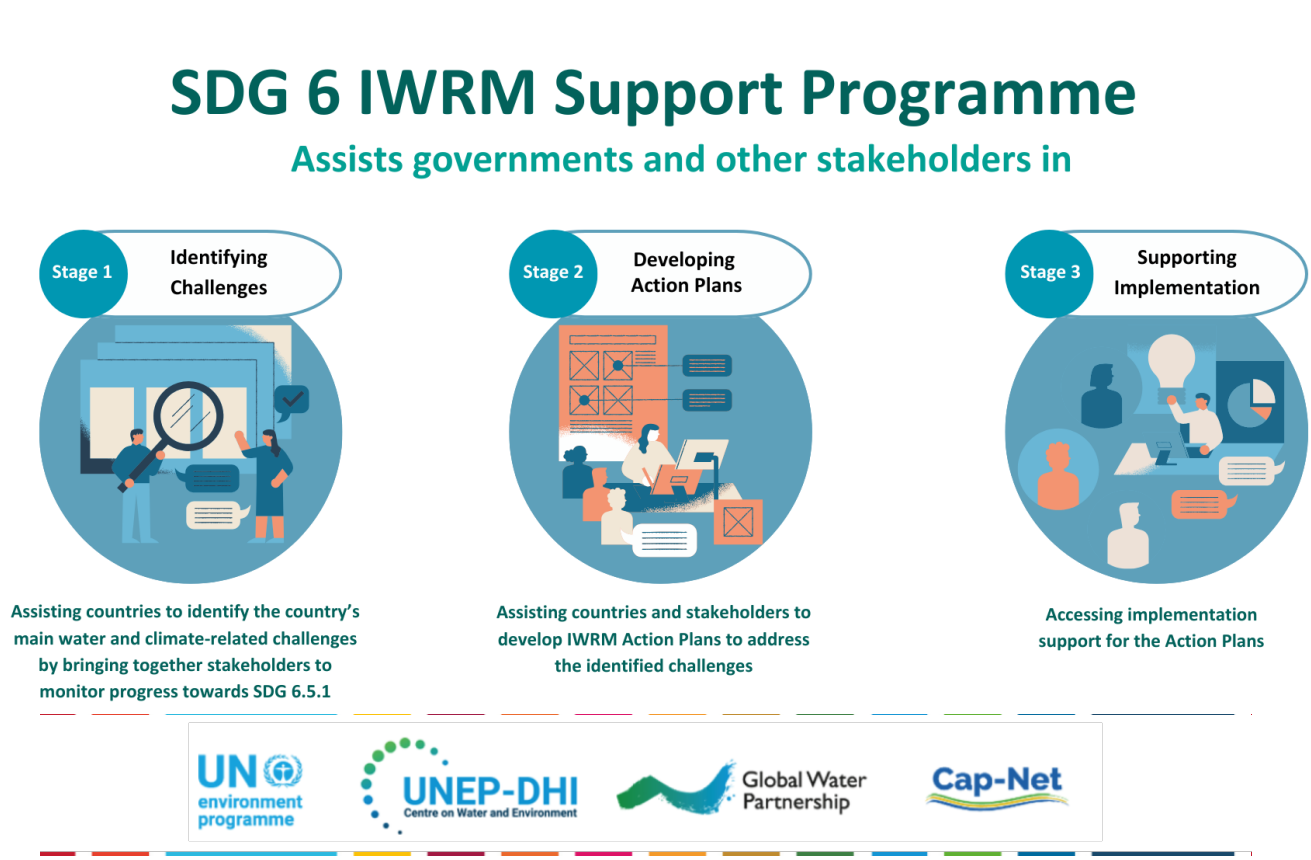
5. Annexes

Annex 1: SDG 6 IWRM Support Programme

This programme assists governments in designing and implementing country-led responses to SDG indicator 6.5.1, which measures the degree of IWRM implementation. The Support Programme aims to monitor and measurably accelerate progress towards water-related SDGs and other development goals, in direct support of the official SDG monitoring and reporting processes.

Under the guidance of the UN Environment Programme (UNEP) and coordinated by the Global Water Partnership (GWP) in collaboration with the UNEP-DHI Centre and Cap-Net, the Support Programme brings together partners in each country representing governments, civil society, academia and the private sector, in the spirit of SDG 17 "Partnerships for the Goals". The Support Programme is structured according to the following three stages:

- Stage 1 – Identifying challenges: Employ the SDG 6.5.1 national monitoring and reporting framework to identify, through multi-stakeholder consultations, critical areas for attention that hinder progress on IWRM. This Stage is completed through the periodic completion by countries of a survey on SDG indicator 6.5.1 designed to allow countries to evaluate the degree of IWRM implementation. Periodic monitoring of this indicator provides a window of opportunity to revisit and revise IWRM Action Plans.
- Stage 2 – Developing IWRM Action Plans: Using the key IWRM challenges identified in Stage 1, the aim of this stage is to facilitate a government-led multi-stakeholder process to formulate and prioritize appropriate responses to those challenges. The result of Stage 2 is typically an IWRM Action Plan (the name might be adapted for each country), which includes a series of attractive investment opportunities to systematically guide the implementation of solutions to IWRM challenges.
- Stage 3 – Implementing solutions: Support countries in implementing IWRM solutions aimed at achieving SDG 6 and other water-related goals as a measurable contribution to progress towards countries' development objectives.



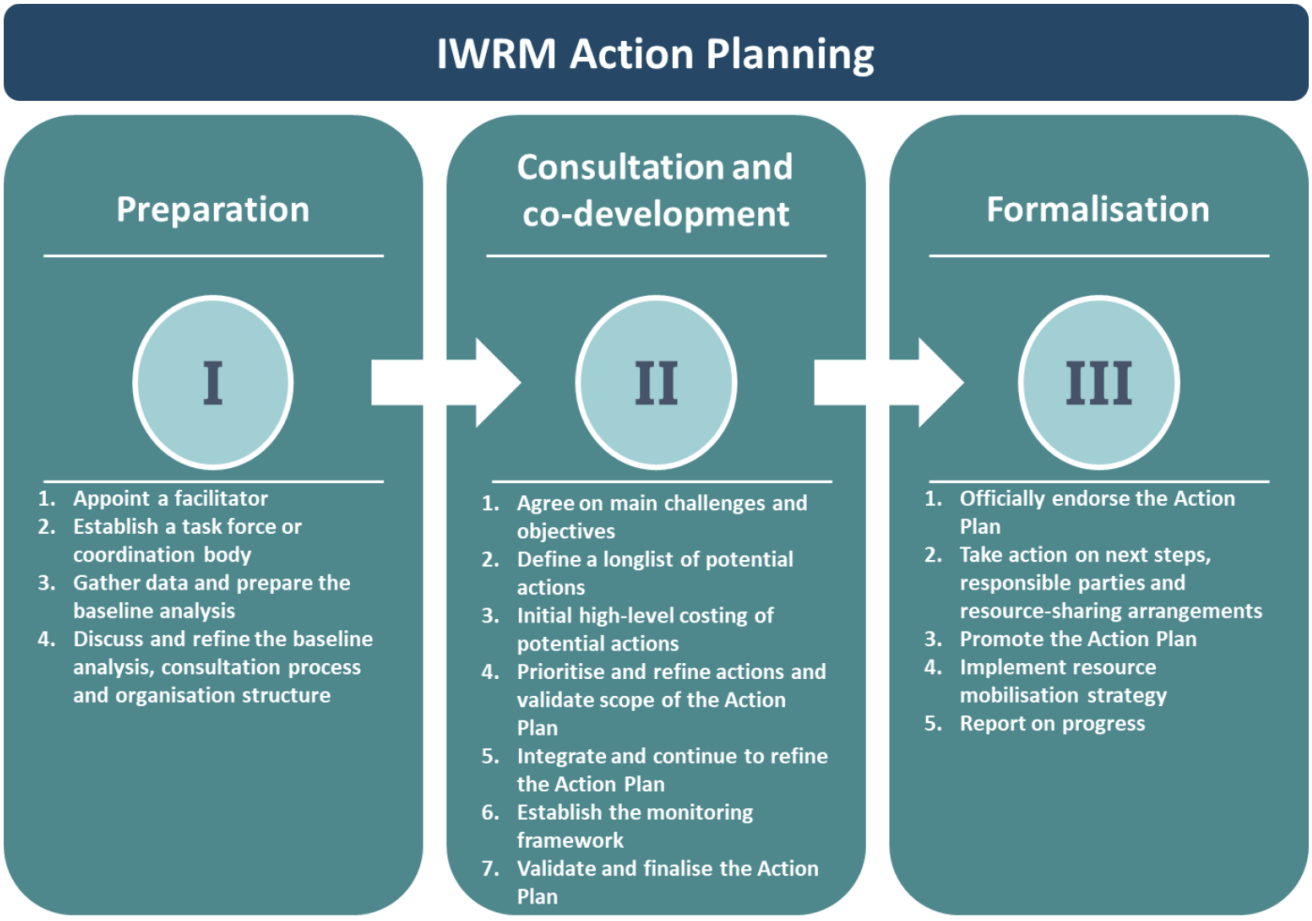


Figure 1.1. *Stages of SDG 6 IWRM support programme and the process for Stage 2: Design an IWRM Action Plan*

Annex 2: Profile of Water Resources in Lao PDR

The Lao People's Democratic Republic (Lao PDR) is a landlocked country covering about 236,800 square kilometers. About 90% of the country lies within the Mekong River basin. The country has rich and varied natural resources, including water. Total average annual available surface water resources in the Lao PDR are 272 cubic kilometers. Compared with other Asian countries, the Lao PDR has the highest per capita water availability. However, little of the national available water resources are developed. The total storage capacity of large reservoirs is about 3% of annual surface water availability, and hydropower generation is about 8% of its estimated national potential (DWR, 2008).

Optimal and sustainable use of water is critical to realize the government's strategic objectives of poverty reduction and sustainable economic growth. Water is the most vital natural resource in the Lao PDR as its sustainable management is indispensable for agriculture, energy, and mining sectors. These sectors are critical for the country's economic growth, especially agriculture, natural resources, and environment sectors, which account for more than 40% of gross domestic product (GDP) and more than 70% of employment. Rice is the country's staple crop, accounting for about 25% of GDP as well as 67% of caloric intake of rural population. About 10% of GDP comes from livestock husbandry and fisheries and 8% from forestry. Providing adequate water and enhancing the productivity of irrigation systems is important to enhancing livelihoods and reducing poverty. Sustainable farming and forestry practices are indispensable to economic growth and poverty reduction. In addition, improved water supply and sanitation contribute to poverty reduction. Investments in improved river basin management practices need to be enhanced for sustainable natural resources use so as to maintain river flows and water quality, and to reduce sedimentation loads and peak discharges.

To exploit the considerable potential of water resources without compromising the long-term quality of the environment and the well-being of local communities, the government has promoted the adoption of integrated water resources management (IWRM) since 1998. The government established the Water Resources and Environment Administration (WREA) under the Prime Minister's Office in 2007. Water sector planning, development, and management are evolving, and coordination among key agencies at the central, provincial and district levels is a challenge, which contributes to limited accessibility of water resources data and information and poor planning.

The significant increase in the percentage of the population with access to safe water, rising from 30% to 60% of the total population between 1990 and 2003, is associated with relevant reductions in the time required to meet basic water needs for many households, freeing time that is now available for education, childcare and income earning activities with important benefits also in terms of gender equality. Apart from its undeniable relevance for the many concerned households, in a context of economic growth, these benefits lead to an increase in the labour supply and therefore the productive potential of the entire economy.

In addition, the increased coverage of improved sanitation facilities (from 11% to 45% between 1990 and 2003) means an effective reduction in water-related diseases. This is association with significant improvements in the effectiveness of education, the productivity of labour and in life expectancy at birth which all contribute to increased and improved human capital, a crucial production factor in any growing economy.

Subsistence agriculture still accounts for nearly half of the gross domestic product and provides 80% of the employment as 69% of the population still live in rural areas. Nevertheless, lowlands suitable for agriculture are relatively scarce in Laos (no more than 13%, compared with 72% in Cambodia and 65% in Thailand) and without modern techniques and appropriate soil preparation, Laos' arable land is mostly suitable for rice cultivation. As a consequence, cropping still follows the natural supply of rain, being at its peak during the monsoon season and declining to less than 10% in the dry season. Food security is still heavily dependent on water supply. Improvements in health, water supply and sanitation, as well as some irrigation development, are responsible for the substantial reduction in rice shortages in most of the lowland cultivated areas of Laos. Rice pads also provide fish which is the other important protein source in rural Laos (Nessbitt et al, 2004).

Growth in population and income levels leads to an increased demand of agricultural products that, without the development of competitive products to be exchanged in the international markets, can only be satisfied by increasing local production of food. This is possible with both the above-mentioned improvements in human capital as well as the existence of abundant water resources. The increase in rice yields per hectare, due to mechanization and irrigation development, has led to higher amounts of stubble available for grazing and feeding more pigs, chickens and ducks. In terms of growth and development, this productive transformation allows food production to increase, even when part of the rural workforce is migrating to expanding urban areas. It also serves to diversify the rural economy beyond traditional subsistence, allowing for the production of market and income earning goods and integrating the rural economy into the local and international economy.

Development also comes with and is supported by an increase in energy consumption. Although Laos has only developed about 4% of its potential for hydropower, it is already recognizing the value of expanding power generation capacity and distribution networks in order to foster economic development both in rural and urban areas. It is estimated than 26 hydropower projects are under construction in the lower Mekong basin and at least 12 mainstream projects and 30 tributary dams are planned for the next 20 years, mostly in the Lao PDR. Although hydropower is the main purpose, the water storage capacity that comes with it is important for promoting development in other critical areas and particularly for providing reliable water supply for new irrigation developments (covering between 100 to 300 thousand hectares in Laos in the next 20 years), providing flood control, aquaculture, and an opportunity to develop tourism.

The potential benefits of hydropower development, for example, fishery or tourism potential in the reservoirs and the reduction of flood and drought damage are considerable. However, costs and environmental impacts also need to be recognized, in particular when these impacts are unavoidable and irreversible. Hydropower development, for example, can result in changes in sediment flows causing irreversible riverbed incision and bank erosion with some predictable impacts such as wetlands losses, impaired agricultural productivities, reduced potential of freshwater fisheries and potential impacts on marine fisheries depending on the river's nutrients loads. Understanding all costs and benefits and the associated risks of different development options is essential for agreeing on which options to adopt, the distribution of the costs and benefits, and the necessary measures to compensate or mitigate potential damages and minimize the risks.

Annex 3: IWRM principles

Integrated Water Resources Management (IWRM) has been defined by the Technical Committee of the Global Water Partnership (GWP) as "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems." IWRM is based on the three principles: social equity, economic efficiency and environmental sustainability.

- **Social equity** means ensuring equal access for all users (particularly marginalized and poorer user groups) to an adequate quantity and quality of water necessary to sustain human well-being. The right of all users to the benefits gained from the use of water also needs to be considered when making water allocations. Benefits may include enjoyment of resources through recreational use, or the financial benefits generated from the use of water for economic purposes.
- **Economic Efficiency** means bringing the greatest benefit to the greatest number of users possible with the available financial and water resources. This requires that the most economically efficient option is selected. The economic value is not only about price – it should consider current and future social and environmental costs and benefits.
- **Ecological Sustainability** requires that aquatic ecosystems are acknowledged as users and that adequate allocation is made to sustain their natural functioning. Achieving this criterion also requires that land uses and developments that negatively impact these systems are avoided or limited.

Operationally, IWRM approaches involve applying knowledge from various disciplines as well as the insights from diverse stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems. As such, IWRM is a comprehensive, participatory planning and implementation tool for managing and developing water resources in a way that balances social and economic needs, and that ensures the protection of ecosystems for future generations. Water's many different uses for agriculture, for healthy ecosystems, for people and livelihoods demands coordinated action. An IWRM approach is an open, flexible process, bringing together decision-makers across the various sectors that impact water resources, and bringing all stakeholders to the table to set policy and make sound, balanced decisions in response to specific water challenges faced.

It has been agreed to consider water as a 'finite and economic commodity taking into account of affordability and equity criteria', in order to emphasize on its scarcity in the Dublin Statement:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good, taking into account of affordability and equity criteria.

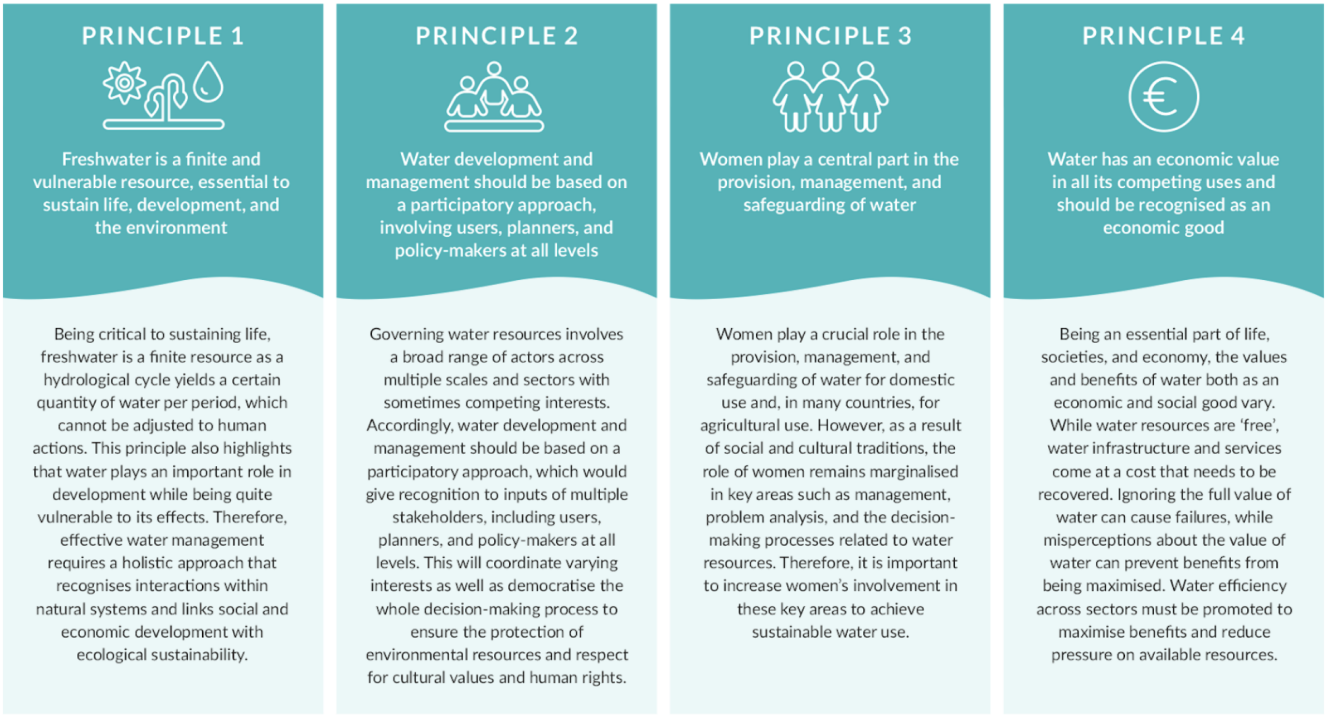


Figure 3.1. *IWRM Principles (Source: Dublin Conference, 1992)*

The action framework for implementing IWRM focuses on a four-pronged strategy (Figure 3.2). These four pillars of IWRM are interdependent, meaning that advancements in one of the pillars are not enough on their own for achieving a high degree of IWRM implementation.

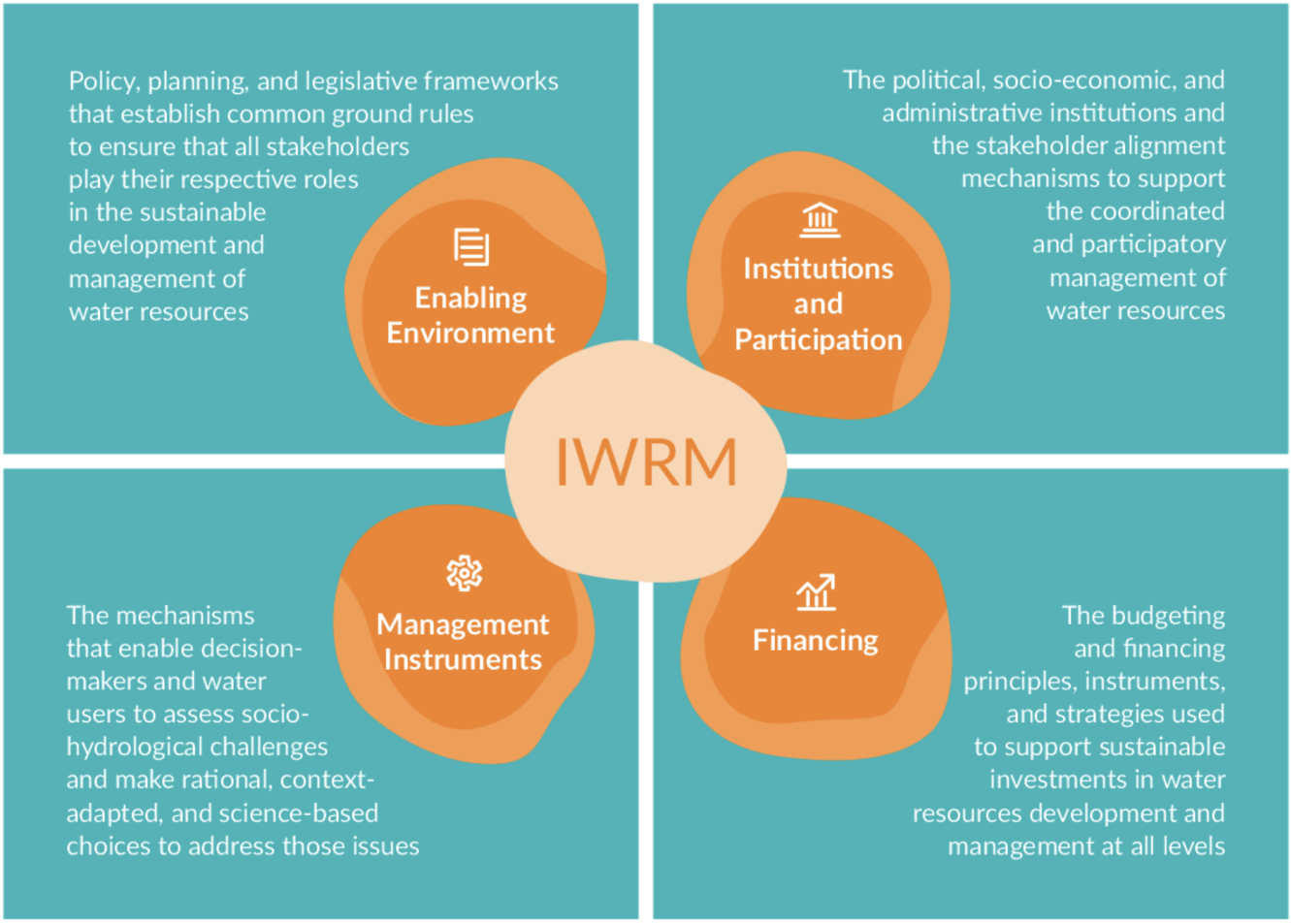


Figure 3.2. *IWRM Action Framework*

IWRM aims to create sustainable water security within the present constraints and to improve the conditions in the catchment basin. Some important conditions for implementing IWRM are presented below (Source: UN World Water Development Report 3):

- **Political will and commitment:** Political will at all levels can help unite all stakeholders and move the process forward. It is especially needed if the resulting plan or arrangement would create or require changes in legal and institutional structures, or if controversies and conflicts among stakeholders exist. Access to actors outside the water box is essential to move political will, gain sectoral support and ease public pressure for IWRM implementation.
- **Basin management plan and clear vision:** Water resources development coordinated among various sectors and users is facilitated by the preparation of a master plan that reflects the individual sector plans and offers the most effective and efficient utilization of the resource.

- **Participation and coordination mechanisms, fostering information-sharing and exchange:** The identification of key stakeholders can be facilitated through interviews and meetings. Stakeholder involvement can be defined appropriately for local conditions and improved gradually. Initial sharing of general basin-wide data and information, and further sharing of more specific information, will assist the self-sustaining system.

- **Capacity development:** Capacity development and training priorities should be expressed at all levels, including that of decentralized local government. Participants who may be adversely impacted and/or socially marginalized may be stimulated to participate within a consensus-building strategy.

- **Well-defined flexible and enforceable legal frameworks and regulation:** It is necessary to assemble and review the full range of existing laws and regulations that apply to water-related activities and determine how existing legislation adapts or can be better adapted to accommodate sustainability and integration with regard to water resources management.

- **Water allocation plans:** As water is a shared resource, water rights should be flexible in terms of allocation in order to accommodate changes. Preparing a master plan that reflects individual sector plans facilitates the coordination among various sectors and advocates the most appropriate utilization of a basin's resource.

- **Adequate investment, financial stability and sustainable cost recovery:** Coordination for IWRM implementation needs financial sustainability – such as the promotion of cost recovery – and must consider long-term management. Various combinations and roles of international financing and donors such as government grants, public resources, user charges and taxes, donor funds, basin environmental trust funds can be considered as funding options.

- **Good knowledge of the natural resources presents in the basin:** Adequate knowledge and information on the water resources inventory and human resources of the basin is desirable. Including scientists as water resource managers can help maintain and accrue sound knowledge of natural resources.

- **Comprehensive monitoring and evaluation:** Monitoring and evaluation are essential for ensuring that the current management of water resources is properly implemented, and to identify the needs for adjusting management strategies. Upgrading new technologies is vital for effective performance both of local and central water management.

Annex 4: Details of Assessment on the implementation of IWRM Action Plan 2021-2025

Strategic Goal I: Integrated River Basin Management									
Outcome 1: Develop a legislation, technical guidelines and coordination mechanisms related to river basin management in a comprehensive and implementable manner									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Develop a legislation, technical guidelines and coordination mechanism									
Activity 1	Develop and update legislation on river basin management	4 Documents	2021-2025	MONRE		completed	2 decrees and 6 agreements were developed as listed inthe and Annex 5.		
Activity 2	Develop a technical guideline on development of a river basin management plan	1 Documents	2021-2025	MONRE		completed	The technical guideline for developing a river basin management plan is developed		
Activity 3	Develop a technical guideline for developing a catchment management plan for the development project	1 Documents	2021-2025	MONRE		completed	The technical guideline for developing a river basin management plan is developed		
Activity 4	Disseminate legislation and technical guidlines on water and water resources management	20 times	2021-2022	MONRE		completed		mandatory	to support the local level, continue in the Action Plan 2026-2030
Activity 5	Review and create a coordination mechanism for the integrated river basin management	1 mechanism	2022-2023	MONRE		delayed but can be completed	improving the coordination mechanism with 21 dam operators who already signed the RBMPs; establishing the coordination for IRBM at provincial level for Oudonxay, Luang Namtha, Bokeo, Khammuoan, Luangprabang, Savannakhet, and Champasak.		
Activity 6	Organize an annual consultation meeting on integrated water resource management	5 times	2021-2025	MONRE		on track	regular annual meeting		continue in the Action Plan 2026-2030
Outcome 2: Develop and implement river basin management plans									
Output 1: Formulate the state of basin reports/river basin profiles									
Activity 1	Formulate the state of basin reports/river basin profiles	14 river basins	2021-2025	MONRE		on track	ongoing Nam Ma and Nam Neun River Basin Profiles from IUCN project		formulate the river basin profiles for medium and small-sized river basins in the Action Plan 2026-2030
Output 2: Develop the River Basin Management Plans (RBMPs) for the river basins of Lao PDR									
Activity 1	Develop the RBMPs for the large-sized river	14 river basins	2021-2025	MONRE		on track	completed RBMPs for 12 large-sized Basins as listed after the reference section; ongoing RBMPs for Nam Ma and Nam Neun		updated RBMPs in the Action Plan 2026-2030
Activity 2	Develop the RBMPs for the medium-sized river basins	3 river basins	2021-2025	MONRE		on track	working on RBMPs for 15 medium-sized basins		continue for the remaining River Basins in the Action Plan 2026-2030
Activity 3	Develop the RBMPs for the small-sized river basins	1 river basin	2021-2025	MONRE		not yet started			continue in the Action Plan 2026-2030
Activity 4	Encourage the project developers to develop and implement the catchment management plan of the hydropower project in accordance with the river basin management plan	N/A	2021-2025	MONRE		on track		mandatory	continue in the Action Plan 2026-2030
Strategic Goal II: Management of data-information systems and assessment of water and water resources									
Outcome 1: Develop a modern data-information system for water and water resources in both national and local levels, which is easy to access and can be disseminated									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Improve and expand water and water resource monitoring stations, including survey work, collect and record information on water and water resources									
Activity 1	Improve and manage the data-information system of water and water resources by ensuring that all parties have access to such data-information such as gender equality	1 system	2021-2025	MONRE		on track	ongoing-improvement of the Lao-WIS	mandatory	continue in the Action Plan 2026-2030
Activity 2	Expand meteorological and hydrological stations	14 river basins	2021-2025	MONRE		on track	expanded hydro-met stations under supports of WMO, JICA, KOICA, LMC, ADB, WB, MRC, FAO		continue in the Action Plan 2026-2030
Activity 3	Survey, collect and record information on water quantity, water quality,	entire country	2021-2025	MONRE		on track		mandatory	continue in the Action Plan 2026-2030

	water use, wetlands and peatlands throughout the country								
Output 2: Disseminate data-information on water and water resources									
Activity 1	Disseminate data-information on water and water resources throughout the country	entire country	2021-2025	MONRE		on track		mandatory	continue in the Action Plan 2026-2030
Outcome 2: Determine the current and future amount of water in the river basin									
Output 1: Assess water and water resources									
Activity 1	Assess the amount of water and water resources in the river basin	14 river basins	2021-2025	MONRE		on track	water assessment from NRESRI and MRC, IUCN project; Rapid Initial Assessment of the State of Water Resources in Lao PDR (eWater)		
Activity 2	Assess the quantity, quality of water and water resources in river basins that are not tributaries of the Mekong River, such as Nam Ma, Nam Neun, Nam Sam and others	3 river basins	2021-2025	MONRE		on track	ongoing Nam Ma and Nam Neun from IUCN project		
Activity 3	Develop a technical guideline on water quantity assessment	1 document	2021-2025	MONRE		completed	the technical guideline for determining minimum flow in a river basin is developed		
Strategic Goal III: Protection and restoration of water and water resources									
Outcome 1: Abundant river basins are protected and degraded river basins are restored									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Define criteria for catchments that are still rich or degraded									
Activity 1	Identify the catchment criteria that are still abundant or degraded	1 document	2023-2024	MONRE, MEM		not yet started			
Activity 2	Identify conservation zones for water and water resources	10 zones	2021-2025	MONRE		not yet started			
Outcome 2: High-value wetland is protected									
Output 1: Protect wetland and peatland									
Activity 1	Develop and update a legislation on the management of wetlands and peatlands	1 document	2021	MONRE, MAF	relevant stakeholders	completed	The decree on wetlands is developed		
Activity 2	Develop and implement a management plan for wetland, peatland, including areas near the Ramsar sites	3 document	2022-2023	MONRE, MAF	relevant stakeholders	on track	There are two wetland management plans for Ramsar site at Beung Kiet Ngong and Xe Champhone		continue in the Action Plan 2026-2030
Activity 3	Determine boundaries of protected areas and land use areas around wetlands according to the Ramsar Convention	3 places	2022-2025	MONRE, MAF	relevant stakeholders	completed	According to the implementation of the master plan for national land use, no. 098/NA, dated 28/06/2018		continue in the Action Plan 2026-2030
Activity 4	Mark and install signs on the wetlands	2 places	2022-2025	MONRE, PONRE, DONRE	relevant stakeholders	completed	at Beung Kiet Ngong and Xe Champhone		
Activity 5	Encourage and promote activities to improve the living conditions of the people in the wetland	entire country	2022-2025	MONRE, PONRE, DONRE	relevant stakeholders	on track		mandatory	
Outcome 3: Restore forests in the river basin and riverside areas									
Output 1: Manage the protection and restoration of forests in the river basin and riverside areas									
Activity 1	Survey and identify forest protection areas in the river basin and riverside areas	14 river basins	2021-2022	MAF	relevant stakeholders	completed	According to the implementation of the master plan for national land use, no. 098/NA, dated 28/06/2018		
Activity 2	Develop and implement a management plan to protect and restore forests in the river basin and riverside areas	2 river basins	2022-2025	MAF	relevant stakeholders	on track	integrated into a river basin management plan		continue in other basins in the Action Plan 2026-2030
Outcome 4: Restore water and water resources									
Output 1: Manage the river flow to protect the environment									
Activity 1	Develop a technical guideline for determining minimum flow	3 document	2021-2025	MONRE	relevant stakeholders	completed	the technical guideline for determining minimum flow in a river basin is developed		
Activity 2	Study and determine the minimum flow	2 locations	2021-2025	MONRE	relevant stakeholders	on track	determine minimum flow/e-flow for the downstream of dams and other projects by local authorities and the developers.		
Output 2: Water pollution is controlled									
Activity 1	Investigate sources of water pollution and assess water quality	N/A	2021-2025	MONRE	relevant stakeholders	on track	depend mainly on the reports of incidence by a case from local authorities.	mandatory	continue in the Action Plan 2026-2030
Activity 2	Develop and improve wastewater treatment systems including promoting the use of treated water for reuse	4 places	2021-2025	city development and administration authority	relevant stakeholders	on track	wastewater treatment exists in the large companies such as Beer Lao, Sun paper, Coca Cola and so on. The decentralized wastewater treatments for some towns are built but still limited.	need to engage more stakeholders for the implemen	continue for other areas in the Action Plan 2026-2030

								tation such as MONRE, MPWT, MOH	
Activity 3	Develop and implement a plan to control water pollution, such as from urban, industrial and mining sources	N/A	2022-2025	MONRE	relevant stakeholders	on track	evaluating and managing the wastewater treatment and release from 6 large industrial investors namely Wanlun cassava powder production company, Sun Paper company, Vinakha agriculture company, Crown Plaza hotel, Coca Cola company, and Beer Lao company.	mandatory	continue for other areas in the Action Plan 2026-2030
Activity 4	Develop regulations on water pollution control	N/A	2022-2025	MONRE	relevant stakeholders	completed	agreement on water quality management and wastewater release, No. 1430/MONRE, dated 07 July 2023.		
Strategic Goal IV: Groundwater Management									
Outcome 1: Ensure an effective groundwater management and utilisation									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Develop and improve a legislation related to groundwater									
Activity 1	Issue water use permission for the use of groundwater	N/A	2023-2025	PONRE, DONRE		on track		mandatory	continue in the Action Plan 2026-2030
Activity 2	Develop and improve a legislation on groundwater management	1 document	2023-2025	MONRE		completed	the agreement on water use (for both surface and groundwater) is developed		
Activity 3	Develop a technical guideline for groundwater management	1 document	2023-2025	MONRE		not yet started			
Output 2: Study, survey data and develop a groundwater management plan									
Activity 1	Survey, collect data and register groundwater throughout the country	entire country	2021-2025	PONRE, DONRE	relevant stakeholders	on track	national groundwater profile is available in July 2023; and the outputs from the groundwater management plans in 6 provinces	mandatory	continue in the Action Plan 2026-2030
Activity 2	Identify risk zones for groundwater quantity and quality	4 provinces	2021-2025	DONRE	relevant stakeholders	not yet started	but some information is available in the national groundwater profile; it can be the outputs from the groundwater management plans in 6 provinces as a basin information	mandatory	continue for other provinces in the Action Plan 2026-2030
Activity 3	Develop a report on the groundwater profile in Lao PDR	1 document	2021-2024	MONRE	relevant stakeholders	completed	national groundwater profile is available in July 2023		
Activity 4	Develop and implement a groundwater management plan	4 provinces	2021-2025	MONRE	relevant stakeholders	on track	implementing the GWMPs for 6 provinces and developing the GWMPs for other 6 provinces		continue for other provinces in the Action Plan 2026-2030
Output 3: Manage the use of groundwater									
Activity 1	Monitor and inspect drilling of groundwater services throughout the country	entire country	2021-2025	MONRE	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Activity 2	Make an inventory for a list of operators of groundwater drilling services at nation level	entire country	2021-2024	PONRE	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Activity 3	Monitor and evaluate the use of groundwater throughout the country	entire country	2021-2025	MONRE	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Strategic Goal V: Development of infrastructure related to water use to cope with climate change									
Outcome 1: Infrastructure related to water use is improved and used efficiently and effectively									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Improve the irrigation system to be more efficient									
Activity 1	Assess the effectiveness of the existing irrigation system	N/A	N/A	MAF	relevant stakeholders	not yet started	there is some information related to irrigation efficiency available in MRC database; during this Action Plan, there is no assessment found.		
Activity 2	Improve the irrigation system to be able to use water efficiently	N/A	2021-2025	MAF	relevant stakeholders	on track	Nam Houm, Houay Gnang, Hinboun Irrigation Schemes are being improved starting in 2024 under the flood and drought mitigation and management project of DOI supported by ADB. To improve the irrigation system, this requires huge budgets for structural measures. However, this is routine work and align with the national plan.	mandatory	continue in the Action Plan 2026-2030
Output 2: Study the feasibility of using the water in the reservoir for multiple purposes									
Activity 1	Study the possibilities and options for using water reservoirs for many purposes such as consumption,	1	2022-2025	MEM, MONRE	relevant stakeholders	not yet started	Nam Theun 2, Nam Ngum 1, Xayaburi are not just for energy production, but serve for flood and drought mitigation, and water		

	industry, energy, transportation, tourism, irrigation, etc.						supply. However, there is not any study for multi-purpose water use from reservoirs published by relevant ministries.		
Activity 2	Develop a plan to use the water in the reservoir for multiple purposes	1	2023-2025	MEM, MONRE	relevant stakeholders	completed	Nam Theun 2, Nam Ngum 1, Xayaburi are not just for energy production, but serves for flood and drought mitigation, and water supply.		continue for other potential reservoirs in the Action Plan 2026-2030
Activity 3	Develop a model to allocate the use of water in the reservoir for multiple purposes	3	2023-2025	MEM, MONRE	relevant stakeholders	completed	Nam Theun 2, Nam Ngum 1, Xayaburi are not just for energy production, but serves for flood and drought mitigation, and water supply.		
Activity 4	Develop a network to exchange information and discuss between hydropower dams across the country and the public and private sectors in water management and water use plans for each dam	2 times	2021-2025	MEM, MONRE	relevant stakeholders	on track	the data sharing and network among dams are initiated under MEM and MONRE		continue to improve in the Action Plan 2026-2030
Output 3: Manage urban flood drainage									
Activity 1	Develop regulations on urban drainage management	N/A	2021-2025	MPWT, MONRE	relevant stakeholders	not yet started			
Activity 2	Promote community participation in urban drainage	N/A	2021-2025	MPWT, MONRE	relevant stakeholders	not yet started			
Outcome 2: Ensure the use of infrastructure related water for a sustainability									
Output 1: Design and build infrastructures to be suitable and resistant to climate change that may occur in the future									
Activity 1	Assess the risk and vulnerability of the water infrastructure to climate change with the aim of improving the infrastructure	N/A	2021-2023	MONRE	MEM, MAF, MPWT	completed	under the implementation of the project on infrastructure development for climate change and disaster resilience in rural areas and towns of the Lao PDR, during 2017-2023, by MPWT and UN-Habitat	no implementation from MAF and MEM and reported. However, there is no clear indicator for this.	align with the strategy on climate change towards 2030, can continue in the Action Plan 2026-2030
Activity 2	Training for provinces and districts to assess the risk and vulnerability of water infrastructure to climate change to improve such infrastructure	N/A	2022-2023	MONRE	MEM, MAF, MPWT	completed	under the implementation of the project on infrastructure development for climate change and disaster resilience in rural areas and towns of the Lao PDR,		align with the strategy on climate change towards 2030, can continue in the Action Plan 2026-2031
							during 2017-2023, by MPWT and UN-Habitat		
Output 2: Design dams and manage reservoirs to ensure safety									
Activity 1	Assess flood and drought risk in the downstream of the reservoir, including flood-drought risk identification and mapping	12 river basins	2021-2025	MONRE	relevant stakeholders	completed	Flood and drought risks are included in the IRBMPs. There are the flood risks mapping available of few dams in Laos, but not in many dams, especially small dams.		continue in the Action Plan 2026-2030
Activity 2	Check the safety of the reservoir of the dam	5 times	2021-2025	MEM, MAF	relevant stakeholders	on track	annual implementation		continue in the Action Plan 2026-2030
Activity 3	Develop dam safety standards	1 document	2021-2025	MEM, MAF	relevant stakeholders	completed	new Law on Dam Safety approved in 2022, guidelines for dam safety with detailed emergency response plan		
Activity 4	Establish a National Water Management Center	1 place	2021-2025	MONRE	MEM	completed	it is located in DMH, Vientiane		
Activity 5	Establish an early warning center	2 locations	2021-2025	MONRE	relevant stakeholders	completed	NDMI: Establishment of Flood Early Warning System in Lao PDR: 4 districts of 3 provinces		can be added more if need
Outcome 3: Infrastructure that provides clean water has been developed and improved so that people can use it widely									
Output 1: Create and implement a water supply infrastructure investment plan									
Activity 1	Survey, collect data and assess water shortages and suitable areas for building water supply infrastructure in urban and rural areas	entire country	2021-2023	MONRE	MOH, MPWT	completed	under the implementation of the project on water supply and sanitation for small towns, by MPWT and ADB; and projects on the expansion of water supply plants of MPWT.		
Activity 2	Develop and implement an investment plan for water storage infrastructure and water supply in urban and rural areas	N/A	2022-2025	MONRE	MPWT, MPI, MEM, MAF	on track	under the implementation of the project on water supply and sanitation for small towns, by MPWT and ADB		continue in the Action Plan 2026-2030
Activity 3	Develop a manual of technical standards for the construction of small-scale water infrastructure	N/A	2022-2025	MONRE	MPWT, MPI, MEM, MAF	on track	there are technical guidelines such as the management and evaluation of water supply sector; dam safety, design, operate, maintenance, adjustment of fish-friendly irrigation, the management of irrigation assets.		
Activity 4	Encourage the relevant sector to provide water to the people	entire country	2022-2025	MONRE	MPWT, MPI, MEM, MAF	on track		mandatory	continue in the Action Plan 2026-2030

Outcome 4: Water use is managed and monitored									
Output 1: Manage and monitor water use									
Activity 1	Develop and improve regulations on water use	1 document	2022-2025	MONRE	relevant stakeholders	completed	The agreement for water use is developed		
Activity 2	Allocate the use of water in the river basin	1 river basin	2022-2025	MONRE	relevant stakeholders	on track	pilot with key companies, hydropower operators in Nam Ngum River Basin		continue for other river basins in the Action Plan 2026-2030
Activity 3	Develop a plan of water use and water use permission for medium and large water use sectors and business units	1 document	2022-2025	MONRE	relevant stakeholders	on track	Developing a technical guideline for issuing water use permission and a technical guideline for water use management plan		
Activity 4	Issue water use permission and monitor water use	entire country	2022-2025	MONRE	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Strategic Goal VI: Creating a financial mechanism									
Outcome 1: A sustainable financial mechanism to serve in water and water resource management and ensure the sustainability of river basin management planning									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Strengthen and develop a sustainable financial mechanism									
Activity 1	Develop a sustainable financial mechanism for water and water resources management	1 document	2021-2023	MONRE	MOF, MPI	delayed but can be completed	several documents are being developed according to the PM decree No. 002.		continue in the Action Plan 2026-2030
Activity 2	Research and Develop legislation on water use fees, penalty on the damage to water and water resources and ecosystem costs	1 document	2021-2023	MONRE	MOF	completed	the agreement on water quality management and wastewater release is developed.		
Activity 3	Monitor the implementation of the collection of water obligations	N/A	2021-2025	MONRE	MOF	on track		mandatory	continue in the Action Plan 2026-2030
Strategic Goal VII: Human Resource Development									
Outcome 1: Staff at the central and local levels have a higher capacity to manage water and water resources									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Assess and develop a personnel development plan in water management and water resources									
Activity 1	Assess the capacity of central and local personnel in water management and water resources	1 document	2021-2022	MONRE		completed	the need assessment for capacity building related natural resources and environment is prepared. The water resources management is included.		review and assess the need towards 2030 in the Action Plan 2026-2030
Activity 2	Develop a personnel development plan in water management and water resources	1 document	2023	MONRE		completed	the capacity building plans for MONRE and DWR are developed.		develop a new plan towards 2030 in the Action Plan 2026-2030
Output 2: Strengthen the capacity in water management and water resources									
Activity 1	Provide trainings on water and water resources management such as river basin management planning, water resource assessment, flood and drought management, groundwater management, water quality management and wetland and peatland management	2 times	2022 and 2024	MONRE	relevant stakeholders	completed	several trainings were provided from DWR, DMH, LNMCS in related topics		continue in the Action Plan 2026-2030
Activity 2	Integrate and develop a water and water resources management curriculum for teaching and learning at each academic level such as primary, secondary, college and university	N/A	2021-2023	MONRE	MICT, NUoL	completed	the curriculum on IWRM is included in the university.		this maybe continue in the Action Plan 2026-2030 for other school levels
Activity 3	Promote research on various topics related to water and water resources	5 topics	2021-2025	MONRE	MICT, NUoL	on track	generally, the thesis and research on water resources management, water resources assessment, and river basin planning can be found from the university of Lao PDR		continue in the Action Plan 2026-2030
Activity 4	Integrate gender roles in water and water resources management	5 times	2021-2025	MONRE		on track	gender mainstreaming is included in all activities related IWRM	mandatory	continue in the Action Plan 2026-2030
Outcome 2: Society and communities are aware with the participation in water and water resources management									
Output 1: Raise awareness and promote the participation of society in management, protection, development and restoration of water and water resources									
Activity 1	Disseminate the importance of wetlands, peatlands and wetlands according to the Ramsar Convention	5 times	2021-2025	MONRE, MAF	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Activity 2	Raise awareness and disseminate the work of water and water resources management to all parts of society and people	5 times	2021-2025	MONRE		on track		mandatory	continue in the Action Plan 2026-2030
Activity 3	Celebrate National Water Day, World Water Day, World Wetland Day, World Peatland Day and other important days every year	annually	2021-2025	MONRE		on track		mandatory	continue in the Action Plan 2026-2030

Strategic Goal VIII: International cooperation									
Outcome 1: Cooperate more with riparian countries, regional and international organizations on water and water resources management									
No.	**Activity**	**Indicator**	**Implem'n Period (year)**	**Implementors**		**Status up to 2024**	**Key Achievements against indicators**	**Remark**	**Possible Work**
				Lead	**Support**				
Output 1: Bilateral cooperation with neighboring, regional and international countries with potential in water and water resources management									
Activity 1	Cooperate with countries and international organizations in managing water resources	based on reality	2021-2025	MONRE, MoFA	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Output 2: Implement international conventions and agreements related to water management and water resources									
Activity 1	Study and research on the participation in international conventions and agreements on water and water resources	based on reality	2021-2025	MONRE, MoFA	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Activity 2	Implement international conventions and agreements such as the Mekong Agreement 1995, the Ramsar Convention, and the Biodiversity Convention	based on reality	2021-2025	MONRE, MAF	relevant stakeholders	on track		mandatory	continue in the Action Plan 2026-2030
Output 3: Cooperate the management of transboundary river basins									
Activity 1	Assess the river flow of transboundary river basins of Sekong, Nam Ma, Nam Neun and Nam Sam	3 River Basins	2021-2025	MONRE	relevant stakeholders	on track	included in the 14 large-sized river basins		
Activity 2	Manage transboundary river basins such as Mekong, Sekong, Nam Ma, Nam Sam, Nam Neun and Nam Nua	2 River Basins	2021-2025	MONRE	MoFA, relevant stakeholders	on track	included in the 14 large-sized river basins; under the MRC framework, IUCN project		

Annex 5: List of developed legislations, plans, and guidelines related to the IWRM Action Plan for 2021-2025

- The decree on the management of river basins and reservoirs, No. 20/Gov, dated 20 January 2021.
- The decree on the increment in the management, protection, development and use of forests, forest land, and in fighting and preventing the invasion and destruction of forests and forest land including forest fires. No. 11/PM, dated 21 July 2023.
- The decree on wetlands, No. 350/Gov, dated 13 November 2023.
- The national strategy on climate change towards 2030 with the decree No. 98/PM, dated 24 February 2023.
- the agreement on groundwater management, No. 1509/MONRE, dated 21 March 2019.
- The agreement on water quality management and wastewater release, No.1430/MONRE, dated 7 July 2023.
- The agreement on water use, No. 6118/ MONRE, dated 29 November 2022.
- The agreement on river basin management, No. 0957/MONRE, dated 16 May 2023.
- The agreement on the water and water resources related data and information management, No. 1182/MONRE, dated 27 June 2024.
- The agreement on the conservation zone for water and water resources, issued by MONRE, dated September 2024.
- The river basin management plan for Xebangfai river basin for 2021-2025, prepared by MONRE, dated December 2022.
- The river basin management plan for Nam Tha river basin for 2021-2025, prepared by MONRE, dated December 2022.
- The river basin management plan for Nam Khan river basin for 2021-2025, prepared by MONRE, dated December 2022.
- The river basin management plan for Xebanghieng river basin for 2021-2025, prepared by MONRE, dated December 2022.
- The river basin management plan for Nam Sueang river basin for 2021-2025, prepared by MONRE, dated August 2023.
- The river basin management plan for Nam Sam river basin for 2021-2025, prepared by MONRE, dated August 2023.
- The river basin management plan for Nam Ngiep river basin for 2021-2025, prepared by MONRE, dated August 2023.
- The river basin management plan for Xedone river basin for 2021-2025, prepared by MONRE, dated August 2023.
- The river basin management plan for Xekong river basin for 2021-2025, prepared by MONRE, dated August 2023.

- The river basin management plan for Nam Ou river basin for 2021-2025, prepared by MONRE, dated May 2022.
- The river basin management plan for Nam Ngum river basin for 2021-2025, prepared by MONRE, dated May 2022.
- The river basin management plan for Nam Theun-Kading river basin for 2021-2025, prepared by MONRE, dated May 2022.
- Draft version of river basin management plan for Nam Ma river basin for 2021-2025.
- Draft version of river basin management plan for Nam Neun river basin for 2021-2025.
- The national groundwater profile, prepared by MONRE, dated 27 July 2023.
- The technical guideline for determining minimum flow for a river basin, issued by MONRE, dated September 2023.
- The technical guideline for developing a river basin management plan, issued by MONRE, dated November 2022.
- The wetland management plan for Ramsar site at Beung Kiet Ngong for 2021-2025, prepared by MONRE, dated 14 August 2023.
- The groundwater management plan for Vientiane province for 2023-2025, prepared by MONRE, dated 19 April 2024.
- The groundwater management plan for Vientiane Capital for 2023-2025, prepared by MONRE, dated 19 April 2024.
- The groundwater management plan for Salavan province for 2023-2025, prepared by MONRE, dated 10 November 2023.
- The groundwater management plan for Savannakhet province for 2021-2025, prepared by MONRE, dated 10 November 2023.
- The groundwater management plan for Sekong province for 2021-2025, prepared by MONRE, dated 10 November 2023.
- The groundwater management plan in Savannakhet for 2021-2025, signed in 2022.
- The action plan on the improvement of the technical revenue management mechanism, No. 5065/MONRE, dated 30 September 2022