

Document of  
**The World Bank**

**FOR OFFICIAL USE ONLY**

Report No: PAD3469

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL CREDIT

IN THE AMOUNT OF SDR18.2 MILLION  
(US\$25 MILLION EQUIVALENT)

IN CRISIS RESPONSE WINDOW RESOURCES

TO THE

LAO PEOPLE'S DEMOCRATIC REPUBLIC

FOR THE

LAO PDR SOUTHEAST ASIA DISASTER RISK MANAGEMENT PROJECT

December 2, 2019

Urban, Disaster Risk Management, Resilience and Land Global Practice  
East Asia And Pacific Region

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

## CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2019)

Currency Unit = Lao Kip

---

LAK 8843 = US\$1

---

US\$ 1.3794 = SDR 1

## FISCAL YEAR

January 1 - December 31

Regional Vice President: Victoria Kwakwa

Acting Country Director: Gevorg Sargsyan

Regional Director: Benoit Bosquet

Practice Manager: Abhas Kumar Jha

Task Team Leaders: Henrike Brecht, Zuzana Stanton-Geddes, Keiko Saito

## ABBREVIATIONS AND ACRONYMS

AF	Additional Financing	IDA	International Development Association
ARAP	Abbreviated Resettlement Action Plan	IFR	Interim Unaudited Financial Report
CPF	Country Partnership Framework	LWU	Lao Women's Union
CRW	Crisis Response Window	MOF	Ministry of Finance
DMH	Department of Meteorology and Hydrology	MONRE	Ministry of Natural Resources and Environment
DHUP	Department of Housing and Urban Planning	MOU	Memorandum of Understanding
DRFI	Disaster Risk Financing and Insurance	MPI	Ministry of Planning and Investment
DRM	Disaster Risk Management	MPWT	Ministry of Public Works and Transport
DOP	Department of Planning (MPI)	M&E	Monitoring and Evaluation
DOW	Department of Waterways	NPV	Net Present Value
DPWT	Department of Public Works and Transport (MPWT)	PAP/ PAH	Project Affected People / Households
DRM	Disaster Risk Management	PDO	Project Development Objective
ECOP	Environmental Code of Practices	PDNA	Post Disaster Needs Assessment
EDPD/ PTRI	Environment Research and Natural Disaster Prevention of the Public Works and Transport Research Institute	PDR	People's Democratic Republic
EGEF	Ethnic Groups Engagement Framework	PMU	Project Management Unit (DOW)
EGEP	Ethnic Group Engagement Plan	POM	Project Operations Manual
EIRR	Economic Internal Rate of Return	PPSD	Project Procurement Strategy for Development
ESHS	Environmental and Social, Health and Safety	RAP	Resettlement Action Plan
ESMF	Environmental and Social Management Framework	RPF	Resettlement Policy Framework
ESMP	Environmental and Social Management Plan	SDR	Special Drawing Rights
FM	Financial Management	SEA	Southeast Asia
GDP	Gross Domestic Product	SEADRIF	Southeast Asia Disaster Risk Insurance Facility
GOL	Government of Lao PDR	SRD	State Reserve Department
GRM	Grievance Redress Mechanism	STEP	Systematic Tracking of Exchanges in Procurement
HIA	Heritage Impact Assessment	UNESCO	United Nations Educational, Scientific and Cultural Organization
ICT	Information and Communication Technology	VMC	Village Mediation Committee

**Lao People's Democratic Republic  
Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance**

**TABLE OF CONTENTS**

<b>I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING .....</b>	<b>7</b>
<b>II. DESCRIPTION OF ADDITIONAL FINANCING .....</b>	<b>11</b>
<b>III. KEY RISKS .....</b>	<b>17</b>
<b>IV. APPRAISAL SUMMARY .....</b>	<b>19</b>
<b>V. WORLD BANK GRIEVANCE REDRESS .....</b>	<b>25</b>
<b>VI SUMMARY TABLE OF CHANGES.....</b>	<b>26</b>
<b>VII DETAILED CHANGE(S).....</b>	<b>26</b>
<b>VIII. RESULTS FRAMEWORK AND MONITORING .....</b>	<b>33</b>



**BASIC INFORMATION – PARENT (Lao PDR Southeast Asia Disaster Risk Management Project - P160930)**

Country	Product Line	Team Leader(s)		
Lao People's Democratic Republic	IBRD/IDA	Henrike Brecht		
Project ID	Financing Instrument	Resp CC	Req CC	Practice Area (Lead)
P160930	Investment Project Financing	SEAU1 (9349)	EACMM (8863)	Urban, Resilience and Land

Implementing Agency: Ministry of Public Works and Transport, Ministry of Natural Resources and Environment, Ministry of Finance, Ministry of Planning and Investment

Is this a regionally tagged project?	
--------------------------------------	--

Bank/IFC Collaboration  
No

Approval Date	Closing Date	Expected Guarantee Expiration Date	Original Environmental Assessment Category	Current EA Category
06-Jul-2017	31-Oct-2022		Partial Assessment (B)	Partial Assessment (B)

**Financing & Implementation Modalities**

<input type="checkbox"/> Multiphase Programmatic Approach [MPA]	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input checked="" type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Disbursement-Linked Indicators (DLIs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a Non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	



**Development Objective(s)**

To reduce the impacts of flooding in Muang Xay and enhance the Government’s capacity to provide hydro-meteorological services and disaster response.

**Ratings (from Parent ISR)**

	Implementation				Latest ISR
	31-Aug-2017	12-Mar-2018	30-Sep-2018	25-Apr-2019	01-Nov-2019
Progress towards achievement of PDO	S	S	S	S	S
Overall Implementation Progress (IP)	S	S	S	MS	MS
Overall Safeguards Rating	S	S	S	S	S
Overall Risk	S	S	S	S	S

**BASIC INFORMATION – ADDITIONAL FINANCING (Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance - P170945)**

Project ID P170945	Project Name Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance	Additional Financing Type Scale Up	Urgent Need or Capacity Constraints Yes
Financing instrument Investment Project Financing	Product line IBRD/IDA	Approval Date 13-Dec-2019	
Projected Date of Full Disbursement 30-Apr-2025	Bank/IFC Collaboration No		



Is this a regionally tagged project?	
No	

**Financing & Implementation Modalities**

<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Disbursement-Linked Indicators (DLIs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a Non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input checked="" type="checkbox"/> Responding to Natural or Man-made disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	
<input type="checkbox"/> Contingent Emergency Response Component (CERC)	

**Disbursement Summary (from Parent ISR)**

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed	
IBRD					%
IDA	30.00	1.97	28.25		6.5 %
Grants	1.00	0.51	0.49		51 %

**PROJECT FINANCING DATA – ADDITIONAL FINANCING (Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance - P170945)**

**FINANCING DATA (US\$, Millions)**

**SUMMARY (Total Financing)**

	Current Financing	Proposed Additional Financing	Total Proposed Financing
<b>Total Project Cost</b>	31.00	25.00	56.00
<b>Total Financing</b>	31.00	25.00	56.00
<b>of which IBRD/IDA</b>	30.00	25.00	55.00



<b>Financing Gap</b>	0.00	0.00	0.00
----------------------	------	------	------

**DETAILS - Additional Financing**

**World Bank Group Financing**

International Development Association (IDA)	25.00
IDA Credit	25.00

**IDA Resources (in US\$, Millions)**

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
<b>Lao People's Democratic Republic</b>	25.00	0.00	0.00	25.00
Crisis Response Window (CRW)	25.00	0.00	0.00	25.00
<b>Total</b>	<b>25.00</b>	<b>0.00</b>	<b>0.00</b>	<b>25.00</b>

**COMPLIANCE**

**Policy**

Does the project depart from the CPF in content or in other significant respects?

Yes  No

Does the project require any other Policy waiver(s)?

Yes  No

**INSTITUTIONAL DATA**

**Practice Area (Lead)**

Urban, Resilience and Land

**Contributing Practice Areas**

Transport

**Climate Change and Disaster Screening**

This operation has been screened for short and long-term climate change and disaster risks



**Gender Tag**

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

**PROJECT TEAM****Bank Staff**

Name	Role	Specialization	Unit
Henrike Brecht	Team Leader (ADM Responsible)		SEAU1
Keiko Saito	Team Leader		SEAU1
Zuzana Stanton-Geddes	Team Leader	Disaster Risk Management	SCAUR
Khamphet Chanvongnaraz	Procurement Specialist (ADM Responsible)	Procurement	EEAR1
Aisha Lanette N. De Guzman	Financial Management Specialist (ADM Responsible)	FM	EEAG1
Siriphone Vanitsaveth	Financial Management Specialist	Financial Management	EEAG2
Manida Unkulvasapaul	Environmental Specialist (ADM Responsible)	Environment	SEAE2
Sybounheung Phandanouvong	Social Specialist (ADM Responsible)		SEAS1
Adu-Gyamfi Abunyewa	Team Member		EEAR1
Alkadevi Morarji Patel	Social Specialist		SEAS1
Amphavanh Sisouvanh	Team Member		IEAT1
Carmenchu D. Austriaco	Team Member	Finance	WFACS
Chanin Manopiniwes	Team Member	Economist	IEAT1



Dixi Mae Perez Mengote	Team Member		SEAU1
Inneke Herawati Ross	Team Member		SEAU1
Jia Wen Hoe	Team Member		SEAU1
Martin Fodor	Team Member	Environmental Safeguards	SEAE2
Mei Wang	Counsel		LEGES
Sombath Southivong	Team Member	Infrastructure	IEAT1
Thao Thi Do	Team Member	Finance	WFACS
Vatthana Singharaj	Team Member	Operations	EACLF
<b>Extended Team</b>			
<b>Name</b>	<b>Title</b>	<b>Organization</b>	<b>Location</b>
Alan Coulthart	Consultant, Lead Municipal Engineer		



## I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

### A. INTRODUCTION

1. This Project Paper seeks the approval of the Board of Executive Directors to provide Additional Financing (AF) of SDR18.2 million (US\$25 million equivalent) from the International Development Association (IDA) Crisis Response Window (CRW)<sup>1</sup> to the ongoing Lao People’s Democratic Republic (Lao PDR) Southeast Asia Disaster Risk Management (SEA DRM) Project (P160930, Credit No. 6120-LA). The CRW funds will support the Government of Lao PDR (GOL) after severe floods in 2018, in line with the request from the GOL through a letter from the Ministry of Finance (MOF) to the World Bank, dated June 10, 2019. This proposed AF project is processed with accelerated emergency procedures.<sup>2</sup>

2. The proposed AF also includes Restructuring of the Lao PDR SEA DRM Project to:

- Revise the project development objective (PDO);
- Change Component 1 scope, costs, and disbursement estimates;
- Revise the results framework and monitoring indicators; and
- Extend the project closing date by 26 months until December 31, 2024.

3. The proposed AF will scale up the activities under the Lao PDR SEA DRM Project to: (i) address the recovery and reconstruction needs following the 2018 floods, through rehabilitation of river course slope protection infrastructure damaged by the 2018 floods, as well as (ii) provide a comprehensive package for risk reduction, through technical and analytical support for resilient planning, and incorporation of resilience into structural designs. The implementing agency is the Department of Waterways (DOW) under the Ministry of Public Works and Transport (MPWT).

4. The Lao PDR SEA DRM Project was approved on July 6, 2017 and became effective on October 11, 2017. The original project’s total financing is US\$31 million equivalent, out of which US\$30 million is financed by International Development Association (IDA) Credit and US\$1 million is financed by the Southeast Asia Disaster Risk Insurance Facility (SEADRIF) Program Multi-Donor Trust Fund. Progress towards achieving the PDO and the implementation progress have both been rated “satisfactory” or “moderately satisfactory” for more than twenty-four consecutive months. With the AF of US\$25 million, the total project financing amount will increase to US\$56 million equivalent.

### B. BACKGROUND

5. **The parent project** is part of a series of projects and a Regional IDA program, which seek to strengthen capacity and cooperation in the field of DRM in the Southeast Asia region, namely in Cambodia, Lao PDR and Myanmar. Lao PDR is exposed to climate and disaster risks including floods, landslides, droughts, and tropical storms and cyclones, with flooding the major natural hazard. Major events include tropical cyclones typhoons in 2009 (Ketsana) and in 2011 (Haima), resulting in damages estimated at over US\$121 million, severe flooding in 2013 with damages in excess of US\$270 million, and most recently, widespread floods in 2018, which significantly impacted Lao PDR’s people and

<sup>1</sup> Management informed the Board of its intention to allocate an indicative amount of SDR18.2 million (US\$25 million) to support Lao PDR’s reconstruction efforts after the 2018 floods at a technical briefing on March 11, 2019 per the technical note entitled “Lao PDR Flood Emergency 2018 – Request to use the IDA Crisis Response Window”, dated February 28, 2019.

<sup>2</sup> According to “The IDA18 Resource Allocation Framework: FY20 Updates to Implementation Guidelines”, CRW-financed operations for IDA countries coping with severe crises and emergencies are processed under accelerated procedures.



economy. The impacts of climate change and rapid urbanization will exacerbate disaster trends. The growth of the area and population that can be considered urban is an estimated 17.3 percent per annum.<sup>3</sup>

6. **The original PDO** is “to reduce the impacts of flooding in Muang Xay and enhance the Government’s capacity to provide hydro-meteorological services and disaster response”. The project comprises five components:

- *Component 1 – Integrated Urban Flood Risk Management (US\$13.5 million IDA Credit)*, implemented by DOW under MPWT, pilots the concept of integrated urban flood risk management in Muang Xay, Oudomxay Province, and strengthens the institutional capacity of the implementing agencies for resilient urban planning.
- *Component 2 – Hydromet Modernization and Early Warning Systems (US\$10 million IDA Credit)*, implemented by the Department of Meteorology and Hydrology (DMH) under the Ministry of Natural Resources and Environment (MONRE), supports preparedness and early warning systems through the modernization and integration of hydromet systems and capacity building for DMH in forecasting and end-user service delivery.
- *Component 3 – Financing Planning for Disaster Resilience (US\$5 million IDA Credit and US\$1 million SEADRIF Grant)*, implemented by the State Reserve Department (SRD) under the MOF, strengthens a comprehensive approach to disaster risk financing and insurance (DRFI) by developing a national DRFI strategy and enabling access to sovereign disaster risk insurance through the Southeast Asia Disaster Risk Insurance Facility (SEADRIF).
- *Component 4 – Knowledge and Coordination (US\$1.5 million IDA Credit)*, implemented by the Department of Planning (DOP) under the Ministry of Planning and Investment (MPI), supports overall project coordination and management, studies for mainstreaming DRM in planning and investment, and day-to-day implementation.
- *Component 5 – Contingent Emergency Response (US\$0)* allows for a reallocation of credit proceeds from other components to provide emergency recovery and reconstruction support following an eligible crisis.

7. **Progress towards achieving the PDO is satisfactory.** The PDO remains relevant, and will be updated under the AF to reflect the broader response associated with the AF. The project is making progress to achieving the PDO with implementation advances across all key contributing components and activities. Related to the first PDO part ‘reducing the impacts of flooding’, civil works preparation is ongoing, with works expected to start in late 2020. Related to the second PDO part ‘enhance the Government’s capacity to provide hydro-meteorological services’, procurement of several consultancies was finalized and capacity building is ongoing. Related to the third PDO part ‘enhance the Government’s capacity for disaster response’, establishment of SEADRIF is progressing, along with priority activities to strengthen financial resilience at the national level.

8. **Implementation progress is moderately satisfactory.** Under Component 1, the procurement of key consulting services and goods for structural investments is ongoing, with 36.4 percent of the planned activities contracted. Technical and pre-feasibility studies were completed. Designs for the civil works are expected to commence this calendar year. Under Component 2, 20 percent of the component allocation has been committed, with several key consultancies for hydrometeorological services improvement mobilized, and procurement for system integration and survey and stations underway. Under Component 3, the trust deed for SEADRIF was signed in July 2019 and the SEADRIF Company will be set up under Singapore jurisdiction by end of 2019. The Government is also developing a contingency plan for SEADRIF

<sup>3</sup> Centre for Development and Environment (CDE), University of Bern. 2019. *Urbanization processes in the Lao PDR: Processes, challenges and opportunities*. Switzerland.



payout. Under Component 4, a Value for Money Strategy will be institutionalized, with a consultancy firm contracted. Implementation of Component 5 is rated satisfactory, with an Emergency Response Manual and an Environmental and Social Management Framework (ESMF) Addendum prepared and cleared by the World Bank.

9. **Project oversight.** The leading ministries remain committed to the project and respective component objectives. The Project Coordination Committee meets regularly to discuss progress, propose actions and agree on timelines, most recently in July 2019.

10. **Legal covenants.** All legal covenants are being complied with. There is no overdue audit report.

11. **Disbursement.** As of October 11, 2019, disbursement was at 6 percent and 51 percent for IDA credit 6120-LA and Recipient Executed Trust Fund TFA5033 respectively, with increased disbursement expected this FY20, including almost-full disbursement of Component 3.

12. **Financial management (FM) performance is moderately satisfactory.** Key FM arrangements and audit requirements have been complied with. The implementing agencies MPWT, MONRE, and MPI have adequately implemented FM arrangements to support the preparation, approval, and recording of project transactions. MOF is in the process of enhancing FM processes to an acceptable level. All implementing agencies have approved their respective Annual Work Plans and Budgets and FM Project Manuals.

13. **Procurement performance is moderately satisfactory.** Across all components, 65 percent of planned procurement packages of the parent project has been contracted and committed, as of October 2019. For Component 1, the DOW has completed the procurement of 8 out of 22 planned packages (36.4 percent), with contractual commitments at US\$273,527 (2.24 percent of the total planned amount of US\$12.22 million).

14. **Safeguards performance is satisfactory.** An Environmental and Social Management Framework (ESMF), a Resettlement Policy Framework (RPF) and an Ethnic Group Engagement Framework (EGEF), including a Grievance Redress Mechanism (GRM), have been adequately complied with under the parent project. Safeguards focal staff appointed from the Environment Research and Natural Disaster Prevention of the Public Works and Transport Research Institute (EDPD/PTRI) and the provincial Department of Public Works and Transport (DPWT) in Muang Xay city of Oudomxay province were provided with safeguards training to implement and monitor ESMF, RPF, EGEF and subsequent instruments in August 2018. Two safeguards consultants were recruited to support the EDPD/PTRI to fulfill safeguards policy requirements. The safeguards focal staff have conducted consultations and training for local communities and authorities in Maung Xay.

15. **Gender.** A gender action plan is in place, based on a rapid gender assessment conducted during parent project preparation with gender issues integrated into the planning, implementation and monitoring and evaluation (M&E) of the project. Roles in the MPWT have been assigned to implement and monitor progress. MPWT's EDPD/PTRI's Environmental and Social team was also strengthened through formal incorporation of staff from MPWT's gender team. At the subproject level, efforts are being made to encourage the active participation of women during the safeguards planning and implementation process. Two national safeguards consultants are being mobilized to strengthen these efforts. The parent project results include a gender breakdown of the PDO indicator "percentage of urban population in Muang Xay protected from floods" and intermediate results indicator "participants in consultation activities during project implementation." In addition, the parent project seeks to promote gender-inclusive employment with equal pay and gender-responsive physical design in standard contract bidding documents, raise awareness of contractors on gender-sensitive employment



practices, the prevention of gender-based violence among their workforce, and hiring of women; and seeks the active participation of women in the identification and management of nonstructural investments to protect against floods in high and low density areas, including through engaging women’s organization, the Lao Women’s Union (LWU), during consultations and workshops.

16. **Lessons learned.** First, in the context of rising and frequent impacts of disasters, there is a high need for investment in flood risk reduction infrastructure and improvements in preparedness and resilience of vulnerable areas. This AF will advance an integrated urban flood risk management approach, combining structural and non-structural measures, which can serve as an example for other cities in Lao PDR and beyond. New information and communication technology (ICT) and innovative approaches can advance flood risk management practice, for example, improving the speed and quality of flood risk assessments or to improve monitoring and maintenance. The AF will, for example, support the development of an asset management system for DOW with GIS information about flood risk reduction assets. Ongoing technical assistance programs by the World Bank will continue to support the introduction of innovative ICT approaches. Second, implementation of the parent project shows the need to continuously build technical and project management capacity of the counterparts. The AF relies on existing implementing structures, which will facilitate faster implementation of the AF investments, including procurement processes. Third, related to safeguards, early engagement with MONRE, local authorities, and local communities is key to establishing consensus and support from these main stakeholders. While the agencies and local communities are willing to play an active role during the planning and implementation of a Resettlement Action Plan (RAP) and Environment and Social Management Plan (ESMP), it is necessary to provide clarity and keep them informed of specific project activities and locations so that specific discussion and actions can be undertaken accordingly. Qualified consultants are needed to assist EDPD/PTRI to prepare ESMP, RAP or Abbreviated Resettlement Action Plan (ARAP) (to be determined) and the Ethnic Group Engagement Plan (EGEP). The safeguard instruments will be prepared as soon as the final investments are defined by the consulting firm to complete the feasibility study and detailed designs.

### C. RATIONALE FOR ADDITIONAL FINANCING

17. **2018 floods.** In 2018, Lao PDR experienced widespread floods, which significantly impacted its people and economy (see Annex 1). Two tropical cyclones and a breached saddle dam in Attapeu Province resulted in extensive flooding between July and September, impacting all parts of the country. A Government-led Post-Disaster Needs Assessment (PDNA), supported by the World Bank, United Nations, and European Union, estimated total damage and losses of US\$371.5 million and recovery needs of US\$520 million. The damages and losses are equivalent to 2.1 percent of Lao PDR’s projected GDP for 2018, and 10.2 percent of Lao PDR’s annual budget in 2018, making the 2018 floods the most expensive in the past 10 years. The floods had a significant impact on physical infrastructure, with waterways and transport being the hardest-hit public sectors. Total needs in the waterways sector were estimated at US\$29.4 million by the PDNA.

18. **IDA CRW.** To help reduce the financing gap and augment the response effort, a technical briefing for the World Bank Board of Directors was held on March 11, 2019 to request the use of the IDA Crisis Response Window financing of US\$50 million for Lao PDR. The CRW funds would be allocated equally between the Lao PDR SEA DRM and the Lao Road Sector Project II (P158504). The proposed AF will allow Lao PDR to further close the financing gap for the reconstruction after the 2018 floods by supporting priority investments based on the results of the PDNA. This AF will complement recovery efforts and help “build back smarter” in the waterways sector, by scaling up support for embankment improvements, slope stabilization, and riverbank protection under Component 1 of the Lao PDR SEA DRM, focusing on the three provinces of (i) Oudomxay, (ii) Luang Prabang, and (iii) Borikhamxay. Efforts to support flood risk management



and climate resilience in key economic areas will have important longer-term effects. While a new emergency recovery loan was considered, this proposed AF is the preferred mechanism for adding emergency recovery activities due to the urgency of reconstruction works, which would benefit from already-established mechanisms for implementation and execution and considering that additional activities are fully in line with the parent project Component 1.

## II. DESCRIPTION OF ADDITIONAL FINANCING

19. **The AF will entail the following changes to the parent project.** (i) the PDO; (ii) project locations, scope and associated costs; (iii) project financing plan and timeline; (iv) results framework; and (v) the use of the World Bank’s new procurement regulations (August 2018).

20. **Revised PDO.** To accommodate new geographic locations of investments, the parent PDO will be revised ‘to reduce the impacts of flooding in *target areas* and enhance the Government’s capacity to provide hydro-meteorological services and disaster response.’

21. **Project locations.** Component 1 will absorb the AF of US\$25 million to strengthen flood protection and resilient urban planning, expanding parent project activities in Oudomxay Province, and adding flood protection investments in two additional provinces—Luang Prabang and Borikhamxay. The three provinces are highly vulnerable to flood risks, including underlying riverine floods during the rainy season, as well as extreme weather events causing flash floods and exacerbating erosion, and rank as the highest priorities in DOW’s five-year investment plan (2016-2021). Key cities in the three provinces were heavily impacted by the 2018 floods. Assessing the technical and economic feasibility of 16 areas, a Master Plan and Pre-Feasibility Study for Integrated River Management for Mekong River within Lao PDR, conducted with support from the Korean Government, also identified Luang Prabang as the highest priority intervention, and Borikhamxay as the fourth, with second and third-ranked sites having received financing from international donors.<sup>4</sup> Regular flooding not only impacts the livelihoods of communities in the provinces but also has wider ramifications on Lao PDR’s economy and society, given the strategic importance of all three provinces. Muang Xay city, Oudomxay Province, which is subject to large-scale flash floods every four to five years, is a critical transportation hub, with a provincial airport providing access to northern Lao PDR. The only road to China passes through Oudomxay province, and the Lao PDR-China railway is currently being constructed in the province. Luang Prabang is a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site and the most significant tourist site in the country. An international entry point with a main provincial airport, Luang Prabang has seen a steady increase in international and domestic tourists in recent years.<sup>5</sup> Luang Prabang is vulnerable to floods due to bank erosion resulting in overflow from the Mekong and Nam Khan Rivers, and rapid urbanization in Luang Prabang is likely to exacerbate disaster impacts (the growth rate is a projected 16 percent).<sup>6</sup> Borikhamxay province is a critical transportation hub as roads to Vietnam and a bridge to Thailand, which is being built, passing through the province. Bank erosion along the Mekong and Nam Xan Rivers results in annual flooding of key transportation infrastructure, including the main artery of Lao PDR, the National Road 13, and a planned bridge to Cambodia.

22. **Changes to components and associated costs.** Under the AF, changes to Component 1 are as follows:

<sup>4</sup> Further information about the study is included in Annex 1 Economic Assessment.

<sup>5</sup> In 2018, Luang Prabang recorded almost 580,000 international and 180,000 domestic visitors, increasing from 380,000 and 150,000 respectively since 2013.

<http://www.tourismloas.org/files/files/Statistical%20Report%20on%20Tourism%20in%20Laos/2017%20Statistical%20Report%20on%20tourism%20in%20Laos.pdf>

<sup>6</sup> CDE. 2019, *Urbanization processes in the Lao PDR: Processes, challenges and opportunities*.



- (a) *Component 1.1 Structural Investments.* This component will finance further support for the climate-resilient construction and rehabilitation of flood protection infrastructure, damaged by the 2018 floods. Component 1.1. will support (a) climate-resilient construction and rehabilitation of flood protection infrastructure, including investments in riverbank protection, embankments, canal improvements, water gates, pumping stations, river-side parks, improvements of public spaces, and restoration of wetlands in urban areas; and (b) resettlement activities through assistance in financing for compensation and assistance to Displaced Person(s).
- (i) **Oudomxay Province.** Flood risk management infrastructure will be upgraded in the provincial capital of Muang Xay to 1 in 20 years return period design standards. Building on flood risk management analytics conducted during parent project preparation, which considered a range of high benefits solutions, the AF will supplement planned structural investments with additional riverbank protection and improvements of public spaces and urban livability, such as river walkways
  - (ii) **Luang Prabang Province.** The AF will finance the construction of riverbank protection along the lower part of Nam Khan and the installation of water gates and associated pumps along the Mekong River and the Nam Khan. The AF will also finance a feasibility study on wetlands restoration, and restore selected wetlands in urban areas in Luang Prabang, which provide natural flood control and erosion control under different climate change scenarios.
  - (iii) **Borikhamxay Province.** Pilot riverbank protection works will be financed, focusing on urgent non-regret investments, complementing a detailed flood risk assessment in Borikhamxay that will be developed under Component 1.2 of the AF.
- (b) *Component 1.2. Non-structural investments.* Under this component, the AF will finance an expanded scope of activities to strengthen the protection and disaster and climate change preparedness of people and assets in disaster-prone areas, as well as increase the capacity of the Government for integrated urban flood risk management. Component 1.2 will provide technical and analytical support for capacity-building on integrated urban flood risk management, including, inter alia: (a) the development of a waterways asset management system and associated data collection; (b) risk-informed urban planning; (c) flood risk management strategies for future investments in urban resilience.
- (i) **Waterways asset management system and associated data collection.** Support will be provided to DOW to upgrade its current basic asset inventory to an asset management system with automatic functionalities, GIS data, and condition information about the flood risk reduction infrastructure to support improved maintenance practice.
  - (ii) **Risk-informed urban planning.** Support the integration of disaster risk management into the spatial and urban plan to inform urban planning in Borikhamxay, considering disaster risks to reduce climate change vulnerability, in conjunction with integrating disaster risk management into spatial and urban plan for Oudomxay under the parent project. Preparedness plans in the three target provinces will also be updated.
  - (iii) **Flood risk management strategies for future investments in urban resilience.** Vientiane City and Borikhamxay experience flooding on an annual basis. Flood risk management strategies for Vientiane





City and Borikhamxay will be developed, identifying structural (engineered) and non-structural (non-engineered) solutions to improve flood risk management and disaster resilience in an integrated manner, laying the foundation for larger flood risk management investments in the future.

(c) *Component 1.3. Project Management.* Provision of assistance to strengthen the institutional, organizational, and technical capacity of MPWT to support implementation of Part 1 of the project, including coordination, technical matters, procurement, FM, social and environmental safeguards, M&E, and reporting.

23. **AF project cost.** With the AF of US\$25 million, the total project financing amount will increase to US\$56 million. The AF project cost by component is as follows:

Project Component	Original project cost US\$ million financed by IDA National and Regional funds and grant funding	With AF US\$ million (IDA CRW)
<b>1. Integrated Urban Flood Risk Management</b>	13.5	38.5
<i>Subcomponent 1.1</i> Structural Investments	11.5	33.5
<i>Subcomponent 1.2</i> Non-structural Investments	1	3
<i>Subcomponent 1.3</i> Project Management	1	2
<b>2. Hydromet Modernization and Early Warning Systems</b>	10	10
<b>3. Financial Planning for Disaster Resilience</b>	6	6
<b>4. Knowledge and Coordination</b>	1.5	1.5
<b>5. Contingent Emergency Response Component (CERC)</b>	0	0
<b>Total</b>	<b>31</b>	<b>56</b>

24. **Closing date.** The proposed AF will result in a 26 months extension to the current closing date of October 31, 2022. The new proposed closing date is December 31, 2024, with the end disbursement date of April 30, 2025.

25. **Change in disbursement estimates.** Disbursement estimated are adjusted to account for the current project implementation progress and the timeline for proposed AF activities.

**Table 4. IDA and Grant Financing Plan for Lao PDR SEA DRM Project and AF (US\$ million)**

IDA and Grant Financing	Implementation period								
	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	Total
Lao PDR SEA DRM	0.9	1.3	9.0	7.5	11.2	1.1			31
Lao PDR SEA DRM AF			0.1	2	3.5	6.0	8.0	5.4	25
<b>Total IDA</b>	0.9	1.3	9.1	9.5	14.7	7.1	8.0	5.4	56

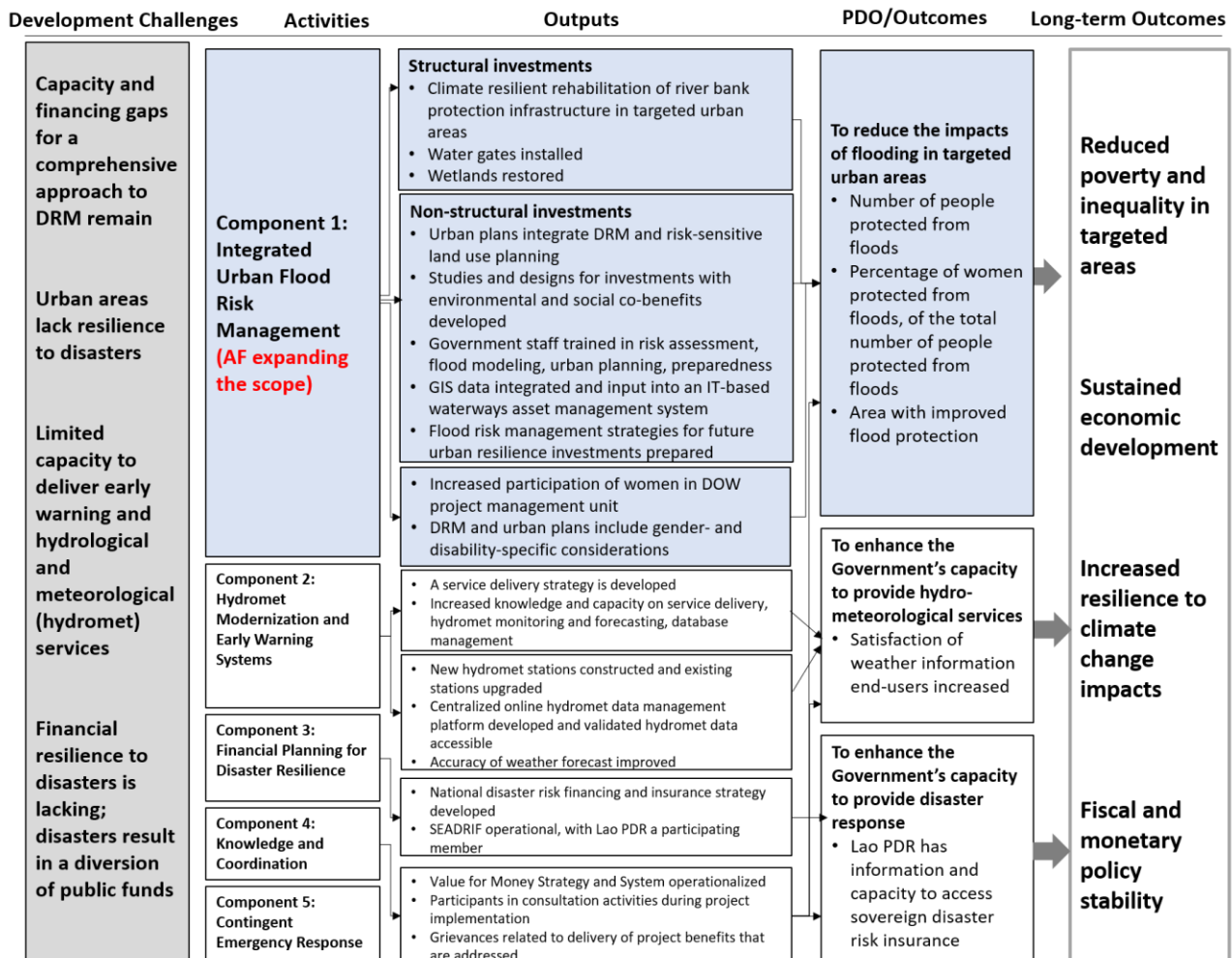
26. **Proposed changes to the results framework.** The PDO indicator for Component 1 is revised to take into account expanded works in Oudomxay and two additional provinces, and continues to be disaggregated to include “the percentage of which are female”. An additional PDO indicator on “area with improved flood protection (km<sup>2</sup>)” is also added. New intermediate results indicators are added to better reflect the gender considerations, efforts to upscale innovations in ICT and activities on improving the Government’s capacity on risk-sensitive urban planning. Key new and revised indicators include for example the following:

- Length of riverbank protection rehabilitated in Oudomxay, Luang Prabang and Borikhamxay (Kilometers).



- Disaster risk management and risk-sensitive land use planning are integrated into several urban plans (Number)
- Watergates installed (Number)
- DRM plans developed and urban plans updated to include disability-specific considerations and at least three gender-specific criteria (Number)
- Studies and designs for investments with environmental and social co-benefits developed (Number)
- Number of Government staff trained in risk assessment, flood modeling, urban planning, and disaster preparedness (Number), percentage of which are women (Percentage)
- Number of provinces for which GIS data on embankment condition and disaster vulnerability has been integrated and input into an IT-based waterways asset management system for riverbank protection (Number)
- Flood risk management strategies for future urban resilience investments prepared (Number)
- Percentage of female staff of the Project Management Unit of DOW (Percentage)
- Participants in consultation activities during project implementation (Number), percentage of which are women (Percentage)

27. **Results chain.** The results chain in line with a theory of change for the parent and AF projects is illustrated below.



28. **Gender equality.**



- **Analysis.** The gender analysis and gender gap action plan of the parent project remain relevant to the AF. Gender gaps in representation in DRM and urban planning processes persist, particularly at provincial and local levels.<sup>7</sup> Women’s voice and participation in community consultations and technical trainings are limited, with women rarely having roles in decision-making and technical matters. This results in a situation when gender-sensitive needs are not systematically considered in DRM and urban design. Only 9 percent of provincial deputy governors and 7 percent of district governors are female.<sup>8</sup> The proportion of women in provincial DPWT is similarly low – in Borikhamxay, 3 out of 11 staff in DPWT’s waterways team are female, and there are no female staff at all in the DPWT waterways teams of Oudomxay and Luang Prabang. According to DOW’s observations from training and community consultations under the parent project and other ongoing projects, female participation in technical training is at 5 percent and participation in community consultations is at 15 percent. The lack of female agency means that women are more likely to be disadvantaged by disasters and urban design. Exclusion from disaster risk assessments and communication creates a gender knowledge gap on disaster preparation, for instance, on which areas have high disaster risk or actions to take in the case of a disaster warning. Gender-blind recovery and reconstruction processes may not consider that disasters often disproportionately affect women, for instance increasing the risk of gender-based violence due to family separations, or that female-headed households face greater challenges in accessing health, legal and social services following a disaster, as reported by the 2018 PDNA. In urban planning, gender-sensitive urban design is important in recognizing that the urban structure affects men and women differently; women are more likely to be subject to harassment in public spaces, particularly if urban infrastructure is badly maintained with dimly lit streets or derelict public spaces.<sup>9</sup> Women also have limited access to private transport, resulting in longer and more complex travel; a World Bank study found that women in Lao PDR are predominant among producers and traders who use public space and transport and therefore are more impacted by poor public places and transport service.<sup>10</sup>
- **Action.** The AF aims to address the above-identified gap, in line with the Country Gender Action Plan, which notes that “fostering an environment where women and the poor are encouraged to participate in planning and decision-making processes at the local level can help reflect their views, needs, and concerns in local development plans”. To directly encourage gender-sensitive considerations in DRM and urban plans, gender-specific criteria in TORs for consultants developing urban plans will be included. Such criteria include (i) promoting gender inclusive employment with equal pay and gender-responsive physical design in standard contract bidding documents; (ii) raising awareness of contractors on gender-sensitive employment practices and the prevention of gender-based violence in their workforce; and (iii) encouraging the active participation of women in urban planning and identifying and managing DRM investments. The AF further aims to address the identified gender gap by facilitating the participation of women in project management and implementation roles and promoting equal access to technical training and community consultations. Actions to increase the participation of women in key roles include setting gender-disaggregated targets in staff hiring, in particular, 50 percent for the project management unit (PMU); conducting gender sensitization trainings for the PMU and provincial-level staff, along with local partners; and providing capacity development training to support women in the PMU and provincial-level to build a pipeline of women in senior positions. Actions to increase female

<sup>7</sup> World Bank. 2017. *Country Gender Action Plan FY2017-2021 for Lao People’s Democratic Republic*.

<sup>8</sup> Lao National Commission for Advancement of Women, 2015, quoted in World Bank. 2017. *Country Gender Action Plan FY2017-2021 for Lao People’s Democratic Republic*.

<sup>9</sup> World Bank. 2019. *Gender Equality in Urban Areas – East Asia and Pacific Regional Workshop*, Da Nang city, Vietnam, 20-21 June 2019, Summary Report.

<sup>10</sup> Asian Development Bank and the World Bank. 2012. *Country Gender Assessment for Lao PDR-Reducing Vulnerability and Increasing Opportunity*.



participation in technical training and community consultations include developing a simple gender checklist that outlines specific and acceptable gender-sensitive approaches to ensure that women can participate in decision-making, with this checklist disseminated to women prior to community consultations; conducting community consultations and training sessions separately between female and male groups, with female facilitators, to help women feel more comfortable; and developing a strong partnership with the LWU to provide outreach on community sessions and ensure the participation of at least one LWU representative at every consultation.

- **Monitoring.** Overall, these activities aim to ensure that DRM and urban planning processes reflect women’s views, needs and concerns, and accordingly the AF includes the following indicator “gender- and disability-specific considerations are included in DRM and urban plans”. An indicator on the “percentage of female staff of the PMU of DOW”, in line with a low baseline of 25 percent observed during parent project implementation, is also included to measure the outcome of increasing female representation in project management. Indicators on “percentage of Government staff trained in risk assessment flood modeling, urban planning, and disaster preparedness, that are women” and “percentage of participants in consultation activities during project implementation that are women” are included to monitor the outcome of increasing female participation in trainings and community consultations. Progress against these indicators will be measured with the help of the PMU’s social and gender safeguards specialist, who will be assigned with the responsibility of collecting and analyzing gender-disaggregated data, preparing regular six-monthly reports to the DOW PMU and the World Bank, and encouraging further action by the PMU and provincial staff based on collected data.

29. **Implementation arrangements.** The activities under the AF will be led by DOW, which is the main implementing agency for Component 1 of the parent project. Existing implementation arrangements have been satisfactory and will continue under the AF. The EDPD/PTRI of MPWT will remain responsible for supporting the planning and implementation of safeguards. Provincial DPWTs in all three provinces will also play an important supporting role in implementation. The Department of Finance will support FM and procurement while the Department of Planning and Cooperation will provide overall guidance. The Luang Prabang World Heritage Office will be involved and consulted for activities in Luang Prabang to ensure that the investments are in line with UNESCO standards for World Heritage sites. Minister of MPWT and the Governors of Luang Prabang and Borikhamxay Province will sign Memorandums of Understanding to ensure a clear assignment of roles and responsibilities. The Project Operations Manual (POM) will be adjusted to reflect changes in funds allocation, project sites, and indicators.

30. **Institutional coordination.** Coordination between central and local levels will continue to be needed under Component 1 to ensure effective implementation, as well as between other parent project Components. Under the parent project, a Memorandums of Understanding (MOU) was signed between the Minister of MPWT and the Governor of Oudomxay. For the AF, an MOU will be also signed within three months of effectiveness with the Governors of Luang Prabang and Borikhamxay Province to ensure a clear assignment of roles and responsibilities. Ongoing project steering committee established under the parent project will continue to support coordination among component implementing agencies.

31. **AF implementation readiness.** AF subprojects have been identified with detailed designs to be developed by a detailed design consultant. For Muang Xay city in Oudomxay, the contract of the detailed designs consultant hired under the original project will be amended to prepare the detailed designs and bidding documents for the AF subprojects and to supervise the works. For Luang Prabang and Borikhamxay, a detailed design firm will be selected through competitive bidding with the firm mobilized as soon as the AF becomes effective.



32. **Country Partnership Framework (CPF).** The AF is consistent with the CPF for Lao PDR for the period FY2017-2021 (Report No. 110813-LA, discussed at the Board on April 27, 2017). The CPF aims at supporting lasting accessible opportunities, including sustained green growth, improved access to human and infrastructure services, and opportunities for all.<sup>11</sup> The proposed program directly supports objective 3.2 of the CPF: “Putting in place enhanced disaster risk management and climate and disaster resilience”, and more generally contributes across the three focus areas. The AF is also in line with the Lao PDR Systematic Country Diagnostic of 2016 (Report No. 112241, March 9, 2017)<sup>12</sup>, which identifies one of the 11 priority areas as “Putting in place strengthened disaster risk management.” The proposed project will strengthen DRM and directly contribute to the achievement of this priority action. Finally, the AF project is fully aligned with the World Bank Group’s East Asia Pacific Regional Strategy<sup>13</sup>, presented to the board in February 2016, contributing to the following strategic pillars: (a) Infrastructure and urbanization through investments in urban flood risk management and (b) Climate change and DRM through physical and capacity investments in flood risk reduction, early warning, and the DRFI. Through gender considerations, the AF will also contribute to the achievement of the Country Gender Action Plan for Lao PDR.

33. **Higher objectives.** The Project will contribute to the World Bank Group’s Twin Goals of ending extreme poverty and boosting shared prosperity. Natural disasters have a disproportionate impact on the population with the highest poverty rates.<sup>14</sup> The poor and vulnerable are not only overexposed to disasters through living in at-risk areas, but also lack the resources, assets, and ability to cope and recover from disasters, losing two to three times their share of wealth compared to the nonpoor. External shocks, such as natural disasters, can exacerbate preexisting inequalities by resulting in catastrophic out of pocket expenditures for poorer households, particularly given the social protection coverage in Lao PDR (only 0.8 million out of a working-age population of 4.8 million covered as of 2017).<sup>15</sup> For instance, the PDNA conducted after the 2018 floods found that vulnerable women, men, boys, girls, people with disabilities were particularly affected. The destruction of farms and microenterprises, coupled with the disruption to social services, affected income sources and increased the debt levels of the 70 percent of households already in debt, and the reduction in expenditure was likely to affect the nutrition levels of the 14.2 percent of the rural population that was already food insecure.<sup>16</sup> All three areas under the AF are vulnerable to regular floods and are part of a Master Plan developed by MPWT in 2015 for Integrated Flood Protection to address increasing flood vulnerability in Lao PDR. Integrated flood risk management investments will lead to better protection and preparedness of people and assets in Oudomxay, Luang Prabang and Borikhamxay.

### III. KEY RISKS

34. **The overall risk rating remains substantial.** This rating is in line with the parent project, due to substantial political and governance, macroeconomic, technical design, institutional capacity, fiduciary, and stakeholders’ risks.

<sup>11</sup> World Bank. 2017. *Lao PDR: Lasting Accessible Opportunities - Country Partnership Framework for Lao PDR 2017–2021*. Washington DC: World Bank Group. Report number 110813-LA.

<sup>12</sup> World Bank. 2017. *Lao PDR - Systematic Country Diagnostic: Priorities for Ending Poverty and Boosting Shared Prosperity*. World Bank Group. Report number 112241.

<sup>13</sup> World Bank. 2016. *East Asia and the Pacific. Overview - Strategy*. Website accessed April 2019.

<sup>14</sup> Hallegatte, S., Vogt-Schilb, A., Bangalore, M., Rozenberg, J., 2017. *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Climate Change and Development; Washington, DC: World Bank.

<sup>15</sup> Government of Lao PDR. 2018. *Post-Disaster Needs Assessment 2018 Floods*; World Bank. 2015. *Drivers of Poverty Reduction in Lao PDR*.

<sup>16</sup> Government of Lao PDR. *Post-Disaster Needs Assessment 2018 Floods*, Lao PDR. December 2018.



35. **Political and governance risks are substantial.** The GOL has made recent efforts to modernize the institutional framework. Overall, there is little risk of significant shifts in policy that could affect the AF project due to the stable political system. Yet, the GOL continues to rank low on several governance indicators, particularly voice and accountability, and there are still weaknesses related to control of corruption and regulatory quality. Institutional challenges arise from the commercialization of the state; nascent capacity of the administration; and limited checks and balances. Governance-related risks will be mitigated through the SEA DRM and the AF through support for procurement, FM, monitoring, and evaluation, and accountability.

36. **Macroeconomic risks are substantial.** Fiscal slippages and failure to control debt build-up and to address financial sector risks can cause instability and undermine the Government's commitment to maintain the momentum for reducing risks to disaster. However, given that the GOL is not investing a significant portion of its own financing into the project, the project's exposure to macroeconomic risks are limited. Risks are being mitigated through the Government's actions to improve fiscal sustainability and financial stability, and strengthen revenue mobilization, with the support of the World Bank, IMF, and other development partners.

37. **Technical design risks are substantial.** Related to Component 1, estimating rainfall intensities, durations, and runoff; river and tide levels; and the impacts of climate change are inherently risky. This is particularly the case where historical data is scarce. Technical designs will have to interpolate data from other regional sources. Related risks will be mitigated by using proven international methodologies. Sub-Component 1.2 and Component 2 of the parent project contribute to mitigating technical design risks by supporting the collection of GIS data and hydrometeorological data.

38. **Institutional capacity to implement project risks are substantial.** The internal approval process within MPWT for the procurement of works and consultant contracts is lengthy, which could delay project implementation and disbursement. There are also risks to the sustainability of investments, particularly regarding maintenance and capacity to replicate technical preparations. To mitigate these risks, the project links institution- and capacity-building to all physical investments. Implementation support and quality assurance will be provided to the implementing agencies.

39. **Fiduciary risks are rated substantial.** The agencies in the parent project are in the process of strengthening its FM capacity by streamlining, harmonizing and improving the timeliness of submission of consolidated financial reports. To date, the project disbursements are still small and there is a risk that with the expected increase in project activities and delayed progress in physical activities, there is an increased risk of funds not getting used for the intended purpose. The parent project submitted the audited financial statements covering the period 11 October 2017 to 31 December 2018. Although the auditors rendered a clean opinion, they also raised issues regarding the following: (a) non-maintenance of an Advance Register and delayed liquidation of advances; (b) inconsistency among supporting documents; (c) no accounting software and data back-up and d) non-compliance with accounting policy on foreign exchange. The effect of these audit observations was not material, but the implementing agencies committed to resolve the issues and provide the Bank with updates on the resolution of the audit observations. The procurement risk rating of the project is also substantial. Lengthy GOL approval processes, governance risks, and limited capability may lead to delays in project implementation or non-compliance. To mitigate these risks and strengthen the procurement capacity of MPWT, the following measures will be undertaken: (i) assign more qualified staff and continue hiring a qualified procurement consultant for the implementation of procurement activities; (ii) provide procurement training for MPWT staff; (iii) ensure that all members of the tender committee sign the Disclosure of Interest forms when carrying out their duties; and (iv) provide technical assistance for supervision and contract management during project implementation.



40. **Stakeholders' risks are rated substantial.** Stakeholder engagement and coordination between central and local levels in the additional locations as well as between DOW and the Department of Housing and Urban Planning (DHUP) will be needed under Component 1 to ensure effective implementation. To mitigate the risks of delayed action or coordination, under the AF, an MOU will be also signed within three months of effectiveness with the Governors of Luang Prabang and Borikhamxay Province to ensure a clear assignment of roles and responsibilities.

41. **Disaster and climate risk screening.** A climate change assessment was completed under the parent project as well as the AF. Lao PDR is highly vulnerable to natural disasters. Current climate change projections suggest that the wet season is expected to become wetter and the dry season drier, indicating increased frequency and intensity of floods and drought, impacting Lao PDR's economy and people's livelihoods. Disaster and climate risk considerations are fully integrated into the parent and AF project design through resilient practice and investments introduced.

## IV. APPRAISAL SUMMARY

### A. Economic and Financial Analysis

42. **Cost-benefit analysis.** A cost-benefit analysis of the AF for Component 1.1 was conducted to calculate the economic internal rate of return (EIRR) and net present value (NPV) in Muang Xay city in Oudomxay province, Luang Prabang city in Luang Prabang province, and Pakxan in Borikhamxay province, comparing costs and benefits under 'without-project' and 'with-project' scenarios. The analysis was conducted for river bank protection and erosion protection investments in the 3 selected areas, wetlands restoration in Luang Prabang, and a flood risk management strategy in Borikhamxay. The major economic benefits in those cities are expected to derive mainly from avoided direct losses of assets from flash flooding as well as the avoided recovery and reconstruction in the flooded area. The estimates for the losses and recovery costs were based on the Lao PDR's PDNA of the floods in 2018. A 12 percent discount rate is used, similar to the parent project. Detailed assumptions and sensitivity analyses are given in Annex 1.

43. **Oudomxay.** The economic analysis of the existing project covers the period from 2017 to 2040. The current implementation of the parent project and AF of US\$7 million in Muang Xay city in Oudomxay province will take place for eight years from 2017, while the stream of benefits from the parent project is expected to start in 2020 after the first phase of construction has been completed, with the stream of benefits from the AF expected to start after five years of additional construction and implementation. It is assumed that investments from the parent project enable the city to avoid flash flood damages of 3 percent of the city's assets, once every four years (i.e. with an Annual Exceedance Probability of 25 percent), and that investments under the AF enable the city to be protected against floods of 6.2 percent of the city's assets once every decade (i.e. with an Annual Exceedance Probability of 10 percent). Based on the data from the PDNA in 2018, total benefits from avoided losses and damages as well as the recovery and reconstruction costs are an estimated 6.2 percent of the city's economic activities. With these assumptions, the parent project and AF investments in Muang Xay will yield an EIRR of 18.2 percent with an NPV of US\$11.14 million.

44. **Luang Prabang.** The economic analysis covers a 20-year period of the AF from 2020 to 2040. The total investment of US\$9 million from additional financing will be invested in the first year for US\$2 million for the non-structural investment and the other structural investment of US\$7 million will be spread across five years from 2020, while the stream of benefits of the AF is expected to start after five years of additional construction and implementation. It is assumed that this new investment will enable Luang Prabang city in Luang Prabang province to avoid flash flood damages and recovery costs of 9.1 percent of the city's assets once every decade, that is, an Annual Exceedance Probability of 10 percent. Based on the data from the PDNA in 2018, total benefits from avoided losses and damages as well as recovery



and reconstruction costs are an estimated 9.1 percent of the city’s economic activities. Therefore, with the AF, flood risk investments in Luang Prabang are expected to yield an EIRR of 22.3 percent with an NPV of US\$9.76 million.

45. **Borikhamxay.** The economic analysis covers a 20-year period of the AF from 2020 to 2040. The stream of additional financing of US\$6 million will be spread across five years from 2020, while the stream of benefits of the AF is expected to start after five years of additional construction and implementation. It is assumed that this new investment will enable Pakxan city in Borikhamxay province to avoid flash flood damages and recovery costs of 5.9 percent of the city’s assets asset once every decade (i.e. with an Annual Exceedance Probability of 10 percent). Based on data from the PDNA in 2018, the estimated total benefits from the avoided losses and damages as well as the recovery and reconstruction costs are 5.9 percent of the city’s economic activities. Based on these assumptions, with a 12 percent discount rate, flood risk investments in Pakxan city will yield an EIRR of 14.4 percent with a positive NPV of US\$1.15 million.

## B. Technical

46. **Identification of AF investments.** The proposed flood protection works were identified based on a review of existing technical studies and priorities of the GOL.

- **Oudomxay.** Proposed additional investments to enhance standards to 1-in-20 years floods are based on the results of the pre-feasibility study supported by the World Bank during parent project preparation. Additional embankment improvements, flood retention areas, and river walkways will be financed.
- **Luang Prabang.** Priority investments were identified, drawing on the Master Plan for Integrated Flood Management in the Mekong River, funded by the Korean Government in 2015, which identified Luang Prabang as the highest priority for flood risk measures along the Mekong in Lao PDR. Based on flood inundation modeling, the Korean study developed a pre-feasibility study and identified flood mitigation measures in Luang Prabang, listing priority investments, including riverbank protection to reduce erosion and water gates to minimize the extensive backwater and flooding effect of main rivers on tributaries. Watergates will be complemented with pumps to address runoff from storms during the flood season.
- **Borikhamxay.** Priority riverbank protection works, drawing on the Master Plan for Integrated Flood Management in the Mekong River, were identified.

47. **Climate change resilience.** The AF project promotes “building back smarter” in reconstruction. “Building back smarter” indicates an improvement not only in design standards, but also in construction quality, overall system performance, and maintenance. Infrastructure will be upgraded to up-to-date technical standards for flood protection. The incorporation of climate-resilient investments will further enhance the resilience of infrastructure to future disaster risks and help protect development gains and people’s livelihoods in these rapidly growing areas. IT-based waterway infrastructure planning systems for construction and maintenance will also be improved. In this way, the AF is expected to have high climate change adaptation co-benefits.

48. **Urban planning and social co-benefits.** The AF will support improved urban planning for a more livable and attractive urban environment that is well-integrated with flood risk management measures and aligned with the development vision of the GoL and the provincial governments. In Muang Xay in Oudomxay and in Borikhamxay, the AF will support risk-informed urban planning and improve DRM practice. As part of this, a review of the ongoing DRM and emergency systems in the two cities will be conducted and a GIS base map will be prepared. Infrastructure plans and tentative costing will be prepared. As part of efforts to improve social and disability inclusion, project-financed river bank protection will reflect also improvements in terms of universal access, (e.g., accessibility standards, compliant





ramps, adequate lighting, etc.). The AF will focus on identifying opportunities to leverage ICT for citizen reporting and feedback, and opportunities for community-based interventions (including maintenance) and for gender mainstreaming, along with risk identification and emergency preparedness and response planning and training.

49. **Green solutions and environmental benefits.** Global experience suggests that a range of nature-based / green infrastructure solutions, such as floodplain parks, walkways, and other landscape features, can complement the ‘hard’ engineering structural investments and produce environmental and social benefits. For example, planting vetivers can help withhold soil and reduce soil erosion while installing bamboo/wooden walls, while other solutions can help reduce water energy and trap sediment. The construction methods for embankment improvement works in Oudomxay, Luang Prabang, and Borikhamxay could include the use of dumping rip-rap; and gabion mattresses, which are rectangular baskets of steel woven-wired mesh, with the final design to be determined with the design firm. The design will also incorporate green components such as seeding mattresses, where seeds are inserted into a mattress made of nylon or natural materials; environmental blocks, constructed by connecting blocks with the same dimension and quality; and planting vetivers. A study will be financed to assess feasibility and implement pilot sites for urban wetland regeneration within Luang Prabang. Experience from other countries, including Colombo in Sri Lanka, will be considered.

50. **Global knowledge and private sector financing.** The project will also seek to leverage established Global Knowledge in the Bank, reviewing good practices related to riverbank protection, urban planning, data management infrastructure, green infrastructure, and other project activities. Options to attract private sector financing for flood resilient investments will be explored, particularly land value capture based on the estimated land value benefits of improving the disaster and climate change resilience of riverbank protection.

### C. Financial Management

51. **FM Arrangements**, including the disbursement modality and assigned finance staff, will remain the same under the AF as those of the original project. The AF will be implemented using the FM systems established by MPWT, as fully documented in the FM Manual, which was accepted by the World Bank. DOW has adequately implemented FM arrangements and has established systems to ensure that project transactions are duly approved and supported. It has implemented key internal controls on filing documents, financial reporting, and preparing reconciliation statements. The parent project FM arrangements have been performing well, with both interim financial reports and audit reports provided on a timely basis.

52. The same segregated Designated Account used for the original credit IDA 6120-LA will be used for this AF. Separate books of account will be maintained for the original project and the AF. An operating account will be opened for the AF under MPWT. The Interim Unaudited Financial Reports (IFRs) and other financial reports will be submitted to MPI for inclusion in the consolidated reports and annual audit. The audited financial statements will be subject to public disclosure in accordance with the World Bank’s Policy on Access to Information. Implementation support will align with that planned for the original financing.

53. If the original financing closes without a further extension in addition to the AF, MPWT will be the only implementing agency left and will oversee the overall FM requirements, including the submission of IFR and audit reports. Under the current set up of the original financing, MPI oversees consolidating reports and hiring the external auditors. MPWT will prepare for provisions for additional FM personnel as necessary towards the latter part of the AF implementation.



54. **Project budget.** Project expenses for the AF are identified and summarized in a project budget. Details of procurement activities are developed and will be regularly updated during implementation through an Annual Work Plan and Budget to be submitted to the Bank for approval on an annual basis, two months before the end of the Lao fiscal year. The budget will be prepared in accordance with the workplan and clearly indicate budget by component/sub-component and sources of financing.

#### D. Procurement

55. **Procurement regulations and guidelines.** The World Bank's procurement guidelines, dated January 2011 and revised July 2014, are being applied under the parent project, whereas the AF, being prepared after July 2016, will follow the Procurement Regulations dated July 2016, revised November 2017 and August 2018. Procurement under national procurement procedures as agreed with the World Bank will be carried out in accordance with national regulations, including the Public Procurement Law No. 30, dated November 2, 2017; Instruction on Implementation of the Law on Public Procurement No. 0477 issued by MOF on February 13, 2019, and No. 1995 issued by MOF on June 24, 2019 (Additional Instruction to Articles 23 and 31 of Implementation of Law on Public Procurement); and the Procurement Manual, dated May 2009. Conditions for the use of such procedures are stipulated in the procurement plan. The use of the World Bank's software system, Systematic Tracking of Exchanges in Procurement (STEP), will be continued under the AF to track and plan procurement activities.

56. **Procurement capacity.** The MPWT team implementing procurement under Component 1 of the parent project will continue to be responsible for procurement under the AF. The team has experience with procuring in accordance with the World Bank procurement procedures. To support the implementation, an international and a local procurement consultant have been hired to assist and train DOW staff.

57. **Procurement strategy.** A Project Procurement Strategy for Development (PPSD) was developed for the AF. A market analysis suggested that MPWT will be able to attract qualified contractors and consultants to perform works identified under the project. Where applicable, an international market approach will be used, in line with World Bank Standard Procurement Documents. The Borrower's regulations, harmonized standard bidding documents, and the request for quotations method will be used for works that use the national market approach.

58. **Procurement plan.** Based on the PPSD, a procurement plan for the project was prepared by MPWT. During implementation, the procurement plan may be updated by MPWT to accommodate changes. The procurement plan and its modifications are subject to the World Bank's prior review and no-objection in STEP. Details for the procurement arrangements are provided in the POM. The procurement plan identifies the risk for each activity and prior or post reviews of these activities are set based on the thresholds, performance, and risk rating. The World Bank will carry out procurement post-reviews on an annual basis.

#### E. Social (including Safeguards)

59. **Safeguards category and arrangements.** The AF activities result in no changes to the safeguards category, which remains as B, with no new policies being triggered, and no new risks anticipated. Implementation of the parent project has not resulted in significant safeguards issues, and substantial impacts are not anticipated under the proposed AF. Overall safeguards compliance of the parent project has been rated satisfactory. The parent project, which has adequate arrangements for safeguards implementation and management, including monitoring systems, will also apply to the AF project activities. The AF will be implemented under World Bank Safeguards OP/BP in line with Bank guidance from



December 20, 2018, on the use of Additional Financing for Scale-up of Ongoing Operations Governed by Safeguard Policies. The current safeguards implementation arrangement is considered adequate for the AF.

60. **Framework approach.** The AF is subject to the frameworks and GRM of the parent project. The addition of Luang Prabang and Borikhamxay provinces as target project areas along with river bank protection and other works under the AF are not expected to raise new environmental and social risks nor trigger new policies. The exact locations of the new investments will be determined by a Feasibility, Detailed Design, and Supervision consultancy firm. Therefore, the exact locations of the new investments will not be known by the time of appraisal. As soon as the investments for the AF are determined, EDPD/PTRI will carry out a detailed impact assessment and prepare impact management instruments, such as the ESMP, ARAP or RAP, and EGEP, required to be applied by the project. The existing safeguards policy frameworks (ESMF, RPF, EGEP) were updated and will be applied under the AF. EDPD/PTRI has also initiated the engagement of MONRE to ensure national policy compliance and seek its support for safeguard implementation.

61. In line with the parent project, two social safeguards policies are triggered: (i) Indigenous Peoples (OP/BP 4.10) and (ii) Involuntary Resettlement (OP/BP 4.12).

62. **Indigenous peoples (OP/BP 4.10).** This policy continues to be triggered because the parent project and the AF may directly or indirectly affect communities that are home to members of ethnic groups. An EGEP, which was prepared for the parent project to address potential adverse social impacts on ethnic minorities that may occur due to project implementation, was updated and will apply under the AF. If an ethnic minority group as defined under OP/BP 4.10 is found to be present in the subproject areas, an EGEP will be prepared and implemented in line with the EGEP.

63. **The Involuntary resettlement (OP/BP 4.12).** This policy remains triggered due to the possibility of minor land acquisitions, the resettlement of project-affected people and their households (PAP and PAHs) due to the construction of riverbank protection and embankment improvements, flood gates, river-side parks, drainage canals, and hydromet stations. The AF does not support investments requiring substantial resettlement. It is expected that less than 40 households will be partially affected with no household having to resettle. An RPF is in place, which includes provisions for compensation and rehabilitation assistance. If land compensation and/or donation is involved, a RAP or ARAP will be prepared including procedures for land contributions. Initial safeguards training was provided in mid-2018 with training on RAP policy and implementation. If land acquisition and resettlement are required and unavoidable, compensation payments for land and assets affected will be completed before construction can begin. The GOL requested that the AF may finance some land expenditures and resettlement compensation with credit proceeds, and this was approved in line with Bank Procedure on Preparation of Investment Project Financing on November 7, 2019..

64. **Grievance redress mechanism.** The parent project has a GRM in place, as per the ESMF, RPF, and EGEP. The GRM is based on the existing system of Village Mediation Committees (VMC) and fiduciary structures in place at local and national levels. The DPWT in Oudomxay is responsible for monitoring and reporting on the status of grievances received and addressed by the VMC. The same GRM will apply for the AF.

65. **Other possible safeguard related issues.** Work contractors to be hired to implement infrastructure subprojects supported by the AF are expected to establish campsites for their workers and provide construction equipment and materials, which may pose possible risks and impacts on local communities, their health, and safety. These include, but are not limited to, possible communicable diseases, (sexually-transmitted diseases, HIV/AIDs, tuberculosis), waste and water-borne diseases, gender-based violence, violence against children, other forms of sexual harassment, and human trafficking. To prevent and address the potential risks and impacts on community health and safety, Environmental and



Social, Health and Safety (ESHS) guidelines including Code of Conducts prepared for the parent project will be applied by AF. ESHS requirements will be included in the bidding documents to be complied with by the work contractors whose performance will be closely supervised and reported by the DPWT.

66. **Citizen engagement.** The parent project has arrangements for citizen engagement during project preparation, design, and implementation. Local communities and stakeholders are engaged and consulted throughout the project cycle to ensure that communities are adequately informed and that the needs of beneficiaries, including women, youth, the elderly and ethnic groups, are addressed. In addition, the project design for Component 1 includes participatory approaches to facilitate citizen engagement in the management of flood risks. For instance, a map-a-thon was organized in November 2018 as the first step towards building an Open Street Map volunteer community. The National Community Engagement Consultant has been mobilized to assist DPWT in Oudomxay province to strengthen and implement the participatory process. The parent project includes intermediate indicators to monitor the percentage of addressed grievances resolved and participation in consultation activities during project implementation across all project components. The AF will build on existing citizenship engagement arrangements.

#### F. Environment (including Safeguards)

67. The AF triggers the same three environmental and one legal safeguard policies as the parent project, i.e. (i) Environmental Assessment (OP/BP 4.01), (ii) Natural Habitats (OP/BP 4.04), (iii) Physical Cultural Resources (OP/BP 4.11), and (iv) Projects on International Waterways (OP/BP 7.50).

68. **Environmental Assessment (OP/BP 4.01) and Natural Habitats (OP/BP 4.04).** Field visits to the proposed sites in Luang Prabang and Borikhamxay suggested that the potential risks and negative impacts during the construction of the proposed investments will be low to moderate. Most of direct impacts will be limited to dust, noise, vibration, household business disturbance, waste generation, and potential disturbance to local habitats. These impacts can be adequately mitigated through an Environmental Code of Practice (ECOP) and effective management of contractors. In Luang Prabang, due attention will be necessary to control movement and operations of large construction machines, transportation of construction materials, and workforce behaviors. The lower part of Nam Khan is affected by the daily and seasonal change of water flows and water levels as well as the operation of the existing upstream dams (Nam Khan 1 and Nam Khan 2). The water levels at works located along the Mekong River are affected by upstream dams along the Mekong River. The proposed subproject sites can only protect a small proportion of areas where erosion is found to be severe and protection is urgently needed. The hydrological situation could change significantly when more upstream dams in the Mekong mainstream, the Nam Khan, and Nam Ou start to operate in the next years. To ensure that the proposed structure can effectively protect the proposed areas for a reasonable time, the ESMP will include a program to monitor river bank erosion upstream and downstream of the proposed sites. Efforts will also be made to reduce water flows and the impacts of water level changes on the river bank through the application of soft solutions, for example, the installation of bamboo rows to dissipate energy and planting of vetivers and/or other local plants to withhold soil and trap sediment.

69. **Physical Cultural Resources (OP/BP 4.11).** Given that the proposed subproject site in Luang Prabang is located in the Luang Prabang World Heritage Area, DOW and World Bank consulted with concerned agencies to ensure that adequate actions will be undertaken during project implementation to address public concerns and comply with OP/BP 4.11. In addition, a Heritage Impact Assessment (HIA), in line with UNESCO guidance, will be developed for investments in Luang Prabang.

70. **Projects on International Waterways (OP/BP 7.50).** Similar to the parent project, the World Bank, on behalf of Lao



PDR, issued a formal notification to the the riparian countries of the Mekong River (Cambodia, China, Myanmar, Thailand, and Vietnam) and the Mekong River Commission about the planned investments on September 24, 2019. Countries were asked to respond with any comments or objections before October 31, 2019. No objections were received.

71. **Instruments.** The parent project ESMF was updated to ensure that the subprojects and activities are implemented in a safe, acceptable, and environmentally and socially sustainable manner. The updated ESMF focuses on the legal and institutional settings, specific requirements regarding contractor performance and the need for close monitoring. It incorporates a generic ECOP, including specific ESHS requirements to address community health and safety-related risks and impacts and additional guidelines and an HIA to identify potential negative impacts and mitigation measures for the infrastructure proposed in Luang Prabang City, as required by UNESCO. The generic ECOP includes a specific requirement on “chance find” procedures. The ECOP will be incorporated in the bidding and contract documents to ensure that bidders are aware of these obligations. The performance of contractors will be regularly monitored by the supervision consultant and/or field engineer during works execution. Contractors will be required to train all workforce on a regular basis. DOW and EDPD/PTRI will conduct safeguards monitoring and submit reports biannually.

72. **Instruments, consultations, and disclosure.** The existing ESMF, EGEF, and RPF were updated to incorporate additional activities to be carried out under the AF. These safeguards policy frameworks were finalized after consultation with local authorities and communities, which took place in Luang Prabang Province, August 15-16, 2019, and Borikhamxay Province on August 20-21, 2019. Information on the project and the proposed subproject sites as well as the potential positive and negative impacts, including the proposed mitigation measures identified in the ESMF, RPF, and EGEF, were provided. The consultations demonstrated overall support for the project. Key comments and suggestions included ensuring the effective management of contractors and providing an adequate budget for local authorities and communities to enable close monitoring of contractor performance. The ESMF, EGEF and RPF were distributed in the project provinces, and publicly disclosed in English and Lao on the MPWT’s website on 18 September 2019, and updated versions on October 1, 2019, with the updated version disclosed on the World Bank’s website in English on October 7, 2019 and in Lao on October 1, 2019.

## V. WORLD BANK GRIEVANCE REDRESS

73. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB’s Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB’s independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank’s attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank’s corporate Grievance Redress Service, please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).



**VI SUMMARY TABLE OF CHANGES**

	Changed	Not Changed
Project's Development Objectives	✓	
Results Framework	✓	
Components and Cost	✓	
Loan Closing Date(s)	✓	
Safeguard Policies Triggered	✓	
Legal Covenants	✓	
Procurement	✓	
Implementing Agency		✓
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
EA category		✓
Institutional Arrangements		✓
Financial Management		✓
APA Reliance		✓
Other Change(s)		✓

**VII DETAILED CHANGE(S)**

**PROJECT DEVELOPMENT OBJECTIVE**

**Current PDO**

To reduce the impacts of flooding in Muang Xay and enhance the Government’s capacity to provide hydro-meteorological services and disaster response.



**Proposed New PDO**

To reduce the impacts of flooding in target areas and enhance the Government’s capacity to provide hydro-meteorological services and disaster response.

**COMPONENTS**

Current Component Name	Current Cost (US\$, millions)	Action	Proposed Component Name	Proposed Cost (US\$, millions)
Integrated Urban Flood Risk Management	13.50	Revised	Integrated Urban Flood Risk Management	38.50
Hydromet Modernization and Early Warning Systems	10.00	No Change	Hydromet Modernization and Early Warning Systems	10.00
Financial Planning for Disaster Resilience	6.00	No Change	Financial Planning for Disaster Resilience	6.00
Knowledge and Coordination	1.50	No Change	Knowledge and Coordination	1.50
Contingent Emergency Response	0.00	No Change	Contingent Emergency Response	0.00
<b>TOTAL</b>	<b>31.00</b>			<b>56.00</b>

**LOAN CLOSING DATE(S)**

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IDA-61200	Effective	31-Oct-2022	31-Oct-2022	31-Dec-2024	30-Apr-2025
TF-A5033	Effective	30-Jun-2022	30-Jun-2022	30-Jun-2022	30-Oct-2022

**Expected Disbursements (in US\$)**

Fiscal Year	Annual	Cumulative
2018	962,498.00	962,498.00
2019	1,300,000.00	2,262,498.00
2020	9,100,000.00	11,362,498.00
2021	9,500,000.00	20,862,498.00
2022	14,700,000.00	35,562,498.00



2023	7,100,000.00	42,662,498.00
2024	8,000,000.00	50,662,498.00
2025	5,337,502.00	56,000,000.00
2026	0.00	56,000,000.00

**SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)**

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	● Substantial	● Substantial
Macroeconomic	● Substantial	● Substantial
Sector Strategies and Policies	● Substantial	● Moderate
Technical Design of Project or Program	● Substantial	● Substantial
Institutional Capacity for Implementation and Sustainability	● Substantial	● Substantial
Fiduciary	● Substantial	● Substantial
Environment and Social	● Moderate	● Moderate
Stakeholders	● Moderate	● Substantial
Other		
Overall	● Substantial	● Substantial

**COMPLIANCE**

**Change in Safeguard Policies Triggered**

Yes

Safeguard Policies Triggered	Current	Proposed
Environmental Assessment OP/BP 4.01	Yes	Yes
Performance Standards for Private Sector Activities OP/BP 4.03	No	No
Natural Habitats OP/BP 4.04	Yes	Yes
Forests OP/BP 4.36	No	No





Pest Management OP 4.09	No	No
Physical Cultural Resources OP/BP 4.11	Yes	Yes
Indigenous Peoples OP/BP 4.10	Yes	Yes
Involuntary Resettlement OP/BP 4.12	Yes	Yes
Safety of Dams OP/BP 4.37	No	No
Projects on International Waterways OP/BP 7.50	Yes	Yes
Projects in Disputed Areas OP/BP 7.60	No	No

**LEGAL COVENANTS – Lao PDR Southeast Asia Disaster Risk Management Project (P160930)**

Loan/Credit/TF	Description	Status	Action
IDA-61200	Institutional Arrangements Financing Agreement: Schedule 2, Section I.A Recurrent, Continuous Recipient to maintain, throughout the Project implementation period: (a) project implementation structures within MPI, MPWT, MONRE, and MOF; and (b) a national disaster risk financing and insurance working group; all with functions, staffing and resources satisfactory to the Association.	Complied with	No Change
IDA-61200	Project Operation Manual Financing Agreement: Schedule 2, Section I.B Recurrent, Continuous Recipient to ensure that the Project is carried out in accordance with the Project Operation Manual; and not amend, waive or abrogate any provisions of the manual unless the Association agrees otherwise in writing.	Complied with	No Change
IDA-61200	Memoranda of Understanding Financing Agreement: Schedule 2,	Complied with	Revised



	<p>Section I.C          Due Date: 3 months after Effectiveness Recipient, through MPWT, to: (a) enter into a memorandum of understanding with Oudomxay, under terms and conditions satisfactory to the Association; (b) exercise its rights under the memorandum of understanding in such manner as to protect the interests of the Recipient and the Association and to accomplish the purposes of the Credit; and (c) not assign, amend, abrogate or waive the memorandum of understanding or any of its provisions unless the Association agrees otherwise in writing.</p>		
Proposed	<p>Memoranda of Understanding. FA: Sched. 2, Sect.I.C: 3 months after Effectiveness Recipient, through MPWT, to: (a) enter into a MOU with Oudomxay, Borikhamxay, and Luang Prabang, with terms satisfactory to the Association; (b) exercise rights under the MOUs protecting the interests of the Recipient and the Association c) not to assign, amend, abrogate or waive the MOU unless agreed by Association.</p>	Not yet due	
IDA-61200	<p>Annual Work Plans and Budgets Financing Agreement: Schedule 2, Section I.D          Annual, Continuous          Recipient to ensure that: (a) the Association is furnished, not later than October 31 of each fiscal year of the Recipient during the implementation of the Project (or such later date as the Association may agree) for the Association’s no-objection, a consolidated Annual Work Plan and Budget; (b) the Project is implemented in accordance with the Annual Work Plan and Budget, and provide, promptly as needed, its share of the Project financing as specified in the plan; and (c) not make or allow to be made any</p>	Complied with	No Change



	change to the Annual Work Plan and Budget without prior no-objection in writing by the Association.		
IDA-61200	Contingent Emergency Response Financing Agreement: Schedule 2, Section I.G Recurrent, Continuous Recipient to adopt a satisfactory Emergency Response Manual for Component 5 of the Project and, in the event of an eligible crisis or emergency, ensure that the activities under said component are carried out in accordance with such manual and all relevant safeguard requirements.	Complied with	No Change
IDA-61200	Environmental and Social Safeguards Financing Agreement: Schedule 2, Section I.E Recipient to ensure that the Project is carried out in accordance with the Environmental and Social Management Framework, the Resettlement Policy Framework, the Ethnic Group Engagement Framework, and any Safeguard Assessment and Plan; not amend, abrogate, or waive any of the safeguard instruments unless the Association agrees otherwise, and report on their status of implementation as part of the semiannual progress reports.	Complied with	No Change
IDA-61200	Mid-term Review Financing Agreement: Schedule 2, Section II.A.2 Due date: 30 months after Effectiveness Recipient to prepare and furnish to the Association a mid-term report, documenting progress achieved in the carrying out of the Project during the period preceding the date of such report; review with the Association such mid-term report; and thereafter take all measures required to ensure the continued efficient implementation of the Project and the achievement of its	Not yet due	No Change



objectives, based on the conclusions and recommendations of the mid-term report and the Association’s views on the matter.

**LEGAL COVENANTS – Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance (P170945)**

**Sections and Description**

No information available

**Conditions**

Type	Description
Disbursement	<p><b>Financing of Premia</b>  Financing Agreement: Schedule 2, Section III .B.1 (b)  The Recipient may not withdraw the proceeds of the Original Credit allocated to the financing of premia until it has requested the withdrawal of the Credit for the payment of Premia to the Southeast Asia Disaster Resilience Insurance Facility or the Association (or both), in each case in accordance with the relevant paragraph of Section IV of Schedule 2 to the Financing Agreement.</p>
Disbursement	<p><b>Contingent Emergency Response</b>  Financing Agreement: Schedule 2, Section III .B.1 (c)  The Recipient may not withdraw the proceeds of the Credit as may be allocated to Component 5 unless an Eligible Crisis or Emergency has occurred, all related safeguards instruments and requirements have been completed, the emergency response implementing entities have adequate staff and resources, and the Recipient has adopted the Emergency Response Manual, acceptable to the Association.</p>



VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Lao People's Democratic Republic

Lao PDR Southeast Asia Disaster Risk Management Project – Additional Finance

Project Development Objective(s)

To reduce the impacts of flooding in target areas and enhance the Government’s capacity to provide hydro-meteorological services and disaster response.

Project Development Objective Indicators by Objectives/ Outcomes

Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Reduce the impacts of flooding in target areas (Action: This Objective has been Revised)</b>											
Number of people protected from floods (Number (Thousand))		8.00	8.00	8.00	9.00	15.00	27.00	33.00	39.00	44.00	44.00
<b>Action: This indicator has been Revised</b>	<b>Rationale: Indicator revised to reflect added works under the AF.</b>										
of which are female (Percentage)		50.00	50.00	50.00	50.00	50.00	50.00				50.00
Area with improved flood protection (Square kilometer(km2))		0.00	0.00	0.00	3.00	6.00	9.00	11.00	13.00	15.00	15.00



Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to capture flood benefits</i>										
<b>Enhance the Government’s capacity to provide hydro-meteorological services</b>											
Satisfaction of weather information end-users increased (Yes/No)	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
<b>Action: This indicator has been Revised</b>											
<b>enhance the Government’s capacity to provide disaster response.</b>											
Lao PDR has information and capacity to access sovereign disaster risk insurance (Yes/No)	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
<b>Action: This indicator has been Revised</b>											
<b>Intermediate Results Indicators by Components</b>											
Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Integrated Urban Flood Risk Management (Action: This Component has been Revised)</b>											



Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
Length of river bank protection rehabilitated in Oudomxay, Luang Prabang, and Borikhamxay (Kilometers)		0.00	0.00	0.00	2.00	5.00	8.00	10.00	12.00	13.00	13.00
<b>Action: This indicator has been Revised</b>	<b>Rationale: Target increased to reflect additional works under the AF.</b>										
Disaster risk management and risk-sensitive land use planning are integrated into several urban plans (Number)		0.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	2.00	2.00
<b>Action: This indicator has been Revised</b>	<b>Rationale: Target increased to reflect additional works under the AF</b>										
Watergates installed (Number)		0.00	0.00	0.00	0.00	0.00	1.00	2.00	3.00	4.00	4.00
<b>Action: This indicator is New</b>	<b>Rationale: Indicator added to reflect additional works under the AF.</b>										
DRM plans developed and urban plans updated to include disability-specific considerations and at least 3 gender-		0.00	0.00	0.00	0.00	1.00	2.00	3.00	4.00	5.00	5.00



Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
specific criteria (Number)											
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to promote and monitor gender equality.</i>										
Studies and designs for investments with environmental and social co-benefits developed (Number)	0.00	0.00	0.00	0.00	1.00	1.00	2.00	2.00	3.00	3.00	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to capture institutional capacity building under the AF.</i>										
Number of Government staff trained in risk assessment, flood modeling, urban planning, and disaster preparedness (Number)	0.00	0.00	0.00	8.00	15.00	25.00	30.00	35.00	40.00	40.00	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to capture institutional capacity building under the AF.</i>										
of which are women (Percentage)	5.00	5.00	5.00	5.00	5.00	10.00	10.00	15.00	15.00	15.00	





Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to promote and monitor gender equality.</i>										
Number of provinces for which GIS data on embankment condition and disaster vulnerability has been integrated and input into an IT-based waterways asset management system for riverbank protection (Number)	0.00	0.00	0.00	3.00	7.00	10.00	13.00	16.00	18.00	18.00	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to capture institutional capacity building under the AF.</i>										
Flood risk management strategies for future urban resilience investments prepared (Number)	0.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	2.00	2.00	
<b>Action: This indicator is New</b>	<b>Rationale:</b> <i>Indicator added to institutional capacity building under the AF.</i>										
Percentage of female staff of the Project Management Unit of DOW (Percentage)	25.00	25.00	25.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	



Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Action: This indicator is New</b>	<i>Rationale: Indicator added to promote and monitor gender equality.</i>										
<b>Hydromet Modernization and Early Warning Systems</b>											
Validated hydromet data is accessible on a centralized online data management platform (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Action: This indicator has been Revised</b>											
Accuracy of weather forecast improved (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Action: This indicator has been Revised</b>											
<b>Financial Planning for Disaster Resilience</b>											
National disaster risk finance strategy developed (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Action: This indicator has been Revised</b>											
<b>Knowledge and Coordination</b>											
Participants in consultation activities during project implementation (Number)	0.00	100.00	200.00	300.00	400.00	500.00	600.00	700.00	800.00	800.00	800.00



Indicator Name	DLI	Baseline	Intermediate Targets								End Target
			1	2	3	4	5	6	7	8	
<b>Action: This indicator has been Revised</b>	<b>Rationale:</b> <i>The target has been revised to reflect the increased scope of works under the AF.</i>										
of which are women (Percentage)	5.00	5.00	5.00	5.00	10.00	10.00	15.00	15.00	20.00	20.00	
<b>Action: This indicator has been Revised</b>	<b>Rationale:</b> <i>Target revised to reflect improved baseline.</i>										
Percentage of grievances registered related to delivery of project activities that are addressed according to agreed procedures (Percentage)	0.00	0.00	0.00	90.00	90.00	90.00	90.00	95.00	95.00	95.00	
<b>Action: This indicator has been Revised</b>	<b>Rationale:</b> <i>The indicator was revised for improved clarity.</i>										
Grievances related to delivery of project benefits that are addressed-(number) (Number)	0.00									100.00	
<b>Action: This indicator has been Marked for Deletion</b>	<b>Rationale:</b> <i>Target dropped to avoid duplication with “grievances registered related to delivery of project activities addressed (Percentage) according to agreed procedures”.</i>										



**Monitoring & Evaluation Plan: PDO Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Number of people protected from floods	Population of targeted urban areas protected by flood risk management infrastructure	Annual	Monitoring reports		DOW
of which are female		At the end of the project	Monitoring reports		DOW
Area with improved flood protection	Area of city protected by structural investments	At the end of the project	Monitoring reports		DOW
Satisfaction of weather information end-users increased	Satisfaction rate towards improved services for civilians and government officials from different sectors, including DRM, civil aviation, media, and agriculture (gender-disaggregated) calculated as a percentage of users surveyed. This will be assessed through a beneficiary survey which will also assess gender specific aspects (e.g. access	At the beginning and end of the project	Monitoring reports		DMH



	to hydromet information; behavioral impact; etc.).				
Lao PDR has information and capacity to access sovereign disaster risk insurance	Country-specific sovereign disaster risk insurance product has been designed and quoted competitively.	At the end of project	Monitoring reports		SRD

**Monitoring & Evaluation Plan: Intermediate Results Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Length of river bank protection rehabilitated in Oudomxay, Luang Prabang, and Borikhamxay	Length of river bank protection constructed and/or rehabilitated in a climate resilient manner in the three provinces. With due recognition of affordability and technical viability constraints, the investments will consider universal accessibility standards.	Annual	Construction reports		DOW
Disaster risk management and risk-sensitive land use planning are integrated into several urban plans	An integrated understanding of disaster risks that addresses flood risk and risk-based land use planning are integrated into urban plans.	Annual	Monitoring reports		DOW & DHUP
Watergates installed	Number of watergates constructed in Luang Prabang	Annual	Construction reports		DOW



DRM plans developed and urban plans updated to include disability-specific considerations and at least 3 gender-specific criteria	Gender and disability-specific issues and solutions identified and articulated in developed DRM and updated urban plans through gender analysis. DRM and urban plans will include gender-specific criteria, such as promoting gender-inclusive employment in standard contract bidding documents, raising awareness of contractors on gender-sensitive employment practices, and encouraging the active participation of women in urban planning and identifying and managing DRM investments. This may also include for example design standards for gender and disability inclusion (e.g., accessibility standards, compliant ramps, bathroom design, adequate lighting, etc.)	Annual	Monitoring reports		DOW
Studies and designs for investments with environmental and social co-benefits developed	Green infrastructure and other environmental/social co-benefits identified and designs developed to	Annual	Monitoring reports		DOW



	incorporate these elements into structural investments in the three target urban areas. The designs will also include gender and disability-specific considerations, such as universal access, safety, etc.				
Number of Government staff trained in risk assessment, flood modeling, urban planning, and disaster preparedness	This indicator will measure the number of government staff who received capacity building risk assessment, flood modeling, urban planning, and disaster preparedness .	Annual	Monitoring reports		DOW
of which are women	Percentage of female staff trained	Annual	Monitoring reports		DOW
Number of provinces for which GIS data on embankment condition and disaster vulnerability has been integrated and input into an IT-based waterways asset management system for riverbank protection	GIS data on embankment condition and disaster vulnerability collected across Lao PDR's 17 provinces and Vientiane to flow into an IT-based waterways asset management system for riverbank protection, which will be developed to support O&M	Annual	Monitoring reports		DOW



Flood risk management strategies for future urban resilience investments prepared	Studies on flood risk management strategies developed, along with investment plans based on the studies, to support future flood risk management investments for Vientiane and Borikhamxay	Annual	Monitoring reports		DOW
Percentage of female staff of the Project Management Unit of DOW	Percentage of female staff of the Project Management Unit of DOW	Annual	Monitoring reports		DOW
Validated hydromet data is accessible on a centralized online data management platform		At the end of the project	Monitoring reports		DMH
Accuracy of weather forecast improved	Establishment of a national verification system for tracking the accuracy of weather forecasts. Improvement in accuracy of forecasts registered in the tracking system.	Annual	Monitoring reports		DMH
National disaster risk finance strategy developed	A financial strategy detailing how funds are mobilized and executed for post disaster response will be developed.	At the end of the project.	Monitoring reports		MOF
Participants in consultation activities during project implementation	Project beneficiaries who participate in consultations on the project activities.	Annual		Monitoring reports	MPI, MPWT, MONRE, MOF





	Relates to all project components. This is a measure of citizen engagement.				
of which are women	Percentage of project beneficiaries who participate in consultations who are women.	Annual		Monitoring reports	MPI, MPWT, MONRE, MOF
Percentage of grievances registered related to delivery of project activities that are addressed according to agreed procedures	Percentage of grievances registered related to delivery of project activities that are addressed according to agreed procedures	Annual		Monitoring reports	MPI
Grievances related to delivery of project benefits that are addressed-(number)					MPI



## ANNEX 1: Economic Analysis

1. As the extension to the parent project of the Lao PDR SEA DRM Project, a cost-benefit analysis of the additional financing of Component 1.1 (Structural Investments) was conducted to calculate the economic internal rate of return (EIRR) and net present value (NPV) in Muang Xay city in Oudomxay, Luang Prabang city in Luang Prabang, and Pakxan city in Borikhamxay, by comparing costs and benefits under ‘without-project’ and ‘with-project’ scenarios. The analysis was conducted for the investment on river bank protection and erosion protection in the three selected cities, wetlands restoration in Luang Prabang, and a flood risk management strategy in Borikhamxay. The major economic benefits in those cities are expected to come mainly from avoided direct losses of assets from flash flooding as well as the avoided recovery and reconstruction in the flooded area.

2. The estimates for the losses and damages as well as the recovery and reconstruction needs were based on the Lao PDR’s Post Disaster Needs Assessment (PDNA)<sup>17</sup> of the floods in 2018. The assessed damage and losses covered three areas – (i) social sectors (Housing and settlements, Education, Health and nutrition, Culture), (ii) Productive sectors (Agriculture: crops, livestock, fisheries, forestry, irrigation, industry and commerce, Tourism), and (iii) Infrastructure sectors (Transport, Electricity, Water supply and sanitation, Waterways). Recovery and reconstruction needs also included the costs of cross-cutting issues such as disaster risk management, environment, and climate change, governance, human development, employment and livelihoods, gender, disability, and child protection, among others. Based on the Bank’s statistics for Lao PDR, the growing return on such assets is 10.22 percent of avoided damages, losses and recovery costs.<sup>18</sup> Based on the World Bank guidance note on discount rates, a 12 percent discount rate is used, similar to the parent project.

### Additional Financing for Oudomxay

3. The economic analysis for the additional financing of the existing project in Muang Xay city in Oudomxay covers the implementation period for both the parent project and additional financing, and stream of benefits extending to 2040, in total looking at the period 2017-2040. The implementation of the parent project began in 2017, and with the additional financing, the project will be implemented for eight years. The stream of benefits from the parent project is expected to start in 2020 after the construction of the first phase finished; it is assumed that the parent project enables the city to avoid flash flood damages of 3 percent to the city’s assets, once every four years (that is, with an Annual Exceedance Probability of 25 percent). The stream of benefits of the additional financing is then expected to start after five years of additional construction and implementation; with the additional financing, it is assumed that additional financing investments enable the city to avoid flash flood damages once every decade (that is, with an Annual Exceedance Probability of 10 percent). Specifically, based on data from the 2018 PDNA in 2018, benefits from the avoided losses and damages as well as the recovery and reconstruction costs are an estimated 6.2 percent of the city’s economic activities. Given the available per capita income<sup>19</sup> at US\$2,577 and population data, Muang Xay’s GDP is estimated to be around US\$196.7 million.

4. With these assumptions, parent project and additional financing investments will yield an EIRR of 18.2 percent with an NPV of US\$11.14 million.

<sup>17</sup> Based on the *PDNA 2018 Floods* that took place between September 24 and October 19, 2018. The report is based on national data as of October 2018 gathered during the assessment by the GOL.

<sup>18</sup> World Bank website. <https://databank.worldbank.org/reports.aspx?source=1250&series=GFDD.EI.06>. Accessed April 2019.

<sup>19</sup> World Bank website. Country Overview Lao PDR. <https://www.worldbank.org/en/country/lao/overview>. Accessed April 2019.



### Additional Financing for Luang Prabang

5. For a new scope of investment under this Project in Luang Prabang, the economic analysis covers a 20-year period of the additional financing from 2020 to 2040. The total investment of US\$9 million from additional financing will be invested in the first year for US\$2 million for the non-structural investment and the other structural investment of US\$7 million will be spread across five years from 2020, while the stream of benefits of the additional financing is expected to start after five years of additional construction and implementation. It is assumed that this new investment will enable Luang Prabang city to avoid flash flood damages and recovery costs once every decade with an Annual Exceedance Probability of 10 percent. Based on data from the 2018 PDNA, the total benefits from the avoided losses and damages as well as the recovery and reconstruction costs are an estimated 9.1 percent of the city’s economic activities. Given the available per capita income at US\$2,577 and population data, Luang Prabang’s GDP is estimated to be around US\$232.74 million.

6. Based on these assumptions, investments in flood protection infrastructure benefits in Luang Prabang will yield an EIRR of 22.3 percent with an NPV of US\$9.76 million.

### Additional Financing for Borikhamxay

7. For the new scope of investments in Borikhamxay, particularly in Pakxan city, the economic analysis covers a 20-year period of the additional financing from 2020 to 2040. The stream of additional financing of US\$6 million will be spread across five years from 2020, while the stream of benefits of the additional financing is expected to start after five years of additional construction and implementation. It is assumed that this new investment will enable Pakxan city to avoid flash flood damages and recovery costs once every decade with an Annual Exceedance Probability of 10 percent. Specifically, based on data from the 2018 PDNA, total benefits from the avoided losses and damages as well as the recovery and reconstruction costs are an estimated 5.9 percent of the city’s economic activities. Given the available per capita income and population data, Pakxan’s GDP is estimated to be around US\$126.47 million. From the analysis, with a 12 percent discount rate, flood protection investment in Pakxan will yield an EIRR of 14.4 percent with a slightly positive NPV of US\$1.15 million.

### Sensitivity analyses

8. Sensitivity analyses on various cost and benefit variations were conducted to test the robustness of the results (Table A1).

**Table A1. Sensitivity Analysis of Component 1 in each city**

Scenario	Luang Prabang		Muang Xay		Pakxan	
	EIRR (%)	NPV (US\$ millions)	EIRR (%)	NPV (US\$ millions)	EIRR (%)	NPV (US\$ millions)
<b>Base case</b>	<b>22.3</b>	<b>9.76</b>	<b>18.2</b>	<b>11.14</b>	<b>14.4</b>	<b>1.15</b>
<b>Investment cost increases by 20 percent</b>	<b>19.9</b>	<b>8.30</b>	<b>16.1</b>	<b>8.19</b>	<b>12.3</b>	<b>0.18</b>
<b>Benefits reduce by 20 percent</b>	<b>19.3</b>	<b>6.35</b>	<b>15.6</b>	<b>5.96</b>	<b>11.9</b>	<b>-0.05</b>
<b>Investment cost increases by 20 percent and benefits reduce by 20 percent</b>	<b>17.0</b>	<b>4.88</b>	<b>13.6</b>	<b>3.00</b>	<b>10.0</b>	<b>-1.02</b>



<b>Discount rate increases to 16 percent</b>	<b>22.3</b>	<b>4.39</b>	<b>18.2</b>	<b>2.85</b>	<b>14.4</b>	<b>-0.60</b>
--	-------------	-------------	-------------	-------------	-------------	--------------

9. To monitor the project’s impact until the exit point, the project will annually collect the following information to measure the actual economic impacts and ‘value-for-money’ from the investment:

- a) Survey of assets affected by flood and recovery costs in each city — total value of (asset) damages due to flash flood and the costs of recovery
- b) Survey of property values in each city, both in the flood-affected areas (under the project) and in no-flood area
- c) City’s local GDP in U.S. dollars
- d) Estimation of annual damages and losses from natural disasters

### Comparisons with the Master Plan for Integrated Flood Management in the Mekong River

10. A consortium of Koran consultants, ISAN Corporation and K-water conducted a Korean-funded Master Plan and Pre-Feasibility Study (PFS) for Integrated River Management (IRM) from March to December 2015. The study comprised a Master Plan covering the entire Mekong River within Laos and a subsequent PFS for flood mitigation measures in Luang Prabang city, which was identified as the highest priority intervention out of a long-list of 16 identified.

11. Results of the economic analysis conducted under the Master Plan are in Table A2 below:

**Table A2. Economic Analysts under the Master Plan**

Long-listed Project Area	Present Value (million USD)		B/C	NPV (million USD)	EIRR	
	Benefits	Costs				
P01	Tonpheung	5.18	49.88	0.10	-44.70	-2.31
P02	Houayxai	13.00	44.84	0.29	-31.84	2.77
P03	<b>Luangprabang</b>	<b>66.45</b>	<b>58.44</b>	<b>1.14</b>	<b>8.02</b>	<b>13.36</b>
P04	Xayabury	32.81	37.76	0.87	-4.95	10.62
P05	Kenethao	0.13	5.21	0.03	-5.08	-
P06	Botene	0.04	1.45	0.03	-1.41	-
P07	Muen	0.20	9.18	0.02	-8.97	-
P08	Pakngum	14.20	63.07	0.23	-48.87	1.42
P09	Thaphabath	8.40	75.16	0.11	-66.77	-1.96
P10	<b>Pakxane+Bolikhanh</b>	<b>26.80</b>	<b>49.18</b>	<b>0.54</b>	<b>-22.38</b>	<b>6.75</b>
P11	Pakkading	8.80	54.29	0.16	-45.49	-0.20
P12	Hinboon	9.02	44.33	0.20	-35.31	0.91
P13	Thakhek	62.00	57.84	1.07	4.16	12.72
P14	Nongbok	42.21	82.73	0.51	-40.52	6.28
P15	Khongxedone	20.23	71.32	0.28	-51.09	2.65
P16	Samakhhixay	62.34	49.12	1.27	13.22	14.61

12. The results of the economic analyses vary, particularly for Pakxan. Under the Master Plan methodology, the NPV for Pakxane and Bolikhanh is -22.38, compared to 1.15 for Pakxan under the World Bank methodology.



Differences in economic analyses results can be explained by differences in proposed investments; the WB economic analysis assumes that new investments of US\$6 million will enable Pakxan city to avoid flash flood damages and recovery costs once every 10 years, i.e. with an Annual Exceedance Probability of 10 percent. In comparison, the Master Plan assessed planned investments assumed to have a 50-year return period for flood frequency, i.e. with an Annual Exceedance Probability of 2 percent, therefore requiring a large investment of US\$73 million. In addition, estimates of damages differ; the Master Plan drew on unit damages obtained from DPWT or village interviews, while the World Bank analysis drew on damage and losses data from the 2018 PDNA report.

### **Impact of the July-September 2018 Flooding – Summary of PDNA 2018 findings**

13. Lao PDR was severely affected by flooding and heavy rains during July–September 2018. On July 18–19, tropical storm Son-Tinh caused heavy rains and flooding in 55 districts covering 13 provinces. Flooding in Attapeu province was exacerbated by a breach in the Xe Pien Xe Namnoy hydropower saddle dam, which caused an unprecedented flash flood in Attapeu Province that severely affected many lives. In this context, a post-disaster needs assessment (PDNA), led by the government, was conducted covering the impacts on 17 provinces and Vientiane Capital.

14. The PDNA estimated the total impact of the floods (damage and loss) on the economy at about 3,167 trillion Lao kip (approximately US\$372 million), of which the total damage accounted for US\$147 million and the losses totaled US\$225 million. These costs are equivalent to 2.1 percent of losses in GDP in 2018. This makes the overall impact of the recent floods more significant than the two previous flood events in 2009 and 2011. The damage and losses due to the floods vary across sectors. The agriculture (mostly crops, livestock, fishery, and irrigation) and infrastructure sectors (mainly land transport followed by water transport infrastructure such as waterways) were the most severely damaged, accounting for 94 percent of the total damage. These damages caused the biggest estimated losses in the agriculture and transport sectors (57 percent and 41 percent of total losses, respectively). In addition to economic losses, the floods added to the fiscal burden, further challenging the government’s fiscal consolidation efforts. The floods are estimated to affect the budget in terms of foregone revenues and reprioritization of expenditure towards the affected regions and away from capital expenditure. As a result, these impacts contribute to an estimated budget deficit of 4.6 percent of GDP in 2018, compared to the pre-flood estimate of 4.3 percent.

15. At the household level, the floods have had serious implications for people’s livelihood and well-being. Unless adequately addressed, the loss of income from the destruction of farms and microenterprises, coupled with the disruption of social services, exacerbate existing nutrition, health, and education challenges. As a relatively significant share of the population is just above the poverty line, disasters such as these affect livelihoods and move vulnerable groups back into poverty. Establishing a social protection system, including Cash for Work programs that create short-term employment opportunities for flood victims, and prioritizing the recovery of social service provision help mitigate the impacts on the poor.

16. The short-, medium-, and long-term needs for flood recovery resources are considerable. Total recovery and reconstruction needs are estimated at S\$520 million or 10.1 percent of the 2018 budget. The needs are higher than damage and losses since they include, first, the application of a “build back better” approach to the reconstruction of damaged infrastructure that improves the weather-resilient consideration and reduces risks; and, second, the resumption of production, service delivery, and access to goods and services. Reconstruction of



the infrastructure sector (mostly land and water transport infrastructure) is expected to account for about 55 percent of the total needs, followed by cross-cutting issues (28 percent). Cross-sectoral needs consider also the clearance of unexploded ordinance due to their possible relocation after the floods, to ensure the recovery of livelihood activities.



ANNEX 2. Additional Finance Map

