



Project Identification Form (PIF) entry – Full Sized Project – GEF - 7

Integrated Water Resource Management and Ecosystem-based Adaptation (EbA) in the Xe Bang Hieng River Basin and Luang Prabang City

Part I: Project Information

GEF ID

10514

Project Type

FSP

Type of Trust Fund

LDCF

CBIT/NGI CBIT NGI**Project Title**

Integrated Water Resource Management and Ecosystem-based Adaptation (EbA) in the Xe Bang Hieng River Basin and Luang Prabang City

Countries

Lao PDR

Agency(ies)

UNDP

Other Executing Partner(s)

MONRE, Department of Water Resources (DWR)

Executing Partner Type

Government

GEF Focal Area

Climate Change

Taxonomy

Focal Areas, Climate Change, Climate Change Adaptation, Climate information, Ecosystem-based Adaptation, Complementarity, Mainstreaming adaptation, Community-based adaptation, Climate resilience, Innovation, Livelihoods, Least Developed Countries, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approach, Stakeholders, Local Communities, Type of Engagement, Information Dissemination, Consultation, Participation, Communications, Behavior change, Awareness Raising, Beneficiaries, Civil Society, Non-Governmental Organization, Community Based Organization, Gender Equality, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Capacity Development, Participation and leadership, Access and control over natural resources, Gender Mainstreaming, Women groups, Gender-sensitive indicators, Sex-disaggregated indicators, Capacity, Knowledge and Research, Knowledge Exchange, Learning, Integrated Programs, Sustainable Cities, Urban Resilience, Integrated urban planning

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 2

Duration

48 In Months

Agency Fee(\$)

506,298

Submission Date

3/17/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	LDCF	2,878,000	11,000,000
CCA-3	LDCF	2,451,452	9,000,000
	Total Project Cost (\$)	5,329,452	20,000,000

B. Indicative Project description summary

Project Objective

Promote integrated management of sites in the Mekong River Basin for increased climate resilience of Savannakhet Province and Luang Prabang communities vulnerable to floods and droughts, which are expected to worsen under future scenarios.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Developing national and provincial capacities for Integrated Catchment Management (ICM) and integrated urban Ecosystem-based Adaptation (EbA) for climate risk reduction.	Technical Assistance	Outcome 1.1: Enhanced capacity for climate risk modelling and integrated planning in the Xe Bang Hieng river ^[1] basin and Luang Prabang urban area.	Output 1.1.1: Central and provincial training program implemented to enable climate risk-informed water management practices in target urban and rural areas Output 1.1.2: Current and future zones of the Xe Bang Hieng River catchment at risk of climate change-induced flooding and drought mapped, based on hydrological models produced and protective infrastructure optioneering conducted Output 1.1.3. Economic valuation conducted of urban ecosystem services and protective options in Luang Prabang.	LDC F	500,000	2,600,000
		^[1] The Xe Bang Hieng River is a major tributary to the Mekong River. Most of Savannakhet Province falls within the Xe Bang Hieng river basin.				

Component 1: Developing national and provincial capacities for Integrated Catchment Management (ICM) and integrated urban Ecosystem-based Adaptation (EbA) for climate risk reduction.	Technical Assistance	Outcome 1.2: Alignment of policy frameworks and plans for land and risk management to support long-term climate resilience	<p>Output 1.2.1: Fine-scale climate-resilient development and land-use plans drafted and validated for Luang Prabang and in the headwater and lowland areas of the Xe Bang Hieng and Xe Champone rivers.</p> <p>Output 1.2.2: Current Xe Bang Hieng river basin hydrological monitoring network – including village weather stations – assessed and updated to improve efficiency.</p> <p>Output 1.2.3: Early-warning systems and emergency procedures of vulnerable Xe Bang Hieng river basin communities (identified under Output 1.1.2) reviewed and revised.</p>	LDC F	700,000	3,700,000
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Component 2: Ecosystem-based Adaptation (EbA) interventions, with supporting protective infrastructure , and livelihood enhancement	Investme nt	Outcome 2.1: Ecosystems restored and protected to improve climate resilience in headwater areas through conservation zone management	Output 2.1.1: Xe Bang Hieng headwater conservation zones[1] restored to ensure ecological integrity is improved for delivery of ecosystem services. Output 2.1.2: Headwater conservation zone management supported to improve resilience to climate change [1] As per the 2017 Law on Water and Water Resources, these are 'water resources reserved areas' subject to additional protections and regulation. In this project, this includes areas in the Phou Xang He and Laving-Lavern National Protected Areas	LDC F	1,400,000	3,700,000
Component 2: Ecosystem-based Adaptation (EbA) interventions, with supporting protective infrastructure , and livelihood enhancement	Investme nt	Outcome 2.2: EbA interventions supported/co mplemented with innovative tools, technologies and protective infrastructure	Output 2.2.1: Protective infrastructure constructed to reduce flood risk (through cascading weirs and drainage channels) and drought risk (by means of reservoir networks and rainwater harvesting). Output 2.2.2: Implementation and distribution of communication and knowledge management tools and technologies (e.g. mobile phone apps, community radio) to increase climate resilience of agricultural communities to floods and droughts	LDC F	1,350,000	4,400,000

Component 2: Ecosystem-based Adaptation (EbA) interventions, with supporting protective infrastructure , and livelihood enhancement	Technical Assistance	Outcome 2.3: Climate- resilient and alternative livelihoods in headwater and lowland communities, supported through Community Conservation Agreements	<p>Output 2.3.1: Market analysis conducted, including: i) analysing supply chains for climate-resilient crops, livestock, and farming inputs; ii) assessing economic impacts and market barriers; and iii) recommending mitigating strategies to address these barriers.</p> <p>Output 2.3.2: Community Conservation Agreement process undertaken to encourage climate-resilient agriculture, fisheries, and forestry/forest-driven livelihoods and practices</p> <p>Output 2.3.3: Diversified activities and opportunities introduced through Community Conservation Agreements (developed under Output 2.3.2.) in agriculture (livestock and crops, including vegetable farming) as well as fisheries, non-timber forest products (NTFP), and other off-farm livelihoods.</p>	LDC F	750,000	2,800,000
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Component 3: Knowledge management and Monitoring and Evaluation (M&E)	Technical Assistance	Outcome 3.1: Increased awareness of climate change impacts and adaptation opportunities in target rural and urban communities	Output 3.1.1: Training and awareness raising provided to Xe Bang Hieng and Xe Champone headwater and lowland communities on: i) climate change impacts on agricultural production and socio-economic conditions; and ii) community-based adaptation opportunities and strategies (e.g. water resources management, agroforestry, conservation agriculture, alternatives to swiddening) and their benefits	LDC F	205,670	700,000
			Output 3.1.2 Project lessons shared within Lao PDR and via South-South exchanges on strengthening climate resilience with regards to: i) catchment management; ii) flash flood management; and iii) EbA.			
			Output 3.1.3 Awareness-raising campaign conducted in Luang Prabang for communities and the private sector on urban EbA and flood management.			
Component 3: Knowledge management and Monitoring and Evaluation (M&E)	Technical Assistance	Outcome 3.2: Community- based water resources and ecological monitoring systems in place	Output 3.2.1: Community-based monitoring systems developed and implemented to measure changes in key ecological determinants of ecosystem health and resilience in the Xe Bang Hieng river basin.	LDC F	170,000	600,000
Sub Total (\$)					5,075,670	18,500,000

Project Management Cost (PMC)

	LDCF	253,782	1,500,000
	Sub Total(\$)	253,782	1,500,000
	Total Project Cost(\$)	5,329,452	20,000,000

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Government	Government of Lao PDR (MONRE, MAF)	In-kind	Recurrent expenditures	19,500,000
GEF Agency	UNDP	In-kind	Recurrent expenditures	300,000
GEF Agency	UNDP	Grant	Investment mobilized	200,000
			Total Project Cost(\$)	20,000,000

Describe how any "Investment Mobilized" was identified

The \$ 200,000 UNDP co-financing grant is in the form of unallocated TRAC financing of approximately \$50,000 per year of project implementation.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	LDCF	Lao PDR	Climate Change	NA	5,329,452	506,298	5,835,750
Total GEF Resources(\$)					5,329,452	506,298	5,835,750

E. Project Preparation Grant (PPG)

PPG Required

PPG Amount (\$)

150,000

PPG Agency Fee (\$)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNDP	LDCF	Lao PDR	Climate Change	NA	150,000	14,250	164,250
Total Project Costs(\$)					150,000	14,250	164,250

Part II. Project Justification

1a. Project Description

1.a.1. Adaptation problem, root causes and barriers

The Lao People's Democratic Republic (hereafter Lao PDR) is a landlocked Least Developed Country (LDC) in Southeast Asia. It has a population of ~7.1 million people[1] and lies in the lower basin of the Mekong River, which forms most of the country's western border with Thailand. The GDP of Lao PDR has grown at more than 6% per year for most of the last two decades and reached ~US\$ 18 billion in 2018 (~US\$ 2,500 per capita)[2]. Much of this economic growth has been dependent on natural resources, which has placed increasing pressure on the environment[3]. Agriculture accounts for ~30% of the country's GDP and supports the livelihoods of 70–80% of the population[4].

Lao PDR is vulnerable to severe flooding, often associated with tropical storms and typhoons, as well as to drought. In 2018, for example, floods across the country resulted in ~US\$ 370 million (~2% of GDP) in loss and damage[5], with agriculture and transport the two most affected sectors. An increase in the frequency of these climate hazards, including floods and droughts, has been observed since the 1960s, as well as an increase in the average area affected by a single flood[6]. Floods in 2019 – the worst in 4 decades – affected 45 districts and ~768,000 people country-wide floods, resulting in US\$162 million in costs. Following the floods, the GoL identified several priorities for responding to flood risk in the country, including: i) improving flood and climate monitoring and early warning systems; ii) public awareness raising to respond to disasters and climate change; iii) building resilience at community level; iv) improved risk and vulnerability mapping; and v) strengthening the capacity of government at the provincial, district and community level for better climate change-induced disaster response[7].

In addition, average increases in temperature of up to 0.05°C per year were observed in the period between 1970 and 2010. These trends are expected to continue, with long-term climate modelling projecting: i) an increase in temperature between 1.4°C and 4.3°C by 2100[8]; ii) an increase in the number of days classified as "Hot"; iii) an increase of 10–30% in mean annual rainfall, particularly in the southern and eastern parts of the country and concentrated in the wet season (June to September); iv) an increase in the number of days with more than 50 mm of rain; v) a 30–60% increase in the amount of rain falling on very wet days[9]; and vi) changing rainfall seasonality resulting in a longer dry season[10]. The increases in temperature and the length of the dry season are expected to increase the severity of droughts and increase water stress, particularly in cultivated areas. The frequency and intensity of floods are also likely to increase as a result of the projected increase in extreme rainfall events – associated with changes iv) and v) described above.

The proposed project will increase the climate resilience of communities in two particularly vulnerable areas in Lao PDR. First, vulnerability to the projected increase in both droughts and floods will be addressed in the Xe Bang Hieng river basin in Savannakhet Province. This is a major rice-producing area and is particularly important for the country's food security. It is also one of the areas in the country which is most vulnerable to droughts and experienced severe flooding in 2017, 2018 and 2019. Second, the city of Luang Prabang is one of the cities in Lao PDR which is most vulnerable to flooding, as well as being an important cultural heritage site[11]. While urban flood risk management is being addressed in four other vulnerable cities in Lao PDR through a GCF project[12], Luang Prabang was not included in that project. Further details of these two project sites are given below.

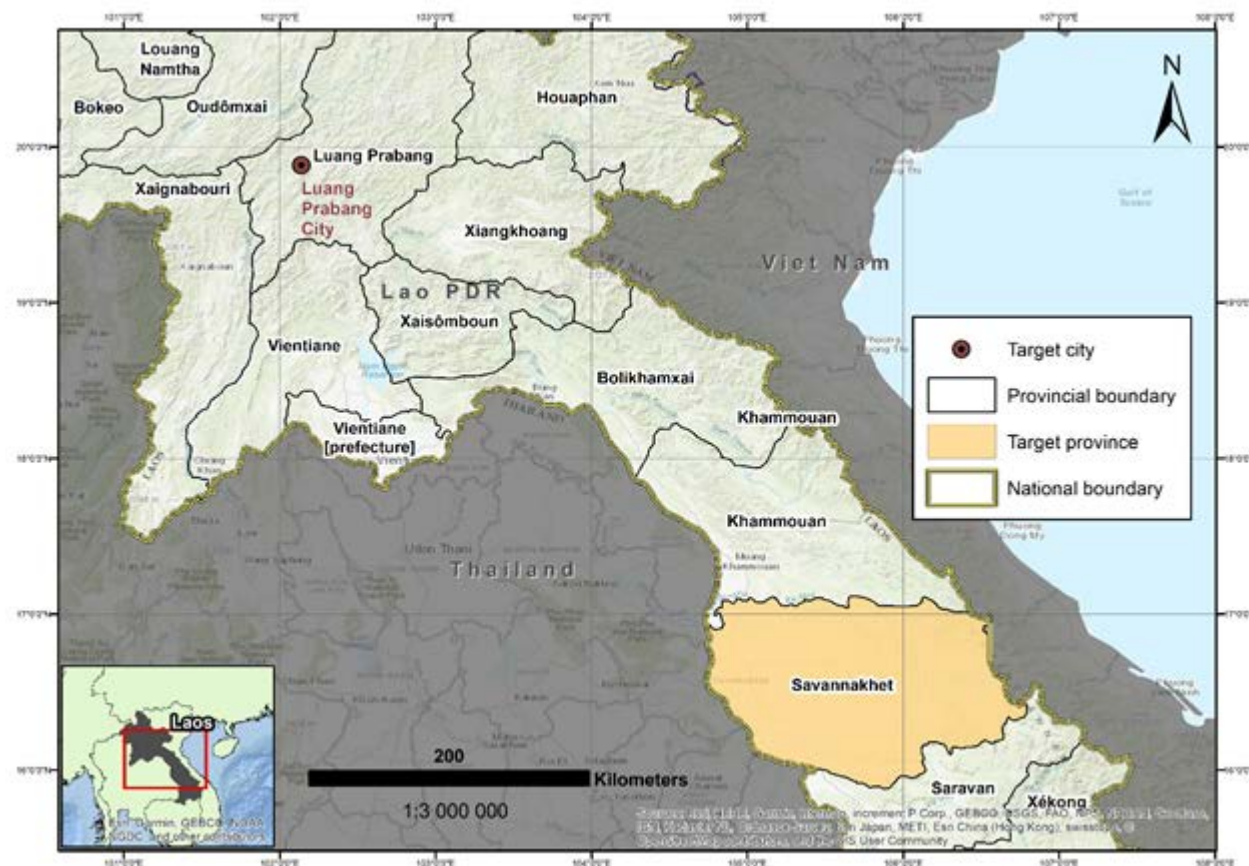


Figure 1. Locality map highlighting Savannakhet Province and the city of Luang Prabang.

Xe Bang Hieng river basin

Savannakhet Province is in the central region of Lao PDR (Figure 1) and is the country's largest and most populous province, with a population of ~1 million people[13]. More than 75% of this population lives in rural areas, typically in small villages with livelihoods based on subsistence agriculture[14]. Most of Savannakhet Province falls within the Xe Bang Hieng river basin[15]. The headwaters of the Xe Bang Hieng River are in the mountains to the east and northeast of the province (near the borders with Viet Nam and Salavan Province) and the river flows into the Mekong River ~70 km southeast of Savannakhet city, on the province's western border with Thailand. In the western part of the province, the lowlands of the Xe Bang Hieng river basin are particularly important for agriculture as a result of their climate, fertility and irrigation infrastructure linked to nearby water sources. Farms in this area supply ~25% of the rice consumed in Lao PDR and are therefore critical to the country's food security.

Approximately 75% of Savannakhet Province is forested, including the high-altitude areas where the headwaters of the Xe Bang Hieng River are located[16]. Communities living in these areas depend on the forests for a range of ecosystem services including the provision of fodder and erosion prevention as well as for non-timber forest products (NTFPs)[17]. However, low agricultural productivity and food insecurity as well as limited opportunities for alternative livelihoods have driven small-scale farmers in these areas to practise unsustainable farming techniques, including swidden agriculture[18]. As a result, areas in the headwaters of the Xe Bang Hieng river basin have become deforested and degraded, reducing the capacity of the forest ecosystems to: i) facilitate infiltration and retain water; ii) support livestock grazing areas[19]; iii) supply NTFPs for food, resale/livelihoods, and household purposes; and iv) supply other ecosystem goods and services such as recreational and cultural benefits. In this way, deforestation and land degradation reduce water security and agricultural productivity, threatening the livelihoods of local communities and increasing the vulnerability of these communities to the impacts of climate change.

In Savannakhet Province, and elsewhere in Lao PDR, a large number of concessions have been granted for commercial agriculture and forestry[20]. While these concessions play an important role in the provincial economy and provide jobs to local community members, they also lead to forest clearing and negatively affect the access of communities to forest and land resources. Land-use change, therefore, reduces the adaptive capacity and increases the economic sensitivity of local communities to climate change by inhibiting their access to land for cultivation and forests for grazing as well as for the sale and consumption of NTFPs[21]. A number of policies, strategies and projects in Lao PDR have been put in place to address land and forest degradation and support environmental protection, both in the Xe Bang Hieng river basin and nationally[22]. The alignment of the proposed LDCF project with national policies, strategies and projects is detailed in Sections 1.a.2, 6 and 7.

Communities in the Xe Bang Hieng river basin are vulnerable to climate hazards – particularly floods and droughts. Major floods occurred in the area in 2017[23], 2018[24] and 2019[25], destroying and damaging homes, displacing people, damaging farmlands and damaging infrastructure related to transport, communication, agriculture, education, water and sanitation, and electricity. In 2019, for example, loss and damage resulting from floods in southern Lao PDR – including Savannakhet Province (Figure 2) – were estimated at US\$164 million (0.3% of GDP)[26]. Approximately 85,000 people in Savannakhet Province were affected (8.5% of the province's population), including ~24,000 people who were displaced by the floods[27], which were considered to be the worst in 42 years[28]. The Xe Champone River – which originates in the north of the province – is a major tributary to the Xe Bang Hieng River and in 2019 the lowland communities of Champone District, which is one of the major rice-growing areas in the province, experienced severe flooding. An estimated 576-1948 mm of rainfall was measured in the province over 15 days between August and September 2019, leading to pronounced flash floods[29]. These floods resulted in substantial damage to crops and loss of livestock, leading to food insecurity in this part of the province.

In addition to being highly exposed to floods, Savannakhet is also classified as the most vulnerable province to drought in Lao PDR[30], with the headwaters of the Xe Bang Hieng river basin being particularly at risk (Figure 3). In 2019, droughts impacted water resources for both rainfed and irrigated areas, decreasing the area planted with rice by ~40% across the country compared with previous years[31]. Droughts have also resulted in loss of pasture, damage to fisheries and forest degradation in the area, with declining food production and disrupted supply threatening food security for the country at large[32].

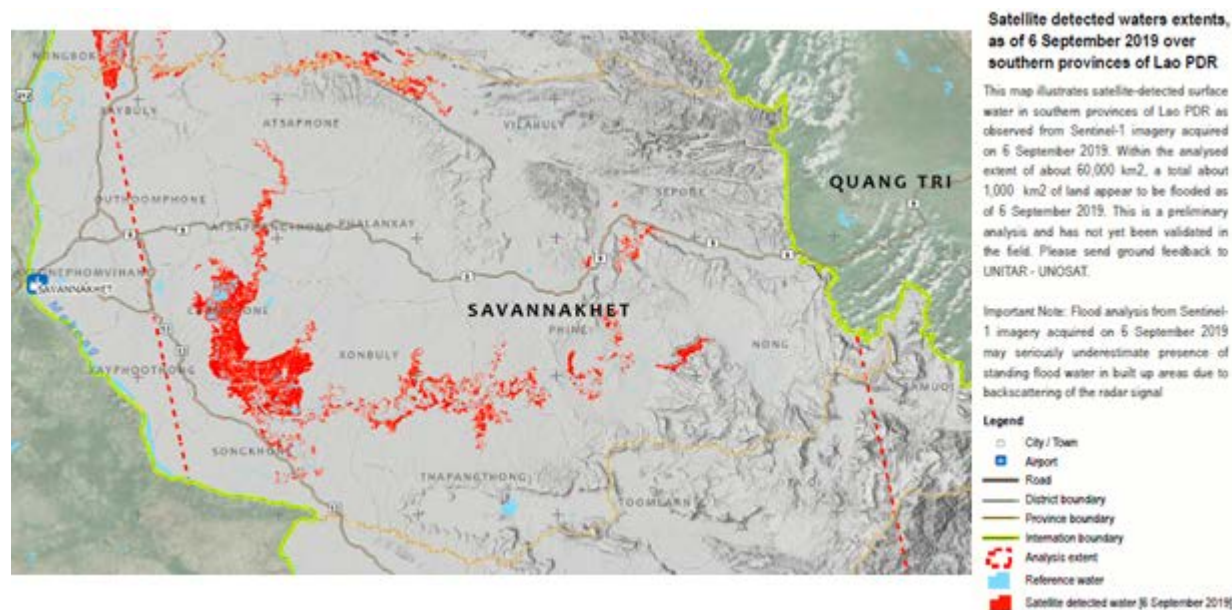


Figure 2. The extent of flooding in Savannakhet Province in August/September 2019[33].

Long-term projections show that the Xe Bang Hieng river basin is expected to warm by ~1.7°C by 2050 and that an increase in annual average rainfall of ~21% is expected[34]. These local projections, as well as national and regional ones, indicate that the severity of both droughts and floods in the Xe Bang Hieng river basin are likely to increase. The lowland areas of the basin have already experienced major floods and are vulnerable to increasingly intense floods under future climate conditions (see Figure 4). Communities in the headwaters of the basin are vulnerable to more severe droughts, exacerbated by land degradation and forest loss in the area. As a result of both droughts and floods, a reduction in agricultural productivity is expected through: i) damage to crops and grazing lands; ii) death of or injury to livestock; iii) the proliferation of crop and livestock pests and diseases; iv) reduced water security; and v) exacerbated land degradation through soil erosion. In addition, more unpredictable rainfall patterns will increase the risk of crop failure for farmers.

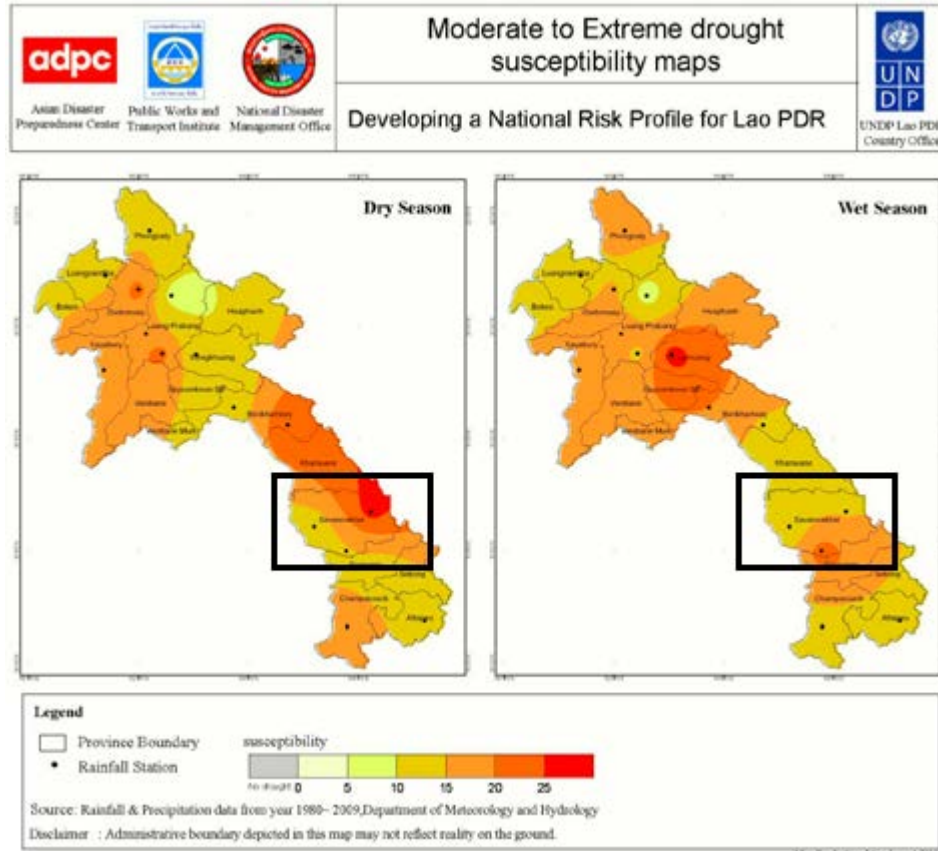


Figure 3. Map of areas susceptible to moderate to extreme drought in the wet and dry seasons. The black boxes show Savannakhet Province[35].

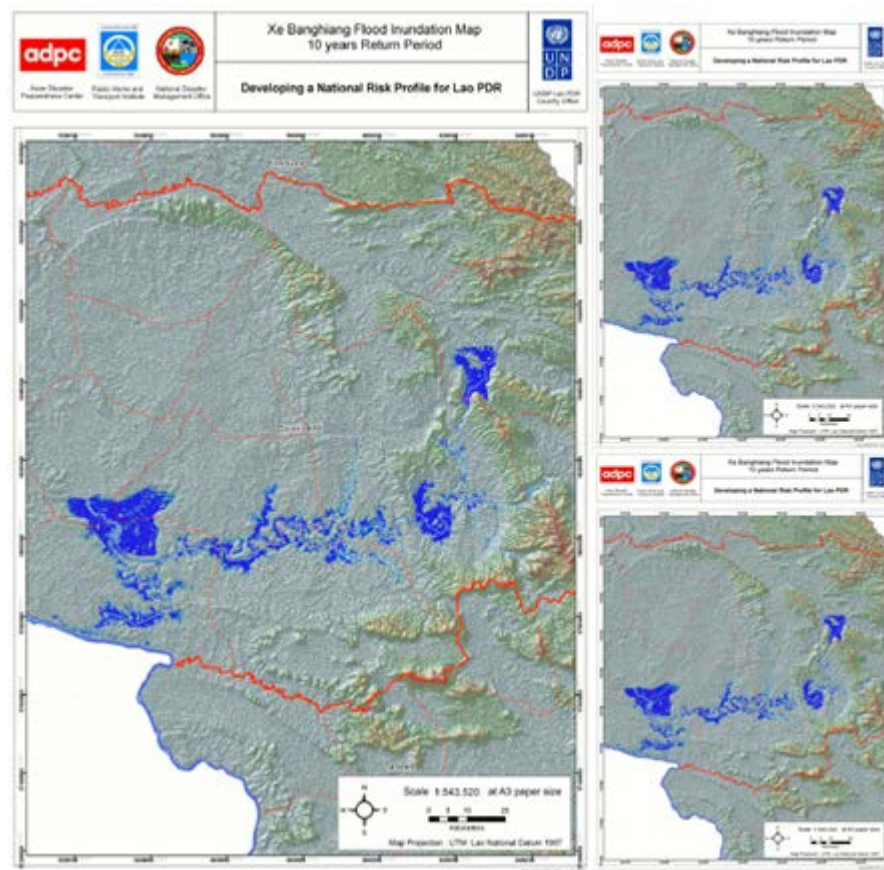


Figure 4. Map of projected flood inundation for a 10-year return period in the Xe Bang Hieng river basin[36].

Luang Prabang city

Luang Prabang is a fast-growing city in Luang Prabang Province, northern Lao PDR, with a population of ~67,000 people[37]. It is one of three UNESCO World Heritage Sites in Lao PDR and is of considerable cultural and historical importance, as well as being a popular tourism destination. Situated at the confluence of the Mekong and Nam Khan Rivers, Luang Prabang is surrounded by mountains associated with steep river valleys and limited floodplain areas. As a result of its location, the city is exposed to extreme climate events such as floods – and landslides associated with intense rainfall – which have increased in number and intensity over the past decade.

Recent floods in Luang Prabang have resulted in damage to transport and communication infrastructure, housing and agricultural lands surrounding the city, as well as threatening water security through the polluting of water sources[38]. In 2018, floods damaged the embankment of the Nam Khan River in the Luang Prabang UNESCO World Heritage Site, with an estimated US\$ 13 million required to repair the damage. In addition, urban water supply and sanitation infrastructure, schools and ~250 houses were damaged or destroyed during these floods[39]. These floods also resulted in losses to the tourism industry, which plays an important role in the local economy.

The increase in frequency and intensity of extreme rainfall events projected for Lao PDR[40] is likely to further increase the risk of flooding in Luang Prabang, which is already one of the most vulnerable cities to flooding in the country. A GCF project entitled *Building resilience of urban populations with ecosystem-based solutions in Lao PDR* will address flood risks in four other vulnerable cities in Lao PDR (Vientiane, Pakse, Paksan and Savannakhet city). Luang Prabang is not included in this project although it was considered during earlier feasibility assessments and site selection. Details of how the proposed LDCF project will align with and build on this GCF project are given in Section 1.a.3. and 6.

The **problem** that the proposed LDCF project seeks to address is the vulnerability of communities in Lao PDR to increases in the frequency and intensity of droughts and floods projected under future climate conditions. These changes are threatening assets and infrastructure of urban communities in Luang Prabang as well as putting livelihoods and water resources at risk in the lowland and headwater communities of the Xe Bang Hieng river basin. In addition, floods and droughts reduce the capacity of ecosystems to provide goods and services – which buffer the impacts of climate change on these communities. Urban and lowland communities are particularly vulnerable to floods which are exacerbated by the degradation and loss of riverine and forest ecosystems. Headwater communities are vulnerable to more intense droughts, which will be compounded by the impacts of climate change in reducing the provision of ecosystem goods and services from the surrounding forests. While initiatives to protect forests and watersheds in parts of Savannakhet Province are ongoing (see Sections 1.a.2. and 6), there is a need to incorporate climate change considerations and accurate hydrological information into the planning and management of the river basin as a whole. In addition, there is a need to upscale urban flood management interventions being implemented in other Laotian cities to Luang Prabang to reduce the vulnerability of these urban communities to the intensifying impacts of climate change-induced flooding.

The **proposed solution** is to strengthen integrated catchment management (ICM) and integrated urban flood management within the Xe Bang Hieng river basin and the city of Luang Prabang, respectively, for increased climate resilience of rural and urban communities. This approach will ensure that water resources and flood risks are managed in an integrated manner, considering the spatial interlinkages and dependencies between land use, ecosystem health and underlying causes of vulnerability to climate change. The protection and restoration of important ecosystems will be undertaken to improve the provision of ecosystem goods and services and reduce the risk of droughts, floods and their impacts on local communities, thereby increasing their resilience to the impacts of climate change.

Improved hydrological and climate risk modelling and information systems will inform flood management as well as adaptation planning in the Xe Bang Hieng river basin and Luang Prabang. This information will be made accessible to national and provincial decision-makers as well as local stakeholders who will be capacitated to use it. Using the ICM and integrated urban flood management approaches and based on integrated adaptation planning, on-the-ground

interventions to improve water resource management and reduce vulnerability to floods and droughts will be undertaken, including ecosystem-based adaptation (EbA). These interventions will be complemented by capacity development and awareness raising as well as support for rural communities to adopt climate-resilient livelihood strategies and climate-smart agricultural practices.

There are several **barriers** to this solution, which the proposed LDCF project will address. These are described below:

- 1. Limited availability of comprehensive ecosystem evaluations and hydrological data to inform ICM and urban flood management decisions.** Although other initiatives are improving the capacity for generating climate information from hydro-meteorological monitoring and trends, this information is not always adequate to support the development and implementation of climate change adaptation activities. Similarly, the dearth of ecosystem evaluations compounds the systemic underappreciation and lack of consideration for these ecosystems in land-use and risk planning. Comprehensive ecosystem evaluations, as well as hydrological assessments based on quality spatial data and model calibration, are needed to support the planning of water resource, catchment and flood management solutions. In Savannakhet Province, the need to map flood-prone areas was identified as a particularly priority for government following the devastating 2019 floods[41]. Additionally, the GoL has limited capacity to collect and analyse hydro-meteorological data at the river basin level to plan for climate change-induced disasters such as floods and droughts. Although other initiatives have begun to address this barrier, their scope is limited at present and does not include the target areas of this project..
- 2. Limited institutional and technical capacity for implementing sustainable forest management and EbA within national and provincial governments.** Although the Ministry of Agriculture and Forestry has a long-term strategy on forestry (see Section 7 for details), there are notable capacity limitations for the enforcement of this policy, which are compounded by coordination issues between relevant sectors and ministries. Decision-makers, planners and contractors require technical capacity and knowledge to understand and effectively implement EbA for flood management. However, the GoL's exposure to the adaptation benefits of EbA (particularly urban EbA) has historically been limited. Although the recently approved GCF SAP project is partially addressing this barrier, the project is limited to urban EbA and does not include Luang Prabang city or the Xe Bang Hieng river basin which are particularly vulnerable to flooding (see Figures 2 and 4). In addition to having limited knowledge about the implementation of EbA, government decision-makers do not have sufficient access to resources and technical expertise to value ecosystem services.
- 3. Knowledge, technology and other limitations in climate-resilient integrated flood management.** To-date, flood management and response in Lao PDR has largely been: i) reactive or post hoc (rather than proactive); ii) of limited geographical or sectoral scope; iii) poorly coordinated between relevant ministries; iv) constrained by technical and capacity limitations; v) occasionally not implemented due to lack of financing, uncoordinated investments and competing development pressures; and vi) limited in its consideration of the impacts of climate change on future land use needs. This has led to significant loss and damage, maladaptation and negative externalities, particularly where competing interests or needs are not considered in risk planning. In Savannakhet Province, raising awareness for communities to prepare for flooding as a result of climate change was identified as a priority following the 2019 floods in the province[42].

4. **Lack of incentives for communities to change farming and land management practices.** Currently, communities' understanding and appreciation of the effects of climate change on the ecosystems they depend upon is limited, although they have experienced these impacts in their daily lives. Headwater communities prioritise the short-term false economies of selling land to concessions or engaging in forest degrading activities, underestimating or overly discounting the long-term impact of the loss of these ecosystems on their agricultural production and access to forest ecosystem goods and services. The loss of these goods and services, as well as the associated impacts on water resources and their primary agricultural livelihoods, compound the vulnerability of these communities to climate change and reduce their capacity to adapt. Moreover, in lowland communities, certain conventionally practiced agricultural techniques (such as swidden agriculture) can compound the impacts of flooding by promoting soil erosion and reducing infiltration. Greater quantification and appreciation of the ecosystem services, as well as the means and incentives to change farming and land management practices, is crucial to effect transformative change to protect these ecosystems, build climate resilience and reverse degradation that increases the vulnerability of these communities to floods and droughts.

1.a.2. Baseline scenario and associated baseline projects

Currently, the expansion of swidden agriculture into natural ecosystems^[43] is causing the degradation of forests in the Xe Bang Hieng river basin. The reduction of these farming techniques is a priority for the GoL^[44], partly because degradation of forest ecosystems reduces the capacity of local communities in both lowlands and headwaters – mostly affected by floods and droughts, respectively – to adapt to the negative effects of climate change. This makes these local communities exceedingly dependent on forest ecosystems, and especially vulnerable to these disasters.

Under a business-as-usual scenario, communities in the Xe Bang Hieng river basin will be increasingly vulnerable to the impacts of climate change and land degradation, as both headwater and lowland communities rely heavily on forest resources and the climate-sensitive sector of agriculture, with limited capacity for alternative livelihoods. Despite current efforts of the GoL to address deforestation, the vulnerability of the headwater communities to floods and droughts will be increased without an integrated approach to reduce their vulnerability taking into account both climate change and land degradation. Lowland communities will further be affected by more frequent and intense floods, exacerbated by forest degradation happening locally. These extreme climatic events will lead to increased runoff, soil erosion and losses of: i) crops; ii) livestock; iii) drinking water; and iv) soil nutrients, amongst other impacts.

Rapid urban growth in cities adjacent to the Mekong River, such as Luang Prabang, is adding to the challenge of managing climate change-induced flooding in Lao PDR. During the wet season, heavy rainfall in catchments with low infiltration rates causes large volumes of rapidly flowing runoff. This results in flash floods in urban and peri-urban streams and canals. These flash floods damage infrastructures as well as urban agricultural areas. In cities with inadequate drainage, such as Luang Prabang, runoff accumulates and causes ponding that results in disruptions to business, damage to property and human health, as well as agricultural losses. In a business as usual scenario, increased floods in Lao PDR will threaten urban food and water security, population health and infrastructure and decrease the potential for tourism in the heritage site of Luang Prabang.

To address the abovementioned problems, the GoL has begun to develop institutional frameworks focused on climate change, environmental degradation and natural disasters, including a National Strategy on Climate Change and a Forestry Strategy[45]. However, these frameworks are currently in nascent stages and often address each of these issues separately. Despite having national targets and plans for addressing both climate change adaptation and land degradation, there has been little integration between these two focal areas. For example, the 2010 Strategy on Climate Change of the Lao PDR recommends adaptation options in the forestry, agriculture and water sectors separately, as opposed to taking an integrated approach. Similarly, in Savannakhet Province, the linkages between water flows, agriculture and forests in the context of climate change are not well integrated into development planning, resulting in a siloed approach to addressing climate change. Despite the need for an integrated approach to increase the resilience of communities such as those in the Xe Bang Hieng river basin, the national and provincial governments currently do not offer integrated catchment management interventions as proposed in the LDCF project.

Externally funded baseline projects

The proposed project will build on baseline initiatives that address underlying causes of vulnerability to climate change in Lao PDR such as deforestation and sectoral water resource management. These baseline projects are listed in Table 1, some of which represent potential baseline co-financing projects for the proposed LDCF project.

Table 1. Externally funded baseline projects.

Project title	Project site	Fund and EE	Date
Mekong Integrated Water Resources Management Project	Nationwide (including the Xe Bang Hieng river basin)	World Bank	2012–2021
Sustainable forest and land management in the dry dipterocarp forest ecosystems of southern Lao PDR	Phin District, Thapangthong District, Songkhone District, Xonabouly District, Phalansay District in Savannakhet Province	GEF UNDP	2016–2022
Protection and sustainable use of forest ecosystems and biodiversity (ProFEB)	Southern Lao (including Khamoune)	GIZ	2019–2021
The Project for Participatory Agriculture Development in Savannakhet Province	Savannakhet Province	JICA	2017–2022
Building Capacities for Resilient Recovery	Bolikhamxay and Saravan provinces	Luxembourg, UNDP	2018–2021

Strategic Support for Food Security and Nutrition Project	Huaphanh, Oudomxay, Xieng Khouang, Phongsaly provinces	IFAD	2016–2022
Second Lao Environment and Social Project (LENS II)	Nationwide	World Bank, GEF and GoL	2014–2021
Integrated Programme for Climate Resilience and Empowerment in Attapeu Province, Lao PDR	Attapeu Province	KOIKA	2019–2023
Climate Change Adaptation in Wetlands Area (CAWA) in Lao PDR- Xe Champhone Ramsar site and Buang Kiat Ngong Ramsar site	Savannakhet Province	GEF FAO	2016–2020
Lower Mekong Basin Wetland Management and Conservation project (MRWP)	Champasack Province	Kfw	2016–2022
Sowing Diversity=Harvesting Security II (SDHS II)	Oudomxay, Xayabouli, Saravane, Attapeu, Vientiane provinces	SIDA-Oxfam	2019–2023
EU FAO FLEGT (Forest Law Enforcement, Governance and Trade) Programme	Nationwide	FAO	2015–2020
Scaling Partnership for Improved Nutrition in Luangnamtha	Luang Namtha Province	EU	2019–2022
Promoting Agricultural Production to Improve Food and Nutrition Security through Multi-Sector Coordination in Phongsaly (SUPA)	Phongsaly Province	EU & CARE Denmark	2016–2020
Promoting Agricultural Production to Improve Food and Nutrition Security through Multi-Sector Coordination in <u>Luang Namtha</u> (SUPA)	Luang Namtha Province	EU & CARE Denmark	2016–2020
Health and Nutrition Services Access	Oudomxay, Phongsaly, Huaphanh, Xieng Khouang provinces	World Bank	2020–2024

Protecting forests and biodiversity	Khammouan Province	German Federal Ministry for Economic Cooperation and Development (BMZ)	2019–2021
Global Programme Responsible Land Policy	Nationwide	BMZ	2015–2021
Sustainable Forest Management and REDD+ Support Project	Luang Prabang Province, Vientiane Capital	JICA	2014–2020
Improved Land Management in the Mekong Region 2	Nationwide	BMZ	2015–2022
Land Management and Decentralised Planning 3	Nationwide	BMZ	2019–2021
Climate Protection through Avoided Deforestation (CliPAD)	Huaphanh Province	BMZ	2019–2021
Scaling Up Participatory Sustainable Forest Management Project	Nationwide	World Bank	2013–2020
Agriculture Competitiveness Project	Bolikhambai, Khammouan, Xayabouli, Vientiane capital and Vientiane provinces	World Bank	2018-2024
Water Supply, Sanitation and Hygiene project	Xieng Khouang, Houaphanh, Phongsaly, Oudomxay provinces	World Bank	2019–2024
Greater Mekong Subregion Sustainable Agriculture and Food Security Program	Nationwide	ADB	2019–2025
Greater Mekong Subregion Climate Change and Environmental Sustainability Program	Nationwide	ADB	2019–2025
Integrated Biodiversity Conservation and Forest	Bokeo, Luang Namtha and Khammuane provinces	Kfw	2015–2022

The proposed project will specifically build on the two following baseline projects in the Xe Bang Hieng river basin and bring in additionality towards climate change risks:

- The ongoing GEF Trust Fund (TF) project **Sustainable Forest and Land Management in the Dry Dipterocarp Forest Ecosystems of Southern Lao PDR (2016–2022)** (also referred to as the SAFE Ecosystems Project) is being implemented in an area covering much of the Xe Bang Hieng river basin. It seeks to: i) strengthen land and resource use planning capacities and procedures; ii) strengthen the policies and regulations that govern them; iii) expand and strengthen the management of resources on the ground by government agencies, local communities and private sector actors; and iv) develop innovative financing mechanisms and programmes – including ecotourism and livelihoods programmes – that can ensure the sustainability of improved land use and resource management approaches. The proposed LDCF project will build on and complement the ongoing TF project by developing national and provincial capacity for integrated catchment management of the Xe Bang Hieng river basin, with a focus on reducing the vulnerability of communities to climate change. On-the-ground EbA interventions such as reforestation and alternative livelihoods development under the LDCF project will further expand the work being implemented under the TF project by targeting headwaters communities as well as lowland communities, with an integrated adaptation approach.
- The World Bank project **Mekong Integrated Water Resources Management Project (2012–2021)** focuses on the development of comprehensive water resources modelling packages and river basin management plans for the 10 priority river basins (including the Xe Bang Hieng river basin). Component 3.1.1 of the World Bank project is particularly relevant for Component 1 of the proposed project as it is preparing a flood management plan for the lower region of the Xe Bang Hieng river basin and supporting the development of a river basin organisation in the area. The proposed project will complement this flood management planning by focusing its activities on climate change-induced flooding and drought management in the river basin. The activities will include mapping current and future zones of the Xe Bang Hieng River catchment which are at risk of climate change-induced flooding and drought. The proposed project will also build upon the institutional arrangements made under the World Bank project by training the Xe Bang Hieng River Basin Coordinating Committee, established under the World Bank project, on the use of climate risk information in planning and implementing water management practices. Coordination meetings between the ongoing World Bank and proposed LDCF projects' teams in Savannakhet are envisaged before the closure of the World Bank project in 2021.

1.a.3. Proposed alternative scenario

The alternative scenario will address the main barriers to climate resilience and the root causes of climate vulnerability, including degradation and land-use change, in Lao PDR. This will be done with investments and technical assistance to strengthen the climate resilience of communities and ecosystems through institutional reform, on-the-ground interventions and targeted knowledge management.

To deliver the alternative scenario, the project objective is to “promote integrated management of sites in the Mekong River Basin for increased climate resilience of Savannakhet Province and Luang Prabang communities vulnerable to floods and droughts, which are expected to worsen under future scenarios”. This objective will be achieved through three inter-related components which will: i) develop national and provincial capacities for Integrated Catchment Management (ICM) and integrated urban Ecosystem-based Adaptation (EbA) for climate risk reduction ; ii) implement EbA interventions within this ICM framework, with supporting protective infrastructure and livelihood enhancement; and iii) promote knowledge management and monitoring and evaluation (M&E), to ensure that the lessons learned and best practices for ICM, flood management and EbA are collected and disseminated to inform the upscaling of these interventions across Lao PDR.

Implementing the proposed interventions will contribute to several of Lao PDR’s development and environmental priorities in water resources, forests, biodiversity, agriculture, and climate resilience. These include: i) the Eighth Five-Year National Socio Economic Development Plan (NSED) 2016-2020, which contains a number of indicators on forests and biodiversity that the project will contribute toward; ii) MONRE’s Vision towards 2030, which provides direction for the management of natural resources and the environment, climate change adaptation and ensuring sustainable socio-economic development; iii) the Forestry Strategy 2020, which includes a number of targets including the improvement of national forest areas, providing sustainable access to forest products for domestic consumption and income generation, protecting threatened species and unique habitats, and conserving soil and watersheds; and iv) Lao PDR’s Nationally Determined Contribution (NDC), which highlights the climate-associated risks of flooding, as well as identifying adaptation priorities in agriculture, forestry and land-use change, and water resources. Further detail on how this project aligns with national priorities is included in Section 7.

Component 1: Developing national and provincial capacities for Integrated Catchment Management and integrated urban Ecosystem-based Adaptation for climate risk reduction

Enhancing the climate resilience of communities and ecosystems in Lao PDR requires a comprehensive, integrated approach to land and water resource management. Additionally, this approach needs to include good planning and the use of innovative tools, including EbA and hydrological modelling. By making considerations of climate models and climate change projections for the target sites, this approach – the hydrological modelling in particular – will help plan for current and future flood and drought risk. This component will contribute to building national and provincial capacity for integrated management to build resilience against climate change through rural catchment management in the Xe Bang Hieng river basin in Savannakhet Province, as well as urban flood management in Luang Prabang. In this way, climate resilience to future hazards will be strengthened through similar, but contextually relevant approaches in both urban and rural settings. These elements will complement the national capacity for urban flood management and adaptation strengthened under the ongoing GCF SAP project “*Building resilience of urban populations with ecosystem-based solutions in Lao PDR*” that is being implemented at a city-scale in Vientiane, Paksan, Savannakhet and Pakse. The proposed project will also complement the capacity-building for climate change adaptation that is being implemented at the watershed level under the GEF LDCF project “*Climate Adaptation in Wetland Areas in Lao PDR*”.

The interventions in Component 1 will be implemented at multiple levels and through different entry points to overcome the barriers to integrated climate resilient planning in rural and urban settings. Outcomes under Component 1 will be achieved through i) developing institutional and technical capacity; ii) providing tools and assessments to develop the knowledge base; iii) undertaking planning processes in Savannakhet Province and Luang Prabang; iv) assessing and updating hydrological networks; and v) revising early-warning systems in the Xe Bang Hieng river basin. These outputs will further be complemented by awareness raising conducted under Component 3.

The outcomes under Component 1 will contribute to the project objective and advance the alternative scenario by addressing several of the barriers described in Section 1.a.1. In addition to building national and provincial capacity, local interventions in Savannakhet Province will target both the lowland and headwater communities – who are most exposed to current and projected floods and droughts, respectively – of the Xe Bang Hieng river basin. The component will build the capacity of institutions and communities in Luang Prabang to adapt to flooding, which is projected to worsen under future climate change scenarios. This approach will build resilience of communities that are currently vulnerable, as well as those in areas where long-term changes in climate trends and variability will cause their vulnerability to increase in the future. As described in the GCF SAP project, urban development in Lao PDR is taking place without sufficient consideration of the increasing, long-term risks of climate change-induced floods. The interventions in the proposed project will address institutional capacity gaps in order to advance the evidence base and develop Integrated Climate-resilient Flood Management Strategies (ICFMS) and urban EbA guidelines for the city.

In order to better plan for climate resilience and risk management, training will be provided to increase the capacity of relevant national and provincial government officials, decision-makers and planners. This training will improve technical skills in producing downscaled and projected climate risk information for the target rural and urban sites and in applying the geographic information system (GIS)-based integrated hydrological models developed under the complementary ongoing World Bank-funded “*Mekong Integrated Water Resources Management Project*”^[46], mapping current and future flood and drought risk zones. This training programme will also enable the development of a database on water inventory, as well as supporting water user rights planning and implementation

Developing an integrated approach in order to manage climate risks requires that cross-sectoral cooperation and comprehensive planning are informed by technical assessments to map risks, as well as an understanding and appreciation of the value of ecosystem services. For this reason, the capacity development will be further supported through improved and/or updated mapping of current and future at-risk zones within the Xe Bang Hieng river basin, as well as ecosystem valuations (determining the economic value of the ecosystem services provided by urban riparian areas, wetlands and streams) and present and projected hydrological assessments in Luang Prabang. The economic valuations, as well as feasibility studies, will also include an options analysis of on-the-ground interventions (protective infrastructure and EbA alternatives) to inform improved planning and support climate-resilient integrated urban flood management. Indicative interventions here would scale-up those being implemented under the GCF SAP project in Vientiane, Paksan, Pakse and Savannakhet city, including: i) wetland restoration and management; ii) natural urban stream rehabilitation and management; and iii) permeable paving solutions in public areas. These types of ecosystem-based interventions will help rehabilitate or restore important degraded urban ecological systems that fulfil a vital role in flood attenuation and ecosystem service provision. Such interventions will improve climate resilience at an urban ecosystem level by reducing the impact of climate-induced flooding – which is projected to increase – through improved infiltration, runoff control, reduced velocity of flash floods, soil and riverbank stabilisation, and erosion control.

This evidence base of technical assessments, mapping studies, economic valuations and options analyses will help decision-makers and planners to identify activities that maximise efficiency, respond to well-understood current and future climate threats, and to develop interventions and risk-responses that are appropriate and timely. Additionally, improving knowledge of the benefits and successful examples of urban EbA in the public sector strengthens uptake and viability of incorporating urban EbA in planning frameworks, as well as supporting the sustainability of future investments themselves.

These advances will further support the alignment of policy frameworks and plans for water, land and risk management to support long-term climate resilience, the process for which will be conducted through consultative dialogue with local government and communities. The evidence base from Output 1.1.1 will inform fine-scale climate-resilient development and land-use plans that are crucial to building the long-term resilience of communities and ecosystems in the Xe Bang Hieng and Xe Champone rivers' headwaters and lowlands, by designating and protecting areas to prevent further degradation and loss of services, which would otherwise compound the impacts of climate change. These plans will work with an updated hydrological monitoring network and revised early-warning systems (EWS) in the catchment, which will further strengthen the capacity of communities and officials to plan for, and respond to, future flood and drought events. The data produced by the weather stations will be compliant with and transmitted to the WMO's 'Global Basic Observations Network. Access to reliable information, forecasting and early warning systems were identified as a priority following the 2019 floods in the province[47]. Current early-warning systems in Xe Bang Hieng catchment communities are not sophisticated enough to respond to multiple hazard responses in an integrated fashion, reducing effective coordination of responses across sectors. Additionally, these systems are not well adapted to the projected increasing frequency and severity of floods and droughts under climate change scenarios. The revised EWS will include capacity building and improved methodologies to analyse and interpret climate data and forecasts (such as that produced by the weather stations and hydrological monitoring networks). These revisions will also include upgrading formal and informal tools (such as radio, loudspeakers and written materials) used to disperse and communicate climate warnings to affected communities in the target catchments. In Luang Prabang, the project will use the evidence base and risk mapping to develop city-level Integrated Climate-resilient Flood Management Strategies (ICFMS) and mainstream urban EbA into relevant policies and plans, which will be informed by the hydrological and ecosystem assessments from Output 1.1.

This component will support subsequent components by creating an enabling environment for: i) undertaking investments to further build the climate resilience of current and projected at-risk communities; and ii) inducing a shift away from unsustainable and vulnerable practices and livelihoods. This approach will also contribute to the sustainability and scalability of the project to other contexts.

Outcomes and outputs within this component are listed below.

Outcome 1.1: Enhanced capacity for climate risk modelling and integrated planning in the Xe Bang Hieng river basin and Luang Prabang urban area

- Output 1.1.1: Central and Provincial training program implemented to enable climate risk-informed water management practices in target urban and rural areas
- Output 1.1.2: Current and future zones of the Xe Bang Hieng River catchment at risk of climate change-induced flooding and drought mapped, based on hydrological models produced and protective infrastructure optioneering conducted
- Output 1.1.3. Economic valuation of urban ecosystem services in Luang Prabang and protective options conducted.

Outcome 1.2: Alignment of policy frameworks and plans for land and risk management to support long-term climate resilience

- Output 1.2.1: Fine-scale climate-resilient development and land-use plans drafted and validated for Luang Prabang and in the headwater and lowland areas of the Xe Bang Hieng and Xe Champone rivers.
- Output 1.2.2: Current Xe Bang Hieng river basin hydrological monitoring network – including village weather stations – assessed and updated to improve efficiency.
- Output 1.2.3: Early-warning systems and emergency procedures of vulnerable Xe Bang Hieng catchment communities (identified under Output 1.1.2) reviewed and revised

Component 2: Ecosystem-based Adaptation (EbA) interventions, with supporting protective infrastructure, and livelihood enhancement

This second component will build upon the enabling environment and ICM framework provided by Component 1, through the implementation of EbA interventions in Savannakhet Province, which will be supported and reinforced by protective infrastructure and climate-resilient livelihood enhancement. This component will strategically target various interventions across the Xe Bang Hieng river basin, using a combination of approaches/activities to address the different dynamics of current and future vulnerability to climate change, making use of climate modelling and projections to map future areas of risk. The EbA interventions in the headwater conservation zones will help manage water resources by restoring degraded forest ecosystems, while the protective infrastructure and livelihood outputs will help to reduce climate vulnerability and prevent further loss and degradation. This reduced vulnerability and avoided loss will be achieved through measures and investments to directly offset the impacts of extreme climate events on communities and ecosystems. These interventions will be supported by providing alternative activities and incentives to shift communities away from unsustainable practices and behaviours. This will help address the barrier of a lack of incentives for communities to change farming and land management practices (Barrier 4), in order to help protect and restore ecosystems.

The first outcome of Component 2 will include the restoration of degraded ecosystems in the headwater conservation zones of the Xe Bang Hieng River and Xe Champone tributary, complemented by improved headwater conservation zone management. Under the amended Law on Water and Water Resources, as “areas at waterheads” and “areas at risk of flood and drought”, these headwater areas can be designated as “water resources reserved areas”, which have additional protections and regulation to protect Lao PDR’s water resources[48]. The restoration activities will include reforestation through replanting ecologically appropriate species to restore ecosystem function, as well as other methods such as assisted natural regeneration and forest boundary management. These EbA interventions will help restore and protect critical ecosystem services and ecological functions for communities in the headwaters, including: i) livestock grazing areas[49]; ii) soil nutrient retention and reduced erosion; iii) infiltration; and iv) non-timber forest products (NTFPs) for food, resale/livelihoods, and household purposes, including mushrooms and wild vegetables, frogs, snails and insect products, bamboo and rattan, kisi damar resin and herbal medicines[50]. The improved supply of ecosystem services resulting from restoration activities will help build the resilience of communities in the

Xe Bang Hieng river basin to future extreme weather events, particularly droughts and floods, that are projected to increase under climate change conditions. The sustainability of this restoration will be enhanced through the improved conservation zone management and Outcome 2.2's livelihood outputs (described below), which will improve the incentives of communities to maintain and expand the restored areas of the river basin.

Further protection from extreme climate events will be provided through investments in protective infrastructure that mitigates against the impacts of floods and droughts in the lowlands and headwaters, respectively. The selection, design and distribution of these activities will be determined through the land-use planning and protective infrastructure optioneering conducted under Component 1. The 'grey' protective infrastructure will mimic the lost ecosystem services for flood management where forest ecosystems are irreparably degraded, non-existent or where EbA is inappropriate given landcover, human settlement or agricultural needs. Additionally, infrastructure to reduce drought risk will build the adaptive capacity of communities to address water insecurity related to prolonged dry seasons or late onset wet seasons, which are projected to occur more frequently under future climate scenarios. These interventions will be supported by tools and technologies for advancing communication and knowledge management at the community level to improve their response to – and handling of – these hazards. Furthermore, the project will enhance the livelihoods threatened by these climate hazards, through targeted interventions to shift behaviours and practices to improve climate resilience.

Activities and incentives to improve resilience will include promoting a shift towards current livelihoods in agriculture, fisheries, and forestry, and promoting context appropriate alternative products, methods and practices including: i) climate-smart agriculture (e.g. agroforestry, intercropping, minimum-tillage, integrated soil fertility management, water harvesting and management); ii) silvopasture; iii) cultivation and sale of NTFPs; iv) aquaculture; and v) other similar livelihood practices. The selection and application of these livelihoods and practices will be informed by a robust, climate-sensitive market analysis which will review extant barriers and opportunities to make recommendations on long-term climate-resilient strategies, and contribute to promoting catchment integrity and reducing deforestation/forest degradation. Lessons from the past GEF-LDCF project "Improving the Resilience of the Agriculture Sector in Lao PDR to Climate Change Impacts" will also be used to inform livelihood enhancement activities. The livelihood enhancement will be underscored by – and implemented through – Community Conservation Agreements (CCA). These agreements are based on the concept of conservation or stewardship agreements, where communities are incentivised to engage with climate change adaptation activities in return for benefits derived from project outputs. Similar agreements are already practiced in the Xe Bang Hieng river basin and elsewhere in Lao PDR, to conserve and restore ecosystems and promote biodiversity conservation. These agreements have also helped to overcome issues relating to insecure land tenure and promote community involvement in sustainable natural resource management. The ongoing GEF project in the Savannakhet Province^[51] is establishing CCAs with 16 villages to relieve pressures on forest resources from local communities in the region. Agricultural support, alternative livelihoods and direct payments to village trusts are provided to local villages on the basis of the implementation of forest conservation strategies. These are mutually agreed between DONRE and the communities and stipulated in signed CCAs between the parties.

The application of the protective infrastructure and livelihood enhancements will be responsive to the respective current and projected threats, geographical context (i.e. topography) and demographics of the different river basin zones. In the headwaters, the EbA interventions will be supported by investments in drought management protective infrastructure (particularly reservoir networks, rainwater harvesting, and associated irrigation), communication tools and technologies to further strengthen early-warning networks, and livelihood enhancement through climate resilient practices. Additionally, these upstream

interventions provide environmental co-benefits to downstream (lowland) communities by decreasing the risk of flash floods, which will further be addressed through the construction of flood protective infrastructure (cascading weirs and drainage channels). The lowland communities will also receive communication tools and technologies as well as livelihood enhancement (as in the headwaters), that are appropriate to their risk and vulnerability context.

Outcomes and outputs within this component are described below.

Outcome 2.1: Ecosystems restored and protected to improve climate resilience in headwater areas through conservation zone management

- Output 2.1.1: Xe Bang Hieng headwater conservation zones restored to ensure ecological integrity is improved for delivery of ecosystem services
- Output 2.1.2: Headwater conservation zone management supported to improve resilience to climate change

Outcome 2.2: EbA interventions supported/complemented with innovative tools, technologies and protective infrastructure

- Output 2.2.1: Protective infrastructure constructed to reduce flood (cascading weirs and drainage channels) and drought (reservoir networks and rainwater harvesting) risk
- Output 2.2.2: Implementation and distribution of communication and knowledge management tools and technologies (e.g. mobile phone apps, community radio) to increase climate resilience of agricultural communities to floods and droughts

Outcome 2.3: Climate-resilient and alternative livelihoods in headwater and lowland communities, supported through Community Conservation Agreements

- Output 2.3.1: Market analysis conducted, including; i) analysing supply chains for climate-resilient crops, livestock, and farming inputs; ii) assessing economic impacts and market barriers; and iii) drafting mitigating strategies to address these barriers.
- Output 2.3.2: Community Conservation Agreements process undertaken to encourage climate-resilient agriculture, fisheries, and forestry/forest-driven livelihoods and practices
- Output 2.3.3: Diversified activities and opportunities introduced through Community Conservation Agreements (developed under Output 2.3.2) in agriculture (livestock and crops, including vegetable farming) as well as fisheries, non-timber forest products (NTFP), and other off-farm livelihoods.

Component 3: Knowledge management and Monitoring, Evaluation and Learning (MEL)

The third component will contribute to capturing the lessons learned from the project implementation and outcomes, to promote the sustainability and scalability of the project. This will include conducting knowledge management and awareness raising in the main areas identified for intervention to build these communities appreciation and understanding of climate change risks, impacts and adaptation options. Project lessons will also be shared within Lao PDR and via South-South exchanges[52] to support upscaling and replication. To further promote local ownership and contribute to shifting attitudes towards restoration and conservation, a community-based water resources and ecological monitoring system will also be developed, to contribute to understanding the baseline condition and project outcomes for these valuable ecosystems. The ecological monitoring system will provide up-to-date indicators and measures of the health and resilience of the Xe Bang Hieng river basin, which can be used by community members and policy-makers to make informed decisions about planning, land-use management and services. This will improve the responsiveness of communities to climate changes, as well as their reducing their exposure to extreme climate events while providing for sustainable offtake of timber, wood fuel, and NTFPs that can promote development and enhance livelihoods.

Outcomes and outputs within this component are described below.

Outcome 3.1: Increased awareness of climate change impacts and adaptation opportunities in target rural and urban communities

- Output 3.1.1: Training and awareness raising provided to Xe Bang Hieng and Xe Champone headwater and lowland communities on: i) climate change impacts on agricultural production and socio-economic conditions; and ii) community-based adaptation opportunities and strategies (e.g. water resources management, agroforestry, conservation agriculture, alternatives to swiddening[53]) and their benefits
- Output 3.1.2: Project lessons shared within Lao PDR and via South-South exchanges on strengthening climate resilience with regards to: i) catchment management; ii) flash flood management; and iii) EbA.
- Output 3.1.2: Awareness-raising campaign conducted in Luang Prabang for communities and the private sector on urban EbA and flood management.

Outcome 3.2: Community-based water resource and ecological monitoring systems in place

- Output 3.2.1: Community-based monitoring systems developed and implemented to measure changes in key ecological determinants of ecosystem health and resilience in the Xe Bang Hieng river basin

1.a.4. Alignment with GEF focal area and/or Impact Program strategies

CCA 1.1: Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience

The proposed project will facilitate the adoption of ICM and integrated urban flood management as institutional technologies for enhancing climate-resilience of at-risk communities in Lao PDR and subsequently beyond in other river basins and cities. These approaches provide innovative strategies for considering and incorporating various stakeholders, interests and priorities for increased drought and flood resilience. Based on the ICM framework, a range of adaptation and climate-risk reduction measures will be deployed in a coordinated manner at the river basin level in Savannakhet Province. These measures will include EbA interventions (Outcome 2.1), complemented by flood protection measures and communication systems (Outcome 2.2). Community Conservation Agreements (CCAs, Outcome 2.3) will support communities to deploy new and enhanced livelihood strategies to increase their climate resilience. The use of innovative and accessible communication technologies – for example, mobile phone applications – will maximise the benefit of the CCAs and on-the-ground interventions by promoting local awareness of climate risks and adaptation opportunities.

CCA 3.1: Climate-resilient planning enabled by stronger climate information decision-support services and other relevant analysis

Under Outcome 1.1 of the proposed project, the capacity of national and provincial governments for climate risk modelling will be improved, in cooperation with the ongoing World Bank project **Mekong Integrated Water Resources Management Project** focusing on the development of comprehensive water resources modelling packages and river basin management plans. This will be done through targeted training for technical staff and coordination with existing hydrological modelling and climate risk assessment systems to produce high-resolution assessments of the Xe Bang Hieng river basin and Luang Prabang city. The information generated as a result of this intervention will be used under Outcome 1.2. to inform fine-scale development and land-use planning in the Xe Bang Hieng river basin and to inform the development of Integrated Climate-resilient Flood Management Solutions (ICFMS) for Luang Prabang city. Early-warning and response systems will also be strengthened using this information, improving the climate resilience of target communities. The continued updating and improvement of the hydrological observation system will also be supported under Outcome 1.2, facilitating continued improvements in the availability of hydrological information to support climate-resilient planning. Through a community-based monitoring system (Outcome 3.2), lessons learned and an evidence base for EbA and flood protection measures will be developed. This information will be disseminated to decision-makers and communities to facilitate the upscaling of effective adaptation measures. Lessons learned through this process will also inform adaptation planning across Lao PDR.

CCA 3.2: Institutional and human capacities strengthened to identify and implement adaptation measures

The proposed LDCF project will develop technical and institutional capacity for effective climate change adaptation at national-, river basin- and community-level. Based on improved climate risk modelling resulting from technical capacity development (Outcome 1.1), context-specific adaptation opportunities for the Xe Bang Hieng river basin and Luang Prabang city will be identified and integrated into development plans or ICFMS (Outcome 1.2). Community-level training to develop the capacity for identifying and implementing adaptation opportunities and urban EbA measures will be undertaken under Outcome 3.1 of the proposed LDCF project. In addition to this training, an assessment will be undertaken to identify opportunities for improving the climate resilience of local livelihoods in the Xe Bang Hieng river basin (Outcome 2.3). Findings from this assessment will inform the development of Community Conservation Agreements and interventions to support the adoption of climate-resilient livelihood strategies and farming methods in the Xe Bang Hieng river basin, so facilitating long-term climate change adaptation in these vulnerable communities.

1.a.5. Incremental/additional cost reasoning and expected contributions from the baseline the GEFT, LDCF, SCCF, and co-financing;

Component 1: Developing national and provincial capacities for Integrated Catchment Management (ICM) and integrated urban Ecosystem-based Adaptation (EbA) for climate risk reduction

There has been limited application of an integrated and climate-resilient approach to river basin and land-use management – as well as integrated urban EbA – in Lao PDR, particularly in considering and planning for future climate risks which may change the profile/areas of vulnerability in the country. As a result, national priorities for climate change adaptation have not been well integrated into plans for all relevant sectors. Existing plans are also constrained in their ability to address current and future climate change risks and land degradation, because of the limited availability of high-resolution information about these risks and vulnerability. In addition, coordination between the ministries governing water resources, forests, agriculture and land-use planning has been limited.

Through funding from LDCF/co-finance (US\$7,500,000), the proposed project will build capacity for ICM and EbA in Lao PDR by: i) enhancing technical capacity for climate risk modelling and integrated planning in the Xe Bang Hieng river basin and Luang Prabang city; and ii) aligning policy frameworks and plans for land and risk management to support climate resilience in the long-term. This approach will ensure that national and provincial efforts to facilitate rural and urban development can address river basin degradation in an integrated manner and can use EbA to build the resilience of vulnerable communities to the current and projected impacts of climate change[54].

Component 2: Ecosystem-based Adaptation (EbA) interventions, with supporting protective infrastructure, and livelihood enhancement

EbA measures and protective infrastructure for floods and droughts are limited in rural Savannakhet Province, which contributed to high levels of loss and damage during the 2019 floods in the province (see Figure 2). If unmanaged and combined with continuing land degradation, the impacts of increasingly frequent and intense floods and droughts on rural communities are likely to increase in a business as usual scenario.

Using LDCF/co-finance (US\$14,400,000), the proposed project will increase the resilience of rural communities in the Xe Bang Hieng river basin to current and future climate change hazards by implementing EbA measures as well as complementary protective measures – such as cascading weirs, drainage channels, reservoir networks and rainwater harvesting – to reduce projected flood and drought risks in currently and projected vulnerable areas. Additionally, the proposed project will increase the adaptive capacity of headwater and lowland communities through the introduction of climate-resilient and alternative livelihoods, supported through Community Conservation Agreements.

Component 3: Knowledge management and Monitoring and Evaluation (M&E)

Adaptation and restoration initiatives have been – and are currently being – implemented, including in Laotian cities and in the Savannakhet Province (see Sections 1.a.2 and 6 for further information on these complementary projects). Upscaling of these initiatives across districts has been limited, however, and lessons learned from these projects have not been systematically collated and disseminated to support their replication.

The proposed project will use LDCF/co-finance (US\$1,675,670) to increase the awareness of current and projected climate change impacts and adaptation opportunities in target rural and urban communities and develop a system to monitor the impact of project interventions and share lessons learned on ICM and EbA across Lao PDR. The proposed project will also improve the sustainability and scalability of adaptation measures in Savannakhet Province and Luang Prabang city by developing community ownership of the interventions through training for community awareness of climate change risks and adaptation opportunities as well as the implementation of a community monitoring system which can be replicated in other river basins, provinces and cities in Lao PDR and the region.

1.a.6. Adaptation benefits (LDCF)

Climate change is expected to increase the frequency and intensity of floods and droughts in much of Lao PDR. As a result, the damage caused by these hazards to ecosystems and livelihoods is likely to increase, particularly in vulnerable communities in the Xe Bang Hieng river basin and Luang Prabang. In the absence of adaptation measures, water security and agricultural productivity are likely to decline further, threatening the income and food security of communities in the Xe Bang Hieng river basin. In Luang Prabang city, there is a need for adaptation measures to protect urban infrastructure and livelihoods as well as the city's important cultural assets.

The proposed LDCF project will directly benefit 492,462 people^[55] (247,991women) by increasing the climate resilience of communities in nine districts in Savannakhet Province^[56], as well as the city of Luang Prabang, through facilitating the adoption of ICM at the provincial and national level and urban EbA at the local level. These communities will benefit through the deployment of technologies and innovative solutions to reduce climate-related risks and enhance resilience (CCA Outcome 1.1). Specifically, physical assets will be made more resilient to climate variability and change (CCA Output 1.1.1) through the deployment of protective infrastructure to reduce flood and drought risk (Output 2.2.1). Livelihoods of communities in the Xe Bang Hieng river basin will be diversified and strengthened (CCA Output 1.1.2) through the development and implementation of Community Conservation Agreements which will be informed by a comprehensive market analysis (Outcome 2.3). The proposed project will also improve the hydrological monitoring network in the Xe Bang Hieng river basin (Output 1.2.2), as well as the development and dissemination of early warnings and climate information to target communities (Outputs 1.2.3 and 2.2.2). These activities will contribute to reducing the vulnerability of these communities to climatic hazards (CCA Output 1.1.3) including droughts and floods.

Through Community Conservation Agreements (Outcome 2.3), ecosystem restoration (Output 2.1.1) and strengthened conservation management (Output 2.1.2), 86,000 ha^[57] of vulnerable ecosystems in the headwaters of the Xe Bang Hieng river basin will be placed under strengthened climate-resilient management (Core Indicator 2). This will increase the resilience of the local communities and their natural resource assets to climate change impacts (CCA

Output 1.1.4) as well as reducing flood risks for downstream communities. The development of ten[58] fine-scale development and land-use plans (Output 1.2.1) will further improve the mainstreaming of long-term climate resilience into land and risk management in these areas (Core Indicator 3). Additionally, strengthened fine-scale, climate-responsive planning will be enabled by stronger climate information produced and analysis undertaken (CCA Outcome 3.1, Output 3.1.2) through the risk mapping activities under Output 1.1.2.

To strengthen institutional and human capacities to identify and implement adaptation measures (CCA Outcome 3.2), 2,100 people – including 1,058 women[59] – will be trained on climate change impacts and adaptation opportunities (Core Indicator 4). This will include capacity development for identifying, implementing and/or monitoring adaptation measures (CCA Output 3.2.1) for: i) 100 provincial and national decision-makers relating to risk-informed water management practices under Output 1.1.1; ii) 1,000 community members on climate-resilient livelihood opportunities under Output 2.3.3; and iii) 500 community members in the Xe Bang Hieng river basin on climate change impacts and community-based adaptation strategies under Output 3.1.1. An additional 500 community members in Luang Prabang will be targeted by the awareness-raising campaign on urban EbA and flood management under Output 3.1.3, contributing to increasing their awareness on climate change impacts, vulnerability and adaptation (CCA Output 3.2.2).

The project is also expected to generate global environmental benefits through the restoration and protection of forest ecosystems. This will: i) enhance the biodiversity of these ecosystems; ii) reduce and reverse land degradation; and iii) enhance the provision of ecosystem goods and services – such as clean water, soil stabilisation and NTFPs – as a basis for long-term resilience.

1.a.7. Innovation, sustainability and potential for scaling up

Innovation: An integrated approach to river basin/catchment management is well recognised as an international best practice. ICM allows for balancing the occasionally competing priorities and interests of various sectors (including water, agriculture, land), in pursuing economic development, social equity, environmental sustainability, and climate resilience. Similarly, the integrated urban flood management approach that is being applied from the GCF SAP project will support the coordination of efforts in addressing flood risk in Luang Prabang city. These approaches require an enabling environment, that is supported by an appropriate institutional framework, capacity-building and knowledge management instruments. The proposed project will deliver an innovative approach to coordinate resilience to floods and droughts at river basin-wide and city level, considering and incorporating the various stakeholders, interests and climate factors applicable. This will be conducted in a manner that promotes sustainability, and that is scalable within Lao PDR, as well as neighbouring countries, as described below.

Sustainability: To promote sustainability by ensuring country and beneficiary ownership, the project is well aligned with national, provincial and district development and adaptation priorities. This ownership and buy-in will further be promoted throughout project development and implementation, through ongoing participatory consultations and stakeholder engagement. The project also builds upon previous and ongoing projects in the area/sector, working with stakeholders and partners to address gaps, avoid redundancy and promote complementarity. Furthermore, project sustainability will be enhanced through the activities in Component 1, which will build institutional and technical capacity; facilitate development and land-use planning, as well as the creation of flood

management strategies; update the knowledge base; and revise or update current hydrological networks and early-warning systems to improve resilience after project completion. The sustainability of investments into EbA and protective infrastructure in Component 2 will also be supported by 'soft' technical assistance in strengthening headwater conservation zone management; providing communication and knowledge management tools and technologies; and developing Community Conservation Agreements. Finally, Component 3 will contribute to the long-term sustainability of the project through knowledge management and M&E interventions to capture and distribute the lessons and outputs of the project for future use by stakeholders/beneficiaries.

Scalability: Whilst the project responds to context-specific baseline conditions and threats, the ICM and ICFMS approaches include easily scalable methodologies and activities that are transferable to other river basins and cities in Lao PDR, as well as in neighbouring countries. National capacity-building for hydrological modelling will also contribute to the scalability of evidence-based adaptation planning to other provinces in Lao PDR. Additionally, the participatory processes with stakeholders will contribute to producing replicable models for addressing climate vulnerability to floods and droughts in similar urban, agricultural or forest contexts. The knowledge management and M&E activities will further contribute to this scalability, by capturing, packaging and sharing the project's lessons to support the replication of ICM, ICFMS and contextually appropriate adaptation actions (including EbA) across Lao PDR and neighbouring countries.

[1] Population estimate from 2018. Work Bank Data. 2019. Lao PDR. Available at: <https://data.worldbank.org/country/lao-pdr>

[2] GDP and GDP per capita in current US\$. Work Bank Data. 2019. Lao PDR. Available at: <https://data.worldbank.org/country/lao-pdr>

[3] World Bank. 2019. Lao PDR – Overview. Available at: <https://www.worldbank.org/en/country/lao/overview#1>

[4] FAO. 2019. GEF PIF: Climate Smart Agriculture alternatives for upland production systems in Lao PDR.

[5] Government of Lao PDR (GoL). 2018. Post-Disaster Needs Assessment (PDNA): 2018 Floods, Lao PDR.

[6] GoL. 2013. Second National Communication to the UNFCCC (SNC).

[7] GoL. 2019. National Disaster Management and Control. Disaster Report 2019.

[8] The lower value in this range is the projection for RCP4.5 and the higher value for RCP8.5.

[9] Projections i) to v) are from: World Bank Group. 2020. Climate Change Knowledge Portal: Laos. Available at: <https://climateknowledgeportal.worldbank.org/country/laos/climate-data-projections>

[10] GoL. 2015. Nationally Determined Contribution (NDC).

[11] The 'Town of Luang Prabang' is one of Lao PDR's three UNESCO World Heritage Sites and was the first site designated.

[12] The GCF Simplified Approval Process project entitled *Building resilience of urban populations with ecosystem-based solutions in Lao PDR* was approved in 2019 and will target the cities of Vientiane, Paksan, Pakse and Savannakhet.

- [13] Lao Statistics Bureau. 2016. Results of Population and Housing Census 2015. Available at: <https://lao.unfpa.org/en/publications/results-population-and-housing-census-2015-english-version>
- [14] Program on Forests. 2015. Using Forests to Enhance Resilience to Climate Change: The case of Smallholder Agriculture in Savannakhet Province in Lao PDR.
- [15] According to the Lao PDR Law on Water and Water Resources (No. 02-96), the Xe Bang Hieng catchment is classified as a large river basin.
- [16] UNDP. 2015. GEF Project Document: Sustainable Forest and Land Management in the Dry Dipterocarp Forest Ecosystems of Southern Lao PDR.
- [17] Program on Forests. 2015. Using Forests to Enhance Resilience to Climate Change: The case of Smallholder Agriculture in Savannakhet Province in Lao PDR.
- [18] Also known as shifting cultivation, this farming technique involves clearing land for cultivation, often using fire, and leaving it to regenerate after cultivation.
- [19] Many communities living in the DDP forests practice a rudimentary form of silvopasture, where animals are grazed in forested areas. For more on this, see Russell et al., 2015. *Using Forests to Enhance Resilience to Climate Change: The Case of Smallholder Agriculture in Savannakhet Province in Lao PDR*. Available: https://www.researchgate.net/publication/286936624_Using_Forests_to_Enhance_Resilience_to_Climate_Change_The_Case_of_Smallholder_Agriculture_in_Savannakhet_Province_in_Lao_PDR
- [20] The top five industrial crops in terms of area in Savannakhet Province are sugarcane, eucalyptus, rubber, cassava and acacia.
- [21] Program on Forests. 2015. Using Forests to Enhance Resilience to Climate Change: The case of Smallholder Agriculture in Savannakhet Province in Lao PDR.
- [22] These policies and strategies include the: i) National Green Growth Strategy for 2030; ii) Law on Disaster Risk Management (2019); iii) Decree on Climate Change (2019); iv) Law on Forestry (revised in 2019); v) Law on Water and Water Resources (2017); vi) Prime Minister's Order on Timber and Illegal Logging (2016); vii) Law on Environmental Protection (revised in 2013); viii) Law on Agriculture (1998); and ix) National Water and Water Resources Strategy (under development).
- [23] Ministry of Labour and Social Welfare, GoL. 2017. Disaster Risk Management Operations in Lao PDR.
- [24] GoL. 2018. PDNA: 2018 floods in Lao PDR.
- [25] ReliefWeb. 2019. Lao PDR: Floods – Aug 2019. Available at: <https://reliefweb.int/disaster/fl-2019-000103-lao>
- [26] ReliefWeb. 2019. Lao PDR: Floods – Aug 2019. Available at: <https://reliefweb.int/disaster/fl-2019-000103-lao>
- [27] ReliefWeb. 2019. Laos Floods – People in Need. Available at: <https://reliefweb.int/map/lao-peoples-democratic-republic/laos-floods-people-need-emergency-response-coordination-centre>
- [28] Savannakhet Department of Natural Resources and Environment. Flooding Report – Savannakhet 2019.
- [29] Savannakhet Department of Natural Resources and Environment. Flooding Report – Savannakhet 2019.

- [30] Mekong River Commission (MRC). 2019. Drought Management Strategy for the Lower Mekong Basin 2020–2025.
- [31] ReliefWeb. 2019. Severe Drought in Mekong Region Reduces Rice Planting in Laos. Available at: <https://reliefweb.int/report/lao-peoples-democratic-republic/severe-drought-mekong-region-reduces-rice-planting-laos>
- [32] MRC. 2019. Drought Management Strategy for the Lower Mekong Basin 2020–2025.
- [33] United Nations Institute for Training and Research. 2019. Satellite detected waters extents as of 6 September 2019 over southern provinces of Lao PDR.
- [34] Scott A, Cranmer C, Thongsavath O, and Xeuasing K. 2018. Climate Change Vulnerability Assessment: Xe Champhone Ramsar Site, Lao PDR. IUCN Lao PDR. Available at: https://www.iucn.org/sites/dev/files/content/documents/2019/climate_change_vulnerability_assessment_xe_champhone Ramsar_site_lao_pdr_compressed_2.pdf
- [35] National Disaster Management Committee, Government of Lao (GoL) and UNDP. 2010. National Risk Profile of Lao PDR.
- [36] National Disaster Management Committee, Government of Lao (GoL) and UNDP. 2010. National Risk Profile of Lao PDR.
- [37] Population census 2015. Lao Statistics Bureau.
- [38] Bhattacharya A. 2018. Exclusive: Luang Prabang fights to stay afloat. In: Gov Insider. Available at: <https://govinsider.asia/connected-gov/exclusive-luang-prabang-fights-stay-afloat/>
- [39] GoL. 2018. PDNA: 2018 Floods, Lao PDR.
- [40] World Bank Group. 2020. Climate Change Knowledge Portal: Laos. Available at: <https://climateknowledgeportal.worldbank.org/country/laos/climate-data-projections>
- [41] Savannakhet Department of Natural Resources and Environment. Flooding Report – Savannakhet 2019.
- [42] Savannakhet Department of Natural Resources and Environment. Flooding Report – Savannakhet 2019.
- [43] Reasons for Swidden agriculture to encroach on forests in the Savannakhet Province include: population growth, limited alternative livelihoods, limited knowledge of communities and governments on the forest ecosystem services and potential for EbA, soil deterioration and land concessions to commercial farming.
- [44] The GoL developed land and forest policies to reduce swidden agricultural practices (see section 7 on national Priorities for further details on these national initiatives).
- [45] Please refer to section 7 (Consistency with National Priorities) for further information on these strategies.
- [46] See Section 1.a.2 for details on how the projects align
- [47] Savannakhet Department of Natural Resources and Environment. Flooding Report – Savannakhet 2019.

[48] Lao People Democratic Republic. 2017. Law on Water and Water Resources (Amended version).

[49] Many communities living in the DDP forests practice a rudimentary form of silvopasture, where animals are grazed in forested areas. For more on this, see Russell et al., 2015. *Using Forests to Enhance Resilience to Climate Change: The Case of Smallholder Agriculture in Savannakhet Province in Lao PDR*.

Available:

https://www.researchgate.net/publication/286936624_Using_Forests_to_Enhance_Resilience_to_Climate_Change_The_Case_of_Smallholder_Agriculture_in_Savannakhet_Province_in_Lao_PDR

[50] Russell et al., 2015. *Using Forests to Enhance Resilience to Climate Change: The Case of Smallholder Agriculture in Savannakhet Province in Lao PDR*

[51] Sustainable Forest and Land Management in the Dry Dipterocarp Forest Ecosystems of Southern Lao PDR

[52] South-South cooperation is a broad framework of collaboration among countries of the South in the political, economic, social, cultural, environmental and technical domains (<https://www.unsouthsouth.org/about/about-sstc/>)

[53] Otherwise known as 'slash and burn' agriculture

[54] See section 1.a.7 for more details on the proposed project's innovative and integrated approach, bridging other projects which are addressing discrete climate or development challenges.

[55] This was calculated based on 75% the total populations of the nine target districts in Savannakhet Province and Luang Prabang city in the 2015 National Census. Data available at: <https://data.humdata.org/dataset/lao-pdr-population-statistics>.

[56] The nine districts of Savannakhet included in this project are Phone, Sepone, Thapangthong, Songkhone, Champhone, Xonbuly, Vilabuly, Atsaphone, and Phalanxay.

[57] This is the area of the Laving-Lavern National Protected Area in the headwaters of the Xe Bang Hieng river basin. This is based on the announcement of the Government Office, No.: 392, dated 25 February 2011 on upgrading from Provincial Protected Area to National Protected Area for Savannakhet and Oudomxay provinces. See:

[58] one for each of the nine target districts in Savannakhet Province and one for the city of Luang Prabang

[59] The total number of people trained was calculated as the sum of 100, 500, 500 and 1000 people trained under Outputs 1.1.1, 3.1.1, 3.1.3 and 2.3.3 respectively. The sex ratio of the total number of beneficiaries was applied to the total number of people trained to calculate the number of women trained.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

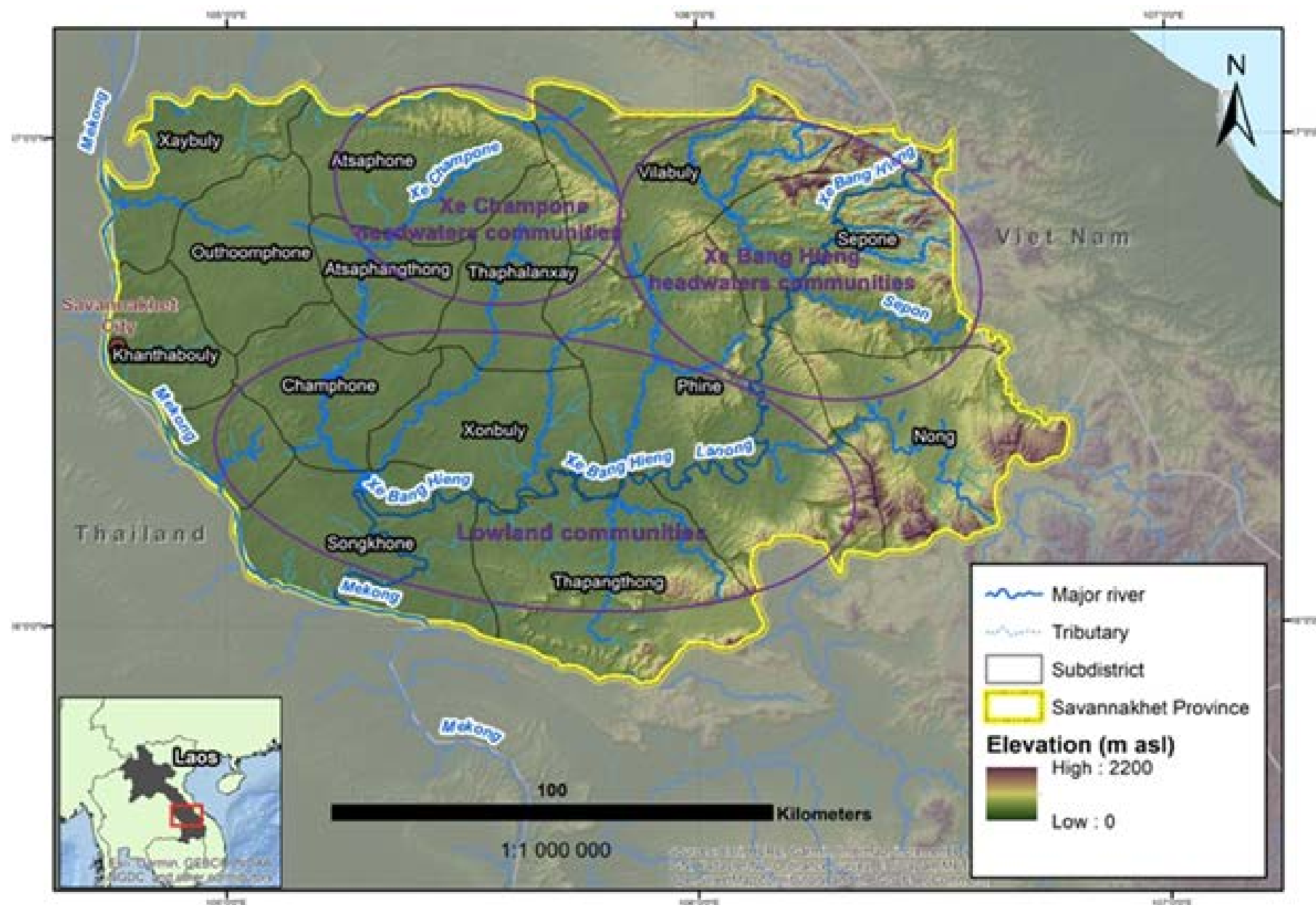


Figure 5. Map of Savannakhet Province with target areas.

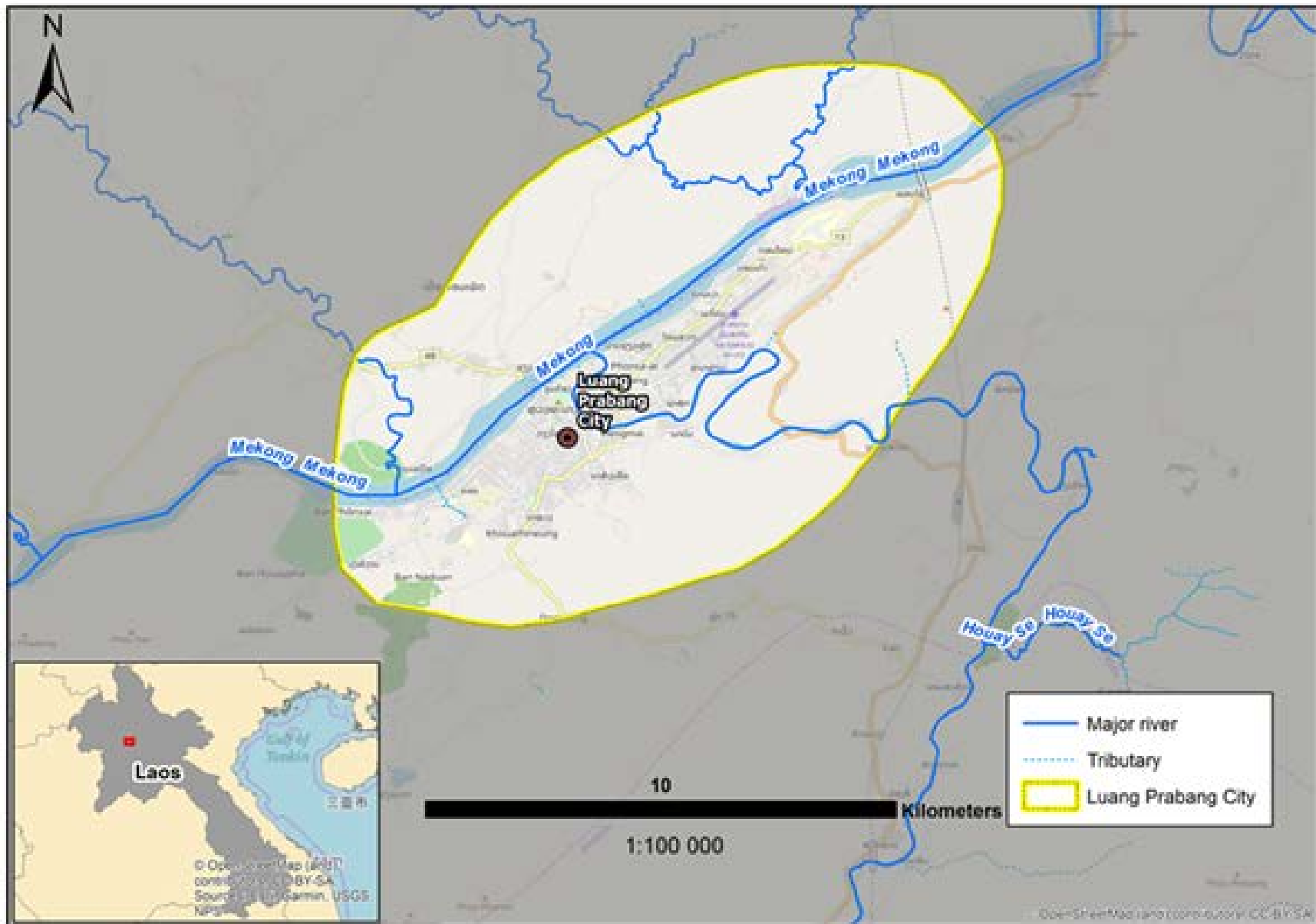


Figure 6. Map of the city of Luang Prabang as a target area.

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities Yes

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

The “Sustainable Forest and Land Management in the Dry Dipterocarp Forest Ecosystems of Southern Lao PDR” project – which had 9 out of 16 target project village sites affected during the September 2019 floods – collected testimonies from local communities, who expressed the atypical extent of this flooding as being much worse than any in recent memory. The project also consulted with the Wildlife Conservation Association (a local Laotian Non-Profit Association) regarding issues in the Laving-Lavern National Protected Area. These consultations have helped inform the development of this PIF document and project concept.

Although stakeholder engagement during the development of the GCF-funded “*Building resilience of urban populations with ecosystem-based solutions in Lao PDR*” project – which this proposal aims to replicate in Luang Prabang – primarily focused on Vientiane, Paksan, Savannakhet city and Pakse[1], working group meetings were also undertaken with CBOs and community members in Luang Prabang. During these working meetings, community representatives provided information on *inter alia*: i) current livelihood activities; ii) climate change effects on livelihoods; iii) local business and governance structures; and iv) interest in alternative livelihoods. Additionally, input regarding implementing the GCF project in Luang Prabang was also solicited from stakeholders from central government, donors and NGOs.

In addition to the stakeholder consultation described above, for novel activities under the proposed project, input has been incorporated from stakeholders within the Ministry of Natural Resources and Environment (MONRE), particularly the Department of Water Resources and the Department of Climate Change. The project also consulted stakeholders from UN agencies operating in Lao PDR, including the Food and Agriculture Organization (FAO), UN Environment Programme (UNEP), and World Food Programme (WFP). This input, as well as considerations of previous participatory processes to determine national and ministerial priorities, has shaped the design, distribution and selection of activities.

Throughout project design and implementation, the proposed project will uphold a participatory approach and conduct ongoing stakeholder consultation periods for all activities, not only for those which, by necessity, require the engagement and participation of community members, such as capacity-building, awareness-raising, and resilient livelihood enhancement. These consultations will include community surveys, regular meetings, focus group discussions, and training and validation workshops. To ensure ownership and uptake, the views, interests and inputs of communities in the target areas will be well considered

during project design and implementation, through the methods described above. This process will also deliberately target engagements with otherwise marginalised or vulnerable populations including women, the youth, and persons with disabilities. During project design and implementation, Social Safeguards and Gender Specialist(s) will be procured to help ensure the communities consultations are inclusive, accessible and wide-reaching, and to ensure a participatory process. Further gender analysis[2] will also be undertaken during Project Document development to identify relative vulnerabilities and adaptive capacities of women and men, which will inform project design as well as the stakeholder engagement approach. The stakeholder consultations will inform the details of project design and implementation, such as *inter alia* final site selection, distribution of interventions, training and capacity-building modalities and curricula, infrastructure needs, and development and land-use planning priorities.

An indicative list of stakeholders – and the roles that they will play in project design – is provided in Table 2 below. The stakeholders and their respective contributions and roles in the project will be confirmed during the PPG phase. During the PPG and implementation phases, the project will also ensure that representatives of relevant ongoing initiatives and projects are regularly consulted to enhance effective and informed collaboration and complementarity. An indicative list of these complementary initiatives and projects is provided in Section 1.a.2.

Table 2. List of potential stakeholders and their possible contributions and roles in the proposed project.

Stakeholder type	Stakeholder list	Possible contributions and roles in the project
Government ministries (at central and provincial levels)	<ul style="list-style-type: none"> · Ministry of Natural Resources and Environment (MONRE) · Ministry of Finance (MOF) · Ministry of Agriculture and Forestry (MAF) · Ministry of Planning and Investment (MPI) · Ministry of Civil Works and Transportation · Ministry of Information, Culture and Tourism (MICT) · Ministry of Labour and Social Welfare 	Beneficiaries of capacity-building; development of relevant plans; delivery of technical components of programmes according to sectoral expertise; coordination with local authorities; mobilisation of human and financial resources
National organisations	<ul style="list-style-type: none"> · Department of Water Resources (DWR) in MONRE · Department of Meteorology and Hydrology (DMH) in MONRE 	Provision of technical advice; provision of specialist services

	<p>gy (DIMH) in MONRE</p> <ul style="list-style-type: none"> · Department of Environmental Quality Promotion (DEQP) in MONRE · Department of Climate Change (DCC) in MONRE · Department of Environmental and Social Impact Assessment in MONRE · Department of Forestry (DOF) in MAF · Department of Planning and Cooperation in MAF · Department of Agriculture Land Management (DALaM) in DAF · Department of Planning (DOP) in MPI · Department of International Coordination (DIC) in MPI · Department of Agricultural Extension and Cooperatives (DAEC), (MAF) · Department of Social Welfare, (MLSW) · National Women's Union (NWU) · Mekong River Commission (MRC) 	
Regional and local administrations	<ul style="list-style-type: none"> · Savnakheth Department of Planning and Investment · Provincial Office of Natural Resources and Environment (PONRE) · District Offices of Natural Resources and Environment (DONREs) · Provincial Agriculture and Forest Office (PAFO) · District Agriculture and Forest Offices (DAFOs) 	Beneficiaries of capacity-building; local coordination of activities; issuance of any relevant authorisations and permits

	<ul style="list-style-type: none"> · Provincial Labour and Social Welfare Department · Provincial Department of Planning and Investment 	
Community-level stakeholders	<ul style="list-style-type: none"> · Village Development Committees · Village leaders · Natural resource user groups · Women's groups · Other vulnerable or marginalised groups · CBOs 	Community mobilisation; selection of appropriate interventions; delivery of programme components; beneficiaries of capacity-building and on-the-ground interventions
NGOs/CSOs	<ul style="list-style-type: none"> · Wildlife Conservation Society (WCS) · International Union for the Conservation of Nature (IUCN) · Lao Wildlife Conservation Association (LWCA) · World Wide Fund for Nature (WWF) 	Provision of technical advice; delivery of training and assets; social mobilisation; monitoring of ecological conditions
Research institutions	<ul style="list-style-type: none"> · National University of Lao PDR (NUoL) · National Agriculture and Forestry Research Institute (NAFRI) · National Economic Research Institute in the Prime Minister's Office (NERI) · Center for Statistics and Information in MAF · Lao Statistics Bureau (MPI) 	Provision of scientific support; the undertaking of research activities
Private sector	<ul style="list-style-type: none"> · Chifeng Jilong mine · Land concession owners related to agriculture and tree plantations 	Provision of goods and services; consultation for market information

[1] Being the cities ultimately selected for implementation

[2] Further to that presented in Section 3

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

Lao PDR had an overall Global Gender Gap Index (GGGI)[1] rank of 43rd of 153 countries in 2020 (down from 26th in 2018), although this relatively high rank hides variability within the index. The country scored 2nd on the sub-index of Economic Participation and Opportunity, but 98th for both the Health and Survival, and Political Empowerment sub-indexes and 110th for the Education Attainment sub-index. In the 2018 Gender Development Index (GDI) – which measures the ratio of female to male HDI values – Lao PDR had a score of 0.929 which placed them in the group of countries with “medium equality in HDI achievements between women and men (absolute deviation of 5–7.5% from gender parity in HDI values)” [2]. The Global Inequality Index (GII) – a composite measure reflecting inequality in achievement between women and men in the dimensions of reproductive health, empowerment and the labour market – ranked the country 110th of 162 evaluated[3]. Lao PDR received a ‘low’ categorisation and a score of 26% in the Social Institutions and Gender Index in 2019[4].

Despite some advances made in recent years and generally non-discriminatory formal regulations, women in Lao PDR usually (compared to men): i) receive lower incomes and have fewer formal livelihood opportunities; ii) experience constraints on their mobility; iii) are unrepresented in local, provincial and national political and decision-making structures; iv) have lower educational attainment and literacy rates; and v) carry a greater burden of unpaid household and care work, including being mainly responsible for household food and water security[5]:[6]. Notably, although women have traditionally played a key role in the agriculture sector, they are being adversely affected by trends towards increased mechanisation and shifts from subsistence to commercial agriculture, as men have tended to assume control of these new livelihood activities. These factors interact with women’s environmental and ecological exposure to the anticipated threats of climate change on their lives and livelihoods. Owing to the gendered roles, responsibilities and inequalities described above, women may be more vulnerable to climate hazards such as floods and droughts as well as having lower adaptive capacity and less opportunity to increase their climate resilience or ability to recover from such events.

Considering the points above, the proposed project will promote gender equality, women’s rights and the empowerment of women in several ways. First, the proposed activities have been designed taking into account that in Lao PDR: i) women’s household roles should be considered in any interventions concerning natural resource management, land-use planning and decision-making; ii) conservation incentives differ for men and women; iii) gendered division of labour needs to be understood prior to the introduction of any livelihood interventions; and iv) women need to have access to, and control over, ecosystem goods and services. Second, an understanding of gender mainstreaming in relevant sectors and associated ministries will be developed, and gaps in gender equality will be identified and addressed in all aspects of project design. Third, women (and other vulnerable groups) will be actively involved in identifying environmentally sustainable activities and interventions that will support them in safeguarding natural resources and promoting their economic development, with specific strategies being developed to target and include female-headed households. To ensure that the project activities are both gender-responsive and designed in a gender-sensitive manner, a gender action plan will be developed during the project preparation phase. This analysis and action plan will be used to further refine the activities and to develop gender-sensitive indicators and targets for the proposed project. In addition, national experts on gender will be included in stakeholder consultations and form part of ongoing project management to ensure that context-specific gender considerations are mainstreamed throughout the project. The GEF policies, standards and guidelines on gender equality will be applied throughout development and implementation of the proposed project.

[1] World Economic Forum. 2020. Global Gender Gap Report 2020. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf

[2] UNDP. 2019. Gender Development Index – country tables. <http://hdr.undp.org/en/content/table-4-gender-development-index>

[3] UNDP. 2019. Gender Inequality Index – country tables. <http://hdr.undp.org/en/content/table-5-gender-inequality-index-gii>

[4] OECD. 2019. Social Institutions and Gender Index – Country Profile: Lao PDR. <https://www.genderindex.org/wp-content/uploads/files/datasheets/2019/LA.pdf>

[5] UN Women. 2020. Women Count Data Portal. Country Profile: Lao PDR <https://data.unwomen.org/country/lao-peoples-democratic-republic>

[6] OECD. 2019. Social Institutions and Gender Index – Country Profile: Lao PDR. <https://www.genderindex.org/wp-content/uploads/files/datasheets/2019/LA.pdf>

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources; Yes

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

The project will seek to engage private sector partners as much as possible, to support the implementation and construction of the protective infrastructure. Other partners will be consulted and involved in *inter alia*: i) the drafting of development plans and revision of EWS systems; ii) the activities of the market analysis into climate resilient agriculture, fisheries and forestry; and iii) the distribution of communication and knowledge management tools and technologies. The project will also aim to strengthen local entrepreneurship in the Xe Bang Hieng river basin and Luang Prabang city by partnering with local community aggregations, associations and groups during consultations and implementation. This would be particularly relevant during the market analysis and livelihood enhancement interventions under Outcome 2.2 in the Xe Bang Hieng river basin, and the awareness raising and community M&E system in Component 3. When appropriate, experts for specified activities would be contracted as consultants to provide capacity-building and awareness raising to government and communities.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Table 3. List of risks to the project.

#	Risk	Potential consequence	Mitigation measure	Probability (P) & Impact (I) (1–5)	Risk rating (R) & Category (C)
1	Extreme climate events (e.g. landslides, flooding) at project sites during project implementation damage or destroy EbA and protective infrastructure implemented through the project.	EbA and protective infrastructure are delayed or project sites need to change.	Current climatic variability and flood risks will be taken into account when selecting intervention sites, periods for construction as well as the design and implementation of all interventions. Disaster risk and response plans will be put in place in collaboration with selected communities.	P = 2 I = 3	R = Modest C = Environmental
2	EbA and protective infrastructure implemented under the project are not maintained by communities and are degraded after the project lifespan.	Project interventions such as reforestation and protective infrastructure constructed to manage flood and drought risk are not maintained by the communities which increase their vulnerability to climate change impacts.	Training will be provided to headwater and lowland communities on climate change impacts on agricultural production and socio-economic conditions which will increase incentives to maintain the infrastructure after the project lifespan. Community-based monitoring systems will also be developed and implemented to measure changes in key determinants of ecosystem health and resilience, which will build the communities' ownership of the inte	P = 2 I = 3	R = Modest C = Social

			ries ownership of the interventions.		
3	Conflict among stakeholders regarding land-use arises, as agricultural land concessions in Savanna khet have often taken place without required land surveys, leading to conflicts between local communities and investors.	Project interventions are delayed because of unclear land use and ownership.	Mechanisms for conflict resolution will be integrated into the sustainability strategy of the project, as well as detailed land surveys at the site selection stage of the project.	P = 2 I = 3	R = Modest C = Social
4	There is a lack of community buy-in for alternatives to swidden agriculture.	Project interventions are delayed as a result of a failure of communities to implement Community Conservation Agreements to effectively adopt climate-resilient agriculture and forestry/forest-driven livelihoods and practices.	Training will be provided to headwater and lowland communities on climate change impacts on agricultural production and socio-economic conditions which will increase incentives to adopt alternatives to swidden agriculture practices. Community Conservation Agreement process will also be undertaken to encourage climate-resilient agriculture, fisheries, and forestry/forest-driven livelihoods and practices.	P = 2 I = 2	R = Modest C = Social
5	Conflicts and misunderstanding among public institutions, private sector partners, NGOs and resource users undermine partnership approaches and implementation of cooperative governance arrangements.	Project interventions are delayed as a result of a lack of cooperation and coordination between responsible government agencies and other stakeholders.	Starting during the project inception phase, the project will seek to establish formal agreements/MOUs with these and/or other partners that clearly define roles and responsibilities for implementation of the project. The project will also support collaboration between	P = 2 I = 2	R = Modest C = Social

		key partners (e.g. MONRE and MAF) and with other government agencies and stakeholders.		
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6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

Institutional structure and M&E

The Ministry of Natural Resources and Environment (MONRE) is the primary ministry responsible for the management, protection, rehabilitation and use of natural resources and the environment including land, water, air, biodiversity, and minerals. Within MONRE, the Department of Water Resources will be responsible for activities developing national and provincial capacity for ICM under Component 1 and developing flood protection infrastructure under Component 2 of the proposed LDCF project. The Department of Meteorology and Hydrology will be in charge of the hydrological monitoring activities under Component 1. The Department of Disaster Management and Climate Change will be responsible for activities to develop knowledge management and community-based ecological monitoring systems under Component 3, as well as urban EbA mainstreaming under Component 1.

The Ministry of Agriculture and Forestry (MAF) executes all land-use decisions in the sector of agriculture, fisheries, irrigation, production and conservation forests as well as National Protected Areas. Within MAF, the Department of Forestry (DOF) is responsible for forest management planning, land-use planning and land cover assessments. The DOF will be the key department responsible for the execution of EbA activities – mostly reforestation – under Component 2 of the proposed project, in coordination with the target communities. The Department of Agricultural Extension and Cooperatives will be in charge of the activities enhancing climate-resilient livelihoods under Component 2.

The overall monitoring and evaluation (M&E) of the proposed LDCF project will be overseen by the Department of Planning under the Ministry of Planning and Investments, which carries out M&E for all planning processes in the country. Please refer to Table 2 in Section 2 (Stakeholders) for further details on the role of each ministry, department and provincial office in the proposed project.

Coordination with other climate change projects

Several projects have been designed to address land degradation and climate change adaptation in Lao PDR. The proposed project will coordinate with these GEF and non-GEF initiatives to: i) facilitate the incorporation of lessons learned into project design; ii) promote synergies between projects' activities; and iii) prevent duplication of effort and resources. In addition, the proposed project is delivering on key priorities identified in the joint GEF-GCF National Dialogue in February 2019 that led to the development of coordinated GEF-GCF programming for Lao PDR^[1]. The UNDP Country Office and the Department of Water Resources have consulted with the GCF national designated authority and the GEF operational focal point in Lao PDR to ensure that activities under the proposed LDCF project are: i) scaling up urban EbA interventions implemented under the GCF and GEF projects described below (projects 1 and 2); and ii) complementing adaptation initiatives in the vulnerable province of Savannakhet (projects 3 and 4).

1) The ongoing GCF–UNEP project **Building Resilience of Urban Populations with Ecosystem-based Solutions in Lao PDR (2020–2025)** is incorporating integrated flood management strategies into planning frameworks and mainstreaming urban EbA to decrease climate change-induced flooding in four cities, including Vientiane, Pakse, Paksan and Savannakhet city. The proposed LDCF project will build on the GCF project interventions and the national structures established under this project to: i) strengthen technical capacity, knowledge and management to reduce flood impacts; ii) implement EbA at river basin level and in rural areas of the Xe Bang Hieng river basin; and iii) implement urban EbA in Luang Prabang. The project could conduct joint capacity-building activities with the GCF project. Joint annual review and planning meetings between the ongoing GEF TF and GCF projects could also be envisaged.

2) The ongoing GEF LDCF–UNEP project **Building Climate Resilience of Urban Systems through Ecosystem-based Adaptation (EbA) in the Asia-Pacific Region (2017–2021)** is currently under implementation in five pilot cities in the Asia-Pacific region, including Phongsaly in the North of Lao PDR. The proposed LDCF project is in line with this regional project for which the objective is to reduce the vulnerability of urban communities in the Asia-Pacific region to climate change by catalysing the integration of EbA into urban planning. UNDP Country Office met with the UNEP project team to discuss synergies between projects while they were in country in February 2020. The discussions covered how to best complement the work that the UNEP project will cover. A number of duplications were initially identified, which were taken into account in the development of this proposal. Further meetings are planned between the two project teams to insure that EbA activities in the city of Phongsaly can inform the proposed EbA activities in Luang Prabang.

3) The GEF LDCF–FAO supported initiative **Climate Adaptation in Wetland Areas in Lao PDR (2016–2020)** implemented ecosystem restoration interventions in rural Lao PDR, including the Xe Champone wetland in Savannakhet Province. The main project components included: i) improvement of knowledge and understanding of climate change impacts and risks; ii) implementation of appropriate climate change adaptation and risk reduction measures; and iii) integration of tested and cost-effective climate change adaptation and disaster management measures into critical planning processes at local and national levels. The proposed LDCF project will build on this recent initiative's interventions in Savannakhet Province, especially on the capacity-building at the provincial government level.

4) The completed GEF LDCF project **Improving the Resilience of the Agriculture Sector in Lao PDR to Climate Change Impacts (2011–2014)** included the Outhumphone and Champone Districts as target sites in Savannakhet Province. The project aimed at reducing the vulnerability of farmers to extreme flooding and drought events through: i) strengthening the knowledge base on climate change impacts on agricultural production and food security; ii) strengthening capacities of sectoral planners and agricultural producers to understand and address climate change; iii) demonstrating and promoting community-based adaptive agricultural practices within suitable agro-ecological systems; and iv) facilitating adaptation learning as a long-term process. The proposed LDCF project will build on recommendations from the terminal evaluation of this completed LDCF project to improve the resilience of neighboring farming communities to floods and droughts in Savannakhet Province, especially by using the community-based adaptive agricultural practices developed under the completed LDCF project.

[1] For example, the Lao PDR GCF Country Programme (February 2019) suggests how GEF and GCF can identify future joint investments in the country's NAP process, building on the PIF approved in 2018 *Building the capacity of the Lao PDR government to advance the National Adaptation Planning process*. Although further NAP proposals have not yet been developed, the Department of Climate Change has indicated that they plan to conduct Climate Risk and Vulnerability Assessments (CRVA) in preparation. These assessments are planned for July 2020, although may be delayed pending the development of the COVID-19 outbreak.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The proposed project is aligned with the national policies, strategies and plans described in the table below.

Table 4. List of national policies, strategies and plans.

National Strategies/Plans	Alignment
National Adaptation Programme of Action (NAPA), 2009	The NAPA identifies supplementary activities and recommends that the GoL: i) strengthen the capacity of the National Disaster Management Committee to deal with likely future adverse impacts; ii) strengthen the Climate Change Office; iii) install an early-warning system for flood-prone areas and improve existing flood protection systems; iv) initiate in-depth studies of the impacts of climate change; v) formulate a strategy on climate change; and vi) increase reforestation efforts for the protection of watersheds and the reduction of erosion in areas vulnerable to floods and droughts. The proposed project is aligned with the adaptation priorities set out in the NAPA, particularly improving flood and drought resilience. This will be done through improving early-warning systems (Output 1.2.3), on-the-ground protection measures (Outcomes 2.1 and 2.2) and enhancing climate-resilient livelihoods (Outcome 2.3). The project will also contribute to building national and province capacity for adaptation planning and building the climate resilience of water resources.
Decree on Climate Change, 2019	The decree determines the principles, regulations and measures on the management, monitoring and inspection of tasks relevant to climate change. This intends to prevent, protect and decrease the potential impacts of climate change, with the aim of ensuring the safety of lives, health, property, environment, biodiversity, and infrastructure. This also includes coordination with regional and international stakeholders, to contribute to socio-economic development for sustainability and green growth.
National Strategy on Climate Change (NSCC), 2010	The NCCS highlights integrated solutions, awareness, education, community participation, innovative financial instruments, and the integration of climate and disease-resilient crops and farming patterns into landscapes. It further outlines adaptation and mitigation options for different sectors, which the proposed project will contribute to realising, including: i) improving and monitoring water resources and water supply systems and rehabilitating

	flood control systems in the agriculture sector; ii) improving forest management systems; and iii) developing reliable early-warning systems to reduce the impacts of disasters such as floods and droughts.
Climate Change Action Plan (CCAP)	The proposed project is consistent with the adaptation actions outlined in the CCAP. This includes actions to: i) develop institutional and human capacity to address climate change; ii) build climate resilience for urban communities, farming systems and rural economies; iii) improve resilience of forest ecosystem goods and services; iv) improve the management of agricultural lands; and v) strengthen education and public awareness in media.
Lao PDR – United Nations Partnership Framework 2017–2021	The Lao PDR – UN Partnership Framework (UNPF) is an articulation of the shared commitment of the UN Country Team to coordinate their efforts and maximise resources and contributions in the best interests of the people of Lao PDR. The proposed project aligns with Outcome 3 of Pillar I of this framework. This Outcome relates to the protection of ecosystems and the increased resilience of people to climate related events and disasters.
Law on Meteorology and Hydrology, 2017	This law defines how meteorological and hydrological activities are to be monitored, managed and evaluated in Lao PDR, to prevent and reduce the impacts of natural disasters. The law also aims to provide timely and accurate data that can be integrated at regional and international levels to contribute to sustainable national socio-economic growth.
Environmental Protection Law, 2013	This law defines the principles, regulations and measures related to environmental management and monitoring of environmental protection, control, preservation and rehabilitation and the reduction of global warming. Additionally, this law relates to the prevention and management of natural disasters.
Water and Water Resources Law, 2019	This updated law adds new provisions on water rights and use, including waste-water discharge permits, wetlands and water-resources protection, ground-water management, and river-basin management. Additionally, the law expands the terms and conditions of large, medium, and small-scale uses and includes articles on environmental flows for hydropower as well as stipulations related to irrigation use.
Forestry Law, 2019	The Forestry Law determines the principles, regulations and measures on forest and forestland's: i) management; ii) preservation; iii) development; iv) utilisation; and v) inspection. The law promotes tree plantation and regeneration to make forest resources rich and sustainable sources of living for the people of Lao PDR. The law also aims at ensuring the protection of soil quality, air quality, water sources and biodiversity of forest and forestland which contributes to national socio-economic development.
Disaster Risk Management Law, 2019	This law determines the regime, regulation and measures relating to disaster management in order to ensure the efficient, effective and up-to-date implementation disaster management.

	<p>gement. The key intention of these measures is to examine and mitigate the impact of disasters on human health, life, communal and individual assets, impacts on the environment and on infrastructure. Disaster management shall ensure timely and clear information dissemination that also links with the regional and international community, while contributing to green and sustainable socio-economic development, that also contributes to ensuring national security</p>
Ten Year Natural Resources and Environment Strategy, 2016-2025	<p>The Vision towards 2030 and the National Natural Resources and Environmental Strategy to 2025 provide a vision and strategic direction for the development and management of natural resources and environment, and to ensure sustainable social economic development, and build capacity for climate change adaptation and mitigate the risks of natural disaster. This strategy aims to achieve sustainable utilisation and management of natural resources and environment, together with improving healthy environment and wealth for all people in Lao PDR.</p>
Renewable Energy Development Strategy, 2011	<p>This strategy aims to encourage the development of renewable energy sources at a national level. The strategy: i) provides an overview of renewable energy and its potential in the country; ii) lays out strategy and policy; and iii) presents possible implementation measures for renewable energy deployment in Lao PDR.</p>
Urban Development Strategy to 2030	<p>This strategy outlines the Ministry of Public Works and Transport's vision on urban development and the country's regional integration into main transport and development corridors of the Great Mekong Subregion from 2016 to 2030. The main objective is to define directions, targets and investment plans for urban development, and should serve as a main reference for infrastructural developments and the protection of the country's architectural, cultural and environmental heritage. Rationales include the urbanization of rural areas through the development of small towns towards reducing rural-urban disparities, as well as strengthened regional integration through the development of economic centres along main trans-country corridors.</p>
Vision 2030 and Ten-Year Socio-economic Development Strategy (2016-2025)	<p>The Vision 2030 aims for Lao PDR to "become a developing country: i) with upper-middle income and with innovative, green and sustainable economic growth; ii) where there is availability of industrial pillars and a strong basic infrastructure system to support industrialization and modernization; the country systematically follows a socialist market economy; iii) where there is social justice, peace and order; iv) where peoples livelihoods are improved and solidarity promoted; v) where there are improved development disparities between urban and rural areas; vi) where there is improved human development that ensures all have access to quality social services; vii) where peoples' rights are protected under the effective rule of law, the administrative system is enhanced by following the '3-builds' directive; viii) where there is environmental protection through efficient utilization of the natural resources to ensure sustainability; ix) where there is political stability and strength; x) where</p>

	re the country is actively moving toward regional and international integration". The ten-year strategy builds upon Lao PDR's goal to graduate from LDC status by 2020 and the national strategy for the transition period of LDC graduation by 2025.
Agricultural Development Strategy (ADS), 2011-2020	The ADS highlights the threat of land degradation, lower productivity and desertification from shifting cultivation. Of particular relevance are the objectives to restore degraded forests and reduce upland degradation to improve resilience to climate change, as well as the aim to stabilise swidden agriculture by 2020. The proposed project will contribute to these objectives by facilitating ICM and the implementation of EbA in the Xe Bang Hieng river basin to restore functional forest ecosystems. In addition, the project will work with rural communities to facilitate a transition to more sustainable agricultural practices and alternative climate-resilient livelihoods.
Forestry Strategy for 2020 (FS 2020)	Priorities set out in the FS 2020 are consistent with the EbA and forest restoration interventions to be undertaken through the proposed project as well as the livelihood enhancement activities. The FS 2020 addresses the development of the forestry sector in accordance with national socio-economic development plans and environmental conservation measures. To support poverty reduction goals through forestry, the FS 2020 highlights capacity-building, participation, NTFP management and the protection of soils and watersheds as priorities, which have been incorporated into the proposed project under Outcome 2.
National Growth and Poverty Eradication Strategy (NGPES)	The NGPES highlights the agriculture and forestry sectors as priorities where there are opportunities for supporting growth and poverty reduction, with agroforestry identified as a key sub-sector to support growth. The proposed project is aligned with the NGPES in promoting and building capacity for sustainable forest and watershed management.
8 th Five-Year National Socio-Economic Development Plan (NSEDP), 2016-2020	The 8 th National Socio-Economic Development Plan (NSEDP) 2016-2020 highlights (among other priorities) the need to: i) halt swidden agriculture and increase forest cover to 70% by 2020; ii) protect and sustain the environment and plan for climate change mitigation, especially to preserve and enhance forest cover and conserve water; iii) identify development zones and land-use areas, especially areas with forest cover, including conservation areas, production forests, protected forests, and watersheds; and iv) ensure resources are available to reduce vulnerability to natural disasters, particularly forest fires, droughts, floods, as well as river bank and mountain erosion. The proposed project's outcomes of reducing flood risk, protecting and restoring watersheds and promoting climate resilient alternative livelihoods will contribute to the goals of the NSEDP.
Second National Communication (SNC), 2013	The SNC highlights Lao PDR's commitments to addressing climate change and contains <i>inter alia</i> : i) an outline of the country's national and regional development priorities, objectives and circumstances with regards to addressing the adverse impacts of climate change; ii) a description of steps taken or envisaged by the GoL to integrate climate change into

	<p>development planning; iii) a description of Lao PDR's vulnerability to the identified climate threats, including the most vulnerable economic sectors to these threats; and iv) the adaptation needs of the country, as well as barriers to achieving the adaptation and mitigation targets outlined in the country's NDC. The proposed project contributes to addressing the adaptation needs and vulnerability of communities to floods and droughts, as identified in the SNC.</p>
Land Law, 2003	<p>The interventions under the proposed project to promote fine-scale land-use planning and restore functional ecosystems are aligned with the Land Law. The objectives of the law are to determine the regime on the management, protection and use of land and to contribute to socio-economic development and environmental protection.</p>
Lao PDR Nationally Determined Contribution (NDC), 2015	<p>The NDC outlines Lao PDR's climate change-related actions to date, including the development of strategies and laws relating to climate change, and identifies the country's mitigation and adaptation contributions. The proposed project is aligned with the NDC, which highlights the risk of flooding and how it will increase as a result of climate change, as well as contributing to the implementation of adaptation priorities relating to water resources, agriculture, forestry and land-use change.</p>
National Environment Strategy to the year 2020	<p>The National Environment Strategy was formulated to provide the general direction, targets and programmes for ensuring environmental protection up to the year 2020. This strategy aims to: i) implement policies that ensure valuable environmental resources are conserved; ii) manage water and water resources; iii) develop and promote the use of land to ensure rich biodiversity; iv) develop and promote environmental and social assessment in rural and urban development projects; v) protect historical and cultural heritage; and vii) develop and promote environmental and education awareness. The proposed project is aligned with this strategy as it focuses on prioritising sustainable management and utilisation of land, water and forest resources to enhance the climate resilience of communities as well as increasing environmental awareness.</p>
MoNRE Vision towards 2030	<p>The proposed project is aligned with the Vision, which provides direction for: i) the development and management of natural resources and the environment; ii) building capacity for climate change adaptation; and iii) ensuring sustainable socio-economic development. The Vision further highlights the impacts of floods and droughts on Lao PDR and how climate change affects the frequency and intensity of these disasters.</p>
National Biodiversity Strategy and Action Plan 2016 - 2025	<p>The proposed project is in line with the National Biodiversity Strategy and Action Plan 2016 – 2025 that seeks to establish direct interventions and capacitate the GoL and partners to address the underlying issues affecting biodiversity loss, including in the forestry or agricultural sectors.</p>

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management will be an important consideration under all components of the proposed project, but will be specifically addressed through Component 3: “Knowledge management and Monitoring and Evaluation (M&E)”. This will include conducting knowledge management and awareness raising in target rural and urban communities to build their appreciation and understanding of climate change risks, impacts and adaptation options (Outcome 3.1). To further promote local ownership and contribute to shifting attitudes towards restoration and conservation, a community-based monitoring system to measure changes in key ecological determinants of ecosystem health and resilience in the Xe Bang Hieng river basin will also be developed (Output 3.2.1).

Lessons learned during project implementation, in addition to those from past and current aligned initiatives, will be collated and considered in the further development and implementation of this project. Results and lessons learned from M&E will be made accessible to stakeholders and decision-makers to facilitate replication and upscaling across Lao PDR, as well as other countries in the region through South-South exchanges (Output 3.1.2).

Further details of the project’s approach to knowledge management will be determined during the PPG phase in consultation with the relevant stakeholders.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Phouvong Luangxaysana	Director General, Department of Planning and Cooperation, GEF OFP	Ministry of Natural Resources and Environment	4/8/2020

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

