

Funding Proposal

SAP009: Building resilience of urban populations with ecosystem-based solutions in Lao PDR

Lao People's Democratic Republic (the) | United Nations Environment Programme (UNEP)|
Decision B.24/09

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Simplified Approval Process Funding Proposal

Project/Programme title:	Building resilience of urban populations with ecosystem-based solutions in Lao PDR
Country(ies):	Lao PDR
National Designated Authority(ies):	Mr. Syamphone Sengchandala, Director of Management and Coordination Division, Department of Climate Change, Ministry of Environment and Natural Resources
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If available, indicate GCF code:	<i><u>This code is assigned to each project upon first submission of a Concept Note or Funding Proposal and remains the same throughout the proposal review process. If you have submitted this project/programme previously please indicate the GCF code here.</u></i>



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This section highlights some of the project's or programme's information for ease of access and concise explanation of the funding proposal.

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Section C **FINANCING INFORMATION**

This section explains the financial instrument(s) and amount of funding requested from the GCF as well as co-financing leveraged for the project/programme. It also includes justification for requesting GCF funding and exit strategy.

Section D **LOGIC FRAMEWORK, AND MONITORING, REPORTING AND EVALUATION**

This section includes the logic framework for the project/programme in accordance with the GCF Results Management Framework and Performance Measurement Framework, and gives an overview of the monitoring, reporting and evaluation arrangements for the proposed project/programme.

Section E **EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA**

This section provides an overview of the expected alignment of the projects/programme with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

Section F **ANNEXES**

This section provides a list of mandatory documents that should be submitted with the funding proposal as well as optional documents and references as deemed necessary to supplement the information provided in the funding proposal.

Note to accredited entities on the use of the SAP funding proposal template

- The Simplified Approval Process Pilot Scheme (SAP) supports projects and programmes with a GCF contribution of up to USD 10 million with minimal to no environmental and social risks. Projects and programmes are eligible for SAP if they are ready for scaling up and have the potential for transformation, promoting a paradigm shift to low-emission and climate-resilient development.
- This template is for the SAP funding proposals and is different from the funding proposal template under the standard project and programme cycle. Distinctive features of the SAP funding proposal template are:
 - *Simpler documents*: key documents have been simplified, and presented in a single, up-front list;
 - *Fewer pages*: A shorter form with significantly fewer pages. The total length of funding proposals should **not exceed 20 pages**, annexes can be used to provide details as necessary;
 - *Easier form-filling*: fewer questions and clearer guidance allows more concise and succinct responses for each sub-section, avoiding duplication of information.
- Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other funding proposal documents such as project appraisal document, pre-feasibility studies, term sheet, legal due diligence report, etc.
- Submitted SAP Pilot Scheme funding proposals will be disclosed simultaneously with submission to the Board, subject to the redaction of any information which may not be disclosed pursuant to the [GCF Information Disclosure Policy](#).

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Please use the following name convention for the file name:

“SAP-FP-[Accredited Entity Short Name]-[yyymmdd]”

A. PROJECT/PROGRAMME SUMMARY					
A.1. Has this FP been submitted as a SAP CN before?			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
A.2. Is the Environmental and Social Safeguards Category C or I-3?			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
A.3. Project or programme	<i>Indicate whether this FP refers to a combination of several projects (programme) or one project.</i> <input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.4. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector	A.5. RFP	Not applicable
A.6. Result area(s)	<p><i>Check the applicable GCF result area(s) that the proposed project/programme targets. Indicate for each checked result area(s) the estimated percentage of GCF budget devoted to it. The summed up percentage should be equal to 100%.</i></p> <p>Mitigation: Reduced emissions from:</p> <p><input type="checkbox"/> Energy access and power generation: <u>Enter number</u> %</p> <p><input type="checkbox"/> Low emission transport: <u>Enter number</u> %</p> <p><input type="checkbox"/> Buildings, cities and industries and appliances: <u>Enter number</u> %</p> <p><input type="checkbox"/> Forestry and land use: <u>Enter number</u> %</p> <p>Adaptation: Increased resilience of:</p> <p><input checked="" type="checkbox"/> Most vulnerable people and communities: <u>60</u> %</p> <p><input type="checkbox"/> Health and well-being, and food and water security: <u>Enter number</u> %</p> <p><input type="checkbox"/> Infrastructure and built environment: <u>Enter number</u> %</p> <p><input checked="" type="checkbox"/> Ecosystem and ecosystem services: <u>40</u> %</p>				
A.a. Total investment (GCF + co-finance)	Amount: 11.5 million USD	A.a.1 Total GCF funding requested	Amount: 10 million USD		
A.b. Type of financial instrument requested for the GCF funding	<i>Mark all that apply.</i> <input checked="" type="checkbox"/> Grant <input type="checkbox"/> Loan <input type="checkbox"/> Equity <input type="checkbox"/> Guarantees <input type="checkbox"/> Others:				
A.7. Implementation period	5 years (60 months)				
A.8. Total project/ programme lifespan	20 years (240 months)	A.9. Expected date of internal approval	11/30/2015		
A.10. Executing Entity information	State of Lao PDR, through its Ministry of Natural Resources and Environment and Ministry of Finance (as "Recipient Entity" in UNEP terminology); and UNEP				
A.11. Scalability and potential for transformation (Eligibility for SAP, max. 100 words)					
<p>The proposed project aims to shift the paradigm of urban flood management in Laos from a limited, hard infrastructure approach towards an integrated approach that enhances climate resilience. This will be achieved by mainstreaming integrated flood management strategies into planning frameworks and implementing urban ecosystem-based adaptation (EbA) to decrease climate-induced flooding. The project will be implemented in four cities that have been shown to be the most vulnerable to climate change through climate risk modelling and consultations with relevant planning institutions in Laos. Project interventions will directly benefit 74,600 people and restore 1,500 ha of urban wetland and stream ecosystems. The project will build on and scale up proven interventions, namely the ecosystem rehabilitation from the FAO supported initiative "Climate Adaptation in Wetland Areas in Lao PDR" in rural Laos, leverage on the established global practice on urban EbA and integrated flood management and test how these interventions can achieve impacts in four Lao cities considering local rainfall regimes, hydrology, and governance systems¹. Lessons learned from the project and its innovations on integrated flood management will feed back into policy recommendations and guidelines at the national level. Project results also have the potential to be further upscaled to 13 other cities and urban centers in Laos, paving the way for further EbA investments by demonstrating benefits. The lessons learned can also more broadly contribute to the knowledge on urban EbA in developing country settings.</p>					

A.12. Project/Programme rationale, objectives and approach (max. 300 words)

Climate change is increasing the frequency and intensity of extreme rainfall events in Laos, leading to more frequent and severe flooding in vulnerable cities along the Mekong River. However, these rapidly growing cities lack adequate flood management. The barriers preventing climate-resilient flood management include: i) limited technical and institutional capacity in government; ii) lack of integrated, climate-resilient approaches to flood management; and iii) limited knowledge about EbA and the valuation of ecosystem services. To address these barriers, the proposed project will facilitate integrated, climate-resilient flood management — including ecosystem-based adaptation (EbA) — in the cities of Vientiane, Paksan, Savannakhet and Pakse. This will be done by: i) strengthening technical capacity and knowledge base and management to reduce flood impacts; ii) developing city-level integrated flood management strategies; iii) identifying sustainable financing options for integrated flood management and; and iv) implementing urban EbA solutions. The project will create and/or strengthen drivers to sustain and up-scale urban EbA planning for flood management in the following areas: developing champions in Government for EbA through improved knowledge, awareness and peer-learning mechanisms; mainstreaming EbA into planning and budgeting instruments — inputs into and reinforcement from the NAP process will be an added driver; and empowering communities to engage with city-level planning and management processes. The project will generate several environmental and social-economic benefits, aside from flood control and use local knowledge².

Overall, the project interventions aim to shift the paradigm of urban flood management in Laos away from the use of mostly hard infrastructure towards innovative use of EbA measures and integrated flood management. GCF support is critical for addressing this financing gap and achieving this paradigm shift, because EbA for flood risk management is chronically underfunded. As a Least Developed Country, Laos lacks domestic resources to invest in longer-term climate change adaptation as it continues to require support for reconstruction after major flood events. To illustrate, damages from floods in 2018 were equivalent to 10% of the country's budget for the same year. International sources of funding continue to focus on hard infrastructure for flood management and provide limited technical assistance for non-structural flood risk management and EbA. Given that the interventions will not generate a revenue stream that can be used to repay a loan, and the country's debt burden limits further international borrowing, the Government of Laos is seeking grant financing from the GCF for this project. Such financing will enable the government to take the urgently needed steps to reduce the flood vulnerability of urban citizens in Laos.

B. PROJECT/PROGRAMME DETAILS

B.1. Context and baseline (max. 500 words)

Cities in Laos³ are among the most vulnerable areas to flooding in South East Asia and experience extreme flooding on an annual basis. The magnitude of this flooding problem is expected to increase because of climate change. Major monetary losses from the floods typically include damage to infrastructure and loss of livestock and crops. Non-monetary losses include outbreaks of water-borne diseases⁴, absenteeism of children from school and disruption of transport systems. Overall economic losses from floods amount to 2.8–3.6% of GDP every year⁵. In 2018, floods caused damages of ~US\$372 million⁶. Consultations⁷ with flood-affected people indicate that per-household costs can reach ~US\$1,000 after a heavy rainfall event, which is ~40% of the annual GDP per capita.

Within the next few decades climate change is expected to greatly increase the frequency, severity and extent of flooding in Laos. This will in turn result in a considerably greater prevalence of water-borne diseases, greater damage to infrastructure, greater loss of livestock, and greater loss of agricultural crops. Indeed, the total economic damages from flooding can be expected to increase several-fold — by as much as five times. Considering that Laos has historically experienced average damages of US\$50 million per annum from flooding⁸, it is plausible based on the results of climate change models (presented below⁹) that these damages will exceed US\$250 million for some years in the decades ahead¹⁰.

The Mekong River does on occasion break its banks and cause flooding in many Laotian cities. However, most urban and peri-urban flooding events in Laos are caused by extreme rainfall events in which rainwater does not drain fast enough into soils and then aquifers¹¹. This is known as pluvial flooding¹². Climate change models show that the frequency of extreme rainfall events — which lead to pluvial flooding — (Annex 2: Feasibility Study, Section 2.4.1, Figure 10). Of even greater concern is that the intensity of the extreme rainfall events is also expected to increase several fold, with some events being five times greater than in the past^{13,14}. Climate models also predict that 400-600 mm/day rainfall events will occur more frequently in the future, possibly becoming as frequent as the current 100–200 mm/day extreme rainfall events that cause flooding. In addition, rainfall events of up to 1000 mm in a single day could become as frequent in the future as 200-400 mm/day rainfall events are currently (Annex 2: Feasibility Study, Section 2.4.1, Figures 11 and 12).

The impacts of these increasingly extreme rainfall events will be exacerbated by Laos' rapid rate of urbanisation¹⁵. Cities in Laos are expanding without comprehensive urban planning¹⁶ that addresses increasing flood impacts under climate change. The combination of unplanned development and rapid urban growth has resulted in poorly designed urban areas, frequently characterised by inadequate infrastructure and high levels of exposure to climate risks. As Laotian cities grow and become more dense, urban wetlands, natural streams and other green areas that are critical for flood management are being lost¹⁷. With the total area of impermeable surfaces increasing, the infiltration of rainwater into soils and drainage into groundwater is greatly reduced. Green areas are also needed for the retention of stormwater, with many wetlands acting as detention areas for river flooding. Moreover, urban wetlands and streams provide other valuable ecosystem goods and services in addition to flood reduction.

To address these impacts of climate change, integrated flood management that incorporates urban ecosystem-based adaptation (EbA)¹⁸ and makes provision for climate change is needed. Such integrated flood management is not, however, being practised currently and the technical skills and knowledge to implement urban EbA are not readily available in Laos. The typical approaches to flood management are site-specific, downstream-focused, 'hard' engineering solutions, rather than an integrated catchment approach which considers the role of ecosystem services in flood control. Current policies on flood management and urban planning in Laos¹⁹ do not provide for an integrated approach to flood management that accounts fully for climate change, and certain policies are not implemented fully.

Problem statement

The problem that the proposed project will address is that cities in Laos are vulnerable to increases in flooding caused by increases in the frequency and intensity of extreme rainfall events. Current urban planning and approaches to flood risk management are not responding to these climate threats. Traditional drainage systems²⁰ alone have been inadequate to date in reducing flood impacts under climate change conditions. Approximately 40% of the population is located within urban areas and the annual urban growth rate is ~4%. Urban development in Laos consequently requires a paradigm shift towards integrated development that: i) benefits from improved planning and developed knowledge base; ii) includes the use of ecosystems to manage floods; and iii) reduces, retains and attenuates runoff at the source as opposed to increasing the discharge capacity of drainage systems.

Preferred solution²¹

The preferred solution is to implement an integrated, climate-resilient approach to urban flood management in Laos, including the use of urban EbA interventions²². This will ensure that city development takes place in a flood-resilient manner. Specifically, urban EbA interventions reduce the impacts of pluvial flooding by improving infiltration and detention. Infiltration is promoted through increasing green spaces and permeable surfaces within a city, which results in less runoff being generated at the source and runoff being attenuated during rainfall events. The rehabilitation and protection of urban streams and wetlands are an important part of urban EbA. Wetlands reduce flood impacts by acting as natural detention areas for both pluvial and river floods²³, while rehabilitated natural streams with intact vegetation reduce the velocity of waterflow and have increased infiltration²⁴. EbA interventions such as maintaining green spaces and restoring wetlands and natural streams will therefore reduce flood impacts on affected communities. Moreover, the restoration of wetland and urban stream ecosystems using climate-resilient indigenous plant species will enhance the resilience of the ecosystems themselves to climate change. While these practices have thus far not been widely applied in urban settings in Laos, the project will test how successful approaches in rural settings in Laos and urban settings in comparable countries can be employed for the selected cities. In addition to the analysis on flood risks under climate change conditions in the feasibility study, the project takes into account local rainfall regimes, hydrology, and habitats through assessments at the start of the project to ensure the measures will work in the context of the selected cities. Environmental and hydrological monitoring systems will be put in place to quantify the magnitude of flood reduction and attenuation impacts that the EbA interventions will have to support further upscaling in the future.

To maximise their functionality, urban EbA interventions should be implemented as part of an integrated flood management approach that takes climate change impacts into account. Such an approach would align development practices with the upstream causes and downstream impacts of current and predicted flooding. For example, this would entail avoiding construction in flood-prone zones and reducing the amount of runoff from upstream developments by: i) implementing urban EbA interventions; ii) advocating policies that promote the use of permeable surfaces; and iii) undertaking construction that facilitates infiltration and increases detention storage. Such interventions should be integrated into the design of new urban developments, as retrofitting urban EbA into existing developments is costly and technically challenging.

Barriers

The main barriers to the implementation of integrated climate-resilient flood management in Laos are outlined below²⁵.

Lack of data for modelling climate impacts to inform climate change adaptation solutions for flood management

While investments are being made to improve technology and performance in generating base climatological information from the monitoring of hydrological and meteorological trends in priority areas in the country, these are not adequate to support the development and implementation of activities to adapt to climate change. For the development of this proposal, independent work has been carried out to downscale climate change parameters in the target areas to assess flood risks. Even then, the scale of modelling is at a coarse scale. Further hydrological assessments based on quality spatial data and model calibration are needed in order to support the planning and design of coordinated distributed flood management solutions.

Limited technical and institutional capacity of provincial and national government for climate-resilient flood management

The Government of Laos (GoL) has limited technical and institutional capacity for the integrated management of climate change-induced floods. Traditionally, the GoL has focused on disaster response rather than a systematic and proactive approach to flood management. Insufficient strategic planning and limited consideration of existing and future land use exacerbates flooding in Laos' cities. The relevant sectors and institutions responsible for flood management lack technical and institutional capacity to address this gap. A comprehensive strategic approach to flood management requires collaboration between different ministries, but coordination among the ministries involved in urban planning, flood management and city development is often limited. In addition, there is limited capacity at the provincial and city-level for spatial planning that reduces flood risks and impacts. Besides lack of capacity for proactive flood management, the existing planning measures to reduce flood risks are not always implemented due to lack of financing, uncoordinated investments, and development pressures.

Lack of integrated, climate resilient flood management approaches

Few, if any, integrated flood management interventions — i.e. interventions that consider climate change and include EbA — have been implemented in Laos. The government often depends on international donor projects for the funding of urban flood management infrastructure. These projects frequently focus on constructing traditional hard infrastructure to manage flooding. While some policies and plans related to urban flood management include climate change adaptation measures, few address this challenge comprehensively and in an integrated manner. For example, building

regulations and zoning do not always make adequate provision for flooding, especially not for increasingly frequent and severe flooding predicted under climate change.

Limited knowledge about EbA and the valuation of ecosystems

To effectively use EbA for flood management, decision makers, planners and contractors require the technical capacity and knowledge to identify, design, implement and maintain urban EbA interventions. However, the GoL has had little exposure to the adaptation benefits of urban EbA and therefore has limited knowledge about urban EbA. This limited knowledge of EbA means that decision-makers still perceive hard infrastructure and end-of-pipe solutions²⁶ as the only way to effectively manage flooding. 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. Consequently, the GoL is more likely to finance traditional hard engineering solutions, where costs and benefits are well understood.

B.2. Project/Programme description (max. 1,000 words)

The proposed project will address the increasing impacts of climate change-induced floods on urban areas in Laos. The project objective is to establish integrated flood management that includes the use of urban ecosystem-based adaptation (EbA) in four major cities: Vientiane, Paksan, Savannakhet and Pakse. This objective will be achieved through two project components: i) Component 1. Technical and institutional capacity building to plan, design, implement and maintain integrated urban Ecosystems-based Adaptation (EbA) interventions for the reduction of climate change-induced flooding; and ii) Component 2. Rehabilitation and protection of ecosystems in response to climate variability and change. The four target cities were selected based on *inter alia* their climate-induced flood exposure and economic importance. Further information on climate change impacts and site selection²⁷ are provided in Annex 2: Feasibility Study.

Component 1. Technical and institutional capacity building to plan, design, implement and maintain integrated urban Ecosystems-based Adaptation (EbA) interventions for the reduction of climate change-induced flooding

Urban development in Laos is taking place without sufficient consideration of the increasing risks of climate change-induced floods. To enhance the flood resilience of cities in Laos requires a comprehensive, integrated approach to flood management that includes good planning and the use of EbA. Cities are not currently adopting such an approach because of the barriers described in Section B.1 above. The project interventions under this project component will work at multiple levels and through different entry points to overcome these barriers. This will be achieved through two project outputs. The first output will focus on increasing awareness and knowledge of urban EbA, as well as building technical and institutional capacity for the implementation of urban EbA interventions. The second output will focus on developing city-level strategies for integrated, climate-resilient flood management, which will be informed by hydrological and ecosystem assessments, and supported by creating an enabling policy environment. The total investment of Component 1 is US\$6,565,887, of which US\$927,827 will be provided as co-financing for staff time, workshops and office space to support the project activities.

Output 1.1 Strengthening of institutional capacity for integrated flood risk management and implementation of urban ecosystems-based adaptation and males and females with increased awareness of climate threats

The uptake of urban EbA for flood management in Laos is constrained by the limited knowledge and awareness of urban EbA among government, the private sector and communities. The activities under this output will address this barrier by building the capacity of the relevant government departments, by creating and sharing knowledge of urban EbA in Laos, and by engaging with communities and the private sector. Improving knowledge of the benefits and successful examples of urban EbA in the public and private sectors and at the community level strengthens adoption and sustainability of incorporating urban EbA in planning frameworks as well as supports the sustainability of the investments themselves.

Activity 1.1.1 Build the capacity of national and local representatives for using urban EbA to manage climate change-induced flooding.

Successfully implementing urban EbA requires effective coordination across institutions and sectors, as well as effective urban planning that maintains the necessary space for urban EbA interventions. This activity will train decision-makers from MONRE, Ministry of Planning and Investment (MPI), Ministry of Public Works and Transport (MPWT),

Ministry of Agriculture and Forestry, provincial governments and other relevant agencies on how to incorporate integrated climate-resilient flood management into urban planning for the cities of Vientiane, Paksan, Savannakhet and Pakse. This training will include training sessions and learning-by-doing and will cover *inter alia* the following topics: i) EbA concepts and roles of different institutions and sectors; ii) how to link spatial planning²⁸ with the planning of investments in socio-economic development²⁹; iii) master planning processes, iterative planning and their applications at local level; iv) how to strengthen district-level planning systems and their links to provincial planning systems; v) how to use City-level Project Steering Committees as the multi-sectoral coordination mechanism for the Integrated Climate-resilient Flood Management Strategies (see Activity 1.2.3.) and linking this mechanism to the provincial administration; vi) existing legal frameworks and their enforcement. Furthermore, implementing urban EbA interventions such as wetland rehabilitation and detention ponds demands technical skills. Technical staff from the relevant national and city-level departments will receive training on how to use urban EbA to reduce climate-induced flooding. This training will include: i) hands-on spatial planning exercises using GIS; ii) drone mapping; iii) best practices on the design, implementation and maintenance of urban EbA; iv) enforcement of land use regulations and buffer zones around wetlands, rivers and streams; and v) submitting applications for the financing of urban EbA interventions, including to the Environmental Protection Fund (EPF). Lastly, the proposed project will arrange a knowledge-exchange trip for senior government representatives, technical experts and academics to a city with considerable experience with urban EbA for flood management³⁰ and that is geographically and culturally close to Laos, which will promote long-term knowledge exchange³¹. This city will be selected within the first year of the project by the Project Steering Committee (co-chaired by MONRE and UNEP) based on an analysis of options by the Project Management Unit. The experiences from this knowledge exchange trip in the second year of the project will equip the participants further to engage in the development of the Integrated Climate-resilient Flood Management Strategies (Activity 1.2.3) and the lessons learned from the partner city will also feed into recommendations for policy revisions in Laos (under Activities 1.2.1, 1.2.3 and 1.2.4).

Activity 1.1.2 Establish a national knowledge hub that produces and disseminates information on urban EbA interventions locally, regionally and internationally.

A national knowledge hub will be established to produce, collate, analyse and disseminate information on local, regional and international urban EbA interventions. This knowledge hub will be hosted by the National University of Laos (NUoL) in Vientiane. Since urban EbA incorporates different disciplines, the knowledge hub will be multi-disciplinary, covering the fields of civil engineering, urban planning, water resource management, economics, agriculture, ecology and governance. The knowledge hub will contribute to economic valuation of ecosystem services (Activity 1.2.1), hydrological modelling and wetland assessments (Activity 1.2.2), guidelines development (Activity 1.2.4) and other relevant activities. Funding will be made available to the NUoL and relevant institutions to conduct joint assessments and monitoring as well as increase knowledge of topics related to urban EbA. An MoU will be signed between the university and MONRE which will require the knowledge hub to deliver annual presentations and reports to the relevant line ministries and the research institutes affiliated with them and/or the Project Steering Committee. The knowledge hub will also create linkages between NUoL and international institutions specialising in urban EbA. The Knowledge Hub will support the hosting and attendance of conferences and regional forums³² on EbA for relevant staff and students, as well as for knowledge exchange and joint research with other EbA initiatives in the region. By linking NUoL and international institutions, the national knowledge hub will ensure that international best practices are applied in Laos.

The knowledge hub will play an important role in providing technical support to government departments for the implementation of EbA interventions, as well as to the community management committees that will be established by the project under Component 2.

Urban EbA content will also be integrated into existing civil engineering curricula at the university. By expanding existing curricula to include modules on EbA, the project will ensure that the long-term capacity to design, implement and maintain urban EbA interventions in Laos remains after project completion. An international urban EbA expert will be contracted to assist with the integration of new content into the existing curricula.

Activity 1.1.3 Conduct awareness-raising campaigns in each of the four target cities for communities and the private sector on urban EbA and flood management.

The active support of various stakeholders is needed for urban EbA interventions to work well and for planning future urban EbA interventions. To achieve this the proposed project will raise awareness among the public about: i) the value of wetlands and urban streams; ii) the importance of proper solid waste disposal; iii) the need to protect natural streams and rivers; and v) regulations on waterway buffer zones; and v) household-level adaptation measures such as keeping

drainage lines on private property open. The awareness-raising campaign will not only communicate the impacts of climate-induced floods and the benefits of urban EbA, but also recommend household-level adaptation measures. These awareness raising campaigns will be conducted via community management committees, village governance structures, water-user associations, and the National Women's Union. Water-user associations and village-level groups consulted during the project preparation have nuanced understandings of flood-related issues in their communities and can be important channels for awareness campaigns and promoting behaviour change in resource use and maintenance of small-scale community infrastructure. Awareness-raising campaigns will be focused on, but not limited to, villages around the wetland and stream rehabilitation sites (see Component 2). This will include information on the appropriate management of these ecosystems and sustainable natural resource use. In Paksan, it will be linked to the sustainable management plan that will be developed under the project for the Nong Peung wetland (see Component 2).

In addition to interactions with communities, the project will also engage selected private sector stakeholders to identify how they can contribute to and benefit from project activities. This will include especially stakeholders that manage large areas of urban land and can therefore contribute to effective management of stormwater runoff, for example special economic zones and shopping malls such as the Savann-Itecc mall in Savannakhet.

Output 1.2 Integrated Climate-resilient Flood Management Strategies and urban EbA guidelines developed for Vientiane, Paksan, Savannakhet and Pakse, and effective Flood Risk Management Committees as coordination mechanisms

Responding adequately to increasing flood risk in Laotian cities because of climate change requires an integrated approach to flood management. Such an approach must include the use of ecosystems (green infrastructure) for flood reduction along with traditional grey infrastructure. To develop this approach in a given city demands cross-sectoral cooperation and comprehensive planning informed by hydrological assessments and understanding of the value of ecosystem services. The activities under this output will address these needs by determining the economic value of ecosystem services provided by urban wetlands and streams, conducting hydrological assessments and mainstreaming urban EbA into relevant policies and plans for each of the four target cities.

Activity 1.2.1 Conduct economic valuation of urban ecosystem services.

In order to prioritise urban EbA, decision-makers need to understand the value of the services, including flood reduction, provided by urban ecosystems. MPI, PWT and the National University of Laos and other key stakeholders will be engaged throughout the activity from inception, to refining methodologies, and presentation of results through meetings and workshops. Briefing notes will be developed and working sessions will be held with key decision makers (i.e. provincial governors, members of working committees for developing certain policies, investment committees under the MPI, staff of planning departments in key ministries) with the objective of communicating evidence of benefits of urban EbA, providing specific policy recommendations, and looking at opportunities for further engagement and investment. Under this activity the ecosystem services provided by the Nong Peung wetland in Paksan and urban streams in the four target cities will be measured and valued. Physical maps developed under Activity 1.2.2 will form the basis of a GIS analysis of the ecosystems. Subsequently, ecosystem services provided by the urban wetlands and streams under different climate change projections will be identified and valued, and a sensitivity analysis will be carried out. The valuation will be undertaken through a variety of market and non-market methods, such as direct damage assessment, spatial analyses of changes in the landscape and studies on people's willingness to accept compensation for losses. The valuation process will entail survey designs, training of enumerators, collection of socio-economic data, model calibration, and computation. Furthermore, based on the valuation, policy recommendations will be developed such as assessing how the valuation of climate change impacts on ecosystem services and EbA measures can contribute to natural capital accounting processes in the country³³, incorporation of operations and maintenance costs of EbA in the government's asset management system, and assessment of options for payments for ecosystem services and water allocation schemes. The policy recommendations will be integrated into the adaptation assessments in Activity 1.2.4 to help mainstream EbA into the planning, policy and legal frameworks.

Activity 1.2.2 Conduct hydrological assessments and climate risk assessments to inform climate change adaptation solutions for flood management in Vientiane, Paksan, Savannakhet and Pakse.

Effective urban flood management strategies cannot be developed without detailed hydrological models at a city-scale. Presently, such models are either not available for Laotian cities, or if they do exist, they are at coarse spatial resolutions that do not assist with planning interventions. To address this gap, detailed spatial and hydrological assessments will be conducted for the four target cities. Data on elevation, land use and existing infrastructure will be collected for the assessments. Drone mapping will be used to obtain high-resolution spatial information.

Using these data, one hydrological model for each of the four cities will be developed to inform the integrated climate-resilient flood management strategies (ICFMS) that will be developed under Activity 1.2.4. The software that will be used to develop these hydrological models will be selected in consultation with local stakeholders to prevent vendor lock-in of costly and inappropriate software. There are also currently no demarcated floodplains³⁴ in Laotian cities. The hydrological models will be used to establish 20-, 50- and 100-year floodlines³⁵ in the four target cities, taking climate change scenarios into account. These floodlines will further inform the ICFMS and future development planning of the cities. To ensure sustainability and effective technology transfer, the modelling and mapping infrastructure and trained staff will be hosted within an appropriate institution to be selected at the start of the project³⁶.

In Paksan, the hydrological assessment will specifically include the Nong Peung wetland. In addition, other aspects of the wetland will be assessed, including the different functional zones, water quality, biodiversity, invasive alien species and community use of the wetland. This general wetland assessment will inform the management plan for the wetland that will be developed under Activity 2.1.1.

Activity 1.2.3 Develop the ICFMS and mainstream climate change and urban EbA into relevant policies, guidelines and plans.

Without a shift in the way cities in Laos are planned and developed, future urban development is likely to further contribute to flooding – particularly as rainfall intensity and frequency increases. Existing spatial development plans in Laos do not take into account the interaction between increasing rainfall and increases in catchment imperviousness. Moreover, many of the existing drainage systems in the four cities have been not been adequately designed to effectively drain runoff from large rainfall events. These poorly performing drainage systems increase the frequency and severity of floods and result in more frequent on-site flooding. To address these challenges, this project activity will develop one ICFMS for each of the four target cities. The development of the ICFMS will take place through broad consultation with stakeholders and continual engagement with existing policy-making processes and planning processes, as well as by holding various workshops focused on the ICFMS. This development will be driven by a dedicated full-time ICFMS Officer that will be established in the provincial office of MPWT, in coordination with the city-level project focal point sitting in PONRE in each city. These strategies will draw on the findings of the assessments done under Activities 1.2.1 and 1.2.2, as well as on the knowledge exchange trip under Activity 1.1.1. and the ICFMS will be aligned with the national urban EbA guidelines developed under Activity 1.2.4. The cross-sectoral ICFMS will be owned by the Provincial Office of Public Works and Transport. A coordination mechanism for the ICFMS with representation from the relevant government departments will be set up, the Flood Risk Management Committee (FRMC), to ensure effective cross-sectoral collaboration. Adopting a cross-sectoral approach will ensure that flood management is considered in all sectoral planning processes. Stakeholder consultations with affected communities, the private sector and civil society will also be conducted during the ICFMS development and implementation. The ICFMS will contain proposed EbA interventions, management recommendations and enforcement arrangements appropriate to each city, as well as options for specific improvements to city regulations and provincial policies.

The ICFMS will be mainstreamed into existing flood master plans, provincial and district development plans, land use plans and guidelines, building codes, plans for Special Economic Zones, as well as provincial level policies and regulations. This will be achieved by proposing policy revisions and updates of the relevant plans, in close consultation with government decision-makers and technical staff. The process to achieve this mainstreaming will be driven in each target province by the above-mentioned ICFMS Officers established in each city in collaboration with the city-level project focal points and via the Flood Risk Management Committee coordination mechanism. This process will include various focused workshops, meetings with stakeholders and engagement with planners and policymakers. Outcomes of the ICFMS will also be linked with the national adaptation planning (NAP) process, for which a UNEP proposal to the GEF is currently under development. This linkage will include joint workshops with the NAP process.

Specific steps in the process include:

1. Sign MOU with PWT to carry out Activities 1.2.3 and 1.2.4 as an implementing partner and embed implementation within its urban planning unit, including looking at options for updating the ICFMS at regular intervals
2. Organise Flood Risk Management Committees at the city level, including representatives from MONRE, MPWT and MPI as well as representatives from relevant provincial departments, to be convened by the provincial governor³⁷. The committee would agree on the terms of reference, as well as decide on indicators and targets for Activity 1.2.3.

The ICFMS includes:

- a. Based on hydrological assessments, develop flood risk maps including 50 and 100-year flood lines and how flood lines would shift under climate change scenarios
- b. Analysis of mix of investment options: infrastructure, urban EbA, early warning, land use and urban planning
- c. Priority urban EbA investments for each city
- d. Operationalization of priority investments
 - i. Identification of financing sources
 - ii. Scoping availability of potential service providers
 - iii. Assessment of technical and operational capacity to execute
 - iv. Operations and maintenance requirements
 - v. Assessment of risks and mitigation measures, including vector-borne disease risk
- e. Proposed zonation in the context of flood risk
- f. Institutional mapping and analysis of mandates on flood risk management
- g. Policy gap analysis and recommendations on urban planning, building codes, permitting processes, investment requirements for concessions including Special Economic Zones, environmental impact assessments, and other relevant areas
- h. Procedures for regular updating of ICFMS, including at project closure to incorporate the lessons learned during the implementation of various project activities.

Options for the mainstreaming work plan are:

- a. Linking ICFMS into district and provincial Socio-Economic Development Plan for the next 5-year cycle
 - b. Examine policies considered in the Provincial Assembly for points of entry
 - c. Link with existing processes for updating building codes and construction approval processes
 - d. Propose revisions to the EIA guidelines in MONRE as appropriate to account for stream and wetland buffers and consistency with developed management plans
 - e. Work with MPI in looking at investment requirements and any opportunities to promote permeable paving and sustainable urban drainage solutions
 - f. Work with partners on the ground at the city-level to link with urban planning, master planning and other projects as appropriate (ADB, JICA, etc.)
3. Along with the mainstreaming work in Activity 1.2.1, policy briefs on the ICFMS will be developed and working sessions will take place with key decision makers and stakeholders to bring forward specific policy recommendations and evidence to be considered in policy working groups.
 4. During project implementation, conduct an annual participatory review of the ICFMS developed, as well as the performance of stakeholders, against the indicators and targets agreed on in the first step.
 5. Incorporate lessons learned during project implementation into the ICFMS, including the findings from the monitoring of the project's physical interventions under Component 2, as well as relevant recommendations from the mid-term evaluation and terminal evaluation of the project.

Activity 1.2.4 Develop national urban EbA guidelines for Laos and recommendations for policies on urban flood management.

National EbA guidelines will be developed to assist the achievement of ICFMS-set flood reduction targets and to promote the uptake of such approaches in other cities not targeted by the project. These guidelines will be designed to inform decision-makers, planners and contractors on how to plan, design, implement and maintain EbA investments.

International civil engineering experts with urban EbA expertise will be contracted to assist in the development of the guidelines. These experts will have in-depth experience in developing urban EbA guidelines in a flood management context to ensure that international best practices are transferred to Laos. The national urban EbA guidelines will include: i) options for urban EbA and Sustainable Urban Drainage Systems in different contexts; ii) institutional responsibilities for enforcement, monitoring and implementation; iii) options for incentives and instruments to promote EbA in the private sector; and iv) options for regulatory reforms. In addition, the guidelines will offer detailed guidance on the processes of:

1. defining the flooding problem, including impacts on women, men and vulnerable social groups;
2. selecting EbA intervention sites;
3. assessing flooding scenarios without EbA interventions;
4. identifying how the flood reduction target can be met using EbA interventions;
5. assessing flooding scenarios with EbA interventions;
6. estimating costs and benefits of EbA interventions;
7. identifying and communicating the desired EbA interventions;
8. following due diligence procedures for procurement, environmental and social safeguards and risk assessment, including for assessment and mitigation of vector-borne disease risk;
9. implementing and maintaining the desired EbA interventions;
10. monitoring and evaluating the EbA interventions; and
11. identifying appropriate sustainable financing strategies to fund the implementation and maintenance of EbA.

In addition to the national urban EbA guidelines, national and provincial policies on flood management and urban planning will be reviewed and recommendations for appropriate policy reforms will be developed³⁸. These will include incorporating climate change, integrated flood management and urban EbA into policies. This review will be conducted by an international expert working with a national policy expert embedded in the MPWT Department of Urban Planning. Similar to Activities 1.2.1 and 1.2.3, policy briefs will be developed and working sessions with key decision makers will be organized to highlight benefits of integrated flood management and urban EbA into various policies. A national workshop will also be organized. The national urban EbA guidelines will be developed by the second year of the project, used during the latter half of the project in the four cities, and it will finally be updated in the final year of the project to incorporate all the lessons learned during project implementation.

Component 2. Rehabilitation and protection of ecosystem in response to climate variability and change

Wetlands and natural streams in Laotian cities play a vital role in flood reduction and provide various other ecosystem services. However, these ecosystems are frequently lost to urban development or degraded. The project interventions under this component will therefore rehabilitate an important urban wetland and urban streams in the target cities. The specific wetland and urban streams were chosen based on their importance to local communities and their role in flood management³⁹. The areas to be rehabilitated are: i) the Nong Peung Wetland in Paksan; ii) the Houay Khi La Meng stream in Savannakhet; and iii) the Houay Nhang stream in Pakse⁴⁰. At the same time, frameworks for the sustainable management of these urban ecosystems will be established. The restoration and establishment of management frameworks for these sites will comprise the first and second outputs under this component. The third output will focus on the problem of the increasing impervious surface area in the built-up parts of cities which contributes to stormwater flooding during extreme rainfall events. To address this problem, the project will introduce and demonstrate the technology of permeable paving in each of the four target cities. The total investment for Component 2 is US\$4,434,113, of which US\$497,173 will be provided as co-financing for staff time, workshops and office space to support the project activities.

Output 2.1 Area of wetland restored contributing to flood reduction and sustainable management of the Nong Peung wetland in Paksan

The Nong Peung Wetland in Paksan plays an important role in reducing flood impacts in the city by absorbing stormwater from intense rainfall events and by buffering river flooding from the Nam San River. This wetland provides a range of ecosystem services to the city and the surrounding farming communities as well as being an important habitat for many fish and bird species. Despite its importance, there is currently no management plan for the wetland and it has been negatively impacted by human activities. The activities under this output will therefore develop a full

management plan for the wetland to ensure that it provides climate change adaptation benefits to the citizens of Paksan, as well as rehabilitating 800 ha of the wetland area to enhance its functioning.

Activity 2.1.1 Develop a wetland management plan for Nong Peung Wetland in Paksan.

The Nong Peung Wetland provides many ecosystem goods and services to the surrounding communities including fishing, irrigation water and flood reduction. However, the wetland is threatened by *inter alia*: i) encroaching rice farming; ii) excessive withdrawal of water to irrigate rice; and iii) invasive alien species. In addition, the wetland has no legal protection and lacks a management plan. To address these threats and gaps, a comprehensive, sustainable management plan for the wetland will be developed under this activity. This will be done through participatory land-use planning with local communities and other stakeholders. The management plan will also be informed by the findings of the wetland assessment that will be conducted under Activity 1.2.2. Community involvement in the management of the wetland will be facilitated by establishing a Community Wetland Management Committee, drawing on representatives from the Pak Peung water user association, local fishing organization, village-level National Women's Union, and other groups in the surrounding villages. A local government representative should be part of each committee and a representative from PONRE and the city-level project coordinator will be *ex-officio* members⁴¹. The committee will work closely with the CPSC and city-level focal points in the ICFMS process, in developing the management plan and monitoring its implementation. This committee, consistent with citizen science approaches, will assist the government with water quality monitoring, fishery management and the monitoring and management of invasive species. The government and the Community Wetland Management Committee will receive technical support from experts from the knowledge hub established under Activity 1.1.2.

Activity 2.1.2 Rehabilitate the Nong Peung Wetland.

Since the Nong Peung Wetland is used extensively by the surrounding communities and people from further afield it has been degraded in certain respects. Specifically, natural vegetation has been lost in parts of the wetland, invasive alien plants are encroaching, and the natural water flow has been disrupted in places. This activity will improve the ecological functioning of the wetland by: i) removing invasive alien plants, especially *Mimosa pigra* and *Eichhornia crassipes* (water hyacinth); ii) removing small human-made barriers that impede natural flow and wetland functioning; and iii) restoring natural vegetation by planting appropriate indigenous plant species including terrestrial and aquatic plants across 800 ha. While the overall target area of the wetland has been identified (see Figure 10.2 in Section 10.2 of Annex 2: Feasibility Study), fine-scale selection of restoration sites will be done in the second year of the project, based on the wetland assessment and wetland management plan. The project will train and employ community members to do the restoration work under the technical supervision of the recruited firm and the CTA and following restoration protocols developed in the project. PONRE staff will be engaged in the execution of restoration work in a "learning by doing" approach to build capacity. Subsequent restoration work can be financed through local government, EPF, and other sources.

Output 2.2 Area of urban streams restored contributing to flood reduction and sustainable management of urban streams in Savannakhet and Pakse

Natural urban streams provide ecosystem goods and services in otherwise built-up areas, including helping to reduce flooding. Intact natural vegetation reduces the velocity of flash floods, protects riverbanks from erosion and reduces sedimentation. Urban development frequently leads to streams being degraded, through loss of vegetation, building within stream buffer zones and deposition of solid waste in streams. The activities under this output will rehabilitate 700 ha along two important urban streams in the cities of Savannakhet and Pakse which provide the above-mentioned services but are subject to degradation.

Activity 2.2.1 Restore natural urban streams in Savannakhet and Pakse.

Under this activity, the Houay Khi La Meng stream in Savannakhet and the Houay Nhang stream in Pakse will be rehabilitated. Firstly, social and environmental surveys of the streams will be undertaken to: i) gain a detailed understanding of how communities use the streams; ii) prioritise specific areas for rehabilitation; and iii) select appropriate indigenous plant species⁴² to be used for restoration. Secondly, solid waste in and around the streams will be removed to increase the drainage capacity of the stream channels, in collaboration with UDAA through Activity 2.2.2. and combined with enhanced community awareness of good solid waste management practices through Activity 1.1.3. Thirdly, invasive alien plants such as *Mimosa pigra* that impede stream flow will be removed. Fourthly, locally

indigenous, climate-resilient plant species will be planted along degraded stream banks to stabilise the banks and improve water quality. Where necessary, plantings will be combined with small-scale installation of geotextile sandbags to combat erosion. Lastly, the legislated buffer zones along the streams will be delineated, with signage installed to indicate the extent of the buffer zones and provide information about the need to protect the streams. These rehabilitation interventions will be implemented across 700 hectares along the two target streams. While the overall target sections of the streams have been identified (see Figures 10.3 and 10.4 in Section 10.2 of Annex 2: Feasibility Study) fine-scale selection of restoration sites along the streams will be done in the project's second year, based on further assessments and stakeholder consultations. The project will train and employ community members to do the restoration work under the technical supervision of the recruited firm and the CTA and following restoration protocols developed in the project. PONRE staff will be engaged in the execution of restoration work in a "learning by doing" approach to build capacity. Subsequent restoration work can be financed through local government, EPF, and other sources.

Activity 2.2.2 Develop management plans for restored urban streams in Savannakhet and Pakse.

To ensure that the streams restored under Activity 2.2.1 are maintained and used sustainably, management plans will be developed in collaboration with communities along the streams. These management plans will include engagement with the Urban Development Administration Authorities (UDAA) on improving the effectiveness of existing regular solid waste collection and drainage maintenance regulations and operations. This engagement will include workshops with UDAA to co-develop the urban stream management plans, which will form part of the ICFMS process. Overall comprehensively addressing solid waste management challenges is beyond the scope of this project and is dealt with by other ongoing projects focused on improving solid waste management⁴³. To assist with the implementation of the stream management plans, Community Stream and Drainage Management Committees will be established within the existing village governance structures. One such committee will be established in Savannakhet and one in Pakse. A local government representative should be part of each committee and a representative from PONRE and the city-level project coordinator will be *ex-officio* members. These committees will work with the relevant government authorities (PONRE and UDAA) to monitor and maintain the rehabilitated streams, with technical support provided by experts from the knowledge hub established under Activity 1.1.2, and in coordination with the city-level project steering committees (CPSCs). The stream management plans will include measures to: i) curb the introduction and spread of invasive plants; ii) raise awareness among streamside communities about improving household-level solid waste management and maintaining small drainage lines; and iii) promote the sustainable use of natural resources such as fish and wood from streambank ecosystems.

Output 2.3 Area of permeable paving solutions installed in public areas contributing to flood reduction in Vientiane, Paksan, Savannakhet and Pakse

As cities in Laos are expanding and densifying, the total impervious surface area in urban catchments is expanding. Green areas that are vital for rainwater infiltration are being converted into hard surfaces. For example, as new buildings are constructed impervious paving is installed around existing buildings and the remaining dirt streets are converted to asphalt roads. This exacerbates flooding caused by stormwater, especially following extreme rainfall events. To address this problem, the activities under this component will introduce permeable paving technology at demonstration sites at public institutions in the target cities. The design, implementation and monitoring of the permeable paving will be conducted in collaboration with the knowledge hub to ensure effective technology transfer.

Activity 2.3.1 Design permeable paving solutions for public areas in Vientiane, Paksan, Savannakhet and Pakse.

Permeable paving technology is not well known in Laos. Public institutions such as hospitals, educational institutions and government offices will therefore be used to demonstrate the benefits of permeable paving. The specific sites in each target city where permeable paving will be installed will be selected at the project outset in consultation with local government and the host institutions (for selection criteria see Annex 2: Feasibility Study: Section 12.1). Thereafter, specific permeable paving solutions will be designed for each site, considering *inter alia*: i) pedestrian and vehicle traffic volumes; ii) groundwater level; iii) potential surface pollutants; and iv) the risk of permeable paving pores becoming clogged by sediment deposition. The selection of specific permeable paving options and the design of the paving that will be installed will be based on international best practice. The design process will include consultation with staff at the knowledge hub to facilitate the transfer of knowledge about permeable paving from the knowledge hub to NUoL, civil engineering firms and the relevant government departments such as MPWT.

Activity 2.3.2 Install permeable paving in public areas in Vientiane, Paksan, Savannakhet and Pakse.

Based on the site assessments and paving designs completed under Activity 2.3.1, permeable paving will be installed at the selected public institutions such as hospitals, educational institutions and government offices. Signs will be installed at the sites to provide information about the advantages of permeable paving to the public. The permeable paving demonstration sites will be monitored by the knowledge hub and government staff to build the local evidence base for this technology. In addition, operations and maintenance arrangements will be set up with the host institutions. The knowledge hub will assess the reduction in stormwater run-off achieved through the permeable paving. The findings of this assessment and general lessons learned from these permeable paving activities will be incorporated into the national urban Eba guidelines and the ICFMS when they are updated in the final year of the project.

B.3. Implementation / institutional arrangements (max. 750 words)

UNEP will be the Accredited Entity (AE) for this project, as designated by Lao PDR. The AE will be responsible for overseeing the implementation, financial management, evaluation, reporting and closure of the project.

The lead Executing Entity (Lead EE), will be the State of Lao PDR, acting through its MONRE. The national-level execution will be undertaken by MONRE, which will coordinate the execution of the project through the Department of Climate Change (DCC) and will be accountable to the AE — for project execution and the effective and efficient use of resources. MONRE will execute all the project activities except for Activity 1.2.1. All operating policies and procedures will follow the UNEP Programme Manual, which includes provisions for financial management and procurement⁴⁴. Project funds will pass through the Ministry of Finance (MOF), which will be the “Recipient Entity” (RE) (in UNEP terminology). MOF will not have a role in the execution of activities apart from disbursement to MONRE, which will be the lead Executing Entity.

The Ecosystems Services Economics Unit in the Biodiversity and Ecosystems Branch of UNEP will be responsible for execution of Activity 1.2.1. (EE role).

Accredited Entity

UNEP through its Climate Change Adaptation Unit in the Freshwater, Land, and Climate Branch in the Ecosystem Division will be responsible for overseeing the implementation of the proposed project in coordination with the national-level Project Steering Committee (NPSC) and a national-level Project Management Unit (PMU). In addition, as the AE, UNEP will: i) sign a Project Cooperation Agreement (PCA) with Lao PDR to establish clear roles and responsibilities for the execution of project activities⁴⁵; ii) ensure that the project is executed in line with GCF and UNEP rules, policies and requirements; iii) supervise, oversee and manage project implementation, as well as report on project progress; iv) participate in the NPSC; and v) ensure that project activities are well coordinated and aligned with national priorities. A Task Manager (TM) will be responsible for project supervision to ensure consistency with GCF and UNEP policies and procedures, and participate in: i) biannual NPSC meetings; ii) the facilitation of the Mid-Term and Final Evaluations; iii) the preparation of Annual Performance Reports and relevant documentation; and iv) technical reviews of project outputs.

National Project Steering Committee

The NPSC will comprise representatives of UNEP and MONRE, as well as potentially representatives of *inter alia* the: i) Ministry of Agriculture and Forestry (MAF); ii) Ministry of Planning and Investment (MPI); iii) Ministry of Public Works and Transport (MPWT); iv) National Women’s Union; and v) National Front⁴⁶. This will include representation from all the relevant ministries and departments overseeing urban land, specifically land classification, management of SEZ land and spatial planning in cities, namely the Department of Land Administration within MONRE, Special Economic Zone Promotion and Management Office in MPI and Department of Housing and Urban Planning in MPWT, respectively. The co-chairs of the PSC will be MONRE and UNEP. Primarily, the NPSC will provide project oversight and advisory support such as: i) overseeing project implementation; ii) reviewing annual workplans and project reports; and iii) approving any changes to the project’s targets, activities or timelines. Biannual NPSC meetings will be held⁴⁷ to take management-related and technical decisions, discuss the project’s main performance indicators and provide strategic guidance. Any changes made by the NPSC to the project’s Results Framework or timeline will be communicated to the PMU by the Project Director (PD). A high-level official from MONRE will fulfil this role of PD⁴⁸ and be responsible for: i) leading and directing the PMU; ii) overseeing the daily responsibilities of the PM; iii) providing administrative and technical expertise; and iv) serving as the focal point for interactions between project stakeholders and partner organisations⁴⁹.

National Project Management Unit

The PMU will consist of: a national Project Director (PD); international Chief Technical Advisor (CTA); a national Project Manager (PM); a Financial and Procurement Officer (FPO); Environmental and Social Safeguards Officer (ESO); Communications Officer (CO); Monitoring and Gender Officer (MGO) and an Administrative Officer (AO).⁵⁰ Both the FPO and AO will report directly to the PM. Their responsibilities will include: i) providing administrative, logistical and financial support and expertise to the PMU; ii) providing reports to summarise the disbursement and projected demands for project funding; and iii) ensuring that all tasks are carried out according to UNEP policies and best practices. In particular, the FPO will manage the financial transactions for the project outputs and activities, which will be implemented in line with the established workplan and national priorities. Project activities will be coordinated by the PMU between the project's AE, EE and various stakeholders. UNEP's Biodiversity Unit will report to the PMU and TM on the progress of Activity 1.2.1.

The PM will be a full-time project staff member, recruited competitively and responsible for the day-to-day implementation and management of the project. This role will include: i) reporting to the PD; ii) managing the project in line with the budget and workplans, and in accordance with GCF and UNEP guidelines; iii) being responsible for in-country financial management and disbursements⁵¹; iv) working closely with national and local authorities, as well as NGOs, to manage the project effectively at a local level; and v) ensuring exchange of information and knowledge across the target cities, including managing communications across city-level Project Steering Committees. To achieve the targets of the proposed project, the PM will *inter alia*: i) acquire on-the-ground information to inform UNEP progress reports; ii) engage with project stakeholders; iii) arrange NPSC, PMU and other meetings; iv) provide technical support, including measures to address challenges to project implementation; v) participate in training activities; vi) write technical reports; and vii) facilitate relevant expert activities. Additionally, the PM will liaise with members of the NPSC and PMU, technical experts, government staff and stakeholders involved to coordinate the implementation of the proposed project's activities.

At the request of the GoL, an International Chief Technical Advisor (CTA) will be employed on a full-time basis to provide technical guidance on urban EbA and ensure that project activities result in building the climate-resilience of Laotian communities from national through to city level. Additionally, the CTA will be responsible for providing technical support to the PMU in each city that will participate in the development of urban EbA guidelines. The responsibilities of the CTA include: i) providing overall technical support for the project; ii) supporting the annual planning process and budgets; iii) providing monitoring and operational support to the project; iv) coordinating and supervising the work of specialist technical consultants who will contribute to specific deliverables within each component; and v) providing biannual reports to the PD and NPSC on project progress, performance towards objectives and recommendations. The CTA position will, if feasible, be based in the PMU in Vientiane.

City-level Project Steering Committees

At a provincial and city level, the proposed project will be represented in Vientiane, Paksan, Savannakhet and Pakse by four city-level Project Steering Committees (CPSCs). The responsibilities of the CPSCs include: i) acting as focal points to facilitate interactions between the NPSC, PMU and stakeholders at local level; and ii) coordinating the implementation of the proposed project's EbA interventions in each of the four target cities. Similar to the NPSC, CPSCs will have a target of 30 percent female representation. The Lao National Women's Union representatives at the provincial level will be included in all four CPSCs. City-level structures are important to build capacity and structures in support of EbA for urban adaptation, and also to directly manage the city-level interventions in the project. Representatives of the CPSCs include relevant agencies that influence policy and execute land use, urban planning, investment planning, and other functions related to integrated flood risk management. They serve as important cross-sectoral coordination bodies at the city-level, which currently do not exist.

The following diagrams summarise the organisational structure of the project (Figure 1) as well as the flow of funds for project implementation (Figure 2).

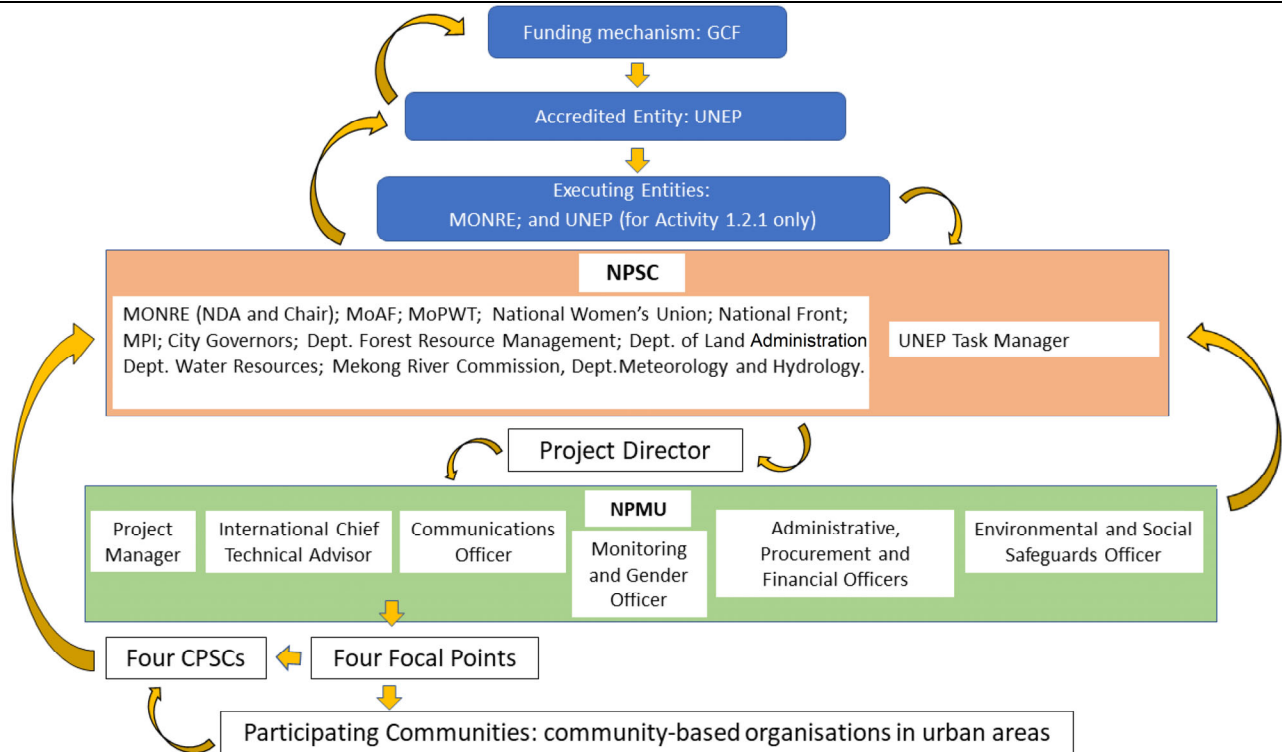


Figure 1. Project management structure.

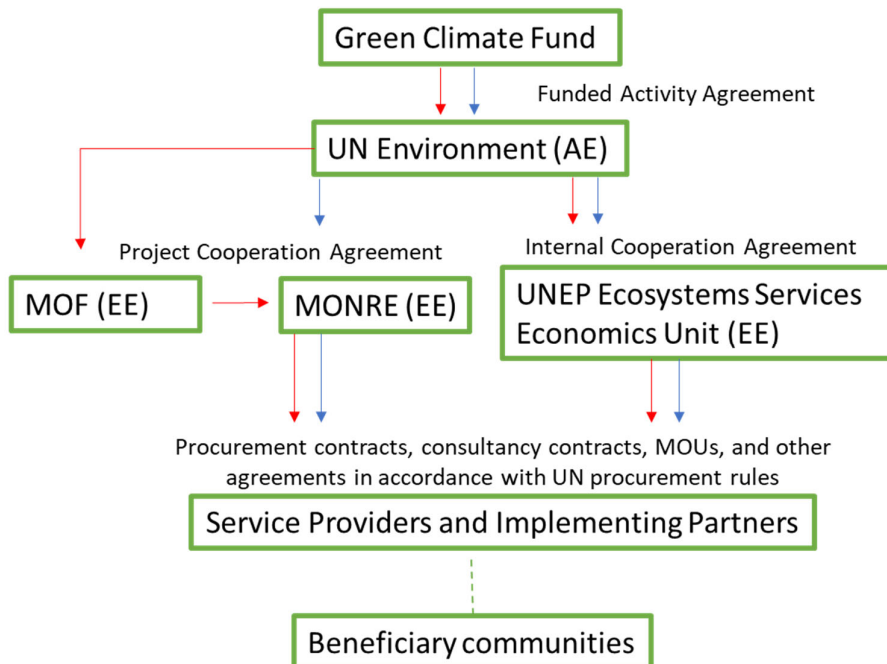


Figure 2. Flow of funds and contractual arrangements for project implementation. The red arrows indicate the flow of funds while the blue lines show the contractual arrangements, including the types of contracts, between the relevant parties.

C. FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding (i + ii + iii + iv + v + vi)		10		million USD (\$)		
GCF Financial Instrument		Amount	Currency	Tenor	Pricing	
(i)	Senior loans	Enter amount	Options	Enter years	Enter %	
(ii)	Subordinated loans	Enter amount	Options	Enter years	Enter %	
(iii)	Equity	Enter amount	Options	Enter years	Enter % equity return	
(iv)	Guarantees	Enter amount	Options		Enter %	
(v)	Reimbursable grants	Enter amount	Options			
(vi)	Grants	10	million USD (\$)			
(b) Co-financing information		Total amount		Currency		
		1.5		million USD (\$)		
Name of institution		Financial instrument	Amount	Currency	Tenor	Pricing
MONRE		In kind	1.5	million USD (\$)	Enter years	Enter%
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%
(c) Total investment (c) = (a)+(b)		Amount		Currency		
		11.5		million USD (\$)		
(d) Co-financing ratio (d) = (b)/(a)		0.15				
(e) Other financing arrangements for the project/programme (max ½ page)		NA				

C.2. Financing by component

An indicative cost breakdown for the proposed project interventions is presented in the table below. The detailed budget is presented in Annex 3.

Component	Output	Indicative cost (USD)	GCF financing		Co-financing			
			Amount (USD)	Financial Instrument	Type	Amount (USD)	Financial Instrument	Name of Institutions
Component 1. Technical and institutional capacity building to plan, design, implement and maintain integrated urban Ecosystems-based Adaptation (EbA) interventions	Output 1.1 Strengthening of institutional capacity for integrated flood risk management and implementation of urban ecosystems-based adaptation and males and females with increased awareness of climate threats	2,260,025	1,830,100	Grants	Public Source	429,925	Grants	MoNRE



for the reduction of climate change-induced flooding	Output 1.2 Integrated Climate-resilient Flood Management Strategies and urban EbA guidelines developed for Vientiane, Paksan, Savannakhet and Pakse, and effective Flood Risk Management Committees as coordination mechanisms	4,305,862	3,807,960	Grants	Public Source	497,902	Grants	MoNRE
Component 2. Rehabilitation and protection of ecosystems in response to climate variability and change	Output 2.1 Area of wetland restored contributing to flood reduction and sustainable management of the Nong Peung wetland in Paksan.	1,631,128	1,419,140	Grants	Public Source	211,988	Grants	MoNRE
Click here to enter text.	Output 2.2 Area of urban streams restored contributing to flood reduction and sustainable management of urban streams in Savannakhet and Pakse	1,579,901	1,425,240	Grants	Public Source	154,661	Grants	MoNRE
	Output 2.3 Area of permeable paving solutions installed in public areas contributing to flood reduction in Vientiane, Paksan, Savannakhet and Pakse	1,223,084	1,092,560	Grants	Public Source	130,524	Grants	MoNRE
PMC		500,000	425,000	Grants	Public Source	75,000	Grants	MoNRE
Indicative total cost (USD)		11,500,000	10,000,000	1,500,000				
C.2.1 Financing structure (if applicable, mandatory for private sector proposal (max.300 words))								
NA								

C.3 Capacity Building and Technology development/transfer

If the project/programme is envisaged to support capacity building and technology development/transfer, please specify the total requested GCF amount for these activities respectively in this section.

C.3.1 Capacity building	Amount: 1,830,100 USD
C.3.2. Technology development	Amount: 1,092,560 USD

C.4. Justification for GCF funding request (max. 500 words)

The Government of Laos (GoL) is seeking a GCF grant of US\$10 million to address the climate-induced flooding that affects vulnerable people in Laotian urban areas. As a Least Developed Country, Laos has limited scope to invest in climate change adaptation through domestic financing. Laos also has substantial external debt — which has increased considerably in recent years — reaching 54% of the country's Gross Domestic Product (GDP) in 2018.⁵²

In Laos, domestic budget reallocation by line agencies and donor assistance are only able to partially cover reconstruction and recovery costs after extreme climatic events such as floods. Outstanding costs are left to be absorbed by vulnerable communities in Laos, whose financial insecurity is exacerbated by these events⁵³. Consequently, funds are not available within the government to take measures to improve flood management and reduce flood impacts, nor within communities to undertake adaptation actions.

Several alternative financing options, such as government funding and loans, have been considered during the development of the proposed project. However, these options are not feasible because: firstly, the GoL has already extended its contribution of 15% of the total project cost in the form of co-financing⁵⁴; secondly, the country's debt burden limits its access to loans from international and regional development banks; and thirdly, the project outputs will be largely public goods and will thus not generate a financial return on investment that can be used to repay a loan.

At present, development financing for flood management in Laos focuses on hard infrastructure (e.g. hard riverbank protection, floodgates, weirs, spillways and concrete canals). Although financiers recognise the importance of ecological functions in flood abatement^{55,56,57}, almost no investments in urban EbA for flood reduction have been made. At best, green infrastructure is combined with hard infrastructure, such as using plants to stabilise dyke slopes or for watershed rehabilitation. Although such interventions have been planned, they have not been implemented to date^{58,59}, partly owing to a lack of awareness and knowhow on EbA, including the valuation of ecosystem services, and political economy drivers that keep investments tied to grey infrastructure. There is thus a gap in financing for urban EbA at scale in Laos as the discourse on urban flood management among decision-makers and practitioners is still largely focused on hard infrastructure and non-integrated approaches. As climate change is likely to result in more frequent and severe flooding, different options for flood management need to be investigated, tested and financed. While initiatives such as *Building climate resilience of urban systems through Ecosystem-based Adaptation (EbA) in the Asia-Pacific region*, financed by GEF and implemented by UNEP, aim to address funding gaps⁶⁰, greater financial resources are required to initiate the shift towards an integrated flood management approach in Laos.

The support of GCF funds is consequently required to overcome the financial, technical and institutional barriers⁶¹ that currently hinder the adoption of an integrated approach to flood management in Laos. With the support of these funds, the project interventions will deliver several benefits and contribute to the achievement of the GCF's gender, environmental and social policies. Firstly, decision-makers in Laos will be supported to become champions of an integrated approach to flood management that includes EbA. The adoption of such an approach will increase the adaptive capacity of 74,600 people in the four target cities. Secondly, 1,500 ha of important urban wetland and streams will be restored under the project, which will lead to the improved provision of ecosystem goods and services under future climate change conditions. Thirdly, permeable paving solutions will be designed and implemented in public areas⁶² in Vientiane, Paksan, Savannakhet and Pakse to improve the drainage of these areas. Lastly, all project interventions have been designed to deliver a wide variety of economic, social and environmental co-benefits to beneficiaries⁶³. Without GCF involvement, Laotian cities will become increasingly exposed to threats from climate change-induced flooding and continue to operate under an existing paradigm of only using hard infrastructure for flood control that is increasingly limited, unfit for purpose and not easily maintained.

C.5. Exit strategy and sustainability (max. 300 words)

The exit strategy for the proposed project requires that after project completion: i) the understanding and uptake of urban EbA continues to be advanced by the knowledge hub; ii) the coordination mechanisms strengthened, strategies and plans developed, information and knowledge base built, and enhanced capacity continue to support urban EbA

interventions; and iii) EbA interventions — i.e. the restored wetland and streams — and permeable paving implemented under Component 2 are regularly monitored and maintained.

Sustainability of the knowledge hub

The knowledge hub will build long-term technical capacity for implementing and maintaining urban EbA interventions by providing the linkages with government research institutions, promoting cross-disciplinary thinking, and through establishing potential linkages with international research groups. Accordingly, the knowledge hub will collate the lessons learned from the project and best-practice examples that can be upscaled and applied in similar Laotian urban contexts. This will link with the demand for such information driven through the NAP process and associated processes such as establishment of national adaptation targets⁶⁴. The host university and its ministry counterparts will sign MoUs (Activity 1.1.2) to ensure long-term knowledge management and sharing, as well as the continued financing of the hub. The expertise on EbA gained by lecturers and researchers during the project, as well as the incorporation of urban EbA into relevant curricula will also ensure that knowledge of urban EbA continues to be available beyond the project period.

Sustainability of physical project interventions

The ecosystems rehabilitated by the project will be maintained through arrangements and practices established in the management plans and ICFMS⁶⁵. This work will be led by MONRE after the project ends, in close collaboration with communities and management committees, drawing on expertise from the knowledge hub. The sustainability of the restored wetland will be ensured through the long-term wetland management plan with the support of the Community Wetland Management Committee (Activity 2.1.1). Similarly, the rehabilitated streams will be maintained by MONRE working together with UDAA and the Community Stream and Drainage Management Committees established by the project (Activity 2.2.2). The permeable pavement demonstration areas will be maintained beyond the project period by the Ministry of Public Works and Transportation along with the institutions providing the demonstration sites. Overall, the mainstreaming of the ICFMS into existing policies, planning and accountability structures during the project (Activity 1.2.3) will create the necessary framework for continued maintenance of the project's urban EbA interventions. During the project preparation, it was found that villages are organised and committed to resolving flood problems in their localities. The stakeholder engagement process throughout the project life cycle will build on this through the management committees.

Financial sustainability

As part of the capacity-building interventions, the project will provide training to city authorities and community organisations on identification of potential integrated flood management interventions and submitting applications for financing to the Environmental Protection Fund^{66, 67}. In addition, the valuation of the benefits provided by urban ecosystems (Activity 1.2.1) will encourage decision-makers to continue maintaining the ecosystems restored under the project and to invest further in such adaptation interventions. Options for sustainable financial mechanisms will be proposed. These could include: i) establishing dedicated, ring-fenced funds for ICFM for each of the target cities; ii) assessing the feasibility of increased and more strongly enforced fines for encroachment into stream and wetland buffer zones to help fund ICFM; iii) preparing loan financing applications for the Environment Protection Fund for installing urban EbA interventions; and iv) leveraging regular domestic spending by integrating ICFMS provisions through guidelines, planning frameworks, and performance frameworks of key institutions.

In summary, the project benefits will be maintained after implementation because of the: i) visible benefits of EbA interventions and permeable paving; ii) increased technical capacity of national and local government; iii) built-in monitoring and evaluation of project interventions; iv) presence of a sustainable knowledge management system; and v) potential availability of national sources of financing for maintaining or scaling up of initiatives. In addition, project outcomes have been designed to be scalable and replicable at national and local level.

C.6. Financial management/procurement (max. 300 words)

The financial management and procurement within the project will be guided by UN financial regulations, rules and practices, as well as UNEP's programme manual. The financial rules of UNEP, which follow International Public Sector Accounting Standards (IPSAS), are promulgated pursuant to the Financial Regulations and Rules of the UN. Within this context, funding allocation mechanisms are managed as per UN rules and procedures, including eligibility criteria, proposal evaluation processes, quality assurance and control, project monitoring and supervision. UNEP is audited annually by the UN Board of Auditors and has established dedicated trust funds for Green Climate Fund (GCF) resources.

The funding of a project will be established through a distinct grant within the Trust Fund, with the project itself being set up in the UNEP Enterprise Resource Planning (ERP) as a "Work Breakdown Structure" (WBS), which is itself further broken down into "Work Breakdown Structure Elements" (WBSEs), organised by output and outcome. The grant of the

project will be linked to the WBSEs to fund the activities contributing to the delivery of specific outputs (as per the disbursement plan detailed in the term sheet). The Accredited Entity fee will be managed through a dedicated grant independently and separately of the GCF project grant funds. In line with UNEP procedures, the project will appoint a Financial Officer within the PMU who will be responsible for monitoring, reporting on and approving requests for funds on a quarterly basis for the activities executed by MONRE. A Fund Management Officer in the Ecosystems Services Economics Unit will perform the same functions for the activity executed by UNEP. Reports to summarise the disbursement and projected demands for project funding will be prepared and submitted to a UNEP Task Manager who will conduct project supervision, in line with reporting standards and methodologies applied in past projects, such as those implemented using GEF modalities. The UN financial regulations and rules require the segregation of duties, and safeguards to ensure compliance with UN financial rules and regulations. In addition, a Fund Management Officer will be appointed to assist UNEP's Task Manager with all financial monitoring and supervision functions. All procurement will be undertaken in line with UN procurement regulations, rules and policies. UNEP's modalities for project implementation, results in funds being transferred in tranches to the Executing Entity (EE) once the EE has satisfied the conditions that are defined under the legal/cooperation instrument (Project Cooperation Agreement; PCA and Internal Cooperation Agreement; ICA) to be signed between UNEP Climate Change Adaptation Unit, Ecosystems Division and the MONRE and UNEP Biodiversity Unit, Ecosystems Division. The PCA will include specific obligations for MONRE on financial management and reporting and will require periodic reporting from MONRE to follow international financial and auditing standards. The PCA specifically requires the audit be undertaken by a recognised firm of certified public accountants or, for governments, by a government auditor. This auditor should state whether the GCF proceeds were covered by the scope of the audit.

As a GoL authority, MONRE follows the government's financial and procurement rules and standards. During the proposed project's inception phase, UNEP will conduct a thorough assessment of MONRE's capacity to undertake procurement in line with UN regulations, rules and processes. This assessment will guide the procurement monitoring plan which will be agreed upon between UNEP and MONRE. The assessment will be conducted following project approval but prior to project implementation. It will include assessments of elements of governance and public accountability such as, *inter alia*, review of the existence and quality of policies, legal and institutional framework, and systems supporting transparency, accountability and controls, especially in the use of donor funds. The outcome of the assessment will determine the threshold for procurement that can be undertaken by MONRE, which will be reflected in the procurement monitoring plan. The procurement monitoring plan is an annex to the PCA and will be shared with GCF upon signature, as required by the FAA. The procurement monitoring plan will also be reviewed periodically. The project's investments in equipment will be undertaken in accordance with UN procurement procedures. Finally, in line with the UNEP Programme Manual, MONRE will be requested to provide an annual compliance audit covering all aspects of the project execution including review of all expenditures incurred during the financial year.

D. LOGIC FRAMEWORK AND MONITORING, REPORTING AND EVALUATION

This section refers to the project/programme's logic framework in accordance with the GCF's [Performance Measurement Framework](#) under the [Results Management Framework](#) to which the project/programme contributes as a whole, including in respect of any co-financing. This is different from the project/programme-level log frame (as there may be other impact measures for example that go beyond those defined by the GCF).

A project-level logical framework, with specific indicators, baselines and targets, means of verification and assumptions should be provided as part of Annex 2.

D.1. Paradigm shift objectives (max.200 words)

Increased climate-resilient sustainable development

The project will increase climate-resilient sustainable development in Laos by reducing the impacts of climate-induced flooding in urban areas. This project will demonstrate EbA for avoided flood losses in four cities that will effect a paradigm shift in urban flood management. The project will effect this paradigm shift by: i) strengthening technical capacity of government for flood-resilient development, the use of urban EbA and embedding ICFMS in existing planning and frameworks; ii) demonstrating the multiple benefits of integrated flood management and urban EbA interventions for flood management; iii) establishing knowledge management practices and strengthening coordination mechanisms to enable the future adaptive management of urban areas to reduce flood impacts under climate change conditions; and iv) identifying sustainable

financing options for integrated flood management. The project will also improve the understanding of Laotian decision-makers on valuing ecosystem services and implementing cross-sectoral planning. National upscaling will be promoted through recommendations for revisions to the policy and regulatory environment and proposals for financing mechanisms, while international knowledge-sharing on EbA interventions will be enabled through the knowledge hub and by leveraging existing UNEP knowledge-sharing platforms.

D.2. Impacts measured by GCF indicators

Refer to Annex 2a Logical Framework for more detailed discussion of indicators and measurement.

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
GCF Core Indicator for adaptation	Number of direct and indirect beneficiaries	Baseline and Completion Surveys	<u>Direct:</u> 0 <u>Indirect:</u> 0	Direct: At least 14,920 people (~2% of the total population of the four target cities) benefiting from reduced flooding from clean drainage lines, implementation of wetland and stream management plans, and restoration. Approximately 50% of direct beneficiaries will be female. Indirect: No people benefitting yet from flood reduction and enhanced ecosystem services through the ICFMS, as ICFMS will only be completed after mid-term.	Direct: Approximately 74,600 people (~9% of the total population of the four target cities) benefiting from reduced flooding from clean drainage lines, implementation of wetland and stream management plans, and restoration. Approximately 50% of direct beneficiaries will be female. Indirect: Approximately 825,000 people (100% of the population of the four target cities) benefiting from flood reduction and enhanced ecosystem services through the ICFMS. Approximately 50% of indirect beneficiaries will be female.	Community members' cleaning of drainage lines lead to flood reduction The target beneficiaries benefit from reduced flood losses from EbA interventions
	Number of direct beneficiaries relative to total population	Baseline and Completion Surveys	<u>Direct:</u> 0% <u>Indirect:</u> 0%	Direct: At least 14,920 people (~2% of the total population of the four target cities) Indirect: 0 people (0% of the total population of the four target cities)	Direct: Approximately 74,600 people (~9% of the total population of the four target cities) Indirect: Approximately 825,000 people (100% of the total population of the four target cities)	Community members' cleaning of drainage lines lead to flood reduction The target beneficiaries benefit from reduced flood losses from EbA interventions

<i>A.1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions</i>	A1.1 Change in expected losses of lives and economic assets (US\$) due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention	Baseline survey and Year 5 monitoring if there is a flood event	Baseline to be determined at inception phase	US\$ amount can only be determined based on the magnitude of the flood that may or may not occur in Year 3	US\$ amount can only be determined based on the magnitude of the flood that may or may not occur in Year 5	If there is a flood event in Year 5, tracking of the final target will be done EbA measures will provide flood reduction
<i>A4.0 Improved resilience of ecosystems and ecosystem services</i>	A4.2 Value (US\$) of ecosystem services generated or protected in response to climate change	Ecosystem valuation methodology and calculation under Activity 1.2.1	No new protection or restoration efforts with climate change risks produce ecosystem services	US\$ 34,464/year in flood protection and other ecosystem services from Nong Peung wetland US\$ 20,104/year in flood protection and other ecosystem services from urban streams in Pakse and Savannakhet	US\$ 344,640/year in flood protection and other ecosystem services from Nong Peung wetland US\$ 201,040/ year in flood protection and other ecosystem services from urban streams in Pakse and Savannakhet	EbA measures will generate provide flood reduction, wastewater treatment, support to fishing and livelihoods and other ecosystem services

D.3. Outcomes measured by GCF indicators

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	A.7.1. Use by vulnerable households, communities, businesses and public-sector services of Fund-supported tools, instruments, strategies and activities to respond to climate change and variability	Key informant interviews Policy uptake scorecard Project reports Interviews with PMU	No incorporation of ICFMS in government policies and plans.	Level 0	Government departments have incorporated ICFMS into their policies and plans at Level 2 of policy uptake scorecard ¹ ;	

D.4. Arrangements for Monitoring, Reporting and Evaluation (max. 300 words)

The Project Manager, under the oversight of the UNEP Task Manager, will be responsible for monitoring progress against output and outcome indicators during project implementation.

¹ This policy uptake scorecard will have four levels, and will measure the extent of use of the ICFMS in relevant government policies and plans. Level 0: ICFMS not integrated meaningfully into urban development plans and policy; Level 1: ICFMS narrative woven through the draft urban development plan; Level 2: Action plan and toolkit for implementation of the ICFMS with EbA fully mainstreamed have been developed; Level 3: Budgets allocated to implement the ICFMS.

A full-time Monitoring and Gender Officer will be employed to conduct and coordinate the M&E of the project and ensure that gender targets are met. This officer will design a performance monitoring framework to track the project's progress towards achieving its targets, in collaboration with a specialist consultant that will be contracted for this purpose. This will be achieved by: i) measuring the indicators to evaluate the progress of the project; ii) reporting the project's performance to the NPSC and PMU; and iii) providing technical support to the PM. At key points (i.e. baseline, annual performance reports, mid-point and end of project) the project team will carry out evidence-gathering exercises to verify this progress. Additionally, the Monitoring and Gender Officer will be responsible for overseeing and monitoring the application of gender-disaggregated indicators⁶⁸. Project targets and results will be triangulated with baseline surveys that will be completed in the project's first year. Moreover, methodologies have been identified for assessing the effectiveness of the project's physical interventions for reducing flood impacts (see Annex 2, Section 12)

In addition to project monitoring and evaluation that will be undertaken by the project team, wetland and stream restoration activities in Laos will be monitored by community management committees that will be established in each city under Component 2. These committees will be trained on data collection, analysis, and reporting and will monitor the physical performance of EbA investments. During the Terminal Evaluation at the end of the project an evaluation consultant will validate a sample of the data collected through these monitoring tools.

The Project Management Unit will prepare and submit progress reports to the AE on a quarterly basis that will highlight progress towards meeting the project's outputs. Monitoring will also be undertaken by the AE through supervision visits and field missions to track implementation progress and challenges and strategically plan the way forward. Furthermore, annual financial and performance reports will be submitted to the AE as will be outlined in the Project Cooperation Agreement (Subsidiary Agreement). Details of the annual reporting arrangements are provided in Annex 2D: Project Timetable.

UNEP will be responsible for managing the Mid-Term Review (MTR) and the Terminal Evaluation (TE). The Task Manager will oversee the process of hiring an external consultant to carry out the MTR, which will provide an assessment of project performance at the project's mid-point. This will be a formative exercise and will include analysing whether the project is on track, what problems and challenges the project is encountering, and what corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. The Project Steering Committee will participate in the MTR and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented during the remainder of the project's operational life.

An independent Terminal Evaluation (TE) will take place at the end of project implementation. UNEP 's Evaluation Office (EO) will be responsible for undertaking the TE at the end of project implementation, which is a summative evaluation, and will liaise with the UNEP Task Manager throughout the process. An independent assessment of project performance against standard evaluation criteria (e.g. strategic relevance, effectiveness, efficiency, likelihood of impact and sustainability) will be made based on documentary evidence, stakeholder interviews and, in most cases, a field mission. Each evaluation criterion will be rated using a six-point rating scheme, and a weighted average will be determined to provide an overall performance rating for the project as a whole. Where there are any differences in ratings between the evaluation team and the Evaluation Office a final determination will be made by the Evaluation Office when the evaluation report is finalised.

The draft TE report will be sent to project stakeholders during a commenting process managed by the Evaluation Office. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. This evaluation report will be publicly disclosed and will be followed by a recommendation compliance process.

The costs for results monitoring and performance evaluation are included in the project budget.

E. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

E.1. Impact potential (max. 300 words)

E.1.1. Expected tons of carbon dioxide equivalent (t CO ₂ eq) to be reduced or avoided (Mitigation and cross-cutting)	Annual	N/A
	Lifetime	N/A
E.1.2. Expected total number of direct and indirect beneficiaries, disaggregated by gender (Adaptation and Cross-cutting)	Direct	~74,600 people ~50% women
	Indirect	825,000 people ~50% women
	<i>*For both, Specify the % of female against the total number.</i>	
E.1.3. Percentage of beneficiaries relative to total population	Direct	~9% of men and women in target cities
	Indirect	~100% of total population in target cities

E.1.4. It is estimated that the project will directly benefit ~74,600 people across Vientiane, Paksan, Savannakhet and Pakse. In particular, ~8,200 people in Paksan will directly benefit from wetland rehabilitation and sustainable wetland management, with a further 11,900 people in Pakse and 9,000 people in Savannakhet benefitting from the restoration and sustainable management of urban streams⁶⁹. These people living around the wetland and streams will benefit from an increased supply of ecosystem goods and services, including a reduction in flood impacts. In addition, a further 45,500 people across the four cities will benefit from improved knowledge about the sustainable use of wetlands and urban streams, resilient livelihood strategies, and household-level flood adaptation measures. In each of the four target cities, ~1000 people will benefit from using the areas of permeable paving at public institutions, which will be subject to less local flooding than regular paved areas. Indirect beneficiaries will include all the residents of the four target cities (~825,000 people), who will benefit from improved flood management in their cities through the ICFMs and enhanced policies.

The project will contribute to the achievement of the following Fund-level impacts stated in the GCF Performance Measurement Framework (PMF):

A1.0 — Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions. The wetland and stream restoration are expected to reduce losses of economic assets due to flooding. The change in economic losses can be tracked in the project only if flood events occur.

A4.0 — Improved resilience of ecosystems and ecosystem services. The rehabilitation of 1,500 ha of wetland and urban stream ecosystems will increase the climate resilience of the services these ecosystems provide to people, as well as that of the ecosystems themselves. The value of the ecosystem services generated or protected in response to climate change will be tracked in the project.

In addition to these direct benefits, it is expected that the project will indirectly contribute to Fund-level impact A3.0 by reducing flood damages to the built environment in the target cities.

Project Outcomes

The relevant GCF Fund-level outcomes — against which the contribution to climate-resilient sustainable development can be evaluated (as per the PMF) — are the following:

A7.0 Strengthened adaptive capacity and reduced exposure to climate risks

The proposed project will develop city-level integrated climate-resilient flood management strategies (ICFMS) and urban EbA guidelines to achieve flood reduction in each of four Laotian cities. Government departments and city administrations will have improved capacity to plan for, and adapt to, flooding through the ICFMS, as mainstreamed into existing policy instruments. In addition, the adaptive capacity of communities will be supported through implementing household-level flood adaptation strategies such as drainage maintenance.

E.2. Paradigm shift potential (max. 300 words)

The proposed project will catalyse a paradigm shift in how the Government of Laos approaches urban flood management, shifting the paradigm from a strong focus on hard infrastructure, end-of-pipe solutions, and siloed approaches towards integrated, climate-resilient flood management. This shift will be achieved through several complementary transformative effects, including: i) strengthening technical capacity of government for flood-resilient development and the use of urban EbA in the context of the 4% average annual urban growth rate; ii) embedding the ICFMS in existing planning and frameworks, thereby leveraging domestic financial resources for the maintenance and upscaling of the urban EbA approach; iii) demonstrating the multiple benefits of integrated flood management and urban EbA interventions for flood management including through quantification of the economic benefits; iv) establishing knowledge management practices and strengthening coordination mechanisms to enable the future adaptive management of urban areas to reduce flood impacts under climate change conditions; and v) identifying sustainable financing options for integrated flood management, including leveraging domestic financial resources for the maintenance and upscaling of the urban EbA approach.

The project will create and/or strengthen drivers to sustain and up-scale integrated flood management and urban EbA in the following areas: i) developing champions in the Government of Laos for EbA through improved knowledge and awareness and peer-learning mechanisms; ii) mainstreaming EbA into planning and budgeting instruments – inputs

into and reinforcement from the NAP process will be an added driver; and iii) empowering communities to engage with city-level planning and management processes, which has been shown to be successful in other projects⁷⁰.

Potential for scaling up and replication

The project will support extensive capacity development⁷¹ within national- and local-level government structures on the use of EbA as an effective approach to urban flood management in four cities. After project completion, city-level planners and decision-makers will be able to use the ICFMS to identify additional sites for the implementation of urban EbA interventions, while knowledge-exchange interventions will facilitate the replication of interventions within the four cities as well as in other cities. In Vientiane, for example, there are eleven other wetlands in the areas surrounding the city that may offer flood control functions and maintain river flows during the dry season, including Na Khay marsh, Nong Ping and Nong Tha. To improve flood management in the city, the conservation of these wetlands and streams needs to be included in the integrated flood master planning. This effect will be further enhanced through the development of recommendations for national-level policy reform⁷² based on the evaluation of ICFMS implemented through the project. Upscaling and replication of project interventions across Laos will also be achieved through the: i) development of national urban EbA guidelines; ii) creation of integrated flood management strategies; iii) engagement of national ministries through the NPSC to support the linkages between city- and national level; iv) engagement with the MPI at national level on applying integrated flood management in Special Economic Zones; and v) a national workshop for provincial governors. In addition to the policy level interventions, the project will conduct awareness-raising campaigns which will contribute to a behavioural change in Laos. By demonstrating the effectiveness of urban ecosystems to buffer against flood impacts, the project will enhance the desirability of EbA amongst local communities, thereby promoting an increased uptake of EbA solutions after project completion.

Potential for knowledge and learning

The proposed project's contribution to knowledge and learning in Laos will be achieved through three pathways. Firstly, the project will establish a national knowledge hub within the NUoL which will: i) collate and store information on EbA interventions relevant to the disciplines of civil engineering, water resource engineering, urban planning, water resource management, agriculture, ecology and governance; ii) disseminate information and provide technical assistance to relevant decision-makers in local and national government; iii) share best practices on EbA with decision-makers, planners, contractors and international academics.; iv) facilitate peer-to-peer learning through the exchange visit to a city with successful urban EbA, thereby also contributing to the development of a community of practice. Secondly, updating university curricula to include urban EbA will ensure that students at the NuOL are taught urban EbA principles and that technical capacity for EbA is developed in the long-term. Furthermore, lecturers and researchers who participate in the planning, design and implementation of EbA interventions will learn practical skills which they can subsequently teach their students. This approach is already used within the NuOL and will ensure that the EbA content in the new curricula is regularly updated with lessons learned and best practices. Finally, the economic valuation of urban ecosystem services will contribute to the knowledge base underpinning urban planning as well as raising awareness of ecosystem dynamics and services and their role in urban adaptation strategies. The proposed project will raise awareness on, provide credible evidence for and promote the benefits of urban EbA for reducing flood risks.

Contribution to the creation of an enabling environment

The project will contribute to the enabling environment through improved knowledge, capacities and development of planning tools. By presenting the economic, social and environmental benefits of EbA measures as well as the cost-effectiveness of such measures compared with hard infrastructural solutions, the proposed project will lead to a behavioural shift among urban residents, government decision-makers and the private sector as they progressively favour EbA interventions over conventional hard infrastructure for flood management⁷³. In addition to increasing knowledge on urban EbA, the proposed project will build the technical capacity for the planning, design and implementation of such interventions in Laos. City-level ICFMS will provide the strategic framework for the four target cities to practise integrated flood management and be embedded in existing policies and planning frameworks. The process of formulating the ICFMS will build capacity, raise awareness and increase ownership of urban EbA. In addition, the Flood Risk Management Committees that will be established to coordinate this process during and beyond the project period will create an enabling environment for integrated, climate-resilient flood management and urban EbA in the four target cities. The ICFMS will be supported by urban EbA guidelines that will enable city planners, decision-makers and contractors to plan and implement EbA interventions to reduce flood impacts. These strategies will address the upstream and downstream factors contributing to flooding in a cross-sectoral manner.

Contribution to regulatory framework and policies

Recommendations will be made for policy reform at national and provincial level. This will promote the uptake of integrated climate-resilient flood management and the use of EbA in all Laotian cities. Where recommendations for

policy reforms are taken up during the project period, the project's activities will align with the revised policies to allow the efficacy of these policy revisions to be tracked during the project period.

E.3. Sustainable development (max. 300 words)

Through the proposed interventions, the project will contribute to 6 out of 17 UN Sustainable Development Goals (SDGs), namely: SDG 3 — Good Health and Well-being; SDG 5 — Gender Equality; SDG 10 — Reduced Inequalities; SDG 11 — Sustainable Cities and Communities; SDG 13 — Climate Action; and SDG 15 — Life on Land. Furthermore, the proposed interventions will achieve numerous environmental, social and economic co-benefits. These are described below.

Economic co-benefits

Below are economic values for ecosystem services supported in this project. Although the studies cited below are based in Laos, they are based on different sites and ecosystems such as upper catchment areas, forests and rural areas. The values developed are site-specific. The wetland and streams covered in the project will likely generate different values due to differences in site biophysical characteristics and use of services by communities around them. The valuation of the specific ecosystem services in project sites will be done through Activity 1.2.1. with reliably collected primary data through site-specific ground surveys and spatial analysis. Further information on the economic benefits of urban EbA and integrated flood management is provided in Annex 2: Feasibility Study, Section 9 and in Annex 10: Economic analysis.

Table 1. Examples Studies Valuing Ecosystem Services in Laos

Year	Author	Ecosystem services valued	Values	Methods employed
2005	Rosales et al.	Watershed protection benefits Downstream fisheries, irrigation and micro-hydropower, and flood control benefits	US\$0.85 million a year or US\$ 3 /ha US\$26.60 million or US\$92.3 per hectare	Market prices, participatory environmental valuation, willingness to pay, production, and other approaches
2004	Gerrard	Flood protection and wastewater treatment services	US\$2.87 million a year or US\$1,436/ha	Market prices, examining damages avoided during floods, and replacement costs of wastewater purification services, and production
2010	ADB	Watershed protection Water quality regulation Soil erosion control	US\$681/ha/year US\$718ha/year US\$380ha/year	
2015	USAID	Wastewater treatment Species consumed	\$1.7 million \$2.5 million / year	Replacement cost, market prices, market substitutes

Environmental co-benefits

The proposed project will use an ecosystem-based approach to urban flood management, focusing on the rehabilitation of the Nong Peung wetland in Paksan and urban stream ecosystems in Savannakhet and Pakse to maximise the provision of ecosystem services. This approach will catalyse several environmental co-benefits, as listed below.

- **Biodiversity and Conservation** — The rehabilitation of wetland and urban stream ecosystems will improve biodiversity in urban and peri-urban areas. This will include providing suitable habitat for a range of aquatic and terrestrial animals which are of both environmental and social importance, such as fish and migratory birds. The development of wetland and stream management plans and models (Activities 2.1.1 and 2.2.2) will ensure that biodiversity is protected and maintained over the long term. In addition, restoring habitats (Activities 2.1.2 and 2.2.1) will improve the ecosystem services provided to local communities — such as the use of streams for fishing resources — subsequently contributing to improved livelihoods,
- **Water quantity management** — The restoration of vegetation in wetland and urban stream ecosystems will reduce runoff and increase groundwater infiltration during intense rainfall events. This will not only reduce flood impacts

but will also increase groundwater availability during dry periods and reduce the amount of water discharged into urban waterways.

- **Water quality management** — Restored wetland ecosystems will act as natural filters, treating urban effluent through processes of retention, absorption and chemical re-composition. Furthermore, urban ecosystems will capture sediment, thereby improving the quality of water entering urban waterways and reducing siltation. Water quality is decreased by solid waste deposition into streams. The creation of a buffer zone (Activity 2.2.1), combined with the development of management models for drainage systems (Activity 2.2.2), will contribute to improved solid waste management in Laos' urban areas over the long term.
- **Erosion reduction** — Restoring streams will decrease the rate of riverbank erosion. This will decrease the sediment load in rivers, thereby improving water quality and reducing: i) downstream sedimentation; ii) downstream flood risks as a result of sedimentation; and iii) the maintenance costs associated with rehabilitating riverbanks.
- **Natural resource availability** — Improved aquatic biodiversity and ecosystem health will increase fish yields for urban residents supplementing their food and livelihoods with fishing. Fish is an important source of protein in the country. Communities, even in urban and peri-urban areas, are dependent on ecosystem services for medicines, herbs, and wild food such as snails from wetlands.

Social co-benefits

Several social co-benefits will be derived from project interventions, increasing the liveability of urban areas in Laos⁷⁴. These benefits are described below.

- **Health benefits** — Several health risks are connected to people's exposure to urban waterways and flood waters, including the transmission of water- and vector-borne diseases that result from contaminated water resources. EbA interventions will reduce these risks to urban residents by improving water quality as well as reducing the extent of flooding.
- **Cultural values** — Increased habitat area will strengthen traditional livelihoods dependent on natural resources⁷⁵. Livelihoods that will particularly benefit from EbA interventions include traditional smallholder rice farming, fishing and livestock grazing. Reductions in flood impacts will also safeguard traditional agricultural practices in flood-prone areas⁷⁶.
- **Social cohesion** — Coordinated land use within communities increases social cohesion and improves the management of land and natural resources. Participatory land-use planning with community representatives and other stakeholders will be undertaken during the development of wetland and stream management plans (Activities 2.1.1 and 2.2.2). Such planning will leverage communities' existing knowledge and practices, support village governance and encourage community involvement in monitoring and management of land use activities.
- **Recreational value** — Green spaces, such as wetlands and urban streams, are greatly valued in Laotian cities. The restoration of urban streams in particular will increase the recreational amenity value to urban residents in the surrounding area, as well as increasing the provision of ecosystem goods such as non-timber forest products (NTFPs). Increased use of recreational spaces has also been linked to positive health impacts by reducing risks of chronic conditions such as heart disease, high blood pressure, strokes, Type II diabetes, arthritis, and certain types of cancer⁷⁷.
- **Job creation** — wetland and urban stream rehabilitation work and the maintenance of urban EbA interventions in general will create sustainable jobs for local residents.

In addition to the direct social benefits mentioned above, promoting the establishment of urban green spaces in future development has the potential to catalyse positive social change. Such spaces have been shown to improve psychological well-being and social cohesion.

Gender-sensitive development impact

Women are particularly vulnerable to flood impacts, considering their role as primary caregivers. In response to this vulnerability, proposed project activities will be undertaken in a gender-sensitive manner and will directly contribute to alleviating existing gender inequalities⁷⁸. This will be achieved in part through two primary pathways, described below.

- **Inequalities in employment** — Women have been identified as being less likely to secure formal employment than men. For this reason, contractors undertaking project design, construction and maintenance activities will be required to demonstrate compliance with the proposed project's Gender Action Plan.
- **Increased climate awareness** — The awareness-raising campaign will include the National Women's Union as a primary partner. In this way, GCF funds will be used to raise women's awareness of climate change impacts and flooding. The campaign will also recommend a diversification of women's livelihoods⁷⁹ as they are frequently dependent on rice agriculture.

E.4. Needs of recipient (max. 300 words)

Laotians are particularly vulnerable to the impacts of climate change⁸⁰. The most frequently-occurring climate-related hazards in the country are floods which — together with storms — adversely impact ~200,000 people and cause ~40 deaths each year. In 2018, floods affected 11 out of Laos' 18 provinces, caused more than US\$372 million in damages and resulted in the destruction of 1,620 houses⁸¹. Floods also have impacts other than direct damages. For example, some communities in the city of Pakse are inundated for up to two months every year with their road access cut off, which makes it difficult for children to go to school and limits access to markets and employment opportunities⁸². Climate change is expected to considerably increase the frequency, intensity and extent of flooding in Laos. The damages to infrastructure, property, agriculture, health and personal safety⁸³ that result from climate change-induced flooding will therefore be even greater in the future.

Because of their frequent occurrence, floods are not insurable in Laos and municipalities and property owners bear the costs of damages. In addition, floods negatively impact the health of urban residents by: i) contaminating domestic water sources with non-potable water, thereby increasing the incidence of water-borne diseases; and ii) creating stagnant water that increases the incidence of vector-borne diseases like malaria and dengue.

In response to the adverse impacts of flooding on the country's water resources, Laos' NAPA⁸⁴ identifies water resource management as an urgent priority for climate change adaption. Included in the NAPA are the needs for: i) reducing the impacts of floods; ii) raising awareness on water management; and iii) strengthening institutional capacity and human resources. However, several gaps exist that prevent these adaptation needs from being addressed sufficiently. These gaps were identified during the design of the proposed project by the preparation teams and include: i) gaps in available data, modelling and assessments; and ii) limited institutional capacity to generate and update climate risk data. The proposed project will address these adaptation gaps by developing institutional capacity to generate, update and use climate information for sustainable urban development and planning. This will be done through: i) supporting integrated processes such as the NAP; and ii) building national capacity to conduct urban EbA valuations.

Financial, economic, social and institutional needs

Laos is among the poorest countries in the world in terms of GDP per capita (ranked 116th out of 192 countries⁸⁵) and scores low in terms of the Human Development Index (138th out of 188 countries⁸⁶). A substantial proportion of government expenditure is focused on socio-economic development activities to address widespread poverty. Furthermore, the Laotian economy is extremely vulnerable to climate change, with annual costs of US\$5.78 billion predicted by 2030^{87,88}. These factors, combined with the country's large external public debt⁸⁹ and high poverty rate, constrain the GoL's ability to fund investments into climate resilience through domestic financing.

Implementing integrated, climate-resilient flood management requires specific technical competencies. At present, the GoL does not have sufficient capacity to adopt an integrated flood management approach. Moreover, there is little or no knowledge about the flood reduction benefits of EbA solutions amongst government and local level stakeholders which has led to an undervaluation of these benefits. The proposed project will strengthen technical capacity of national and local government institutions and other stakeholders for designing, planning, coordinating and implementing adaptation interventions to build the climate resilience of Laotian cities. This capacity building will focus on the importance of EbA as a cost-effective and complementary means of adapting to climate-induced flooding. GCF resources will be used to train government officials on planning for integrated, climate-resilient flood management to address climate-induced risks in the long-term.

E.5. Country ownership (max. 500 words)

Alignment with national priorities.

Country ownership has been ensured through the inclusion of national bodies and decision-making processes in all aspects of project design and implementation⁹⁰. The project was also designed to be well-aligned with national mid- and long-term priorities and ongoing initiatives, including:

- priority activities and approaches promoted by relevant national strategies and action plans on climate change such as the NAPA, NAP, NCCS, Draft Law on Disaster Risk Management and Climate Change, and the Strategic Plan on Disaster Risk Management in Lao PDR until 2020⁹¹;
- the NCCS objective of increasing stakeholder buy-in through strengthening the awareness and understanding of the impacts of climate change on future development; and
- the NAP project proposed to the GEF by the country and UNEP⁹².

Provision has also been made for emerging national priorities to be considered throughout the project implementation period. In addition to supporting the climate change adaptation priorities of Laos, the proposed project will align with the global priorities outlined by the SDGs, as well as ongoing policy reforms towards green growth in Laos outlined in the National Socio-Economic Development Plan (NSED).

Through engagement with the NSCCC, the National Climate Change Office and related stakeholders⁹³, the project will provide information and guidance to promote the integration of EbA into national adaptation plans. In so doing, project activities will contribute towards the adaptation priorities noted in the INDC.

Experience and track record of UN Environment

As the Accredited Entity (AE), UN Environment (UNEP) will provide the necessary oversight and support during the implementation of project activities. In particular, this support will focus on the effective management of the multiple socio-economic and environmental factors affecting ecosystems during project implementation. UNEP's comparative advantage as the AE lies in its ability to provide robust scientific/technical advice regarding climate change adaptation and sustainable national planning as well as development processes. It has a broad global portfolio of climate change projects funded through *inter alia* the Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF), Adaptation Fund (AF) and bilateral arrangements with organisations such as the European Commission. Through these projects, UNEP has supported selected national governments and local communities to adapt to climate change. Such projects comply with the mandate from the UNEP Governing Council, as detailed in the Bali Strategic Plan for Technology Support and Capacity-building⁹⁴. The UNEP knowledge-base is derived from completed and ongoing projects that have: i) developed methods and tools for decision-making; ii) prioritised, designed and implemented adaptation interventions; iii) enhanced climate resilience by restoring vulnerable ecosystems that underpin community livelihoods; and iv) monitored the socio-economic and environmental benefits of adaptation interventions. UNEP will draw upon these previous experiences and lessons learned during the implementation of the proposed project.

In addition to serving as accredited entity, UNEP will act as executing entity for Activity 1.2.1. on ecosystem valuation as referenced in Section B.3⁹⁵. UNEP has a proven track record in environmental economics and demonstrating the technical capacity to deliver on the ecosystem evaluation.

Experience and track record of the Ministry of Natural Resources and Environment (MONRE)

The lead Executing Entity (EE) will be the State of Lao PDR, acting through its MONRE. In this capacity, MONRE will be responsible for the execution of the proposed project activities in each of the four target cities through the regional representatives of the Provincial Office of Natural Resources and Environment (PONRE). The role of the EE has been outlined and the various implementation arrangements described under Section B.3.

MONRE was created in 2011 by merging the mandates of the Water Resources and Environment Administration and the National Land Management Authority. Other competencies covering geology, mining and forest resource management were also integrated into MONRE at the same time. Within MONRE, the Department of Disaster Management and Climate Change (DDMCC)⁹⁶ will be involved in the execution of the project, in close coordination with the departments of Water Resources, Land Administration, Meteorology and Hydrology, as well as the Executive Office of the Environment Protection Fund (EPF). A formal financial management and procurement capacity assessment will be performed by UNEP on the DDMCC upon approval of the project by the GCF Board, but prior to project implementation.

The suitability of MONRE as an executing entity is demonstrated by its track record in executing several past or ongoing projects under the Global Environmental Facility. This experience is summarised below.

- Climate Adaptation in Wetland Areas (through FAO; US\$ 4.7 million)
- Sustainable Forest and Land Management in the Dry Dipterocarp Forest Ecosystems of Southern Lao PDR (UNDP; US\$ 10.9 million)
- Strengthening Agro-climatic Monitoring and Information Systems to Improve Adaptation to Climate Change and Food Security in Lao PDR (FAO; US\$ 5.5 million)
- Strengthening Protection and Management Effectiveness for Wildlife and Protected Areas (World Bank; US\$ 6.8 million)
- Effective Governance for small-scale rural infrastructure and disaster preparedness in a changing climate (UNDP; US\$ 4.7 million)

Engagement with NDA, civil society organizations and other relevant stakeholders

The proposed project has been developed in consultation with civil society, multiple representatives of the GoL, NGOs, academics, and international development agencies⁹⁷. Importantly, the stakeholder engagement process has included close coordination with the National Designated Authority, which has endorsed this proposal.

Extensive consultations were held with various project stakeholders throughout the design process. An initial scoping mission in September 2015 identified target cities and validated the overall project objective⁹⁸. Following this, four further missions to Laos were undertaken to engage with stakeholders and collect information. Hydrological experts and international adaptation consultants visited six cities⁹⁹ between August 2016 and December 2017 to: i) downscale climate change scenarios for each city; ii) assess flood vulnerability; and iii) identify potential sites and interventions. During these missions, meetings and workshops were held with various national and local stakeholders in all six cities. A final mission was undertaken in April 2019 to: i) conduct further community consultations; ii) assess flood damages in communities; iii) consult government stakeholders; iv) determine ways to promote sustainable drainage systems in Special Economic Zones; and v) gather data and further assess the Nong Peung wetland and streams¹⁰⁰. As a result of these extensive consultations, the proposed project is well-aligned with the needs and priorities of the recipients and is supported by the GoL.

E.6. Efficiency and effectiveness

E.6.1. Estimated cost per t CO ₂ eq, defined as total investment cost / expected lifetime emission reductions (Mitigation and Cross-cutting)	(a) Total project financing	US\$ _____
	(b) Requested GCF amount	US\$ _____
	(c) Expected lifetime emission reductions	_____ tCO ₂ eq
	(d) Estimated cost per tCO₂eq (d = a / c)	US\$ _____ / tCO ₂ eq
	(e) Estimated GCF cost per tCO₂eq removed (e = b / c)	US\$ _____ / tCO ₂ eq
E.6.2. Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (Mitigation and Cross-cutting)	(f) Total finance leveraged	US\$ _____
	(g) Public source finance leveraged	US\$ _____
	(h) Private source finance leveraged	US\$ _____
	(i) Total Leverage ratio (i = f / b)	_____
	(j) Public source leverage ratio (j = g / b)	_____
	(k) Private source leverage ratio (k = h / b)	_____

E.6.3. (max. 500 words) Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objective(s), including addressing existing bottlenecks and/or barriers; providing the minimum concessionality; and without crowding out private and other public investment.

Financial structure

GCF financing will overcome the existing barrier of insufficient funding for flood management solutions in Laotian cities. This will be achieved in the first place by leveraging co-financing of US\$1.5 million from the GoL. Moreover, the project will catalyse further public investments in urban EbA by creating an enabling environment and demonstrating the benefits of urban EbA across Laos. GCF financing will therefore promote both public and private investments in urban EbA to meet Laos' climate change adaptation needs.

Economic efficiency

The project interventions are designed to be economically efficient (see Annex 2: Feasibility Study, Section 9 for a summary of cost effectiveness and Annex 10 for economic analysis).

The avoided flood losses due to the implementation of a range of flood mitigation measures¹⁰¹ was estimated over a 20-year period in Vientiane, Paksan, Savannakhet and Pakse. The losses included in the analysis were limited to direct loss of income from business closure, agriculture, household possessions and infrastructure. The methodology applied in the analysis is adopted from a World Bank report on the Lao PDR Southeast Asia Disaster Risk Management Project. Over 20 years, the avoided flood losses have been estimated to be US\$24.45 million in Vientiane, US\$27.89 million in Paksan, US\$46.24 million in Savannakhet and US\$12.26 million in Pakse.

Economic efficiency will be achieved by: i) using proven urban EbA solutions that are cost-effective; ii) building the capacity of the GoL and other stakeholders to plan ICFMS and EbA in a context where cities are growing by 4%; and iii) increasing efficiency through ongoing learning and adaptive management. The proposed project budgets for a five-year period and will impact ~74,600 direct and ~825,000 indirect beneficiaries. In general, the type of EbA intervention

proposed for this project have been shown to have net positive economic impacts (Annex K) because of their low cost and high potential for reducing expected economic losses caused by flooding. The social and ecological co-benefits generated by EbA interventions also increase the economic efficiency of project activities compared to hard engineering measures. This will support and promote sustainable development in the face of climate change for urban areas in Laos. The project will implement Activity 1.2.1 on urban EbA valuation to assess the main adaptation and co-benefits from the project.

Cost-effectiveness

Urban EbA has proven to be a cost-effective measure for reducing flood impacts internationally. The economic analysis (Annex 10) identifies a number of analogous investments in developing countries. These investments have all been shown to have net positive benefits through their flood reduction benefits alone. Likewise, the EbA interventions proposed in the project activities are amongst the most cost-effective solutions investigated by the economic analysis. This analysis shows that urban EbA interventions for flood reduction are expected to be economically feasible in Laos.

Cost-effectiveness will further be insured through sound project design. Wherever possible, cost-efficient methods for data collection will be utilised, including: i) the use of innovative data acquisition methods such as drone mapping; and ii) involving students in conducting field surveys and training community members on how to hold effective consultations. The involvement of local communities and academic institutions (such as NuOL) in monitoring the performance of project interventions will also contribute to the cost-effectiveness of the project design.

Coordination

To avoid duplication of efforts and maximise resources (thereby increasing efficiency), existing provincial administrations as well as the city-level project steering committee (CPSC) will be used to coordinate project activities during implementation. (see Section B.3 on institutional arrangements for more details). In addition to those technical cooperation mechanisms, complementarity and coherence will be ensured by the DCC. For example, the DCC is the focal point of several activities such as: i) the UNEP-led project “Building climate resilience of urban systems through Ecosystem-based Adaptation (EbA) in the Asia-Pacific region; and ii) the FAO project “Climate Adaptation in Wetland Areas (CAWA) in Lao PDR” both financed through the Global Environment Facility. The GoL further demonstrated its commitment to seeking complementarity and coherence with other financiers during the project preparation phase by submitting to the CTCN a request to prepare the necessary climate change vulnerability analysis.

Best practices and lessons learned

The integration of best practices and lessons learned from past initiatives with a similar focus is expected to increase project effectiveness. In particular, lessons learned from past and ongoing projects (such as the CAWA project) that use green infrastructure as oppose to grey (conventional) infrastructure in Laos and the Greater Mekong Subregion have been integrated into the project design¹⁰². The CAWA project¹⁰³, for example, uses bioengineering (revegetation and tree planting) to stabilise erosion-prone riverbanks, reduce sedimentation and improve infiltration rates¹⁰⁴. Such approaches have been proven to be more efficient and economically beneficial than hard infrastructure solutions. The reason for this is two-fold: firstly, green infrastructure improves air and water quality, reduces flooding, decreases strain on local drainage infrastructure and filters pollutants; and secondly: these approaches promote nature-based ecotourism that subsequently leverages private sector investment¹⁰⁵.

In addition to integrating lessons learned on the benefits of green infrastructure, best practices for knowledge sharing and coordination were used to inform the design of interventions to be implemented under Component 1. For instance, the Project Manager of the “Effective governance for small-scale rural infrastructure and disaster preparedness” project¹⁰⁶ highlighted the difficulty in finding adequate expertise to implement the identified EbA measures. As a result, the integration of a new curriculum, the strengthening of EbA capacities amongst national engineers, and the development of a knowledge hub have all been integrated into the design of the proposed project.

F. ANNEXES

F.1. Mandatory annexes

- ☒ Annex 1 NDA No-objection Letter(s) ([Template](#))
- ☒ Annex 2a Example project level logframe ([Example](#))
- ☒ Annex 2b Example timetable ([Example](#))
- ☒ Annex 3 Budget plan that provides breakdown by type of expense ([Template in excel sheet](#))
- ☒ Annex 4 Gender assessment and action plan ([Template](#))
- ☒ Annex 5 Co-financing commitment letter
- ☒ Annex 6a Term sheet
- ☒ Annex 6b Evidence of internal approval
- ☒ Annex 7 Risk assessment and management ([Template](#))
- ☒ Annex 8 Procurement plan model ([Template](#))
- ☒ Annex 9a Legal Due Diligence (regulation, taxation and insurance) ([Template](#))
- ☐ Annex 9b Legal Opinion/Certificate of Internal Approvals ([Template](#))

F.2. Other annexes to be submitted when applicable/requested

- ☒ Annex 2 Feasibility Study
- ☒ Annex 10 Economic and/or financial analysis
(mandatory for private-sector proposals)
- ☐ Annex 11 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project (NA)
- ☒ Annex 12 Environmental and Social Action Plan (ESAP) ([Template](#))
- ☒ Annex 13 Vulnerability Assessment
- ☒ Annex 14 Fee Breakdown
- ☒ Annex 15 Figures, Tables, and Endnotes

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

¹ For further information, see Annex 2: Feasibility Study, Section 4. The CAWA project focuses on ecosystem-based adaptation to support the capacity of wetlands to buffer livelihoods against the impacts of climate change. Although the project focus is on rural resilience, many approaches on development of hydrological and vulnerability assessments and restoration approaches are applicable to the wetland and streams for the current project.

² This includes existing management practices such as no-take areas for fishing during spawning season and local farming practices that are compatible with ecosystem protection (minimal use of pesticides, no use of weed killers, etc.). These will be relevant to the development of management plans.

³ which are located predominantly on the Mekong River, on the border of Thailand.

⁴ Flooding leads to reduced access to clean water and sanitation, which increases the risk of people being affected by waterborne diseases such as shigella, cholera, hepatitis A and typhoid fever. For example, in 2015 there were 1,096 reported cases of skin infections and 36 reported cases of diarrhoea as a result of flooding in Vientiane alone (World Health Organisation. Lao People's Democratic Republic. 2015).

⁵ Based on modelled flood impacts. World Bank, 2018. As cited in Post-Disaster Needs Assessment: 2018 Floods, Lao PDR. Available at: <https://www.gfdrr.org/en/publication/post-disaster-needs-assessment-2018-floods-lao-pdr>. Accessed on: 30 April 2019

⁶ Equivalent to 2.1% of the country's projected 2018 GDP and 10.2% of the government's total budget for 2018. Recovery needs were estimated at US\$520 million, with the highest impacts identified in the transport, agriculture and waterways sectors. The collapse of a dam wall coupled with heavy rainfall in Attapeu province caused ~10% of the total damages countrywide (Post-Disaster Needs Assessment: 2018 Floods, Lao PDR. Available at: <https://www.gfdrr.org/en/publication/post-disaster-needs-assessment-2018-floods-lao-pdr>. Accessed on: 30 April 2019).