



**GREEN
CLIMATE
FUND**

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22 October 2019

Consideration of funding proposals - Addendum XIII

Funding proposal package for SAP009

Summary

This addendum contains the following seven parts:

- a) A funding proposal titled “Building resilience of urban populations with ecosystem-based solutions in Lao PDR”;
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat’s assessment;
- e) Independent Technical Advisory Panel’s assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel’s assessment; and
- g) Gender documentation.

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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

Accredited Entity: United Nations Environment Programme (UNEP)

Date of first submission: [YYYY/MM/DD]

Date of current submission/
version number: [YYYY/MM/DD] [V.000]

If available, indicate GCF code: *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.*



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Contents

Section A **PROJECT / PROGRAMME SUMMARY**

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

Section B **PROJECT / PROGRAMME DETAILS**

This section focuses on describing the context of the project/programme, providing details of the project/programme including components, outputs and activities, and implementation arrangements.

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](#).

Please submit the completed form to:

fundingproposal@gcfund.org

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)	<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> Mitigation: Reduced emissions from: <input type="checkbox"/> Energy access and power generation: <u>Enter number</u> % <input type="checkbox"/> Low emission transport: <u>Enter number</u> % <input type="checkbox"/> Buildings, cities and industries and appliances: <u>Enter number</u> % <input type="checkbox"/> Forestry and land use: <u>Enter number</u> % Adaptation: Increased resilience of: <input checked="" type="checkbox"/> Most vulnerable people and communities: <u>60</u> % <input type="checkbox"/> Health and well-being, and food and water security: <u>Enter number</u> % <input type="checkbox"/> Infrastructure and built environment: <u>Enter number</u> % <input checked="" type="checkbox"/> Ecosystem and ecosystem services: <u>40</u> %				
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).

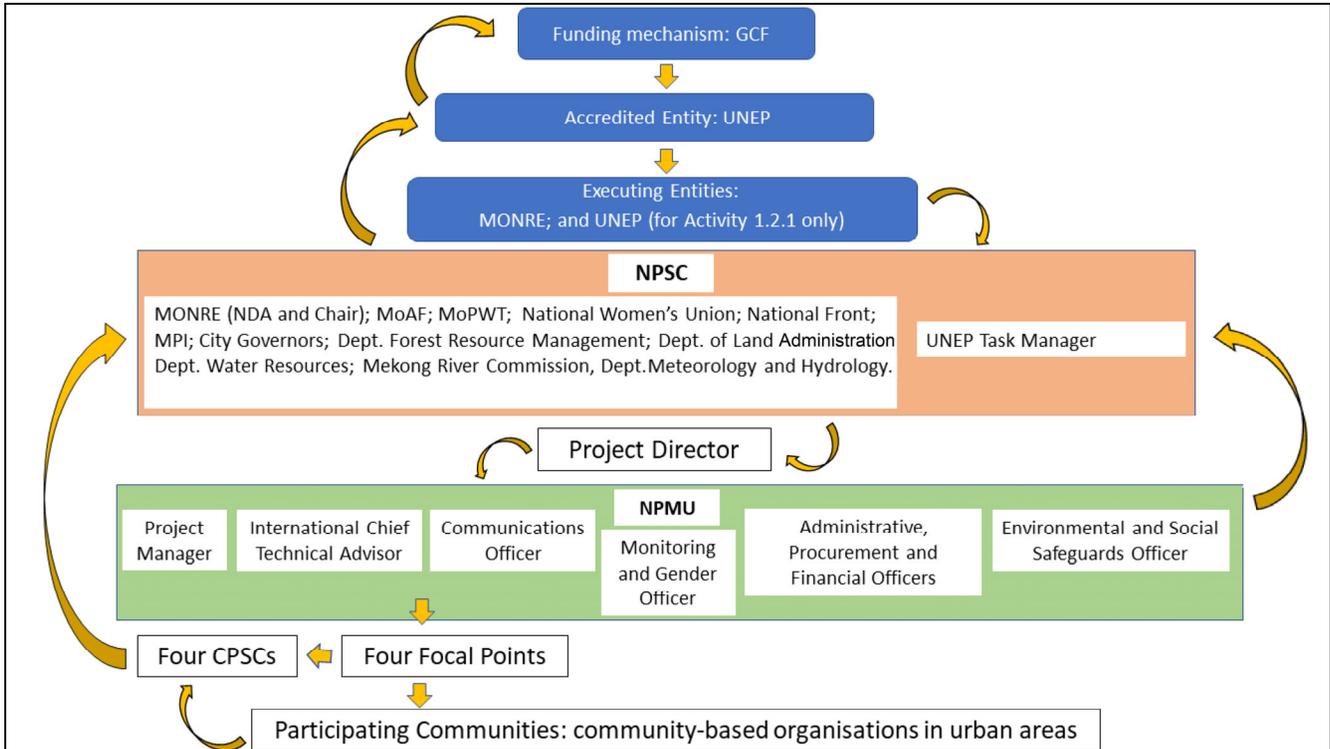


Figure 1. Project management structure.

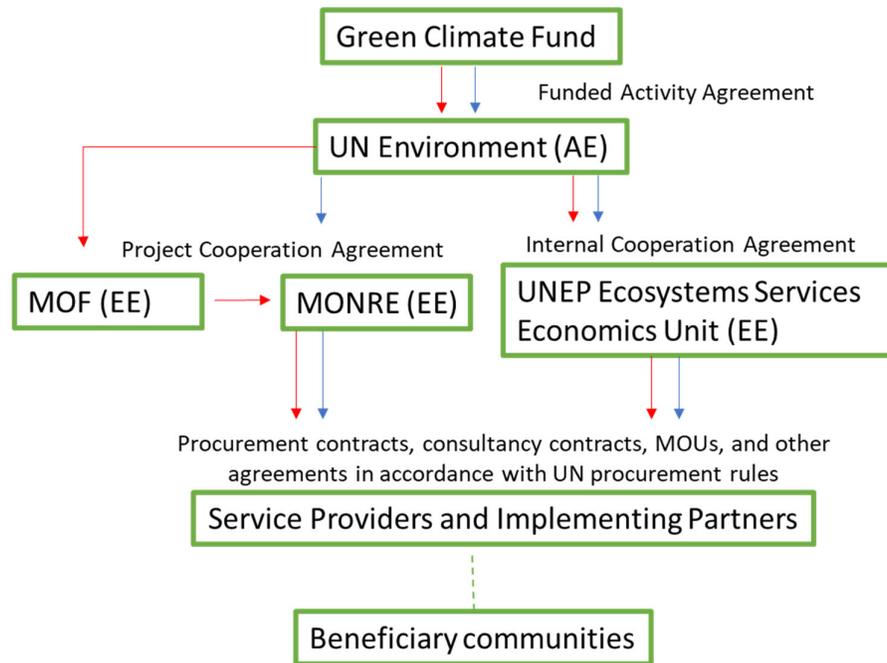


Figure 2. Flow of funds and contractual arrangements for project implementation. The red arrows indicate the flow of funds while the blue lines show the contractual arrangements, including the types of contracts, between the relevant parties.

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	Seniority
MONRE		In kind	1.5	million USD (\$)	Enter years	Enter%	Options
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%	Options
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%	Options
Click here to enter text.		Options	Enter amount	Options	Enter years	Enter%	Options
(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 Click here to enter text.	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
	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
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C.3.2. Technology development	Amount: 1,092,560 USD
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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

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

D.3. Outcomes measured by GCF indicators

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
<p>A7.0 Strengthened adaptive capacity and reduced exposure to climate risks</p>	<p>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</p>	<p>Key informant interviews</p> <p>Policy uptake scorecard</p> <p>Project reports</p> <p>Interviews with PMU</p>	<p>No incorporation of ICFMS in government policies and plans.</p>	<p>Level 0</p>	<p>Government departments have incorporated ICFMS into their policies and plans at Level 2 of policy uptake scorecard¹;</p>	

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 adaptation. 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 (NSEDP).

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).

⁷ Village-level consultations were conducted in project areas from March 28 – April 6. The report is included in Annex 12. Environmental and Social Action Plan.

⁸ MONRE, 2013. Lao PDR Second National Communication to the UNFCCC

⁹ The climate change models used in the development of this Funding Proposal are discussed further in the paragraphs below and in Annex 2: Feasibility Study, Section 2.

¹⁰ Extreme rainfall events that cause urban flooding are expected to become as much as five times more intense. Given the magnitude of this plausible scenario, a precautionary approach is advisable whereby major investments in adaptation are made now to avert such climate change-induced damages in the future.

¹¹ This is partly because of the impervious nature of many urban and peri-urban surfaces (e.g. roads, roofs of buildings, pavements and parking lots). But it is largely because of the intensity of the rainfall in many parts of Laos. During intense rainstorms, rainwater accumulates rapidly in streets, agricultural fields, and inundates infrastructure, often reaching up to the second storeys of houses and buildings over vast areas within a particular city. It then often takes several weeks for the water to subside so that repairs can be made to infrastructure and economic activity in a particular urban area can start up again. The hidden costs of such floods are thus considerable.

¹² Pluvial flooding occurs when intense rainfall events exceed the infiltration capacity of the local substrate, resulting in localised intense runoff of rainfall. Such flooding is typically highly localised and is likely to occur frequently and as a result of a single rainfall event. For further details on types of floods in Laotian cities, see Section 2 of Annex 2: Feasibility Study.

¹³ The impacts of climate change in the target cities were determined by a UNEP-DHI study that was commissioned specifically for the proposed project and conducted through CTCN. This study is summarised in Annex 2: Feasibility Study and provided in full as Annex 13 i.e. the events that currently cause flooding in urban and peri-urban areas.

¹⁵ The annual urban growth rate is ~4% and the urban population of Laos is expected to more than double between 2010 and 2030.

¹⁶ Including limited coordination, strategic spatial planning or investment in infrastructure, as well as insufficient consideration by government urban planners of the effects of climate change on urban areas.

¹⁷ in the absence of urban planning frameworks that recognise the value of these areas and ensure that they are protected from inappropriate development.

¹⁸ Ecosystem-based Adaptation (EbA) is broadly defined as the sustainable use of biodiversity and ecosystem services to help people adapt and to strengthen societal resilience against the adverse effects of climate change. In the context of the proposed project, urban EbA refers to the use of ecosystems in urban areas in Laos to reduce climate change-induced flooding and to mitigate the impacts of flooding.

¹⁹ Details of policies are provided in Section E.5 and in Annex 2: Feasibility Study, Section 3.5.

²⁰ In general, cities and towns in Laos have poor drainage networks that contributes to frequent flooding after rainstorms. Drainage systems are typically silted with soil from unpaved roads and are polluted from poor sanitation services. ADB. 2012. Urban Development Sector Assessment, Strategy, and Roadmap.

²¹ For further details, the Theory of Change is included in Annex 2. Feasibility Study.

²² Early warning systems serve an important role in integrated flood risk management systems. This is being developed in the country through institutions such as the National Disaster Management Office and the Department of Meteorology and Hydrology. Development partners support these initiatives through the World Bank Integrated Water Resources Management Project Phase I where hydrological and meteorological monitoring systems are supported and the Lao PDR Southeast Asia Disaster Risk Management Project which supports hydrometeorological services and response in Muang Xay. While critically important, direct interventions in the development of flood early warning systems is outside the project scope. The project, through the ICFMS, will coordinate with disaster risk management institutions.

²³ Hey, D.L. and Philippi, N.S., 1995. Flood reduction through wetland restoration: the Upper Mississippi River Basin as a case history. *Restoration Ecology*, 3(1), pp.4-17.

²⁴ Bernhardt, E.S. and Palmer, M.A., 2007. Restoring streams in an urbanizing world. *Freshwater Biology*, 52(4), pp.738-751.

²⁵ The barriers are described in further detail in Annex 2: Feasibility Study, Section 6.

²⁶ 'End-of-pipe' suggests that you solve the problem downstream in the catchment, rather than preventing it from becoming a problem by using integrated, distributed solutions.

²⁷ The extensive site selection process considered vulnerability of target communities to floods, through a vulnerability assessment process and stakeholder consultations.

²⁸ including land use planning and flood risk planning

²⁹ Through the Socio-Economic Development Plans of the Ministry of Planning and Investment, and building on lessons learned from the GIZ-funded project "Land management and decentralised planning I & II"

³⁰ Options for the knowledge exchange trip include Bangkok, Manila, and Guwahati, India. Considerations for selecting the city will include similarity of institutional contexts, relevance of their flood management strategies and urban EbA interventions to the Laotian setting, and potential for sustaining linkages across institutions.

³¹ The project design adopts similar approaches as the Mekong Integrated Water Resources Management Project (M-IWRMP), which is a transboundary cooperation for river basin management between Laos and Thailand. That project has had successful outcomes in peer to peer learning.

³² Such as the Asia Pacific Climate Change Adaptation Forum, ASEAN working group sessions, and other appropriate venues.

³³ Approaches in Mekong countries, including Lao PDR, are outlined in ADB. 2015. Investing in Natural Capital for a Sustainable Future in the Greater Mekong Subregion. Manila, Philippines.

³⁴ Floodplains are the areas adjacent to a river that are flooded.

³⁵ Floodlines are geographical demarcations of the floodplain for a flood with a particular return interval. For example, a 1-in-100-year floodline demarcates the floodplain of the 1-in-100-year flood.

³⁶ Options include the Civil Engineering Department of the NUoL or the Public Works and Transport Institute within MPWT.

³⁷ This structure is adapted from the Land Allocation Committees in the GIZ project Land Management and Decentralized Planning.

³⁸ for further information about the relevant policies, see Annex 2: Feasibility Study.

³⁹ Further details on site selection are provided in Annex 2: Feasibility Study, Section 10.

⁴⁰ Maps of the wetland and streams are provided in Annex 2: Feasibility Study, Section 10.

⁴¹ Similar arrangements are expected for the Community Stream Management Committees under Activity 2.2.2.

⁴² Indigenous plant species that occur naturally along streambanks in and around each city will be identified in consultation with local ecologists. A wide range of these species will be used, since diversity increases ecosystem resilience, as well as focusing on species that are climate-resilient e.g. heat tolerant and well-suited to withstand flooding and reduce erosion.

⁴³ such as the ADB-funded Pakse Urban Environment Improvement Project.

- ⁴⁴ The EE will be required to comply with UNEP rules, policies and procedures on procurement.
- ⁴⁵ The PCA will determine requirements for the disbursement and management of funds to the EE, as well as establish agreed upon supervisory roles.
- ⁴⁶ The PMU will have a target of 30% female representation.
- ⁴⁷ with ad hoc meetings held wherever necessary
- ⁴⁸ This role will be part-time and financed by the GoL.
- ⁴⁹ such as government departments, NGOs and civil society groups
- ⁵⁰ Recruitment of all project personnel will be guided by gender equality and non-discrimination principles, with a target of 50% female representation.
- ⁵¹ The PM will be accountable to Government of Laos and UNEP.
- ⁵² CEIC data. Available at: <https://www.ceicdata.com/en/indicator/laos/external-debt--of-nominal-gdp>. Accessed on 2 May 2019.
- ⁵³ During flood events, these communities are affected by the halting of economic and social activity as well as reduced mobility for weeks at a time in flooded neighbourhoods while reconstruction and recovery is undertaken.
- ⁵⁴ The GoL has committed US\$1.5 million in co-financing.
- ⁵⁵ ADB. 2016. Nature-based Solutions for Building Resilience in Towns and Cities: Case Studies from the Greater Mekong Sub-region. Accessed from: <https://www.greatermekong.org/sites/default/files/nature-based-solutions.pdf#overlay-context=nature-based-solutions-building-resilience-towns-and-cities-case-studies-greater-mekong-subregion>. Accessed on 15 May 2019.
- ⁵⁶ JICA. 2011. The Project for Urban Development Master Plan Study in Vientiane Capital. Available at: http://open_jicareport.ica.go.jp/pdf/12023693_01.pdf. Accessed 13 May 2019.
- ⁵⁷ ADB. 2015. *Building Resilience in Kaysone Pomvihane, Lao PDR*, Volume 7 of the Resource Kit for Building Resilience and Sustainability in Mekong Towns, Prepared by ICEM – International Centre for Environmental Management for the Asian Development Bank and Nordic Development Fund. Manila (TA 8186).
- ⁵⁸ ADB. 2015. *Building Resilience in Kaysone Pomvihane, Lao PDR*, Volume 7 of the Resource Kit for Building Resilience and Sustainability in Mekong Towns, Prepared by ICEM – International Centre for Environmental Management for the Asian Development Bank and Nordic Development Fund. Manila (TA 8186).
- ⁵⁹ Personal communication. 2018. ADB Project Manager and international consultants.
- ⁶⁰ This regional project covers four Least Developed Countries, with a budget of US\$ 468,000 for EbA interventions in Laos' regions of Oudomxay and Phongsaly.
- ⁶¹ The barriers are stated in Section B.1 of this SAP proposal and described in detail in Annex 2: Feasibility Study, Section 6.
- ⁶² such as universities, schools, and government offices
- ⁶³ The economic, social and environmental co-benefits that will result from project interventions are discussed in further detail in Section E.3 of this SAP Proposal.
- ⁶⁴including other relevant planning frameworks that have performance targets
- ⁶⁵ The implementation of the ICFMS and their regular updating will be ensured through the process of mainstreaming the ICFMS into relevant policy and planning frameworks.
- ⁶⁶ GCF resources from the project will not be provided to the EPF to enable this upscaling. The EPF is a potential source of sustainable financing, particularly for watershed protection-related activities. It is in the process of seeking accreditation with the GCF and obtains financing from the ADB and World Bank.
- ⁶⁷ These financial resources are channelled to beneficiaries in Laos and invested in the form of an endowment fund to generate interest for financing the operation costs of the EPF. Case Study Report: Environmental Protection Fund in Lao PDR. UNDP. Available at: http://www.asia-pacific.undp.org/content/dam/rbap/docs/Research%20&%20Publications/environment_energy/ncf/APRC-EE-2012-NCF-CaseStudy-Lao.pdf. Accessed on 12 February 2019.
- ⁶⁸ The project's gender targets as well as the associated gender-disaggregated indicators are presented in Annex 4: Gender Assessment.
- ⁶⁹ Direct beneficiaries have been defined as those individuals living in villages directly adjacent to project interventions that will benefit from flood reduction.
- ⁷⁰ These projects are discussed in Annex 2: Feasibility Study.
- ⁷¹ the capacity building process is discussed in Section B.2.
- ⁷² The process for updating national policies is described in Section B2.
- ⁷³ Among government decision-makers this will be facilitated in part through the setting of adaptation targets as part of the NAP process.
- ⁷⁴ United States Environmental Protection Agency. 2017. Available at: <https://www.epa.gov/green-infrastructure/benefits-green-infrastructure>. Accessed on: 14 November 2017
- ⁷⁵ Many urban residents in Laos rely on fishing urban streams to supplement their livelihoods. Wetland and stream restoration activities will increase the habitat for aquatic biodiversity.
- ⁷⁶ Small-scale farmers in urban areas preferentially plant a high-value rice variant that is not resilient to the impacts of inundation. A reduction in flood impacts will allow small-scale farmers to continue their practices rather than growing flood-resilient varieties that are less desirable in the local market.
- ⁷⁷ United States Environmental Protection Agency. 2017. Available at: <https://www.epa.gov/green-infrastructure/benefits-green-infrastructure>. Accessed on: 14 May 2019.
- ⁷⁸ Further details on how project outputs will be delivered in a gender-sensitive manner are presented in Annex 4: Gender Assessment.
- ⁷⁹ In Paksan, the National Women's Union is already promoting household vegetable gardens to supplement women's income when rice fields are flooded.
- ⁸⁰ The impacts of climate change in Laos, as well as the associated damages, are described in detail in Section B.1.
- ⁸¹ 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
- ⁸² For further information about flood impacts on communities, see the stakeholder consultation report in Annex 12.
- ⁸³ The damages that result from climate change-induced flooding will be exacerbated by Laos' rapid rates of urbanisation; the expansion of hard infrastructure areas will increase the total area of impervious surfaces, which greatly reduces infiltration into soils and drainage into groundwater.
- ⁸⁴ Laos NAPA, 2009.
- ⁸⁵ United Nations Statistics Division. January 2019.
- ⁸⁶ Human Development Index, 2017. Available at: https://en.wikipedia.org/wiki/List_of_countries_by_Human_Development_Index

⁸⁷ including US\$15 million from floods and landslides and US\$5 million from droughts annually. WRI, 2014. Climate change in the Lower Mekong Basin: An analysis of economic values at risk. Available at:

http://mekongarcc.net/sites/default/files/usaid_marcc_values_at_risk_report_with_exesum-revised.pdf

⁸⁸ Overall, climate change impacts on agriculture are predicted to cost US\$1 billion. Reduced labour productivity, as a result of *inter alia* increased temperatures, across all sectors is expected to cost US\$4.75 billion.

⁸⁹ External public debt reached 54% of the country's Gross Domestic Product (GDP) in 2018. (CEIC data. Available at: <https://www.ceicdata.com/en/indicator/laos/external-debt-of-nominal-gdp>. Accessed on 2 May 2019.)

⁹⁰ Further details on the implementation arrangements are presented in Section B.3 of this Sap proposal.

⁹¹ For example, the NCCS outlines the need for climate proofing urban development plans and infrastructure; *the project will contribute to achieving such goals through implementation of urban EbA interventions*. (NCSS).

⁹² The NAP project is envisioned to be co-located in the Department of Climate Change in MONRE. Efficiencies in delivery, standardization of project management processes, as well as substantive input of the proposed GCF project to the NAP process are envisioned.

⁹³ Such as the INDC and NAPA development teams.

⁹⁴ Bali Strategic Plan for Technology Support and Capacity building-. 2004. Governing Council of the United Nations Environmental Programme. Available at: <https://aarhusclearinghouse.unece.org/resources/bali-strategic-plan-for-technology-support-andcapacity-building> [accessed 22.11.2017].

⁹⁵ Specific initiatives that it has led relating to this topic are described in Section E.2.

⁹⁶ a division of MONRE with an advisory role to the ministry and direct responsibility for managing disasters and climate change across the country

⁹⁷ organisations included UNDP, UN-Habitat, IUCN, and GIZ

⁹⁸ During this mission, discussions were only possible with representatives from Laos' capital city, Vientiane. Input on the other target cities was provided by central government, donors and NGOs.

⁹⁹ Vientiane, Paksan, Savannakhet, Pakse, Luang Prabang and Thakhek

¹⁰⁰ including land use around the wetland, and opportunities for improving its flood storage capacity

¹⁰¹ These estimates are conservative as they make no assumption of the increased frequency and severity of flood impacts due to climate change, which would result in greater flood losses in the absence of mitigation measures. The additional benefits provided by EbA interventions and the indirect avoided costs due to flood losses are also not included in the estimates. Note that the calculations for the reduced flood damages used in the economic modeling do not directly correspond to the EbA interventions proposed in this project. Measuring flood retention and abatement from restoration is challenging and site-specific. More information is indicated in the activity descriptions under Component 2.

¹⁰² Further details on relevant past and ongoing projects and initiatives in Laos are presented in Annex 2: Feasibility Study.

¹⁰³ Further details on the CAWA project are presented in Section 4.1.2 of Annex 2: Feasibility Study.

¹⁰⁴ FAO. 2014. Project Document. Climate change Adaptation in Wetland Areas (CAWA) in Lao PDR.

¹⁰⁵ <https://www.thegef.org/project/sustainable-forest-and-land-management-dry-dipterocarp-forest-ecosystems-southern-lao-pdr>

¹⁰⁶ which concluded in 2017.

Annex 2a. Project Logical Framework

	Description	Indicators	Baseline	Targets (mid-term)	Targets (final)	Sources and means of verification	Assumptions
GCF Core Indicators	GCF Core Indicator for adaptation	Number of direct and indirect beneficiaries	<u>Direct:</u> 0 <u>Indirect:</u> 0	Direct: At least 14,920 people (~2% of the total population of the four target cities) benefitting 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 for each	Direct: Approximately 74,600 people (~9% of the total population of the four target cities) benefitting 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) benefitting from flood reduction and enhanced ecosystem	Baseline and Completion Surveys ¹	Community members' cleaning of drainage lines lead to flood reduction The target beneficiaries benefit from reduced flood losses from EbA interventions

¹ Means of Verification for Fund-level Impact and Outcome indicators will be triangulated with the baseline surveys that will be undertaken by project consultants, and at project mid-term and project end with the latest available national census data (2015), as well as with the extensive data from assessments after the last major flood in Laos (i.e. Post-Disaster Needs Assessment: 2018 Floods, Lao PDR. Available at: <https://www.gfdr.org/en/publication/post-disaster-needs-assessment-2018-floods-lao-pdr>). When data is available from the next national census, scheduled to take place in 2020, this will be used, and in the event of another major flood during the project period the relevant post-disaster needs assessment will also be used as reference point.

				city will only be completed after mid-term.	services through the ICFMS. Approximately 50% of indirect beneficiaries will be female.		
		Number of direct beneficiaries relative to total population	<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) ²	Baseline and Completion Surveys ³	Community members' cleaning of drainage lines lead to flood reduction The target beneficiaries benefit from reduced flood losses from EbA interventions
Objective related to GCF RMF Impact Areas Impact	A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions	A1.1 Change in expected losses of lives ⁴ and economic assets (US\$) due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention	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	Baseline survey and Year 5 monitoring if there is a flood event	If there is a flood event in Year 5, tracking of the final target will be done EbA measures will provide flood reduction
	A4.0 Improved resilience of ecosystems and ecosystem services	A4.2 Value (US\$) of ecosystem services generated or protected in response to climate change	No new protection or restoration efforts with climate change	US\$ 34,464/year in flood protection and other ecosystem services from Nong Peung wetland	US\$ 344,640/year in flood protection and other ecosystem services from Nong Peung wetland	Ecosystem valuation methodology and calculation under Activity 1.2.1 ⁵	EbA measures will provide flood reduction, wastewater treatment, support to fishing and livelihoods and other ecosystem services

² The beneficiary targets are percentages of the combined total populations of the four cities.

³ Means of Verification for Fund-level Impact and Outcome indicators will be triangulated with the baseline surveys that will be undertaken by project consultants, and at project mid-term and project end with the latest available national census data (2015), as well as with the extensive data from assessments after the last major flood in Laos (i.e. Post-Disaster Needs Assessment: 2018 Floods, Lao PDR. Available at: <https://www.gfdrr.org/en/publication/post-disaster-needs-assessment-2018-floods-lao-pdr>). When data is available from the next national census, scheduled to take place in 2020, this will be used, and in the event of another major flood during the project period the relevant post-disaster needs assessment will also be used as reference point.

⁴ Methodologically it is challenging to anticipate the change in losses of lives and set targets, so the indicator to be reported would focus on change in losses of economic assets US\$, noting that this can only be measured at project end point if there is a flood event at that time.

⁵ The methodology used will be from international best practice, including from peer-reviewed sources. The values generated will be compared with similar studies in the country identified in Table 1. Examples Studies Valuing Ecosystem Services in Laos of the funding proposal.

			risks produce ecosystem services	US\$ 20,104/year in flood protection and other ecosystem services from urban streams in Pakse and Savannakhet	US\$ 201,040/year in flood protection and other ecosystem services from urban streams in Pakse and Savannakhet		
Fund-level Outcome(s)	A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	A7.1 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	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 ⁶	Key informant interviews Policy uptake scorecard Project reports Interviews with PMU	

⁶ 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.

Outputs	<p>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</p> <p>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</p>	<p>1.1.1 Number of institutions with strengthened institutional capacity for integrated flood risk management and implementation of urban ecosystems-based adaptation as measured by the capacity scorecard</p>	<p>Baseline institutional capacity to be measured in Year 1</p>	<p>4 institutions with strengthened capacity with minimum score of 4 out of 10 each</p> <p>Mid-term targets will be determined based on the baseline study that will be conducted in Year 1 of project implementation</p>	<p>10 institutions with strengthened capacity with minimum score of 8 out of 10 each</p> <p>Final targets will be determined based on the baseline study that will be conducted in Year 1 of project implementation</p>	<p>Capacity scorecard⁸</p>	<p>Trainings, awareness-raising and enhanced curricula are sufficient to build knowledge and technical capacity amongst relevant stakeholders.</p>
	<p>Output 1.2 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</p>	<p>1.1.2 Number of males and females with increased awareness of climate threats and participating in implementation wetland and stream management plans and cleaning of drainage lines.</p>	<p>Males = 0 Females = 0 Total = 0</p>	<p>14,920 people with increased awareness (50% male and 50% female)⁷</p>	<p>37,300 people with increased awareness (50% male and 50% female)</p>	<p>Project Progress report Media/outreach survey</p>	

⁷ During inception, a survey instrument / scorecard approach will be designed to have a robust measurement of awareness of climate threats.

⁸ The indicator scale is based on five-step criteria of capacity assessment for each stakeholders group: i) Are the stakeholders aware of the current and expected impacts of climate change-induced floods on cities?; ii) Do the stakeholders have the capacity to plan for and implement integrated flood management and urban EbA approaches at city, provincial, and national levels, including coordination among institutions?; iii) Do the stakeholders have access to the city-level urban EbA manuals within the ICFMS and to national urban EbA guidelines?; iv) Do the stakeholders have the capacity to access funding for integrated flood management and urban EbA interventions?; v) Is there evidence of adequate institutional capacities for the continuous monitoring and reviewing of ICFMS and learning from urban EbA interventions that have been implemented through the project and the ICFMS?. Each question is answered with an assessment and score for the extent to which the associated criterion has been met: not at all (= 0), partially (= 1) or to a large extent/completely (= 2). An overall score is calculated, with a maximum score of 10 given five criteria. These five criteria will be elaborated, reviewed and validated at inception phase of the project. Sub-questions under each criterion will correspond to deliverables of capacity building activities in the project. For example, training activities will have tests to measure learning of participants, linkage of the knowledge hub to the research centres of relevant ministries will be assessed, and local governments' use of financial tools or programming of funds for operation and maintenance based on economic valuation work will be assessed.

	<p>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</p>	<p>1.2.1 Level of effectiveness of Flood Risk Management Committees established as coordination mechanisms</p> <p>1.2.2 Level of uptake of ecosystem valuation</p>	<p>Level 0⁹</p> <p>Level 0¹⁰</p>	<p>Level 1 for 4 cities</p> <p>Level 1 for 4 cities</p>	<p>Level 3 for 4 cities</p> <p>Level 3 for 4 cities</p>	<p>Monitoring and Evaluation reports, cities' annual reports</p> <p>Interviews with provincial and district officials</p> <p>Monitoring and Evaluation reports, cities' annual reports</p> <p>Interviews with provincial and district officials</p>	
	<p>Component 2: Rehabilitation and protection of ecosystems in response to climate variability and change</p> <p>Output 2.1 Area of wetland restored contributing to flood reduction and sustainable management of the Nong Peung wetland in Paksan</p>	<p>2.1.1 Area (ha) of wetland restored contributing to flood reduction</p>	<p>No new protection or restoration efforts with climate change risks incorporated for ecosystems in the target sites</p>	<p>80 ha of the Nong Peung wetland restored (10% of target area)</p>	<p>800 ha of the Nong Peung wetland restored</p>	<p>Project -level Field surveys comprising interviews with local communities</p> <p>GIS mapping of sites</p> <p>Project reports</p> <p>Interviews with PMU, local communities</p>	<p>Wetland restoration activities are sufficient in reducing flood impacts.</p>

⁹ Level 0 = no coordination mechanism; Level 1= coordination mechanism in place; Level 1 = coordination mechanism in place, meeting regularly with appropriate representation (gender and decision-making authorities); Level 3 = coordination mechanism in place, meeting regularly, with appropriate representation, with appropriate information flows and monitoring of action items/issues raised.

¹⁰ Level 0 = provincial governments have no awareness of ecosystem valuation generated by the project; Level 1 = provincial governments have awareness of ecosystem valuation generated by the project; Level 2 = provincial governments implement one of the following activities: identify sustainable financial mechanisms based on the economic valuation; include operations and maintenance of restoration interventions in annual budgets; identify new investments to scale up project interventions; cite the ecosystem values in Socio-Economic Development Plan; and devise a natural capital accounting system for the province; Level 3 = provincial governments implement at least two of the following activities: identify sustainable financial mechanisms based on the economic valuation; include operations and maintenance of restoration interventions in annual budgets; identify new investments to scale up project interventions; cite the ecosystem values in Socio-Economic Development Plan; and devise a natural capital accounting system for the province.

		2.1.2 Level of uptake of wetland management plan	Level 0 ¹¹ for the community management committee and Level 0 for government agencies specified in the management plan	Level 1 for the community management committee and Level 1 for all government agencies specified in the management plan	Level 2 for the community management committee and Level 2 for at least 40% of government agencies specified in the management plan	Monitoring and Evaluation reports, cities' annual reports Interviews with provincial and district officials	Resources are available to implement the management plans The wetland management plan assigns specific actions or practices to government agencies
Output 2.2 Area of urban streams restored contributing to flood reduction and sustainable management of urban streams in Savannakhet and Pakse	2.2.1 Area (ha) of urban streams restored contributing to flood reduction	No new protection or restoration efforts with climate change risks incorporated for ecosystems in the target sites	70 ha (10% of total target) of urban stream ecosystems rehabilitated and sustainably managed	700 ha (100% of target) of urban stream ecosystems rehabilitated and sustainably managed	Field surveys GIS mapping Project reports Interviews with PMU	Urban stream restoration activities are sufficient in reducing flood impacts.	
	2.2.2 Level of uptake of stream management plans	Level 0 ¹² for 3 community management committees and Level 0	Level 1 for 3 community management committees and Level 1 for all government agencies	Level 2 for 3 management committees and Level 2 for at least 40% of government agencies	Monitoring and Evaluation reports, cities' annual reports	Resources are available to implement the management plans The stream management plan assigns specific actions or	

¹¹ Level 0 = the relevant bodies and agencies are not aware of the management plan; Level 1 = the relevant bodies and agencies are aware of and have access to the management plan; Level 2 = the relevant bodies and agencies are implementing at least 50% of the management practices proposed in the plan; Level 3 = the relevant bodies are implementing 80% of the management practices proposed in the plan.

¹² Level 0 = the relevant bodies and agencies are not aware of the management plan; Level 1 = the relevant bodies and agencies are aware of and have access to the management plan; Level 2 = the relevant bodies and agencies are implementing at least 50% of the management practices proposed in the plan; Level 3 = the relevant bodies and agencies are implementing 80% of the management practices proposed in the plan.

			for government agencies specified in the management plan	specified in the management plan	specified in the management plan	Interviews with provincial and district officials	practices to government agencies
	Output 2.3 Area of permeable paving solutions installed in public areas contributing to flood reduction in Vientiane, Paksan, Savannakhet and Pakse	Square meters of permeable paving solutions installed in public areas contributing to flood reduction	Baseline study to be conducted in Year 1 of project implementation.	9,000 square meters of permeable paving solutions	18,000 square meters of permeable paving solutions	Field surveys Project reports Interviews with PMU	Permeable paving solutions will be sufficient in improving drainage of identified public areas.

	Activity title	Activity description	Sub-activities	Deliverables
Activities	Activity 1.1.1 Build the capacity of national and local representatives for coordination and using urban EbA to manage climate change-induced flooding.	Under Activity 1.1.1, 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 will be trained on how to incorporate integrated climate-resilient flood management into urban planning for the cities of Vientiane, Paksan, Savannakhet and Pakse. Additionally, technical staff from the relevant national and local departments will be trained 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; and iv) submitting applications for financing. A knowledge-exchange trip for senior government representatives, technical experts and academics to a city with similar topographical, climatic and socio-economic contexts to the four target cities.	<p>Train national and city-level decision-makers on how to include integrated climate-resilient flood management into development planning.</p> <p>Train technical staff at national and city-level on best practices for using urban EbA to reduce flooding.</p> <p>Conduct an exchange trip to the selected city with urban EbA examples as case study.</p>	<p>16 Training workshops conducted for decision-makers on how to incorporate integrated climate-resilient flood management into urban planning</p> <p>16 Training workshops conducted for national- and city-level technical staff on best practices for using urban EbA</p> <p>1 Knowledge exchange trip held for senior government representatives, technical experts and academics to a city with similar topographical, climatic and socio-economic contexts to the four target cities</p>
	Activity 1.1.2 Establish a national knowledge hub that produces and disseminates information on urban EbA interventions locally, regionally and internationally.	A multi-disciplinary knowledge hub will be established in the Civil Engineering Department of the National University of Laos in Vientiane, covering the fields of engineering, urban planning, water resource management, agriculture, ecology, and governance. The purpose of this hub will be to: i) integrate urban EbA content into relevant existing curricula at the university; and ii) provide technical support to government and Community Management Committees established under Outcome 2. In addition to the establishment of the knowledge hub, targeted action research projects linked to the project activities will be funded and conferences will be held on urban EbA to support knowledge exchange with other EbA initiatives in the region. An operational mechanism will be put in place to manage the research fund supporting the research activities.	<p>Develop and sign MoU between NUoL and MONRE</p> <p>Contract knowledge hub manager to oversee the hub</p> <p>Set up operational mechanism for the monitoring and assessment fund</p> <p>Contract an international expert to assist with the integration of EbA content into existing curricula</p>	National knowledge hub is operational and producing knowledge products.
	Activity 1.1.3 Conduct awareness-raising campaigns in each of the four target cities for communities and the private sector on	Awareness raising campaigns will be conducted to: i) raise awareness among the public about the value of wetlands and urban streams, solid waste disposal, protection of waterways, and regulations on waterway buffer zones (by means of village governance structures, water user associations, and National Women's Union); and ii) raise	Design an appropriate city-level awareness-raising campaign in each of the four cities, in co-operation with city-level stakeholders	Awareness raising campaigns including communities and private sector implemented in target cities

urban EbA and flood management.	awareness and promote the sustainable management of the Nong Peung wetland in Paksan based on the wetland management plan developed under Outcome 2. Private sector stakeholders (e.g. shopping malls and Special Economic Zones) will also be engaged under this activity to identify how they can contribute to and benefit from project activities.	Implement the four awareness-raising campaigns. Engage with relevant private sector stakeholders.	
Activity 1.2.1 Conduct economic valuation of urban ecosystem services.	An economic valuation will be conducted on the range of ecosystem services provided by the Nong Peung wetland in Paksan and urban streams in the four target cities. The findings from this valuation will be: i) inform long-term management plans; and integrated into the adaptation assessments in Activity 1.2.4 to help mainstreaming EbA into the planning, policy and legal frameworks.	Undertake an economic valuation of the Paksan wetland and urban streams in Savannakhet, Pakse and Vientiane. Conduct a capacity needs assessment of major stakeholders on implementing sustainable land use planning Provide technical backstopping support for the development of the ecosystem services valuation framework	Ecosystem services for 1 wetland and 3 streams valued
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.	Fine-scale hydrological mapping will be conducted in each of the target cities and the results from this mapping will be used to develop detailed hydrological models at catchment scale that account for increasing rainfall intensity under climate change. Hydrological maps and models produced, along with the relevant staff conducting the mapping and developing the models, will be hosted within an identified appropriate national institution. The maps and models generated will be used to inform the flood management strategies that will be implemented under Activity 1.2.4. In addition, an international and a national expert will be contracted under this activity to conduct an extended wetland assessment on <i>inter alia</i> : extent of wetland, different functional zones, water quality, biodiversity, invasive alien plants and community use of the wetland. This assessment will be used to inform the development of the wetland management plan under Activity 2.1.1.	Conduct stakeholder consultations with affected communities, the private sector and civil society Conduct drone mapping of the four cities to collect detailed spatial data on elevation, land use and infrastructure Develop hydrological models for each of the four cities Contract an international and a national expert to conduct a wetland assessment	4 hydrological assessments and 4 climate risk assessments completed

<p>Activity 1.2.3 <i>Develop the ICFMS and mainstream climate change and urban EbA into relevant policies, guidelines and plans.</i></p>	<p>Integrated flood management strategies (ICFMS) will be developed for each of the target cities based on outputs from Activities 1.2.1, 1.2.2, and 1.2.3. The ICFMS will contain proposed EbA interventions, management and enforcement arrangements, options for specific regulations and policy at the provincial level. Following their development, these strategies will be mainstreamed into existing flood master plans, provincial and district development plans, land use plans and guidelines, urban plans for Special Economic Zones, and provincial level policies and regulations through proposed revisions and updating of relevant plans. Outcomes of the ICFMS will also be linked with National Adaptation Planning (NAP) process (UNEP proposal to GEF under development).</p>	<p>Develop an ICFMS for each of the four cities</p> <p>Review ICFMSs and identify required local-level regulatory framework changes</p> <p>Provide recommendations and policy briefs to local-level decision makers for the implementation of changes identified</p>	<p>4 ICFMS developed</p>
<p>Activity 1.2.4 <i>Develop national urban EbA guidelines for Laos and recommendations for policies on urban flood management.</i></p>	<p>National urban EbA guidelines will be developed for Laos to inform urban development planning under future conditions of climate change. These guidelines will include, <i>inter alia</i>: options for urban EbA and Sustainable Urban Drainage Systems in different contexts, institutional responsibilities for enforcement, monitoring, and implementation, options for incentives and instruments to promote EbA in the private sector, and options for regulatory reforms.</p>	<p>Contract international civil engineering experts/consultants with urban EbA expertise to assist in the development of the guidelines, in close co-operation with local contractors, academics and other stakeholders</p>	<p>1 national urban EbA guidelines developed</p>
<p>Activity 2.1.1 Develop a wetland management plan for Nong Peung wetland in Paksan.</p>	<p>A wetland management plan will be developed for the Nong Peung wetland for the sustainable use and management of the wetland. This plan will be used by the Community Wetland Management Committee, which will be established at the village level to assist with <i>inter alia</i> water quality monitoring, fishery management and monitoring of invasive plants, with technical support from the knowledge hub established under Activity 1.1.2. Participatory land-use planning workshops will be also be conducted under this activity.</p>	<p>Conduct land-use planning workshops with relevant national and local government representatives and project stakeholders</p> <p>Establish a Community Wetland Management Committee in Paksan</p>	<p>1 wetland management developed</p>
<p>Activity 2.1.2 Rehabilitate the Nong Peung wetland.</p>	<p>A local service provider will be contracted to rehabilitate the Nong Peung wetland in Paksan. Rehabilitation activities to be conducted under this activity will include: i) removing invasive plants such as <i>Mimosa pigra</i> and water hyacinth; ii) removing small man-made barriers that impede natural flow and wetland functioning; and iii) planting appropriate indigenous plants in areas where natural vegetation has been lost or degraded.</p>	<p>Implement appropriate control measures (e.g. bio-control or mechanical control for invasive alien plants</p> <p>Identify areas for the planting of indigenous plants</p>	<p>800 ha of Nong Peung wetland restored</p>

			<p>Contract a local service provider to remove the identified invasive species and man-made barriers</p> <p>Contract a local service provider to plant indigenous plants in identified areas</p>	
Activity 2.2.1 Restore natural urban streams in Savannakhet and Pakse.	A local service provider will be contracted to restore natural urban streams in Savannakhet and Pakse. Restoration activities to be implemented under this activity will include: i) removing invasive plants such as <i>Mimosa pigra</i> ; ii) restoring natural aquatic vegetation and vegetation on banks; iii) removing solid waste that impedes flow; and iv) delineating stream buffer zones and install signage.	<p>Contract a local service provider to restore aquatic vegetation and stream banks</p> <p>Contract a local service provider to remove solid waste</p> <p>Contract a local service provider to delineate stream buffer zones and install signage</p>	700 ha of streams restored	
Activity 2.2.2 Develop management plans for restored urban streams in Savannakhet and Pakse.	Community Stream and Drainage Management Committees will be established at the village level. Protocols will also be developed under this activity detailing the roles and responsibilities of these committees in the management of urban streams. A critical consideration in the management of urban streams is establishing effective processes for waste management. In this light, workshops will be conducted to enable the Community Stream and Drainage Management Committees to engage with Urban Development Administration Authorities (UDAA) on improving the effectiveness of existing regular solid waste collection and drainage maintenance regulations and operations. Furthermore, to support the sustainable management of these streams, a local service provider will be contracted to identify and implement appropriate measures to curb the introduction and spread of invasive plants in wetlands and streams.	<p>Establish Community Stream and Drainage Management Committees</p> <p>Contract a local service provider to identify and implement measures to reduce the spread of invasive species</p> <p>Facilitate communication and knowledge sharing between the UDAA and Community Stream and Drainage Management Committees on best practices for implementing effective waste management</p>	4 management plans for drainage and stream maintenance developed	
Activity 2.3.1 Design permeable paving solutions for public areas in Vientiane, Paksan, Savannakhet and Pakse.	An international civil engineering experts/consultancy with urban EbA expertise to assist with selecting appropriate sites and designing permeable paving solutions for each site according to international best practices. This will include consideration of potential surface pollutants,	<p>Conduct site-specific surveys (social surveys and environmental surveys)</p> <p>Contract an international civil engineering experts/consultancy with urban EbA expertise to assist with the</p>	At least three types of permeable paving solutions designed	

		groundwater level and risk of permeable paving pores clogging because of sediment deposition.	design of permeable pavement solutions Validate technical designs of the permeable paving solutions	
	Activity 2.3.2 Install permeable paving in public areas in Vientiane, Paksan, Savannakhet and Pakse.	A service provider will be contracted to install the permeable paving solutions in the public areas (such as universities, schools and government offices) identified in Activity 2.3.1. Site-specific O&M plans, management plans and M&E plans will also be developed in collaboration with host institutions under this activity using findings from the site surveys conducted under Activity 2.3.1.	Contract a service provider to install permeable paving solutions at identified sites Using results from the surveys conducted under this activity, develop site-specific O&M plans, management plans and M&E plans	18,000 sq. m of permeable pavements installed

No-objection letter issued by the national designated authority(ies) or focal point(s)



**Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity**

Ministry of Natural Resources and Environment
Department of Climate Change

Vientiane, dated: 4 June 2019

To: The Green Climate Fund (GCF)

Subject: No-objection Letter - Funding proposal for the GCF by United Nations Environment Programme regarding “Building resilience of urban populations with ecosystem-based solutions in Lao PDR”

Dear Madam, Sir,

We refer to the project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR as included in the funding proposal submitted by United Nations Environment Programme to us on 3 June 2019.

The undersigned is the duly authorized of the National Designated Authority of Lao PDR Mr. Syamphone Sengchandala.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR” as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of Lao PDR has no-objection to the project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR” as included in the funding proposal;
- (b) The project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR” as included in the funding proposal is in conformity with Lao PDR’s national priorities, strategies and plans;
- (c) In accordance with the GCF’s environmental and social safeguards, the project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR” as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the project “Building resilience of urban populations with ecosystem-based solutions in Lao PDR” as included in the funding proposal has been duly followed. We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Syamphone Sengchandala'.

Syamphone Sengchandala
National Designated Authority of Lao PDR

Environmental and social report(s) disclosure

Basic project/programme information	
Project/programme title	Building resilience of urban populations with ecosystem-based solutions in Lao PDR
Accredited entity	United Nations Environment Programme (UNEP)
Environmental and social safeguards (ESS) category	Category C
	<i>Note: Environmental and social report disclosure not required for Category C and Intermediation 3 projects and programmes.</i>
Environmental and social report disclosure information	
Description of report/disclosure	N/A

Note: This form was prepared by the accredited entity stated above.

Secretariat’s assessment of SAP009

Proposal name:	Building resilience of urban populations with ecosystem-based solutions in Lao PDR
Accredited entity:	United Nations Environment Programme (UNEP)
Country/(ies):	The Lao People’s Democratic Republic
Project/programme size:	Small

I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
The Lao People’s Democratic Republic is increasingly vulnerable to the effects of climate change, particularly to floods, with its main cities sitting along the Mekong River and its tributaries. Urban flood management strategies and ecosystem restoration can contribute greatly to reduce vulnerability and economic losses	On-the-ground implementation of flood control measures is limited, with pilot-scale interventions on the restoration and sustainable management of wetlands and urban streams, as well as permeable pavements. Lack of data on hydrology and flood impacts did not allow the detailed designs necessary for more complex infrastructure. This was a key factor in the framing of this intervention to address knowledge and policy gaps and set up the enabling environment for future investments
Introduction of innovative economic valuation tools for ecosystems has strong paradigm shift potential, shifting the focus from grey to green infrastructure for flood control	It is important to ensure the application of these decision-making tools in actual flood-management interventions resulting from the flood-management strategies, through strong engagement with the government. There may be resistance to change decades of practice on flood management away from grey infrastructure, on the basis of enhanced decision-making tools alone
The Lao People’s Democratic Republic, with relatively small cities integrated with the surrounding landscape, is suitable for the implementation of ecosystem-based adaptation	

- The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XVII, titled “List of proposed conditions and recommendations”.

II. Summary of the Secretariat’s assessment

2.1 Project background and climate rationale

3. The Lao People’s Democratic Republic is a least developed country with its major urban centres located along the Mekong River. These cities are highly vulnerable to the impacts of floods, which are confidently predicted to be exacerbated by climate change. Lao cities are among the most vulnerable areas to flooding in South-East Asia, with extreme flooding occurring on an annual basis, causing economic losses of around 3 per cent of gross domestic product (GDP), mainly due to damage to infrastructure and loss of livestock and crops. Climate change models estimate loss and damage may frequently exceed USD 250 million in the years to come. This figure does not include further non-monetary losses such as waterborne diseases, absenteeism of children from school and disruption to transport systems. Much of the cost of flood recovery is borne by households – consultations conducted by the United Nations Environment Programme (UNEP) with flood-affected people indicate that per-household costs can reach approximately USD 1,000 after a heavy rainfall event, which is approximately 40 per cent of the annual GDP per capita. Flood management strategies are thus critical to reducing the vulnerability of households and increasing their resilience to climate change.

4. The traditional, mainstream approach to flood risk management in the Lao People’s Democratic Republic, focused on grey infrastructure such as dams and drainage systems, is not adequate to face the increasing floods expected as a result of climate change. The quick growth of cities, at an annual rate of 4 per cent, adds an additional layer of vulnerability since, in the absence of adequate urban planning, urban growth frequently takes place in vulnerable areas, sometimes also affecting critical ecosystems which provide flood-protection services.

5. The UNEP proposal aims to develop an alternative approach centred around urban planning following ecosystem-based adaptation (EbA) principles, which would strengthen the natural capacity of ecosystems to regulate water flows, limiting the exposure of local populations and assets in vulnerable areas. This is an innovative approach in the region, and suitable in the context of the Lao People’s Democratic Republic, the cities of which are still relatively small and highly connected to the surrounding landscapes.

6. A key gap for the development of adequate flood management solutions is the lack of climate and hydrological data, which is fundamental to understanding areas of vulnerability and design-appropriate interventions.

2.1.1. Project financing

Funding sources (USD)		GCF funding uses (USD)	
GCF	10,000,000	Integrated flood management strategies and urban ecosystem-based adaptation plans	3,807,960 (38.1%)
Government of the Lao People’s Democratic Republic	1,500,000	Capacity-building	1,830,100 (18.3%)
Total	11,500,000	River and wetland restoration, permeable pavements	3,936,940 (39.4%)
		Project Management Costs	425,000 (4.2%)

2.2 Component-by-component analysis

Component 1: Strengthened technical and institutional capacity to plan, design, implement and maintain integrated urban EbA interventions for the reduction of climate change-induced flooding (total cost: USD 6,565,887; GCF cost: USD 5,638,060, or 86 per cent)

7. Urban development in the Lao People's Democratic Republic is taking place without sufficient consideration of the increasing risks of climate-change-induced floods. The interventions under this component will establish a comprehensive, integrated approach to flood management that includes planning for climate resilience and the application of EbA. Activities have been designed to develop the necessary knowledge, technical capacity, institutional coordination and policy tools to create an enabling environment for cities to plan for flood management. The activities address the capacity gaps in a comprehensive way and work together to cover all the steps of the project management cycle, from design to development, operation and maintenance with the involvement of communities, and knowledge generation to disseminate lessons from the application of EbA. The national EbA guidelines and the valuation of urban ecosystem services to be conducted by the project will be applicable to all urban centres in the country, as well as to similar urban centres across the South-East Asia region. The integrated flood management strategies will also be replicable for other urban centres. In particular, the integration of EbA into the civil engineering curriculum at the National University of Laos will ensure that future generations of Lao engineers are capable of applying green infrastructure measures for flood management.

Component 2: Ecosystems protected and rehabilitated in response to climate variability and change (total cost: USD 4,434,113; GCF cost: USD 3,936,940, or 89 per cent)

8. Wetlands and natural streams in Lao cities play a vital role in flood reduction and provide various other ecosystem services. However, these ecosystems are frequently lost or degraded due to urban development. The project interventions under this component will rehabilitate an important urban wetland and urban streams in the target cities. At the same time, frameworks for the sustainable management of these urban ecosystems will be established. The restoration of ecosystems and establishment of management frameworks for these sites will comprise the first and second outputs under this component. A third output will focus on the problem of the increasing impervious surface area in the built-up parts of cities, which contributes to 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. Demonstration sites will be selected at schools, hospitals and government offices, so that multiple beneficiaries can observe and experience first-hand the improvement in drainage when permeable paving is used, as opposed to traditional paving or tiling. The expectation is that these demonstration sites will motivate more institutions and households to apply permeable paving to apply permeable paving.

III. Assessment of performance against investment criteria

3.1 Impact potential

Scale: N/A

9. The funding proposal is expected to contribute to an increase in the resilience of an estimated 74,600 people against floods exacerbated by climate change directly as a result of the project interventions, with a further 825,000 benefitting indirectly as a result of improved flood planning in their municipalities.

10. As part of component 1, 45,500 people will receive training on the sustainable management of wetlands and urban streams, resilient livelihood strategies, and household-level flood adaptation measures, which should have a modest to moderate effect on their resilience to

climate impacts while strengthening the sustainability of the interventions on ecosystems. Component 2 of the funding proposal features three sets of interventions that, albeit small, are highly relevant in helping to demonstrate the feasibility and value of ecosystem-based approaches against the challenges posed by floods. Restoration and sustainable management of the Nong Peung wetlands in Paksan will contribute to reduce flood damages for the 8,200 people living in adjacent areas. Similarly, 11,900 people in Pakse and 9,000 people in Savannakhet will benefit from reduced flood damages and other ecosystem services as a result of riverine ecosystem restoration and improved management. A total of 1,500 hectares of wetland and riverine ecosystems will be made more resilient as a result of restoration and management.

11. Overall, the direct impact of the proposal is considered moderate. Due to the costs associated with floods, particularly for households, flood reduction interventions have a strong potential to enhance the resilience of livelihoods of the local population. The direct impacts of the intervention are somewhat limited due to the small scale of the interventions and the focus of the proposal on capacity-building. The more relevant dimension of the interventions is the degree to which they allow the necessary data to generate to design more complex interventions, demonstrate integrated flood reduction through ecosystem-based approaches, and generate support for such an approach.

12. The ultimate impact will depend on how these tools are used and how interventions are maintained and/or enforced. This impact will depend upon the leadership of local officials.

3.2 Paradigm shift potential

Scale: N/A

13. The core objective of the funding proposal is to enable a shift from hard infrastructure and end-of-pipe solutions towards integrated urban flood management approaches with a focus on EbA, which is critical in the context of climate change and rapid urban growth. The proposal clearly articulates the fundamental capacity gaps that exist in the Lao People's Democratic Republic that impede the development of such interventions, which include: a) limited climate, hydrological, and other data for modelling climate impacts and to inform climate change adaptation solutions for flood management; b) limited technical and institutional capacity of provincial and national governments for climate-resilient flood management; and c) traditional reliance on hard infrastructure, with limited knowledge in the theory and practice of EbA and integrated flood management approaches.

14. The proposal's focus on knowledge management is particularly noteworthy. It includes, first, the creation of a knowledge hub at the National University of Laos, which will have a central role in generating and sharing knowledge related to the interventions, while participating in the development of policy-making tools such as the ICFMS and the national EbA guidelines. This would allow the country to develop and keep indigenous technical capacity to expand the programme to other cities, as well as improve upon current practices based on lessons learned. At the same time, EbA training will be embedded in the civil engineering curriculum, ensuring that such approaches can be considered as mainstream options for future engineers in the country, and adequately designed following best practices.

15. The institutional capacity-building package is also comprehensive and follows a logical approach to improve flood management decision-making and planning processes, not only in the four target cities but most importantly in other cities in the country. Urban EbA guidelines at the national level, prepared by international experts in collaboration with the knowledge hub at the National University of Laos, will guide the development of local ICFMS. Tools for the economic valuation of ecosystem services will be applicable to different ecosystems within the country, and thus usable by policymakers in any city to respond to flood management challenges. Institutional coordination will also be fostered through the engagement of national ministries through the national-level project steering committee to support the linkages

between city and national levels, as well as engagement with the Ministry of Planning and Investment for applying integrated flood management in special economic zones.

16. In addition to the policy-level interventions, the proposal also recognizes the importance of the local beneficiaries' involvement and leadership on the maintenance and enforcement of ecosystem interventions, and will conduct awareness-raising campaigns that should contribute to behavioural changes and better knowledge of the value of ecosystem services among the Lao.

17. In summary, it is expected that, as a result of the project, climate change considerations will be embedded within the local planning framework through the ICFMS, and there will be adequate technical and institutional capacity to design and maintain flood reduction interventions using ecosystem-based approaches. From a design perspective, this is a comprehensive and innovative approach in the regional context to address the challenges of floods through ecosystem-based approaches and has a strong potential for lessons to be learned and applied regionally and globally.

18. Some of the challenges to fully realizing the project's paradigm shift potential include the need for leadership by local decision makers to implement the approach and enforce regulations, the need for relevant local capacity to be sustained, and the need to ensure adequate budgets are available for the implementation of the local plans and operations and maintenance of the interventions.

3.3 Sustainable development potential

Scale: N/A

19. The project would contribute to 6 out of 17 United Nations Sustainable Development Goals (SDGs), including 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).

20. One of the key strengths of ecosystem-based approaches to flood management with respect to more traditional hard infrastructure options is the provision of substantial environmental and social benefits, as outlined below.

3.3.1. Environmental benefits

21. The environmental benefits of ecosystem-based approaches include:

- (a) Improved biodiversity in urban and peri-urban areas: the maintenance of wetlands and rivers, areas of critical ecological importance, would provide suitable habitats for aquatic and terrestrial animals, such as fish and migratory birds, which are of both environmental and social importance;
- (b) Improved water quality and quantity: well-maintained wetland and river ecosystems provide key ecosystem services in terms of water resource management, reducing run-off, increasing infiltration, and filtering pollutants, among others; and
- (c) Reduced erosion from riverbanks, resulting in decreased sediment load and flood risks, as well as improved water quality.

3.3.2. Social benefits

22. The social benefits of ecosystem-based approaches include:

- (a) Preservation of cultural and recreational values and social cohesion: strengthening ecosystem services and reducing flood damages will contribute to preserving traditional livelihoods based on rice farming, fishing and livestock grazing, and safeguarding the

link between cities and the surrounding landscape. Green spaces are traditionally highly valued in the Lao People's Democratic Republic; their preservation will have a positive effect in terms of public amenities for the local population;

- (b) Social cohesion, as a result of the participation and coordination of local communities in land-use planning processes and maintenance of infrastructures; and
- (c) Health benefits, as a result of reduced water and vector-borne diseases associated with floods and poor water quality.

3.3.3. Economic benefits

23. The interventions will contribute to reduced economic losses due to floods. This is particularly relevant at the household level, with increases in available income and a reduced need to resort to harmful coping strategies when impacted by extreme events.

3.4 Needs of the recipient

Scale: N/A

24. The Lao People's Democratic Republic is a least developed country highly vulnerable to the impacts of climate change. Floods affect around 200,000 people annually (2.9 per cent of the country's population) causing an average of 40 deaths and economic losses of roughly 3 per cent of GDP. Annual costs are expected to rise to USD 5.78 billion by 2030.

25. With a level of poverty of 23 per cent, the local population is highly vulnerable and unable to cope with floods, vulnerability exacerbated by climate change and by the fast urbanization rate. Financial resources for adaptation are scarce; as such, the GCF intervention is critical to make the project viable and sustainable.

26. The proposal has involved extensive consultations at the national, municipality and community levels and the specific needs of the multiple recipients considered in the design. It clearly outlines the capacity gaps and barriers to effective flood-risk management and the broader development challenges at all levels. The interventions are designed to meet these specific needs.

3.5 Country ownership

Scale: N/A

27. The project has been a strong priority for the country throughout the long development period of the proposal. The proposal is well aligned with national mid- and long-term priorities and ongoing initiatives, including: a) priority activities and approaches promoted by relevant national strategies and action plans on climate change such as the national adaptation programme of action, national adaptation plan, national climate change strategy, Draft Law on Disaster Risk Management and Climate Change, and the Strategic Plan on Disaster Risk Management in Lao PDR until 2020; b) the national climate change strategy's objective of increasing stakeholder buy-in through strengthening the awareness and understanding of the impacts of climate change on future development; and c) the national adaptation plan project proposed to the Global Environment Facility by the country and UNEP. 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 the Lao People's Democratic Republic, the proposed project will align with the global priorities outlined by the SDGs, as well as ongoing policy reforms towards green growth in the country outlined in the National Socio-Economic Development Plan. The proposal clearly articulates the strategic vision of the country's climate change strategy, its nationally determined contribution and broader disaster risk reduction strategy. It clearly aligned with the SDGs (targets 1,2, 3, 6, 12 and 13) as well as the Sendai Framework.

28. The accredited entity (AE) duly considered and involved the national and provincial bodies and decision-making processes, as well as other key stakeholders such as universities and community groups, in project design and implementation. The establishment of long-term institutional structures, such as the knowledge hub in the National University of Laos, can contribute to generating long-lasting ownership and support for the proposed approaches.

29. The final impact of the intervention will depend on how local decision makers support and champion ecosystem-based approaches. While training will be provided, it is important that the accredited entity closely monitors local leadership engagement with the project and takes adequate actions to ensure that the policy tools developed are put into practice through on-the-ground interventions, enforcement of ecosystem management or zoning regulations, etc., in the face of competing pressures.

30. The executing entity (EE), the Ministry of Natural Resources and Environment (MONRE), was created in 2011 and has worked in the implementation of several Global Environment Facility projects with international entities such as the Food and Agriculture Organization of the United Nations or the United Nations Development Programme. This will mark the first project from UNEP that MONRE will execute.

3.6 Efficiency and effectiveness

Scale: N/A

31. GCF is requested to provide a grant of USD 10 million, to finance a project with a total cost of USD 11.5 million. The proposal features a USD 1.5 million in-kind contribution from the national government in the form of office space, equipment, staff and support for the workshops that the project will organize.

32. Fifty-seven per cent of the GCF funding will be used for capacity-building and enabling environment activities (component 1), with 39 per cent being allocated to on-the-ground activities (component 2) and a further 4 per cent to project-management costs. The proportion of investment on physical interventions is lower than usual, and the project will rely significantly on the outputs of international consultants bringing in expertise in highly specialized fields, such as ecosystem service valuation or EbA. This is considered adequate in this particular case due to the need to generate background knowledge and adequate planning to inform the development of more complex interventions.

33. While in the short term GCF funds will not translate to a large impact on the ground, the long-term effectiveness of the funds will be dependent on the degree to which the national EbA guidelines help to develop ICFMS in other cities and the degree to which ICFMS transforms into actual land-use practices and flood management interventions. Studies have shown that urban EbA interventions can be a very cost-efficient alternative to hard infrastructure. The project has a high cost-effectiveness upside: mainstreaming the approach through national and local planning has the potential to result in a large reduction in vulnerability to floods at a limited cost while preserving and improving ecosystems with key environmental and social benefits.

34. Considering both the immediate and long-term results that GCF funding will enable, the Secretariat assesses the project's overall cost-effectiveness as medium.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

35. The AE has screened and assessed the project to have minimal or no adverse environmental and/or social risks and impacts equivalent to category C. The project will strengthen the technical and institutional capacity to be able to mitigate and implement an

integrated climate-resilient approach to urban flood management including the use of urban ecosystem-based adaptation (EbA) approaches. The project aims to rehabilitate and improve the ecological functioning of the the Nong Peung Wetland by removing invasive alien species such as the giant sensitive plant (*Mimosa pigra*) and water hyacinth (*Eichhornia crassipes*), removing small barriers that obstructs the natural flow, and planting appropriate indigenous plant species. The Houay Khi La Meng stream in Savannakhet and the Houay Nhang stream in Pakse will be rehabilitated by removing solid wastes and replacing invasive plants that impede stream flow. Climate-resilient plant species will also be planted along the stream banks employing community members to do the restoration work. Installation of permeable pavements will also be done in demonstration sites.

36. The AE has provided an environmental and social risk screening and an Environmental and Social Action Plan (ESAP) which identifies actions necessary to carry out the avoidance, minimization, and mitigation measures for the minimal risks identified under the project. A detailed Construction and Operation Environmental and Social Management and Monitoring Plan will also be prepared and implemented and monitored by the Environmental and Social Officer. Community-based wetland and stream drainage committees will also be created to assist in the local level monitoring. A wetland and biodiversity expertise will also be available to the Project Management Unit.

37. The ESAP provides an analytical rationale for why the project activities are unlikely to trigger the application of GCF Indigenous Peoples Policy (IPP). The cultural analysis is complemented through village visits and consultations. While project operates in urban and peri-urban environments, the communities do rely upon natural resources, for example for hunting birds and wild honey. In the case of the Nong Peung Wetland, the communities are largely dependent on the wetland, and there is a risk that the traditional subsistence livelihoods of farmers, including women, may be impacted without adequate alternative options.

38. The AE has conducted stakeholder consultations which will continue to be undertaken throughout the duration of project. The stakeholder consultation processes in the project will ensure, when possible, to include members of all ethnic groups to ensure their participation and their ability to voice concerns in relation to impacts to their livelihoods. A Grievance Redress Mechanism has been included in the ESAP to address any complaints regarding social and environmental issues.

4.2 Gender policy

39. The proposal contains a gender assessment; therefore, it complies with the operational guidelines of the GCF Gender Policy and Action Plan. The context of gender issues in the Lao People's Democratic Republic is described in the gender assessment in terms of the legal framework for promoting gender equality, access to education and participation in the labour force by women and men, gender-differentiated vulnerabilities of women and men, among other issues. Further to a desk review of available information sources, the AE also undertook a field assessment of the gender issues, which included consultations with various groups, albeit in two of the cities where the project will be implemented, Luang Prabang and Vientiane. The AE is recommended to reflect in the gender assessment, inputs from stakeholder meetings that show the needs and priorities of women and men in as far as the project's interventions are concerned.

40. The proposal contains a project-level gender action plan (GAP). For each of the project's outcomes, the GAP proposes gender-related activities that can be implemented as part of the project, and criteria for evaluating performance. The GAP has set minimum targets for gender; however, no baseline information has been provided and also without baseline information it is difficult to comprehend the basis for setting these targets. Where sex-disaggregated targets have been provided in the project-level GAP, the AE is requested to rationalize these or provide

baseline information that indicates these figures are ambitious and reflects the reality in the project areas. Additionally, in the GAP matrix, the targets are not sex-disaggregated. The AE is also requested to provide in the GAP, timelines that are aligned to the project's timeframe as indicated in the funding proposal, responsibilities for implementing the proposed actions (i.e. human resources with gender expertise), and the project's budgetary resources that have been allocated for the implementation of the GAP. Current institutional arrangements that have been put in place by the AE are an international environmental and social safeguards expert to provide technical support on gender issues.

41. The AE has provided the expected number of direct and indirect beneficiaries disaggregated by gender as part of the core impact potential indicators of the project in the funding proposal. Gender-disaggregated targets have been incorporated in the logic framework at the fund-level impacts and outcome level for beneficiaries of improved flood management and EbA interventions. The baseline information to rationalize sex-disaggregated targets in the logic framework has been provided. Sex-disaggregated targets in the logic framework will need to be rationalized by baseline data collected before the project commences implementation to ensure that they reflect the situation in the project areas.

42. Implementation arrangements include a monitoring and gender officer in the national project management unit.

4.3 Risks

4.3.1. Overall proposal assessment (medium risk):

43. GCF is requested to provide a grant of USD 10 million to mainstream integrated flood management strategies into planning frameworks and implementing urban EbA to decrease flooding. The project will build on previous initiatives funded by other donors and leverage the lessons learned. It will be implemented in four cities in the Lao People's Democratic Republic. The government (MONRE) is providing co-financing of USD 1.5 million and there is no co-financing by the AE.

44. The Government of the Lao People's Democratic Republic is seeking a full grant from GCF. As a least developed country, the country's debt burden (54 per cent of GDP) limits its access to loans from international and regional development banks, and GCF grant funded activities are largely public goods and do not generate a financial return on the investment.

4.3.2. AE/EE capability to execute the current programme (medium risk):

45. The AE, UNEP has experience in providing technical advice regarding climate change adaptation and sustainable national planning. It has a broad portfolio of climate change projects funded by different donors in the country. The AE will also act as an EE for activity 1.2.1 on ecosystem valuation.

46. The main EE, MONRE, demonstrates its track record in executing projects funded by external donors, with budgets ranging from USD 4.7million to USD 10.9 million. However, the AE stated the high staff turnover may affect the capacity of the EE and the feasibility study pointed out that limited technical institutional capacity of provincial and national government for flood management is one of the barriers in the country.

4.3.3. Project-specific execution risks (medium risk):

47. The funding proposal is mainly focusing on technical assistance for the integrated flood management and capacity-building. The activities such as economic valuation of ecosystem services, hydrological modelling and wetlands assessment will provide data/information to

develop guidelines and policy recommendations. However, the AE stated that whether the policy recommendations/guidelines will lead to actual policy changes or not is beyond the project’s scope. The project may face challenges if the political decisions are not coherent with the project activities. The FP stated that the risk could be mitigated by mainstreaming of the ICFMS and actively engaging policy makers, planners and decision makers during the project.

48. The removal of solid waste around the streams and human-made barriers that impedes natural flow, drainage and wetland functioning is part of the project’s activities. In addition, the project will carry out awareness-raising campaigns which will contribute to people’s behavioural change in the Lao People’s Democratic Republic. To avoid the risk of the same issues reoccurring, the campaigns along with the enforcement of the regulations/laws for waste/wetlands management will be required. Therefore, the project will put a mitigant, such as the establishment of a Community Wetland Management Committee and promoting community ownership of the project interventions, in place.

49. Economic and financial viability: The AE provided an economic analysis which covers broader areas than the actual project target cities. It provides costs and benefits of flood mitigation hard engineering solutions versus co-benefits of the EbA interventions based on examples from developing countries with similar interventions due to the limited availability of data in the Lao People’s Democratic Republic. The AE analysis concluded that the EbA interventions would be cost-effective and economically defensible.

4.3.4. Compliance risk (medium risk):

50. Several reviews of Lao laws and regulations to address money laundering and terrorist financing conducted by the Financial Action Task Force and other regulators have found several deficiencies and the jurisdiction has been rated as a jurisdiction of concern by several reviewing entities.

51. The AE (UNEP) has responded that it is aware of such risks and has an active and robust compliance system to identify, monitor and mitigate those risks, including measures taken to ensure that the funds are not used or diverted for money laundering or terrorist financing. In light of the stated efforts of the AE, along with details of how such are to be implemented, the higher risk elements attributable to the Lao People’s Democratic Republic is offset to a great extent by the anti-money-laundering/countering the financing of terrorism efforts of the AE. Accordingly, Compliance assigns a “medium” compliance rating to this project.

4.3.5. GCF portfolio concentration risk (low risk):

52. In the case of approval, the impact of this proposal on GCF portfolio concentration in terms of results area and single proposal is not material.

4.3.6. Recommendation:

53. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment	
Overall programme	Medium
Accredited entity (AE)/executing entity (EE) capability to implement this project	Medium
Project-specific execution	Medium

GCF portfolio concentration	Low
Compliance	Medium

4.4 Fiduciary

54. UNEP will be the AE for this project. As the AE, UNEP will provide the necessary oversight and support during the implementation of project activities, responsible for financial management, evaluation, reporting and closure of the project. UNEP, through its Climate Change Adaptation Unit, will coordinate with the national-level project steering committee and a national-level project management unit.

55. The EE for this project is UNEP and the Lao People’s Democratic Republic. UNEP will be responsible of activity 1.2.1 on ecosystem valuation. The lead EE will be the Lao People’s Democratic Republic. The national-level execution will be undertaken by MONRE and it will be accountable to the AE for project execution and the effective and efficient use of resources.

56. The financial management and procurement within the project will be guided by United Nations financial regulations, rules and practices, as well as the UNEP programme manual. The financial rules of UNEP follow International Public Sector Accounting Standards. UNEP is audited annually by the United Nations Board of Auditors and periodic reporting from MONRE will follow international financial and auditing standards.

57. The Project Cooperation Agreement (PCA) will be signed by the Government of the Lao People’s Democratic Republic and UNEP and will be the subsidiary agreement. The PCA will outline the roles and responsibilities of the Ministry of Finance and MONRE for the execution of this project and will clarify the flow of GCF proceeds from UNEP to MONRE through the Ministry of Finance.

58. PCA will specifically requires the audit be undertaken by a recognized firm of certified public accountants or, for governments, by a government auditor. The auditor shall state that GCF proceeds are covered within the scope of the audit.

59. As stated on the term sheet, the capacity assessment of the EE is to be submitted once it is available.

4.5 Results monitoring and reporting

60. This project proposes using an EbA-integrated approach to enhance climate change resilience by combining capacity-building, awareness-raising and investments of EbA adaptation towards urban development in the Lao People’s Democratic Republic. The project aims for a paradigm shift from a limited, hard infrastructure approach towards an integrated approach that enhances climate resilience. It is an adaptation project expected to impact an anticipated 74,600 people (9 per cent) direct beneficiaries (50 per cent female and 50 per cent male) and 825,000 (100 per cent) indirect beneficiaries located in four of the country’s most climate-vulnerable cities. It will restore 1,500 ha of urban wetland and stream ecosystems.

61. The project will contribute to achieving two fund-level impacts, namely: i) improved resilience of ecosystems and ecosystem services; and ii) strengthened adaptive capacity and reduced exposure to climate risks.

62. The timetable of implementation has been revised to a great extent following interaction with the Secretariat and conforms with the standard GCF format.

63. For the logical framework, the revised funding proposal incorporated the comments and suggestions provided by the Secretariat, and thus conforms to GCF's results management and performance measurement frameworks.
64. Under the monitoring and evaluation section of the funding proposal, detailed information has been provided, complying with GCF standards.

4.6 Legal assessment

65. The accreditation master agreement (AMA) was signed with the AE on 15 December 2016, and it became effective on 20 February 2017.
66. The AE has provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project.
67. The proposed project will be implemented in the Lao People's Democratic Republic, a country in which GCF is not provided with privileges and immunities. This means that, among other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed. The Secretariat submitted a draft of the privileges and immunities agreement to the Government of the Lao People's Democratic Republic on 21 February 2019. The agreement is currently under consideration by the Government of the Lao People's Democratic Republic.
68. The Heads of the Independent Redress Mechanism and Independent Integrity Unit have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by GCF are made only after GCF has obtained satisfactory protection against litigation and expropriation in the country, or has been provided with appropriate privileges and immunities.

4.7 List of proposed conditions (including legal)

69. In order to mitigate risk, it is recommended that any approval by the Board be made subject to the following conditions:
- (a) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days of Board approval or of the date when all internal approvals by the AE are obtained; and
 - (b) Completion of legal due diligence to the satisfaction of the Secretariat.

Independent Technical Advisory Panel's assessment of SAP009

Proposal name:	Building resilience of urban populations with ecosystem-based solutions in Lao PDR
Accredited entity:	United Nations Environment Programme (UNEP)
Project/programme size:	Small

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential

Scale: Not reported¹

1. Lao People's Democratic Republic is a South-East Asian country located along the Mekong River. The country has been experiencing climate variability and change in recent decades, as has been demonstrated through the time series analyses of recorded meteorological datasets. The consequences of the changes in climate parameters such as temperature and rainfall have been discernable and alarming. It is found that climate-related phenomena such as floods, droughts and storms are occurring more pronouncedly compared to that of historical averages, having significant negative impacts on the lives of poor and marginalized populations and on the country's economy.

2. In Mekong-influenced areas, monsoon and flooding have been known phenomena for millennia. Despite the occasional occurrences of floods, many urban areas have emerged along the Mekong River, taking advantage of navigation potential for both freight and human movement. The Lao People's Democratic Republic is no exception. It has experienced growth of the economy and urbanization, occurring simultaneously in recent decades. However, most of the urban developments have been observed in the cities and urban peripheries located along the Mekong River system. As a landlocked country, the river system offers the Lao People's Democratic Republic a viable navigational route to the neighbouring countries and the rest of the world. Recent rapid urbanization in the Lao People's Democratic Republic, which experienced a high urban growth rate in recent years, has created the will to fight poverty.

3. However, the climate-induced phenomenon of flood is severely affecting the livability of cities in the Lao People's Democratic Republic. Over the years, weak institutional coordination and management capacities have yielded a gradual decline in overall capacity of the urban and peri-urban drainage systems, while urban encroachments might have reduced water retention capacities of wetland systems. These results have been compounded by the climate variability and change-induced rainfall extreme events. For example, an analysis of inter-decade trends for the occurrence of ninetieth percentile rainfall events (as a proxy indicator for extreme rainfall) covering the 1980s, 1990s, 2000s and 2010s shows that the high rainfall episodes are bringing increased amounts of rainfall to the cities of the Lao People's Democratic Republic. The recent trends also indicate that the probability of extreme precipitation events occurring is also increasing with time. Moreover, the analyses of intra-seasonal data reveal that rainfall totals and changes in intensity of rainfall are more prominent towards the later period of the monsoon season (July to September). The evidence presented in the funding proposal highlights that the climate-related increased rainfall extremes are among the drivers that have contributed

¹ There is no reporting requirement for small-scale projects nor for projects under the simplified approval process.

significantly to occurrence of recent flood events in the cities of the Lao People's Democratic Republic.

4. Despite the heavy tolls on the economy due to the increased occurrence of high-intensity floods in recent times, the Lao People's Democratic Republic has been fighting hard to overcome the challenges posed by the relatively high incidence of poverty. In recent years, the Lao People's Democratic Republic has made good progress in economic terms. Rapid employment generation, urbanization and expansion of services around industry/urban-centric growth are the major strategies to achieve economic growth and address poverty. However, in the wake of climate change and induced flood-related vulnerabilities, such strategies will face significant challenges in the coming decades.

5. The situation is aggravated by the intensity of extreme rainfall events and consequential floods are most likely to increase in future decades. The projections involving climate change provide insights into the potential risk of more severe flooding in the cities of the Lao People's Democratic Republic. Modelling exercises considering a time frame from 2046 to 2065 suggest that the intensity of extreme rainfall events is expected to occur to a much greater extent than currently observed within the cities of the Lao People's Democratic Republic. From model outputs, it is found that the rare episodes of rainfall with 100–200 mm/day extreme events may occur more frequently, and the current rarest 200–400 mm/day extreme events may become as high as 1,000 mm in a single day. Such projections suggest that, even if the Lao People's Democratic Republic makes significant progress in the management of urban drainage, the future risk of flooding in the urban areas will be significantly higher under climate-induced extreme rainfall events. Therefore, the usual management relating to urban drainage should embrace ideas that integrate existing conventional urban drainage management with novel but tested ecosystem-based approaches to lead to integrated urban flood management in the country. In doing so, the project proposal argues that ecosystem-based adaptation (EbA) is the way forward for increasing the resilience of urban populations in the Lao People's Democratic Republic.

6. The objective of the project is to develop and implement integrated climate-resilient flood management strategies (ICFMS), which would include the use of urban EbA in four major flood-vulnerable cities. These are: Paksan, Pakse, Savannakhét and Vientiane. In meeting the objective, a two-pronged approach is considered: (1) technical and institutional capacity-building for planning, designing, implementing and maintaining urban EbA interventions to reduce flooding; and (2) rehabilitation and protection of ecosystems in response to climate variability and change.

7. Based on an analysis of key barriers to address flooding in cities and peri-urban areas in the Lao People's Democratic Republic, the project considers the building of technical and institutional capacity for the integration of urban EbA, in responding to climate change-induced flooding. Although urban EbA for flood management is practiced globally in both developed and developing countries,² there is no precedence for the application of such a concept in the Lao People's Democratic Republic. The project therefore intends to extrapolate EbA practices which have been found useful in the rural areas of the Lao People's Democratic Republic through a pilot project, implemented in collaboration with the United Nations Food and Agriculture Organization (FAO).

8. The core of the urban EbA builds around the strengthened institutional arrangements involving knowledge management, staff training, adoption of technologies and decision-support techniques, legislative and regulatory frameworks and the development of urban management guidelines in view of establishing an ICFMS regime, among other initiatives. However, much of the urban EbA will be delivered by (a) restoring wetland areas for enhancing reservoir capacity (particularly in the Nong Peung wetland in Paksan city); (b) restoring urban streams to facilitate

² For example, in the Philippines and in Sri Lanka.

drainage (particularly in Savannakhét and Pakse cities); and (c) installing permeable pavements to enhance percolation and sub-surface groundwater recharge. In doing so, the volume of flood water will be distributed among various systems, thereby flood intensity will be reduced.

9. The pre-feasibility study for the proposal describes the technical merits of each of these EbA techniques to ameliorate flooding in urban and peri-urban areas, particularly in cities where availability of landmass is ensured and adequate geophysical conditions prevail, as is the case for the four target cities of the Lao People's Democratic Republic. Moreover, the EbA practices do not often require high initial capital costs (compared to engineering-focused alternatives), supplemented by high expenditure in operation and maintenance (O&M), thus piloting in the four target cities of the Lao People's Democratic Republic appears promising.

10. If implemented, the project will directly benefit a total of 74,600 people, constituting about 9 per cent of the urban population in the Lao People's Democratic Republic. The project is expected to indirectly benefit 825,000 people in urban areas of the Lao People's Democratic Republic, which represents 100 per cent of urban population in the four cities. It is assumed that 50 per cent of the direct (and also indirect) beneficiaries will be female, because the project is likely to offer equal services to women and men. If the EbA-led ICFMS becomes the norm for future urban development across the Lao People's Democratic Republic, then experimentation involving a small-scale project under the Simplified Approval Process Pilot Scheme appears worthwhile.

11. The project targets serving all urban inhabitants in the four cities, regardless of their economic status. However, given that the most vulnerable suffer the most during floods and often lose out on income opportunities while struggling to safeguard their assets from inundation, the project will certainly provide valuable adaptation services to the most vulnerable, including women, and marginal groups, including people with disabilities. The project aims at institutional strengthening and capacity-building, while also intending to generate and share climate information for improved decision-making on future urban development. The project has already involved local communities in the project development phase and intends to engage the urban population in establishing a people-centric management regime, which most likely will be key to addressing the core issues of flood management in urban settings.

12. One of the weaknesses of the project is that the political economy is not studied, especially around urban development involving land-use change particularly related to encroachment on drainage facilities and including land grabbing in urban and peri-urban wetland systems. Climate change is certainly not the only problem, however the combination of anthropogenic drainage impediments and additional water generated by rainfall run-off is often devastating. The current institutional weaknesses and political interference in the process of impeding drainage need to be thoroughly understood; without such awareness the desired adoption of EbA in an urban setting might not be successful, especially in countries where weak governance prevails.

13. The project will be delivered within five years of its inception, at a total budget of USD 11.5 million. GCF is requested to provide a grant of USD 10 million. The co-financing amount is USD 1.5 million, which will be contributed by grant from the lead executing entity (EE), the Ministry of Natural Resources and Environment (MONRE).

14. It appears from the above discussions that the project, although experimenting with EbA in urban settings for flood management, will have medium impact potential. However, if through the political integration foreseen, it is possible to empower the institutions involved, enabling them to exercise their legal mandate without political inhibition, the project, although small, is likely to have high impact potential.

15. The experimental project can bring about a paradigm shift in addressing flood hazard in urban settings in the Lao People's Democratic Republic. The concept is tested in the current regulatory regime in rural areas of the country. Keeping in view the complexities of urban settings and strong political and economic concerns around urban development, the project may trigger a game-changing people-centric participatory regime to integrate EbA and share the benefits under an ICFMS. The key challenge is to establish good governance. There is moderately high potential for scaling up, since there are many other urban centres in the Lao People's Democratic Republic where such ideas may easily be replicated, if supported through a strengthened institutional control mechanism and governance process. Since the mechanisms and tools are likely to employ elements of the ecosystem, rather than conventional engineering solutions, the project could be a step towards sustainable development and therefore a valid investment.

16. The entire approach is innovative. It draws on an earlier application of EbA in rural areas for a similar purpose, but is adapted to urban complexities. The intended changes in the existing regulatory regime will require innovation involving the participation and continued engagement of individuals and will be key to sustain the EbA approaches.

17. There are only a few examples from developing countries where EbA approaches and tools are employed to address urban flooding issues. If successful, the proposed project is likely to inspire many other cities to follow suit along the Mekong River across South-East Asia, and in many other parts of the world. The project offers major learning opportunities. Moreover, the proposed institutional strengthening will occur through a process of enhancing skills of current staff and overall capacity-building, while the management aspect will be strengthened through a participatory process involving various urban stakeholders. All these are likely to contribute to raising awareness in the Lao People's Democratic Republic and also beyond the national territory.

18. The theory of change (TOC) indicates both scaling-up opportunities and replication potential. The TOC also places EbA in the purview of an ICFMS, which is likely to be realized through a consultative and participatory process. The project activities focus on knowledge generation, sharing and management, so that the participatory processes will inform decisions bringing greater resilience against climate-induced floods in future years.

19. However, there is an apparent weakness in the planned activities to achieve the project objectives. This concerns the lack of a thorough analysis of the political economy of land management in and around urban areas and with the potential for political interference. If the relevant institutions are not adequately empowered, establishing governance could be quite challenging and may jeopardize the success of the project. It is therefore necessary to create an enabling environment for the institutions to implement the legal regime and apply control mechanisms effectively. Political buy-in of the concept of EbA for urban flood management is required and greater emphasis on this aspect is necessary.

20. The existing policy regime in the Lao People's Democratic Republic has not taken EbA on board, mostly because there is little awareness of its efficacy in solving a complex issue such as urban flood management. However, if endorsed by the Board the current project would help policymakers understand the concept and integrate it in policy for the benefit of the people of the Lao People's Democratic Republic. The paradigm shift potential for the project is found to be high.

1.3 Sustainable development potential

Scale: Not reported

21. The project is in alignment with the globally endorsed Sustainable Development Goals (SDGs). The ultimate objective of the project aligns fully with SDG 11, which calls for sustainable cities and communities. Since EbA will be implemented, the project therefore serves towards

achieving SDG 13 (Climate Action). In addition to these two SDGs, the project will have indirect contributions to achieving SDG 15 (Life on Land), by conservation of the wetlands and protection of the watersheds. The positive contribution of resuscitation of urban and peri-urban wetlands and reservoirs to help inhabitants maintain their health is also of importance (SDG 3, Good Health and Well-being). However, in the wake of climate change, poor and inadequate management of water bodies around an urban centre may lead to increased risk of mosquito-driven health hazards such as malaria and dengue. The consequences of having water bodies around urban centres will largely depend on the efficiency of management by the related institutions.

22. The concept of EbA already revolves around the well-being of an ecosystem, which in turn is an environmental priority in any society. The resuscitation of drainage streams and channels, the enhanced capacity of reservoirs and wetlands to accommodate more water when in need (i.e. in a time of flooding), and the potential percolation and recharge of groundwater through permeable layers instead of concrete (only applicable in public institutions) will have significant environmental benefits for the four target cities. The aquatic flora and fauna could greatly benefit from such conservation and restoration activities. The water bodies may also be converted into recreational parks with planned development, in order to offer greater ecosystem-based services to the urban population. This in turn could offer employment potential for the urban poor.

23. The greatest environmental co-benefit may arise from hydrological enhancement of the built-up areas of the cities. Increased groundwater recharge potential is high. An abundance of moisture in the top soil profiles will tend to counterbalance urban heat stress, a significant phenomenon with adverse health implications in cities under climate change. The EbA may thus offer significant positive social and economic benefits through improvements in environmental as well as health conditions.

24. The proponents propose that fish species that eat mosquito larvae be released and raised purposefully in the wetlands so that adverse health effects could be managed. If the flood reduction objective is blended adequately with environmental targets such as pollution control, the wetlands could be turned into large fish ponds, thereby adding an economic dimension to the ecosystem services. The management of pollution and sludge is also a key concern. If polluted water is released in wetlands beyond management control, the potential recharge of groundwater aquifers can lead to irreversible loss of the aquifer water. Realization of the above environmental co-benefits will largely depend on the overall management effectiveness of the institutions involved.

25. Avoided cost of damage due to floods is already very high for the target cities in the Lao People's Democratic Republic. Although full analysis is yet to be completed, the primary estimations indicate amounts that are extremely high. The urban economic drivers such as commerce and industries can benefit significantly due to reduced risks from flooding. The poor and marginalized groups also gain economically, especially from the reduced threat of sudden layoffs following a leave of absence caused by the inundation of low-lying homes in areas where the urban poor and marginalized groups often live.

26. As indicated above, the potential improper management of wetlands can lead to hazards provoked by the proliferation of mosquito-driven diseases. On the other hand, EbA as planned can have benefits such as combating urban heat stress. Moreover, water supply can accrue benefits if the health of the water bodies is well managed and potential pollution can be prevented in both surface-water bodies and groundwater aquifers. Much depends on the exercise of control mechanisms by the institutions involved without any negative interference.

27. The participation of stakeholders is passive but is an important mechanism to build social cohesion and remove mistrust among competing stakeholder groups. Water bodies are considered as sacred to many societies. A collective effort towards the restoration and

preservation of cultural aspects of the use of water bodies could itself be a significant element in societal cooperation.

28. Literature suggests that an urban flood always affects women disproportionately compared to their male counterparts. At a minimum, floods impede movement, increase workload as regards household chores, create problems undertaking work or curriculum activities, especially for girls. Therefore, a reduction in flooding will have positive results for women. This project therefore potentially generates greater benefits to address gender-differentiated flood hazards in the target cities.

29. The adverse health risks due to mosquito-driven diseases must be contained. The potential risk of pollution of urban wetlands needs to be managed and controlled at source. Taking these into consideration, the independent Technical Advisory Panel (iTAP) finds the sustainable development potential to be medium.

1.4 Needs of the recipient

Scale: Not reported

30. The recipient country, the Lao People's Democratic Republic, is a least developed country (LDC) and also among the countries most vulnerable to climate change. The historical meteorological data and trends presented in the proposal clearly support the claim that the country has been experiencing rising surface temperatures and dwindling rainfall behaviour. As indicated above, high intensity rainfall has already been observed, with particular reference to stations representing the four target cities. The country is located along the Mekong River and is already faced with higher intensities of floods. In an average year, floods affect about 2.9 per cent of the total population (i.e. some 200,000 people), causing the deaths of about 40 people and inflicting a damage toll of 2.8 to 3.6 per cent to gross domestic product. For an LDC, such high losses are often irrecoverable. Climate change-induced floods alone may cause an annual damage figure of USD 5.78 billion by 2030, most of which may take place in urban areas of the Lao People's Democratic Republic. The flood of 2018 caused total damage of USD 372 million. Such economic losses are not sustainable for an LDC such as the Lao People's Democratic Republic.

31. As occurs in many LDCs, the rural poor often migrate to urban centres to make a living. In the Lao People's Democratic Republic, the urban population is growing fast, which is evidence of a gradual polarization of poor people in the urban centres. However, climate change-induced hazards such as floods essentially ruin opportunities for livelihoods and can lead to destitution. The current poverty level stands at 23.2 per cent in urban areas, and this population is highly vulnerability to becoming flood victims. The need to reduce flood risk is paramount for the urban poor as they cannot cope with the high intensity floods and are unable to return to their ancestral villages where they no longer have access to productive resources.

32. Different institutions are involved in urban management and flood management. In many cases the issue of climate change has not been integrated into the routine activities of these institutions. The human skills necessary to address the exacerbated risks associated with the problems of climate change are inadequate. The relevant national institutions require capacity-building support in terms of technologies, human skills to interpret warnings and link them with risks and management priorities. The control function for updating and enforcing advanced guidelines for urban development is completely inadequate. The national institutions need immediate support to build capacities and to adopt an integrated flood management approach that is coordinated across various relevant institutions. The importance of EbA and the valuation of ecosystem services need to be internalized before such integration can take place.

33. As in other LDCs, there is a dearth of financing to address issues such as urban flood management. On the one hand the Government of the Lao People's Democratic Republic has

been finding it difficult to invest adequately for the priority social and economic sectors such as health, education and food security. Meanwhile, climate variability and change have made financial decision-making increasingly difficult as the impacts of flooding are exacerbated, and consequently aggravate poverty. Moreover, the financial support of development partners related to flood management often tends to divert critically important investments into heavy engineering solutions. As a result, funds are rarely allocated for proven EbA alternative solutions to flood reduction. GCF financial support appears critically important to test the application of EbA in an urban setting and set standards for future adaptation pathways.

34. The anticipated results of the proposed project will bring about public goods and services in target cities. The private sector does not generally venture into such investments, no matter how small an investment is required. The private sector has no interest in establishing an EbA regime and strengthening the relevant national institutions for improved management capacities. It is therefore not realistic to envisage small-scale financing from the private sector of the Lao People's Democratic Republic. Financing is extremely difficult due to the inability of the Government to invest and the absence of a relevant private sector.

35. The absence of EbA in the policy horizon is a further issue. Despite some piloting in rural areas, the successes have not been sufficient to attract decision-makers to invest in such innovative ideas. There is also a risk of failure, especially if political buy-in for the concept of EbA cannot be established. It therefore appears that the financing risk of experimentation to reduce climate change-induced flood hazard must also be borne by GCF. However, given the potential of the concept, the investment appears worthwhile as the process will provide good lessons to learn from. The iTAP is of the opinion that the overall needs of the recipient appear medium to high.

1.5 Country ownership

Scale: Not reported

36. The issue of flood management is highlighted in almost all the relevant national policy and strategy documents. The risk of climate change-induced floods is understood and well articulated in the national adaptation plan of action, national adaptation plan, national climate change strategy and the strategic plan on disaster risk management in the Lao People's Democratic Republic until 2020. The draft law on disaster risk management and climate change also highlights the need for flood management in view of climate change. The proposed project is also relevant to the green growth objectives of the country, as outlined in the national socioeconomic development plan. The strategic alliance of the broader project objective with national climate change strategies, risk reduction strategies and the nationally determined contribution is noteworthy. Therefore, the project is generally in alignment with existing national policies and strategies. However, the modality to deliver the risk reduction function, the application of EbA, is not articulated in the policy regime as a viable modality to achieve the project objective. As indicated earlier, the application of EbA is not embedded in the decision-making processes. Therefore, policy integration is only partly accomplished.

37. However, the proponents have attempted to include relevant national bodies and decision-making processes in all aspects of project design and have received positive feedback. The organogram and the activities suggest that a careful integration process will be initiated in the implementation phase of the project. The proposed National Project Steering Committee consists of all major national institutions, which is likely to contribute to improved inter-agency coordination.

38. The institutions involved in the process have consistent track records and relevant experience. The United Nations Environment Programme (UNEP) is the accredited entity for the project. UNEP has been promoting EbA globally and has been active in delivering adaptation projects with finance from the Least Developed Countries Fund, Special Climate Change Fund

and Adaptation Fund. In addition to serving as the accredited entity, UNEP will act as the EE for one specific activity (i.e. activity 1.2.1) to conduct a study on ecosystem valuation.

39. The lead EE will be the State of the Lao People's Democratic Republic, acting through its Ministry of Natural Resources and Environment (MONRE). The lead EE has the national mandate to deal with flood management, to protect and enhance natural environmental resources, among others. The Department of Disaster Management and Climate Change (DDMCC) will be directly involved in execution of the project. DDMCC is located within MONRE. In order to enhance implementation efficiency, MONRE and DDMCC will coordinate with relevant institutions such as the Department of Water Resources, Land Administration, Department of Meteorology and Hydrology, and the Executive Office of the Environment Protection Fund; the latter will be a vital source of finance for future sustenance of the project beyond its timeline. In the recent past, MONRE has delivered a number of projects roughly the size of the proposed project.

40. The project document bears testimony that the project is designed in consultation with the national designated authority (NDA) and also with representatives of civil society organizations, non-governmental organizations, academia, international development agencies and all key national line ministries and departments. There is a lack of evidence regarding the inclusion of gender and marginalized groups including people with disabilities in the stakeholder consultations. However, separate stakeholder consultations have been organized in each of the target cities before deciding that EbA will be at the centre of the approach to reduce urban flood vulnerability under climate change. The NDA has endorsed the project and served an official no objection letter to GCF with request for financial support.

41. Although the proponent of the project is UNEP, the proposal places decision-making responsibility with in-country institutions and intends to strengthen the domestic system to ensure accountability. However, the analysis on political economy is missing and consequently the establishment of good governance to sustain an EbA solution remains questionable. Due to a lack of analysis of the key stakeholders who cause impediments to available drainage capacities by encroachment and/or by land grabbing, it is not clear whether the representatives of such key groups and their political patrons were duly consulted to determine that EbA would be the potential solution. The project, however, is viewed as a pilot and should therefore provide an opportunity to understand the dynamics of flood management in urban areas of the Lao People's Democratic Republic.

42. Capacity-building is the key towards empowering local institutions and particularly the local actors. However, training alone will not empower local bodies. The upgrading of standard land-use directives, the integration of legal enforcement with coordinated institutional frameworks and participation of all stakeholders, including the private sector, are key elements to embark upon an ICFMS. Pollution control must also be linked with ICFMS. In view of the above analysis, the overall country ownership appears medium.

1.6 Efficiency and effectiveness

Scale: Not reported

43. The project budget is estimated at USD 11.5 million, where a total of USD 10 million is sought from GCF as grant. The rest (USD 1.5 million) will be borne by the lead EE.

44. The majority of the budget (some 57 per cent) is allocated for building institutional capacity and the creation of an enabling environment, without which the project outcomes will not be sustained. As a test case, real allocation for implementing EbA is kept low, within 39 per cent of the budget. Only 4 per cent of the allocation is earmarked for bearing the project management cost, which is highly cost effective and is probably due to the non-costed management of MONRE personnel, who are likely to play a vital role in the implementation processes of the project.

45. The project will be assisted by the involvement of international consultants, especially in the valuation of ecosystem services and also to implement EbA in the Lao People's Democratic Republic. However, the real challenge will be to hand over the technical know-how that would be retained among local personnel. Both these elements are necessary to test a concept that is somewhat new and innovative in the context of the Lao People's Democratic Republic. The function of knowledge management, including generation and sharing, will be vital for the realization of future replication and sustenance of the EbA.
46. The recipient country belongs to the LDC group. Since special provisions are in place in the United Nations Framework Convention on Climate Change for LDCs, it is also given preferential treatment by GCF within the purview of its governing principles. In light of such provisions, grant financing for the Lao People's Democratic Republic is fully justified including the implementation of an innovative idea to reduce vulnerability to climate change-induced flood in urban areas.
47. The finance is expected to address a number of barriers, which are adequately discussed in the pre-feasibility study report. Therefore, GCF finance will be utilized to remove a few existing and critically important bottlenecks towards implementing a sustainable solution to floods in urban areas of the Lao People's Democratic Republic. The financial structure involves co-financing from the lead EE (i.e. MONRE), which will be an in-kind contribution. This is usual in light of past GCF financing practices. Moreover, the co-financing ratio of 1:0.15 is also typical for adaptation projects for developing countries. The financing sought will not crowd out any private financing for the same or similar causes, therefore GCF financing is well justified.
48. The project proponent did not envisage potential to catalyse private sector financing by the project. The experimental nature is perhaps the primary reason for not including any possibility of catalyzing private sector financing. If such EbA-led approaches succeed in the Lao People's Democratic Republic, it is expected that private sector financing will automatically occur with a reduction in flood vulnerability of the target cities. Therefore, a short-term leveraging of private sector finance may not be envisaged at this stage, although possibilities of future private sector financing should not be ruled out if the flood reduction indeed takes place following the implementation of EbA. In the long run, the investment is likely to be effective in drawing in private financing. In addition, poor households will be able to significantly reduce the cost of damage to assets, while the Government will be able to save the amount being mobilized to serve humanitarian needs of poor and marginalized people in the occurrence of a major flood. The proposal claims that, over 20 years, the avoided flood-related losses could be USD 110.84 million for the four target cities. In this view, the project outcome is cost effective.
49. The EbA interventions considered for this project have been shown to have net positive economic impacts. This is primarily because of the fact that EbA solutions are generally low-cost and the return potentials are high. When the economic efficiency of project interventions is compared with those of conventional engineering measures, EbA solutions appear much more cost-efficient in economic terms.
50. Project delivery will be facilitated by the involvement of city-level project steering committees, as proposed. This will also help develop an inter-agency coordination, which is absolutely essential for sustaining the project outcomes. Since the project is innovative in nature, it should be strengthened by means of stakeholder participation and day-to-day involvement of local-level institutions and personnel. This element will ensure cost effectiveness and increased project efficiency.

II. Overall remarks from the independent Technical Advisory Panel

51. Based on the above discussions, the iTAP recommends the Board endorse the experimental project.



52. The iTAP also recommends the accredited entity to:
- (a) Carry out a political economic analysis for each of the target cities so that the key stakeholders are all engaged from inception of the project and work closely to embark upon a sound governance system for the ICFMS to succeed; and
 - (b) Strengthen the environmental management framework in anticipation of greater functions regarding pollution control in each of the four target cities and integrate such aspects in future integrated environmental management frameworks.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (SAP009)

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

Accredited entity: United Nations Environment Programme (UNEP)

Impact potential

We thank the iTAP for the review. UNEP is in general agreement with the points raised with some clarifications.

One of the weaknesses of the project is not studying political economy around urban development (i.e. land use change), especially when it relates to encroaching into drainage facilities, including land grabbing in urban and peri-urban wetlands system.

On political economy, during project preparation the team analysed factors contributing to flooding, including land use-related factors. There were observations of some encroachment into buffer areas—some are private developments while a few are settlements of poor families. The process of developing an Integrated Climate-resilient Flood Management Strategy (ICFMS) for each city will include proposed strengthened regulatory measures (e.g. building permitting system, urban planning and zoning, enforcement) in close consultation with interest groups, private developers, residents and other stakeholders to avoid further encroachment in the future. This will be complemented by promoting community awareness on the value of buffer areas for flood reduction.

Paradigm shift potential

However, one may find an apparent weakness in the planned activities to achieve the objective of the project regarding the non-existence of a thorough analysis of the political economy of land management in and around urban areas and its relationship with political interference.

On the issue of land management, institutional roles and regulatory environment are described in detail in the feasibility study based on consultation with relevant government agencies and development partners. Following the iTAP recommendation in their overall remarks, there is room to expand this analysis. Political economy factors will be analysed during the process of the development of ICFMS, including key interest groups and stakeholders that have influence over outcomes of EbA and integrated flood management in each city. This analysis will also identify risks and mitigation measures.

The paradigm shift potential for the project is found to be high.

We agree that the main strengths of the project lie in innovation and high paradigm shift potential. Lao urban areas offer an ideal opportunity to implement and measure the benefits of urban ecosystem-based solutions due to geography, relatively low densities, and the beginning of some EbA initiatives and awareness through technical assistance and development projects.

Sustainable development potential

The proponents argued that, mosquito larvae eating fish species will be released and raised purposefully in the wetlands, so that adverse health effects could be managed.

To clarify, the project will not release mosquito larvae-eating fish into the wetland as introduction of new species may carry risks. Instead, EbA interventions overall will reduce health risks to urban residents by improving water quality as well as reducing the extent of flooding. Monitoring and risk management of vector-borne diseases is included in the Environmental and Social Management Framework and would be pursued as part of the ICFMS.

The potential risk of pollution of urban wetlands needs to be managed and controlled at source.

On water quality of the wetland, water quality will be assessed under Activity 1.2.2 and will continue to be monitored and managed. Based on field observations and studies of Charles Sturt University, the baseline water quality does not appear to be severely degraded and surrounding communities do not use weed killers and expressed a wish to be trained better on organic farming techniques. As the wetland is a vital fishing area for communities there is also an incentive to protect water quality, including through the wetland management plan that will consider potential water quality impacts from existing small-scale fishponds. For clarity, the project will not promote large fishponds and aquaculture in the wetland. Existing artisanal fishing methods appear more compatible with wetland use. In brief, the management plans will continue to monitor water quality, but this issue is not foreseen to be high risk.

A lot depends on whether the institutions involved will be able to exercise control mechanisms without any negative interference.

The ICFMS process promotes a transparent, consultative, and deliberative process to discuss issues related to integrated flood management and ecosystem-based adaptation. It will become a forum for different stakeholders and their interests to be discussed and where agreements on the strategy will be made. The project also supports the regulatory functions of key agencies responsible for land use, building and infrastructure at the local level. The focus is on supporting existing legal frameworks and their enforcement (Activities 1.1.1 and 1.2.4).

Needs of the recipient

The other issue is the absence of EbA in the policy horizon. Despite some piloting in rural areas, the successes have not been adequate to attract the decision-makers to invest in such innovative ideas. There exists some risk of failure as well, especially if the said governance regime cannot be established due to the inability to organise political buy-in for the concept of EbA.

EbA policy in Laos, while in the incipient stages, is being built over time. In 2013, national guidelines on EbA practices for the country was published by the Executing Entity. In 2016, the Asian Development Bank, a key player on infrastructure development in the region, published a case studies report called Nature-based Solutions for Building Resilience in Towns and Cities, promoting green solutions for adaptation. An urban EbA project is currently being implemented in Laos by UNEP under GEF-financing, together with three other countries. The project will result in policy briefs and decision-making tools to support local government EbA planning. This project is part of broader initiatives by the Lao government, supported by development partners, in promoting EbA. To support political buy-in for urban solutions in particular, investments and test cases need to be implemented to demonstrate success. This is what the project aims to achieve through Outcome 2 activities. Moreover, the

ICFMS process will strengthen governance on EbA and integrated planning. Follow up actions will mainstream the ICFMS into sectoral policies and regulations (Activities 1.2.3 and 1.2.4).

The iTAP is of the opinion that the overall needs of the recipient appear medium-high.

We generally agree with the assessment, particularly that GCF support on urban EbA in a Least Developed Country setting is crucial, amid a financing gap. For the factors mentioned by the iTAP, our view is that the needs of the recipient are high.

Country ownership

There is a lack of evidence regarding the inclusion of gender and marginalized groups including people with disabilities in the stakeholder consultations. However, separate stakeholder consultations have been organized in each of the target cities before deciding that EbA will be the centrepiece of the approach to reduce urban flood vulnerability under climate change.

On lack of evidence including gender and marginalized groups, the community consultations report shows inclusion of women and elderly. Some village chiefs and officials were also women. The Gender and Social Inclusion Assessment and Action Plan and Stakeholder Engagement Plan outline steps to promote the gender sensitive approach of the project.

However, the analysis on political economy is missing, which is why the establishment of good governance to sustain with EbA solutions remains questionable.

As discussed above in the response on paradigm shift potential, political economy analysis will be done at the start of the project. The project supports governance with the involvement of key institutions at the national and local levels, through training, developing coordination mechanisms and decision making fora through the ICFMS, and learning by doing through the execution of project investments.

It is unsure whether the representatives of such key groups and their political patrons were duly consulted to determine that EbA would be the potential solution.

Extensive consultations were done at different levels, with national ministries, provincial and district-level officials, and communities at village level. Specific groups with practices that have potential negative impacts on drainage and land use such as Special Economic Zone managers, fishing and irrigation cooperatives, and local residents were part of this consultation process. Overall, there is keen interest on how to work with the project to solve flood issues that affect most groups.

Efficiency and effectiveness

The function of knowledge management, including generation and sharing will be vital for the realization of future replication and sustenance of the EbA.

We agree that local knowledge on urban EbA is key in sustaining activities, hence developing the knowledge hub in Activity 1.1.2 and promoting the approach of pairing international with national consultants.

The project proponent did not envisage potential to catalyze private sector financing by the project.

Drawing in private sector financing through regulatory mechanisms, particularly in Special Economic Zones, will be pursued in the project (Activities 1.1.3, 1.2.3, and 1.2.4).

Overall remarks from the independent Technical Advisory Panel:

The iTAP also recommends the Accredited Entity to do the following:

- (a) Carry out a political economic analysis for each of the target cities so that the key stakeholders are all engaged from the inception of the project and work closely to embark upon a sound governance system for the ICFMS to succeed; and*
- (b) Strengthen the environmental management framework in anticipation of greater functions regarding pollution control in each of the four target cities and integrate such aspects in future integrated environmental management frameworks.*

We thank the iTAP for the endorsement and recommendations.

Further analysis of political economy, including interest groups, private developers, and other stakeholders, for each of the target cities will be conducted at the start of the project that would inform stakeholder engagement and the ICFMS process.

Water quality monitoring within the project timeframe is included in the Environmental and Social Action Plan, which specifies that the recruited safeguards officer will be primarily responsible for monitoring key environmental indicators including water quality and presence and abundance of indicator species. More broadly, water quality monitoring and management in the wetland and streams will be included in the wetland and stream management plans (Activity 2.1.1 and 2.2.2, supported by the engagement of the National University of Laos for sustainability beyond the life of the project.

Gender documentation for SAP009

UNEP Funding Proposal for the GCF

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

Annex 4: Gender and Social Inclusion Analysis and Action Plan

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1. Introduction

The main results of the analysis in this document are the following:

- The analysis of gender in Laos benefits from understanding the ethnic context. Laos is a multi-ethnic country and patterns of gender relations differ across ethnic groups.
- There is overall complementarity in gender roles among women and men. Some types of livelihoods are differentiated along gender lines while others such as rice farming are less differentiated.
- Through illustrative examples, the analysis shows that women's sources of power and roles can be rooted in the people's relationship to the environment and how development projects in general need to be careful in promoting interventions that disrupt existing patterns and sources of women's power in their communities and families.
- In the proposed project, the activities will not likely have negative impacts on gender relations. The activities that are most related to gender and social issues are ecosystem restoration and the development of management plans under Outputs 2.1 and 2.2. As included in the Gender Action Plan, positive actions to further ensure equitable benefits and participation of women and men in the project will include:
 - In specific contexts, conducting separate consultations with groups of women and men;
 - Ensuring equitable representation and participation of women and men in community management committees, including in leadership roles and monitoring activities;
 - Based on consultations and a participatory planning process, the management plans developed for the wetland and streams will equitably consider benefits to livelihoods of women and men;
 - Sites identified for restoration work in the wetland and streams will also take into account equitable benefits to women and men, particularly for livelihoods such as fishing where women and men are demonstrated to fish in different locations in the Nong Peung wetland;
 - The economic valuation of wetlands and streams will take into consideration economic benefits of ecosystem services to women and men, where they are differentiated;
 - Information generated by the knowledge hub would be accessible to women and men;
 - Capacity building activities will benefit women and men equally;
 - Awareness raising campaigns in communities to be led by women and men;
 - Opportunities to engage in restoration work will be equally available to women and men, provided women choose to engage in types of work required;
 - Overall, gender targets in the Gender Action Plan will be promoted, taking into consideration women's preferences and time availability to participate in the activities, and these targets will be monitored and reported on.

2. Background

This analysis focuses on gender in the Lao PDR, located in the cultural region of Southeast Asia. In the 2018 Gender Gap Report of the World Economic Forum the Lao PDR received a score of 0.748, ranking 26th out of 149 countries assessed, second only to number 8-ranked Philippines in Asia.¹ The next closest countries are Thailand and Vietnam with ranks of 73 and 77 respectively. These countries show wide disparities in population and per capita GDP with

¹ Other sets of statistics conflict with those of WEF. Compare for example the rank of 26th out of 149 countries in the WEF Gender Gap Report with that of the UNDP Gender Inequality Index which ranks Laos 106th out of 159 countries. The WEF numbers are used here as they agree more closely with decades of anthropological literature and other qualitative studies such as ADB (2001, 2006) and World Bank (2005).

which there is no apparent correlation in Gender Gap ranking. Likewise, there is no correlation between the various sub-indexes, such as between women’s educational attainment, where Laos ranks 105th, and economic opportunity where they are indeed ranked first in the world.

Table 1. The Gender Gap Compared: Laos in relation to its neighbouring countries (Source WEF 2018)

(Out of 149 countries)	Laos	Thailand	Vietnam	Myanmar	Cambodia
Population (millions)	6,758	68,863	94,569	52,885	15,762
Per capita GDP	6,397	16,287	6,172	5,592	3,645
Global Gender Gap Score	26	73	77	88	93
Economic Opportunity	1	13	33	35	29
Education attainment	105	72	101	98	105
Health and Survival	98	1	143	61	1
Political Empowerment	89	89	99	133	94

The breakdown is shown in Table 3. Statistics in the Lao PDR are always skewed due to high levels of ethnic diversity and few sources provide reliable disaggregation by ethnicity. An example is literacy. In 2000 UNESCO carried out a comprehensive tested literacy study with a sample size of 26,000. The disaggregation by ethnicity are revealing:

Table 2. Literacy rates by ethnicity in the Lao PDR (Source MoE/UNESCO 2002)

	Male	Female	Total
National secured functional literacy level	37.4%	24.5%	30.8%
Lao-Tai (Kra-Dai)	47.6%	33.5%	40.3
Mon-Khmer	28.6%	17.2%	22.7%
Sino-Tibetan	22.1%	14.6%	18.3%
Hmong-Mien	28.7%	06.8%	18.1%

Note, for example the rate for Hmong-Mien women of 6.8 percent. In the 2015 Census the literacy rate for Hmong women is listed at 70 percent. Setting aside the methodological differences and the time gap, this discrepancy is still difficult to explain.

Table 3. Breakdown of Sub-indexes by sex for the Lao PDR (source: WEF 2018)

	rank	score	avg	female	male
Economic participation and opportunity	1	0.915	0.586		
Labour force participation	5	0.984	0.669	80.8	82.1
Wage equality for similar work (survey)	24	0.736	0.645		
Estimated earned income (PPP, US\$)	1	1.000	0.510	7,165	6,880
Legislators, senior officials and managers	1	1.000	0.329	59.0	41.0
Professional and technical workers	1	1.000	0.753	50.4	49.6
Educational attainment	105	0.968	0.949		
Literacy rate	106	0.883	0.882	79.4	90.0
Enrolment in primary education	102	0.989	0.978	92.8	93.8
Enrolment in secondary education	118	0.980	0.967	59.8	61.1
Enrolment in tertiary education	1	1.000	0.939	16.1	15.4
Health and survival	98	0.971	0.955		
Sex ratio at birth	1	0.944	0.921		
Healthy life expectancy	106	1.033	1.034	58.8	56.9
Political empowerment	89	0.137	0.223		
Women in parliament	49	0.380	0.284	27.5	72.5
Women in ministerial positions	123	0.080	0.208	7.4	92.6
Years with female head of state (last 50)	71	0.000	0.189	0.0	50.0

As of the latest census in 2015, Urban literacy rates overall, and for the areas selected for the project, are high, and the disparity between males and females is small. These rates are not tested,² so overall, they are probably high. It is relevant that urban areas are inhabited primarily by ethnic Lao-Tai groups for whom literacy rates are 95 for men and 92 for women, very close to the total urban rates of 96.2 and 90.8 for males and females respectively, as shown in Table 4.

Table 4. Urban Literacy Rates in Project Areas (Source: Lao Statistics Bureau 2015)

	Lao PDR	Vientiane City	Paksan	Savannakhet	Pakse
Male	96.2	98.8	95.7	95.1	96.7
Female	90.8	97.3	89.0	89.1	92.5

The Gender Gap ranking is of course based on a large number of other indicators, but nevertheless it is clear that statistics do not tell the whole story. To complement the presentation of statistics, the analysis that follows explores

² That is, the rates are derived by asking the village chief or other official “how many in the village have attended school?” There is no determination whether, having gone to school, an individual can read and write.

more specifically the social dynamics of the Lao PDR with respect to gender, and the status of this situation in relation to potential gender impacts resulting from the current Green Climate Fund project on Building Resilience of Urban Populations with Ecosystem-Based Solutions In the Lao PDR.

Finally, given the essential gender complementarity³ of the Lao PDR, it can be assumed that where there appear to be imbalances between men and women's participation in various areas, this may be the woman's choice, a result of considering what does or does not make sense from a Lao woman's perspective as can be seen in the literature cited. For example, some gender statistics show an inequality in women's participation in parliament and ministries. It may be that for Lao women this is a personal choice, not evidence of discrimination against women.

Socially speaking, Laos falls into the cultural area of Southeast Asia, as separate from East Asia and South Asia. Many of its distinctive characteristics relate directly to gender as will be discussed below. It is a region with a high degree of biophysical diversity paralleling ethnolinguistic diversity found in each province. The latter necessitates placing the utmost value on ethnographic detail since gender matters cannot be addressed without regard to ethnicity and social organization. The two most important social parameters in this regard are (1) the cultural as well as physical distinctions between upland and lowland, and; (2) bilateralism (cognatic kinship systems⁴ and gender complementarity).

Lowland cultures in Laos have more in common with each other than either does with upland cultures that may be geographically closer. With respect to gender, there is more variation among upland groups, ranging from patrilineal (e.g. Hmong) to matrilineal (e.g. Pray). But even here, with in-depth analysis, bilateral influences are strong.

Compared with the neighbouring regions of China and India that are traditionally typified by male dominance and stark opposition between the sexes, Southeast Asia has been characterized as an area of complementarity as opposed to stratification, an area where history presents powerful female figures including queens and sultanas (Van Estrik 1995; Whitmore 2000). In Vietnam the Trung Sisters are considered the first rulers, the fifteenth century queen of Burma, Shinsawbu, played an important Buddhist religious role as well as a role in the establishment of trade centres throughout the country, and female rulers were common throughout the history of the various island states of Indonesia, such as Aceh where a final succession of four sultanas in the seventeenth century marked their demise, although female leaders continued to play a strong role in the war against the Dutch (Reid 1988).

Social and ecological conditions that account for the relative equality of Southeast Asian women have been suggested, among them (Van Estrik, 1982):

1. availability of new frontier land and women as pioneers in land development;
2. low population density on the mainland that lend importance to women's work in agriculture and in the household;
3. rice production and farm management systems dominated by women;
4. the late development of centralized states distancing patriarchal states from local cultures;
5. the predominance of bilateral kinship, and an emphasis on matrilocality;
6. the inheritance of land by daughters;
7. women's control over money and management of family finances.

³ The view that women and men have different but complementary roles is an approach accepted in anthropological research in Southeast Asia.

⁴ A system of bilateral kinship where relations are traced through both a father and mother.

Typically, in Southeast Asia, for girls, sexual experience is sought independent of family censorship, but without losing one's perceived natural gender attributes. For women these include femininity, being sexually accommodating, motherhood, homemaker, food processor, economic manager, and keeper of communal ritual relations. For men, the comparable attributes would include masculinity, aggressiveness, hunter, economic provider, guardian of political and religious institutions. However, what sets Southeast Asia apart is the flexibility and fluidity of the boundaries between masculine and feminine, and the considerable degree to which either sex may easily and gracefully veer into the territory of the other. Thus in Southeast Asia male dancers are typically 'feminine' and female politicians or businesswomen may appear 'masculine,' without upsetting the social equilibrium (Karim, 1995, Ockey, 1999, Ong, 1995).

Gender complementarity may be vulnerable or threatened and even transformed into gender stratification when new meanings of gender are acquired from outside influences, including development projects. While this is not the case for the proposed project, when major upheavals are undergone, such as in cases of relocation of villages, or when access to natural resources is denied, women lose control of agricultural land and may cease to participate in rituals for ancestors. Their power to preserve culture may be lost as a result. This dialectic between bilateralism and ecological change leads to gender asymmetry that is detrimental to women (Karim 1995).

Gender complementarity, bilateralism, and hierarchies defined by age rather than sex therefore lie at the heart of any gender research undertaken in the region.

Time and space do not permit a comprehensive analysis that would capture the details of gender inclusion for each of the 50 ethnic groups in the country. Therefore, some representative examples will be provided in the section that follows.

3. The roots of exclusion: women and ethnicity

Gender roles in Laos, even in urban areas, are largely traditional or were so until recently. In this environment, Gender and Social Inclusion concerns cannot be examined without an ethnographic approach. The cultural premises that define each group determine the impacts upon gender relations. More in-depth research becomes mandatory, but if put into practice should lead to increased benefits for women and ethnic minorities in the form of successful interventions. The literature of development is replete with negative examples of what happens when development projects fail to take language and culture into consideration or fail to understand the on-the-ground realities of how lives are lived. A few examples are offered here as exemplary, divided by ethnolinguistic stocks.

3.1 *Mon-Khmer*

In the Mainland Southeast Asia Mon-Khmer ethnic groups are found widely distributed in Vietnam, Laos, Thailand, Cambodia and Burma. Most (but not all) prefer to live at higher altitudes and carry out swidden cultivation on mountain slopes. They are, in these situations, vulnerable to social upheaval as a result of large hydropower development and the construction of roads and railways. One Mon-Khmer group, the Khmu, is the second largest ethnic group in the country.

Relocation in cases of involuntary resettlement mandated by social safeguards often removes people from their original homes and livelihoods with traumatic affects upon individuals, households and communities. In one study (ADB 2006) focused on the Nam Ngeum watershed in Vientiane Province, the location of six large hydropower projects. It was found:

In their world views or ways of thinking and learning the Mon-Khmer groups studied are all rotational swidden cultivators. In these systems the work of the swidden is carried out essentially by women who are the providers of sustenance through their care for the rice, vegetables and wild forest edibles such as various arthropods, amphibians, piths, stalks, shoots, mushrooms, and so on. The provision of food is then a source of women's status and power. Pounding of rice and food preparation is another source. In addition, women are the primary suppliers of water and firewood. Metaphorically, water represents rain and fertility, and fire is the hearth, centre of warmth and the family. Fire is also the means by which raw food becomes cooked and hence the emblem of civilization. Likewise, preparation of food for spirits of the rice, the fields, the water and the forest and the tutelary spirits of the land, is done by women regardless of whether or not they actually perform the ceremonial functions (as these roles differ among the various ethnic groups). The swidden is the source of biodiversity (which gives life to the forest) and the heart of the ecosystem, the woman is the heart of the swidden and hence, on one hand she is the progenitor of the ecosystem, and on the other the source of human life (childbearing) and sustenance for the family by virtue of the swidden. ... When swidden systems are eliminated or damaged so too these inseparable corporeal and spiritual sources of female power may pass into oblivion together with biodiversity and the ecosystem.

Also, in this area, some Khmu and Phong people were allowed to remain in upland locations but with reduced land areas to cultivate. Rotational swiddens which originally required a 10-year fallow period for the soil and forest to regenerate, were reduced to a 3-year cycle. The impact on women was severe.

In one example an ethnic Phong village in Phoun District, one hectare of swidden used to produce 2 tons of rice, whereas following the shortening of fallow cycles one hectare then produced only 700-800 kilograms. The ecological imbalances caused an increase of grasses that need to be weeded by women. In the past the weeding of one hectare would take approximately 5 days, but after shortening the fallow cycles it takes two weeks. Furthermore, weeding originally needed to be carried out only twice during a growing season, but after this had been done four times prior to harvest. That means women must spend two months or 60 days out of every year weeding one hectare of swidden compared to only ten days in the past, a 600 percent increase in labour.

Yet it is a price Khmu and Phong women were willing to pay in order to maintain their symbolic, spiritual, and very real roles as providers and sustainers in the family and in society.

3.2 Hmong

Hmong cultural conditions are somewhat different.

The Hmong arrived in Laos relatively late in 1810 from Guizhou and Hunan in China via northern Vietnam. Hmong ethnic minorities are found in Thailand and Vietnam as well as in southern China. They belong to the Hmong-Mien ethnolinguistic family that originates in China and are often cited in gender studies as the archetypal male dominated ethnic group. Hmong society is stratified by both age and gender, their social structure focuses on strict patrilineal clans characterized by exogamy where a wife must move into the patri-clan of the husband and the children become part of the male line.

By comparison to Mon-Khmer women, whose source of power lies in the ecosystem, Hmong women are recognized as essential to the continuity of life and the survival of the lineage, while men ostensibly rule the patriarchy.

However, patrilineal social organization does not always imply female disadvantage. Dr. Patricia Symonds (2004), an expert on Hmong gender, who lived and worked with Hmong people for more than 25 years, notes the following.

The anthropological debate on gender inequality and the universality of gender-based oppression is no longer at the forefront of gender studies. To understand what, to a Westerner, appears to be an unequal relationship between Hmong men and women, we have to conceptualize our analysis within the Hmong social structure. The discourses on gender hierarchy introduce Western arguments and then place certain cultures, such as the Hmong at the low end of the development hierarchy due to what is perceived as the low status of women. But even if we abandon the concept of and arguments around gender asymmetry, we are still left with the question of how to comprehend a stratified society. What measurements do we use to comprehend the meaning of gender in such a society? Does gender stratification lead to inequality? Or can we interpret the asymmetrical relation between men and women as complementarity instead?

In the same study mentioned above (ADB 2006) it was found that in Hmong villages men and women share labour in the various activities more than in the Mon-Khmer villages, including cooking at ceremonial rituals. The main division of labour is the more natural one where men carry out the heavy labour tasks such as the felling of large trees and hunting, while women care for children. In the swiddens, although men actually decide on locations to be cultivated, the tasks of clearing, burning, planting, weeding, harvesting and transporting are all shared by both men and women.

3.3 Akha

The Akha belong to the Loloish branch of Tibeto-Burman. They are found in Burma, Yunnan, Laos and Thailand.

A useful term is “patterned shifting asymmetries” (Kammerer 1988) referring to the calendrical interplay of rituals for spirits associated with rice and rice production where women have prominence, and ancestor rituals where men have the dominant responsibility. These are interwoven in an annual cycle that together maintains cosmic continuity which is dependent upon the unity of husband and wife. That is to say, the relative importance of men or women waxes and wanes according to the cycles of calendars and of life.

Kammerer (1988) noted that when the traditional ritual system is attenuated and loses its force due to social upheaval or impoverishment, especially as the state continues to regard traditional religions as backward, women begin to lose their innate advantage, and even though artificial legalities are put forward to protect “women’s rights”, so-called empowerment is often an illusion and in the end women suffer more. All that remains is hard work without the cosmological compensation.

With reference to the Lisu, another Tibeto-Burman group related to the Akha, Kleine-Huteesing (1995) notes that for what she refers to as marginal or rim societies of Southeast Asia, with reference to customary rights and property, fair treatment of the sexes is inferred. But with changes brought on that affect niches and the environmental settings these rights are in danger of being lost to more patriarchal forces in the name of economic development. It is necessary, she suggests, to identify and distinguish what are the forms and degrees of penetration by these forces into the ecology. She concludes:

The breaking point of sexual equality is when female and male prestige systems undergo a mutation of meaning. It is when males have access to consumer goods, markets, and class associated symbols, that male honour becomes a more pervasive symbol of power than female honour. The power of possession may make men more powerful than females who become seemingly more illiterate as they fail to acquire the language and symbols of industrialized modernity. (p.92)

Conditions such as this arise when villages are relocated and when women's roles in agriculture are diminished and men become the primary source of income based on hiring out labour outside of the village, acquire mainstream languages and provide cash for the household, and women must remain at home to care for children. The balance of power within the family is lost.

3.4 Lowland Societies

The ethnic groups located in the planned project areas of Pakse, Savannakhet and Paksan are all lowlanders, and even though, as in Savannakhet and Pakse, residence is in urban areas, thinking is still bound by assumptions that surround lowland wet rice agriculture. Many still hold title to rice fields outside of the city.

That is, peri-urban and urban areas, are peopled by societies whose thinking is agrarian. The majority of lowland people outside of cities are rice farmers, and the majority of lowlanders in the project areas are Theravada Buddhists and belong to the Tai ethnolinguistic family. Other lowland groups in Southeast Asia include Cambodian and Vietnamese (Mon-Khmer), Burmese (Tibeto-Burman), and Cham (Malayo-Polynesian).

Religion is an important factor where women are concerned. It has been suggested that,

... one reason for the success of Theravada Buddhism in early Southeast Asia was its appeal to women. The maternal metaphor, a prominent theme in Buddhist texts, was both familiar and relevant to the lives of all females, regardless of their social standing. Translated into a local environment, the interaction between motherhood and merit-making provided new opportunities for lay women to display their piety and strengthened their links with the monkhood. (Andaya 2002)

The major foreign element found in the local consultations for the project is Vietnamese and Chinese. Vietnamese religion is primarily syncretic, a mixture of Confucian and Taoist beliefs coupled with local cults. While Confucianism is notoriously patriarchal, it remains a Sinitic overlay on a fundamental Southeast Asian bilateralism.

4. Ethnicity in the Project Areas

The three project locations visited were the cities of Pakse in Champasak Province, Savannakhet (Kaysone Phomvihane) in Savannakhet Province, and Paksan in Bolikhamsay Province.

Pakse is the capital of Champasak province. In former times, at least since the 7th-8th century, the nearby ruins of Vat Phou marking the centre of the Champa Kingdom. This was a Khmer kingdom that later fell under the greater Khmer empire beginning in the 10th-11th century until the fall of Angkor. The Lao Kingdom of Lan Xang took over the territory in the 14th century, including adjacent parts of Cambodia in Rattanakiri and Steung Treng where Lao is still spoken. The people of Pakse city are all ethnically Lao and speak a dialect of Southern Lao.

Savannakhet (and Khammouane) was part of Champa as well, until the arrival of Lan Xang. The city is also ethnically Lao, and the local dialect is similar to that of Pakse.

Paksan has a quite different history. The people of the city belong to several non-Lao Tai speaking groups: Phouan, Nyo, and Meuy, all of who arrived here from different directions. The Phouan are descendants of another old kingdom, at least as old as Lan Xang located in what is now Xieng Khoang Province, often referred to as Meuang Phouan. According to the annals, they reached an agreement with Lan Xang to coexist. Then, over the following years they were caught in the middle of battles between Lan Xang and the expansionist Vietnamese, rulers of Dai Viet and later Hue. The Siamese deported many Phouan to Thailand in an attempt to depopulate the area and deny

their manpower to the Vietnamese who were threatening Siam in the 19th century. Many Phouan people escaped and took up residence in areas along the way, including Paksan.

The Nyo people belong to an ancient group of Tais known as Ou (Nyo) Yue, Tais whose closest relatives live in Guangxi Province, China. They were at one time living in Thanh Hoa, Vietnam, and gradually moved south through Nghe An and then into Laos to escape the Soek Cheuang wars of the late 19th century.

The Tai Meuy, are a Tai group, closely related to Red Tai, who also lived in Thanh Hoa and Nghe An. Like the Black, White, and Red Tai groups social organization is based upon patri-lineages, usually attached to an interdicted animal such as monitor lizards, tigers or hornbills, depending upon the lineage. Lineages should not be confused with clans such as those of the Hmong discussed above. Lineages are not exogamous and seem to be a remnant of an earlier social system about which little is known.

All of these Paksan groups appear to be merged with one another in the villages visited. In any event, they all belong to the Lao-Tai ethnolinguistic family and follow the social characteristics of other lowlanders as discussed. The impact upon gender relations would not be anticipated to pose problems for implementing the project as the essential bilateralism would still prevail as a basic premise. With respect to identification of indigenous peoples⁵, the Paksan groups consulted are not usually considered as ethnic minorities, and do not appear to think of themselves as separate from the mainstream, at least not in the urban areas. In one of the project villages, Padsum, there seems to have been an overt agreement to refer to themselves as Phouan, even though many families derive from Meuy or Nyo. No doubt this is because Phouan is more prestigious as an ethnonym, being associated with a former kingdom with a royal family.

5. Gender Roles in Project Areas

Stakeholder consultations were carried out between March 28 and April 6 2019, in Pakse, Savannakhet, and Paksan. The report is included in Annex 3 of Annex 12: Environmental and Social Action Plan. There was good representation of women in the consultations in Pakse and Savannakhet. Two out of seven village chiefs consulted in these areas were women and there were many female deputy chiefs and officers. In Paksan, however, most of the participants were men in the two villages consulted.

The reasons for the differences in women's participation between the cities could be because of different factors. It may be worth noting that the consultations in Pakse and Savannakhet were conducted during weekdays, and men may have been at work if formally employed. In Paksan, the consultations were done on a Saturday. The difference in participation can also be partly attributed to ethnicity. In Paksan, the Phouan and Nyo people have patrifocal cultures, but not to a degree that could be labelled gender exclusion. The Tai Meuy people who also live in Paksan have patrilineal kinship ties but that does not affect the typical Southeast Asian patterns of residence and inheritance.

In Paksan, the most agriculture-oriented among the three cities, both women and men share tasks related to agriculture and fishing. Some activities are usually limited to men, such as fishing in certain areas or frog hunting alone at night. Ploughing and harrowing, which were formerly strictly male activities, are now carried out by both women and men after the introduction of hand tractors.

The consultations discussed how floods affected women and men differently. Women, particularly in Pakse, recounted how children could not go to school, poultry were killed, vegetable gardens were destroyed, and that

⁵ In compliance with International Finance Corporation Performance Standard 7.

they could not go to the market to buy food. Men, particularly in Paksan, described crop and livestock losses and loss to their businesses. The difference in reported damages may not be along gender lines, but also according to location. The villages visited Pakse and Savannakhet are more urban and have livelihoods oriented near homesteads, while in Paksan larger areas are available for farming and aquaculture.

In Pakse, some of the women consulted requested ducks and chickens as these were the assets usually damaged by floods. Support for livelihoods and compensation for losses, is however, outside the project scope. There are general differences in livelihood practices where men would take larger animals such as water buffalos for pasture grazing. Ducks and chickens are usually kept by women in the homestead. Fishing patterns in the Nong Peung wetland are gender-differentiated. Complementary gender roles were observed by Millar et al.⁶ where women catch a greater variety of fish and fish closer to the villages than men.

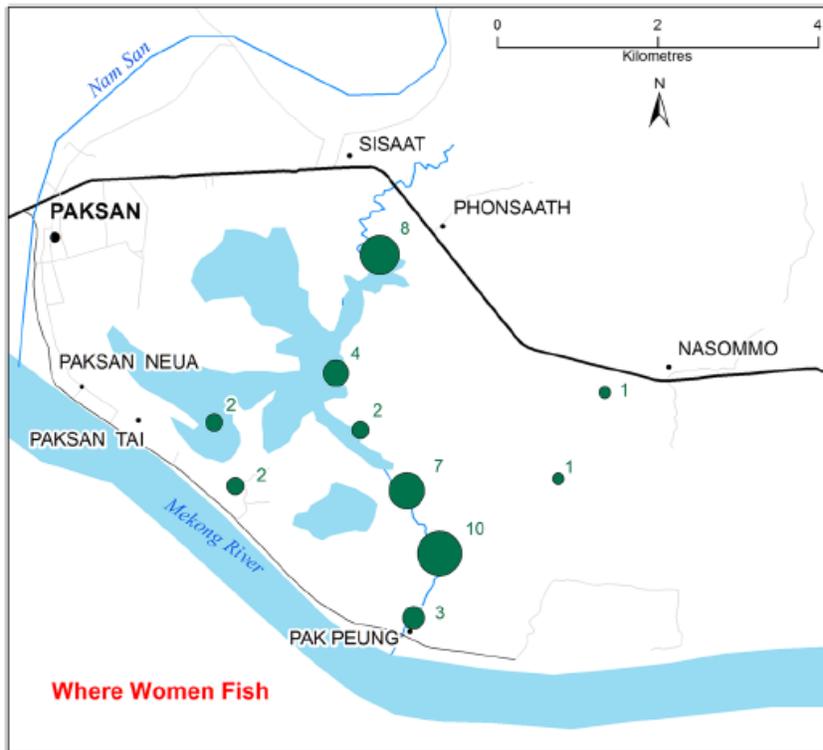


Figure 1. Fishing areas for women in the Pak Peung wetland⁷

6. The challenge of economic valuation

In social safeguard policies of the World Bank and IFC, the fundamental premise is to ensure that project affected peoples are at least as well-off or better-off than they were prior to being resettled. Since there will be no resettlement associated with the present project, this is not entirely relevant, but it is worth mentioning that the

⁶ Millar, Joanne et al. 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: The case of Pak Peung wetland in Lao PDR.

⁷ Millar, Joanne et al. 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: The case of Pak Peung wetland in Lao PDR.

definition of 'well-off' is usually interpreted in an economic sense and is measured by statistical economic means. Unfortunately, this rarely agrees with the value systems of those who are affected. In upland societies whose presence would trigger the implementation of the Indigenous Peoples safeguards, economics and politics are embedded in religion and the concept of 'ritual prestige.' And for both uplanders and lowlanders their concern is with quality of life as opposed to standard of living. If "as well-off as" is measured only in countable terms, the implication is that women and men may work twice as hard as before for a return that only just equals their prior condition. Other aspects of lifeways: convenience, access to forests and rivers, aesthetic value, and so on, are not measurable by statistical means and therefore not included in safeguard packages.

Where affected populations include multiple ethnic groups as is often the case, usually lowlanders have the advantage. They speak the language of the majority, of the policy makers, and the investors. Upland minorities will be less able to compete. Since our project affects only lowland people this does not become an issue.

Another major potential problem with project development and its link to safeguards has been the role of the state in carrying out safeguard policies. Some states have been known to use safeguard policies for their own purposes, especially in amalgamating people from a number of small villages to form larger towns in the process of implementing the social safeguard on involuntary resettlement; or, opening up protected areas for outside exploitation in the name of environmental management. This aspect of safeguard implementation is particularly challenging as it is always necessary to include government personnel in decision-making. While hierarchical labelling by development agencies, such as 'least developed country'⁸ and development indexes are used based upon economic statistics in part to acknowledge different levels of vulnerability and in turn allocation of resources, leaders of states begin to see themselves as inferior in the eyes of their neighbours and Western countries, and respond with coercive measures aimed at eradicating 'primitivism' in their respective countries causing much hardship in communities of indigenous peoples. Again, this is mentioned here as a cautionary tale. It is also not unusual for governments to view infrastructure as superior to nature, a precarious stance in the light of global climate change and the objectives of the project.

7. Conclusions

Gender issues in Laos are complex and do not fit well into a Western or universalist frame of reference. To be able to relate each group to the ecological setting, to the sociocultural changes that have occurred, to the ideational systems of the various societies and to that which defines gender relations, to the gap between the ideal and the actual, and to the impact of all of these on women and then to the ecosystem, is a challenge indeed.

In principle, based upon socio-cultural characteristics of the country, there is no reason that exclusion should occur based on gender or ethnicity. Problems arise when outside values are applied to indigenous knowledge systems and when these latter are not investigated and understood in sufficient detail to allow for equal inclusion of women and men in participatory processes – *in their own milieu*. Consultation frameworks that take into consideration differences in language and culture are especially important, as is the continual application of gender and safeguard policies throughout the life of projects rather than only at the beginning. In summary, the proposed project is consistent with existing gender dynamics, particularly supporting ecological functions and ecosystem services, including food production, that underlie women's source of power in these agrarian communities.

⁸ In the GCF and climate negotiations, recognizing the different needs of countries, LDC, African states, and Small Island Developing States as a group are entitled to 50% of the Fund resources for climate change adaptation.

Table 5 summarizes socio-cultural characteristics that need to be taken into consideration when assessing the gender situation in Laos. These have all been culled from sources listed in the References section of this analysis. They can be of use when seeking compliance from IFC, though the Project is not expected to trigger either Involuntary Resettlement or Indigenous Peoples Performance Standards.

Table 5. Summary of General Socio-Cultural Characteristics related to Gender in Lao PDR with respect to IFC Performance Standards

	Labour	Time	Resources	Culture
Women	<p>Preference: <u>Sociality</u>-done in groups, diurnal, continuous but low energy. When these are ignored then women can be negatively impacted. In general:</p> <p>(1) All activities are carried out with other persons present [activities done alone are the exception];</p> <p>(2) All activities are simultaneous or multifaceted [single or mono-faceted activities are the exception]</p>	<p>Traditional: <u>Atemporal</u>, <u>detemporalized</u>, <u>cyclical</u>. When these are expected to change in terms of how time is utilized by women, psychological stress can result. Traditionally,</p> <p>(1) no activities have strict time constraints [rushed activities are the exception]; (2) the only fixed activities (that must be carried out daily) are rice and food preparation.</p>	<p>Access to resources such as land, forests, and water are critical to a woman's position in the family for whom she is responsible. Seed for next season's planting is also managed by women and rice in storage is allotted by women for daily consumption. In non-rural settings natural resources may be replaced by other substituted commodities such as food or fuel. This is true even when cash for purchases comes from a man's labour and is handed over to the woman for management.</p>	<p>Implementation of projects needs to allow sufficient time for in-depth research to fully understand women's roles and how they will change as a result of planned interventions. Especially risk-prone are shifts from complimentary to stratified gender roles that result from devaluation of women's labour contributions, and the threat of resultant upsets to social equilibrium.</p>
Men	<p>More individual, can be solitary, can be at night, short spurts of high energy.</p>	<p>Traditional: <u>Atemporal</u>, <u>detemporalized</u>, <u>cyclical</u>. Men can cope more readily and may not appreciate the additional pressures placed upon women who are still expected to carry out household chores as usual.</p>	<p>Access to natural wild resources from hunting and fishing is mostly men's responsibility. This role may be denied by resettlement plans with serious repercussions such as resorting to illegal activities like logging or wildlife trade.</p>	<p>Men, in the wake of social impacts, such as the stress involved in the need for cash, are more prone to alcoholism and depression. Drug use is frequently high among teenagers whose roles are not foreseen.</p>
Household	<p>Many male activities such as hunting and felling large trees are now outlawed, motivating men to seek employment outside of the village where they become</p>	<p>(1) time is not uppermost in thinking and this results in, or is reinforced by, cultural systems and structures that serve to immobilize time;</p> <p>(2) in determining</p>	<p>Typically, good land is unavailable under resettlement conditions, necessitating high labour inputs. When labour requirements for subsistence are</p>	<p>Depending on the residence patterns after marriage of the various ethnic groups, second and third generation expansion is often not taken into consideration for livelihoods and land</p>

	<p>more familiar with the outside world, while women remain at home with children. This changes the balance of power in the family from the woman to the man. Economically, households are essentially self-supporting without interdependencies with other households.</p>	<p>value of an activity, energy expended takes precedence over time expended; (3) the unit of analysis in development work would more usefully be regarded as the 'activity' rather than 'time'; and (4) gender roles are fluid, those that have traditionally been associated with women's time use shift easily to men (and vice-versa) when convenient. The balance of time expended for livelihoods may change when women are expected to perform both household as well as livelihood activities. Often resettlement plans do not take this into consideration, and time spent in childcare may not be factored into development plans.</p>	<p>high, children's labour may outrank education as a necessity. In most rural settings in the Mekong Region, wild food is a vital element in household economies. Livelihood restoration or planning needs to maintain this element to be successful.</p>	<p>for housing. This may lead to overcrowding in resettlement sites, and over-harvesting of wild resources in areas set aside for collection of NTFPs and firewood.</p>
<p>Community</p>	<p>Reciprocity between members of the community is paramount and necessary for harmonious relations. Communal labour requirements need to be balanced.</p>	<p>Time is cyclical, based upon lunations and calculations of the interaction between denary and duodenary cycles. Communities rely on this system and may be confused by reliance on the Georgian calendar. The premise of cyclicism is at once complex and contradictory. The agricultural cycle stands as the prototype for the cultures with which the GSIA is</p>	<p>Project benefits need to be calculated according to an ethnic definition, not solely on the basis of economic return. Most upland peoples, for example, measure production as a return on labour not as a return on land. Thus, planned agricultural production taken as a whole may not be considered satisfactory if labour inputs are too high.</p>	<p>Spiritual considerations are important in all cultures and need to be well-studied in carrying out projects and mitigations. Sacred forests, cemeteries, as well as shrines and temples need to be a part of planning.</p>

		<p>concerned, with annual seasons and biological changes connected to the larger cycles of the universe by numerous rituals that form an inseparable part of the production process. This gives birth to the notion that time is cyclical, as opposed to linear, that the past is as important as the future as evidenced by the emphasis on the propitiation of ancestors. Cycles are contradictory because while they mark the passage of time, they are unchanging.</p>		
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8. Gender Action Plan and Budget

Impact Potential. The project will confer adaptation benefits in the form of flood reduction, increased ecosystem services from wetlands and streams, and increased knowledge directly to ~74,600 people living in villages near project interventions. Laotian cities are growing at a rate of 4.9% per annum. Through improvements in planning, policy and institutional capacity for urban EbA and integrated flood management, project activities will also indirectly benefit ~825,000 people in Vientiane, Paksan, Savannakhet and Pakse. This will contribute to Fund-level Outcome A7.0: Strengthened adaptive capacity and reduced exposure to climate risks. In addition, the project will contribute to GCF impact area A.4.0: Improved resilience of ecosystems and ecosystem services.

Targets for women's participation differ across project activities and range from 30% to 50%. These targets are based on the above GSIA and the findings of the community consultations undertaken during project development (see Annex 12: ESAP, Annex 3 Village Consultation Report). The baseline for these targets will be validated at project inception by the Monitoring and Gender Officer through gender workshops in each city (budgeted under Activity 2.1.1.) and household surveys. This will ensure that targets reflect local realities and women's preferences. To track whether these targets are being met the Monitoring and Gender Officer will monitor project interventions and continually collect data, which will be combined with the findings from community surveys at mid-term and the end of the project. This will include household surveys of a sample of randomly selected households at mid-term and the end of the project; these surveys will include questions targeted to gender aspects and all data from household surveys in general will be disaggregated by sex.

Based on the findings of the GSIA, ESAP and community consultations, various gender considerations have been incorporated in the project design. This includes: i) the wetland management plan which will be developed through a participatory process that will specifically consider the voices of both women and men in the local communities; ii) the establishment of community wetland and stream management groups that will have equal male and female representation; iii) the requirement of female representation in all project decision-making structures, including the Project Steering Committee; and iv) the environmental and social management framework of the ESAP which includes provisions for gender balance.

The Monitoring and Gender Officer will be a full-time position in the project management unit. This officer will be responsible for: i) incorporation of gender aspects in stakeholder surveys/consultations in collaboration with the staff/consultants/firms responsible for surveys/consultations; ii) validation of gender target baselines at project inceptions; iii) ongoing collection of sex-disaggregated data for monitoring of gender targets; iv) implementation of gender action plan in collaboration with PMU colleagues; and v) advising project staff on gender aspects across all project activities.

This Gender Action Plan will also be facilitated through the project oversight provided by the Accredited Entity, UNEP. As a UN agency, UNEP follows the UNEP Gender Equality and the Environment Policy and Strategy. All relevant UNEP and UN regulations and practices will be adhered to; also, for Activity 1.2.1 for which UNEP will be the Executing Entity. All other project activities will be executed by the main Executing Entity, MONRE, which will be required to follow UNEP guidelines on gender, in addition to its own policies on gender inclusion. MONRE staff responsibilities for implementing the GAP will be coordinated by the Monitoring and Gender Officer working in the PMU under MONRE.

The delicate balance or "shifting asymmetries" in gender relations in Laos suggests that the principle of "first do no harm" be adopted in implementing the Gender Action Plan. In the project sites, an underlying social cohesion exists that should not be disturbed, and that can be an asset in coping with the effects of climate change.

Activities	Indicators and Targets	Enabling Actions	Timeline	Responsibilities	Costs
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					
<i>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</i>	<i>Equal inclusion of women and men in training and capacity building in urban EbA. (minimum 50% participation by women in capacity building training, study trips or workshops)</i>		<i>Years 1 to 5; Q2–Q20</i>	<i>MONRE, PONRE, Local Administration, Project</i>	

<p>Activity 1.1.1. Build the capacity of national and local representatives for using urban EbA to manage climate change-induced flooding.</p>	<p>Women shall be engaged in these technical activities. In the cases of MONRE and MPI relevant gender balance (50% women) can be achieved, but perhaps less so for the highly technical areas where women have traditionally shown little interest. The international knowledge-exchange trip will include at least 30% women. These targets will be measured using the indicator of % female involvement and will be verified through surveys among government staff and workshop participants.</p>	<ul style="list-style-type: none"> • Formulate gender specific targets and outcomes • Make early, regular and formal communication to concerned government counterparts on such gender targets. • Include social issues when designing the content of trainings, workshops and study trips. • Extend invitations to non-technical experts, participants from other ministries and civil society organizations. • Include women’s and men’s responsibilities when deciding on the date, time, duration and location of the workshops and trips. 	<p>Years 1 to 5; Q2–Q20</p>	<p>MONRE,PONRE, Local Administration, Project staff</p>	<p>US\$16,800 (This cost covers the travel costs of a target of 7 women for the knowledge exchange trip. This target is ~30% of participants in the trip.)</p>
<p>Activity 1.1.2 Establish a national knowledge hub that produces and disseminates information on urban</p>	<p>Given the smaller female presence in engineering enrolments at the university and in public service, the project will strive for gender balance</p>	<ul style="list-style-type: none"> • Formulate gender specific targets and outcomes • Include social issues when designing the 	<p>Years 1 to 5; Q2–Q20</p>	<p>MONRE, Project</p>	<p>US\$25,000 (5% of the knowledge fund will contribute to gender mainstreaming across the knowledge hub activities)</p>

EbA interventions locally, regionally and internationally.	(30% women), within reason. At local levels, gender parity is more likely. This indicator of % women's representation will be verified through surveys and interviews with knowledge hub staff, engineering students and public servants.	<p>content of trainings, workshops and study trips.</p> <ul style="list-style-type: none"> • Monitoring and Gender Officer to support the design of context-appropriate messages that can promote gender-equitable participation in EbA and flood management activities. • Map out the different needs and preferred information channels of both women and men. • Design messages in plain language and images. • Use multiple channels to disseminate the information, including those that can reach out to both women and men. 			
Activity 1.1.3 Conduct awareness-raising campaigns in each of the four target cities for communities and the private sector on	Awareness raising will be carried out by women and men through existing local community groups including the National Women's Union. The campaign will also be	<ul style="list-style-type: none"> • Formulate gender specific targets and outcomes • Make early, regular and formal communication to concerned government 	Years 1 to 5; Q2–Q20	PONRE, Local Administration, Project	US\$52,500 (15% of the total cost of the meetings that will be conducted under this activity as well as the design of the awareness raising

<p>urban EbA and flood management.</p>	<p>designed to be relevant, and accessible to men and women, and will aim to reach equal numbers of women and men. This will be assessed through surveys of the channels used for awareness raising, namely: community management committees, village governance structures, water-user associations, and the National Women's Union local structures.</p>	<p>counterparts on such gender targets.</p> <ul style="list-style-type: none"> • Include social issues when designing the content of trainings, workshops and study trips. • Extend invitations to non-technical experts, participants from other ministries and civil society organizations. • Include women's and men's responsibilities when deciding on the date, time, duration and location of the workshops and trips. • Monitoring and Gender Officer to support the design of context-appropriate messages that can promote gender-equitable participation in EbA and flood management activities. • Map out the different needs and preferred 			<p>campaigns will be allocated to gender considerations.)</p>
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		<p>information channels of both women and men.</p> <ul style="list-style-type: none"> • Design messages in plain language and images. • Use multiple channels to disseminate the information, including those that can reach out to both women and men. 			
<p><i>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</i></p>	<p><i>Planning should include separate planning sessions for women and men in communities after which plans can be merged through consultation and mutual agreement. At the government level planning is carried out in joint sessions.</i></p>		<p>Years 1 to 5; Q2–Q20</p>	<p><i>MONRE, PONRE, Local Administration, Project</i></p>	
<p>Activity 1.2.1 Conduct economic valuation of urban ecosystem services.</p>	<p>A structured social cross-section of each village will participate in the economic valuation, this will include surveys of</p>	<ul style="list-style-type: none"> • Include in the Terms of Reference and advertisements that gender balance and 	<p>Years 2 and 3; Q5–Q11</p>	<p>Project</p>	<p>US\$20,000 (A portion of the total cost of this activity has been allocated to ensure that gender-</p>

	<p>equal numbers of women and men.</p> <p>The enumerators and researchers contracted under this output should be at least 30% women. 50% of those consulted/surveyed should be women.</p> <p>Socio-economic surveys should be gender-disaggregated and include questions that illustrate gender dynamics at the household level, such as flooding's impacts on women's and men's caring responsibilities, concerns specific to women and men, etc.</p> <p>These targets will be assessed by reviewing the economic valuation outputs, quantifying gender representation among enumerators and researchers, and</p>	<p>gender knowledge will be selection criteria.</p> <ul style="list-style-type: none"> • Broaden promotion channels to reach out to potential female and male candidates. • Include both female and male members in the selection panel, with at least 30% of either sex. • Include both feminine (e.g. attention to details, sensitivity) and masculine (e.g. assertiveness, discipline) traits as selection criteria. • Organise separate focus group discussions with women and men as needed. • Conduct such consultations at times and venues convenient to both women and men. • Sex-disaggregate all responses. • Monitoring and Gender Officer to review and 			<p>specific benefits are considered when valuing ecosystems.)</p>
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	reviewing the socio-economic surveys conducted under this activity.	revise the gender-related questions developed by the national consultants.			
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.	<p>Village-level consultations for <i>inter alia</i> the wetland assessment in Paksan will include separate focus groups with women and men., and equal numbers of men and women.</p> <p>30% of the enumerators and researchers contracted under this output should be women, subject to availability of women qualified and interested in these positions. 50% of those consulted/surveyed should be women.</p> <p>Socio-economic surveys should be gender-disaggregated and include questions that illustrate gender dynamics at the</p>	<ul style="list-style-type: none"> • Include in the Terms of Reference and advertisements that gender balance and gender knowledge will be selection criteria. • Broaden promotion channels to reach out to potential female and male candidates. • Include both female and male members in the selection panel, with at least 30% of either sex. • Include both feminine (e.g. attention to details, sensitivity) and masculine (e.g. assertiveness, discipline) traits as selection criteria. • Organise separate focus group discussions with 	Years 1 and 2; Q2–Q7	MONRE, PONRE, Local Administration, Project	Hydrological assessments will be conducted by a technical firm and a gender budget has therefore not been allocated to this activity.

	<p>household level, such as flooding's impacts on women's and men's caring responsibilities, as well as women and men's livelihoods derived from <i>inter alia</i> the Paksan wetland.</p> <p>These targets will be assessed by reviewing the outputs of the village consultations and socio-economic surveys, and by surveys of gender representation among project staff.</p>	<p>women and men as needed.</p> <ul style="list-style-type: none"> • Conduct such consultations at times and venues convenient to both women and men. • Sex-disaggregate all responses. • Monitoring and gender officer to support the design of the gender-related questions. 			
<p>Activity 1.2.3 <i>Develop the ICFMS and mainstream</i> climate change and urban EbA into relevant policies, guidelines and plans.</p>	<p>Stakeholder consultations for the development of ICFMS will include women. For affected communities and civil society equal numbers of women and men will be consulted, while consultations with the private sector will aim to include at least 30% women.</p>	<ul style="list-style-type: none"> • Monitoring and Gender Officer to support mainstreaming of gender into relevant policies, guidelines and plans 	<p>Years 1 to 5; Q4–Q20</p>	<p>MONRE, PONRE, Local Administration, Project</p>	<p>US\$3,000 (10% of the total workshop costs for this activity will be dedicated to ensuring that the ICFMS fully consider gender)</p>

	<p>The ICFMS will include clear gender components and considerations, which will be reported to the Project Manager and Monitoring and Gender Officer</p> <p>Flood Risk Management Committees at the city level will include at least 30% women.</p>				
Activity 1.2.4 Develop national urban EbA guidelines for Laos.	Guidelines will be gender-sensitive and contain articles mandating the gender balanced inclusion of women and men. This will be assessed through reviews of the draft and final guidelines.	<ul style="list-style-type: none"> Monitoring and Gender Officer to support the development of context-appropriate content for the urban EbA guidelines. 	Years 1 and 2; Q2–Q8 and Year 5; Q19–Q20	MONRE	US\$5,000 (A portion of the consultation costs for this activity have been allocated to ensure that the development of these guidelines is undertaken in a gender-sensitive manner.)
Component 2. Rehabilitation and protection of ecosystem in response to climate variability and change					
<i>Output 2.1 Area of wetland restored contributing to flood reduction and sustainable management of the</i>	<i>Women and men participate equally in the management of the wetlands at Nong Peung (minimum 50% of management</i>	Form community wetland management committee with adequate representation of both men and women from diverse socio-economic backgrounds. This committee and the broader community will	<i>Years 1 to 5; Q2–Q20</i>	<i>PONRE, Local Administration, Project</i>	

<i>Nong Peung wetland in Paksan</i>	<i>responsibilities are held by women).</i>	participate in development of the wetland management plan, , in the restoration of the wetland and in maintenance.			
Activity 2.1.1 Develop a wetland management plan for Nong Peung wetland in Paksan.	Women and men participate equally in the development of the wetland management plan for Nong Peung wetland (minimum 50% of stakeholders engaged in the development of the plans are women).	<ul style="list-style-type: none"> • Hire a national gender specialist to conduct the studies to assess gender aspects of different roles in the rehabilitation and management where necessary. • Recruit both female and male enumerators and facilitators (preferably 50/50 gender balance) to reach out to both women and men. 	Years 1 and 2; Q2–Q6 and Years 3, 4 and 4; Q10, Q14, Q17, Q20		US\$15,000 (Gender workshops will be conducted in the target cities under this activity.)
Activity 2.1.2 Rehabilitate the Nong Peung wetland.	Studies will be carried out to assess the role of both women and men in the restoration project (minimum 30% of those hired for restoration or== =work are women, provided that women choose to engage in this work ⁹).	<ul style="list-style-type: none"> • Organize focus groups with women and men as needed. • Conduct such consultations at times and venues convenient to both women and men. • Sex-disaggregate all responses. 	Years 2 to 5; Q5–Q20	PONRE, Local Administration, Project	US\$22,500 (30% of the community engagement workshop budget will be allocated to including women fully in restoration activities.)

⁹ Women’s preferences and availability should be considered when setting and assessing all these gender inclusion targets.

		<ul style="list-style-type: none"> • Hire a national gender specialist to conduct the studies to assess gender aspects across potential roles in the rehabilitation process. • Hold gender workshops to determine gender issues that need to be incorporated in wetland management plan and restoration. 			
<i>Output 2.2. Area of urban streams restored contributing to flood reduction and sustainable management of urban streams in Savannakhet and Pakse</i>	<i>Women and men participate equally in the sustainable management with training provided as necessary (minimum 50% of participants involved with trainings and with management are women).</i>		<i>Years 1 to 5; Q2–Q20</i>	<i>PONRE, Local Administration, Project</i>	
Activity 2.2.1 Restore natural urban streams in Savannakhet and Pakse.	Minimum 30% of those hired for restoration work are women, provided that	<ul style="list-style-type: none"> • Establish community stream management committees that will have equal 	Years 2 to 5; Q5–Q20	PONRE, Local Administration, Project	US\$22,500 (30% of the community engagement workshop budget will be allocated to including women)

	women choose to engage in this work ¹⁰ .	representation of women and men and help to implement gender aspects of stream management plans.			fully in restoration activities.)
Activity 2.2.2 Develop management plans for restored urban streams in Savannakhet and Pakse.	Women and men participate equally in developing stream management plans and for monitoring the management of urban streams (minimum 50% of stakeholders engaged in designing management plans and monitoring management are women).	<ul style="list-style-type: none"> The stream management plan should also incorporate formation of user groups with adequate representation of both men and women from diverse socio-economic background. The user groups can actively participate in planning, management and restoration of the streams. 	Years 1 to 2; Q2–Q6 and Years 3, 4 and 5; Q12, Q16, Q20	MONRE, PONRE, Local Administration, Project	US\$8,438 (15% of the total meeting and workshop costs for this activity will be used to ensure that women are included fully in the development of stream management plans)
<i>Output 2.3 Area of permeable paving solutions installed in public areas contributing to flood reduction in Vientiane, Paksan, Savannakhet and Pakse</i>	<i>Women and men from villages surrounding target public institutions are equally involved in the design process (minimum 50% of stakeholders consulted and involved in the design process are women).</i>		<i>Years 1 to 5; Q2–Q20</i>		

¹⁰ Women’s preferences and availability should be considered when setting and assessing all these gender inclusion targets.

Activity 2.3.1 Design permeable paving solutions for public areas in Vientiane, Paksan, Savannakhet and Pakse.	<i>Women and men from villages surrounding target public institutions are equally involved in the design process (minimum 50% of stakeholders consulted and involved in the design process are women).</i>	<ul style="list-style-type: none"> Recruit both female and male facilitators (preferably 50/50 gender balance) to reach out to both women and men. Organize focus groups with women and men as needed. Conduct such 	Years 1 to 3; Q2–Q9	PONRE, Local Administration, Project. Public Works	US\$27,000 (30% of the community engagement workshop budget will be allocated to ensuring gender balance.)
Activity 2.3.2 Install permeable paving in public areas in Vientiane, Paksan, Savannakhet and Pakse.	<p><i>Women and men from villages surrounding target public institutions will be equally involved in the design process (minimum 50% of stakeholders consulted and involved in the design process are women).</i></p> <p>Firms hired to install permeable paving should aim to employ women and men, provided that women choose to engage in this work¹¹.</p>	<ul style="list-style-type: none"> consultations at times and venues convenient to both women and men. Sex-disaggregate all responses. Firms installing permeable paving will be required to hire each worker with an individual contract with proper safety measures enforced; family work units or child labour will not be allowed. 	Years 1 to 3; Q4–Q12	PONRE, Local Administration, Project, Public Works	US\$20,000 (A portion of the cost of implementing this activity has been allocated to including women (where they express interest) in the installation of permeable paving solutions.)
Full-time Monitoring and Gender Officer contracted for the duration of the project (five years)					US\$225,000
Total gender allocation					US\$462,738

¹¹ Women’s preferences and availability should be considered when setting and assessing all these gender inclusion targets.

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