

# Annex 12: Environmental and Social Action Plan

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

July 2019



*Houay Khi La Meng urban stream in Savannakhet*

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## 1. Introduction

This Environmental and Social Action Plan (ESAP) has been prepared as an annex to the GCF SAP Funding Proposal titled “Building resilience of urban populations with ecosystem-based solutions”. The proposed project will use Ecosystem-based Adaptation (EbA) in four urban areas of Laos, namely in Vientiane, Paksan, Savannakhet, and Pakse, to reduce the impacts of climate change-induced flooding.

The project objective is to foster an integrated approach to flood management and implement ecosystem-based adaptation measures to build the climate resilience of urban communities in Laos. The project interventions are described in more detail in Section 2 below and in the Funding Proposal, the Feasibility Study and its appendices.

This project is classified under UN Environment’s Environmental, Social, and Economic Sustainability Framework (ESESF) as “low risk” or with minimal to negligible potential for negative impacts. Please refer to the Environmental, Social and Economic Review Note (ESERN) in Annex 1 for more information on the screening decision. The corresponding classification of the project under the Green Climate Fund Environmental and Social Management System is Category C, i.e. activities with minimal or no adverse environmental and/or social risks and/or impacts.

Project activities are expected to result in positive environmental and social impacts including increased provision of ecosystem services (such as flood mitigation, fish resources and non-timber forest products, reduced erosion, and others), support to biodiversity and conservation values, improved management of natural resources and solid waste, positive gender outcomes, and community mobilisation and empowerment.

## 2. Proposed project

In Laos, urban residents are especially vulnerable to flooding, as climate change is increasing the frequency and intensity of extreme rainfall events (for details on climate change impacts in Laos, see the Funding Proposal and its Annex 2: Feasibility Study). This is exacerbated by current development practices that do not adequately take flood impacts into account. Laotian cities are frequently characterised by limited spatial planning and buildings, infrastructure and other sensitive land uses are often situated in flood-prone areas. Simultaneously, cities are developing rapidly, and upstream catchments are hardened by the expanding built environment. This results in increased runoff during rainfall events that exacerbates downstream flood impacts. Integrated flood risk management approaches that include ecosystem-based measures have the potential for reducing these flood impacts by supporting increased infiltration, runoff attenuation and water storage. This will *inter alia* reduce peak flows during extreme rainfall events and mitigate the impacts of flooding. In addition to being cost-effective to construct and maintain, EbA interventions also provide numerous co-benefits such as increased biodiversity and habitat functioning, provision of food and non-timber forest products, and many others.

The proposed project comprises the following outcomes, outputs, and activities:

**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.

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 planning<sup>1</sup> with the planning of investments in socio-economic development<sup>2</sup>; 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

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<sup>1</sup> including land use planning and flood risk planning

<sup>2</sup> 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"

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

experience with urban EbA for flood management<sup>3</sup> and is geographically and culturally close to Laos which will promote long-term knowledge exchange<sup>4</sup>.

A national knowledge hub will be established to produce, collate, analyse and disseminate information on local, regional and international urban EbA interventions, including local and indigenous knowledge on EbA. 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 forums<sup>5</sup> 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

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<sup>3</sup> Options for the knowledge exchange trip include Bangkok, Manila, and Singapore. In selecting the city, the considerations include similarity of institutional contexts, relevance of the urban EbA interventions to the Laotian setting, and potential for sustaining linkages across institutions.

<sup>4</sup> The project design adopts similar approaches with the Mekong Integrated Water Resources Management Project (M-IWRMP), which is a transboundary cooperation for river basin management between Laos and Thailand. The project has had successful outcomes in peer to peer learning.

<sup>5</sup> Such as the Asia Pacific Climate Change Adaptation Forum, ASEAN working group sessions, and other appropriate venues.

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 country<sup>6</sup>, 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

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<sup>6</sup> 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.

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 floodplains<sup>7</sup> in Laotian cities. The hydrological models will be used to establish 20-, 50- and 100-year floodlines<sup>8</sup> 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 project<sup>9</sup>.

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. 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

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<sup>7</sup> Floodplains are the areas adjacent to a river that are flooded.

<sup>8</sup> 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.

<sup>9</sup> Options include the Civil Engineering Department of the NUoL or the Public Works and Transport Institute within MPWT.

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.

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 governor<sup>10</sup>. 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
- 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

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.)

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<sup>10</sup> This structure is adapted from the Land Allocation Committees in the GIZ project Land Management and Decentralized Planning.

*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;
  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.
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.
- 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 developed<sup>11</sup>. 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.

## **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

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<sup>11</sup> for further information about the relevant policies, see Annex 2: Feasibility Study.

importance to local communities and their role in flood management<sup>12</sup>. 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 Pakse<sup>13</sup>. 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.

#### 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<sup>14</sup>. 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

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<sup>12</sup> Further details on site selection are provided in Annex 2: Feasibility Study, Section 10.

<sup>13</sup> Maps of the wetland and streams are provided in Annex 2: Feasibility Study, Section 10.

<sup>14</sup> Similar arrangements are expected for the Community Stream Management Committees under Activity 2.2.2.

appropriate indigenous plant species including terrestrial and aquatic plants across 800 ha. 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 species<sup>15</sup> 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. 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 management<sup>16</sup>. 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. These committees will work with the relevant government authorities (PONRE and UDAA) to

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<sup>15</sup> 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.

<sup>16</sup> such as the ADB-funded Pakse Urban Environment Improvement Project.

### 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. 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 through 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.*

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.

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.

Maps of the sites in each city are presented below.

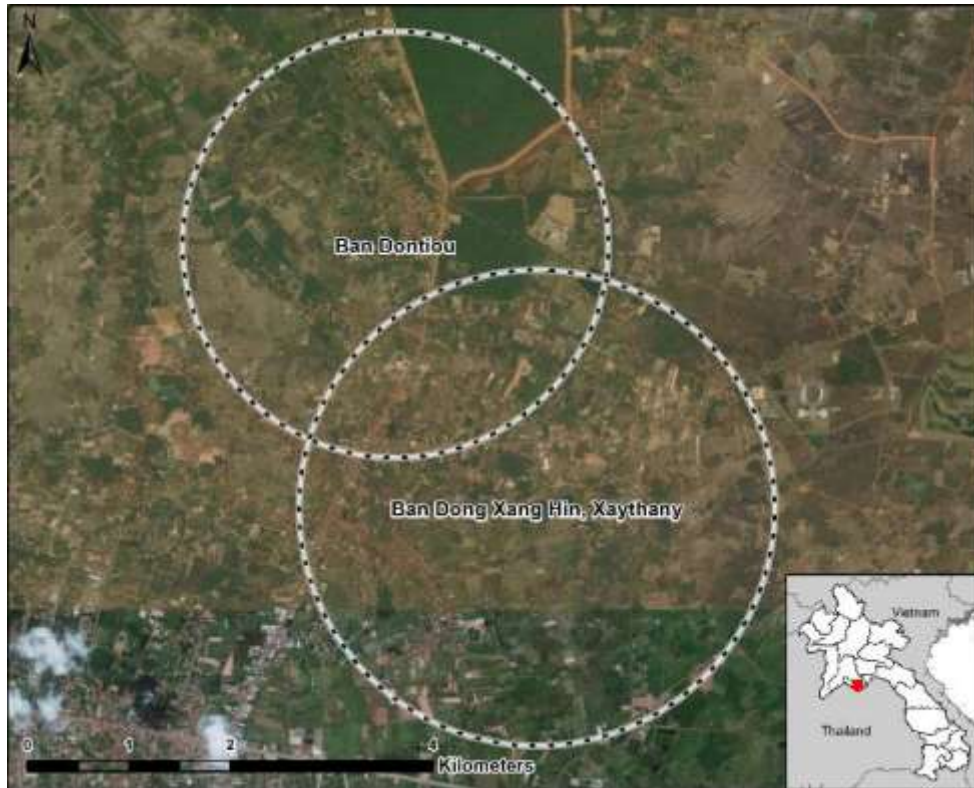


Figure 1. Target areas in Vientiane.



Figure 2. Target area in Paksan. The wetland area that will be restored is indicated.



7. National Strategic Plan on Disaster Risk Management in Lao PDR 2020;
8. National Environment Strategy;
9. Forestry Strategy (2005);
10. Draft law on Disaster Risk Management and Climate Change; and
11. Climate Change Action Plan (2013-2020)

Relevant legislation includes:

1. Environmental Protection Law (EPL) 2012;
2. Environmental Impact Assessment Decree of 2010;
3. Decree on the Compensation and Resettlement Management in Development Projects 2016;
4. Law on Land 2003;
5. Law on Water and Water Resources 1996;
6. Labour Law 2013;
7. Law on National Heritage 2005;
8. Law on Urban Plans; and
9. Law on Investment Promotion.

All project activities will be subject to Laotian law, particularly the Environmental Protection Law (EPL) 2012 (No. 29/NA), which specifies necessary principles, rules and measures for managing, monitoring, restoring and protecting the environment in order to protect the public, natural resources and biodiversity. The Environmental Impact Assessment Decree of 2010 has also been enacted to elaborate on EIA requirements described in the predecessor of the EPL. The Decree identifies requirements for Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA). EIAs contain both Environmental Management and Monitoring Plans (EMMPs) and Social Management and Monitoring Plans (SMMPs). Neither instrument is required for the activities proposed in the project.

In addition to local regulations, UN Environment has internal Environmental and Social Safeguards Standards in place that are monitored and enforced by the agency in all UN Environment projects. These standards have been classified into eight Safeguards Standards and are guided by the human rights and precautionary principles. These Safeguard Standards will be applied as part of the ESAP to minimise the potential adverse impacts of the project throughout its implementation. The Safeguards Standards are listed below:

- SS 1: Biodiversity, Natural Habitat and Sustainable Management of Living Resources
- SS 2: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes
- SS 3: Safety of Dams;
- SS 4: Involuntary resettlement
- SS 5: Indigenous peoples
- SS 6: Labour and working conditions
- SS 7: Cultural Heritage
- SS 8: Gender equity
- SS 9: Economic Sustainability

Moreover, the project will adhere to the GCF Environmental and Social Management System and any obligations UN Environment would incur in the Accreditation Master Agreement and the Funded Activity Agreement. In 2014, the GCF adopted in the interim the IFC Performance Standards for Environmental and Social Sustainability. These performance standards are listed below and broadly overlap with the UN Environment Safeguard Standards.

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts
- PS 2: Labour and Working Conditions
- PS 3: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes

- PS 4: Community Health, Safety, and Security
- PS 5: Land Acquisition and Involuntary Resettlement
- PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PS 7: Indigenous Peoples
- PS 8: Cultural Heritage

The discussion under Section 6 below follows the IFC Performance Standards, where the UN Environment standards differ, e.g. for economic sustainability, they are discussed separately.

## 4. Assumptions

The following assumptions are made about project implementation:

- Project activities will not result in any resettlement. All the project interventions will take place on public land. No resettlement or displacement of economic activities is expected under the proposed project;
- The project sites have been assessed not to occur in any critical habitats;
- Where construction is required – i.e. for the installation of permeable paving – best practices regarding operational health and safety, as well as environmental management, will be implemented;
- Project activities will not result in significant release of pollution or chemicals;
- The project does not have any associated facilities<sup>17</sup>;
- The project is not likely to have cumulative impacts;
- The project does not have transboundary impacts. While some of the project sites are adjacent to the Mekong River which forms the border with Thailand, the project activities will not result in adverse impacts on the hydrology or water quality of the Mekong River. It is expected that the EbA interventions will result in water quality improvements of urban streams discharging into the Mekong River;
- As part of due diligence and through the missions conducted and consultations held with national and local governments as well as communities, there no ethnic groups were identified that are typically classified as indigenous in World Bank and International Finance Corporation projects in Laos.
- Communities will be adequately notified and engaged with throughout all phases of the project as described in the Stakeholder Engagement Plan (see Section 8);
- The consultation processes, management committees, and awareness raising activities will target inclusion of women and all ethnic groups and promote their equitable access and participation in the project, its decision-making processes, and its benefits.

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<sup>17</sup> The project uses the definition of the International Finance Corporation as “facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable”.

## 5. Background and context

### Country background

Laos is a country with a population of 6.858 million people across 18 provinces. The main urban population centers are located from north to south, along the Mekong river in Louang Prabang, Xaynaboury, Vientiane, Paksan, Thakhek, Savannakhet, and Pakse.



All provinces of Laos share international borders with at least one or two countries, with the exception of Xaysomboun. Both Louang Namtha in the north and Attapeu in the south border three countries each. Socio-cultural influences from Thailand, China and Vietnam are particularly strong. The Annamite or Sai Phou Louang mountain chain stretches from Phongsaly in the far north to Attapeu in the far south. In all but one of the provinces of Laos, this watershed divide means that rivers flow from the Annamites into the Mekong. Only the province of Houa Phan lies to the east of the watershed where its streams and rivers drain into the Nam Ma, the Nam Xam (Sông Chu in Vietnamese) and Nam Neun (Sông Ca in Vietnamese) eventually emptying into the South China Sea. Each of the sub-watersheds of Laos shows unique

characteristics, all the more so when the diverse human populations are taken into consideration, each ethnic group interacting in distinct ways with the particular environments.

Laos is assigned a status of least developed country under the United Nations Framework Convention on Climate Change or Lower Middle-Income Economy under World Bank classification. Poverty in Laos is cash poverty (as opposed to hunger), as shown in a number of studies, including two Participatory Poverty Assessments (ADB 2001,2007). Laos has a low population, with a very low population density, the lowest of all ASEAN countries. Wild food has always comprised high portions of diets (ibid) and this is rarely captured in socioeconomic studies. Nutritional problems are not natural but rather result from involuntary relocations where nutritious wild food is replaced by foil packets of junk food (Krahn 2005).

For social analysis purposes Laos can be divided into four regions:

North:	Louang Namtha, Oudomxay, Phongsaly, Xagnaboury, and Louang Prabang;
Central:	Vientiane Province and Vientiane Capital;
East:	Houa Phan, Xieng Khoang, Borikhamxay, Khammpouane;
South:	Savannakhet, Saravanh, Xekong, Champasak, and Attapeu.

While these differ from the conventional North, Central, and South regions delineated by arbitrary lines, the divisions are based on historical, linguistic, anthropological and social commonalities that are more useful for social analyses.

The project will be implemented in three locations. Borikhamxay in the East, and Savannakhet and Champasak in the South. Historically and ethnically, as indicated below, Borikhamxay is substantially different from Champasak and Savannakhet.

### Demographic Characteristics

The Lao population is predominantly rural, with 67.1 percent considered rural and 32.9 percent urban. In the project provinces urban areas constitute 31 %, 20 % and 32 % for Borikhamxay, Savannakhet and Champasak respectively.

#### Population (2015)

Champasak Pakse	77,860
Savannakhet	25,622
Borikhamxay	45,042

#### Population density (persons per km<sup>2</sup>):

Champasak	45
Savannakhet	45
Borikhamxay	18

#### Annual population growth rates by province:

Champasak	-1.3 %
Savannakhet	1.5 %
Borikhamxay	2.0%

#### Annual Births and Deaths (per 1,000 pop.):

Champasak	27	6.6
Savannakhet	24	7.1
Borikhamxay	32	8.0

All the communities visited have electricity and water with education available through secondary school. All the villages have at least one primary school and a preschool within the village limits. The majority of children have attained some level of secondary level education. Likewise, all the communities live only short distances from health facilities, usually the provincial hospital.

### Ethnic groups

Laos is one of the most ethnically diverse countries in the world. While the official number of officially recognized groups is set at 50, this figure is not necessarily the number and categorization determined based on differentiated ethno-linguistic groups. The figure has been approved by the National Assembly. The ethnic groups are classified into ethnolinguistic families, that agree with internationally acknowledged categories. They are:

- (1) Lao-Tai (Kra-Dai or Tai-Kadai)
- (2) Mon-Khmer (Austroasiatic)
- (3) Hmong-Mien (also known as Miao-Yao)
- (4) Chine-Tibet (Sino-Tibetan)

In addition, some 160 *xeng* or subgroups are mentioned, each of them belonging to one or the other of the established 50. These are closer in number to the more than 200 groups that have been identified by recognized scholars in the field.

Some uncertainty surrounds the internal classification of the Lao-Tai group. While “Lao” is in fact a term that can be linguistically defined, and comprises perhaps 30 percent of the total population, a number of non-Lao but related groups have been placed in this category ostensibly for statistical purposes, so that “Lao”, after which the country has been named, show up as statistically more significant. Approximately 53 percent of the population as of the 2015 census are counted as Lao-Tai, but of these about half are ethnic Lao, the rest belonging to ethnic Tai-Thay groups. Another 25 percent are Mon-Khmer, 10% Hmong-Mien, and 5 percent Tibeto-Burman (Sino-Tibetan).

The question then arises as to which of the groups should be considered “indigenous” for purposes of safeguard policies. This has caused much uncertainty as the government does not recognize this category. First, indigenous, as it was originally applied to the first safeguard policy of the World Bank in the early eighties in South America, was used to separate the rather stark dichotomy between American Indians and Spanish or Portuguese settlers. In Laos, the question of which ethnic group were the original settlers is unsettled. Second, indigenous is related to the French “indigène” meaning native, which is likewise a term deemed unacceptable. “Minority” was in use for a brief period but was later rejected as being too difficult to translate into Lao language. The politically approved practice is to refer to each group by their own autonym. In this practice everyone belongs to an ethnic group, including Lao. In everyday usage, however, “ethnic group” has come to mean non-Lao and this is an ongoing debate.

To date, groups belonging to Mon-Khmer, Hmong-Mien, and Sino-Tibetan ethnolinguistic families usually qualify as indigenous under IFC, World Bank, and ADB safeguard standards. There are no populations from these groups in the project areas. But Thai-Tai, with whom Lao people have interacted more closely throughout history, pose a challenge. Many projects classify all Lao-Tai as non-indigenous citing their linguistic and cultural proximity. Many groups, despite their origins, have quite openly and voluntarily assimilated to what they perceive as Lao language and culture. When asked about their ethnicity they usually reply they are “Lao Loum” (lowland Lao), an out-of-date category, but one which unites people, especially in urban areas, as related culturally and linguistically.

Paksan has a different history. The people of the city belong to several non-Lao speaking groups: Phouan, Nyo, and Meuy, all of who arrived here from different locations. 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 19<sup>th</sup> century. Along the way 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 19<sup>th</sup> 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. 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 consciously 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 indigenous peoples, they 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 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.

As can be seen in Annex 2, the Phouan and the Nyo are officially classed as “Lao”, whereas the Meuy (Moey) belong to Number 3, “Tai”, a separate category.

By their own self-identification, in the project area of Paksan ethnic Phouan, Nyo, and Meuy fall into an amorphous (and unofficial) “Lao-Loum” category. For purposes of this area and project, the peoples visited,

- Are economically self-sufficient
- Possess(ed) of a distinct spoken and written Language distinct from Lao
- Have/had their own traditional dress and material culture
- Have/had their own singing, dances, music and ceremonies
- Have ethnic pride, and voice their opinions openly to the government
- Have a considerable historical and literary heritage dating at least from the 13<sup>th</sup> century

Only the Meuy are officially classed as an ethnic minority among the groups listed by the government, and meet the criteria set forth in PS7:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; (until recently)
- Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture; (until recently)
- A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

However, with reference to the intent of the PS as indicated in the introductory paragraph, all evidence indicates that these groups,

- are not “marginalized or vulnerable”
  - while they are not the dominant ethnic group(s) in the country they do have considerable political and administrative authority in the villages shared with each other
- their economic, social and legal status does not “limit their capacity to defend their rights to, and interest in, lands and natural and cultural resources,”
  - they are well-off economically, have very large tracts of land. Cultural pride is evident in a wide array of popular media, and ethnic festivals in which all villagers participate (These have been modified to blend with those of the Lao.)
- and, “their ability to participate in and benefit from development,” is not restricted in any form as far as can be discerned from our investigation.

Based upon information collecting visits to a sample of villages in the projects area, it is clear that the Phuan, Nyo and Meuy have not had their lands and resources “transformed, encroached upon, or significantly degraded” within living memory. Their languages, cultures, religions, spiritual beliefs, and institutions are intact and not under threat. It is highly unlikely, based upon our investigations, that they will suffer “adverse impacts associated with project development” more than non-indigenous communities. The groups are not liable to lose their identity, culture, or natural resource-based livelihoods, nor are they likely to be exposed to impoverishment and disease at any time in the foreseeable future.

Groups in the project areas of Pakse and Champasak are ethnic Lao and do not trigger the Indigenous Peoples safeguards.

The other two project locations visited were the cities of Pakse in Champasak Province, and Savannakhet (Kaysone Phomvihane) in Savannakhet Province. Pakse is the capital of Champasak province. In former times, at least since the 7<sup>th</sup>-8<sup>th</sup> century, the nearby ruins of Vat Phou marked the center of the Champa Kingdom. This was a Khmer kingdom that later fell under the greater Khmer empire beginning in the 10<sup>th</sup>-11<sup>th</sup> century until the fall of Angkor. The Lao Kingdom of Lan Xang took over the territory in the 14<sup>th</sup> century, including adjacent parts of Cambodia in Rattanakiri and Stung 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) were 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.

## Education

As many of the project activities relate to capacity building and technical knowledge development, a brief assessment of education in the country is presented.

According to the ADB Lao PDR Higher Education Sector Assessment (ADB 2016), in academic year 2014/15, 81% of enrolments were in public or publicly funded Higher Education Institutions (HEIs), and the remainder in private institutions. Of the public HEIs, the University of Health Sciences is governed by the Ministry of Health, and the other four fall under the domain of the Ministry of Education and Sports (MOES) to some degree. Students may sit entrance exams at any or all public universities, though nominally each university has its own catchment area: Champasack University caters to the southern provinces; Savannakhet University (SKU) to the central provinces; Souphanouvong University to the northern provinces; and National University of Laos (NUOL) to the capital area, but all also attract students from the whole country. Total HEI enrolment in 2014/15 stood at 130,807—i.e., 32,203 (25%) at the four MOES-controlled universities, 3,619 (3%) at University of Health Sciences, 57,596 (44%) in institutions and colleges, and 37,389 (28%) in private HEIs.

Enrolment by discipline in 2012 was as follows: engineering, manufacture, and construction (8.4%); sciences (5.4%); agriculture (5.0%); and health, welfare, and services (6.6%). In comparison: social

sciences, business, and law (42.5%); humanities and arts (12.8%); and education (19.4%). The social demand for what is regarded as “easier” disciplines is exacerbated by the fact that the biggest employer of university graduates is the state, and generally, the discipline of the degree is not important for government employees. Females outnumber males in post-secondary education, though their labor force participation is lower.

Women make up 50% of education students at universities, 65% of Teacher Training College enrolments, 45% of bachelor’s degree students, 58% of business and administration students, 25% of STEM enrolments, and 42% of agriculture students.

Perhaps the most useful indicator is teaching quality measured by qualifications of the teachers. Only 5% of university teaching staff hold doctorates, and 90% of these are concentrated in NUOL. At the five public universities in 2014/15, the ratio of doctoral– master’s–bachelor’s–associate degrees was 1:7:11:1. Reconsidering the student–teacher ratios in the light of this ratio (assuming that students should be taught at least by a holder of the next-higher degree), the student–teacher ratio for associate degrees would be 1:1, for bachelor’s degrees 30:1, and for master’s degrees 7:1.

Overall, educational quality in Laos presents challenges, and is especially weak in science and technology. Capacity building will need to take this into consideration and note that more extensive training and education may be called for.

### Biophysical and Human Ecology Approaches

Current planning and thinking about ecological systems focus on biophysical systems. Insufficient attention has been accorded to understanding human relationships with the environment, or the notion that humans are a part of, not apart from the ecosystem. Views of ecological systems need to be expanded to include the role and relationship of humans in perceiving, using, and shaping their environments. For example, in rural areas in Laos, both biodiversity and non-timber forest products depend upon environments created in the process of long-term rotational fallows in swidden agriculture; when this practice is lost, so too are biodiversity and non-timber forest products. The project approach, hence, is to look at the interactions of people and their environment, the values people assign, ecosystems services they derive, local management practices currently adopted, and the community’s role supporting ecosystem management. The discussion below, focusing on the Nong Peung wetland, describes ecological values, land use, and practices of surrounding communities.

### Communities’ Profiles

The communities in the project areas vary. Specific characteristics are described in the Stakeholder Consultation Report in Annex 3 of this document. Some communities consulted are more urban while others are peri-urban with agricultural activities practiced such as keeping ducks and chickens, having vegetable gardens, rice farming and fishing as livelihoods. There are also different economic statuses among these communities. The village Ban Tha Hai<sup>18</sup> for example, while very vulnerable to flooding, appears more affluent and is populated by traders.

Many of the communities use natural resources from their surroundings despite being in urban and peri-urban areas. The case of the Nong Peung wetland is exceptional, as the livelihoods of people are largely dependent on the wetland for fish, irrigation, and fertile soils surrounding it. This is discussed in detail below. In Savannakhet the project preparation team observed villagers smoking out beehives for honey and setting bird traps (for food) along a forest stream that is in the project area. As urbanisation advances, it would be important to preserve these ecosystems and the ways people relate to their immediate environment.

By common economic metrics and income measurements, many of the village populations would qualify as cash poor. However, their self-identification may not necessarily be as poor or deprived of resources as

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<sup>18</sup> The village will no longer be a project site because of limited land availability to carry out interventions.

they depend on their neighbours for support (in the case of Ban Pakse where people share food from home gardens) or supplement market-bought food by fishing and harvesting forest products and wild food. In the Stakeholder Consultations Report, characterization of communities' income levels are largely based on self-identification of the communities.

High levels of social cohesion were observed in the communities visited. Most of the communities are self-reliant and depend on each other or pool resources for support rather than government services. In Ban Pakse for example, the community members buy diesel to operate pumps that discharge flood water from the village out into the Mekong. In some, there are women village leaders (Ban Na Kae, Ban Pakse) or most of the attendees of the consultations were women (Ban Ke and Ban Pakse). The villages in Paksan (Ban Padsum and Ban Pak Peung) were the exception in that mostly men participated in the consultations.

### Baseline Assessment of Nong Peung wetland in Paksan

The Nong Peung wetland<sup>19</sup> in the provincial capital Paksan is one of the target areas for the proposed project. It is adjacent to the urban area of Paksan and is surrounded by various villages (Figure 5). The wetland acts as an important natural flood buffer, protecting the surrounding agricultural and urban areas. Nong Peung wetland is a modified habitat that exists in its current form through the modification of two stream outlets to the Mekong River. This alteration of the wetland's hydrology was done mainly for irrigation purposes. The Nong Peung wetland provides important ecosystem goods and services to surrounding communities, and harbours notable biodiversity. Land use in and around the wetland includes rice farming, vegetable gardens, fishing from streams and the wetland, fish farming in artificial ponds, grazing, and excavation of soil for construction. An overview of the wetland's characteristics is provided below.

#### *Wetland dynamics*

The Nong Peung wetland is located in a natural depression and is fed by rainfall runoff from: i) the surrounding areas; ii) the Houay Peung stream; and iii) floodwater from the Nam San river. It is a modified floodplain wetland and, as such, is typical of many similar small reservoirs within the floodplain of the Mekong or its larger tributaries.

The wetland covers 300 hectares in the dry season and 1,200 hectares in the wet season<sup>20</sup>. To the south, the Houay Peung stream connects the wetland to the Mekong River, as indicated in the map in Figure 5. A floodgate (wetland regulator) was installed in 1986 at the village of Pak Peung, where the Houay Peung stream flows into the Mekong, in order to increase rice production in the dry season (November to May) and control flooding in the wet season (June to October) (Millar et al 2018). The floodgate is functional but in poor condition and needs to be turned by hand to open and close. The installation of the floodgate has resulted in siltation of the wetland system, as the movement of sediment to the Mekong is inhibited.

The levels of the Nong Peung wetland are also artificially regulated by a road levee parallel to the Mekong which acts as a dam, and the above-mentioned floodgate at Pak Peung village passes under the levee and acts as regulator. The road along the natural Mekong levee was built-up and fitted with culverts and floodgates in the 1980s and outflows from the lake were blocked to support irrigation<sup>21</sup>. The aims of damming floodplain lakes in this way are to: i) maintain high water levels to allow gravity diversion to adjacent parts of the floodplain via canals; ii) regulate the rate of water level fall so that recession rice can be grown within the reservoir's boundary in the dry season; iii) store some water which can be pumped to

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<sup>19</sup> also known as the Paksan/Pakxan wetland, Pak Peung wetland and Houay Peung Reservoir

<sup>20</sup> Millar, J., Robinson, W., Baumgartner, L., Homsombath, K., Chittavong, M., Phommavong, T. and Singhanouvong, D., 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: the case of Pak Peung wetland in Lao PDR. *Environment, Development and Sustainability*, pp.1-18.

<sup>21</sup> Hortle and Khonglialiane, 2014. *Aquaculture Survey of Six Reservoirs in Lao PDR*. Report to the CGIAR Challenge Program on Water and Food, Vientiane, Lao PDR. Available at:

[https://www.researchgate.net/profile/Kent\\_Hortle/publication/301341982\\_Hortle\\_KG\\_T\\_Khonglialiane\\_2014\\_Aquaculture\\_Survey\\_of\\_Six\\_Reservoirs\\_in\\_Lao\\_PDR\\_Report\\_to\\_CGIAR\\_Challenge\\_Program\\_on\\_Water\\_and\\_Food\\_Vientiane\\_66\\_pages/links/571347b708ae39beb87a55aa.pdf](https://www.researchgate.net/profile/Kent_Hortle/publication/301341982_Hortle_KG_T_Khonglialiane_2014_Aquaculture_Survey_of_Six_Reservoirs_in_Lao_PDR_Report_to_CGIAR_Challenge_Program_on_Water_and_Food_Vientiane_66_pages/links/571347b708ae39beb87a55aa.pdf)

irrigate the dry-season rice as required; and iv) prevent the inflow of water from the Mekong River as water levels rise in the early wet season, so that the rice crop that grows in the dry season rice can be harvested. While the Nong Peung wetland has always been perceived to be quite productive for fisheries, the floodgate is impassable for most of the year to upstream-migrating fish, so many formerly common Mekong species are rare or absent from the wetland and local fishers believe that catches have declined as a result. A fish passage circumventing the floodgate was built in 2015 and allows fish from the Mekong to enter the wetland as juveniles or to spawn.

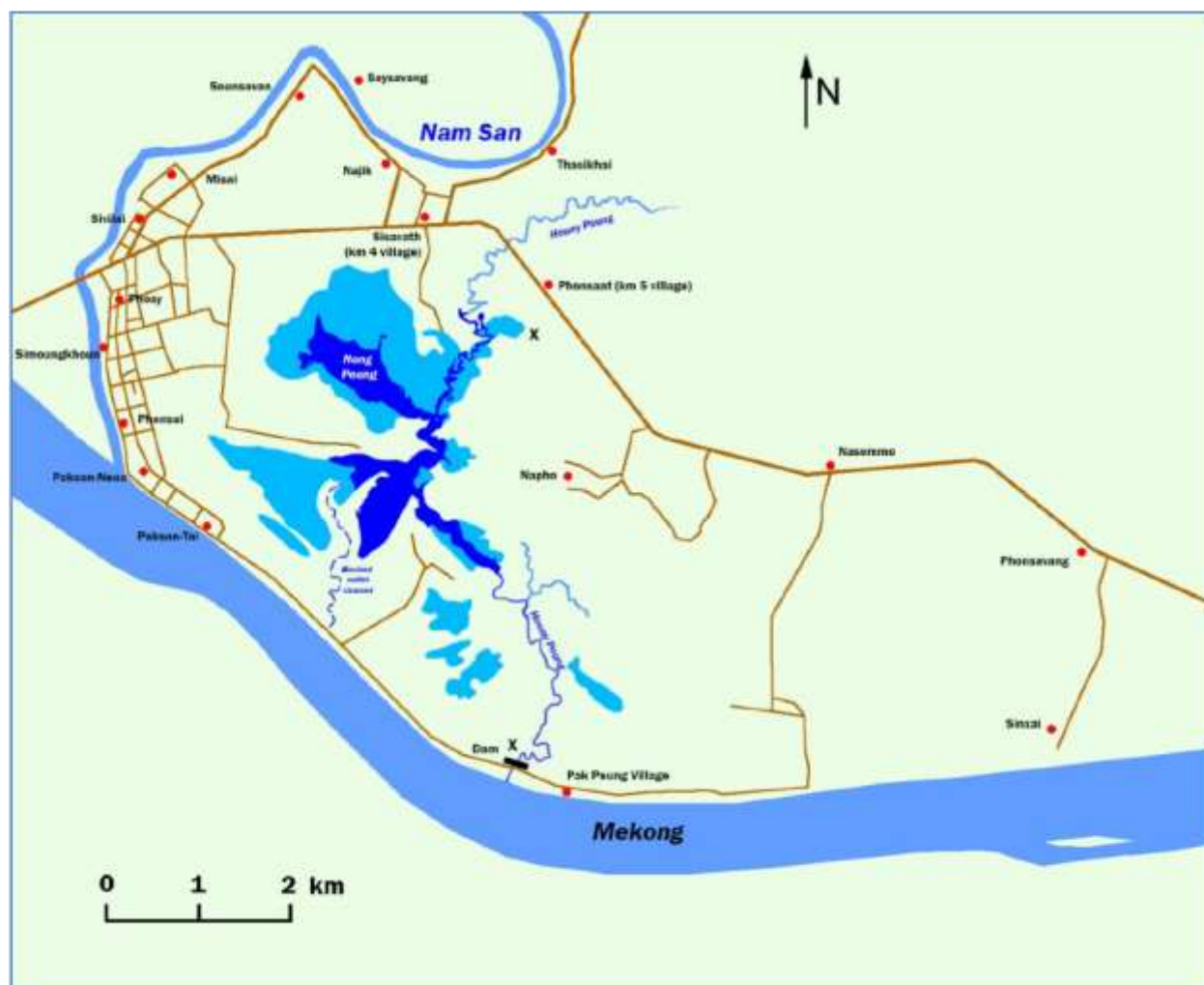


Figure 5. Map of Nong Peung wetland<sup>22</sup>. The “Dam” indicated by “X” is the location of the floodgate/regulator.

#### *Land use and informal management practices*

There are six villages surrounding the wetland with a total population of about 5,300 people. These villages use the wetland for irrigation of rice paddies, mostly in the south to southeast. A pump is located a few meters from the floodgate at Pak Peung village. The Water User Association manages water extraction and

<sup>22</sup> Hortle and Khonglialiane, 2014. Aquaculture Survey of Six Reservoirs in Lao PDR. Report to the CGIAR Challenge Program on Water and Food, Vientiane, Lao PDR. Available at: [https://www.researchgate.net/profile/Kent\\_Hortle/publication/301341982\\_Hortle\\_KG\\_T\\_Khonglialiane\\_2014\\_Aquaculture\\_Survey\\_of\\_Six\\_Reservoirs\\_in\\_Lao\\_PDR\\_Report\\_to\\_CGIAR\\_Challenge\\_Program\\_on\\_Water\\_and\\_Food\\_Vientiane\\_66\\_pages/links/571347b708ae39beb87a55aa.pdf](https://www.researchgate.net/profile/Kent_Hortle/publication/301341982_Hortle_KG_T_Khonglialiane_2014_Aquaculture_Survey_of_Six_Reservoirs_in_Lao_PDR_Report_to_CGIAR_Challenge_Program_on_Water_and_Food_Vientiane_66_pages/links/571347b708ae39beb87a55aa.pdf)

pumping from the wetland and user fees go towards the cost of energy for operating the pumps, but the water is free. In addition, the Department of Irrigation in the Provincial Agriculture and Forestry Office supports infrastructure maintenance costs. There is no management structure in place to ensure the maintenance of environmental flows, including the water levels required to sustain the wetland ecosystem.

Water from the wetland in the south is also drawn for use in fishponds for catfish, snakehead fish and other species that are fished for food and to be sold to the market. Wastewater from fishponds are disposed from ponds three times a month into a small permanent water body to the east of the main wetland area. This practice is likely to result in nutrient loading, which could lead to eutrophication.

Fishing in the wetland is also widely practiced and has been well documented by Charles Sturt University (CSU) researchers<sup>23</sup>. This research provides information regarding: i) gendered differences in site use; ii) average catch per day; iii) fish use; and iv) community perceptions of changes to the wetland ecosystem. Additional evidence suggests that the installation of floodgates for irrigation has had a negative impact on fish populations in the wetland<sup>24</sup>. In addition, the upper part of the wetland is seasonally flooded and used for grazing in the dry season. Construction companies also extract soil in this area between Highway 13 and the wetland, with permission from the landowners.

While the Nong Peung wetland is not under a formal management regime, there are informal management practices in place such as no take zones for fish during spawning season and village patrols<sup>25</sup>. Community members and local officials have a high level of awareness of conservation, in part because of the fish passage project by CSU. Encroachment of rice paddies into the wetland is a concern that community members shared.

#### *Biodiversity of the Nong Peung wetland*

Although it is a modified habitat and is used extensively by people, the Nong Peung wetland area continues to provide various ecosystem services and habitat for wildlife. However, the Nong Peung wetland does not enjoy any formal legal protection under Laotian or international law. It is not a protected area, nor is it recognised under any international frameworks such as the Ramsar Convention. The Nong Peung wetland is also not listed among the 27 Important Bird and Biodiversity Areas recognized in Laos<sup>26</sup>, however, it is recognised as a Key Biodiversity Area<sup>27</sup>.

The biodiversity of the Nong Peung wetland is well-studied. Research in the wetland has been ongoing over the last two decades<sup>28</sup>, with focused research conducted over the last decade as part of an Australian-funded research initiative<sup>29</sup>.

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<sup>23</sup> Millar, J., Robinson, W., Baumgartner, L., Homsombath, K., Chittavong, M., Phommavong, T. and Singhanouvong, D., 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: the case of Pak Peung wetland in Lao PDR. *Environment, Development and Sustainability*, pp.1-18.

<sup>24</sup> Baumgartner, L.J., Barlow, C., Mallen-Cooper, M., Boys, C., Marsden, T., Thorncraft, G., Phonekhampheng, O., Singhanouvong, D., Rice, W., Roy, M. and Crase, L., 2019. Achieving fish passage outcomes at irrigation infrastructure; a case study from the Lower Mekong Basin. *Aquaculture and Fisheries*.

<sup>25</sup> Millar, J., Robinson, W., Baumgartner, L., Homsombath, K., Chittavong, M., Phommavong, T. and Singhanouvong, D., 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: the case of Pak Peung wetland in Lao PDR. *Environment, Development and Sustainability*, pp.1-18.

<sup>26</sup> BirdLife International (2019) Country profile: Laos. Available from <http://www.birdlife.org/datazone/country/laos>. Checked: 2019-05-25

<sup>27</sup> BirdLife International (2019) The World Database of Key Biodiversity Areas. Downloaded from <http://www.keybiodiversityareas.org> on 09/06/2019.

<sup>28</sup> Duckworth, J.W., 2006. Six species of bird new to Laos. *Forktail*, 22, p.147; Duckworth, J.W., 2012. Recent, rapid, colonisation of Lao PDR from the south by Yellow-vented Bulbul *Pycnonotus goiavier*. *Ardea*, 100(2), pp.187-196.

<sup>29</sup> Baumgartner et al., 2016. Final Report: Development of fish passage technology to increase fisheries production on floodplains in the lower Mekong basin. ACIAR

Laos uses the IUCN Red List of Threatened Species<sup>30</sup> to classify its biodiversity. In terms of this classification there is one critically endangered species that has been observed in the Nong Peung wetland, the Siamese Tiger Perch (*Datnioides pulcher*), and one endangered species that has been recorded, namely Jullien's golden carp (*Probarbus jullieni*). The Nong Peung wetland does not support globally-important concentrations of either of these species, and these species do not have restricted ranges, as discussed below.

There have been a few observations of *Datnioides pulcher* in the Nong Peung wetland in recent years – following the construction of the fish passage at Pak Peung to allow entry into the wetland and after a long absence<sup>31</sup> from the area<sup>32</sup>. *Datnioides pulcher* occurs over a wide range, across Laos, Vietnam and Cambodia<sup>33,34</sup>). This species inhabits main streams of rivers such as the Mekong, tributaries and also larger lakes connected to rivers. The Nong Peung wetland is at the very northernmost limit of the species' range, which extends across all of the Mekong south of Paksan and various tributaries. In Laos, *Datnioides pulcher* is also recorded at other sites, e.g. Se Bangfai in Champasak Province<sup>35</sup>

The endangered fish species *Probarbus jullieni* was also observed for the first time in many years in the Nong Peung wetland after the construction of the fish passage at Pak Peung. Adults of this species prefer main river habitats, whereas juveniles will enter floodplain habitats during the rainy season<sup>36</sup>. Since the installation of the permanent fish passage in 2015, this species has been reported by local villagers and recorded by scientists<sup>37</sup>. The historical natural distribution of *Probarbus jullieni* includes the Chao Phraya and MaeKlong River basins in Thailand; the Mekong basin in the Laos, Thailand, Vietnam and Cambodia; and the Pahang and Perak basins in peninsular Malaysia. In the Mekong River, it is known from at least as far upstream as Luang Prabang, in northern Laos<sup>38</sup>. The numbers and extent of occurrence of *Probarbus jullieni* have declined in recent decades, mainly because of overfishing and disconnection of floodplain habitat from main rivers. There are still multiple populations of *Probarbus jullieni* extant along the Mekong river. One of the sites in Laos where it is recorded in substantial numbers is at the Siphandone wetland area in Champasak province<sup>39</sup>.

Overall, the fish in the Nong Peung wetland have been studied extensively, with a total of 177 species recorded<sup>40</sup>. No other endangered or critically endangered species have been observed in the wetland over the course of these studies.

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<sup>30</sup> MoNRE, 2016. Fifth National Report to the United Nations Convention on Biological Diversity.

<sup>31</sup> Local communities reported seeing this species in the wetland again in 2015, for the first time in many years.

<sup>32</sup> Baumgartner et al., 2016. Final Report: Development of fish passage technology to increase fisheries production on floodplains in the lower Mekong basin. ACIAR

<sup>33</sup> Vidthayanon, C. 2011. *Datnioides pulcher*. The IUCN Red List of Threatened Species 2011: e.T180969A7656475. <http://dx.doi.org/10.2305/IUCN.UK.20111.RLTS.T180969A7656475.en>. Downloaded on 27 May 2019.

<sup>34</sup> <https://www.fishbase.se/summary/50395>

<sup>35</sup> Vidthayanon, C. 2011. *Datnioides pulcher*. The IUCN Red List of Threatened Species 2011: e.T180969A7656475. <http://dx.doi.org/10.2305/IUCN.UK.20111.RLTS.T180969A7656475.en>. Downloaded on 27 May 2019.

<sup>36</sup> Hogan, Z. & Baird, I. 2011. *Probarbus jullieni*. The IUCN Red List of Threatened Species 2011: e.T18182A7742599. <http://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T18182A7742599.en>. Downloaded on 02 May 2019. Available at: <https://www.iucnredlist.org/species/18182/7742599>

<sup>37</sup> Baumgartner et al., 2016. Final Report: Development of fish passage technology to increase fisheries production on floodplains in the lower Mekong basin. ACIAR

<sup>38</sup> Baird, I.G., 2006. *Probarbus jullieni* and *Probarbus labeamajor*: the management and conservation of two of the largest fish species in the Mekong River in southern Laos. Aquatic Conservation: Marine and Freshwater Ecosystems, 16(5), pp.517-532.

<sup>39</sup> Baird, I.G., 2006. *Probarbus jullieni* and *Probarbus labeamajor*: the management and conservation of two of the largest fish species in the Mekong River in southern Laos. Aquatic Conservation: Marine and Freshwater Ecosystems, 16(5), pp.517-532.

<sup>40</sup> Baumgartner et al., 2016. Final Report: Development of fish passage technology to increase fisheries production on floodplains in the lower Mekong basin. ACIAR

In terms of its bird diversity, the Nong Peung wetland is not listed among the 27 Important Bird and Biodiversity Areas recognized in Laos<sup>41</sup>. Overall, Laos is home to 29 globally threatened (i.e. critically endangered or endangered) bird species. None of these species appears to have been recorded in the Nong Peung wetland, despite frequent bird surveys of the wetland area<sup>42</sup>. One IUCN-listed vulnerable bird species has been recorded at the wetland, namely the White-browed Reed-warbler (*Acrocephalus tangorum*). This species is not resident at Nong Peung wetland but uses the area as a stop-over site during its long-distance migration<sup>43</sup>.

The proposed project activities in the wetland will lead to improved protection and management of the Nong Peung wetland. Considering the notable biodiversity of the wetland and the importance of the ecosystem services provided by the wetland, appropriate measures will be taken to safeguard the habitats and biodiversity of the wetland during the implementation of the proposed project. These measures are discussed below.

## 6. Assessment of Risks based on the IFC Performance Standards and the UN Environment Safeguards Standards

This section identifies the International Finance Corporation Performance Standards for Environmental and Social Sustainability complemented by the UN Environment Safeguard Standards pertinent to the project and assesses potential impacts and measures for avoidance, minimisation and mitigation, as well as appropriate management actions.

### PS 1: Assessment and Management of Environmental and Social Risks and Impacts

In compliance with PS 1, the project was screened for environmental and social risks (See Annex 1: ESERN). The assessment of risks is based on up to date information. Structured community-level consultations were conducted in the project sites to gather basic social information about the communities, gather information on flood risk and impacts, inform communities about the project and proposed interventions, and to obtain community feedback on interventions and their own proposed solutions to flood problems they experience. The Stakeholder Consultation Report is in Annex 3 of this document. Sections 4, 7 and 8 of this ESAP outline the safeguards assumptions, environmental and social actions and management system governing the project.

### PS 2: Labour and Working Conditions

The project will promote the fair treatment, non-discrimination and equal opportunity of workers, and compliance with national labour and employment laws. Project contractors will be required to provide occupational health and safety for workers and this will be built into the terms of references published for procurement. Vulnerable workers are not expected to be employed. The activities requiring employment of workers are ecosystem restoration and building of permeable pavements, which are not particularly risky areas of work.

### PS 3: Resource efficiency, pollution prevention and management of chemicals and wastes

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<sup>41</sup> BirdLife International (2019) Country profile: Laos. Available from <http://www.birdlife.org/datazone/country/laos>. Checked: 2019-05-25

<sup>42</sup> the Paksan wetlands have been visited for many years, including intermittently since 1994, with particularly intense bird-watching during 2000–2002, two pulses in 2005, and three in 2010. Duckworth, J.W., 2012. Recent, rapid, colonisation of Lao PDR from the south by Yellow-vented Bulbul *Pycnonotus goiavier*. *Ardea*, 100(2), pp.187-196.

<sup>43</sup> BirdLife International (2019) Species factsheet: *Acrocephalus tangorum*. Downloaded from <http://www.birdlife.org> on 25/05/2019. Downloaded from <http://www.birdlife.org> on 25/05/2019.

The installation of permeable paving at demonstration scale as part of the project is material to Safeguard Standard 3. Light construction machinery used for the installation of permeable paving may result in small oil or fuel spills that may cause local contamination and negatively affect nearby residents. If not disposed of adequately, solid waste from the paving work could contaminate both aquatic and terrestrial ecosystems and negatively impact the environment for local residents. The permeable paving will be done on a relatively small scale and will not require an IEE or ESIA under Laotian law. Risk minimisation, avoidance and mitigation measures for the above risks will include the following:

- No construction is to take place during the rainy season to prevent excess erosion.
- All solid waste from construction sites will be disposed of at designated solid waste disposal sites in an environmentally sound manner.
- Construction workers will be trained on environmental protection measures and a suitably qualified environmental officer will be present for all construction activities.
- All construction machinery will be fully compliant with relevant local standards to prevent oil and fuel leakage.
- Construction will be limited to normal working hours (08:00-17:00, Monday to Saturday) to reduce the impacts of noise pollution on local residents.
- Where construction sand is used, construction piles will be covered or kept moist to prevent dust pollution in surrounding residential areas.
- Construction practices will follow OHSAS 18001 guidelines for operational health and safety.
- Resource Efficiency Standards will be adopted; for example, the project will ensure that measures are adopted that reduce water consumption during construction.

Future construction activities that will be conducted as a result of the development of the ICFMS will be subject to all the relevant Laotian laws and regulations, including preparation of ESIAs and ESMPs as appropriate, as discussed in Section 3 above. It is therefore expected that minimal environmental and social impacts will arise from future construction activities.

#### **PS 4: Community Health, Safety and Security**

The project will not be building any critical infrastructure that present safety risks. Project activities are also not expected to include work with any hazardous materials. In terms of ecosystem services, the project is not expected to have adverse impacts on such services that will pose health and safety risks to communities. In contrast, the project focus is on restoring wetland and stream ecosystems to support the services they provide to the communities. Project activities do not pose health risks or exposure to diseases to the communities. In cases of flood events and emergencies that can occur within the project period, the project will work with existing early warning systems and the local government as appropriate and avoid construction and restoration work during heavy rainfall events.

#### **PS 5: Land Acquisition and Involuntary Resettlement**

None of the activities involve resettlement and dispossession, land acquisition, or economic displacement of persons and communities. The project will work with communities to conserve and restore wetland and stream ecosystems on public land. Management plans will be developed with the full participation of communities involved, be based on existing management practices, and would not result in economic displacement of persons or communities.

#### **PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**

The project activities will include the restoration and rehabilitation of natural urban streams in Pakse and Savannakhet and the Nong Peung wetland area. All these target areas are modified habitats and do not fall under the protected areas system of Laos, nor under any international frameworks such as the Ramsar convention. Moreover, none of the target areas are assessed to be critical habitats. Overall, the proposed project interventions are fully aligned with the conservation and sustainable management of urban stream

and wetland ecosystems. The specific interventions, namely restoration and rehabilitation of natural, indigenous vegetation, the removal of invasive alien vegetation, the removal of solid waste from streams and the removal of some small human-made barriers impeding natural waterflow in the wetland will all contribute to enhancing habitat for biodiversity and increasing the supply of ecosystem services.

The Nong Peung wetland harbours notable biodiversity and a baseline assessment of the wetland has thus been completed (see Section 5 above). Further detailed technical assessments of the wetland will be conducted as part of the project, under Activity 1.2.2. These biodiversity and hydrological assessments will include: i) mapping important wildlife habitats<sup>44</sup> including for fish and bird species; ii) identifying areas appropriate for removal of invasive alien vegetation; iii) hydrological mapping and modelling of the wetland; and iv) identifying appropriate small human-made barriers that can be removed to enhance wetland functioning without impacting livelihoods. These assessments will be carried out prior to any physical interventions being implemented in the wetland. Following these assessments, a comprehensive wetland management plan will be developed through a participatory process (Activity 2.1.1) involving communities and other stakeholders that use the wetland area. This wetland management plan will guide all the restoration activities in the wetland to avoid and minimise any negative impacts on biodiversity, and to mitigate any unavoidable impacts that may occur. The wetland management plan will be aligned with the safeguards measures described in this ESAP document in Table 1 below.

Wetlands and biodiversity expertise will be available to the Project Management Unit to ensure appropriate guidance in implementing the project's activities. In particular, the full-time Safeguards Officer will ensure the implementation of all appropriate social and environmental safeguards measures during project implementation. The Terms of Reference for the Safeguards Officer will specify that the Officer should have biodiversity expertise.

Monitoring and reporting of biodiversity safeguards will be done by the Safeguards Officer, in collaboration with the knowledge hub researchers and the community management committees that will be established by the project. This will include monitoring of key environmental indicators such as water quality, as well as presence and abundance of indicator species.

The ICFMS will include city-specific details on biodiversity conservation for the purposes of flood management. The ICFMS will provide an Environmental and Social Management Plan (ESMP) as needed for all physical interventions such as construction proposed under the strategy. These ESMPs will be aligned with existing conservation plans and strategies in each city and be compliant with the UN Environment Environmental and Social Safeguards.

## **PS 7: Indigenous Peoples**

Village level consultations were conducted in the project sites and have confirmed that no indigenous peoples are residing in those villages. Section 5 of this document describes the ethnic groups residing in the project sites—all of which belong to the Lao-Tai group, which is the dominant ethnic group in Laos. The activities are not expected to have direct or indirect adverse impacts on indigenous peoples, ethnic minorities, or vulnerable and marginalized groups and their livelihoods. The project operates in urban environments where indigenous peoples' customary rights of use and access to land and natural resources would not be as prominent as they would be in rural, agricultural, or mountain environments. 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 issues in the case of any impacts on their livelihoods and well-being emerging.

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<sup>44</sup> for instance tall grass habitats threatened by people harvesting grass.

**PS 8: Cultural Heritage**

Project activities are not expected to have adverse impacts on cultural heritage sites since the activities are not located in areas with cultural heritage values. No structures, precincts or populations of cultural importance or heritage were found in project target areas in Vientiane, Paksan, Savannakhet and Pakse.

[Additional UN Environment Safeguard Standards](#)

**Safeguard Standard 8: Gender Equity**

The proposed project has been designed to be inclusive and promote gender-positive development, and a Gender Action Plan has been developed. None of the activities are expected to exacerbate existing gender inequalities and flood reduction is expected to benefit women in particular. All procurement that will take place during the project will be inclusive and women will be fairly represented at steering committees as well as during community consultations. The National Women's Union of Laos will play an active role in the project, particularly for community engagement. This involvement will ensure that women's rights and interests are represented throughout the project. The Gender and Monitoring and Evaluation Officer will, as part of their TOR, monitor the mainstreaming of gender into all project activities.

**Safeguard Standard 9: Economic Sustainability**

Project interventions are expected to support the livelihoods of communities, especially those that are dependent on ecosystem services. The project does not promote activities that will have short term gains at the expense of longer-term impacts on communities' livelihoods. Project activities are expected to generate employment, particularly for restoration work and installation of permeable paving.

## 7. Potential Impacts of Project Activities

The actions necessary to carry out the avoidance, minimization, and mitigation measures for the risks identified are provided in the table below.

Table 1. Potential social and environmental impacts of EbA interventions and permeable pavements and recommended mitigation measures. Key to risk ratings is provided in Table 2

Summary of risks	Avoidance, minimization, and mitigation measures	Risk significance <sup>45</sup>	Responsible party/person	Schedule
Invasive alien plant species that have detrimental effects on ecosystem services and biodiversity may be introduced through plantings during wetland/stream restoration activities.	Only locally indigenous plant species will be used for the restoration of urban wetlands and streams. Surveys to determine locally indigenous plant species will be conducted as part of the wetland assessment under Activity 1.2.2. and as part of the planning of urban stream restoration under Activity 2.2.1. in consultation with Laotian botanists.	2	Chief Technical Advisor, consultants, Environmental and Social Officer	Throughout the implementation of Activity 2.1.2 and 2.2.1. (Q2 to Q20)
Potential negative impacts on habitats of threatened species	Specific areas that are important habitats for the threatened species which have been observed in the wetland (See Section 5 above) will be mapped during the wetland assessment (Activity 1.2.2). These areas will be demarcated and avoided during restoration activities, or where indigenous planting or invasive alien plant removal is required, it will be done using methods that cause the lowest possible impacts and disturbance, outside of the breeding seasons of the threatened species. Contractors and workers employed in restoration and invasive plant clearing will be trained to identify the threatened species and	1	Chief Technical Advisor, Project Manager, consultants, Environmental and Social Officer	Throughout the implementation of Activity 2.1.2 (Q5 to Q20)

<sup>45</sup> The probability of occurrence is the likelihood for a risk to occur and can be characterized in terms of the degree to which it will happen. The impact or magnitude of risks is the description of how severe the impacts would be if it were to occur. A significance value of the risk can be obtained by combining the probability and impact values. The risk significance indicates the relationship between probability and severity or magnitude of impacts. See: [https://www.greenclimate.fund/documents/20182/574766/Guidelines\\_-\\_Guidelines\\_for\\_the\\_Environmental\\_and\\_Social\\_Screening\\_of\\_Activities\\_Proposed\\_under\\_the\\_Simplified\\_Approval\\_Process.pdf/4df31b53-87bd-419a-9373-854047e3e87f](https://www.greenclimate.fund/documents/20182/574766/Guidelines_-_Guidelines_for_the_Environmental_and_Social_Screening_of_Activities_Proposed_under_the_Simplified_Approval_Process.pdf/4df31b53-87bd-419a-9373-854047e3e87f).

	<p>their typical habitats. In general, restoration of indigenous vegetation will be undertaken in a phased manner, and in a way that maintains overall habitat heterogeneity. Invasive vegetation such as <i>Mimosa pigra</i> will also be removed gradually over time. Blocks of limited areas will be treated at a time, in order to leave cover for wildlife and to avoid sudden changes to habitat. <i>Mimosa pigra</i> shrubs will be removed during the dry season when water levels are low and fish are not breeding or migrating.</p>			
<p>Erosion and sedimentation as a result of invasive alien plant clearing, planting of indigenous plant species or removal of small human-made barriers.</p>	<p>Erosion and sedimentation as a result of invasive alien plant clearing will be avoided and minimised by phasing and timing of clearing and use of low impact clearing methods. Blocks of limited areas will be treated at a time, in order to avoid soil erosion and sedimentation. Clearing will be done during the dry season and no tractors or machinery will be used. Clearing will be followed by planting of indigenous plants to limit erosion. In terms of removing small human-made barriers to water flow, these will be carefully selected and only removed after assessment of the impacts on local hydrology to ensure the desired positive outcome of restoring natural water flow. Such removal will also be timed to occur after any erosion-prone areas have been restored with indigenous plants.</p>	2	<p>Chief Technical Advisor, Project Manager, consultants, Environmental and Social Officer</p>	<p>Throughout the implementation of Activity 2.1.2 and 2.2.1. (Q2 to Q20)</p>
<p>Herbicide contamination of wetlands or streams during invasive alien plant clearing.</p>	<p>No herbicides will be used during the clearing of invasive alien vegetation. Both <i>Mimosa pigra</i> and water hyacinth are commonly controlled by hand in Laos and without the use of herbicides. Local and international best practices for clearing these species will be followed.</p>	1	<p>Project manager, consultants, Environmental and Social Officer</p>	<p>Throughout the implementation of Activity 2.1.2 and 2.2.1. (Q2 to Q20)</p>

Potential conflicts arise on land use and management	The development of management plans for the Nong Peung wetland and the target urban streams shall be done in a participatory way through the community management groups and stakeholder consultations. A robust complaints register and grievance redress mechanism has been set up.	2	Project Manager, city-level focal point, Environmental and Social Officer, Recruited consultants	Across implementation of Activity 2.1.1 and 2.2.2.
Potential to limit traditional livelihoods of subsistence or smallholder farmers, including women, that encroach on the Nong Peung wetland	<p>Encroachment of rice paddies into the wetland was a threat that community members themselves identified and that they would like to manage better. Farming in the area is a mix of traditional and mechanized methods and employ both women and men. Production is both for household consumption and market selling. Most of the production is, however, for selling to the market in the city proper as well as northern regions. The main driver of increasing rice production appears to be commercial success of farming instead of population increase. Population in the village is stable as in-migration does not happen. The area is touted as one of the most successful for fish and rice production in the province and not characterized by subsistence rice production of the most vulnerable people.</p> <p>The development of farming—both the installation of wetland regulators for irrigation and expansion of farmland—poses a threat to traditional fishing as well, so that different livelihoods and values need to be balanced and managed. The objective of the management plan is to understand competing values and manage trade-offs in a participatory and community-led way.</p>	1	Project Manager, Environmental and Social Officer, Monitoring and Gender Officer	Throughout the project implementation process.
Potential not to equitably include women in decision making and consultation	Community engagement protocols are drafted to accommodate women and men, in separate discussions if required. The Gender Action Plan has specific activities and targets on	2	Project Manager, Gender Officer, Environmental and Social Officer	Throughout the project implementation process.

	including women in decision making groups. Particular attention during implementation will be placed in Paksan, where village consultations during preparation were mostly with men.			
Safety issues during construction and restoration work, particularly during heavy rainfall events	Works during heavy rainfall events will be avoided. Safety procedures will be built into terms of references of contractors. The Environmental and Social Officer will conduct spot checks to monitor compliance.	1	Contractors, Environmental and	Throughout the restoration and construction works.
Community members are not aware of residual risks from flooding, after urban EbA measures are implemented and are not aware of the complementary roles of urban EbA and structural measures.	The community awareness campaigns in Activity 1.1.3 and stakeholder consultations in the development of management plans under Activities 2.1.1 and 2.2.2 will be used as opportunities to promote awareness on the benefits and limitations of urban EbA vis-à-vis flood risks, structural measures, and residual risks.	1	Communications Officer, Environmental and Social Officer	Throughout implementation of Activities 1.1.3, 2.1.1, and 2.2.2.

Table 2. Description of scores and ratings of social and environmental impacts.

Score	Rating	Social and environmental Impacts
5	Critical	Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent and duration; areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict
4	Severe	Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impact may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe.
3	Moderate	Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures
2	Minor	Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment.

## 8. Monitoring and reporting

The compliance of interventions with the ESAP will be continually monitored throughout the project lifespan. A Physical Interventions Environmental and Social Management and Monitoring Plan will be developed by the Environmental and Social Officer with the guidance of the Chief Technical Advisor. This would cover all the physical interventions in the project under Component 2 and include parameters identified in this ESAP, particularly Section 7 Potential Impacts of Project Activities. This plan will allow the project manager and other project staff to monitor and assess the effectiveness of environmental and social safeguards risk management activities. The plan would be periodically reviewed and updated based on monitored and emergent risks, which will feed back into the reviews of this ESAP. This will help reduce the overall environmental and social impact of the project by accounting for issues as they are identified. Monitoring will be done by the Environmental and Social Officer with the support of the Monitoring and Gender Officer under the guidance of the Chief Technical Advisor. Any issues will be flagged by the Project Management Unit to the UNEP Task Manager in a timely way as they emerge and through periodic supervision meetings and missions. Monitoring will also be complemented by information gathered during ongoing engagement with communities and other stakeholders through the Stakeholder Engagement Plan (see Section 8). Moreover, the establishment of community wetland and stream drainage committees will contribute to local level monitoring, as discussed below.

### Community wetland and stream management committees

The project activities will include the establishment of a Community Wetland Management Committee in Paksan, as well as Community Stream and Drainage Management Committees in Savannakhet and Pakse. These committees will include community representatives, spiritual leaders, representatives from the

National Women's Union and representatives of PONRE. One of the functions of these committees will be to assist with the monitoring of project implementation and with relaying information to the national knowledge hub. It is recommended that these committees will also monitor execution of the ESAP to ensure day-to-day compliance by contractors at the grassroots level. This will complement the formal monitoring of ESAP implementation by the PMU staff, specifically the full-time Safeguards Officer.

Community participatory monitoring will be promoted through these committees. Certain parameters of EbA interventions can be measured easily without requiring costly training. For example, community members could be trained to read river gauges and relay this data to the committees. Because smartphones are prevalent in Laotian cities, community members can also be requested to send pictures of pollution incidents, flood impacts or damage to EbA interventions. Such community monitoring is a cost-effective method for increasing the amount of data generated while increasing community involvement in, and ownerships of, project activities. Community members will be trained on participatory monitoring and citizen science as part of the proposed project.

Parameters to be measured will include: i) water quantity – to be measured with river gauges and weirs; ii) water quality – to be measured with physical indicators<sup>46</sup>; iii) biodiversity indicators – such as the presence of indicator species and species composition; and iv) social indicators – such as the number of users, gender-inclusive participation and sentiment expressed with regards to EbA. The parameters to be monitored will be selected by each of the three monitoring committees and outlined in the respective monitoring plans.

## 8. Stakeholder Engagement Plan

### Community-Level Consultations Framework

The Framework provides an approach to continued stakeholder participation, consultation, dissemination, training and project implementation throughout the project life cycle that is based upon the principles of free, prior, and informed consent FPIC and that will provide information to the project as well as inform villagers on all aspects of the project.

The framework assumes that technical expertise is available and that this expertise will be available throughout the duration of the project. It is crucial that the consultation process be perceived as a continuous on-going interaction that allows project personnel to meet and discuss frequently with villagers and to jointly participate in all aspects of the project. Villagers do not compartmentalize activities such as forestry, agriculture, religion, or development. Rather these are viewed as integrated wholes. And since this link is already there the project should take advantage of the situation to foster close working relationships.

#### STEP 1. Prerequisite Research and Literature Reviews

For each of the in the project extant sociocultural and socioeconomic information needs to be accessed and internalized by the project, together with original research results, in the form of guidelines, training manuals, and other materials that can be simplified and translated into Lao language. This information will include: (1) social organization; (2) religious beliefs and practices; (3) Indigenous Knowledge (IK); (4) leadership and decision-making.

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<sup>46</sup> Physical indicators are likely to include *inter alia* temperature, pH, dissolved oxygen content, turbidity, *E. coli* count, nutrient concentrations and heavy metal concentrations.

Knowledge about any given group needs to be incorporated into the consultation process at the outset. This should begin with investigating history of the villages to be impacted by the project. This can be done by identifying knowledgeable and respected persons in the village who can relate the history of the families in residence, including previous migrations and inter-village or inter-group relationships.

Where existing written materials or studies carried out are available, these should be consulted and verified in the field. The types of information needed includes:

*Social organization*

- ethnicity (preferred ethnonyms)
- kinship (clans and lineages)
- marriage, residence, inheritance (patrilineal, matrilineal, bilateral)

*Religion and beliefs*

- description of religious practices
- important ceremonies
- important local spirits
- sacred areas, forests, graves, mountains, caves ...
- agrarian rites and changes already noted by villagers
- Illness and Medicine
- spiritual healing
- traditional medicine
- conventional medicine

*Indigenous Knowledge*

- agriculture, farming and fishing practices
- informal resource management practices and agreements in the community
- NTFPs

*Livelihoods and income sources*

- Occupations
- Formal and informal sector participation
- Income levels

*Adaptation strategies*

- Alternative crops farmed
- Alternative livelihoods
- Coping strategies to flooding (e.g. use of boats for transport)
- Autonomous adaptation strategies (e.g. building houses on higher land or on stilts)

*Leadership and decision-making*

- important traditional leaders and their roles
  - o how do they think consultation should be carried out
- to whom do villagers go for advice and consultation for what purposes, e.g.
  - o illness
  - o marital problems
  - o disputes with other families
- how decisions are made, e.g.
  - o meetings
  - o small groups
  - o absolute judgment by religious leaders
  - o spiritual ceremonies / guidance

When information on these issues is not available in existing sources, it will be necessary to carry out additional data collection (that is, in lieu of verification of other research). Note that this investigative process can be viewed as a positive indicator to villagers that the project is concerned about their welfare.

## STEP 2. Language

Language issues need to be well understood and addressed in the process. This includes the preparation of oral and audio visual materials such as maps in local ethnic group languages as well as ensuring that all dissemination and training materials are available in Lao language. The most efficient way to ensure participation and communication is to train villagers to carry out consultations themselves. In this way, although training of villagers takes place in Lao language, consultations and information dissemination takes place in the local language. Care needs to be taken to train both male and female villagers and to select individuals that have some innate potential for the task. These persons can be referred to as Village Facilitators (VF).

## STEP 3. Training of Local Government Staff

Training for local staff will include (1) rural sensitivity and awareness; (2) specific simplified ethnographic knowledge of the social groups in the particular district; (3) methods of training Village Facilitators to carry out participatory consultations in the village; (4) reporting and record keeping.

## STEP 4. Methodologies

(a) Methodologies used in the consultation process need to be informed by knowledge of village social organization that is acquired in Step 1. In this respect the consultation process might be described as a system for finding a system that is sensitive to the cultural setting.

(b) Consultation is also a feedback loop. Information that emerges from the process is continually fed back into the process always evolving and adapting to a changing situation as villagers become more competent and confident in their abilities and capacity.

(c) Culturally important individuals should play an advisory role where possible to assist VFs in carrying out consultations in ways that are culturally appropriate.

(d) It may be the case that women are more comfortable learning and discussing among themselves rather than with husbands and other men present. This needs to be accommodated through separate processes or in small breakout groups if necessary.

(e) the size and composition of the groups involved in consultations should be determined by the villagers taking into consideration the type of consultation or training that is being carried out.

(f) likewise, the methods of presentation should be determined by local tradition and in settings where villagers feel comfortable. Selection of meeting halls should be one that villagers prefer. For example, an open sala-type structure where people sit in a circle might be preferable to a school-type arrangement where people sit in rows with the “teacher” at the front. Discursive methods are preferable to lecturing

(g) Audio visual materials need to be used with care and always pilot tested for meaning before being adopted.

## STEP 5. Record Keeping

It is desirable to always keep a record of consultations, especially in terms of recording villager recommendations and preferences and agreements that can be used to improve the project overall. Although this task should fall to local staff who attend as resource persons, he or she may need to sit with the VF and/or other competent attendees immediately following the meetings to record the results. These

should then be typed up and copies maintained in project and district offices and in the village. These records should be available for monitoring and evaluation purposes and if necessary for use in a grievance process.

#### Recursiveness

Consultation is an on-going process that is continually being refined as more information becomes available and as villagers with access to new information can improve their own level of understanding. New ideas will emerge, and the combined application of indigenous knowledge and improved access to information can potentially give rise to solutions to problems emanating from potential changes in livelihoods or ways of doing things. The feedback loops are essential to this process.

## 9. Complaints Register Grievance Redress Mechanism

During the implementation activities, a person or group of people may be adversely affected, directly or indirectly. Grievances may be related to:

- social impacts such as eligibility criteria and entitlements, disruption of services, temporary or permanent loss of livelihoods and other social and cultural impacts; or
- environmental impacts such as excessive dust generation, damages to infrastructure, noise, traffic congestions, decrease in quality or quantity of groundwater, damage to home gardens and agricultural lands.

To address these issues, a Grievance Redress Mechanism (GRM) has been included in the ESMF & MP to address any complaints. The Environmental and Social Officer (ESO) will be responsible for undertaking a review of all enquiries, complaints and concerns and ensuring progress toward resolution of each matter.

Individuals that have a complaint or that feel aggrieved by project activities will be able to communicate their concerns and/or grievances through an appropriate process. The Complaints Register (CR) and GRM set out in this ESMF will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially vulnerable groups who often lack access to formal legal recourse.

While recognising that many complaints may be resolved immediately, the CR and GRM set out in this ESAP encourages mutually acceptable resolution of issues as they arise. The CR and GRM have been designed to: i) be legitimate processes that allow for trust to be built between stakeholder groups and assure stakeholders that their concerns will be assessed in a fair and transparent manner; ii) allow simple and streamlined access to the CR and GRM for all stakeholders; iii) provide clear and known procedures for each stage of the GRM process; and iv) enable continuous learning and improvements to the GRM.

All complaints regarding social and environmental issues can be received either orally to the field staff, by phone, in complaints boxes or in writing to UN Environment or the relevant contractor. Information about the GRM and how to make a complaint will be placed at prominent places at all intervention sites.

### Complaints Register

All enquiries, concerns and complaints will be recorded on a register and the appropriate manager will be informed. All material will be published in Laotian and English. The ESO will be responsible for undertaking a review of all enquiries, complaints and concerns and ensuring progress toward resolution of each matter.

Where there is a community issue raised, the following information will be recorded in the Complaints Register:

- time, date and nature of enquiry, complaint or concern;
- type of communication;
- name, contact address and contact number of complainant;
- response and investigation undertaken as a result of the enquiry, complaint or concern; and
- actions taken and name of the person responsible.

Based on the complaint, the following actions will take place:

- any complaint will be reported to PONRE within one working day of receiving the complaint;
- the complaint will be screened; and
- following the screening, complaints will be referred to UN Environment or MONRE for commentary and/or advice.

Wherever possible, the project team will seek to resolve the complaint as soon as possible, and thus avoid escalation of disputes. However, some enquiries, complaints and concerns may require an extended period to address. The complainant(s) will be kept informed of progress towards rectifying their concerns. All enquiries, complaints and concerns will be investigated, and a response given to the complainant in a timely manner. A GRM has been included in the ESMF to address any complaints that may not be resolved quickly.

### Grievance Redress Mechanism

In order to ensure that any grievance that may arise is resolved in a manner that will accrue maximum benefits to the project and affected parties, a number of factors, described below, will be taken into consideration by the ESO while implementing the mechanism.

- Building on existing national mechanisms in Laos – during the consultations with MONRE, it was suggested that Laos has an existing law on Grievance Redress (No.12/NA, 05 December 2014) as well as existing Grievance Redress Mechanisms as part of its resettlement and rehabilitation policies under the Land Acquisition and Disaster Management frameworks. Such mechanisms may be utilised/aligned for the purpose of this project. It should be noted that the proposed project will not result in resettlement.
- Ensure that communities have information about the project activities, selection criteria and possible impact on them.
- Special attention is given to social-economic and cultural norms in Laos.
- Building productive relationships among the stakeholders including any affected parties.
- Providing a mechanism for the affected parties to negotiate and influence the decisions and policies of the project which might adversely affect them.
- Harmonising project activities with the activities of potentially affected parties to avoid grievances or disputes if possible before they arise.

It should be noted that the GRM has been designed to be a problem-solving mechanism with voluntary, good-faith efforts and it is not a substitute for legal processes. The GRM will, as far as practicable, be used to resolve complaints and/or grievances on terms that are mutually acceptable to all parties. When making a complaint and/or grievance, all parties must act, at all times, in good faith and should not attempt to delay and/or hinder any mutually acceptable resolution. Access to the GRM will be inclusive; to this end, the mechanism will be available in all relevant local languages. The mechanism will also be presented in a

culturally-appropriate manner, to ensure that marginalised and the most vulnerable groups — including illiterate women and children — will have access to the GRM. Participation by local community representative groups with active community engagement channels – such as the National Women's Union — will be encouraged wherever possible.

The GRM has been designed to ensure that an individual and/or group are not financially impacted by the process of making a complaint. Reasonable costs incurred as a result of lodging a legitimate complaint and/or grievance will be covered under the GRM. Should such a complaint and/or grievance be deemed ineligible, associated costs will not be covered.

The ESO will be designated as the officer in charge of the GRM. The Terms of Reference for this position will include the following responsibilities with respect to the GRM:

- coordinate formation of Grievance Redress Committees before the commencement of constructions to resolve issues;
- act as the focal point on Grievance Redress issues and facilitate the resolution of issues;
- create awareness of the Grievance Redress Mechanism amongst all the stakeholders through public awareness campaigns;
- assist in the redress of all grievances by coordinating with the concerned parties;
- maintain information on grievances and redress;
- monitor the activities of PONRE and MONRE on grievances; and
- prepare monthly/quarterly progress reports.

As soon as a complaint is received, the ESO will issue an acknowledgement and forward the complaint to the concerned officer with specific deadlines for replying and redressing the same. The ESO will hold meetings with the affected persons/complainant and then attempt to find a solution to the complaint received. If necessary, meetings will be held with the concerned affected persons/complainant and the concerned officer to find a solution to the problem and develop plans to redress the grievance. The deliberations of the meetings and decisions taken are recorded. All meetings in connection with the GRM, including the meetings of the grievance redress committee, must be recorded. The ESO will be actively involved in all activities.

A two-tier GRM structure will be implemented to address all complaints in the project. The first-tier redress mechanism will involve the receipt of a complaint at the local/village and/or district level. The stakeholders will be informed on how to submit complaints and/or grievances that will be received by the ESO. This is followed by coordinating with the concerned people to redress the grievances. The ESO will coordinate the activities at the respective village or district level to address the grievances and would act as the focal point in this regard. The designated officer of the village or district will be provided with sufficient training in the procedure of redress to continue such systems in future.

The resolution at the first tier will normally be completed within 15 working days and the complaint will be notified of the proposed response through a disclosure form. Should the grievance not be resolved within this period to the satisfaction of the complainant, the grievance will be referred to the next tier of Grievance Redress Mechanism. At this tier, the complaint will be addressed by the relevant representative at MONRE, in conjunction with the UN Environment Task Manager. After referral, the complaint will be addressed within 25 working days. Any grievance related to corruption or any unethical practice should be referred immediately to the UN Environment Task Manager.

The ESO will coordinate with the respective District and Provincial Authorities in getting the Grievance Redress Committees constituted so that they can be convened whenever required. The Terms of Reference for the Grievance Redress Committee will include:

- providing support to the affected persons in solving their problems;
- prioritising grievances and resolving them at the earliest;
- providing information to the PMU and MONRE on serious cases at the earliest opportunity;
- coordinating with the aggrieved person/group and obtaining proper and timely information on the solution worked out for his/her grievance; and
- studying the normally occurring grievances and advising PMU, National and Local Steering Committee on remedial actions to avoid further occurrences.

The Grievance Redress Committee will hold the necessary meetings with the aggrieved party/complainant and the concerned officer and attempt to find a solution acceptable at all levels. The Grievance Redress Committee would record the minutes of the meeting. ESO will be present in all the meetings of the Committee. Grievance Redress Committee will communicate proposed responses to the complainant formally. If the proposed response satisfies the complainant, the response will be implemented, and the complaint closed. In cases where a proposed response is unsatisfactory to the complainant, the Grievance Redress Committee may choose to revise the proposed response to meet the complainant's remaining concerns, or to indicate to the complainant that no other response appears feasible to the GRC. The complainant may decide to take legal or any other recourse if s/he is not satisfied with the resolutions.

## Annex 1: UNEP Environmental, Social and Economic Review Note (ESERN)

I. Project Overview	
<b>Identification</b>	
<b>Project Title</b>	Building resilience of urban populations with ecosystem-based solutions in Lao PDR
<b>Managing Division</b>	Ecosystems
<b>Type/Location</b>	National
<b>Region</b>	Asia
<b>List Countries</b>	Laos
<b>Project Description</b>	The project will build the resilience of communities using an EbA approach, with an increase in the level of ecosystem services. The project will implement urban EbA interventions – such as wetland and stream rehabilitation, as well as permeable paving – that increase the attenuation, storage and infiltration of rainfall runoff, in order to reduce urban flooding. The project interventions will also create an enabling environment for the integrated use of EbA in Laotian cities to manage floods beyond the project's lifetime. In so doing, the project will result in a paradigm shift in flood management that will contribute to the long-term, climate-resilient sustainable development of urban landscapes across Laos. The project follows a participatory and gender-responsive approach from its outset and is thus expected to contribute meaningfully to community ownership and social co-benefits.
<b>Estimated duration of project</b>	5 years
<b>Estimated cost of the project</b>	11.5 million USD

II. Environmental Social and Economic Screening Determination			
<b>A. Summary of the Safeguard Risks Triggered</b>			
<b>Safeguard Standard Triggered by the Project</b>	<b>Impact of Risk<sup>47</sup> (1-5)</b>	<b>Probability of Risk (1-5)</b>	<b>Significance of Risk (L, M, H)</b>
SS 1: Biodiversity, natural habitat and Sustainable Management of Living Resources	3	1	L
SS 2: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes	2	1	L

<sup>47</sup> Refer to UNEP Environment, Social and Economic Sustainability (ESES): Implementation Guidance Note to assign values to the Impact of Risk and the Probability of Risk to determine the overall significance of Risk (Low, Moderate or High).

SS 3: Safety of Dams	1	1	L
SS 4: Involuntary resettlement	1	1	L
SS 5: Indigenous peoples	2	1	L
SS 6: Labor and working conditions	2	1	L
SS 7: Cultural Heritage	2	1	L
SS 8: Gender equity	2	1	L
SS 9: Economic Sustainability	2	2	L
Additional Safeguard questions for projects seeking GCF-funding (Section IV)	2	1	L

**B. ESE Screening Decision**<sup>48</sup> (Refer to the UNEP ESES Framework (Chapter 2) and the UNEP's ESES Guidelines.)

Low risk ☒ Moderate risk ☐ High risk ☐ Additional information required ☐

**C. Development of ESE Review Note and Screening Decision:**

Prepared by: Name: Mara Baviera Date: 24 April 2019

Safeguard Advisor: Name: Yunae Yi Date: 06 May 2019

**D. Recommended further action from the Safeguard Advisor:**

This project is in the low safeguard risk category, as some potential risk issues have been assessed to be low or avoided through community engagement and initial assessment during the project development stage. Having said that, continuous monitoring and oversight of UN Environment, the project executing entity, implementing partners, the government, and engagement local communities will reduce or prevent any unintended issues that may arise during the project implementation.

Although risks are foreseen to be minimal, some areas to continue to monitor are: i) Nong Peung wetland management and conservation, which may raise potential conflict with the business community who has been benefitting from soil excavation in the course of identifying the buffer zones; ii) safety and emergency issues that may arise, such as flooding, during the project implementation; iii) managing community awareness on residual flood risks that would not be mitigated by the proposed ecosystem-based flood management; iv) ensuring equitable benefits among upstream and downstream communities; v) ensuring that stakeholders have a common understanding of the complementary roles of urban hard infrastructure and EbA approaches in flood management; and vi) that stakeholders have the capacity to plan and manage multiple values and land and water use (e.g. conservation, agriculture, and flooding issues).

Regular site visits and stakeholder engagement through the agreed stakeholder engagement plan are recommended. Stakeholder engagement plans should be available in local language and be disclosed at the project sites. Regular reports on the progress and engagement with stakeholders should be done in the most accessible and active manner.

**Note from Task Manager:**

All the proposed measures and recommendations of the Safeguard Advisor have been considered and included in the project design and the Environmental and Social Action Plan.

<sup>48</sup> **Low risk:** Negative impacts negligible: no further study or impact management required. **Moderate risk:** Potential negative impacts, but less significant; few if any impacts irreversible; impact amenable to management using standard mitigation measures; limited environmental or social analysis may be required to develop a ESEMP. Straightforward application of good practice may be sufficient without additional study. **High risk:** Potential for significant negative impacts, possibly irreversible, ESEA including a full impact assessment may be required, followed by an effective safeguard management plan.



### III. ESES Principle and Safeguard checklist

#### Precautionary Approach

The project will take precautionary measures even if some cause and effect relationships are not fully established scientifically and there is risk of causing harm to the people or to the environment.

#### Human Rights Principle

The project will make an effort to include any potentially affected stakeholders, in particular vulnerable and marginalized groups, in the decision-making process that may affect them.

The project will respond to any significant concerns or disputes raised during the stakeholder engagement process.

The project will make an effort to avoid inequitable or discriminatory negative impacts on the quality of and access to resources or basic services, on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups.<sup>49</sup>

Screening checklist	Y/N/ May be	Comment
<b>Safeguard Standard 1: Biodiversity, natural habitat and Sustainable Management of Living Resources</b>		
Will the proposed project support directly or indirectly any activities that significantly convert or degrade biodiversity and habitat including modified habitat, natural habitat and critical natural habitat?	N	<p>Outcome 2 includes restoration of the Nong Peung wetland in Paksan and urban streams in Pakse and Savannakhet. There are no activities that would lead to conversion and degradation of these environments.</p> <p>The Nong Peung wetland is a modified habitat. It is primarily used for irrigation of rice paddies, fishing, as water source for fish ponds for catfish and snakehead fish; both for subsistence and selling to the market. The upper part of the wetland is seasonally flooded and used for grazing in the dry season. Construction companies also mine soil in this seasonally dry part of the wetland with permission from the landowners. Encroachment of the wetland by expanding farms is a concern that community members share. People practicing aquaculture change the water in their ponds three times a month, disposing waste water into a permanent waterbody in the wetland, which likely results in nutrient loading.</p> <p>The wetland is shallow, with permanent water only two meters deep in some areas as reported by villagers. The installation of a floodgate in the 1990s has resulted in sedimentation, in particular of one of the main streams in the wetland system. An Australian project funded by Australian Centre for International Agricultural Research (ACIAR) has installed a fish passage to allow spawning fish from</p>

<sup>49</sup> Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to “women and men” or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

	<p>the Mekong to bypass the floodgate and enter the wetland. The wetland has high conservation value. There is a high diversity of fish species. After the construction of the fish passage, there have been sightings of two IUCN-listed endangered species (<i>Datnioides pulcher</i> [CR] and <i>Probarbus jullieni</i> [EN]) and one vulnerable species (<i>Scaphognathops bandanensis</i>) around 2015. However, it is not a critical habitat for any of these species, since all three species have wide geographical ranges stretching across multiple countries<sup>50,51,52</sup>, and thus it is not a “habitat of significant importance” for these listed species.</p> <p>While the Nong Peung wetland does not have any legal status as protected area and is not Ramsar wetland, it is recognised as a Key Biodiversity Area<sup>53</sup>. Overall, the wetland is well-studied, see for example:</p> <p>Baumgartner, L.J., Marsden, T., Singhanouvong, D., Phonekhampheng, O., Stuart, I.G. and Thorncraft, G., 2012. Using an experimental in situ fishway to provide key design criteria for lateral fish passage in tropical rivers: a case study from the Mekong River, central Lao PDR. <i>River Research and Applications</i>, 28(8), pp.1217-1229;</p> <p>Millar, J., Robinson, W., Baumgartner, L., Homsombath, K., Chittavong, M., Phommavong, T. and Singhanouvong, D., 2018. Local perceptions of changes in the use and management of floodplain fisheries commons: the case of Pak Peung wetland in Lao PDR. <i>Environment, Development and Sustainability</i>, pp.1-18;</p> <p>Baumgartner, L.J., Marsden, T., Singhanouvong, D., Phonekhampheng, O., Stuart, I.G. and Thorncraft, G., 2012. Using an experimental in situ fishway to provide key design criteria for lateral fish passage in tropical rivers: a case study from the Mekong River, central Lao PDR. <i>River Research and Applications</i>, 28(8), pp.1217-1229;</p> <p>Baumgartner, L.J., Barlow, C., Mallen-Cooper, M., Boys, C., Marsden, T., Thorncraft, G., Phonekhampheng, O., Singhanouvong, D., Rice, W., Roy, M. and Crase, L., 2019. Achieving fish passage outcomes at irrigation infrastructure; a case study from the Lower Mekong Basin. <i>Aquaculture and Fisheries</i>.</p> <p>The activities of the project directly support conservation values, particularly removal of invasive species and planting of appropriate indigenous species and removal of some small man-made barriers that impede waterflow. The removal of invasive species would primarily be manual, with no introduction of other species to be used. The risks would therefore be minimal. In addition, a management plan will be developed that seeks to support the traditional conservation management regimes put in place by the community and to promote sustainable livelihood practices in and around the wetland. The activities are expected to have net benefits to the fish species and overall ecosystem health and are not expected to have direct or indirect negative impacts.</p>
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<sup>50</sup> Baird, I. 2011. *Scaphognathops bandanensis*. The IUCN Red List of Threatened Species 2011: e.T180703A7650832. <http://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T180703A7650832.en>. Downloaded on 02 May 2019. Available at: <https://www.iucnredlist.org/species/180703/7650832>

<sup>51</sup> Hogan, Z. & Baird, I. 2011. *Probarbus jullieni*. The IUCN Red List of Threatened Species 2011: e.T18182A7742599. <http://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T18182A7742599.en>. Downloaded on 02 May 2019. Available at: <https://www.iucnredlist.org/species/18182/7742599>

<sup>52</sup> Vidthayanon, C. 2011. *Datnioides pulcher*. The IUCN Red List of Threatened Species 2011: e.T180969A7656475. <http://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T180969A7656475.en>. Downloaded on 02 May 2019. Available at: <https://www.iucnredlist.org/species/180969/7656475>

<sup>53</sup> BirdLife International (2019) The World Database of Key Biodiversity Areas. Pakxan Wetlands. Available at: <http://www.keybiodiversityareas.org/site/factsheet/31518>

Will the proposed project likely convert or degrade habitats that are legally protected?	N	The wetland and streams will not be converted or degraded. They are not legally protected.
Will the proposed project likely convert or degrade habitats that are officially proposed for protection? (e.g.; National Park, Nature Conservancy, Indigenous Community Conserved Area, (ICCA); etc.)	N	The wetland and streams will not be converted or degraded. They are not officially proposed for protection.
Will the proposed project likely convert or degrade habitats that are identified by authoritative sources for their high conservation and biodiversity value?	N	This project aims to preserve wetlands and streams for the value of flood regulation services that they provide. While there are high conservation and biodiversity values in the Nong Peung wetland, habitats will not be converted or degraded.
Will the proposed project likely convert or degrade habitats that are recognized- including by authoritative sources and /or the national and local government entity, as protected and conserved by traditional local communities?	N	Habitats will not be converted or degraded. The proposed activities and management plan are consistent with current community practices and local government management.
Will the proposed project approach possibly not be legally permitted or inconsistent with any officially recognized management plans for the area?	N	The project will seek to develop a management plan for the Nong Peung wetland. No existing management plans exist. The activities around the urban streams will be consistent with laws and regulations, including the identification and protection of buffer zones.
Will the proposed project activities result in soils deterioration and land degradation?	N	In removing invasive alien vegetation to make way for planting local plant species to improve infiltration and soil stability, there may be temporary erosion of topsoil until vegetation is established. The project will mitigate this risk by undertaking a formal hydrological and vulnerability assessments to get an understanding of water flow paths and planning around this. A phased approach in re-vegetating the sections of catchment will reduce erosion and improve rate of recovery. The overall impact of the project will be the restoration of ecosystems.
Will the proposed project interventions cause any changes to the quality or quantity of water in rivers, ponds, lakes or other wetlands?	Y	The ecosystem interventions in the wetland and streams aim to improve water retention and flood storage capacity. Water quality is expected to be improved in the wetland and urban streams due to restoration, awareness campaigns on solid waste management, and improved livelihood practices in and around these water bodies.
Will the proposed project possibly introduce or utilize any invasive alien species of flora and fauna, whether accidental or intentional?	N	The project will remove invasive alien vegetation to make way for planting local species to improve infiltration and soil stability.
<b>Safeguard Standard 2: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes</b>		
Will the proposed project likely result in the significant release of pollutants to air, water or soil?	N	
Will the proposed project likely consume or cause significant consumption of water, energy or other resources through its own footprint or through the boundary of influence of the activity?	N	
Will the proposed project likely cause significant generation of Green House Gas (GHG) emissions during and/or after the project?	N	

Will the proposed project likely generate wastes, including hazardous waste that cannot be reused, recycled or disposed in an <u>environmentally sound and safe manner</u> ?	N	
Will the proposed project use, cause the use of, or manage the use of, storage and disposal of hazardous chemicals, including pesticides?	N	
Will the proposed project involve the manufacturing, trade, release and/or use of hazardous materials subject to international action bans or phase-outs, such as DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants or the Montreal Protocol?	N	
Will the proposed project require the procurement of chemical pesticides that is not a component of integrated pest management (IPM) <sup>54</sup> or integrated vector management (IVM) <sup>55</sup> approaches?	N	
Will the proposed project require inclusion of chemical pesticides that are included in IPM or IVM but high in human toxicity?	N	
Will the proposed project have difficulty in abiding to FAO's International Code of Conduct <sup>56</sup> in terms of handling, storage, application and disposal of pesticides?	N	
Will the proposed project potentially expose the public to hazardous materials and substances and pose potentially serious risk to human health and the environment?	N	
<b>Safeguard Standard 3: Safety of Dams</b>		
Will the proposed project involve constructing a new dam(s)?	N	
Will the proposed project involve rehabilitating an existing dam(s)?	N	

<sup>54</sup> "Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms

<http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/en/>

<sup>55</sup> "IVM is a rational decision-making process for the optimal use of resources for vector control. The approach seeks to improve the efficacy, cost-effectiveness, ecological soundness and sustainability of disease-vector control. The ultimate goal is to prevent the transmission of vector-borne diseases such as malaria, dengue, Japanese encephalitis, leishmaniasis, schistosomiasis and Chagas disease." ([http://www.who.int/neglected\\_diseases/vector\\_ecology/ivm\\_concept/en/](http://www.who.int/neglected_diseases/vector_ecology/ivm_concept/en/))

<sup>56</sup> Find more information from [http://www.fao.org/fileadmin/templates/agphome/documents/Pests\\_Pesticides/Code/CODE\\_2014Sep\\_ENG.pdf](http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf)

Will the proposed project activities involve dam safety operations?	N	
<b>Safeguard Standard 4: Involuntary resettlement</b>		
Will the proposed project likely involve full or partial physical displacement or relocation of people?	N	
Will the proposed project involve involuntary restrictions on land use that deny a community the use of resources to which they have traditional or recognizable use rights?	N	
Will the proposed project likely cause restrictions on access to land or use of resources that are sources of livelihood?	N	
Will the proposed project likely cause or involve temporary/permanent loss of land?	N	
Will the proposed project likely cause or involve economic displacements affecting their crops, businesses, income generation sources and assets?	N	
Will the proposed project likely cause or involve forced eviction?	N	
Will the proposed project likely affect land tenure arrangements, including communal and/or customary/traditional land tenure patterns negatively?	N	
<b>Safeguard Standard 5: Indigenous peoples<sup>57</sup></b>		
Will indigenous peoples be present in the proposed project area or area of influence?	N	Village consultations have been conducted in eight villages across 3 cities where the project interventions would be conducted. There are no indigenous peoples in these areas.
Will the proposed project be located on lands and territories claimed by indigenous peoples?	N	
Will the proposed project likely affect livelihoods of indigenous peoples negatively through affecting the rights, lands and territories claimed by them?	N	
Will the proposed project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	N	
Will the project negatively affect the development priorities of indigenous peoples defined by them?	N	
Will the project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	N	

<sup>57</sup> Refer to the Toolkit for the application of the UNEP Indigenous Peoples Policy Guidance for further information.

Will the project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	N	
<b>Safeguard Standard 6: Labor and working conditions</b>		
Will the proposed project involve the use of forced labor and child labor?	N	Remuneration and working conditions of all personnel will be in accordance with Lao labour law.
Will the proposed project cause the increase of local or regional un-employment?	N	
<b>Safeguard Standard 7: Cultural Heritage</b>		
Will the proposed project potentially have negative impact on objects with historical, cultural, artistic, traditional or religious values and archeological sites that are internationally recognized or legally protected?	N	
Will the proposed project rely on or profit from tangible cultural heritage (e.g., tourism)?	N	
Will the proposed project involve land clearing or excavation with the possibility of encountering previously undetected tangible cultural heritage?	N	The installation of permeable paving will not be at greenfield sites and will not involve excavation, therefore there is no possibility of finding previously undetected tangible cultural heritage or risk of unexploded ordnance.
Will the proposed project involve in land clearing or excavation?	N	
<b>Safeguard Standard 8: Gender equity</b>		
Will the proposed project likely have inequitable negative impacts on gender equality and/or the situation of women and girls?	N	The project's outputs and activities have been designed to be gender-sensitive and are not expected to negatively impact gender equality and equity. All outputs and activities will be delivered in accordance with the Gender Action Plan (Annex J of the funding proposal).
Will the proposed project potentially discriminate against women or other groups based on gender, especially regarding participation in the design and implementation or access to opportunities and benefits?	N	
Will the proposed project have impacts that could negatively affect women's and men's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?	N	
<b>Safeguard Standard 9: Economic Sustainability</b>		
Will the proposed project likely bring immediate or short-term net gain to the local communities or countries at the risk of generating long-term economic burden (e.g., agriculture for food vs.	N	EbA was selected as an adaptation strategy to ensure the sustainability and longevity of project benefits and ecosystem services provided by the Nong Peung wetland and urban streams.

biofuel; mangrove vs. commercial shrimp farm in terms of fishing, forest products and protection, etc.)?		
Will the proposed project likely bring unequal economic benefits to a limited subset of the target group?	N	

#### IV. Additional Safeguard Questions for Projects seeking GCF-funding

Community Health, Safety, and Security		
Will there be potential risks and negative impacts to the health and safety of the Affected Communities during the project life-cycle?	N	
Will the proposed project involve design, construction, operation and decommissioning of the structural elements such as new buildings or structures?	N	
Will the proposed project involve constructing new buildings or structures that will be accessed by public?	N	
Will the proposed project possibly cause direct or indirect health-related risks and impacts to the Affected Communities due to the diminution or degradation of natural resources, and ecosystem services?	N	The project intends to regulate flood water through a range of measures that enhance ecosystem function. There may be some soil erosion during wetland and stream rehabilitation and the removal of invasive alien plants but these risks will be minimized through taking a phased approach to re-vegetating to reduce erosion and improve rate of recovery.
Will the proposed project activities potentially cause community exposure to health issues such as water-born, water-based, water-related, vector-borne diseases, and communicable diseases?	N	
In case of an emergency event, will the project team, including partners, have the capacity to respond together with relevant local and national authorities?	Y	Safety practices would be implemented in installation of permeable pavements and ecosystem restoration. These include assessment of hazards, wearing of protective gear, use of proper equipment, and conducting activities in safe weather conditions. The restoration and installation of permeable pavements are intended to be done in the dry season. In case of emergencies, the relevant local and national authorities, and the project team would have the capacity to respond.
Will the proposed project need to retain workers to provide security to safeguard its personnel and property?	N	
Labor and Supply Chain		

Will UNEP or the implementing/executing partner(s) involve suppliers of goods and services who may have high risk of significant safety issues related to their own workers?	N	
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## Annex 2: Ethnic Groups: Lao Front for National Construction Classification<sup>58</sup>

<b>I: The Lao-Tai Language Family (8 Groups)</b>			
<b>No.</b>	<b>General Name</b>	<b>Subgroup</b>	<b>Other local names</b>
1	Lao		Lao
		Phouan	Phouan
		Kaleung	Kaleung
		Bo	Bo
		Yooy	Yooy
		Nyo	Nyo
			Thay Pheung
			Isane <sup>59</sup>
			Thay Xam
			Thay Yeuang
			Thay Lane
			Thay Cha
			Thay Mat
			Thay O
			Thay Lang
2	Phou Thay		Phou Thay
			Thay Ang Kham
			Thay Kata'
			Thay Kapong
			Thay Sam Kau

<sup>58</sup> This classification of the Lao Front for National Construction, dating from August 2000, is based on language families generally recognized by specialists internationally.

<sup>59</sup> Refers to the Lao of Northeastern Thailand who migrated to Laos.

			Thay Vang
3	Tai	Tai Dam	Tai Dam (Black Tai)
		Tai Deng	Tai Deng (Red Tai)
		Tai Khao	Tai Khao (White Tai)
		Tai Moey	Tai Mène
			Tai Theng
			Tai Et
			Tai Xom
4	Lue		Lue
		Kheun	Kheun
5	Nyouan		Nyouan
		Kalom	Kalom
		Ngiau	Ngiau <sup>60</sup>
6	Yang		Yang <sup>61</sup>
7	Sek		Sek
			Koy
8	Tay Neua		Tay Neua <sup>62</sup>
<b>II: The Mon-Khmer Language Family (32 Groups)</b>			
9	Khmou		Khmou, Kammu

<sup>60</sup> The Lao word for Shan.

<sup>61</sup> The conventional spelling in Nhang, the outsider term for the group that calls itself Yay.

<sup>62</sup> Recent immigrants from the Sze Mao area of Yunnan, not to be confused with the 'Neua' of Sam Neua.

		Khmou Ou	Khmou Ou
		Khmou Lue	Khmou Lue
		Khmou Nyouan	Khmou Nyouan
		Khmou Khrong	Khmou Khrong
		Khmou Rok	Khmou Rok
		Khmou Khwène	Khmou Khwène <sup>63</sup>
		Khmou Mè	Khmou Mè
		Khmou Kasak	Khmou Kasak
		Khmou Cheuang	Khmou Cheuang
			Mok Pray
			Mok Prang
			Mok Tang Chak
			Mok Kok
			Mok Tou
10	Pray	Thin	Thin, Lawa, Lao May <sup>64</sup>
11	Ksing Moul		Phouak, Lao May
12	Phong		Phong, Kaniang
		Phong Piat	
		Phong Lane	
		Phong Fène	Phong Fène
		Phong Chapouang	Phong Chapouang
13	Thène		Thène, Thay Thène
14	Oe Du		Oe Du, Thay Hat

<sup>63</sup> Or 'Kwène'.

<sup>64</sup> More commonly referred to as 'Phay' in Laos. T'in and Lawa are names used in Thailand.

15	Bit		Bit
16	Lamet		Lamet
17	Sam Tao		Sam Tao
		Doi	Doi
18	Katang		Brou Katang
		Pha Keo	Pha Keo
19	Makong <sup>65</sup>		Brou Makong
		Trouy	Trouy
		Phoua	Phoua
		Maroy	Maroy
		Trong	Trong
20	Tri		Brou Tri
21	Jrou		Laven, Sou'
		Jrou Kong	Jrou Kong
		Jrou Dak	Jrou Dak
22	Triang		Triang
23	Ta Oy		Ta Oy
		Tong	Tong
		Yir	In
24	Yè'		Yè'

<sup>65</sup> As of this year (2019) an additional group, simply Brou, has been added bringing the total number of ethnic groups to 50. In fact, Brou, Tri, and Makong are dialects of a single language called Brou by linguists.

25	Brao		Lavè, Louy Vé
		Kavèt	Kavèt
		Halang	Halang
26	Katu		Katu <sup>66</sup>
		Triu	Triu
		Dak Kang	Dak Kang (Panh Deng)
27	Halak		Alak
28	Oy	Sapouan	Sapouan
		Sok	Sok
		Inthi	Inthi
			Mèkrong
			Mèreuyao
29	Kriang		Ngè'
		Chatong	Chatong
		Ko'	Ko'
30	Cheng		Cheng
31	Sadang		Sedang <sup>67</sup>
		Kayong	Kayong
		Sadang Douan	Sadang Douan
32	Souay		Souay

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<sup>66</sup> Conventional spelling.

<sup>67</sup> Conventional spelling.

33	Nya Heun		Tang Kè', Heunh
34	Lavi		Lavi
35	Pacoh		Pacoh <sup>68</sup>
		Kado	Kado
		Kanay	Kanay
36	Khmer		Khom, Khmer <sup>69</sup>
37	Toum		Toum
		Liha	Liha
		Thay Cham	Thay Cham
			Thay Poun
		Thay Pong	Thay Pong
			Moy
38	Ngouan		Ngouan
39	Meuang		Moy
40	Kri <sup>70</sup>		Salang, Arem
			Tong Leuang
		Maleng	Maleng
		Mlabri <sup>71</sup>	Labri, Tong Leuang

<sup>68</sup> Conventional spelling.

<sup>69</sup> Conventional spelling.

<sup>70</sup> This is a problematic classification. The Vietic (or Viet-Meuang) subgroups of Nakai and adjacent areas consist of a number of languages, of which 'Kri' is one. Salang is a local term for this group, and Arem is the Brou term for the same group. 'Tong Leuang' (Lit. 'Yellow Leaf') is the Lao expression for hunter-gatherers that refers to the shelters constructed for short-term residence during cyclical foraging in the forest, the idea being that when the leaves turn yellow it is time to move on.

<sup>71</sup> The Mlabri (also hunter-gatherers and hence the confusion) do not belong to the Kri group and are misclassified here, rather they may be related to Khmou, Pray, Palungic or none of these and are found in Xaygnaboury.

<b>III: The Chine-Tibet Language Family (7 Groups)<sup>72</sup></b>			
41	Akha		Ko, Iko
		Akha Chi Cho	Chi Cho
		Akha Pouly	Pouly
		Akha Pana	Pana
		Akha Fé	Ko Fé
		Akha Nou Kouy	Nou Kouy
		Akha Louma	Louma
		Akha Oe Pa	Oe Pa
		Akha Chi Pya	Chi Pya
		Akha Mou Chi	Mou Chi
		Akha Ya Oe	Ya Oe
		Akha Kong Sat	Kong Sat
42	Singsily <sup>73</sup>		Phou Nou, Pisou
		Phou Yot	Phou Yot
		Tapat	Tapat
		Ban Tang	Ban Tang
		Cha Ho	Cha Ho
		Lao Xeng	Lao Xeng
		Phay (Phong Saly)	Phay (Phong Saly)
		Lao Pane	Lao Pane
		Phong Kou	Phong Kou
		Phong Set	Phong Set

<sup>72</sup> This is the Lao term for the larger superstock known as Sino-Tibetan which consists of two main families: Sinitic (Chinese) and Tibeto-Burman. Most of the languages of this family in Laos belong to the Tibeto-Burman family, the only exception are the Chinese Ho.

<sup>73</sup> Also found written as 'Sengsaly'.

43	Lahu		Mou Xoe
		Lahu Dam	Mou Xoe Dam (Black Lahu)
		Lahu Khao	Mou Xoe Khao (White Lahu)
		Kouy <sup>74</sup>	Kouy Soung
			Kouy Louang
44	Sila		Sida
45	Hanyi		Hanyi
46	Lolo		Lolo
47	Ho		Ho <sup>75</sup>
<b>IV: The Hmong – (lu) Mien Language Family (2 groups)<sup>76</sup></b>			
48	Hmong		
		Hmong Khao	Hmong Daw (White Hmong)
		Mong Lai	Mong Leng, Mong Youa (Green Mong)
		Hmong Dam	Hmong Dam (Black Hmong)
49	lu Mien		Yao
		Lantène	Lao Houay, Lènetène <sup>77</sup>
		Yao Phon May Deng	Yao Phon May Deng
		Yao Khao	Yao Khao

<sup>74</sup> Call themselves Lahu Shi 'Yellow Lahu'.

<sup>75</sup> Yunnanese Chinese.

<sup>76</sup> The recent name for this family is Hmong-Mien (lu Mien is the name of a particular group of Yao). The alternate name for this family is Miao-Yao.

<sup>77</sup> Usually refer to themselves as 'Kim Moun' or 'Mane'

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

### **Annex 3 Village consultation report**

#### **Introduction**

The project locations visited are located in the cities of Pakse in Champasak Province, Savannakhet (Kaysone Phomvihane) in Savannakhet Province, and Paksan in Borikhamxay Province. It was found that titled land ownership is universal for the areas visited. This is to be expected for urban and peri-urban areas.

#### **Champasak: Pakse**

Pakse is the capital of Champasak province. In former times, at least since the 5<sup>th</sup> century, the nearby ruins of Vat Phou the original center of the Champa Kingdom. This was a Chen-la and Khmer kingdom that later fell under the greater Khmer empire beginning in the 10<sup>th</sup>-11<sup>th</sup> century until the fall of Angkor. The Lao Kingdom of Lan Xang took over the territory in the 14<sup>th</sup> century, including adjacent parts of Cambodia in Rattanakiri and Steung Treng where Lao is still spoken. The people of Pakse city are ethnically Lao and speak a dialect of Southern Lao. In each location there are Vietnamese families, some of whom were brought to work as petty officials for the French during the colonial period.

### **Ban Kae, 28 March 2019**

Present were:

The village Chief  
Deputy Village Chief  
Head of the Lao Woman's Union  
Somsak, LFNC  
Bouasone, asst Village Chief  
Bounchanh, deputy LFNC  
Bounnyot, deputy LFNC  
Ms. Thongsy Pongvilay, head of school PTA  
Ms. Khoumhin Phommavong, Head of LFNC  
Ms. Kaysouan Sipasoet, Health and Sanitation  
About 30+ villagers, both women and men.

Ban Kae was established in the year 1810. It grew from a boat landing for cargo boats plying between Vientiane and Pakse. Not much is known about the early history of the village. The villagers do recall that there was a devastating flood that occurred during World War II. Until recently (exact period unknown) 80-90% of the villagers were rice farmers. The first settlers consisted of only 4-5 families. The land was mostly dense forest with tigers. There were no roads. In the year 1900, the population had increased to 50-60 households, and has been increasing ever since. Currently the population stands at 237 households, 1,368 people (678 female).

The temple of the village was built in the year 1920. There is one primary school, one clinic, a district hospital, and no market. Traditional festivals including the boat races, the rocket festival, the Bon Pravet, and Lao New Years are all celebrated.

No community owned land is extant, with the exception of the cemetery, which encompasses two rai (3,200 square meters). All households in the villages have official land titles.

By the villagers' own estimate, only a few families would be considered wealthy, and some are in the average range. But the majority are poor, consisting of factory workers, day laborers, and government officials. Eight families are still rice farmers. 20 of the households currently have female heads.

Since 2005, the village floods every year, and in most years the standing water last for approximately two months. Chickens, ducks and household gardens are the main losses, in addition to household goods, though nowadays valuable items are kept on the second floor. Chickens and ducks are a mainstay of the economy, the estimated numbers for the village are 60,000 chickens and 80,000 ducks. One family present at the consultation lost over 70 combined chickens and ducks. Women are often the most immediately affected as the waters rise suddenly when the men are away at work.

Solutions to flooding proposed by villagers include, acquisition of large pumps, and raising the level of the roads, and purchase of boats, as during the flooding families are cut off from traveling. Otherwise they are essentially at a loss to solve the problem. In all, each year, some 130 households are affected by the floods.

## **Ban Tha Hay, 28 March 2019**

Present were:

Mr. Visouk, Village Chief  
Ms Khemphet, Asst Village Chief  
The Lao Front for National Construction Representative  
Three villagers (2 female)

The village of Tha Hay is estimated to be around 200 years old. It grew from a cluster of four villages, that were eventually united under the common name of Tha Kok Hay ('port+tree+banyan'), and later shortened to Tha Hay in 2006.

The population consists of 845 families, 579 households, 3, 408 people (1748 female). Of the total, 192 families (166 households) are ethnically Vietnamese (total population 664 (335 female). The Vietnamese population are old residents but have not changed their nationality. There is one Vietnamese temple in the village in addition to a Lao one. All households have land titles, but for the Vietnamese they grant only permission to stay on the land, not to own it.

70 percent of the villagers are engaged in commerce, 20 percent are government officials, and 10 percent are laborers. A large portion of the merchants are middlemen who purchase produce from farmers and then mostly resell it in the Dao Heuang market of Pakse. The village also has several cottage industries

that manufacture bread, sausages, *patangko* (a kind of fried pastry) and noodles. The village is generally considered well-off, but some 5 percent are classed as 'poor'. There is no intensive agriculture, mostly kitchen gardens, and some people fish commercially depending on the season. Fish in this area are particularly large, some averaging between 1-50 kilograms (the *paa poen*). There is a protected pond in the village where no fishing is allowed. Livestock consists only of chickens and ducks, as all four-legged livestock are forbidden to raise in urban areas. Fish populations seem to be decreasing and now fish are very expensive in the market.

Flooding occurs every year and affects some 15 percent of the households. Families living in low lying areas are forced to move in with relatives or stay in temples or schools. There is one primary school in the village and one kindergarten. There is also a Vietnamese kindergarten. The depth of the water during flooding averages 1.5 meters, and this is because some of the water is expelled by pumps which run 24 hrs a day. The plan of the district is to purchase larger pumps. The flood waters come into the village from four different sources so one suggestion is to divert some of these waters to other areas.

All children in the village attend school, including secondary school, though not all of them finish. Many traditional festivals are no longer celebrated, including the boat races and rocket festival. The abbot of the temple (where racing boats are customarily stored), has forbidden the keeping of boats in the temple.

In addition to the Buddhist temple, there is a house for the guardian spirit of the village called the Ho Sop Xé, villagers who enter and leave the village always let this spirit know of their comings and goings. They also ask the spirit, Father Sop Xé, for protection against floods. A large pond could be used for retention, approximately 2,885m<sup>2</sup>. It belongs to the government, and if expanded and deepened could also help with the flooding.

## **Ban Koun, 29 May 2019**

Ban Koun and Ban Pakse were originally all one village. Villagers say Ban Pakse floods more. Here the Village Chief is a woman.

The population is 1,329 (645 female), 221 households, 217 families. Ethnic Vietnamese and Chinese live in 20 houses, 18 households are government officials, 64 are merchants. The combined labor force of the village is 855, of whom 446 are female. All homes are electrified and benefit from good municipal water system. There are no extremely poor households in the village and hunger is not a problem. There is a temple and good access to the hospital, but some respondents described the poor quality of health care in Laos, and why everyone goes to Thailand for health care. It was mentioned that corruption in all public services is a major problem that has not been resolved.

Flooding occurs for a duration of 1-2 months every year. About 60 households are affected, 18 of them severely. Two pumps are used but they are too small to cope, and often get flooded themselves. The government does not assist, only local community entities collect money to pay for diesel to run the pumps. During the floods, households have no means of livelihood as standing water is a major problem. There are some donations made from the private sector to help run the pumps. One-storey houses are the worst off, and occupants must find shelter in schools and temples. Each rainy season, people try to prepare, but the floods come suddenly, and without warning. Villagers say they are afraid to sleep at night.

They really want to find a solution to the flooding and the poverty it brings. The worst months are August and September.

Before some families had boats, but these are no longer present. Some villagers said they have sold their boats once the pumps have been installed. However, the pumps have not solved the flooding and they need the boats back. Every one of the solutions has failed. Thievery is a problem as the house are often unguarded during flooding. Losses include small livestock (domestic fowl) and household appliances.

The main occupation of villagers is commerce, small shops or selling things in the market. Some families have small gardens. There are hotels and guest houses in this village that employ some local people, along with cafes and noodle shops. Garbage and waste disposal are becoming a serious problem as the economy grows. Also land boundary disputes are common, despite all households having official titles and deeds. The problem is so bad that banks will not accept deeds as collateral for loans firm this village.

## **Ban Pakse. 29 March 2019**

Ms. Chanhpheng, Village Chief  
Ms. Somdavone Asst Village Chief  
Noukham, Asst Village Chief  
Khonelay Saygnasane, Asst Village Chief  
Sinya Meksavanh, Asst Village Chief  
Sonethilath, Security  
Bounpakhong, Securityvillage Chief  
Soet, Asst Village Chief  
Thavone, Asst Village Chief  
Head of Security  
Lao Youth Union Head  
About 10 + villagers, mostly women.

The village has a woman village chief, and one of her assistants is also a woman. All assistants and representatives of mass organizations and the party secretary were present. Ban Pakse is a member of the “Green Development Project” of Korea. But they have now disappeared, and the 28 billion dollars (according to the community) they were promised has never materialized.

Not much is known about the village history, as it has had several name changes and boundary changes since the regime change in 1975. Currently there are 217 families, 222 households, 1,229 people (645 female). 20 families are Mixed Chinese and Vietnamese, 18 families are government officials, 64 families are merchants, and 4 belong to police and military. The total labor force is 833 persons, 440 are female. There are no health clinics as they are close to the provincial hospital, and for serious health issues they go to Thailand. All homes are electrified and have water systems. All children go to school, though in the surrounding villages. In Ban Pakse there is only a kindergarten. There is likewise no temple, because they are close to a major temple in an adjacent village. There is not much cottage industry, just a few places making noodles and “banh canh”, a Vietnamese dish. Some livestock, even pigs are raised. Selling snack foods on the street is forbidden.

Land ownership is now a problem. When the dyke was installed, 125 families were relocated, now they want to come back.

In 2018, flooding was severe. Some 60 families were badly affected. Two years ago, a dyke and a flood gate were installed, but it was difficult to open and close and was unable to control flooding. Mass organizations and security officials helped the flooded persons to evacuate and guarded their homes from thieves.

Villagers want a larger pump to clear out the water which now stands for one or two months, making it impossible for homeowners to recover economically as all livestock and gardens are destroyed. Villagers say that flooding is a recent problem and was not a problem in the past. The only solution they say is to purchase more pumps, but no funds for this are available, and they blame the government. What little assistance they have had is from donations from Thailand.

### [Savannakhet: Kaysone Phomvihane \(since 2005\) or Savannakhet City](#)

Savannakhet (and Khammouane) was part of the Champa Kingdom as well, until the arrival of Lan Xang. The city is mostly ethnic Lao, with some Phou Thai in certain villages. The Phou Thai are scattered throughout the province but most populous in Xépon and Viraboury. Their center is in the latter in the territory known as Meuang Vang –Ang Kham. The Phou Thai are ethnically most closely related to the Nyo and Phouan discussed under Paksan below.

The city has become an economic hub, situated on the East-West corridor that connects the Da Nang deep water port with Laos, Thailand and Myanmar. A bridge over the Mekong River links Savannakhet with Mukdahan on the Thai side. Two Special Economic Zones, one at the Lao-Vietnam border, and one in Kaysone Phomvihane are located in the province.

## **Ban Houa Meuang Tay**

Village Chief, female

Deputy village Chief, female

Deputy Village Chief, male

The Lao Front for National Construction Representative

Village chief is a woman, just newly elected.

Previously the village was named Na Kae, Khoun #3.

In 1960 it became Houa Meuang.

In 1990 it was split into two sectors, north and south (The “Tay” of the name means ‘south’.)

In 1993 it was further divided to include Houa Meuang Tha (‘boat landing’)

In 2003 Tha and Tay merged to become Houa Meuang Tay

It is established at the northern end of what is known as the Meuang Kaysone Phomvihane flatlands. The village area is 63.78 hectares. There are 407 families, 458 households, 33 sections (*nouay*), with a total population of 2,640 (1,366 female).

In the population there is a substantial group of Phou Thay, 296 (154 female).<sup>78</sup> The “foreign” groups are 4 households of Vietnamese, 1 Chinese, and 4 Indian.

Occupation-wise, 79 families are government officials, 3 are military, 10 are police, 112 are merchants, 3 are furniture makers, 12 are farmers, and 188 are workers.

94 % of the population are Buddhists, and 5 % are Christians. Some religious festivals have been abandoned, but boat races are popular. They had a 23-meter-long boat, but it fell into disrepair, so not they rent boats from a neighboring village and won second place last year.

Infrastructure: there is one main paved road and 8 lanes. There is one temple with 14 monks, 44 novices, and one nun in residence. There is one kindergarten, 1 primary school, 1 market (named “Savanhxay”). And 1 cemetery 60 x 60 meters. All homes are electrified and have water systems. The house of the village chief has one all-weather well about 12 meters deep, although the water level rises in the wet season.

There is one tract of 8 hectare land, said to belong to the relatives of a famous revolutionary hero, that is rented out to farmers who wish to grow crops or rice. The soil is slightly sandy and good for farming. There are 7 cows, 4 goats, 30+ pigs, and many chickens as well being raised.

About 5 families are affected by flooding which last about 2 months and causes loss of produce. One woman said her losses were estimated at about 10 million kip. The flood in 2008 was especially bad and then again in 2018, when the water rose 18 meters a bridge was washed out. There is a flood gate that has fallen into disrepair. Most other years the flooding was said to be not as serious.

## **Ban Phongsavang Tay, 2 April 2019**

Village Chief

Deputy village Chief, female

Deputy Village Chief, male

2 flood victims

Ban Phongsavang had been the location of French military base since 1957, and then in 1964 a stadium was constructed here as well. Then a monk came one day and meditated under a tree, and a temple was built at that place. The temple was called Vat Non Savang, from which the village gets its name. It had been called Ban Tha Savang in 1959-60 and then changed to Ohonsavang at that time. After this people came to plant rice, about 50-60 families at first. It continued to expand and then in 1983-4 it was designated Phongsavang Tay (South Phongsavang).

The village encompasses 339.5 hectares, has 56 sectors, 1,076 families, 1,106 households, with a total population of 6,055 (3,098 female). Of this, 4,438 persons (2,265 female) are age 15 or over. Also, there are 16 Vietnamese families, 2 Chinese, 1 Canadian, 1 French, and 1 Thai. The village is also home to the office of the Central Ban, the Nakhon Military Stadium, the Provincial offices of Education, Justice, Labor and Social Welfare, MoNRE, Public Works and the Provincial Court, Planning and Investment, the

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<sup>78</sup> The Phou Thay are a distinct ethnic group, but for official purposes are counted as ethnic Lao.

Provincial Peoples Assembly, the Vietnamese Consulate, Lao Turakhom Telecommunications Office, and the National Printing House.

There are 1 kindergarten 1 primary school, 1 lower secondary school, and the Xaysombath technical college. There is one temple with 59 novices and 15 monks. The Bou Pravet, Rock Festival, boat races, and other merit-making festivals (Boun Kanthin) are all celebrated.

Construction of a mall / convention center (Savann-ITECC) encroaching on the natural stream has caused some flooding affecting about 10 families, with water levels of about 1 meter. The flooding, however, does not last long. It appears to be caused by a large diameter water pipe flowing into a smaller one causing the water to back up and flood. Since 2012 there have been three floods, the worst was last year in 2018. Losses are not heavy now as people are prepared. Villagers feel that Savann ITECC should accept responsibility but so far they have taken no action, and do seem to not be doing so well financially.

### **Ban Na Kae, 3 April 2019**

Village Chief  
Deputy village Chief, female  
Deputy Village Chief, male  
Deputy Village Chief, male  
1 flood victim

The village of Na Kae is an old village first founded in 1860 by villagers who established wet rice paddies and vegetable gardens along the shores of the river. Today it is still situated along the Mekong river and was named a “cultural village” by the city administration. The primary occupation of approximately half of the population (2,569, 1,387 female), remains wet rice cultivation for consumption and sale. The remainder are government officials, merchants, and day laborers, some of whom only do this as a subsidiary activity after the rice harvest. All are ethnic Lao.

The village carries on local traditions and festivals, including boat racing and the rocket festival although the latter has been discontinued as a result of the rockets landing on houses across the river in Thailand. The Boun Pavet (Mahaxat) and Boun Kathin, festivals are still practiced in the Buddhist temples. Of which there are two, as well as one Christian church. There are two schools, one kindergarten and one primary school. Secondary schools are located in adjacent villages.

The total land area of the village is 269,492 hectares, of which 84 hectares are wet rice fields, and 24 hectares are second season fields. All households are connected by roads, are electrified and are serviced by the city water system. One of the main bridges over the Mekong is located here connecting Savannakhet to the Thai city of Mukdahan, part of the East-West Economic Corridor system linking the deep water port of Da Nang in Vietnam, passing through Savannakhet Province, Thailand (connecting to the Eastern Seaboard and Bangkok), to Moulmein, Myanmar, with side links to Cambodia. A second system, the India–Myanmar–Thailand Trilateral Highway, links this to India.

Na Kae classifies itself as upper moderate economically, based primarily on proceeds from agriculture and livestock raising. Total holdings were given as 54 buffaloes, 250 cows, 600 goats, and 1,800 combined ducks and chickens.

There is a plan by the Special Economic Zone initiative to construct a golf course, and a children's amusement park on this village's land, but with a commitment to not interfere with agricultural land. To date this has not begun as the costs of compensation to landowners would be too high to be feasible.

In the year 2018, five households were flooded and part of the agricultural land, with waters estimated at 1.5 meters in depth. Household furniture and appliances were lost, and an unspecified amount of rice died in the field from prolonged inundation. One of the reasons was drainage pipes under roads were too small and were clogged with refuse. Vegetable gardens were also lost.

The floodgate in the village was built around 1999 or 2000, that has helped abate flooding when the Mekong River levels are high. Floodwaters in the village also come through from inland, as there is water from the area of the casino flows downstream to this area. Now a new steel reinforced concrete road. Route No. 4, through the village is planned. Villagers are requesting that this road be constructed with large diameter culverts to allow free flow of flood waters in future years.

#### Borikhamxay: Pakxan (aka Paksan)

6 village committee representatives

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 19<sup>th</sup> century. Along the way 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 19<sup>th</sup> 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 patrilineages, 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 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 indigenous peoples, they 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 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.

## **Ban Patsum, 6 April 2019**

Bounnyou, Village Chief  
Asst Village Chief  
Asst Village Chief  
Bounlom, flood victim  
Soun Inthilath, flood victim  
Village Committee  
2 flood victims

The village. Located on the Xanh River, was established in the 19<sup>th</sup> century, though the exact year is unknown. They believe most had moved from the district now known as Tha Thom, near the headwaters of the Xanh. The villagers belong to three ethnic groups: Meuy, Nyo, and Phouan (discussed above). There are currently 279 families in the village and a total population of 1,250 (692 female). Most of the population are farmers, and of these some 30 households have family members who are also government officials. All villagers are Buddhists and celebrate traditional holidays. They also hold boat races each year on the Nam Xanh River.

The total land area is 1350 hectares, of which 375 hectares are wet rice fields and 198 hectares are used for cultivation of other crops such as bananas, sugar cane and cassava.

All homes are electrified and have water systems, though a few households retain their own wells in addition. There are three temples and two schools. For health services they can access the provincial hospital which is three kilometers away.

Economically each household has their own land, averaging 2 hectares, and raise livestock. There are no poor households in the village. The only threat to production is flooding. There are flood a few flood tolerant varieties of goho or sticky rice. When the crops are destroyed, gardening of alternative crops such as chili, lettuce, and cabbage for subsistence and selling to the market are done. Men also go to work in other places. There are few extension officers servicing the area. There is no irrigation. Non-timber forest products are harvested as herbs and medicines and boiled with water.

Water is mostly from wells at depths of 7 – 20 meters but depending on the location. From 2014, some households have tap water. There are few households with toilets and septic tanks.

Flooding is serious and happens every year. In 2018, 72 hectares of rice fields were flooded, as well as 12 hectares of bananas and 5 hectares of cassava. All households experienced losses, including both large

and small livestock. Standing water remained for long periods. Some houses are submerged for 1-2 meters. Most houses are located on higher ground and were only minimally affected.

Flooding results from heavy and sustained rainfall that affects the village from the Nam Xanh River, where canals are too narrow and drainage pipes are too small flowing into the Nam Peung. Also in the other direction, when the Mekong rises, water flows into the village land as well as it is quite low. Usually flood waters come hard and fast without warning. There are no pumps to redirect the water. The government issues flood warnings from megaphones on vehicles that drive around. There are a few hours of warning before the floodwaters come. When it floods, there are a lot of fish from the Nam San river and villagers eat them. But they do not last long, and crops have been destroyed.

Prior to 2015, the local roads were dirt and low lying, when floods came the water simply flowed over them. Then the main was raised, and the culverts too small so the water backs up into people's houses.

Community members think that there are 50-50 benefits from the roads. On one hand it improves transportation, but it also worsens the flooding. Mr. Bounnyou, the village chief, said the water in his house was 1.5 meters deep. Two hectares of paddy fields were flooded and he lost half of his crop. This was because his land is slightly higher than others.

Mr. Bounsom, age 64, lost his entire rice crop of 3 hectares (amounting to 200 sacks at 36 kilos per sack), enough to feed his household for one year with some left over for sale. He also lost one hectare of bananas and 3 rai of cassava, estimated at 4 million kip. 40 duck and chickens died, and all of the household appliances were destroyed. Since there was no place to cook, food was prepared on open fires by the side of the road.

Mr. Houn, age 66, lost 50% of his rice crop, about 80 sacks, and one hectare of cassava, estimated at 6 million kip. 40 ducks and chickens were lost as well.

## **Ban Pak Peung, 6 April 2019**

Bounliap Thammavong, Village Chief  
Phongsavanh Fangthing, Asst Village Chief  
Head of LFNC  
Head of Security  
Khamvanh, flood victim  
Kikeo, flood victim  
Khambing, flood victim  
Head of the fish raising cooperative

This ethnic Nyo village was founded in 1893 when the country was a French colony. In the year 2000 there were 75 families, today the that number has risen to 135 families, 145 households, and a total population of 686 (358 female). For purposes of the census the classify themselves simply as Lao. The village is considered as very industrious and has been named a "cultural village" because of its economic success and for good health. Most villagers (90%) are farmers and fishers and a few (15 persons), are government

officials. Some income is also realized by households selling vegetables and fish. There is no in-migration of other villagers into the village. The only new members are those that intermarry with villagers.

All houses are electrified. There are 5 artesian wells and most household have their own wells. There is one community-owned artesian well for public use. Drinking water is bought.

The main religion is Buddhism, and all Buddhist holidays are celebrated. In addition the village participates in the boat races, and each year celebrates the rocket festival. (These latter two are pre-Buddhist holidays that have survived until the present.)

The total village area covers 1,006 hectares, including streams, rivulets and ponds. There are 368 hectares of wet rice fields and 221 hectares of second crop rice fields. 30 hectares of land are community land and protected forest. There are 9 ponds, both large and small, the largest covering 15 hectares. There is a primary school with 60 students and 3 teachers, all women.

Agriculturally, the area is rich in natural fertility with loam soil and organic matter deposits, crop yields are high and livestock raising, including fish raising, is very successful. The area is thought of as the “cradle of rice and fish,” by the city of Paksan. Pesticides and weed killers are not used. NPK fertilizer is used. Fields are not burned after harvest and instead cows and water buffalos eat leftover straw. Village members are keen to learn more about organic fertilizers and farming techniques. Production is higher than in the past because of irrigation and extension services available. About 10 tons of fish are shipped each month to markets in the city. All families are entirely self-sufficient with an average income of 18,300,000 kip per year per family. Wetland and stream fishing is also done in addition to fish farms. Fish traps are set. Snails from the wetland are eaten.

There are different birds and ducks found in the wetland. Invasive vegetation include water hyacinth and imperata grass at the edges of the pond.

Flooding happens every year, but some years are worse. The years 1985, 1995, 2005 and last year (2018) was especially bad. Flooded area remained under water for two months and losses were severe. Over 300 hectares of rice crops died, 45 hectares of vegetable gardens (morning glory, melons, papayas, and various kinds of onions), 3 buffaloes, 70 cows, 60 goats, and large numbers of chickens and ducks, and fish ponds. Overall more than a 100 million kip.

Flooding is caused by heavy rains and insufficient drainage, as the flood gate is too small. When rainfall is high then both the Xanh and the Mekong are high whereas the village land is low.

Mr. Bounliap, the village chief, had 5 hectares of rice fields inundated, and was able to salvage only 15 sacks of rice (the investment in planting amounts to 12 million kip per year). He also lost 6 goats, 3 cows and 5 fishponds. Usually he is able to harvest 3 tons of fish per year, but last year (2018) only 800 kilograms was possible.

Mr. Khambing is head of the village fish raising association. The association consists of 14 families, with 65 fishponds, of which 40 were flooded. Each pond has approximately 25,000 fish, which sell at an average price of 12-25,000 kip per kilogram, so losses were calculated in hundreds of millions of kip.

Mr. Khamvanh, age 58, lost one hectare of paddy field and harvested on 4 sack of rice (usually 90 sacks without flooding). Also lost were 2 rai (1 ha. = 6 rai) of gardens with tomatoes, eggplants, corn and onions, estimated at a loss of 15 million kip. He also lost one cow, more than 30 chickens, and 3 goats.

Mt. Kikeo, age 42, lost all 2 hectares of rice crop, the equivalent of 180 sacks of rice and livestock.

If there is a project to create a large storage pond, the village will provide volunteer labor and will not require compensation for lands that are used for this purpose. They are also very interested in improving the fish spawning facilities, with deeper pools and deeper and wider canals. Community members propose to dig the streams expressed desire to get a new pump, and to pump the Mekong water into the pond.

## Annex 3A – Schedule of village consultations

### Champasak

#### **Ban Kae, 28 March 2019**

Present: Village leaders and cross section of villagers both men and women



#### **Ban Tha Hai, 28 March 2019**

Present: Village Chief Mr. Visouk, deputy Village Chief Ms. Khemphet, villagers



#### **Ban Koung, 29 May 2019**

Present: Village Chief Ms. Khamtsy (not real name), and villagers

### **Ban Pakse. 29 March 2019**

Present: Village Chief Ms. Chanpheng; Deputy Village Chiefs Mr. Phonelay, Mr. Bounkham, Ms Chindavone; all mass organization representatives and the party secretary



### **Savannakhet**

#### **Ban Houa Meuang Ta, 1 April 2019**

Present: Village Chief Ms. Bounmy (not real name), Deputy Mr. Bounthavy; villagers



#### **Ban Phongsavang Tay, 2 April 2019**

Present: Village Chief Mr. Saisamone, Deputy Mr. Mr. Khonesavanh, Deputy Mr. Phounthasa, Neo Hom Mr. Phoumay, Ms. Nang Kham, members of the village committee

### **Ban Na Kae, 3 March 2019**

Present: Village Chief Mr Phimphone, Deputy Mr. Seuth. Deputy Mr. Thavone



### **Borikhamxay**

#### **Ban Patsum, 6 April 2019**

Present: Village Chief Mr. Bounnyou and villagers



#### **Ban Pak Peung, 6 April 2019**

Present: Village Chief Mr Bounliap, Deputy Mr. Phongsavanh and villagers



Annex 3B – Participants of Local Government and Community Consultations

①

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມລົງເກັບກຳຂໍ້ມູນເພີ່ມເຕີມ ເພື່ອປະກອບເຂົ້າໃນບົດສະເໜີໂຄງການ "ສ້າງຄວາມທົນທານຕໍ່ການປ່ຽນແປງດິນຟ້າອາກາດ  
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Ecosystem-based in Lao PDR Project), ໃນວັນທີ...31.....ທີ່ ແຂວງ...ຈຳປາສັກ/Champasack .  
27 - 31 March Champasack .

ລ/ດ	ຊື່ ແລະ ນາມສະກຸນ	ຕຳແໜ່ງ	ພາກສ່ວນ	ເບີໂທຕິດຕໍ່	ອີເມວ	ລາຍເຊັນ
No	Name and surname	position	organization	contact Number	Email	Signature
1	ທ. ສິນສັກ	ແມວໂຮມ	ບ.ປ. ນ.ກ	22273780		
2	ທ. ບິຈສອນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	56690690		
3	ທ. ບຸນຈິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	9381499		
4	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	5570098		
5	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	55168356		
6	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	1305518145		
7	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	59097571		
8	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	4477 7744642		
9	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	0309802703		
10	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	522104054		
11	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ	99272141		
12	ທ. ບຸນສິນ	ຮຽກປະກອບ	ບ.ປ. ນ.ກ			

13	ນ.ພິວາ	ນ.ປ	ນ.ປ			
14	ທ.ປະທັບ	ນ.ປ	ປ.ປ	56890300		Raf
15	ທ.ສິນທິພອນ	ນ.ປ	ນ.ປ	83403347		ສິ
16	ທ.ສິນທິພອນ	ນ.ປ	ນ.ປ	55977988		Homly
17	ທ.ສິນທິພອນ	ນ.ປ	ປ.ປ	0305043088		Sy-
18	ທ.ສິນທິພອນ	ປ.ປ	—	0305141447		ສິ
19	ທ.ປະທັບ	ປ.ປ	—	96435559		ສິ
20	ທ.ສິນທິພອນ	ປ.ປ	—	50488950		ສິ
21	ທ.ສິນທິພອນ	ປ.ປ	ປ.ປ	0305198484		Klu
22	ທ.ສິນທິພອນ	ປ.ປ	ປ.ປ	0305754777		lung
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Ecosystem-based in Lao PDR Project), ໃນວັນທີ...01-04/ເມສາ...ທີ່ ແຂວງ...ສະໂກດລິນເນເອດ...  
01-04 April Savannakhet

ລ/ດ	ຊື່ ແລະ ນາມສະກຸນ	ຕຳແໜ່ງ	ອົງການ	ເບີໂທລີເຟັ	ອີເມວ	ລະຫຼັກ
No	Name and surname	position	organization	contact Number	Email	Signature
1	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	55777570	sisavang.vongvilay@gmail.com	
2	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	55777570	Chambha.Vongvilay@gmail.com	
3	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	0309779360	-	
4	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	52276399	houmlouay@gmail.com	
5	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	99605050	L.ketsavanh1988@gmail.com	
6	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	97907103		
7						
8	ທ. ສິສະວຸໂສງ ສິສະວຸໂສງ	ຊ່າງປະຕິບັດ	ສຳນັກງານ	5679 1799	bounthenee21@hotmail.com	
9	Dr Pham Boulain	Consultant	CUES	55775922	sinchamboulain@gmail.com	
10	P. Botha	Consultant	CUES		pieter.botha@cues.co.za	P. Botha
11	Mara Baviera	UN staff	UNEP		mara.baviera@un.org	
12	Thipaphone	Interpreter	Freelance	55388882		

K. village

13	ကျ. ပုသိမ် ၇၄၂/၁၃	၄.၂.၁၁.၂၀၁၆	၇၆၅၅၆၃၀၀		
14	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၀၃၀၇၄၈၃၃၂၆		
15	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၀၃၀ ၇၆၅၅၆၃၀		
16	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၀၃၀ ၅၁၃၀၈၃၀		
17	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၀၃၀ ၅၁၃၁၇၁၈၈		
18	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၈၂၀၇၁၁၁၁.၁	DetongSu.Kone 1919@gmail.com	
19	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၈၇၈၀၄၅၆		
20	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၇၆၅၅၆၃၀		
21	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၅၅ ၄၄၄၄၆		
22	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၅၆ ၄ ၁၁၁		
23	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၅၇ ၄၄၄၃၄၁		
24	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၅၈ ၁၀၁၄၄		
25	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၅၉ ၆၄၄၄၄		
26	ကျ. ပုသိမ် ၁၂၈၁/၁	၁၅.၁၁.၂၀၁၆	၅၆၀ ၅၀၅၅၆		
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ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມລົງເຕັບກຳຂໍ້ມູນເພີ່ມເຕີມ ເພື່ອປະກອບເຂົ້າໃນບົດສະເໜີໂຄງການ "ສ້າງຄວາມທົນທານຕໍ່ການປ່ຽນແປງດິນຟ້າອາກາດ  
ຂອງປະຊາກອນໃນລະດັບຕົວເມືອງ ໂດຍອີງໃສ່ລະບົບມີເວດ (Building Resilience of Urban Populations with Solutions  
Ecosystem-based in Lao PDR Project), ໃນວັນທີ...05-08 April...ທີ່ ແຂວງ...Paksan, Bolikhamsay.

ລ/ດ	ຊື່ ແລະ ນາມສະກຸນ	ຕຳແໜ່ງ	ພາກສ່ວນ	ເບີໂທຕິດຕໍ່	ອີເມວ	ລາຍເຊັນ
No	Name and surname	position	organization	contact Number	Email	Signature
1	ທ. ສິນທິ ພິມມະວະສົມ	ຮຽນ/ຮ	ສະພາບາດສະໝາຍ	22822995	-	
2	ທ. ສິດທິ ສິດ ພິມມະວະສົມ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	55552120		
3	ທ. ສິມພັດ ສິມພັດ	ຫົວໜ້າຂະແໜງ	ພຣັດ, ສິມພັດ	68421229	sisumwong_2009@hotmail.com	
4	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພຣັດ	0304555483	vsaidhounmy-2010@hotmail.com	
5	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	97719920		
6	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	22416456		
7	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	22823978		
8	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	54987771	viengveo.pd@gmail.com	
9	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	99877858		
10	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	22339666	Phone_mef@hotmail.com	Secretary
11	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	98876666	PXUAAA@ya.ho.com	
12	ທ. ສິມພັດ ສິມພັດ	ຮຽນ/ຮ	ພະນັກງານປະຊາທິປະໄຕ	55536118	SP.siphonagmail.com	

13	Ji Chandra bin	Consultant	CUES	55/18727	5mait.com jinchandra@5mait.com	<i>Ji</i>
14	Mara Baviera	UNEP staff	UNEP		mara.baviera@un.org	<i>Mara</i>
15	Pieter Botha	Consultant	CUES		pieter.botha@cues.co.za	<i>PW Botha</i>
16	ທ. ທຸນເຊືອງ ບຸນທະວີ	ວິຊາການ	DCC	2282 2221	Thounheuang.b@gmail.com	<i>Thounheuang</i>
17	ທ. ວັນນະວົງ ລາວ	ວິຊາການ	ລາວ	222 45532	vannavonglao@yahoo.com	<i>Vannavonglao</i>
18	ທ. ສິນທິພອນ ສິນທິພອນ	ສາມາດ	ປາກ	5909 0626		
19	ທ. ສິນທິພອນ ສິນທິພອນ	ສາມາດ	ປາກ	5545 2849		
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## Annex 3C Guideline Discussion Instrument for Village Consultations

To be carried out in each administrative unit affected.

Initial discussions should include the village development committee, that is the Village Chief, and assistant(s), Neo Hom, LWU, and other relevant mass organizations, together with representatives of households with land holdings on or near sites where any construction will take place.

Prior to consultations, do a transect walk to the area to be impacted to observe the sites for planned mitigations.

Describe the project, what kind of work will be carried out and by whom.

Note numbers of women in the discussion. **Use visual aids if available.**

Organize separate women's session if time allows. (focus on economic aspects of land use and attitudes towards the project)

Begin with introductions.

Participants

Topics to be covered

1. Village history
  - a. Origin of people in the village
  - b. Ethnic groups
  - c. What year established
  - d. Current population . hh/persons/M/F
2. Characteristics of village
  - a. Temples
  - b. Schools
  - c. Health clinic
  - d. Market
  - e. Main annual festivals
  - f. Guardian spirit of the village
  - g. Primary occupations of villagers
  - h. Rate hhs in the village, wealthy, medium, poor (village criteria)
  - i. Number of female headed households
3. History of flooding in the village
  - a. Frequency
  - b. Time of year
  - c. Does flooding cause economic loss
4. How is the land in question currently being used, for what purpose(s)
  - a. Agriculture (by gender)
    - i. Gardening
    - ii. Livestock
    - iii. Fish raising
  - b. Commercial or own use
5. Land ownership in the area in question, number of households, m<sup>2</sup> per hh
  - a. Land titles for each hh ? in whose name (HU or WI or Both?)
  - b. Customary title , gender
  - c. Inheritance pattern, gender
6. Customary use as opposed to ownership

- a. By hh, describe
  - b. By cooperative group, describe
- 7. Or, formal community ownership
  - a. Describe activities
- 8. Economic value of land use, produce, livestock, fish, etc
  - a. Market prices (even if own use)
  - b. Main source of food/income or supplemental?
- 9. Ritual value if any (e.g. sacred lands)
- 10. Attitudes towards the project
  - a. Benefits
  - b. Losses
  - c. Do the villagers support the project, why or why not