

LAO PEOPLE'S DEMOCRATIC REPUBLIC  
PEACE INDEPENDENCE DEMOCRACY UNITY PROSPERITY



**Ministry of Public Works and Transport (MPWT)  
The Department of Road (DoR) and  
The Public Works and Transport Research Institute (PTRI)**

## **Environmental and Social Management Framework (ESMF) Executive Summary**

### **Lao Road Sector Project 2 (LRSP2)**

Project No. (P158504)

**Vientiane, 06 July 2016**

## INTRODUCTION

1. The proposed Lao Road Sector Project 2 (LRSP2) builds on the achievements of the Lao Road Sector Project (LRSP) and is being prepared to support the Government of Lao PDR (GoL) in the preservation of the Lao road network. The Project will finance civil works in the form of routine and periodic maintenance **to preserve the road network as well as spot improvements to strengthen vulnerable sections and thereby enhance climate resilience**. The Project will undertake a programmatic approach towards physical investments, **with the identification and prioritization of candidate projects based on technical and social criteria**. The Project may have complementary funding for civil works provided by other donors such as the Nordic Development Fund (NDF)<sup>1</sup>, the European Investment Bank (EIB) and the European Union (EU). **This ESMF will apply to all activities/subprojects regardless of financing source. All other financiers/donors supported activities/subprojects will be “in compliance” with the ESMF**. The Project will also undertake technical assistance activities—including strengthening the capacity of the Ministry of Public Works and Transport (MPWT) to prepare and implement public-private partnerships<sup>2</sup>—with a particular focus on addressing the climate change challenges that the road network is facing.

2. The Project Development Objective (PDO) is to improve reliable road connectivity to support economic development and human well-being, and, in the event of an Eligible Crisis or Emergency, to provide immediate and effective response to said Eligible Crisis or Emergency.

3. The Project is envisaged to potentially be sector wide, with investments—particularly in routine maintenance—being expanded to all of the Lao PDR in the future. Annex A presents locations map and key features of Lao PDR and road network map. During the first phase, six provinces have been identified as candidates for piloting: Phongsaly (PSL), Oudomxay (ODX), Xayabouli (XBL) Houaphan (HP), Xiengkhouang (XK), and Bolikhamxay (BKX).

### Project Component

4. **Component 1: Climate Resilient Road Maintenance:** (US\$46.3 million including contingencies). This component will finance: (i) maintenance works and supervision on Local (Provincial and District) roads in six provinces; and (ii) preparation of a comprehensive, network-wide climate-resilient maintenance and preservation program for the national road system, covering all National roads.

1.1: Routine Maintenance: The project will implement routine maintenance contracts for provincial and district roads, which would entail grouping all maintainable non-national roads in an area, e.g., district or province, into one contract to undertake routine maintenance activities. The contract design, modalities, etc. will be confirmed at the onset of implementation, but it is envisaged that some form of performance based contracting would be carried out on a pilot basis. Activities will build on lessons from local experience with community-based road maintenance groups and micro-enterprises.

1:2: Climate Resilient Periodic Maintenance and Spot Improvements: Many existing roads—especially gravel—are in too poor a condition for routine maintenance to be effective. The

---

<sup>1</sup> NDF has expressed interest in supporting TA on capacity building and development of tools necessary to address Climate resilience aspects of road network as well as some pilot testing of civil works to test solutions.

<sup>2</sup>In accordance with the “Interim Guidelines on the Application of Safeguard Policies to Technical Assistance (TA) Activities in Bank-Financed Projects and Trust Funds Administered by the Bank” the project has been classified as Category A for environment and safeguards since the Private Public Partnership (PPP)-related activities arising from this TA support may lead to major environment and/or social impacts downstream when these activities are implemented. The PPP road investment itself is outside the scope of the project. Also preparation of Feasibility Study (FS) and safeguards instruments that meet Category A requirements for the NR13 PPP project are already underway under the on-going Lao Road Sector Project (LRSP).

project will undertake periodic maintenance and spot improvements to bring the condition up to a point where the roads will be maintainable going forward with routine maintenance.<sup>3</sup> Where required, climate resilience interventions may include elevating flood prone road sections, paving road sections with steep slopes and sections passing through large communities, drainage improvement or construction, and slope improvement and stabilization. Under this component road safety issues would be considered, such as improvements in road furniture.

1.3: Preparation of Climate Resilient Maintenance and Preservation Program for the National Road Network (7500 km): With the growth of sustained economic activity and road traffic, the maintenance and preservation needs of National roads require a comprehensive technical and economic assessment and formulation of a medium-term expenditure program. The project will finance the required studies and preliminary engineering for this program, as well as the detailed engineering for the first-year slice of the prioritized investment plan.

1.4: Design and supervision of civil works: The component will cover technical assistance and operating costs for design and supervision of investment activities, as well as quality assurance for maintenance and spot improvement works in the selected Provinces under 1.1 and 1.2.

5. **Component 2: Institutional Strengthening:** (US\$7.9 million including contingencies) to provide technical assistance, goods, training, and operating costs for:

2.1. Sector Strategic Planning: (a) provide high-level policy advice for updating and operationalizing the Sector Strategy to 2025 and Action Plan to 2020; and (b) develop the strategic planning framework for provinces, including assessment and optimization of the road sector financing and integration of climate change adaptation.

2.2. Climate Resilient Road Asset Management: (a) support MPWT to (i) develop its climate change action plan as described in the Intended Nationally Determined Contribution (INDC), (ii) participate in the cross-ministerial National Disaster Management Committee, and (iii) implement the INDC; (b) operationalize the hazard maps into practical vulnerability maps for planning of infrastructure maintenance or investments; (c) review current planning tools (including Road Management System (RMS), Provincial Road Maintenance Management System (PROMMS)) to (i) include risk-based planning by identifying sections vulnerable to extreme weather, and (ii) operationalize the ICT platform to include hazard risks and links to provincial levels; (d) support annual field surveys for data collection and inputs in RMS and PROMMS for risk-based planning; (e) review current design, standards and guidelines in cooperation with other development partners in the sector to incorporate climate resilience aspects; and (f) further develop standards of operation for emergency repair.

2.3. Sector Governance: (a) improve the Information and Communication Technologies (ICT) platform i.e. Integrated Road Asset Management (IRAM) (MPWT's web-based platform) to (i) support procurement, management, monitoring, and information disclosure and e-archive, (ii) cover local roads, and (iii) support roll out of the ICT platform to Department of Public Works and Transport (at provincial level) (DPWTs); (b) upgrade the Road Maintenance Fund (RMF) and DPWTs' accounting system and development of expenditure tracking tools; and (c)

---

<sup>3</sup> Many of these roads require heavy periodic maintenance to reconstruction, and the outcome would be an 'excellent' road. Since there is insufficient budget to achieve this across the network, the objective would be to improve the road to 'fair' and then undertake regular routine maintenance to keep the road in that condition.

strengthen internal controls through: (i) the rolling out of the road sector technical audit guidelines to provincial level, (ii) the strengthening of technical capacities of provincial level internal control units, and (iii) supporting the inspection tasks in six pilot provinces.

2.4. Sector Capacity Building: (a) provide technical training for MPWT, DPWT, and Office of Public Works and Transport (at district level) (OPWT) on climate resilient design, repair and maintenance, improved road asset management systems and tools including data collection, Performance-based contracts (PBC) contract management, and PBC implementation training for contractors in collaboration with local institutions, regional twinning arrangements, and curricula development for tertiary education institutions in country; (b) provide technical assistance and training to MPWT, DPWT, OPWT and relevant government agencies including Ministry of Natural Resources and Environment (MONRE) for the future implementation of potential PBC and PPP projects in the road sector through development of environmental and social safeguards management and monitoring, and technical capacities to identify and prepare investments using PPP modalities; and (c) update environmental documents including the Environmental and Social Operation Manual (ESOM).

2.5. Road traffic safety: Provide technical Assistance to the National Traffic Safety Council and Department of Transport (DoT), including update and implementation of the traffic safety action plan, and roll out of public awareness raising campaigns.

6. **Component 3: Project Management:** (US\$2.9 million including contingencies) to finance consulting services, goods, and Incremental Operating Cost (IOC), for: (i) Project management and coordination for day-to-day implementation, and coordination among the implementing departments; (ii) Monitoring and Evaluation of activities including impact evaluation, and beneficiary satisfaction assessments; (iii) financial and technical audit; and (iv) procurement advisory support.

7. **Component 4: Contingency Emergency Response:** This ‘zero component’ (initially without any allocations of funding) will allow for the rapid reallocation of funds required for emergency recovery. An Emergency Response Operations Manual will apply to this component, detailing financial management, procurement, safeguards and any other necessary implementation arrangements.

### **An Environmental and Social Management Framework (ESMF)**

8. An Environmental and Social Management Framework (ESMF) was prepared by the MPWT. The document is a high-level program document for the LRSP2. It was prepared based on the Government of the Lao People’s Democratic Republic (GoL) related regulations including the MPWT Environmental and Social Operations Manual (ESOM) and the implementation experience on safeguard implementation by MPWT agencies/staff and current issues related to road projects in Lao PDR. It meets the requirements of World Bank (WB) safeguards policies. The purpose of this ESMF is to identify the safeguard issues affecting the LRSP2 program, direct the formulation of more detailed, specific safeguard documents such as the Environmental and Social Management Plans (ESMPs), Abbreviated Resettlement Action Plans (ARAPs)/Resettlement Action Plans (RAPs), Ethnic Group Development Plans (EGDPs) etc., as appropriate for the specific civil work activities which are identified. The ESMF covers all aspects of the project including investments and technical assistance, including those related to provision of TA to prepare and implement road projects through PPP modalities.

9. These project level safeguard documents—irrespective of which donor they are developed for—are expected to be in compliance with this ESMF and provide the necessary detail to address the

safeguard issues appropriate for each investment activity. This document is considered a living document and can be modified in close consultation with the WB to reflect any changes to program investments, national legislation, WB or other donor policies. The WB review and clearance process of any revised ESMF will be necessary.

## **SAFEGUARDS LEGAL FRAMEWORK**

### **National Laws and Regulations Related to Safeguards**

#### *Environmental and Natural Resources Management:*

10. In Lao PDR, there are many laws and regulations that govern the utilization and management of natural resources (land, forest, water, aquatic and wildlife, etc.) and that were established in late 1990's; many have been updated and/or revised. The Environmental Protection Law (EPL) established in 1999 and revised in 2012, describes the principles, regulations and measures for managing, monitoring, restoring, and protecting the environment including the pollution control and the impact assessment processes, especially the Environment and Social Impact Assessment (ESIA) and Initial Environmental Examination (IEE) regulations that were established in late 2013. A number of decrees, regulations, and guidelines have also been established and applied during the 2000s. Key regulations and guidelines on environmental and natural resources management include: MoNRE regulation on ESIA and IEE (17 December 2013); MoNRE guidelines for the preparation of EIA, SIA and IEE report including the public involvement in the EIA and IEE processes; draft pollution control decree; draft Environment Ambient Standard (2009) and draft Pollution Emission Standards (2009); Forestry Law (24 December 2007); Wildlife Law (24 December 2007), Decree on Protection Forest (No. 333 PM, dated 19/07/2010) and the Decree on Protected Area established in 2015 (No. 134/G, dated 13/05/2015). MoNRE is the lead ministry responsible for implementation of the EPL and its regulations and/or guidelines.

#### *Social safeguards:*

11. *Decree on Compensation and Resettlement of People Affected by Development Projects (7 July 2005)*. This decree defines principles, rules, and measures to mitigate adverse social impacts and to compensate for damages that result from involuntary acquisition or repossession of land and fixed or movable assets, including changes in land use, restriction of access to community or natural resources affecting community livelihood and income sources. The Decree is being revised in line with the current organization and regulations and in accordance with the Government policy regarding decentralization. It is expected that the revised Decree will be approved by the Prime Minister in 2016.

12. *On ethnic groups.*<sup>4</sup>In Lao PDR the term ethnic group (EG) is used to characterize a variety of cultural groups. Constitutionally, Laos is recognized as a multi-ethnic society and Article 8 of the 1991 Constitution states that "All ethnic groups have the right to preserve their own traditions and culture, and those of the Nation. Discrimination between ethnic groups is forbidden". The 1992 policy on EG focuses on realizing equality between EG and gradually improving the lives of EG while promoting their ethnic identity and cultural heritage. The Lao Front for National Construction (LFNC) introduced an official ethnic classification into forty-nine main groups comprising four ethno-linguistic facilities, namely the Tai-Kadai, the Mon-Khmer, the Tibeto-Burmese, and Hmong-Mien which are distributed from the north to the south of the country. Out of the four regions, the north has the highest

---

<sup>4</sup>The official terminology for describing the diverse population of Lao PDR which was introduced with the 1991 Constitution, and it is considered equivalent to the definition described as the Indigenous Peoples according to OP/BP 4.10.

number of districts with ethnic groups comprising about 87% of the region population, while the east has the second highest number of 69% and followed by the southern and central regions, each of which has ethnic populations of about 50%<sup>5</sup>.

*National Policy and Plan on Gender:*

13. In Lao PDR, under the leadership of the Government Office and the Lao Women's Union (LWU), gender issues have received priority attention and have been integrated into national policy and plans including: the Eight Five-year National Socio-Economic Development Plan (NSED) (2016-2020); and the National Strategy for the Advancement of Women for 2011-2015. A National Commission for the Advancement of Women was established in 2003 to drive national policy and to promote gender equality and empower women.

**World Bank Safeguard Policies Triggered and Instruments**

*Project Category:*

14. The project has been assigned Category "A" in accordance to the World Bank policy OP/BP 4.01 on Environmental Assessment, due to the fact that under Component 2, the Project may provide technical support to build safeguard capacity of MPWT to effectively address road sector investments, including PPP projects, which may involve major upgrading and rehabilitation of existing roads. The TA component would include environment and social safeguard related capacity development activities which would be up to the level required for Category A investment.

*Environmental Safeguard Policies:*

15. The project triggered four environmental safeguard policies including Environmental Assessment OP/BP 4.01, Natural Habitats (OP/BP 4.04), Forestry (OP/BP 4.36) and Physical Cultural Resources (PCR) (OP/BP 4.11). The civil works activities will focus on routine and periodic road maintenance, including spot improvement in order to improve climate resilience and road safety of road networks. Investment activities may include elevating flood prone road sections, paving road sections with steep slope and the sections passing through big communities, drainage improvement/construction, slope improvement/stabilization etc. It is envisaged that all activities would be carried on the existing carriageway within the existing right of ways (RoW) and may involve minor realignments to improve road safety and/or strengthen road climate resilience. The potential impacts from these activities will be minor, site specific, localized, temporary, and can be mitigated. Potential impacts include dust dispersion, noise, traffic obstruction and access, construction and road safety etc. Large clearance of natural habitats and forest will not be required. However, the project will provide TA supports that may lead to implementation of PPP project in the future that have substantial environmental and social impacts downstream, when implemented. This TA component will not finance a Feasibility Study or any engineering assessment, or the safeguard preparation of prospective PPP project. The preparation of safeguards instruments that meet Category A requirements for the potential NR13 PPP project is being prepared under the on-going Lao Road Sector Project (LRSP) to address downstream impacts if the potential PPP project is implemented.

16. Given that this is a sector wide programmatic project and subproject locations are not known before appraisal, an Environmental and Social Management Framework or ESMF, including a generic Environmental Codes of Practice (ECoP) and also an outline Environmental and Social Management Plan (ESMP), has been prepared to provide: (i) guidance for screening, identifying and addressing environmental and social impacts from the project activities; and (ii) guidance to ensure that TA

<sup>5</sup> National Biodiversity Strategy to 2020 and Action Plan to 2010, 2004.

activities, particularly PPP capacity building activities, are conducted inline with WB safeguards policies and up to level expected for Category A investment. The ESMF includes procedures to conduct safeguard screening, which have been designed to detect and avoid potential negative impacts on natural habitats, forests and PCR. The ESMF also requires that a “chance find” procedure be included in the contract specification.

### *Social Safeguard Policies*

17. The project triggered two social safeguards policies including *Involuntary Resettlement OP/BP 4.12 and Indigenous Peoples OP/BP 4.10*.

18. *Involuntary Resettlement OP/BP 4.12*: The Project will not involve physical relocation of people. The work will be conducted on existing roads and may involve minor realignments without expansion and affect trees and other roadside private assets, but no major loss of private assets including land would occur. The policy is triggered because the Project may involve minor land acquisition for road maintenance in some areas where road safety and/or road stability is necessary. A Resettlement Policy Framework (RPF) has been prepared describing policies and procedures to avoid, minimize or mitigate negative impacts that may result from the Project investments including scope of an RAP and ARAP which will be required when involuntary land acquisition occurs. The need for preparation of RAP or ARAP will be identified during the safeguard screening to be conducted as part of the road maintenance investment plan which will be prepared annually. WB approval of RAP and ARAP will be required.

19. The TA component of the Project will seek to strengthen the capacity of the MPWT as well as its provincial offices in managing and monitoring environmental and social issues associated with the prospective PPP project, including the capacity to develop and implement resettlement plans, in coordination with relevant authorities such as MONRE. However, this TA component will not finance a Feasibility Study or any engineering assessment, or the safeguard preparation such as the development of resettlement plans or EMPs, of prospective PPP project.

20. *Indigenous Peoples OP/BP 4.10*: Many Project beneficiaries are expected to be ethnic minorities who are known in Lao PDR as ethnic groups and meet eligibility criteria under OP/BP 4.10. For example, Hmong, Khmu, Mien, Makong, Bru and others are living in and around the Protected Areas (PAs) of the target provinces. These are considered to be vulnerable ethnic groups in Lao PDR as their livelihood is heavily based on subsistence agriculture and forests. The presence of these ethnic groups triggers this safeguard policy. The impact of the road maintenance works on these communities is generally positive; however, any negative impacts that may occur are addressed under the Ethnic Group Policy Framework (EGPF) which has been prepared to outline procedures to ensure that the following would be conducted in line with the OP 4.10, namely: (i) ethnic screening; (ii) free, prior and informed consultations with ethnic groups leading to their broad community support; and (iii) Social Assessment (SA) and the development of an Ethnic Group Development Plan (EGDP). The need for preparation of an EGDP will be identified during the safeguard screening to be conducted as part of the road maintenance investment plan which will be prepared annually as well as during sub-project preparation. WB approval of EGDP will be required.

21. The Project will not involve procurement and/or use of pesticides, therefore Pest Management (OP/BP 4.09) is not triggered. The Project will also not involve any dam, international waterway, and/or disputed area, therefore the Safety of Dams (OP/BP 4.37), the Projects on International Waterways (OP/BP 7.50), and the Projects in Disputed Areas (OP/BP 7.60) will not be triggered.

22. In addition to the ESMF, RPF and EGPF mentioned above, during implementation the project will prepare specific guidelines to further mitigate environmental issues including (i) specific

guidelines and/or measures to minimize the potential negative impacts (direct and indirect) during works execution and road operations located within and/or nearby the national protected area (NPA) and/or the national protection forest areas (NPFA) and in priority areas considered to be highly sensitive to natural disaster; and (ii) specific guidelines on safeguards requirements to be incorporated into the Emergency Road Operation Manual.

23. ***ESOM implementation experience:*** An Environment and Social Operation Manual (ESOM) was developed for the LRSP and it has been implemented since 2009. A review of the updated ESOM (2015) and the training evaluation report during the preparation of the ESMF suggested that application of the ESOM is not quite effective given a complex nature of ESOM and limited capacity of DPWT and the normal turnover of MPWT staff both at national and local levels. Discussion with MoNRE agencies suggested that a number of laws and regulations related to environmental and social safeguards are being revised and expected to be completed in 2016-2017. It is necessary for MPWT to work closely with MoNRE agencies and agree on sector guidelines and procedures to be used for road sector. The LRSP2 project will support activities to strengthen DPWTs and MPWT capacity and will provide resources to implement and monitor safeguards measures. LRSP2 will also support activities to strengthen the coordination between the MPWT and MoNRE, and to update the ESOM taking into account the experience and lessons learned of its previous implementation.

## **SAFEGUARDS IMPLEMENTATION ARRANGEMENTS**

24. **Implementation Arrangements:** MPWT will be the implementing agency with the overall management and coordination of the Department of Planning and Cooperation (DPC). The Department of Roads (DoR) will be responsible for planning and implementation of road related activities under Component 1. DoR will work in close coordination with and provide technical support to the provincial DPWTs in the Project provinces tasked with carrying out the works and supervision, and with Public Works and Transport Research Institute (PTRI) tasked with road asset data collection and analysis and overall supervision and monitoring of the implementation of environmental and social safeguards according to the ESOM that has been applied for LRSP. The Environment and Social Division of PTRI (ESD/PTRI) will be the lead agency on safeguards supervision and monitoring. The ESD/PTRI will also be responsible for providing safeguard training, ensuring effective mainstreaming of safeguard requirements into the road development project cycle, and undertaking research activities including updating the ESOM in close consultation with MoNRE and other agencies and the WB. The DoR will be responsible for ensuring that safeguard requirements are mainstreamed in road maintenance planning, design and pre-construction works including tendering and contracting process. The DPWT of the Project provinces will establish the Environmental and Social Unit (ESU) specifically for the road sector to be responsible for safeguards. The Department of Transport (DoT) will be responsible for implementation of the road safety program to be implemented under the Project.

25. **Safeguard Coordination Working Group (SCWG):** The MPWT Public Works and Transport Research Institute (PTRI) through its Environment and Social Safeguards Division (ESD) will establish a SCWG on road works to facilitate effective coordination and cooperation among key agencies (at national and local levels) on environment and social safeguards for medium and large scale road projects (road rehabilitation, improvement, and upgrading). The SCWG will also be responsible for overseeing the planning and implementation of the case studies as well as other capacity building activities aiming to ensure effective integration of safeguard measures into road development project cycles including those to be implemented by the private sector.

26. **Capacity Assessment and Capacity building needs:** Among the key agencies involved in ESMF implementation, ESD/PTRI is the only agency with enough safeguards capacity and staffing to oversee the implementation of safeguards instrument for the project. Given the restructuring of MPWT since 2012, roles and responsibility of MPWT agencies and DPWT have been modified over time and ESD/PTRI is the lead agency responsible for environment and social safeguard for MPWT. Currently, ESD/PTRI has seven staffs fully responsible for safeguards related tasks. These seven staff members are highly knowledgeable, experienced and committed to the implementation of the ESOM – they also have solid experience using WB safeguards instruments. During the implementation of on-going LRSP, ESD/PTRI provided training on the application of ESOM to DPWTs and key divisions of DoR, and started the process of updating the ESOM. The number of ESD/PTRI staff is adequate to fulfil the current mandate but would need more resources for LRSP2 as the PTRI safeguards supervision roles will be increased. A capacity need to be further strengthened to prepare safeguards instruments and supervise more complex works i.e. preparation and implementation of future Public-Private Partnership (PPP) projects. In terms of budget, the ESD/PTRI has insufficient budget to effectively monitor all subprojects. Nonetheless, under LRSP ESD/PTRI conducted safeguard monitoring and reporting, and six month and annual reports are available.

27. The DoR has three staff responsible for environmental safeguards but only one staff has experience on safeguard. At provincial level, the capacity assessment of the six project pilot provinces indicates that all have a certain level of capacity. In each between 3-7 staff were trained on ESOM, and/or were responsible for its implementation. However, only some DPWTs had assigned engineers for ESOM supervision and monitoring. Three out of six project pilot provinces had not assigned staff for ESOM/safeguards. For LRSP2, each DPWT in the project provinces will establish the Environmental and Social Unit (ESU) for the road sector. One engineer will be assigned for safeguards implementation. A design and supervision consultant will be hired using NDF TA support. The scope of works of the design and supervision consultant will include safeguards implementation and supervision aspects. LRSP2 will include safeguard trainings to concerned staff of PTRI, DoR and DPWTs to ensure effective implementation of safeguards measures.

28. **Safeguard review and clearance:** Given the small size and limited impacts of the road maintenance works and limited impacts, it is proposed that ESD/PTRI will review and approve safeguard documents (ESMP, EGDP, RAPs) of the subprojects subject to the TA capacity building support provided by the World Bank. DoR, in consultation with ESD/PTRI, will prepare a safeguard review and clearance plan for the subprojects to be approved by MPWT and WB in the annual work plan. All of the documents will be kept in the project files for WB post review. For subprojects requiring an Initial Environmental Examination (IEE), DPWT assisted by qualified consultants will prepare an IEE report. ESU/DPWT and ESD/PTRI will review and comment on the IEE report prepared by the consultant before the final report is submitted to Provincial Department of Natural Resource and Environment (PONRE) for review and approval.

29. **Safeguard implementation, monitoring, and reporting:** DPWTs responsible for execution of the road maintenance subprojects will be responsible for implementation of the ESMP, EGDP, and/or RAPs. Supervision, monitoring, and reporting will be conducted by ESD/PTRI in close cooperation with DoR and/or other agencies as needed. The WB will conduct safeguard supervision, monitoring, and post review.

30. **Consultation and information disclosure:** Consultation on and disclosure of safeguard issues and mitigation measures are required during the preparation of the ESMP, RAP/ARAP and EGDP, and the activities will be conducted by ESU/DWPT in close consultation with ESD/PTRI. The approved Alignment Sheet and monitoring results will be made available for public access through the responsible DWPT and the ESD/PTRI websites.

31. **Specific Actions for TA Activities and Emergency Road Works:** To mitigate the potential negative impacts and/or enhancement of potential positive impacts of TAs to be implemented under Component 2, the following actions will be carried out:

- ESD/PTRI will take the lead in safeguard training and ensuring that clear safeguard requirements for road maintenance will be integrated into the policy and planning process;
- ESD/PTRI will take the lead to build safeguards capacity of MPWT and key agencies that will manage the future PPP project, including establishing a coordination and cooperation mechanism with key agencies of MoNRE that are responsible for ESIA/IEE, PA/PFA, and disaster management and climate change;
- ESD/PTRI will also establish a SCWG to be responsible for revision of the ESOM, including the development of specific guidelines for (i) mitigation measures for road works in PA/PFA and sensitive areas, (ii) community actions on road safety, (iii) use of good quality construction materials (quarries, borrow pits, etc.), (iv) development of compensation procedures for the road sector, and (v) RoW management including registration of encroachment activities. The guidelines will be developed through case studies and lessons learned and the results will be incorporated into the revised ESOM.

32. For emergency road works, ESD/PTRI will prepare a section on safeguard requirements to be included in the emergency operation manual that will be reviewed and approved by the World Bank.

33. It will be necessary to undertake a capacity building program to ensure proper oversight and support for safeguards. Capacity building and training programs on environmental and social safeguards has been proposed in the ESMF to facilitate effective preparation, implementation and monitoring of ESMF, RPF and EGPF and relevant sub-project specific instruments.

## **APPLICATION OF SAFEGUARDS**

### **Screening and Approval**

34. To ensure that the Project will not finance activities/subprojects without adequate due diligence and mitigation measures, the following activities will not be eligible for Project financing:

- Road sector activities likely to create adverse impacts on ethnic groups within a village and/or in neighbouring villages or unacceptable to ethnic groups communities living in a village of mixed ethnic composition;
- Activities causing loss or damage to cultural property, including sites having archaeological (prehistoric), paleontological, historical, religious, cultural and unique natural values;
- Purchase of gasoline or diesel generators and pumps; guns; chain saws; large amount of pesticides, insecticides, herbicides and other dangerous chemicals; asbestos and other investments detrimental to the environment;
- Significant conversion or degradation of natural habitat or where the conservation and/or environmental gains do not clearly outweigh any potential losses; and
- Construction of new roads and major road upgrading, improvement, and/or rehabilitation that is classified as EA Category A according to OP/BP 4.01.

35. For all road maintenance activities to be implemented under the project, the safeguard screening will be conducted following key steps outlined in *Figure 1*. Relevant safeguards instruments

will be prepared for each specific sub-project including ESMPs, RAPs /ARAPs and EGDPs in accordance with safeguard screening results.

## **Environmental Management**

36. For small maintenance activities such as routine and periodic maintenance, the generic ECoP which was included as part of the ESMF shall be updated to reflect the specific activities and location.

37. For larger impact activities, such as rehabilitation, realignment and, and climate resilience work:

- When government systems do not require an IEE, the ESMP, which includes an ECoP that reflects the specific activities and location of the works will be prepared following the guideline on ESMP preparation provided in the ESMF;
- When in addition to the above ESMP and ECoP, an IEE is required, the IEE shall be prepared according to the government guideline.

## **Land Acquisition**

38. In the event that land acquisition or physical relocation are involved, an ARAP or a RAP will be prepared in accordance with the RPF. The RPF describes a process whereby communities are consulted on, and can meaningfully participate in, the planning and decision making activities when land acquisition and/or loss of assets will be necessary. Issues that are likely to be identified include the loss of land, assets, and/or income due to minor adjustment of road alignments to improve road safety and/or stability.

## **Ethnic Groups**

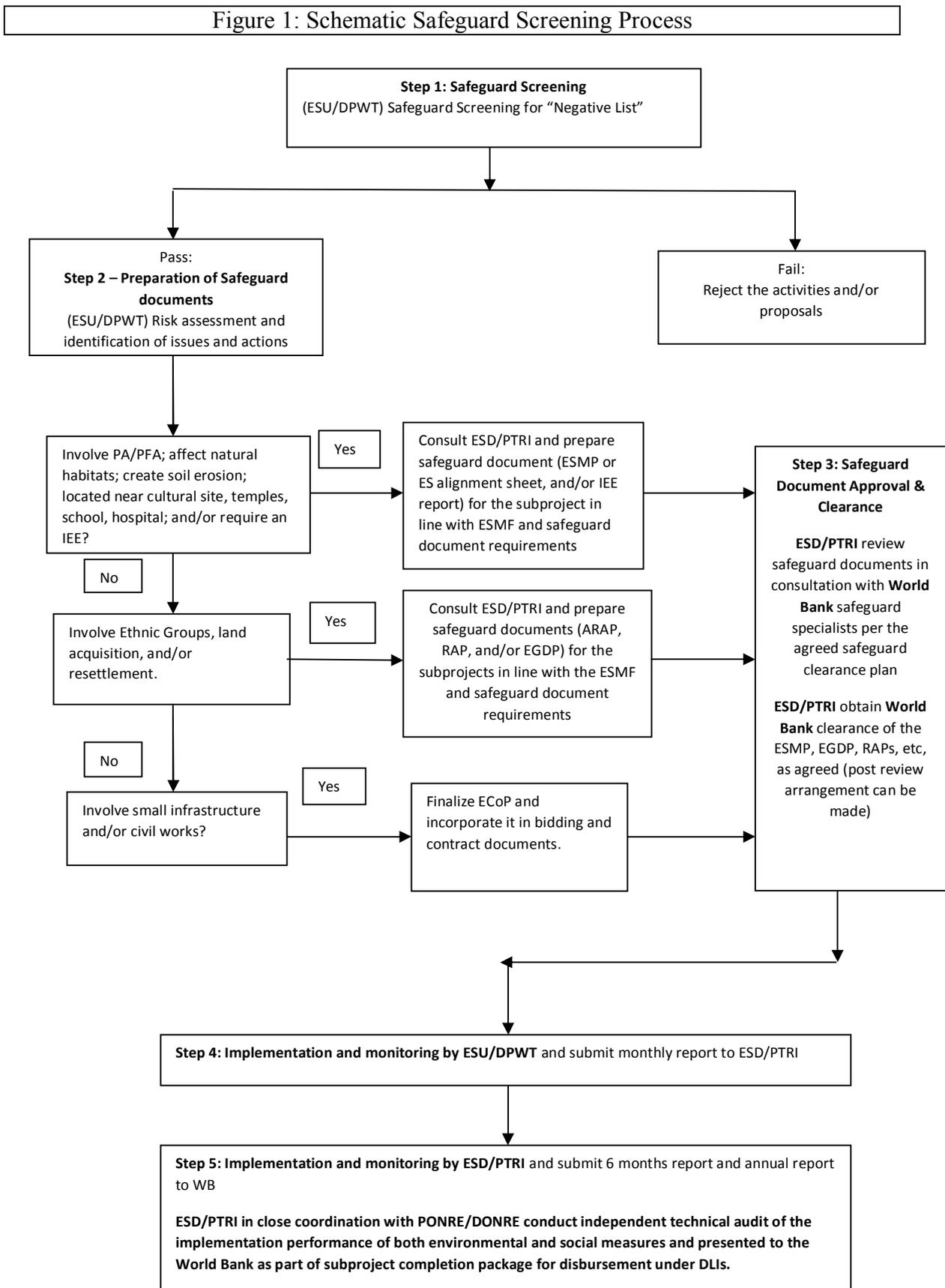
39. In accordance with the screening procedure of this ESMF, for each location where investments are proposed, screening shall be conducted to identify whether or not ethnic groups are present. If ethnic groups are found to be present or have collective attachment to the project areas, the procedure outlined in the EGPF shall be followed and the appropriate instrument (e.g., EGDP) shall be prepared to minimize/mitigate impacts to ethnic groups.

40. The core principles are highlighted as follows:

- All communities will be approached in the spirit of honest and constructive collaboration, and clear explanation provided about the rationale for road safety, and of the subproject's purpose, activities, potential benefits and potential losses.
- All communities, regardless of their ethnic group or social status, will be engaged in an inclusive and culturally relevant manner on the basis of a free, prior and informed consultation aimed at establishing broad-based and sustainable community support for the subproject.
- All communities will be kept informed by the responsible DPWT throughout the subproject implementation, through appropriate means of information, education and communication. If needed, communication throughout the project cycle will use appropriate information, education, and communication materials to respond to issues of language and ethnicity, literacy/illiteracy, gender, and social vulnerability.

- All communities will have the opportunity to participate in and benefit from the subproject as well as take on the responsibility to adhere to road safety rules and sustainable road maintenance.
- Subprojects will give sufficient attention to encourage women to play an active role in the consultation process. During implementation, the women will be: (a) consulted and their concerns addressed; (b) given the opportunity to participate in community group meetings, focus group discussions, planning and implementation; and (c) represented equally in the Grievance and Redress Committees (GRCs).

Figure 1: Schematic Safeguard Screening Process



## Technical Assistance Activities

41. During the design and implementation of the TA activities, *the Interim Guidelines on Application of Safeguard Policies to Technical Assistance Activities in Bank-Financed Projects and Trust Funds Administered by the Bank*<sup>6</sup> will be applied to ensure integration of environmental and social objectives into the TA process and to promote transparency through stakeholder participation and public information disclosure during the planning process. All TORs for TAs under Component 2, especially those related to PPP, will comply with the WB safeguard policies and be submitted to WB for review and clearance.

42. Trainings and capacity building programs will be carried out during the implementation of the project to strengthen safeguards capacity of the ESD/PTRI, DOR, DPWTs and strengthen coordination among the MPWT agencies and relevant ministries. These TA activities include: (i) conduct safeguard trainings to concerned staff of MPWT and DPWT of the Project provinces at least 1 time/year; (ii) engage local authority (PONRE), local mass organization, and/or local community to assist in monitoring performance of the contractor especially in areas that are sensitive and likely to be affected by the subproject activities and workers; (iii) revise the ESOM in close consultation with MoNRE agencies and PONRE including development of trainings and specific guidelines for road works (road improvement, road upgrading, and road rehabilitation) focusing on the following key areas (a) works in PA, PFA, and other sensitive receptors, (b) use of good quality of construction material sources (quarries and borrow pits) (c) community actions on road safety measures, (d) development of compensation procedure for road sector, (e) RoW management including registration of activities conducted within RoW, and (f) capacity development of MPWT staff to adequately manage E&S aspects of PPP. A Safeguard Coordination Working Group (SCWG) on road sector will be established to ensure effective coordination among agencies during the updated of ESOM and development of these technical guidelines. Qualified national/regional consultants will be mobilized to assist ESD/PTRI undertaking the capacity building activities including updating ESOM in close consultation with MoNRE agencies and the provinces.

43. *Gender mainstreaming*: To be in line with OP/BP4.20<sup>7</sup> (gender mainstreaming), all TAs will be designed to incorporate gender considerations during the design and implementation of road development projects, and key gender issues will be considered and addressed as appropriate.

## Emergency Works

44. To ensure that emergency works are conducted in accordance with safeguard policies, the ESD/PTRI will ensure that the emergency operation manual will specifically include how to address safeguard issues.

## POTENTIAL PROJECT IMPACTS AND MITIGATION MEASURES

45. The project environmental and social risk is considered “substantial” as component 2 of the project will provide TA support to develop capacity of the MPWT. This will include activities aimed

<sup>6</sup> The guideline will be applied to the following types of TA: *Type 1: Strengthening client capacity; Type 2: Assisting in formulation of policies, programs, plans, strategies or legal frameworks etc.; Type 3: Land use planning or natural resources management (NRM); Type 4: Preparing feasibility studies, technical designs or other activities directly in support of the preparation of a future investment project (whether or not funded by the Bank).*

<sup>7</sup>WB also recognizes that gender issues are important dimensions of its poverty reduction, economic growth, human well-being and development effectiveness agenda and that the gender issue is associated with disparities between men and women in access to resources, in economic opportunities, and in voice.

at implementing potential future PPP (Category A) projects. These TA activities may lead to implementation of PPP project in the future that has “high” environmental and social impacts downstream, when this is implemented. Safeguard instruments for addressing potential National Road (NR) 13 PPP subprojects is being prepared under the on-going LRSP outside scope of this project. Assessment of the safeguard risks of the proposed activities to be implemented under the Project are summarized below.

46. **Impacts of Civil Works Activities:** The overall impacts will be positive in improving road accessibility, road safety, and well-being of local people. Short-term and localized negative impacts of these activities on local communities and local environments may arise from road maintenance and spot improvements to enhance climate resilience. These impacts will be limited to road safety, temporary disruptions of local traffic, and limited impacts on air quality, noise, and vibration etc., which can be mitigated through the application of specific requirements that will be included in the ESMP and/or ECoP and close supervision of the subproject owner (DPWT).

47. **Impacts of Emergency Response Contingency:** As with the regular civil works, potential impacts will be positive especially in areas important for road transportation. Potential negative impacts will be mitigated through inclusion of safeguard requirements into the Emergency Response Operations Manual and training of DPWT staff and contractors. It is foreseen that post environmental audits will be made by ESD/PTRI for all the emergencies activities.

48. **Impacts of Institutional Strengthening:** The project TA activities will have positive impacts on policy and planning, improved standards and specifications on road maintenance, and enhancing capacity of MPWT and DPWT on climate resilience, improve safety in selected urban sites with high incidence of traffic accidents and in selected provinces where road maintenance work is undertaken. Although TA support for PPPs in the road sector may potentially generate downstream adverse environmental and social impacts when the PPP projects are implemented in the future, the project supported TA and capacity building for use of PPP in the road sector will enhance MPWT’s capacity to implement investment through PPP process and facilitate close coordination and cooperation among key agencies (MoNRE, Ministry of Planning and Investment (MPI), and Ministry of Finance (MoF)) and strengthen environmental and social safeguards capacity. Also safeguard instruments for addressing potential NR 13 PPP subprojects is being prepared under the on-going LRSP outside scope of this project.

49. **Safeguard actions:** To mitigate the potential impacts of the proposed Project, the safeguard actions identified in [Table 1](#) will be carried out.

**Table 1. ESMF Approach for Component Activities under LRSP2**

| Components   | Activities to be financed by the Project   | Safeguards Actions   | Timing for Preparation and Implementation  |
|--|--|--|--|
| <b>Component 1: Climate Resilient Road Maintenance</b> | <p><i>1.1. Routine Maintenance;</i></p> <p><i>1.2. Climate Resilient Periodic Maintenance and Spot Improvements</i></p> <p><i>1.3. Preparation of Climate Resilient Maintenance and Preservation Program for the National Road Network</i></p> <p><i>1.4. Design and Supervision of works (consultants and operating cost (IOC))</i></p> | <ul style="list-style-type: none"> <li>Apply ESMF, EGPF, and RPF during the preparation and implementation of the subproject specific ESMP, EGDP, and/or RAP/ ARAP.</li> <li>Conduct safeguard training, monitoring, and reporting.</li> </ul> | Sub-project ESMP, EGDPs, RAPs/ ARAPs, will be prepared during implementation before civil works start. |

|  |  |   |  |
|--|--|---|--|
| <p><b>Component 2: Institutional Strengthening</b></p> <p>(TA/consultant, goods, training, and IOC) -To enhance institutional sector capacities for planning and analysis of MPWT.</p> | <p><i>2.1 Sector Strategic Planning</i></p> <p>Support MPWT for high-level policy advice for the operationalization of the Sector Strategy to 2025 and Action Plan to 2020,</p> <p><i>2.2 Climate Resilient Road Asset Management</i></p> <p>To (i) further develop necessary systems and tools for planning, prioritization, budgeting, implementation and monitoring for road asset management, (ii) strengthen the capacity of MPWT, DPWTs and contractors on environmental and social management, quality control and contract management, and climate resilience.</p> | <p>Revise ESOM in close consultation with the provinces and MoNRE agencies by undertaking a number of cases studies and lessons learned on the following priority areas:</p> <p>(a) Integrate safeguard requirements into the policy and planning process for road development (public and private) for (i) road maintenance, and (ii) road upgrade/rehabilitation.</p> <p>(b) Develop specific training and guidelines for (i) mitigation measures for road works in PA/PFA and sensitive areas, (ii) community actions on road safety, (iii) use of good quality construction materials (quarries, borrow pits, etc.), (iv) development of compensation procedure for road sector, and (v) RoW management including registration of activities conducted within RoW, and (vi) capacity development of MPWT staff to adequately manage E&amp;S aspects of PPP.</p> | <p>During implementation.</p> <p>ESD/PTRI will set up a safeguard coordination working group during the planning and implementation of the cases studies and revision of the ESOM to ensure that the revised ESOM will be acknowledge and recognized by PONRE and Department of Environmental and Social Impact Assessment (DESIA) of MoNRE.</p> |
|  | <p><i>2.3 Sector Governance.</i></p> <p>Strengthen MPWT's internal control and financial management systems</p>  | <ul style="list-style-type: none"> <li>Monitoring: Conduct an independent annual technical audit of environmental and social measures.</li> </ul>   | <p>During implementation.</p>  |
|  | <p><i>2.4 Sector Capacity Building.</i></p> <p>Continue developing the institutional capacity of MPWT to better prepare the sector for the future implementation of potential PBC and PPP projects.</p>  |   |  |
|  | <p><i>2.5 Road Traffic Safety.</i> To strengthen capacity of DOT-MPWT and the National Traffic Safety Council and raise public awareness on traffic safety.</p>  |   |  |
| <p><b>Component 3: Project Management</b></p>  | <p>TA, goods, IOC, etc.</p>  | <ul style="list-style-type: none"> <li>Incorporate ESMF implementation in project progress report.</li> </ul>   | <p>During implementation.</p>  |
| <p><b>Component 4: Contingency Emergency Response</b></p>  | <p>An Emergency Response Operations Manual will apply to this component, detailing financial management, procurement, safeguards and any other necessary implementation arrangements. (works)</p>  | <ul style="list-style-type: none"> <li>Include safeguard measures in the Emergency Responses Operation Manual and conduct post audit.</li> <li>Conduct safeguard training.</li> </ul>   | <p>During implementation.</p>  |

## MONITORING AND REPORTING

50. To ensure effective implementation of the ESMF requirements, the DPWT will put in place both internal and external monitoring and reporting programs.

51. **Internal monitoring and reporting:** At subproject level, ESU/DPWT staff, together with local authorities and local communities, will be responsible for monitoring the implementation of mitigation measures as approved in the ESMP. Monitoring information together with other information collected from various stakeholders and with observations of project activities will be reported monthly to DPWT. ESD/PTRI will prepare consolidated bi-annual and annual monitoring reports from the provinces for DoR and DPC. These reports will be filed to permit easy retrieval and indicators will be incorporated into the Project M&E system.

52. **External Monitoring:** An independent annual technical audit of both environmental and social measures will be conducted by ESD/PTRI in close coordination with PONRE. Efforts will be made to invite representatives from local communities and mass organizations to participate in the process. The technical audit report will be submitted to WB for information and comment.

## **GRIEVANCE REDRESS MECHANISM (GRM)**

53. The Project GRM process has been established and will be clearly documented in the Project Operations Manual. DPWT is responsible for the GRM at provincial level. The safeguards unit of DPWT at provincial level (ESU/DPWT) will ensure that communities directly affected by the Project have a full understanding of the GRM and ways to access it. For each province, a ‘Grievance Redress Committee’ (GRC) will also be established. The project will use the ‘Grievance and Complaints Logging System’ (GCLS) which has been used on multiple World Bank financed projects to help ensure that projects are implemented in accordance with appropriate environmental and social practices. The GCLS will be used to record grievances and complaints on a central database, and then to monitor the progress until eventual resolution.

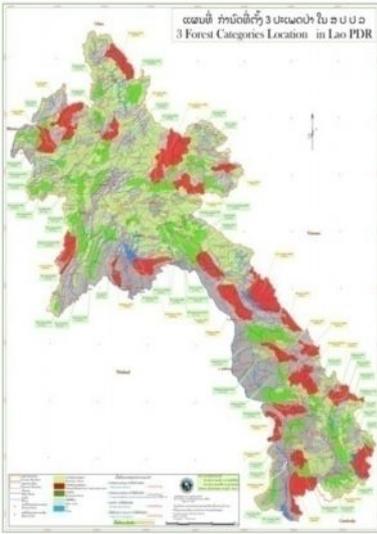
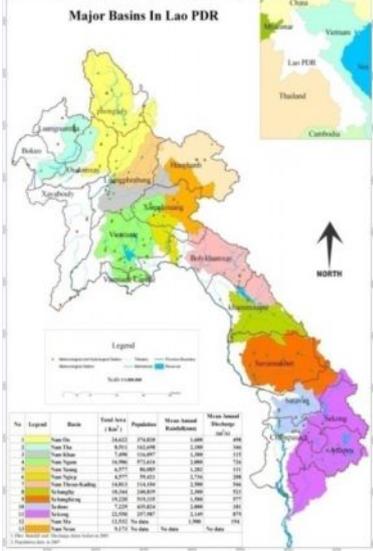
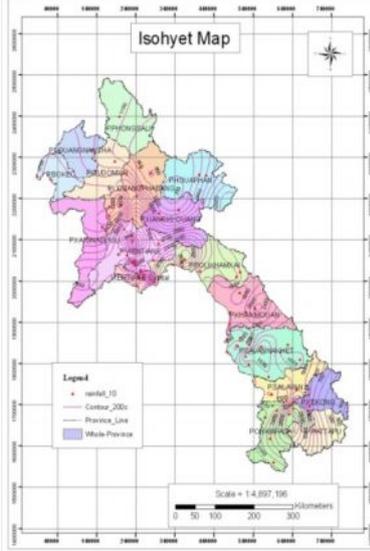
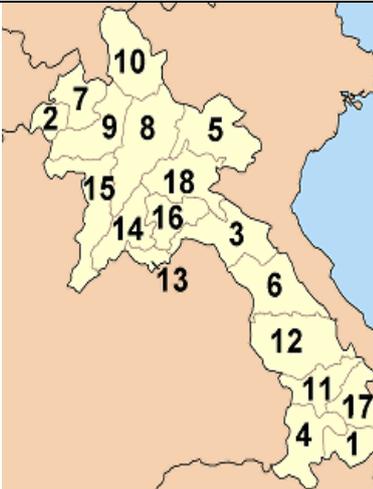
## **CONSULTATION AND INFORMATION DISCLOSURE**

54. **Consultation:** The Project has conducted consultations on ESMF twice. The first consultation was conducted in Vientiane on 25 February 2016 to inform the public, key agencies and local civil society organizations about the objective and scope of the project as well as the draft TORs for the ESMF, RPF, and EGPF. The second consultation was made in Vientiane on 29 April 2016 on the draft ESMF, RPF, and EGPF. Two consultations were also made in some of the selected pilot provinces where the project will be implemented (Bolikhamxay (BKX) and Xayabouly (XBL)) with local authorities and communities including ethnic peoples. The first consultations in BKX and XBL were made in March 2016. The second consultations in XBL were made during 20-23 April 2016 and in BKX during 25-27 April 2016. Furthermore, additional consultations on the draft ESMF, RPF, and EGPF were conducted in two more provinces in the north (Houaphan and Oudomxay), which are home to multiethnic groups, on June 29, 2016 and July 04, 2016, respectively. Information provided and discussed included project objective, description, and components, potential impacts (positive and negative), and the draft ESMF including draft documents were translated and distributed. Results suggest that most of the related agencies and people in the pilot provinces fully support the project and consider that the proposed ESMF is appropriate and can be applied on the ground. Key issues raised during consultations include coordination and supervision of safeguards implementation, management of construction materials sources, dust dispersion, routine maintenance of roads, local community expressed their willingness to participate in routine maintenance, consultation and dissemination of project information before construction, etc. These issues were considered during the preparation of the ESMF, RPF and EGPF and have been included in the project design as relevant. Discussion with the representative of ethnic peoples and women’s groups also confirmed their full support. A summary of the consultation minutes is on file. It has been agreed that during the preparation of specific subprojects to be proposed by the provinces and the preparation of the environmental

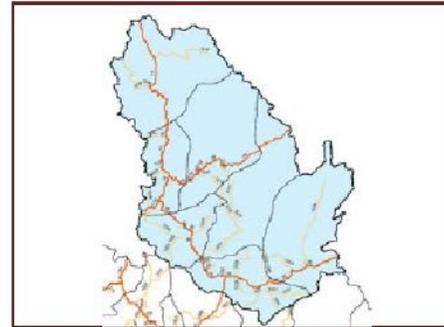
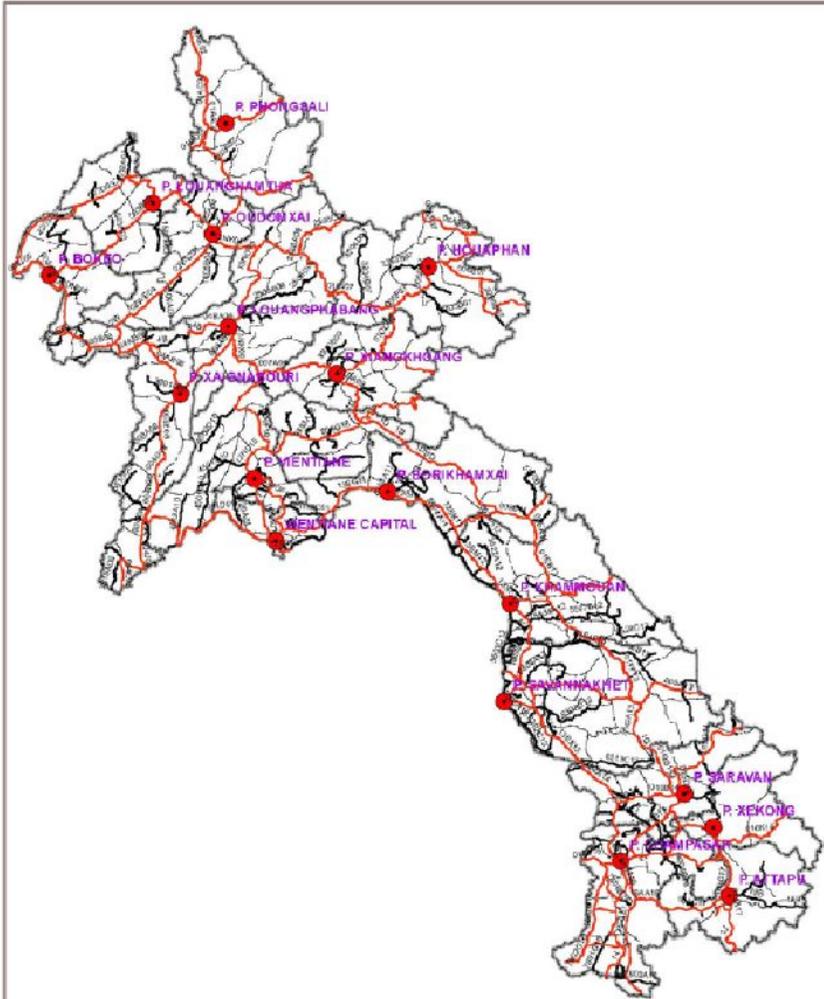
management plan or other plans as required by the ESMF, additional consultations will be carried out in close consultation with the local authorities and people likely to benefit and/or be affected by the subproject.

55. ***Information disclosure:*** The draft ESMF including RPF and EGPF were disclosed (in English) in the MPWT website and World Bank Website on 11 April 2016. The final ESMF, RPF and EGPF will be re-disclosed in the country (in both local language and in English) as well as the World Bank Website after clearance from the World Bank and before appraisal.

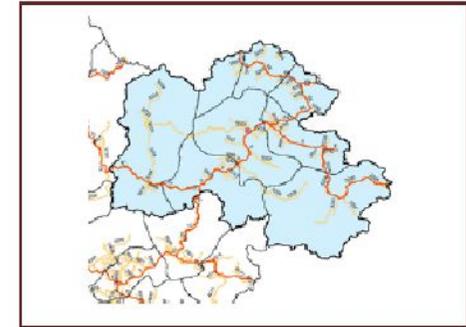
**ANNEX A: MAPS PRESENTING LOCATIONS, KEY FEATURES, AND ROAD NETWORKS OF LAO PDR**

| <p align="center"><b>Map 1: Locations and Key Features of Lao PDR</b></p>   |   |   |            |                               |   |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
|---|---|---|------------|-------------------------------|---|---------------------------|---|---|----------|--------|---------|-------|-----|---|----------|-------|---------|-------|-----|---|----------|-------|---------|-------|-----|---|----------|--------|--------|-------|-----|---|----------|-------|--------|-------|-----|---|----------|-------|--------|-------|-----|---|----------|-------|--------|-------|-----|---|----------|-------|--------|-------|-----|---|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|----|----------|-------|--------|-------|-----|---|
| <p>National Protected Areas (NPA or NCBA), the National Protection Forest Area (NPFA), and the production forests</p> | <p>River Basins in Lao PDR</p>  | <p>Rainfalls (isohyets Map)</p>   |            |                               |   |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
|                                     |  <table border="1" data-bbox="568 974 941 1111"> <thead> <tr> <th>No.</th> <th>Basin</th> <th>Total Area (km<sup>2</sup>)</th> <th>Population</th> <th>Mean Annual Rainfall (mm)</th> <th>Mean Annual Discharge (m<sup>3</sup>/s)</th> </tr> </thead> <tbody> <tr><td>1</td><td>Sanoukha</td><td>24,432</td><td>274,034</td><td>1,494</td><td>486</td></tr> <tr><td>2</td><td>Sanoukha</td><td>9,251</td><td>102,084</td><td>1,494</td><td>169</td></tr> <tr><td>3</td><td>Sanoukha</td><td>7,486</td><td>104,077</td><td>1,494</td><td>117</td></tr> <tr><td>4</td><td>Sanoukha</td><td>16,496</td><td>87,612</td><td>1,494</td><td>174</td></tr> <tr><td>5</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>6</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>7</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>8</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>9</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>10</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>11</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>12</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>13</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>14</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>15</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>16</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>17</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>18</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>19</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> <tr><td>20</td><td>Sanoukha</td><td>4,277</td><td>86,081</td><td>1,291</td><td>111</td></tr> </tbody> </table> | No.   | Basin      | Total Area (km <sup>2</sup> ) | Population                                | Mean Annual Rainfall (mm) | Mean Annual Discharge (m <sup>3</sup> /s) | 1 | Sanoukha | 24,432 | 274,034 | 1,494 | 486 | 2 | Sanoukha | 9,251 | 102,084 | 1,494 | 169 | 3 | Sanoukha | 7,486 | 104,077 | 1,494 | 117 | 4 | Sanoukha | 16,496 | 87,612 | 1,494 | 174 | 5 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 6 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 7 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 8 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 9 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 10 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 11 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 12 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 13 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 14 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 15 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 16 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 17 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 18 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 19 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 | 20 | Sanoukha | 4,277 | 86,081 | 1,291 | 111 |  |
| No.   | Basin   | Total Area (km <sup>2</sup> )   | Population | Mean Annual Rainfall (mm)     | Mean Annual Discharge (m <sup>3</sup> /s) |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 1   | Sanoukha  | 24,432  | 274,034    | 1,494                         | 486                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 2   | Sanoukha  | 9,251   | 102,084    | 1,494                         | 169                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 3   | Sanoukha  | 7,486   | 104,077    | 1,494                         | 117                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 4   | Sanoukha  | 16,496  | 87,612     | 1,494                         | 174                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 5   | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 6   | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 7   | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 8   | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 9   | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 10  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 11  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 12  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 13  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 14  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 15  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 16  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 17  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 18  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 19  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| 20  | Sanoukha  | 4,277   | 86,081     | 1,291                         | 111                                       |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
| <p>Topography</p>   | <p>Provinces</p>  | <p>The Project pilot provinces</p>  |            |                               |   |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |
|                                    |    | <p>Bolikhamxay (BKX #3);<br/>                     Xayabouly (XYB #15);<br/>                     Phongsaly (PSL #10);<br/>                     Oudomxay (ODX #8);<br/>                     Houaphan (HP#15);<br/>                     Xiangkhouang (XK #18);</p> |            |                               |   |                           |   |   |          |        |         |       |     |   |          |       |         |       |     |   |          |       |         |       |     |   |          |        |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |   |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |    |          |       |        |       |     |   |

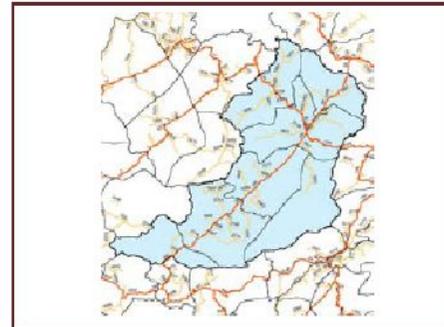
Map 2: Road Network in Lao PDR



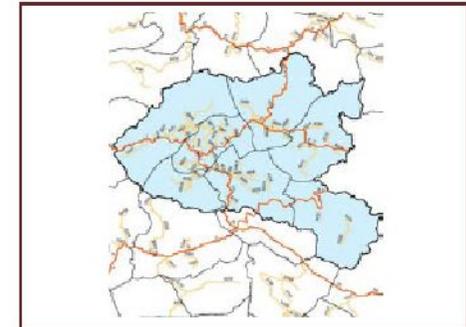
PHONGSALI PROVINCE



HOUAPHAN PROVINCE



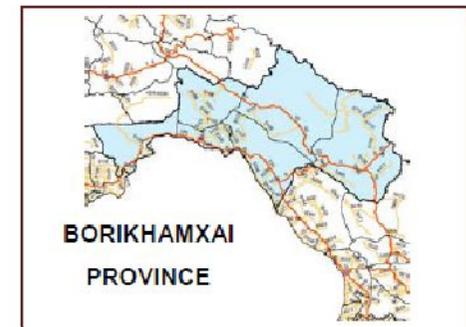
OUDOMXAI PROVINCE



XIANGKHUANG PROVINCE



XAIGNABOURI  
PROVINCE



BORIKHAMXAI  
PROVINCE