



Laos People's Democratic Republic
Peace Independence Democracy Unity and Prosperity

Environment Protection Fund

LENS2 Sub-project Application

General Instructions: Please refer to the Project Implementation Manual (PIM) Volumes 1 to 5 for subproject design, implementation and monitoring/evaluation (M&E). In summary:

- Applications should be submitted in both Lao and English to EPF Office. Translating the application is SDA's responsibility. It can be financed by the subproject preparation facility, if such facility has been mobilized, or pre-financed by EPF.
- Applications must demonstrate that the subproject meets the following eligibility criteria: (a) supports a Government of Lao PDR policy, strategy and/or an official plan; (b) contributes to at least one outcome indicator and at least one intermediate outcome indicator from the LENS2 results framework; (d) fits into either the PICE or CBIEPF funding windows; (e) excludes activities from the negative check-list in the PIM, and (f) aligns with project's geographical scope which includes the national/central level and the following provinces: Bolikhamxay, Khammouane, Houaphan, Xiengkhouang, LuangPrabang, Savannakhet, Vientiane and Xaysomboun.
- Applications for protected area and wildlife sub-projects must demonstrate that the subproject meets an additional eligibility criteria: contributes to a regional or global outcome such as cross-border cooperation, knowledge transfer or prevention of illegal wildlife trade.
- Sub-projects are approved for their proposed duration. However, implementation requires the prior annual approval of an Annual Work Plan and Budget (AWPB). EPF has the possibility to cancel an approved subproject if the annual performance is consistently unsatisfactory and the achievement of its objective has become unlikely.

An SDA can only implement one subproject at a time although additional financing is possible

EPFO Sub-project number:

1. Sub-project delivery agency (SDA) (name/address)	Natural Resources and Environment Institute (NREI) Ministry of Natural Resources and Environment (MoNRE) Lane Xang Rd, PO Box 7864, Fax: (856)21-263799, Vientiane Capital, Lao PDR
2. SDA focal point (name/function/contact details)	Mr. Virasack Chundara Deputy Director General Natural Resources and Environment Institute (NREI), MONRE
	<input type="checkbox"/> International level <input checked="" type="checkbox"/> Central/national level <input checked="" type="checkbox"/> Provincial/district level. Please indicate target provinces: Vientiane Capital, Luangprabang, Bolikhamxay, Khammuan and Savannakhet <input type="checkbox"/> Protected area. Please indicate (NPA, protection forest, conservation forest and name):
4. Sub-project title	Institutional strengthening on air and noise quality monitoring and the Improvement of resources efficiency and transfer appropriate technology for waste management in SMEs
5. Amount requested (US\$)	\$ 829.000
6. EPF's eligible funding window (please check only one window)	<input checked="" type="checkbox"/> Policy Implementation and Capacity Enhancement (PICE) <input type="checkbox"/> Community Biodiversity Investment (CBI)

7a. Project development objective¹	To help strengthen selected environmental protection management systems, specifically for protected areas conservation, enforcement of wildlife laws and environmental assessment management.
<p>8. Sub-project related sectoral and institutional context, challenges and priorities</p> <p><i>(Describe role of SDA, current capacity and activities related to PA/wildlife/env. and social safeguards, challenges and priority needs and approach proposed to address priority needs/gaps).</i></p> <p>Ambient Air Quality Monitoring Mobile Car</p>  	<p>8.1. Overview:</p> <p>The vision of year 2030 and the strategies 10 years (2016-2025) determine that Social-Economic development should follow mission of green economic development and approach the sustainable development which are assured that Natural Resources are used in effective way in order to become industrialization and modernization country, it is required that all departments and institutes should focus on various priority tasks such as:</p> <ul style="list-style-type: none"> • Pollution control in urban area mainly soil, water, air and noise pollution which is caused by expanding industries, agriculture and other facilities should meet acceptable range of Environmental Standard guideline before discharge. • To promote sustainable natural resources usage that bring extremely benefits toward nation and reduces unsustainable and waste natural resources usage • To reduces Environmental and Social Impact from investment activities (Hydroelectricity, dam, mining, forest, agriculture, industry, infrastructure and services) across the country in order to guaranteed and approach all priority tasks that mention in vision above until year 2030 and strategy 10 years (2016-2025) to take action, it is required that all departments and institutes focus on various priority tasks such as: <ul style="list-style-type: none"> ○ Building technical and organized capacity in terms of research, analysis, and establish network for Environmental quality monitoring including construction and improvement of Laboratory and use advanced equipment to serve analysis and monitoring work in particular analysis of air and noise quality; ○ Baseline Data Collection for air and noise pollution to refer to determination, improvement of Environmental Standard and state of Environment Report annually; ○ Gathering and support environmental information (air and noise pollution) in order to establish database on environment, monitoring and analysis toxic waste in the country, hazardous and dangerous chemical, air and noise pollution, waste water discharge across the country especially urban road No.13; ○ Collection and enhance haze data to ASEAN member countries, that caused by slash and burn and forest fire especially in Northern area; ○ Support and monitoring the environmental quality to assess and manage the environmental impact in terms of air and noise pollution which occur due to investment project and various activities. <p>Lao National Standard on Environment has been officially entered into the enforcement since 2009. The environmental standard specifies various types of emissions including air and noise emission and requires the natural resources and environment institute (NREI) to implement monitoring program, conduct environmental quality</p> <p>Building technical capacity to assess ambient environmental quality, and analysis</p>

¹ This is the proposed LENS2 PDO. Until LENS2 project becomes effective, sub-projects for LENS2 will not be processed for approval.

the releases of pollutants – including air and noise quality — is national high priority needs and fundamentally important for sustaining environmental quality, enforces the national environmental standard as well as ensuring the effective management of environmental impact assessment (EIA).

National environmental quality standards (ambient and emission) and EIA/IEE regulations require environmental quality monitoring in place. However, government's capacity for measuring emission releases and monitoring compliance to regulations is still limited. Given the rapid growth of industry, mining, and service sectors in the country, it is critical to build technical capacity of the government agencies and the private sector to conduct research and development including applying regulations, and measuring environmental quality correctly. While some progress has been made on surface water quality monitoring, the capacity to measure air and noise remains limited and there is no standard equipment and facilities in Lao PDR that could be used to certify the quality of the measurements.

The National Environmental Laboratory (NEL): MONRE's policy is to build its capacity to monitor air, noise, vibration, and other environmental quality parameters including establishing a national environmental quality laboratory and toxic substances. During 2011-2014 with technical assistance and financial support from the Government of Finland through the implementation of the Environmental Management Support Program (EMSP) a capacity building program on surface water quality monitoring was implemented for NREI and the Department of Water Resources (DWR) and the 17 provinces. To scale-up this work, under the Mekong Integrated Water Resources Management (M-IWRM) project, the World Bank (WB) is providing funding for the construction of a national environmental laboratory (completion expected for 2016). EMSP was expected to fund the procurement of lab equipment and further training staff in its operation. Unfortunately, the Government of Finland has decided to phase out the EMSP, and currently NREI is looking for donors to finance the lab equipment.

Capacities for air and noise analysis are on the other hand weak. At present MONRE has a semi mobile air quality monitoring station in Vientiane capital and has recently purchased an ambient air quality-monitoring vehicle for urban use. However, MONRE still lacks the basic air and noise equipment that would enable to monitor and verify the emissions from industry, construction, and mining outside urban Vientiane.

8.2 Role and responsibility of NREI

NREI was established in mid-2012 to analyse of water quality, air quality, noise/vibration, and the level of toxic substances, to provide consultation and services to the government and enterprises, and to undertake studies related to environmental economics and best available or environmental friendly technology. With respect to air and noise quality including vibration NREI is expected to play a key role in collection, compilation, survey, research and assessment of base line information throughout the country, the development of standards on data and technologies for air quality management, as well as provision of proposals and advice for air, vibration and noise quality management planning.

To perform its functions, NREI is divided into 1 division and 5centers: Planning and Management Division (PAD), Natural Resources Research Center (NRRC), Environment Research Center (ERC), Environmental Quality Monitoring Center (EQMC), Remote Sensing Center (RMSC), Research Data and Information Center (RDIC). NREI has a total of 45 staff comprising 29 technical officials, including 16 women and 13 of the current staff are in temporary roles.

▪ EQMC's role are as follows:

- To propose for establishing the environmental laboratory network in each region to process the environmental quality analysis and water

quality monitoring network, air, and others by automatic information linkage system in the whole country;

- To attend the monitoring and inspection on environmental impact problems in case of any emergency such as water quality, air, soil, leaking chemical, and others.
- To make and disseminate report on monitoring and inspection on environmental quality and chemical in each period
- To support PCD and DSIA the monitoring and inspection on environmental impact problems in case of any emergency such as water quality, air, soil, leaking chemical, and others.
- To use and manage the national environment laboratory to be the standard to reach the receiving ISO 17025;
- To research and develop guideline on the method of collection and environmental sampling analysis, using equipment and development the laboratory standard system;
- To organize training on technical and giving suggestion for related sectors on collecting and analyzing environmental sampling, using tools, and developing laboratory standard;
- To provide technical service on quality of water, air, chemical and others for related sectors;

The Environmental Quality Monitoring Center will mainly focuses on air and noise quality monitoring and analysis. The EQMC comprise of 4 sectors:

- 1) Water Quality Monitoring Section;
- 2) Air Quality Monitoring Section;
- 3) Chemical Monitoring Section;
- 4) The National Laboratory Section;

▪ **Duties of Division of Natural Resources Research Center**

- To research and assess the surface and ground water, air and noise quality by using models to support the planning and natural resources management and to predict the dispersion emissions that may impacts on environment and human health
- To promote on using model in natural resources area of related sectors in central and locality in the whole country
- To provide technical service in natural resources areas

Natural Resources Research Center comprise of 4 sections:

- 1) Surface Water Resources Sector;
- 2) Ground Water Resources Sector;
- 3) Research and Model Sector;
- 4) Water Resources Data Sector

▪ **Duties and Role of Environmental Research Center**

- To implement the study and research on environmental technology especially excellent and friendly with environment
- To research alternatives for adapting with climate change and environmental mitigation and environmental friendly
- To provide technical service in the environmental research area and make plan for approving using technical income in each period and implement obligation according to the regulation
- To study the environmental impact across the borders such as: air pollution, water quality, waste, and others

Environmental Research Center comprise of 5 sectors:

- 1) Environmental Technology Research Sector;
- 2) Climate Change Research Sector;
- 3) Disaster Risk Research Sector;

- 4) Environmental Threshold Research Sector;
- 5) Impact Across Border Research Sector

NREI has on-going capacity development programs being implemented with assistance of development partners (ADB/DFAT, WB, IFC, MRC, Finland, German, etc.). Below a list of the activities, most will be completed during 2015.

Key Activity	Status	Remarks
(1) The National Integrated Water Resources Management Support Program (NIWRMSP) (ADB/DFAT, 2006-2015)	Activities nearly completed	Ends in 2015.
(2) Environmental Management Support Program (EMSP, Finland)	Completed	Completed in 2015.
(3) Mekong Integrated Water Resources Management (M-IWRM) (WB)	On-going. NREI is responsible for the construction of the water quality laboratory and setting up water quality monitoring in Sekong River basin, Xechamphone wetland RAMSAR site, and Nam Ngum in areas that source Vientiane Capital's water supply. This work focuses on surface water quality monitoring.	Ongoing until 2018.
(4) Community-Based Environmental Monitoring Program in Laos	On-going. NREI, PONREs and DONREs of Vientiane and Bolikhamsai provinces and NOUL are responsible for building capacity and developing district biological water quality monitoring sites.	Ends in 2015.

8.3 Challenges and Priority Needs

Refer to the environmental strategy from 2016-2025 and the vision until 2030 of the ministry of natural resources and environment, which stress the needs of the socio-economic development of the country toward the green and sustainable development, guarantee the utilization of natural resources in more efficient way, industrialize and modernize the development in the country.

In achieving the goal and objectives economic and social development in more efficient and sustainable manner, requires all department and institutions under the MONRE to focus on some of the following areas:

- Greater pollution control on soil, water quality, air and noise quality from industrial development, agriculture and services and in urban in accordance with the national standard
- Encourage more efficient way of natural resources and maximize the benefits to the country and reduce the unsustainable manner consumption of resources
- Reduce impacts of project development (energy and hydropower, mining) within the country with minimal impact on social and environment

To achieve the needs and the objective of the MONRE' strategy and Work plan as mentioned above, its require related departments and institution under the supervision of NREI to:

- Strengthen institution capacity and technical capability of the staffs on monitoring, establish and expanding environmental quality monitoring network within the country, built and develop national environmental laboratory including to modernize the laboratory equipment for monitoring of environmental quality (air and noise quality),
- Collect base line data and analysis environmental quality including air and noise data for setting new or improved the national environmental standard and the state of environmental report of the country
- To monitor and provide data and necessary information for the establishment of environmental quality including air and noise pollution,

toxic chemical and wastewater and waste material within the country
Provide data of air quality relates to haze and smog from bush fire, slash and burn
of shifting cultivation in the northern territory to ASEAN member countries
Supports PCD and DESIA in monitoring and control the project development and
assessment of IEE and EIA.

8.3.1 Analyzing and Monitoring Environmental Quality

Ensuring the effective management of natural resources and environment is time and resource consuming involving many agencies and subsectors. The agencies involved in this work include the Department of Water Resources (DWR), the Department of Environmental Quality Promotion (DEQP), the Pollution Control Department (PCD), and the Department of Environment and Social Impact Assessment (DESIA) as well as the Ministry of Industry and Commerce (MOIC). Provincial Offices for Natural Resource and Environment (PONREs) are tasked with monitoring responsibilities at the local levels. Within this institutional context, NREI plays a key role providing up-to-date data and analysis, and coordinating information needs on which the work of all the agencies can be based. It is for this reason that building NREI technical capacities to provide quality analytical services on air (particulate matter), groundwater, and noise emissions are critical priorities.

Measuring and monitoring environmental quality especially water quality (surface and groundwater), air, noise, and vibration are key elements of an effective environmental management system, especially related to EIA. However, performing these functions effectively requires continued inputs of experienced staff and specialists and this is a major challenge in Lao PDR. More so given the current rapid increase in industrial, commercial, extractive, and hydropower activities. To address this challenge, MONRE's policy is to build a national laboratory of high quality that could certify environmental analysis, to provide services and verify the standard compliances of air and noise emissions from industry, mining, and project development. As well as to strengthen the country's EIA system. As indicated, under a separate project financed by the World Bank (M-IWRM) the water quality laboratory is being constructed and additional procurement of equipment is being discussed so that the laboratory could be in operation in early 2016. However, this support focuses on surface water and a gap exists regarding human capacities, equipment, and technical assistance to conduct NREI's work on groundwater, particularly related to analyzing releases of wastewater from industrial and commercial operations. Similarly, air and noise quality monitoring are high priorities that remain unfunded. Critical needs in these areas include equipment, technical assistance, and training.

8.3.2 Strengthening Capacity on Air Quality and noise quality Management

The number of mining operations and industries, including cement plants, steel rolling mills, thermal power plant, and used-oil processing, and/or coal as raw material for energy generation is growing at a fast pace, increasing air and noise pollution levels in industrial as well as rural areas. At the same time, trade and increased access to vehicles by the population is intensifying the amount of air pollution including dust and CO emissions in the larger urban centers such as Vientiane. While not as extreme as in neighboring countries, these emissions are having local negative impacts on human health and the environment.

In order to strengthen the enforcement of law and regulations on air and noise emission, as well as to implement MONRE's policy to support sustainable growth, green policy, and green city, it is critical to build the capacity of NREI not only on monitoring of pollutants from industries, mining and project development, but also of ambient air quality in urban areas. To build NREI capacity to measure air quality and noise, equipment, technical assistance, and training needs have been identified as priorities (Annex 1 details the key equipment required).

8.3.3 Greening SMEs through waste management and pollution control

Small and Medium Enterprises (SMEs) play an important role in Lao's economy. SMEs offer more than 60,000 job opportunities, which account for 40 percent of the country's total employment. It is therefore necessary to provide proper support for sustaining reasonable growth in SMEs in Lao PDR. However, SMEs lack capital and access to modern technology and know-how on environmental management (wastewater treatment technology), and will cause environmental risks due to their high numbers and potential cumulative effect. The negative environmental impact of manufacturing SMEs is largely acknowledged as they consume energy and natural resources, and generate waste and pollution including air emissions which are released untreated into the environment. There are opportunities in engaging this sector of the economy to identify technology that is cost effective and applicable in the context of Lao PDR to reduce the negative impact of SME's releases.

8.4 Subproject approach

Approach: Recognizing the PDO and the Intermediate Outcome Indicators of LENS2, the role of EPF and the WB, the subproject has been designed to improve NREI functional capacity to conduct air and noise quality monitoring and to provide technical advisory services to Small and Medium Enterprises (SMEs) to enhance their pollution management practices and compliance with national standards and regulation. To achieve this subproject has a two-fold approach.

(1) The first one is to increase the technical capacities of NREI to conduct air and noise quality monitoring. In this sense, while the national water quality laboratory will be operational in 2016, it is still critical to further develop staff's capacities at national and local levels, to effectively use the laboratory, particularly to analyze and monitor air and noise quality from industrial activity. This has become urgent, as the action plan to develop such capacities has now no funding mainly due to Finland decision not to extend the EMSP program.

(2) The second line of action proposed by this sub-project is to engage directly with SMEs. NREIs proposal is to: (i) raise awareness among SMEs on regulation, standards, and cost-effective technologies to manage and reduce industrial pollution; (ii) share know-how and best practices and promote dialogue on their application to SMEs in Lao PDR; and (iii) conduct pilots on the application of promising, cost effective technologies to reduce wastewater, solid waste, air pollution, and noise levels among selected key industrial sectors (foods processing, agro processing and poultry industries, and share the lessons learned with a wider public.

It is expected that this approach will enhance the sustainability of the investment by building simultaneous capacities for data collection, analysis, and overall quality monitoring among NREIs staff and awareness and know-how for compliance among productive sectors of the economy. The approach intends to also engage key stakeholders such as DWR, DESIA, DEQP, PCD, MIC, and the Chamber of Commerce and open a space for dialogue and knowledge exchange on practical experiences between government and the private sector.

Design: The activities will be implemented through 3 components (1) Building NREI's capacities on wastewater, air quality, and noise monitoring; (2) Building SME's capacities on resources efficiency and environmental management; and (3) Subproject administration and monitoring

9. Sub-project objective (only one sentence)

To strengthen country systems for monitoring compliance with pollution control regulations (wastewater and solid waste) and air and noise standards, and to build pollution control management capacities among SMEs in selected sectors.

<p>10. GoL Policy/Plan/Strategy supported by Sub-project <i>(including provincial if applicable)</i></p>	<ul style="list-style-type: none"> • The Environmental Protection Law (2013), Part 3 Section 2 (Pollution Control), Section 3 (Toxic chemicals and solid wastes), and Section 4 (Environmental certification and permit) • National Ambient Environmental Standard, No. 2734, dated 07th December 2009. • Regulation on Industrial Air quality standards No. 2062/MoIC, date 14th October 2009 • Regulation on Industrial Noise Quality No. 2063, 14th October 2009 <p>MONRE's Vision to 2030 and Strategy on Environment 2016-2025 which aims at environmental planning for sustainable urban and rural development, and to implement and monitor pollution including air emissions from industries, service sector and family business (SMEs), to expand air quality monitoring within the country.</p>
<p>11. Sub-project Regional or global outcomes <i>(for protected area and wildlife related sub-projects only: e.g. cross border cooperation, knowledge transfer, prevention of regional illegal wildlife trade)</i></p>	<p>Not Applicable</p>
<p>12. Sub-project Outcome Indicators <i>Select and list the related outcome and intermediary outcome indicators from the PAW/LENS2 Results Framework and describe additional sub-project specific outcome indicators.</i></p> <p><i>Outcome/impact is the longer-term benefit of particular goods or services to a target group.</i></p>	<p>In line with the LENS2 Results Framework, NREI subproject outcome indicator will be related to the following indicators:</p> <ol style="list-style-type: none"> I1. Aggregate index of functional or educative capacity of selected public institutions (annual) (Also LENS2 Outcome Indicator) I2. Increase in training effectiveness as determined by an third-party analysis (annual) I3. Increase in teaching effectiveness as determined by an third-party analysis (annual)
<p>13. Sub-project main outputs <i>(Goods or services provided by the sub-project's intervention (supply-driven) e.g. x staff trained; guidelines on x developed)</i></p>	<p>The subproject components will deliver the following intermediary outcomes or output:</p> <p>Component 1 - Capacity building on air quality and noise monitoring</p> <ul style="list-style-type: none"> - NREI has equipment and instrument to detect air an noise pollution; - Capacity of NREI on air and noise monitoring is strengthened - Technical officer have knowledge and experience to use the detection instrument; - Data set and report on air and noise quality in urban areas (Vientiane Capital, Luangprabang and Savannakhet); - Data set and Report on air and haze pollution report for Vientiane capital(air and noise problems due to increasing of traffic, number of vehicles, industries and high of living density) delivered to MONRE and Asian countries; - Data set and Report on air and noise quality in polluted industry areas such as: Cement plants and Silicon Manufacture, Economic and Trade zone and Vientiane industrial zone; - Technical manual with method for air and noise pollution testing; - Technical documents and maintenance manual for the analysis instrument and other equipment. <p>Component 2 - Building research capacities on environmental management and technologies applicable for waste treatment for SMEs</p> <p>At least 10 short-term training courses of research studies related to resources efficiencies and best available technologies for waste management and cleaner</p>

	<p>production in SMEs are designed and organized;</p> <ul style="list-style-type: none"> - About 3-5 demonstration units will be selected as pilot units at target provinces (Vientiane capital, Vientiane, Bolikhamxay, Khammuane and Savannakhet) for wastewater management to carry out Cleaner Production assessment and resources efficiency will be carried out and implemented; - Publication and awareness material (manual, brochure, poster on Cleaner Production and resources efficiency) and available technologies for waste management. <p>1) <i>Under Component 1 (Capacity building on air quality, and noise monitoring and application of pilot activities)</i>, key outputs will include: (a) completed procurement of air and noise quality and wind speed and condition equipment such as: Total Suspended Particulates, Particulate matter less in 10 micrometers, sulfur monooxide, carbon monooxide, hydrocarbone detectors; (b) Purchase equipment and modeling air and noise dispersion program which are important for creating air pollution and noise modeling; (c) At least 10 trainees including 4 females staffs will be trained internal and external training courses on air and noise modeling and monitoring will be organized throughout the project period. The training includes in class and on the job trainings; (d) Trained staffs will be able to operate, maintain and carry out sampling air, noise emissions and draft the report; (e) Select and identify the polluted industries to carry out monitoring on ambient air and noise quality such as: industries and mining zones; (f) Capacity building for corporation with related sectors on air and noise monitoring will be strengthen and equipment are available; (g) Create and public the hand out for modeling, air and noise quality and equipment maintenance; (h) writing report for ambient air and noise quality in monitoring area, in order to refer to policy, air and noise pollution standard in the future.</p> <p>2) <i>Under Component 2 (Capacity building and research, and development on environmental management of pilot SMEs)</i>: Key outputs will include results of the pilot activities including improved awareness/knowledge of the SMEs on appropriate technology and environmental management and practices; improved capacity of the selected SMEs to comply with regulations; and a number of training, workshops, study visits as needed such as:</p> <ul style="list-style-type: none"> - After selected staffs from NREI, PCD, DEQP, PONREs and SMEs will be trained on resources efficiencies and best available technologies for environmental management in SMEs; - Demonstrations will be selected as pilot units at target in Vientiane capital, Vientiane, Bolikhamxay, Khammuane and Savannakhet has been awareness on productivity, safe cost, available technology, resources efficiency, energy efficiency and environmental management; Due to high number of SMEs in Vientiane capital and that's a potential for project study. Therefore, this city is selected as a pilot project in this proposal - Establish documents, manuals, case promotion studies on resources efficiency and technologically appropriate for the environment management in SMEs. <p>3) <i>Under Component 3</i>, key outputs will include: (i) effective coordination of subproject activities; (ii) timely submission of AWPB for 2016, 2017, and 2018; (iii) timely procurement and proper record keeping; (iv) timely clearance of subproject advance and record keeping; and (v) quarterly M&E reports and compliance with the subgrant agreement and the agreed triggered described in Section 26 which is outlined as follows:</p> <ol style="list-style-type: none"> a. Compliance with fiduciary and safeguard requirements (at least Moderately Satisfactory in year 1 and Satisfactory in subsequent years). b. Compliance with reporting requirement (number, quality and timeliness) (at least Moderately Satisfactory in year 1 and Satisfactory in subsequent years). c. Year 1, at least 50 % of activities in AWPB completed. Year 2 and after, at least 75 % of activities in AWPB completed.
--	---

	<p>d. All outcome targets for current year are measured, evaluated and show progress towards target.</p> <p>e. AWPB produced for the new fiscal year cleared by WB and approved by EPF Board.</p>
<p>14. Sub-project Components and Activities: <i>List the components and main activities to produce outputs above. Do not use more than 5 components. Details will be in Annual Work Plan and Budget (AWPB) annex attached.</i></p>	
Components	Main Activities
<p>Component 1: <i>Developing capacities on air quality, and noise modeling, analysis and monitoring. The component will strengthen the capacity of NREI and PCD to conduct air quality and noise pollution analysis and monitoring through:</i></p>	<p>Component 1- \$ 380,000</p> <p>Activity 1.1 Procurement of Key Equipment (\$ 248,000)</p> <ul style="list-style-type: none"> ❖ Procurement of air and noise measuring equipment (Annex 1) <ul style="list-style-type: none"> • Sound Level Meter (Class 1) - 2 units • Air measurement equipment comprising: <ul style="list-style-type: none"> - (i) High Volume Air Sampler (TSP) - (ii) High Volume Air Sampler (PM-10) - (iii) NO₂ and SO₂ Analyzer • Meteorological System (Wind Condition, Speed and Direction) – 1 • Filters, spare parts and necessary accessories for equipment – • Air and sound dispersion model software • Truck for transportation of noise and air monitoring equipment - 1 unit, <p>Activity 1.2 Training Staffs (\$ 132,000)</p> <ul style="list-style-type: none"> • Training workshops on air/noise quality management and monitoring methodology (sampling and analysis) will be conducted for staff of the environmental quality monitoring center (NREI) and representatives from key relevant department under MONRE and PONRES. Training in laboratory analysis (air, noise, etc.) will be conducted at MONRE in Thailand where a cooperation agreement is in place. A detailed program will be developed in consultation with MONRE Thailand (PCD, DEQP). Later on when the laboratory is operational and equipment in place, NREI will train PCD and other government staff on procedures and methodology for sample collection and analysis. Training for the private sector will also be conducted, however private participants will cover their training costs. • Study visit for technical and management levels on air and noise emission monitoring, planning and monitoring program • Identification and selection of target groups (e.g. industry, industrial estate, steel rolling mills, cement plants, brick factory, mining project) where analysis and monitoring will be undertaken; it is expected that about 3-5 IEE and EIA projects will be selected for national standard compliance monitoring (NREI will work closely with DESIA, DWR, PCD, and the Ministry of Industry and Commerce during the identification/ selection stage).
<p>Component 2: Building research capacities and monitoring environmental management of SMEs. This component will support pilot activities to be carried out with selected SMEs in close consultation with PCD, DEQP, and/or DESIA. The activities will strengthen the capacities of Government agencies for analysis and monitoring, and of SMEs to comply with national</p>	<p>Component 2 - \$ 294,000</p> <p>Activity 2.1: Building research capacity of staff (Government and SME) on monitoring and research study on technologies and pollution control applicable for SMEs</p> <ul style="list-style-type: none"> • Training staffs on cleaner production approach and technique, and study the best available and appropriate technology on waste management and pollution control for SMEs; <p>Activity 2.2: Identification technologies and pollution control applicable to SMEs</p> <ul style="list-style-type: none"> • Conducting study and Identify of technologies for waste management and pollution control applicable to pilot SMEs at target in Vientiane capital, Vientiane, Bolikhamxay, Khammuan and Savannakhet; <p>Activity 2.3: Awareness Raising</p>

<p>standard requirements and regulations, and apply appropriate know-how and technology on waste management (wastewater and solid waste) and pollution control. Key activities would include:</p>	<ul style="list-style-type: none"> • Awareness raising of SMEs on regulations and standards, problems caused by non-compliance, and affordable and practical solutions to improve waste management and pollution control; <p>Activity 2.4: Selected as pilot SMEs and trails performed on resources efficiency and available technologies transfer for the environmental management</p> <p>Identify and select SMEs for pilot study to implementation at Vientiane capital, Vientiane, Bolikhamxay, Khammuan and Savannakhet on resource efficiency waste management and technique for wastewater treatment. A rapid assessment will be made to identify type of SMEs being operated in Lao PDR that has opportunity to demonstrate the application of simple and cost effective technology in wastewater treatment. So that 2-3 types of them could be selected for pilot capacity building on waste management and minimization. The activities will be carried out in close consultation with PCD and the Department of SMEs Promotion (DOSMEP) of MOIC, and Chamber of Commerce. Implement the waste management and minimization in the pilot SMEs and disseminate the results. It is expected that the cost of the pilots (particularly installation of technology, etc.) cost will be shared between the SMEs and the subproject.</p> <p>Training on resource efficiency, appropriate technology for waste management, pollution control for NREI's staff and technical officers from PCD, DEQP, DOI and CPC-L, and DoSMEs and Department of Industry and Commerce of Vientiane will be selected and trained as TOTs. Short-term training program in neighboring countries, especially Thailand will be defined and organized. Regional and experienced experts from neighboring countries especially Thailand will be invited as coaches and trainers for training on specific topics and themes. Target sector and groups of SMEs and business operator from Vientiane capital and target provinces will be identified and trained. These include awareness raising program, publication of material and dissemination of information.</p> <p>Given that management of waste for SMEs has been promoted in Thailand for many years, 1-2 study visits will be made to this country to study appropriate technology that could be applicable to SMEs in Lao PDR (such as wastewater treatment for food processing industry including noodle and factory, poultry and pig farms, etc.). This activity will be planned and conducted in close consultation with PCD and DOSMEP of MOIC, and the Lao Chamber of Commerce. Furthermore, under this activity 2-3 knowledge-sharing events will be organized to share and discuss international experiences, best practices, and potential technology options for MONRE, relevant sectors, and SMEs.</p>
<p>Component 3:</p>	<p>Component 3 – \$ 78,000</p> <p>The activities will include, but not be limited to, annual preparation of AWPB, M&E, reporting, fund flow management, and procurement (as agreed with EPF). A full time national consultant will be mobilized to assist the subproject team in the overall coordination, planning, and submission of monitoring reports while a full time accountant will be mobilized to work closely with EPF and facilitate effective fund flows including ensuring timely payment of eligible expenses and clearance of subproject advance and proper filing of various accounting documents. The subproject account may be subjected to internal auditing by DWR and/or EPF.</p>
<p>15. Sub-project direct beneficiaries</p>	<p><input checked="" type="checkbox"/> Governmental staff Total number (240) of which women (13) <i>Central level (45) of which women (5)</i> <i>Provincial level (20) of which women (8)</i> <i>District level () of which women ()</i> <input type="checkbox"/> Rural communities () Number of people () of which women () <input checked="" type="checkbox"/> Students (35) of which women (7) <input type="checkbox"/> General public</p>

	<input checked="" type="checkbox"/> Private sector (140)
16. Proposed Start Date	1 October 2016
17. Proposed End Date <i>(duration in years)</i>	December 30, 2019 (3 years)
18. Co-financiers <i>(source and amount (US\$) including in-kind contribution; per component if possible)</i>	In-kind contribution of about \$ 30,000 including staff salary, offices, and utilities
19. Complementary ongoing or planned projects/programs/initiatives <i>(name/source of funding/linkage)</i>	<p>NREI is implementing 2 sub-components on Integrated Water Resources Management Program (IWRM-P) Phase 1. The IWRM-P is an Adapt Program Loan through WB. The program composes of 4 components and NREI is implementing 2 sub-components including Sub component 2-2-<i>Support for Water Quality and Aquatic Ecosystem Health and water quality monitoring laboratory</i>, which would become a national reference, and sub –component 2-3: <i>Water Resources Modeling, including review and selection of appropriate, adapted models, technical assistance and training</i>. The IWRM-P phase 1 will be finished in 2017.</p> <p>No negative activities in IWRM-P list are under this sub-project. NREI is a research institute, not a regulator but service provider.</p>

20. Implementation Arrangements

a. Describe the project management structure.

b. What additional staffing or technical assistance is needed to successfully complete the proposed project (e.g. M&E officer, accountant, ...)?

a. Project Management Structure/sub-project implementation team

The subproject will be implemented by **NREI** team comprising responsible staff from 1 divisions and 2 centers as follows:

- The Environmental Quality Monitoring Center (EQMC) will be responsible for Component 1
- The Environment Research Center (ERC) will be responsible for Component 2
- The Planning and Administration Division (PAD) will be responsible for Component 3

The DG or DDG will be responsible as the project manager and provide oversight throughout implementation. Day to day subproject management and monitoring will be led by the Head of Environmental Quality Monitoring Center, Mrs. Setouanh Phanthavongsa, with assistance from the Deputy Head of Center, Mr. Vanhna Phanpongsa, and other **NREI** staff as needed.

A Working Group (WG) will be established to guide implementation and coordination with PCD, DEQP, DESIA, and/or the target provinces. The WG will meet quarterly. The WG will comprise but not limited to the responsible staff of each division/center as assigned by the DG of NREI and the focal point from the target provinces.

One full time national consultant and one full time accountant will be hired to assist in the overall subproject coordination, monitoring and evaluation, and management of fund flows.

b. Additional Staffing/Technical Assistance (TA)

The subproject will also hire short term consultants (national or international) to assist in the development/consultation on the draft guidelines. International technical advisors specialists in water, air quality, pollution management, technologies for SMEs, etc. will be hired as necessary.

Readiness: NREI is ready to implement the sub-project. The implementation team has been identified and the scope and activities have the full support of the Institute and of MONRE. The first year annual work plan and budget (AWPB) will be prepared in consultation with key agencies and other related subprojects once the Concept Note has been approved.

21. Summary Budget

*Detailed activity plan and budget for total period and year one must be attached in annex. Provide a summary of the budget as part of the proposal. Note that the sub-project will be approved for the entire duration but the sub-grant agreement will be signed on a yearly basis based on previous year performance (and agreed triggers as defined in section 24). **For approved sub-projects, a procurement plan will be developed by EPFO.***

Components (not more than 5 components including project management)	LENS2 (US\$ Budget)	Other direct and parallel co-financing in kind GOL <i>(as applicable with source and in US\$)</i>	Total Subproject (US\$)
Component 1	380,000		380,000
Component 2	294,000		294,000
Component 3	78,000	30,000	78,000
Base cost	752,000	30,000	752,000
Contingency (5%)	38,500		38,500
Inflation (5%)	38,500		38,500
Total	829,000		829,000

22. Sustainability

Please explain how the benefits of the project will continue or be maintained once the sub-project is complete.

The subproject is designed to build capacity of NREI to cooperate the national environmental quality laboratory effectively so that NREI could provide environmental quality analysis services to other agencies, provinces, and/or private sector. In addition procurement of air/noise measuring equipment and training will help building MONRE capacity to monitor air/noise quality and ensure compliance with the national environmental quality standards. NERI is charging fees for the laboratory analysis and is working with MONRE and the Ministry of Finance to clearly allocate budget collected from the services for operation and maintenance of the laboratory services. This will enhance sustainability of the laboratory operation. Furthermore, sustainability is expected from the work with SMEs through the combination of awareness raising on national environmental regulations combined with practical capacity building on technical aspects and appropriate technologies.

23. Environment and Social Management Plan (ESMP)

Check if an Environmental and Social Management Plan (ESMP) needs to be prepared (see guidelines in the Environment and Social Management Framework (ESMF) to be obtained from EPF website).

The subproject will not create any negative social or environmental impacts. Activities will be related to procurement of equipment, technical assistance, meetings, training, and/or study visits that would strengthen NREI capacity to operate/provide environmental quality analysis.

No negative activities in ESMF list are funded under this subproject. NREI is not a regulator but service provider so their activities will not have impacts on general public.

24. Community Engagement including gender issues at community level

Check if compliance with the Community Engagement Framework (CEF) is needed and follow guidelines on steps to be obtained from EPF website.

Please check if CEF applies²

Not applicable. However, the subproject activities will promote active participation of the local communities when possible.

25. Gender issues (mainstreaming)

Please explain how the sub-project is compliant with GoL commitment to gender issues under the project.

A National Commission for the Advancement of Women (NCAW) was established in 2003 to drive national policy and to promote gender equality and empower women and a National Strategy on the Advancement of

² Please follow the procedures outlined in the CEF document and ensure that details related to sub-project CEF implementation including implementation arrangements, activities, indicators and budget are correctly included in the sub-project application sections (RF, budget, activities, M&E).

Women for 2011-2015 has been established. In fact most of **NREI** staff are women and **NREI** has high ratio of women/men at all level.

Equal opportunity and active involvement of **NREI** staff both men and women will be applied. It is expected that training and staffing opportunities included under this subproject will benefit a proportion of women (with an aim of 40%).**NREI** will monitor and report disaggregated data on men and women beneficiaries of the subproject. The project will aim at including SMEs managed by women, if applicable in the selection of capacity building pilots.

26. Agreed Annual Performance Triggers

For information find below the list of agreed targets that must be achieved to trigger approval of next year's funds:

Agreed triggers:

- Compliance with fiduciary and safeguard requirements (at least Moderately Satisfactory in year 1 and Satisfactory in subsequent years).
- Compliance with reporting requirement (number, quality and timeliness) (at least Moderately Satisfactory in year 1 and Satisfactory in subsequent years).
- Year 1, at least 50 % of activities in AWPB completed. Year 2 and after, at least 75 % of activities in AWPB completed.
- All outcome targets for current year are measured, evaluated and show progress toward target.
- AWPB produced for the new fiscal year cleared by WB and approved by EPF Board.

27. Document Checklist

Please ensure to attach the following based on templates (excel file) provided:

- Sub-project results framework (entire period)
- Sub-project detailed budget entire period (2a. per component and 2b. per category)
- Sub-project detailed activity work plan per component year 1
- Sub-project Environmental and Social Management Plan (ESMP) **if applicable**

Signature

Submitted by:

Date:

Approved by:

(Head/DG of SDA or equivalent)

Edits to a submitted application prior approval not requiring re-submission, accepted by SDA and EPF, are summarized below: *(Please list application form reference number (e.g. #20) or annexes and date of EPFO communication on accepted changes to SDA).*

ANNEX 1: Detail and Specification of Equipment to be purchased under sub-project

(1) Specification for High Volume Air Sample (Total Suspended Particulate-TSP)

- Electronic or programmable mass flow control
- Graphic LCD displays for pre-set flow Rate, instantaneous flow rate
- Volume of Air Sample, and Elapsed Sample Time with Password Protected
- Display & Programming
- Networking & Communication Capabilities
- Elapsed, Resettable, Electronic Timer
- Size selective, vertically symmetric inlet
- Continuous flow recorder (e.g., Dickson chart recorder)
- Cassette holder and cover for loading and transporting filters
- Electrical power supply rated at 220 V, 50HZ
- Applicable to US EPA's 40 CFR 50, App.

(2) PM-10 Flow-Set High Volume Air Samplers - Specification

- Air Intake Uniform, 58,000mm² nominal air intake
- Power Input: 240V, 50Hz, Single Phase
- Event Timer: 7 day, Programmable
- Hour Run Clock: 240V Synchronous
- Filter Support 230 x 280mm (removable) (2 off, one with transport cover supplied as standard)
- Automatic Flow Control and sampling PM-10 to 2.5
- Programmable Controller with Data Logging and Interface for Remote Control, Meteorological Instruments and Real Time Dust Monitors
- Comply with US EPA standard and requirement App.



(3) Ambient SO_x and NO_x Gas Emission Analyser –specification

- Digital measurement with wide range and high efficiency
- Compatible with US EPA standard
- Fully automatic and Continuously measurement with high storage capacity
- Auto calibration with communication port of RS 232 and can be downloaded with software
- Install in safe and strong containment for transportation and measurement in field
- Compact and easy to transport



(4) Wind Condition, Speed and Direction

- High performance wind measurement system with ultrasonic wind sensor technology
- System for use in any climate and wide range of measurement
- Ultrasonic sensor can be mounted upside down to eliminate measurement disruptions
- Proven accuracy and design - wind tunnel and field tested
- Powerful data logger to collect and store information and can be downloaded with software
- Continuous data collection
- Comply with US EPA standard and requirement App.



(5) *Noise*

- Class 1 integrating sound level meter
- An auto range function and Wide Measurement Range
- High Memory for data record and storage
- PC interface and Software Package included as standard
- Simultaneous measurement of all Parameters, Frequency Weightings and Time Weightings
- RS 232/USB interface • AC/DC signal output
- Live analysis when linked to a computer using supplied software
- Comply with US EPA standard and requirement App.

