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# NATIONAL IMPLEMENTATION PLAN FOR THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS IN LAO P.D.R



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Supported by: **United Nations Industrial Organization (UNIDO)  
Global Environment Facility (GEF)**



Vientiane, Lao PDR  
July, 2010

The National Implement Plan (NIP) on the implementation of the Stockholm Convention was prepared by a team of national consultants under the supervision of the Project Coordination Unit (PCU) on the “Enabling Activities for the Development of the National Implementation Plan of the Stockholm Convention on Persistent Organic Pollutants (POPs)”. This PCU was firstly under the Environment Research Institute of the Science Technology and Environment Agency (STEA), and now under the Cabinet of the Water Resources and Environment Administration (WREA), Prime Minister Office of Lao PDR.

The NIP was developed and published into Lao and English languages. The NIP provides information on the situation and management frameworks of POPs-pesticides being used for agricultural purposes, DDT for disease vector control, PCB dielectric fluid, and the formation and release from unintentionally produced POPs. The initial POPs inventory’s reports (the POPs-pesticides, the PCB and Unintentionally Produced POPs inventories being undertaken in September 2004 - May 2005, further sampling and analysis related to PCBs and Dioxin in January and March 2008 were also supported by the Japanese Trust Fund) provide fundamental information to the elaboration of the NIP.

In addition, comments, feedback and recommendations from various national workshops and meetings related to the environment sound chemicals management, such as the formulation of the National Strategy on Hazardous Chemicals and Substances up to the year 2020 including POPs in particular and the implementation of the Globally Harmonized System Project, has also been incorporated in this document. Furthermore, one international expert in the field of PCBs and another one on the Unintentionally Produced POPs were recruited to provide knowledge and experiences in sound management of POPs to Lao staff from concerned ministries, institutions, academic institutes, mass organizations, civil societies, and other key stakeholders. These international experts also assist Lao staff undertaking these above mentioned POPs inventories, and reviewing the national consultants’ reports.

The NIP was developed and published into Lao and English languages. The Global Environment Fund (GEF), the United Nations Industrial Development Organization (UNIDO), the World Bank, the Governments of Canada, Japan, Lao PDR and Switzerland, the United Nations Institute for Training and Research (UNITAR), the Switzerland Green Cross, and Hatfield Consultants have provided their technical and financial support to the development of this document.

## FOREWORD

In recognition of global concerns related to impacts of POPs (Persistent Organic Pollutants) on the environment and human health, the Government of Lao PDR is committed to join the global community to reduce, and where possible phase out, and eliminate the release of POPs throughout Laos. This commitment was clearly demonstrated by the Government's endorsement of the National Implementation Plan of the Stockholm Convention (NIP) in April 2009.

The NIP describes overall goals and specific targets designed to reduce concentrations of POPs in soil, water and air. It lays out pragmatic approaches towards POPs reduction that are coherent with the National Social-Economic Development Strategy (2020), Five Years Plans, Millennium Development Goals, the National Economic Growth and Poverty Eradication Strategy, the National Environment Strategy, and the Five Year Plan within the Water Resources and Environment Administration.

Actions related to implementing this important commitment will help Laos reduce levels of extreme poverty by the year 2020, and also provide incentives that contribute towards sustainable development. The NIP clearly reflects commitment by the Government of Lao PDR towards compliance with provisions of the Stockholm Convention. Together with Laotian citizens, and in partnership with the international community, the Government of Lao PDR will work to mitigate impacts of these chemicals to create a cleaner and safer environment for all.

I would like to take this opportunity to express my sincere gratitude to relevant Lao ministries and institutions, development donors and non-profit organizations, notably the Global Environment Fund (GEF), the United Nations Industrial Development Organization (UNIDO), the Governments of Canada, Japan, Sweden and Switzerland, the World Bank, the United Nations Institute for Training and Research (UNITAR), the Switzerland Green Cross, the Hatfield Consultants and others for their kind and effective support to the elaboration of our NIP.



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## ABBREVIATIONS AND ACRONYMS

<b>Abbreviation</b>	<b>Meaning</b>
ADB	Asian Development Bank
AFD	Agence Française du Développement
APCS	Air Pollution Control System
APIP	Agricultural Productivity Improvement Project
BAMS	Bureau of Agricultural Material Standard
BAT	Best Available Techniques
BEP	Best Environmental Practice
DDT	Dichlorodiphenyl trichloroethane
DDVP	Dichlorvos, sometimes called DDVP, is the common name of dimethyl 2,2dichlorovinyl phosphate
EDL	Electricité du Laos
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESM	Environmentally Sound Management
ETAP	Environmental Technical Advisory Programme
FAO	Food and Agricultural Organization
fat wt	Fat weight
g.TEQ	gram Toxic Equivalent
g.TEQ/a	gram Toxic Equivalent per annum
GDP	Gross Domestic Products
GEF	Global Environmental Facility
GIS	Geographic Information System
GPS	Geographic Positioning System
GSP	Generalized System of Preference
HPLC	High Performance Liquid Chromatography
IPM	Integrated Pest Management
IRWR	Internal Renewable Water Resources
JICA	Japan International Cooperation Agency
KWH	Kilo-Watt Hour
Lab	Laboratory
LDCs	Least Developed Countries
LFA	Logical Framework Approach
LPG	Liquefied Petroleum Gas
MAF	Ministry of Agriculture and Forestry
mg/ha	Milligram per hectare
MIC	Ministry of Industry and Commerce
MEM	Ministry of Energy and Mines
ml/ha	Milliliter per hectare
MoH	Ministry of Health
MoI	Ministry of Interior
MIC	Ministry of Information and Culture
MoJ	Ministry of Justice



MPWT	Ministry of Public Works and Transport
MWH	Mega Watt Hours
NCC	National Coordinating Committee
NCMP&E	National Center for Malaria Control, Parasitology and Entomology
NEAP	Second National Environmental Plan
ng/g	Nanogram per gram
NGO	Non-Governmental Organization
NGPES	National Growth and Poverty Eradication Strategy
NIP	National Implementation Plan
NPAs	National Protected Areas
NSDP	National Strategic Development Plan
PAHs	Polyaromatic Hydrocarbons
PCB or PCBs	Polychlorinated Biphenyl(s)
PCDD	Polychlorinated Dibenzo-para-dioxins
PCDF	Polychlorinated Dibenzofuran
PCU	Project Coordinating Unit
PEU	Provincial Electrical Utility
PIC	Prior Informed Consent (Rotterdam Convention)
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
ppm	part per million
PRL	Pesticide Residue Laboratory
PTS	Persistent Toxic Substances
RPE	Respiratory protective equipment
SARUP	Safe and Responsible Use of Pesticides
SC	Stockholm Convention
UCP	Uncontrolled Combustion Process
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNEP/GEF	United Nations Environment Programme/Global Environment Facility
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UXO	Unexploded Ordnance
WB	World Bank
Wet wt	wet weight
WHO	World Health Organization
WSS	Water Supply and Sanitation

## EXECUTIVE SUMMARY

In accordance with the main provisions of the Convention on Persistent Organic Pollutants, each country prohibits and/or takes legal and administrative actions required for elimination/ restriction of production and use of chemicals and releases thereof. For this purpose, parties are obliged to elaborate a National Implementation Plan for POPs and submit it to the Convention Secretariat within two years after coming into force of the Stockholm Convention. In addition, the Convention sets forth a number of obligations that the Parties shall or which they are encouraged to undertake, including designating a national focal point, fostering information exchange, providing technical assistance, promoting and facilitating public awareness and participation, consultation and education, stimulating research and monitoring, and reporting. At present, the Stockholm Convention has 170 parties to the Convention. It enters into force on May 17 2004; Lao PDR is a party state to the Stockholm Convention on Persistent Organic Pollutant (POPs); signed this Convention on 5 March 2002 and ratified on 28 June 2006. Bound by this Convention, Lao PDR affirmed its full commitment to cooperation with the international community for the reduction and elimination of POPs as regulated by the provisions of the convention based on the capacity of the country.

Proceeding from the above mentioned and conscious of the need to take measures at national level to prevent adverse effects caused by persistent organic pollutants in the Lao people's Democratic Republic, previously the Science Technology and Environment Agency (STEA), and actually the Water Resources and Environment Administration (WREA) in cooperation with United Nations Industrial Development Organization (UNIDO) and with the financial support from the Global Environmental Fund (GEF) had executed the project entitled "Enabling Activities to Facilitate Early Action on the Implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in the Lao People's Democratic Republic" – GF/LAO/02/016. Accordingly, the National Implement Plan has been prepared as an outcome of the said project. The NIP was approved by the Government of Lao PDR in April 2009.

Positioned at the center of the Indochinese peninsula, the Lao's People Democratic Republic – Lao PDR, also known as Laos, and formerly described as the country of Million Elephants, offers the characteristic to be without maritime façade. Surrounded by the People's Republic of China (505km) in the North, the Union of Myanmar (236 km) in the North West, the Kingdom of Thailand (1835 km) in the West, the Socialist Republic of Viet Nam (2,069km) in the East, and the Kingdom of Cambodia (435km) in the South, Laos presents itself as a succession of plateaus, leaned against the annamese chain, and progressively descending towards the mighty Mekong River.

The Lao PDR covers a total of 236,800 square kilometres, three-quarters of which is mountains and plateaus. The country has three distinct regions: the North, Center and the South. The country comprises 16 provinces and Vientiane Capital City. According to the national population census there is about 5,526,000 people, of which 2,575,000 females, 2,516,000 males 748,529 households, 15% of the total population lives in urban areas while 85% in rural areas. The country's annual per capita income in 1998 was \$US350 (Socio-Economic Development Strategy 2001). The human development index developed by the UNDP for the year 1998 gave Lao P.D.R a value of 0.465, placing it in

the “low human development” category. Lao P.D.R. ranked 138 among the 175 countries.

The Lao P.D.R.'s economy remains un-diversified and is heavily dependent on the country's natural resource base. The government has committed itself to introducing a market-oriented economy. This reform started in 1986. Gross Domestic Product (GDP) of the country consists of four sectors: agriculture, industry, services, and import duties. In 1998, the GDP of agriculture accounted for 52%, industry 21.75%, services 25.1%, and import duties 1% (Lao P.D.R., 2001 State of Environment).

Agriculture remains to be the principal economic sector in the Lao P.D.R. To date, the sector has made up 52 percent of Laos' Gross Domestic Product (GDP) (agriculture – 27%, animal husbandry – 19% and forestry – 6%). The forestry sector is one of the Government's main focuses at the present time. There are over 167,000ha of tree plantations. Slash-and-burn agriculture has basically been stopped all over the country since 2005. Forest resources are an important source of income, providing construction material, fuel wood, and other non-timber products in the Lao P.D.R.

Lao P.D.R is endowed with a wide range of minerals. Despite the government's commitment to develop the mining sector, there has been little investment in this sector to date. The majority of domestic mining companies are state-owned, but the mining sector was opened to foreign investment in the early 1990s. Difficult terrain and poorly developed infrastructure are the major constraints on growth of the mining industry. The manufacturing sector is characterized by small-scale processing and assembly plants predominantly concentrated in and around Vientiane.

Many rivers and streams crisscross Lao P.D.R. The Mekong River flows through 1,835 km of the country from north to south. The country's hydroelectric power generation potential is estimated to be about 12,300 MW excluding the Mekong mainstream, but it has barely been tapped.

The Science Technology and Environment Agency (STEA), formerly served as the National Focal Point for the Stockholm Convention, actually is the Water Resources and Environment Administration (WREA) with the assistance provided by the UNIDO/GEF, had prepared the National Implementation Plan for the Stockholm Convention on POPs, hereinafter called “NIP”.

The outline of the NIP document is divided into four main chapters: the Introduction (Chapter 1), The Country Baseline (Chapter 2), the National Action Plan (Chapter 3), the Proposed Priority Projects (Chapter 4) and Annexes to provide detailed information as needed.

Chapter 2 of the NIP document describes the country's baseline including socio-economic profile (geography, population, policy and economic profiles, profile of economic sectors, and environmental overview, mainly focusing on POPs), institutional, policy and regulatory frameworks related to chemicals management including POPs, and assessment of the POPs issues in the country. The POPs issues in the country are discussed as follows:

- the assessment of the status of POPs substances addressing in Annex A, B and C to the Stockholm Convention,
- the information on state of knowledge on stockpiles, contaminated sites, wastes, identification and quantity, relevant regulations, guidance, remediation measures, and data on releases from sites,
- the future trend of using and releasing of POPs,
- the existing programs for monitoring the releases and the impact on the environment and human health,
- the mechanism for information sharing within country and parties to the convention,
- the relevant activities of non-governmental stakeholders involve in participation with the management of chemicals including POPs,
- the technical infrastructure for POPs assessment, measurement, analysis, and research,
- the magnitude and scale of threats to the public health and the environment.

Chapter 3 of the NIP document is mainly focused on the strategy and action plan for implementation of the Stockholm Convention and setting up of goals, objectives, activities and tasks related to the sound management of POPs as well as responding to the issues addressed within the convention. Key problems associated with POPs issues in Lao PDR are also mentioned in this part. In order to solve POPs related issues in Lao PDR, a number of actions have been identified and such actions are then grouped into four main sections with the first three sections addressing the three main groups of POPs (POPs-pesticides, PCBs, and unintentionally produced POPs) and the last section describing the coordination activities for NIP implementation.

Based on the identified activities, Chapter 4 of the NIP has identified and proposed 34 projects profiles in order to carry out the implementation of the Stockholm Convention on POPs effectively. The proposed project profile documents are written in the same format of contents including project name, goal, objectives, activities, key responsible agency. Annexes are also enclosed to provide supporting information.

The development of the NIP document is primarily based on the comments and feedbacks from key government institutions involved in chemicals management in Lao PDR and from stakeholders who were invited to participate in various workshops related to chemicals management, e.g. National Hazardous Chemicals Inventory, National Hazardous Chemicals Strategy; POPs Inventory Reports, etc.... More importantly, a number of meetings among the key governmental institutions were also set up to identify the key problems of POPs related issues and find out proper measure for addressing these issues.

Pesticide inventory revealed that only three POPs pesticides were found in the local market and these were DDT, chlordane and heptachlor. Quantities of these pesticides reported in the inventory were 7.6 kg of chlordane and 0.25 kg of heptachlor. However, there are many other pesticides also available in the markets, which local people used to refer to as DDT. Moreover, the import and use of DDT has been banned in Laos since 1992. In terms of the management of pesticides, Laos has some regulation and law dealing with the general management of pesticides including the banned pesticides

and POPs pesticides. However, law implementation and enforcement are still limited due to a number of reasons. In conclusion, Laos still uses POPs pesticides (as sometimes unaware of) by local farmers for agricultural purpose, but in very small quantities. There is no specific waste management policy in Laos for obsolete POPs pesticides. Obsolete pesticides waste disposal in general has been specified in Article 34,35 and 38 of the Agriculture Law dated 10/10 1998. Inventory also revealed that around 36.54 tonnes of obsolete pesticides have been disposed of through dumping at different locations during 1993 and 1998.

Laos does not produce PCBs and dielectric fluids. Presence of PCBs and dielectric fluid in the country is through import of the electrical equipment and devices such as transformers, capacitors. Through the PCBs inventory, about 6,867 dielectric transformers were estimated to exist in Laos, among them about 5,332 transformers were recorded (including self-reporting) and 418 pieces of equipment had been inspected, recorded and oil samples were taken by the task team. Based on the records of 5,332 transformers, 5136 units are found to be in use, 45 units are standing-by for use, 86 units are awaiting repair, and 69 units are awaiting disposal.

In addition, it has been recorded that of those units, 4509 are PCB-free, 418 are assumed to contain PCBs, and 119 contain PCBs dielectric fluid. It has also been identified that the in-use transformers which are PCB-free, assumed to contain PCBs, and contain PCBs dielectric fluid consist of 5,232, 236, and 119 units respectively. For the same categories, 86 units are waiting as standby for use. Related to the management of PCBs, Laos does not yet have any specific law/regulation for the management of PCBs or for equipment contaminated with PCBs, whether in the form of products or wastes.

Inventory report has also identified the problem of stockpiling of transformers waiting for repair and or disposal. Inventory also identified sites contaminated with PCBs through spillage or leakage from electrical equipments and devices. Another issue inventory has highlighted is the improper storage and disposal facilities and as result the used dielectric fluid is sold for local needs/use as secondary fuel. Some challenges that were identified during the inventory process include: lack of awareness and capacity on PCBs risks; poor management of all type of transformers: common practice of retro-filling of dielectric fluid; use of old transformers (over 20 years in age); improper disposal of equipment including those contaminated with PCBs; staff working at PCBs contaminated sites have no personal protective equipment; contaminated sites can be easily and freely accessed by the public; and lack of treatment and storage facilities for PCBs dielectric and PCBs contaminated materials.

The goal of the dioxins/furans inventory was to identify and quantify dioxin and furan releases from industrial and other sources, including historical applications of Agent Orange herbicide during the Vietnam War along the Ho Chi Minh Trail, and to assess the potential negative impacts on the environment and public health. The inventory was also designed to provide baseline data on dioxin/furans levels. To collect primary data, field visits were undertaken to a number of factories and government agencies in Vientiane Capital City and Province, including textile, paper, and steel factories; a medical waste incinerator at Sethathirath Hospital; the UXO Lao office; and Vientiane Cleaning office. Field visits were also carried out to selected provinces in

southern Lao P.D.R, which are the main industrial areas of the country (Bolikhamxay, Khammouane, Savannakhet and Champassak). Field surveys at the hot spots in Agent Orange herbicide sprayed area along the former Ho Chi Minh Trail was also undertaken. Based on the inventory completed for each main source category and sub-category of PCDDs/PCDFs, it was estimated that a total of 102.2 g TEQ/a released to all environment compartments. Uncontrolled combustion processes accounted for the majority of PCDDs/PCDFs, with 90.7 g TEQ/a or 90% of the total annual releases. This was followed by power generation and heating (5.5 g TEQ/a), and miscellaneous sources at 2.2 g TEQ/a. Historical Agent Orange herbicide spray data (1965-1971), provided by the US Government (via UXO Laos), were analyzed and plotted on maps prior to conducting field investigations. Soil, sediment and fish samples were collected at 12 different sites (N=21 samples collected) to assess the current levels of dioxins and furans in these media.

Overall dioxin levels recorded in soils, sediment and fish tissue samples were low, with 2 exceptions. Samples ranged in concentration from non-detectable (ND) to 37.8 pg/g. The highest values were obtained from the former Javan army base in Dakcheung District, Sekong Province, which had been used by the French and US, as well as by the Laotian and Vietnamese militaries at different time periods. According to veterans who were at the base during wartime, Agent Orange barrels were found at this site, although the exact location remains unclear. The recorded values of 37.8 pg/g and 31.5 pg/g at this site were obtained from a very short sampling program. It is likely that this site has much higher contamination, and should be investigated further, given the presence of two villages (Dak Laan and Dak Sieng) in close proximity to the former base. Elevated dioxin levels in spray plane crash sites (especially in Savannakhet, Saravane and Sekong) may have health implications for villagers retrieving metal scrap and for Lao/US missing in action (MIA) recovery teams working at these sites.

In the Lao P.D.R, unintentionally produced dioxins/furans releases generally are not managed in an environmentally sound manner, and legislation specifically targeting the management of dioxins/furans does not exist, except for some related statutory instruments such as the *Law on Environmental Protection* and relevant *National Resources Management Laws*. Lao P.D.R, presently does not possess data/information dealing with threats to health and the environment caused by unintentionally produced dioxins/furans releases. There is an urgent need to improve the capacity of Lao PDR technical staff in environmental management and monitoring, particularly related to POPs and other hazardous chemicals. The potential health effects from POPs are of concern to the rural poor, who rely on the natural resource base of the country for their survival, and are also the most susceptible group to the contamination.

The existing acts/laws and regulations are not enough to address overall chemical management including import and its use. Barriers at policy and institutional level including social and financial barriers might hinder the effective implementation. The Government of Lao PDR has prioritized the issue of chemicals management including POPs. The approval of this National Implementation Plan (NIP) confirms commitment of the Government of Lao PDR to implement the provisions set under the Stockholm Convention. This National Implementation Plan would play a very important role as a national policy for POPs management and planning guidance for all the relevant



stakeholders to implement all actions contained in the document. This national plan shows also an initial direction for all agencies concerned with POPs management in Lao PDR to implement and update their activities for achieving the long term goal to reduce, and where possible, eliminate POPs in the country.

This NIP was developed at a very appropriate time, in the beginning of the Third Five-Year National Socio-Economic Development Plan (NSED) of the Government of Lao PDR, set for the years 2006 – 2010 and 2011-2015. The NIP presents very specifically the various action plans and the policy response developed by the Government of Lao PDR to address and solve POPs problems. This NIP is the first national plan initiated for a four-year implementation (2010-2014). Therefore, the NIP supports the governmental policy framework and Lao PDR's millennium development goals in the following areas:

1. Improvement of public health,
2. Prevention of toxic chemical releases into the environment, and
3. Reduction of poverty through reducing cost of health services.

Moreover, the NIP would provide a good opportunity for the involvement of stakeholder representatives in consultation, support, and direct implementation. In addition, some action plans in this NIP may be integrated into the existing activities of the stakeholders' initiation.

### **Priority issues related to POPs**

Based on the result of identification and specific assessment of POPs related issues, the following are the main areas of concern:

- Institutional and regulatory framework;
- Public health and environment;
- Socio-economic aspects;
- Data and information framework;
- Human resources development; and
- Public awareness.

Identification and development of priority issues for the management of Persistent Organic Pollutants (POPs) in Lao PDR are built upon the participation of relevant institutions and stakeholders. Priority problem areas are:

1. POPs pesticides,
2. PCBs,
3. Unintentionally produced POPs,
4. POPs Management, including strengthening of coordination at the national level,
5. Awareness building, and
6. Information dissemination.

The result of priority setting of POPs related problems in Lao PDR has been used to provide basic input for the development of a national implementation plan and is summarized as follows:

### ***National Prioritized Problems of POPs Pesticides***

1. The existing regulation has limited provision for complete management of pesticides used in agriculture and households, including the storage and disposal;
2. Lack of pesticide evaluation capacity and facilities for legislative enforcement;
3. Lack of qualified relevant staffs in monitoring and assessing the effective storage, disposal and management of pesticides, including POPs;
4. Inadequate laboratory facilities for testing and analyzing pesticides, including POPs;
5. Lack of awareness and knowledge on safe and responsible use of POPs pesticides among workers in formulating units, retailers and users;
6. Lack of awareness and knowledge about the hazards associated with POPs pesticides;
7. Limited knowledge and insufficient monitoring of POPs pesticide residues in the environment, agricultural produce and human beings;
8. Lack of data records and a national database management system for management of pesticides especially POPs;
9. Lack of information exchange network and technology transfer;
10. Lack of pesticide disposal policy and disposal facilities.

### ***National Prioritized Problems of PCBs***

1. Lack of both human resources and technical facilities to effectively manage and phase out PCBs;
2. Lack of specific laws and regulations on PCB management, including the use, storage and disposal of PCBs;
3. Lack of appropriate laboratory capacity;
4. Improper management of used and obsolete transformers and dielectric capacitors;
5. Lack of safety precaution and protection measures for handling PCB contaminated equipment and contaminated sites including workshops, warehouses, etc.;
6. Lack of awareness on PCBs hazards at all levels;
7. Lack of awareness on the technical safeguard and hazard of PCBs amongst employees and workers;
8. Lack of data records and database management system on PCBs; and
9. Lack of national as well as international mechanism for information exchange and technological transfer.

### ***National Prioritized Problems of Unintentionally Produced-POPs***

1. Lack of technical expertise and technical guidelines for unintentional POPs by-products management;
2. Uncontrolled burning (waste at municipality and rural landfills, etc.);
3. Insufficient regulation related to by-product management and enforcement;
4. Lack of detailed information available on Agent Orange used in Lao PDR, including areas sprayed, former military installations where herbicides were stored, and spray plane crash sites;
5. Lack of awareness of potential dioxin generation sources, including open burning, factories, incinerators, clearing of land/forest fire;



6. Lack of public awareness on hazards of dioxins, and potential impacts to human health;
7. No Public awareness on unintentional POPs by-products, generation and hazard;
8. No control measures for reducing the release of by-products from all sources;
9. No waste separation policy in practice (by interest groups like scavengers);
10. No data records regarding the incidents from unintentional POPs by-products, and poor database management system and information exchange mechanism among the governmental agencies and stakeholders; and
11. Lack of laboratory and equipment facilities for monitoring and analyzing POPs.

***National Prioritized Problems of awareness raising / information dissemination -POPs***

1. Low awareness on POPs issues (technical and policy) among policy makers and general public;
2. Lack of data records, network and communication system on both national and international levels regarding the POPs information exchange;
3. Lack of resources for promoting awareness on POPs at all levels of society;
4. Lack of awareness and education programs for management, employees and workers responsible for and exposed to PCBs;
5. Insufficient education and information dissemination on safe and responsible use of pesticides;
6. Lack of technical training on the hazards of unintentional POPs by-products;
7. Lack of comprehensive unintentional POPs by-products information disseminated through mass media; and
8. Lack of programs to promote public awareness on reduction of unintentionally produced POPs, including by-products released at source.

Due to recent reorganization, the Water Resource and Environment Administration (WREA) serves as the POPs National Focal Point and Coordinator would be the main institution in coordinating the effective implementation of the NIP. The national strategy of the government to implement the action plan must have an improved institutional and structural mechanism for better coordination, improved information exchange/sharing through a participatory approach, skilled/trained human resources and a sustainable financial support. In parallel with the above national strategy for implementation of the NIP and in order to successfully implement the Stockholm Convention, the Government of Lao PDR has also developed a direct implementation strategy. This strategy has been set under the Stockholm Convention including: Identifying, Assessment and Mitigation of the Stockpiles, Articles in Use and Waste Consisting of/Containing and/or Contaminated with POPs; and Improvement of POPs Information Exchange.

**ACTION PLANS**

To achieve the objectives of the NIP, detailed action plans related to the management and safe disposal of the 12 POPs chemicals have been divided into three main sections according to the group of POPs chemicals. At the same time, in order to facilitate successful implementation of the NIP and the ensuring smooth processing of the administrative management system, coordination for implementation of NIP is considered as a part of the action plan. Detailed action plans are, therefore, divided into

the following four main sections in this NIP:

- Management of POPs pesticides,
- Management of PCBs,
- Management of unintentionally produced POPs, and
- Coordination and management of the NIP implementation.

Objectives of each section are aimed at fundamental and urgent national capacity building for POPs management, reduction, and elimination actions in the government institutions, non-governmental organization.

The most important part of this document is the project profiles which are designed to specifically identify national needs and assistance in order to comply with provisions under the SC and bring about sustainable future. Priority Projects are as below.

## List of Priority Projects

Project	Project Title	Duration (months)	Estimated Cost (USD)	Remark
<b>A: Project Profiles for Reduction and Elimination of POPs Pesticides</b>				
A1	Assessment of existing laws and other technical standards for amendment, and promotion of effective law enforcement;	24	250,000	
A2	Strengthening capacity of relevant institutions to prevent the import, trafficking and use of illegal pesticides	24	150,000	
A3	Strengthening capacity in analysis of pesticides focusing on POPs	18	500,000	
A4	Raising public awareness on pesticides issues, including POPs pesticides and other obsolete pesticides	24	150,000	
A5	Raising awareness of policy and decision-makers on pesticides issues, including obsolete pesticides and POPs pesticides	12	55,000	
A6	Comprehensive inventory on obsolete pesticides including POPs pesticides	24	350,000	
A7	Monitoring process on the trafficking of illegal pesticides, including POPs pesticides	24	350,000	
A8	Collection campaign for temporary storage of obsolete pesticides, including POPs pesticides, in regional storage depots prior to disposal	18	500,000	
A9	Environmentally Sound Management of Obsolete Pesticides including Pops Pesticides through safe disposal	36	-	Pending Inventory Outcome
<b>B: Project Profiles for the Management of PCBs</b>				
B1	Develop legal instruments or technical guidelines for managing PCBs	24	250,000	
B2	Comprehensive inventory of equipment and accessories containing and contaminated with PCBs	24	250,000	
B3	Environmentally Sound Management for “In Use” Equipment	18	250,000	
B4	Assessment of socio-economic aspects for phasing out of electrical equipment and accessories that contain or are contaminated with PCBs	24	200,000	
B5	ESM compliance of the maintenance and repair of electrical equipment	18	300,000	
B6	Strengthening laboratory capacity for PCBs analysis	24	250,000	
B7	Environmentally Sound Management of “out of use” equipment	24	350,000	
B8	Capacity Building and Public Awareness on PCBs issue	24	200,000	
B9	Establishment of PCBs database management	24	180,000	

Project	Project Title	Duration (months)	Estimated Cost (USD)	Remark
<b>C: Project Profiles for Management of Unintentionally Produced POPs</b>				
C1	Legislation related to sound management of unintentionally produced POPs	36	300,000	
C2	Research on Health Risk Management of Unintentionally POPs Specifically on the Dioxin/Furan from Agent Orange and Industrial sectors and waste incinerators plants.	24	400,000	
C3	Institutional strengthening and capacity building for Environmentally Sound Management of unintentionally produced POPs	36	450,000	
C4	Public awareness raising on unintentionally produced POPs	24	300,000	
C5	Promotion of sound waste management practices	24	400,000	
C6	Promotion of controlled landfills and prevention of uncontrolled burning of waste	24	350,000	
C7	Introduction and promotion of BAT & BEP in existing waste incineration plants	24	200,000	
C8	Application of BAT & BEP for unintentionally produced POPs operational release sources	30	500,000	
C9	Promotion of the use of BAT/BEP in the SMEs	36	1,000,000	
C10	Improvement in medical waste management practices	24	300,000	
C11	Inventory of Unintentionally Produced POPs releases	24	400,000	Excluded Dioxin/Furan Inventory cost
C12	Inventory of Dioxin and Furan Hot Spots, Raising Public Awareness to Protect Public from Exposure and Prioritisation of Contaminated Sites	30	2,000,000	
<b>D: Project Profiles for the Coordination of NIP Implementation</b>				
D1	Strengthening Capacity of POPs National Coordinating Unit for continuing the NIP coordination and implementation	48	900,000	
D2	Establishment of Centralized National Chemicals Database including POPs for Effective Exchange of Information	24	1,000,000	
D3	Chemical Management Law	30	400,000	
D4	Capacity Building of targeted academic institutions on the delivery of Chemical Engineering Course	40	150,000	
<b>Grand Total</b>			<b>13,585,000</b>	

# *Chapter 1*



# CHAPTER 1

## INTRODUCTION

### 1.1 INTRODUCTION

In May 2001, the *UN Stockholm Convention on Persistent Organic Pollutants-POPs* (later on referred to as the Stockholm Convention) was adopted. Signatories to this convention are obliged to adopt measures to eliminate sources of releases of the twelve chemicals belonging to the group of persistent organic compounds (aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorbenzene, mirex, toxaphene, PCBs, DDT, PCDD, and PCDF). Besides the listed chemicals, these measures will, in relevant cases, also concern polyaromatic hydrocarbons (PAHs). These measures shall include restriction of their direct production, gradual phasing out of POPs containing equipment, prevention of unintended POPs production generated by the identified industrial activities, and raising information and awareness among government institutions as well as public with regard to POPs issues. For this purpose, parties are requested to elaborate a National Implementation Plan for POPs and submit it to the Convention Secretariat within two years after coming into force of the Stockholm Convention.

#### **Stockholm Convention, its aims and obligations**

The overall objective of the Stockholm Convention is to protect human health and the environment from POPs. It makes specific reference to the precautionary principle as set forth in Principle 15 of the Rio Declaration on Environment and Development. The Stockholm Convention provides subscribing Parties with basic objectives, principles and elements to be used in developing comprehensive programs and control regimes with respect to POPs. It is structured to address POPs that are a) *intentionally produced*, such as pesticides and PCBs, and b) *produced and released unintentionally* as a result of human activities, including dioxins, furans, PCBs, and HCB. The nine chemicals currently listed in **Annex A** of the Convention are subject to a ban on production and use except where there are generic or specific exemptions. In addition, production and use of DDT, a pesticide still used in many developing countries for malaria and other diseases vector control, is severely restricted, as set forth in **Annex B** of the Convention. Import and export of the ten intentionally produced POPs is allowed only for the purpose of environmentally sound disposal under restricted conditions.

Special provisions are included in the Stockholm Convention for those Parties with regulatory assessment schemes to review existing chemicals for POPs characteristics and to take regulatory measures with the aim of preventing the development, production and marketing of new substances with POPs characteristics. Releases of unintentionally produced by-products listed in **Annex C** are subject to continuous minimization with, as objective, the ultimate elimination where feasible. The most stringent control provision with regard to by-products is that Parties shall promote and, in accordance with their action plans, require the use of Best Available Techniques (BAT) for new sources within major source categories.

The Convention also foresees identification and safe management of stockpiles containing or consisting of POPs. Waste containing, consisting of or contaminated with POPs should be disposed of in such a way that the POP content is destroyed or irreversibly transformed so that it does not exhibit POPs characteristics. Where this does not represent the environmentally preferable option or where the POPs content is low, waste shall be otherwise disposed of in an environmentally sound manner. Disposal operations that may lead to recovery or re-use of POPs are explicitly prohibited. With regard to shipment of wastes, relevant international rules, standards and guidelines, such as stipulated in the Basel Convention, are to be taken into account.

In accordance with the main provisions of the Convention on POPs, each country prohibits and/or takes legal and administrative actions required for elimination/ restriction of production and use of chemicals and releases thereof. POPs present themselves as organic compounds, which possess various degree of stability to photolysis, biological and chemical degradation. These substances are semi-volatile; this latter allows their long- distance transport through air flow to all parts of the globe, even to remote areas thousands of kilometers from the nearest POPs source.

POPs are frequently halogenated: they are poorly water-soluble and easily dissolved under the effect of lipids. Many of these substances were used and large quantities thereof are still applied all over the world and due to their stability in the environment, POPs possess the ability for bioaccumulation in adipose tissues and biomagnifications. Certain POPs can persist in the environment for years. In this connection, the level of bioaccumulation increases 70 thousand times. As a result of biomagnifications, organisms of the upper trophic level organisms are subject to a more intense POPs impact. POPs are able to cumulate in upper links of trophic chain, promoting penetration into human organisms and exerting unfavourable actions to health. Scientists have confirmed the real threat for human and environmental health posed by persistent organic pollutants. Certain POPs can become the cause of oncology states incidence, to affect reproductive and immune systems in several human generations.

The Convention requires Parties to develop implementation plans to indicate how they will meet their obligations under the Convention. The implementation plans are to be transmitted to the Conference of the Parties within two years of the Convention entering into force. In addition, the Convention sets forth a number of obligations that the Parties shall or which they are encouraged to undertake, including designating a national focal point, fostering information exchange, providing technical assistance, promoting and facilitating public awareness and participation, consultation and education, stimulating research and monitoring, and reporting

At present, the Stockholm Convention has 169 parties to the Convention as of July 2010. Lao PDR signed the Stockholm Convention on Persistent Organic Pollutant (POPs) on 5<sup>th</sup> March 2002 and ratified on 28<sup>th</sup> June 2006. Bound by this Convention, Lao PDR affirmed its full commitment to cooperate with the international community for the reduction and elimination of POPs as regulated by the provisions of the Convention based on the capacity of the country.



## 1.2. NATIONAL IMPLEMENTATION PLAN (NIP)

The goal of the NIP is to provide a framework and management options and measures in order to meet the obligations taken by Lao PDR by joining the Stockholm Convention and to reach national objectives including priorities related to POPs. The Water Resources and Environment Administration (WREA), under the Prime Minister Office has the main responsibility for developing the NIP as the state authority responsible for compliance and enforcement of national legal requirements and international obligations related to management of toxic and hazardous products and substances.

The National Implementation Plan was prepared by a multi-disciplinary group of national experts. From the very beginning, the NIP development was approached as a process with active participation of all key stakeholders and based on the shared responsibility of the governmental bodies at the national level, local communities, consumer groups, the private sector, scientific community, mass organizations, civil societies, etc.

A preliminary national inventory of POPs was undertaken in order to provide primary quantitative and qualitative information for initiating development of an Action Plan. Gathered data allowed for setting priorities and determining the national objectives in the field of POPs minimization and elimination, a process in which national stakeholders were largely involved. On the basis of the discussion and agreed priorities and objectives, the National Implementation Plan has been formulated covering different areas of POPs.

Technical-oriented teams were set out, to tackle specific issues related, for example, to persistent organic pesticides or PCBs or Dioxin/Furan monitoring and research. While undertaking the activities, the Project Coordinating Unit and Experts Groups worked closely with relevant counterparts of the concerned governmental, private sector and local community. Workshops were organized that brought together senior representatives of all of these sectors to share views on national strategies and options for eliminating POPs.

At the same time, the NIP is consistent with the National Socio-Economic Development Strategy up the year 2020 and Plan for the years 2006-2010 and 2011-2015, as well as the National Economic Growth and Poverty Eradication Strategy. It also contributes to the realization of the National Environment Strategy up to the year 2020 and Action Plan for the years 2006-2010 and 2011-2015. In the context of the NIP, poverty and environment are related through a complex web of relationships. Environmental conditions have major effects on the health, opportunity, and security of poor people, involved in or directly depends on agriculture activities, which makes them susceptible to impacts from obsolete pesticides.

Contamination of agriculture land and foodstuffs with POPs pesticides residues compromises the future options for developing organic agriculture and undermines the export potential of agriculture products. Therefore, the sound management of POPs has not been treated as an exclusively environmental issue. One of the major themes of the NIP is that improving environmental conditions by mitigating POPs-related problems can help to stimulate economic growth and reduce poverty. Links between environmental



management and poverty reduction provide the rationale for systematic mainstreaming this nexus in the NIP priority activities.

To carry out the above goals/aims of the Stockholm Convention effectively, particularly for the protection of human health and the environment from negative impacts of POPs, each member state to the convention shall consider and undertake the following activities:

- Strengthen institutional capacity for POPs managing and monitoring;
- Promote of education and dissemination of POPs issues to the public and stakeholders;
- Develop/amend legal and policy frameworks related to POPs environment sound management, and provide incentives for law enforcement;
- Develop a national action plan for the reduction and, where possible, the elimination of POPs and effectively implement such legal instruments; and
- Strengthen mechanisms for information exchange and research.

Responding to this commitment and as assigned by the Government of Lao PDR, the Water Resources and Environment Administration, serving as the National Focal Point and Coordinator for the Stockholm Convention and with the assistance provided by the UNIDO/GEF, has prepared the First National Implementation Plan for the Stockholm Convention on POPs, and hereinafter called “NIP”.

This NIP is divided into 4 Chapters: (i) Introduction, (ii) the Country Baseline, (iii) the Implementation Strategy and Action Plan, and (iv) Proposed Priority Projects.

Chapter 1 provides introduction, the Stockholm Convention, its aims and obligation and the NIP structure. Chapter 2 of the NIP document describes the country's baseline including socio-economic profile (geography, population, policy and economic profiles, profile of economic sectors, and environmental overview, mainly focusing on POPs), institutional, policy and regulatory frameworks related to chemicals management including POPs, and assessment of the POPs issues in the country. The assessment of the POPs issues in the country is discussed as follows:

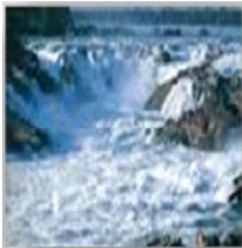
- The assessment of the status of POPs substances addressing in Annex A, B and C to the Stockholm Convention;
- The information on state of knowledge on stockpiles, contaminated sites, wastes, identification and quantity, relevant regulations, guidance, remediation measures, and data on releases from sites;
- The future trend of using and releasing of POPs;
- The existing programs for monitoring releases and the impact on the environment and human health;
- The mechanism for information sharing within country and parties to the convention;
- The relevant activities of non-governmental stakeholders involved in the participation with the management of chemicals including POPs;
- The technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, management and research; and
- The magnitude and scale of threats to the public health and the environment.

Chapter 3 of the NIP document is mainly focused on the strategy and action plan for the implementation of the Stockholm Convention and setting up of goals, objectives, activities and tasks related to the sound management of POPs as well as responding to the issues addressed within the Convention. Key problems associated with POPs issues in Lao PDR are also mentioned in this part. In order to solve POPs related issues in Lao PDR, a number of actions have been identified and such actions are then grouped into four main sections which the first three sections addressing the three main groups of POPs (POPs-pesticides, PCBs, and unintentionally produced POPs) and the last section describes the coordination activities for NIP implementation.

Based on the identified activities, there are 34 proposed projects profiles elaborated in order to carry out the implementation of the Stockholm Convention on POPs effectively. The proposed project profile documents in Chapter 4 are written in the same format of contents including project name, goal, objectives, activities, key responsible agencies, etc. In addition to these four main chapters, annexes are also enclosed to provide supporting information.

The development of the NIP document is primarily based on the comments and feedback from key government institutions involved in chemicals management in Lao PDR and from stakeholders who were invited to participate in various workshops related to hazardous chemicals and substances, i.e. consultation on Preliminary National Hazardous Chemicals Inventory Report, National Hazardous Chemicals and Substance Strategy, the Globally Harmonized System, specific assessment of POPs, priority setting and national objectives determination, etc. More importantly, a number of meetings among key governmental institutions were also set up to identify key problems of POPs related issues and possible measures for addressing such problems.

# Chapter 2



## CHAPTER 2 COUNTRY BASELINE

### 2.1 COUNTRY PROFILE

#### 2.1.1 Geography and Population

Positioned at the center of the Indochinese peninsula, the Lao's People Democratic Republic – Lao PDR, also known as Laos, and formerly described as the country of Million Elephants, offers the characteristic to be without maritime façade. Surrounded by the People's Republic of China (505km) in the North, the Union of Myanmar (236 km) in the North West, the Kingdom of Thailand (1835 km) in the West, the Socialist Republic of Viet Nam (2,069km) in the East, and the Kingdom of Cambodia (435km) in the South, Laos presents itself as a succession of plateaus, leaned against the annamese chain, and progressively descending towards the mighty Mekong River.

The Lao PDR possesses a land area of 236,800 square kilometers, stretching more than 1,700 km from North to South, and between 100 km to 400 km from East to West. Around 80% of the country total area is mountainous. It is endowed by abundant natural resources. Forest cover currently stands at forty five percent of the country area. It retains considerable mineral resources, and a large volume of internal renewable water resources. The Mekong River flows through 1,865 km of Lao PDR territory and forms the major portion of the border with Thailand (1,835 km). 60% of the water entering this mighty river system originates in Lao PDR.

The country is divided into three geographical zones: the Northern, the Central, and the Southern regions. It is administratively composed of 17 provinces, consisting of a number of 142 districts, among them 72 have been identified as poor districts, and 46 have been selected to be the poorest and need to be paid special attention.

The Lao population is actually accounted to around six million<sup>1</sup>, with a population density of 25 per km<sup>2</sup>. It consists of 49 Ethno linguistic groups, according to preliminary



<sup>1</sup> The National Statistic Organization of the Ministry of Planning and Investment, Vientiane, Lao PDR, 2010

figures given to Symposium on the name of ethnic group on August 13-14/2000. The majority of Lao population (85%) is farmers, which underlines the continued importance of the sector in terms of living standards, poverty alleviation, and effective conservation of renewable natural resources. Around 25 percent of the total Lao population is affected by Unexploded Ordnances being severely bombed during the 60ths and 70ths.

### **2.1.2 Political and Economic Profile**

Since the liberation of the country in 1975, the Government of Lao PDR has aimed to heal the wounds of war and steadily improve people's living conditions. In 1986 the Government adopted the New Economic Mechanism, moving economic activity away from a Central Command system towards a market-based approach, allowing the private sector an active role in socio-economic development. Since then there has been considerable progress, with steady improvements in key social and economic indicators.

The Lao PDR's longer term development goals are to exit the group of Least Developed Countries – LDCs by the year of 2020. This will be achieved through:

- Moving consistently towards a market-oriented economy
- Building up essential infrastructure
- Improving the well-being of the people by providing greater food security, extending social services and conserving the environment while enhancing the spiritual and cultural life of the country's multi-ethnic population.

Moreover, the Government long term vision is to achieve balance between the three regions (North, Center and South) and among provinces within the regions, building upon the natural and human resources in each area. The Government aims to address the disparities among and within regions through mobilizing funds for each region and to follow-up on these. The potentials of each region in areas, such as agriculture, forestry, hydropower, mining and tourism will be utilized in building the regions equitably and boosting economic growth. The Government will continue investing in building socio-economic infrastructure, expanding the expansion of goods, providing facilities for health and education for the people and reducing poverty.

Exiting the status of LDC requires eradicating poverty in a sustainable manner. In October 2003 the Lao National Assembly mandated the Government to implement the National Growth and Poverty Eradication Strategy – NGPES, which becomes central to the National Development agenda and reflects the Government's policy and strategy framework to achieve the country's 2020 goal. The NGPES is a comprehensive framework for sustainable growth and development and has a particular focus on the improvement of the poverty situation in the poorest districts.

Among its several priorities, the NGPES articulates “Environment and natural resources management are a high priority, for they are integral to poverty eradication. Accordingly, close attention is given to conserving the rich biodiversity of the land. In addition, close attention is given to community-based forest management, upgrading deteriorated ecological areas, countering industrial pollution and other concerns.”



### **2.1.3 Profile of Economic Sectors**

#### **2.1.3.1 Agriculture**

During the past years, the Government, line ministries, sectoral and local authorities of the Lao PDR have concentrated on the development of agricultural production, following the direction set, i.e. orienting the agriculture sector from subsistence and semi-subsistence to commercial production to ensure the enhanced supply of raw materials to processing industries, meeting the growing domestic requirements for agricultural products has been restructured positively with increasing economic effectiveness. This therefore allowed a stable growth in the production of agriculture, forestry and fisheries, albeit under constrained development conditions. In addition organic farming has been strongly promoted and developed. Over the last years, the value of production in the agriculture sector has increased on average by 3.4 percent per year.

The move to commercial production is growing strongly in the high-potential areas. Prominent among these are the emphasis on the cultivation of rubber in Luang Namtha Provinces; cashew nuts in Oudomxay and Phongsaly Provinces; corn, vegetables and fruit trees in Vientiane Province and Vientiane Capital; seeded-trees for oil extraction and sugarcane in Savannakhet Province; and rice in Vientiane Province.

Emphasis is placed on research and the adoption of high-yield/high productivity crops and livestock. Currently, several new varieties have been introduced, such as rice, maize, vegetables, beans, coffee, tobacco, tea, fruit trees and a number of domestic animals. The livestock and fisheries sectors are developing quite rapidly mainly due to the industrial farming systems applied in many localities and because of increased market opportunities and reductions in marketing costs.

Forest conservation and development are given increased attention line ministries and local authorities compared to the previous plans. The forestation movement by the people has regained momentum, especially in the central provinces, such as Vientiane, Bolikhamxay, Khammouane and Savannakhet Provinces. More specifically, many areas have combined forestation with the development of high commercial value industrial trees, such as teak in Luang Prabang, Sayaboury, Vientiane, Bokeo, Champassak, Bolikhamxay and Attapeu Provinces, and rubber in the provinces of Luang Namtha, Khammouane, Champasak, Saravane, Sekong, Attapeu, Bokeo and Oudomxay.

#### **2.1.3.2 Tourism**

The Lao PDR is one of countries most enriched in natural environments, a wide variety of culture, historical and ancient archaeological sites. This mix of conditions makes the country attractive to tourists. The Government considers tourism as one of its eight priority development programmes and has therefore set guiding policies for the development of this industry.

During the past years the global trading system has been altered dramatically and this meant changes occur in Laos too. Business units have been restructured to effectively work under the guidelines of the Government and to operate in compliance with the rules on goods production. Thanks to this, import-export management measures

were better enforced, the foreign trade deficit rate has been reduced while exports have been promoted and have increased each year. In 1990-1991 the value of imports reached USD 249.18 million while the exports were worth USD 137 million. In 2000-2001 the import value reached USD 528.27 million whereas the exports were worth USD 324.88 million.

Steps and obstacles in business operations have gradually been removed and companies that run import-export businesses are encouraged to produce goods. Strategic and daily life goods are being appropriately monitored, controlled and managed. The Government has worked, in cooperation with concerned sectors and local authorities, in setting up goods production projects. Thus the production of some types of goods has been protected, and measures for countering and preventing out-system trading being set up.

These include widening economic and cultural relations and cooperation with foreign countries, promoting the tourism industry with the aim of gradually improving the living conditions of all Lao people, promoting domestic production in all fields, upholding the distinctive arts and culture of the Lao PDR, disseminating the customs, traditions and brave history of the Lao people, preserving historical and ancient archaeological sites and antiquities as tourist attractions, creating jobs, generating and distributing income for people of all Lao people; and setting up friendly relations with all countries in compliance with the policy of the Government on tourism promotion.

In addition, the Government has widened the policy on tourism, particularly creating favorable conditions for entering and leaving the country, allowing the issuance of visas at Lao Embassies and Consulates abroad and international border checkpoints. Thus, the number of tourists visiting the country has been rapidly increasing.

### **2.1.3.3 Industry and Handicrafts Sectors**

Industrial production has grown at a quite rapid rate, with the sector-wide average growth 11.3 percent per year, exceeding the Plan target of 10-11 percent. The mining industry increased by 33.87 percent; food processing 9.17 percent; tobacco 20.75 percent; textiles 20.11 percent; garments 11.15 percent; footwear 7.57 percent; and wood processing 1.17 percent. The sectors receiving foreign investment have achieved an impressively rapid growth rate, followed by the non-state sector, with the domestic private sector growing slowly.

Most of the industrial products have reached higher growth rates compared to 2000, including coal, salt, beer, soft drinks, tobacco, animal feed, soap, leather shoes, pharmaceutical drugs, plastic products, furniture, ready-made clothing, bricks, cement, manual agricultural instruments, and agricultural machinery. In particular, the operation of the Sepon gold mine in Vilabouly District, Savannakhet province, started in 2003 with a production of 39 mt in 2005. The mining industry has developed rapidly, as illustrated by the investments by 90 companies in mining at the end of 2005, of which 34 are foreign, 56 domestic. The number of handicraft businesses in the country also increased rapidly in the last five years, especially in Vientiane City and in a number of major urban centers. There were 26,200 industrial-handicraft units (rising from 23,574 units in 2001) in the last five years.

#### **2.1.3.4 Agriculture**

Considering the agriculture and forestry sector as the basis for country's industry development, this sector has expanded consistently and managed with an average growth rate of 4-5 percent a year. To date, the sector has made up 52 percent of Laos' Gross Domestic Product (GDP) (agriculture 27%, animal husbandry 19% and forestry 6%).

The Government has focused investments on constructing infrastructure, particularly irrigation systems to enhance agricultural production. There are currently 24,695 irrigation systems all over the country, which can provide water to 215,000ha of arable land in dry season. This is a massive increase when compared to 1976 when there were only just over 2,700ha of irrigated land in the country in the dry season.

Apart from growing rice and planting other crops, animal rising both in the farming industry and through native methods has expanded consistently. Livestock numbers have increased by three percent a year and fish numbers have grown by 15 percent a year, meaning the country can basically meet the demands of the domestic market. Moreover, many types of animal products are now being exported and, to date, the export value of Lao animal products has reached US\$ 70 million a year. Organic farming has been rapidly developed at the national level.

#### **2.1.4.4 Environmental Overview**

##### **i. Environment Status**

The country is blessed with abundant natural resources. With a standing at 41.5 percent of the country total area, Lao forest cover is still affluent compared to other Asian countries. There are substantial differences in total forest cover across the country's three regions. Current forest cover is only 28 percent of total land area in the North, 46 percent in the Centre and 56 percent in the South<sup>2</sup>.

As part of its efforts to conserve local biodiversity, Lao PDR currently has 20 National Protected Areas (NPAs) and two Corridors, covering almost 3.34 million hectares, or 14 percent of the country. If the area under provincial and district protection is added, the area increases to 5.3 million hectares, or 22.6 percent of the land area.

The forestry sector is one of the Government's main focuses at the present time. There are over 167,000ha of tree plantations. The land and forest allocation project has been completed in 6,510 villages and 1,920,150ha of agricultural land and 3,640,117ha of forests have so far been allocated. Slash-and-burn agriculture has basically been stopped all over the country since 2005. Furthermore, 10,611,416ha of forests have been surveyed and managed.

However, the national forest cover has been declining by an average of 53, 000 ha per annum, from 70 percent of the land area in 1940 to 41.5 percent in 2004, as a result of economic development activities, rapid population growth, wood business and slash and burn shifting cultivation.

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<sup>2</sup> Ministry of Agriculture and Forestry, "*Forest Inventory Report: 2002*", Vientiane, Lao PDR



Lao PDR's mountainous terrain precludes expansive permanent agriculture, with 70 percent of the land area having a slope of more than 20 degrees. The area suitable for intensive agriculture is estimated at nearly 1.9 million hectares, or only 8 percent of the total land area. Much of the country land is susceptible to soil erosion as a result of the large amount of land with a high degree of slope, the types of soils and the thigh rainfall. Soil erosion is compounded by shortened fallow periods and increased pesticides use, resulting in lower productivity and ever increasing demand for more land. Some forms of shifting cultivation, including long rotational swidden, are not harmful to the land and are suitable for Lao PDR. Nonetheless, pioneer's slash and burn is still used in Lao PDR. Moreover, Unexploded Ordnances (UXO) affects 14 of the Lao PDR's 17 provinces and remains in more than 25 percent of the total land area of the country<sup>3</sup>.

Lao PDR has been recognized as one of the most biodiversity-rich countries in Southeast Asia. A small population, with a tremendous diversity of ethnic groups, a multiplicity of ecosystems, and a low rate of natural resources exploitation compared to neighboring countries have allowed significant natural and cultivated biological resources to survive and to be developed. Of the 1140 animal and plant species reviewed in 1999, 319 are considered of national and global conservation significance based on their limited numbers and limited range, such as, the Kouprey (*Bos sauveli*), the Saola (*Pseudoryx nghetinhensis* and large-Antlered Muntjac, Siamese Crocodile, and Java Rhinoceros.

Around 456 fish species have been identified in Laos, from which 100 were new to science, such as the Mekong Giant Catfish (*Pangasianodon gigas*), and the Irrawaddy Dolphin. Despite relatively poor information, it is known that over-harvesting and wildlife trade are by far the greatest threat to biodiversity, placing much of it at risk of domestic extirpation domestic and increased foreign demand. Forest, land and water resources degradation pose a threat to the sustainability of the national biodiversity resources.

The Mekong River flows for about 1,860 km through Lao PDR, covering 90 percent of the country total area. A significant part of the country water resources is generated within its own watersheds. Average annual rainfall ranges from 1,300mm to 3,700mm per year, corresponding to an annual rainfall of 434 billion m<sup>3</sup>, of which less than half is estimated to be runoff. Lao PDR has accordingly estimated internal renewable water resources (IRWR) of 190 billion m<sup>3</sup> per year of 35, 000m<sup>3</sup> per capita per year. This makes it the largest per capita volume of IRWR in the region, relative to Cambodia (9201), Thailand (3,344), and Viet Nam (4690). Nevertheless, generalized water figures can be deceiving, as water demand and local water constraints, shortages, and /or natural disasters. For example, over the recent years, the country has suffered from both severe droughts and floods.

Environment health impacts from inadequate water supply and sanitation appear to be disproportionately affecting the poor in Lao PDR. With the rising population, both water and air pollution is on the rise – with consequent effects on mortality and

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<sup>3</sup> UXO Lao 2008

morbidity. Recognizing this, the Government's definition of poverty embraces important environment services, such as access to safe water and sanitation. Surface water is the major sources for urban water supply, while groundwater is usually a main source for the rural population in lowland areas, particularly in the central and southern parts of the country, where the groundwater table is sufficiently high and of sufficient quality. There is little information available on groundwater quality in Lao PDR, even though it is the main source of rural water supply. No systematic monitoring of impacts of fluoride, pesticide, nitrate from fertilizer and other chemicals pollutants is carried out.

The National Ambient Environment Quality Standards Regulation was approved in 2010, serving as a strong basis to monitor environment quality, such as water, air, land and noise, etc. In general, the water quality of rivers within the Lao PDR is considered to be still good. The level of oxygen is high and the nutrient concentration is low. Nevertheless, higher sediment loads are affecting several rivers, varying considerably from 0.41 to 3.45 tones per hectare per year. Upon pressure from rapid demographic growth, socio-economic development and urbanization, however, water quality is deteriorating. The Government has committed itself to implement the Millenium Development Goals (MDG). The MDGs for water supply and sanitation (WSS) are to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

The generation of solid waste in urban areas in Lao PDR is increasing, and might have affected the quality of surface and ground water. Solid waste in Lao PDR comprises mainly of organic materials, plastic, paper, and glass, cans and other metals. Hazardous and toxic wastes such as batteries, old paint cans, aerosols and other refuse are also mixed with these wastes. Hazardous and infectious wastes are often disposed of with municipal waste. The current scale of recycling in Lao PDR is still very modest.

Hazardous chemicals of concern include heavy metals, such as mercury, lead, cadmium, arsenic, chromium, copper, and zing as well as persistent organic pollutants (POPs). At present their environmental impact is still poorly understood in Lao PDR. Heavy metal contamination results primarily from industrial activities, which are increasing significantly as the country develops. Of particular concern is lead production and rudimentary metal smelting facilities in the country, as well as releases of mercury, cyanide, copper, cadmium and other heavy metals from mining activities.

Presently, herbicides and pesticides are used only in moderate levels in Lao PDR, mostly as a result of low per-capita incomes and traditional agricultural practices in rural areas. However, there is evidence of banned pesticides and herbicides still being illegally imported into Laos from neighboring countries.

Overall air quality in urban and rural areas in Lao PDR is currently at acceptable levels. Initial air quality monitoring was conducted in Vientiane Capital City in September 2002, February 2003, January 2004, April 2005, and in Vang Vieng District of Vientiane Province in March 2010. The monitoring results show that the averages of all pollutants comply with international standards.

## ii. Institution, Policy and Legislation Framework

The institutional structure for environmental management in Lao PDR consists of: (a) national committees which guide inter-sectoral coordination among agencies (National Environment Committee, the Lao National Mekong Committee (National Water Apex Body); (b) the Water Resources and Environment Administration (WREA)<sup>4</sup> under the Prime Minister Office as the main manager, monitor and coordinator of the environment at the national level, and a number of other ministries and institutions in charge of mitigating environment issues arising from their sectoral development activities; (c) provincial and district entities which have devolved responsibility for environmental protection at the local level; and (d) mass organizations, civil societies and the National Industry and Commerce Union which support the government in promoting participation and awareness.

The Ministries and Institutions being involved in POPs management and control in Laos comprise the Ministries of Agriculture and Forestry, Industry and Commerce, Energy and Mining, Public Health, Defense, Public Work and Transport, Justice, Planning and Investment, Foreign Affairs, Finance, Information and Culture, National Science and Technology Authority, the Water Resources and Environment Administration, serving as the National POPs Focal Point and Coordinator, and all concerned departments at the provincial level.

Since the 1992 Earth Summit, Lao PDR has formulated several national policies and strategies on the environment. The First National Environment Action Plan for the year 2000-2005 was promulgated in 1999. In 2004, the Government approved its 2020 vision in the form of the National Environment Strategy (NES), which also includes the Second National Environmental Plan (NEAP) for the years 2006-2010. The National Strategies on Environmental Education and Awareness, and Biodiversity, including their respective action plans for the years 2006-2010 were also released in 2005. The National Policy and Strategy on Water Resources is expected to be submitted by August 20 and the National Hazardous Chemicals and Substances Strategy up the year 2020 to be adopted by the end of November 2010.

Article 14 of the First National Constitution (1989) and Article 19 of the Second National Constitution (2003) state that: ***“All individuals and entities shall protect the environment and shall preserve natural resources, such as land, forest, wildlife watercourse and the air, that from the basis of protection of environment in Laos”***. Since 1990, a wide array of environmental legislation has been approved, namely the Laws on Forestry, Water and Water Resources (1996); Land, Mining and Electricity (1997); Environment Protection: the comprehensive environmental law, and Industrial (1999) and others. The Environment Impact Assessment Decree was approved in 2010. The revised Environment Protection Law is expected to be submitted in November 2010. This will include articles related to the environment sound management of hazardous chemicals and substances, including POPs and the Globally Harmonized System. Regulations related to pesticides, food and drug have been enforced.

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<sup>4</sup> It was split from the former Science Technology and Environment Agency (STEA) in July 2007

## 2.2 STATUS OF POPS

### 2.2.1 Assessment of the POPs Issue in the Lao PD R

#### 2.2.1.1 Assessment with respect to Annex A, part I chemicals (POPs pesticides)

##### 2.2.1.1.1 Introduction

POPs pesticides belong to the group of most bio-active substances, which are directly introduced into various components of the environment, and may significantly endanger ecosystem and human health in areas with intensive agriculture. Health effects from this substance group are based on the fact that they are active in very low concentrations, practically everywhere and are present also in remote regions, far from their production, storage or application sites. POPs pesticides degrade in the environment very slowly, and concentrate mainly in fatty tissues due to their bioaccumulation. In this way, they are still present in the environmental media or in human and animal tissues even decades after cessation of their usage. Typical examples are DDT, mirex and others.

##### 2.2.1.1.2 Requirements of the Stockholm Convention

With regard to pesticides, the Stockholm Convention concentrates on reduction of their production and use. Because of actual usage of DDT for malaria control, possible exemptions for countries, combating vector-based diseases, are dealt with separately. Following are the basic provisions:

- Each party shall prohibit and/or take the legal and administrative measures necessary to eliminate its production and use of the chemicals listed in Annex A
- Each party shall prohibit and/or take the legal and administrative measures necessary to eliminate its import and export of the chemicals listed in Annex A
- Each party shall restrict its production and use of the chemicals listed in Annex B (DDT)
- Each party shall take measures to ensure that a chemical listed in Annex A or Annex B is imported only for the purpose of environmentally sound disposal
- Each party shall take measures to ensure that a chemical listed in Annex A or Annex B is imported only for the purpose which is permitted for that party
- Laos neither has any specific exemption under the Convention nor a reason to ask for it
- Each party shall take measures to ensure that a chemical listed in Annex A is not exported from it except for the purpose of environmentally sound disposal
- Each party that has one or more regulation and assessment schemes for new pesticides or new industrial chemicals shall take measures to regulate with the aim of preventing the production and use of new pesticides or new industrial chemicals which, taking into consideration the criteria in paragraph 1 of Annex D, exhibit the characteristics of persistent organic pollutants; and
- Each party that has one or more regulation and assessment schemes for pesticides or industrial chemicals shall, where appropriate, take into consideration within this schemes the criteria in paragraph 1 Annex D when conducting assessments of pesticides or industrial chemicals currently in use.

### 2.2.1.1.3 Situation in Laos

In Laos, out of nine POPs pesticides, DDT and chlordane are still being illegally used. DDT has been used in Laos since 1953 when it was used in malaria control. Its application in various provinces started with malaria elimination project during 1957-1960 with the support of the operation unit from the USOM. In 1961, the Lao Government and the World Health Organization (WHO) signed an agreement to set up a Malaria control project in Vientiane Province especially in Nam Ngum Hydropower Dam area to check malaria outbreak, where many people (both Lao and Japanese workers) died from malaria.

Again in 1969, the project restarted with DDT spraying at selected locations in Nam Ngum area and the surrounding villages. Between 1969-1973 additional districts such as Saythany, Nasaythong and Phonhong and districts namely Vientiane, Champasack and other provinces were covered in DDT application. According to the geographical survey, habitat location in malaria affected area and means of Malaria spreading were carried out for many years.

In 1975, the activities of DDT spraying stopped once again due to several pressures. In 1977, the malaria control project restarted with the cooperation of WHO. The activity started in Vientiane Province which was extended to 9 Provinces. The spraying of DDT was done once a year in April-May before rainy season. DDT had been officially forbidden since 1990.

Pesticide inventory revealed that only three POPs pesticides were found in the local market and these were DDT, chlordane and heptachlor. Quantities of these pesticides reported in the inventory were 7.6 kg of chlordane and 0.25 kg of heptachlor. However, there are many other pesticides also available in the markets, which local people used to refer to as DDT. Moreover, the import and use of DDT has been banned in Laos since 1992. In terms of the management of pesticides, Laos has some regulations and laws dealing with the general management of pesticides including the banned pesticides and POPs pesticides. However, law implementation and enforcement are still limited due to a number of reasons.

In conclusion, Laos still uses POPs pesticides (mostly unaware of their danger) by local farmers for agricultural purpose, but in very small quantity. There is no specific waste management policy in Laos for obsolete POPs pesticides. Obsolete pesticides waste disposal in general has been specified in Article 34, 35 and 38 of the Agriculture Law dated 10/10 1998. Inventory also revealed that around 36.54 tones of obsolete pesticides have been disposed of through dumping at different locations during 1993 and 1998.

The Department of Agriculture has the overall responsibility concerning the import, manufacture, and usage of pesticides in the country. The Department is responsible for administration of the “*Regulation on Management and Usage of Pesticides in Lao PDR*” (Law No. 0886/MAF, dated 10 March 2000). The Regulation on Management and

Usage of Pesticides clearly states which pesticides are permitted to be imported and used, and it also clearly states which pesticides are prohibited.

In 2000, the Department made a registration of all pesticides found in the market in number of towns in the western part of the country (Ref. “*Inventory of Pesticides in Lao PDR, 2000*”, Department of Agriculture, Supported by FAO). The survey included permitted, as well as prohibited, pesticides, which were categorized according to WHO’s toxicity classification. The inventory results indicated that the import and use of pesticides is limited compared to many other countries, and that only small amounts of prohibited pesticides are imported.

It should be emphasized that it is difficult to verify the amount of prohibited pesticides being imported as these are imported illegally. Therefore, stricter enforcement of pesticide import should be implemented, with confiscation of prohibited products. Provisions of the Pesticide Law be disseminated widely and public be made aware about the consequences of using prohibited pesticides.

Results of Air Monitoring on Persistent Organic Pollutants Pesticides in East Asian Countries being conducted in 2008 at the sampling site located in Na Long Koun Village, Vientiane Province, Lao PDR, shows that HCB (360pg/m<sup>3</sup>), p,p'-DDT (8.0pg/m<sup>3</sup>), p,p'-DDE (7.3pg/m<sup>3</sup>), o,p'-DDT (3.0pg/m<sup>3</sup>), o,p'-DDE (0.86pg/m<sup>3</sup>), chlordanes (10pg/m<sup>3</sup> for trans- and 7.7pg/m<sup>3</sup> for cis-), nonachlors (6.3pg/m<sup>3</sup> for trans- and 0.70pg/m<sup>3</sup> for cis-), heptachlor (3.4pg/m<sup>3</sup>) and cis-heptachlorepoxyde (0.47pg/m<sup>3</sup>) were detected.

These results of back and forward trajectory analyses indicated the possibilities of the long-range transportation of POPs pesticides, as Laos does not produce and use them. When the height data was high, the transport speed of POPs in the air was relatively fast and long-range or trans-border transportation of POPs were possibly assumed at back trajectory mode and affected to far distant leeward.

#### *2.2.1.1.4 Priority issues*

- Completion of inventory of the stockpiles with the aim of their immediate safe storage until final disposal;
- Environmentally Sound Management including safe disposal of chlorinated POPs pesticide preparation; and
- Elaboration and ensuring measures to reduce population exposure to POPs pesticides.

The above issues would be addressed through:

- Cooperation with the key sectors
- Safe storage
- Adoption of environmentally sound destruction manner
- State support of the ultimate destruction of POPs pesticides
- Measures to reduce exposure of inhabitants.



## **2.2.1.2 Assessment with respect to Annex A, part II chemicals (PCBs):**

### *2.2.1.2.1 Introduction*

Polychlorinated biphenyls (PCBs) and equipment containing PCBs present a serious problem for Laos from the point of view of the Stockholm Convention requirements. This is the reason why a particular attention is needed to meet the Stockholm Convention conditions.

PCBs have been widely used since the 1930s as cooling fluid in transformers and dielectric fluid in capacitors. Minor applications of PCBs in equipment have been as heat transfer fluids and hydraulic fluids in industry, and as cooling fluid in switches, voltage regulators and motors. Open applications of PCBs have been as plasticizer in paint, plastics and sealants and in carbonless copy paper.

PCB-containing equipment is still in service, PCB contaminated equipment stored as waste or PCBs themselves still exist in many countries. Thus, PCBs may be found in closed electrical systems, in partially closed applications as heat transfer and hydraulic fluids, in vacuum pumps and switches, and in some open applications.

### *2.2.1.2.2 Requirements of the Stockholm Convention*

Polychlorinated biphenyls are subject to the separate Part II of Annex A, where following obligations are stipulated:

Each party:

(a) With regard to the elimination of the use of polychlorinated biphenyls in equipment (e.g. transformers, capacitors, or other receptacles containing liquid stocks) by 2025, subject to review by the Conference of the Parties, take action in accordance with the following priorities:

(i) Make determined efforts to identify, label and remove from used equipment containing greater than 10 percent polychlorinated biphenyls and volumes greater than 5 liters;

(ii) Make determined efforts to identify, label, and remove from used equipment containing greater than 0.05 percent polychlorinated biphenyls and volumes greater than 5 liters; and

(iii) Endeavor to identify and remove from used equipment containing greater than 0.005 percent polychlorinated biphenyls and volumes greater than 0.05 liters;

(b) Consistent with the priorities in subparagraph (a) promote the following measures to reduce exposures and risk to control the use of polychlorinated biphenyls:

(i) Use only in intact and non-leaking equipment and only in areas where the risk from environmental release can be minimized or quickly remedied;

(ii) Not use in equipment in areas associated with the production or processing of food or feed;

(iii) When used in populated areas, including schools and hospitals, all reasonable measures to protect from electrical failure which could result in a fire, and regular inspection of equipment for leaks;

- (c) Notwithstanding paragraph 2 of Article 3, ensure that equipment containing polychlorinated biphenyls, as described in subparagraph (a), shall not be exported or imported except for the purpose of environmentally sound waste management;
- (d) Except for maintenance and servicing operations, not allow recovery for the purpose of reuse in other equipment of liquids with polychlorinated phenyls content above 0.005 percent;
- (e) Make determined efforts designed to lead to environmentally sound waste management of liquids containing polychlorinated biphenyls and equipment contaminated with polychlorinated biphenyls having a polychlorinated biphenyls content above 0.005 percent in accordance with paragraph 1 of Article 6 as soon as possible but not later than 2028, subject to review by the Conference of the Parties;
- (f) In lieu of note (ii) in Part I of this Annex, endeavor to identify other articles containing more than 0.005 percent polychlorinated biphenyls (e.g. cable-sheets, cured caulk and painted objects) and manage them in accordance with paragraph 1 of Article 6;
- (g) Provide report every five years on progress in eliminating polychlorinated biphenyls and submit it to the Conference of the Parties pursuant to Article 15;
- (h) The reports described in subparagraph (g) shall, as appropriate, be considered by the Conference of the Parties in its reviews relating to polychlorinated biphenyls. The Conference of the Parties shall review progress towards elimination of polychlorinated biphenyls at five years intervals or other period, as appropriate, taking into account such reports.

#### *2.2.1.2.3 Situation in Laos*

The information on the inventory of PCBs used in dielectric fluid that was undertaken between January to August 2005 throughout 6 main provinces of Laos by the PCBs task team, being led by a national consultant, provide relevant data as below:

Through the inventory, about 6,867 dielectric transformers were estimated to exist in Laos, among them about 5,332 transformers were recorded (including self-reporting) and 418 pieces of equipment have been inspected, recorded and oil sampling by the task teams. Based on the records of the 5,332 transformers, 5136 units are in use, 45 units are standing-by for use, 86 units awaited to be repaired, and 69 units are awaiting disposal. In addition, we have recorded that of those units, 4509 are PCB-free, 418 are assumed to contain PCBs, and 119 contain PCBs dielectric fluid.

It has also been identified that the in-use transformers, which are PCB-free, assumed to contain PCBs, and contain PCBs dielectric fluid consist of 5,232, 236, and 119 units respectively. For the same categories, 86 units are waiting as standby for use. These figures have been compiled using certain assumption rules, which are based on one or more types of information related with the manufacturing date, dielectric type, cooling system, historical repairing, and missing or illegible name plates. Furthermore, the



findings based on screening test analysis on dielectric fluid confirmed that about 29% of transformers are contaminated with PCBs.

More importantly, even where some transformers indicated that their cooling systems did not contain PCBs-contaminated dielectric fluid, tests confirmed that they did contain such dielectric fluid. Those transformers are normally imported by EDL to private sectors and operated for private business. Beside the classification of transformer by use-status and dielectric fluid contaminated type, there are also some areas that have been contaminated with PCBs such as warehouses and workshops. Based on the density test, some areas were to be contaminated with PCBs substance.

In relation to the management of PCBs, Laos does not have any specific law/regulation for the management of PCBs or for equipment contaminated with PCBs, whether in the form of products or wastes yet. Main challenges being identified during the inventory process include: lack of awareness and capacity on PCBs risks; poor management on all types of transformers: common practice of retro-filling of purification dielectric fluid; use of old transformers (over 20 years in age); improper disposal of equipment including those contaminated by PCBs; staff working at PCBs contaminated sites have no personal protective equipment; contaminated sites can be easily and freely accessed by the public; and lack of treatment and storage facilities for PCBs dielectric and PCBs contaminated materials.

Furthermore, the knowledge of government officers and stakeholders on PCBs management is still limited and provision for the safe and sound management of PCBs substances and contaminated materials is inadequate. Moreover, infrastructure for the management, control and monitoring of PCBs-contaminated equipment is limited and there are some challenges including findings and chemicals reagents. All of these deficiencies need to be overcome by firstly developing a proper plan for safe and sound management in the future.

#### *2.2.1.2.4 Identification of problems*

With regard to PCBs and PCBs-containing equipment as problem areas, the following issues may be defined:

- Stockpiles of obsolete wastes and stored PCBs stocks
- Use and gradual removal from use of equipment containing PCBs
- Safe and environmentally sound destruction and disposal of PCBs and PCBs wastes

Following issue may be pointed out as potentially problematic

- Focus of POPs monitoring on potential sources
- Coordination of POPs measurement in individual monitoring programs and their methodological direction
- Coordination of presentation of the measurement results
- Insufficient data base about the occurrence of PCDD/PCDF in all monitoring matrices
- Insufficient data on POPs occurrence in the air

### **2.2.1.3 Assessment of Releases from Unintentional Production of Annex C Chemicals (PCDD/PCDF, HCB)**

#### *2.2.1.3.1 Introduction*

The Stockholm Convention identifies as unintended POPs by-products PCDD (Polychlorinated dibenzo-p-dioxins), PCDF (Polychlorinated dibenzofurans), PCBs (Polychlorinated biphenyls) and HCB (hexachlorobenzene). Subject of the POPs Protocol to the UNECE Convention on Long-range Trans-boundary Air Pollution (hereafter referred to as “POPs Protocol”) are in addition PAHs (poly-cyclic aromatic hydrocarbons).

Unintended POPs by-products are unwanted by-products, generated and released by certain thermal and chemical processes, particularly if organic matter is present under higher temperature and relatively low or no oxygen concentration. Depending on process type releases of unintended POPs by-products to air (e.g. from incineration), to products (PVC production), to land and to solid wastes (e.g. production of bleached pulp) and rarely also to water, may be prevailing.

#### *2.2.1.3.2 Requirements of the Stockholm Convention*

The goal of the Stockholm Convention (Article 5) is continuing minimization and, where feasible, ultimate elimination of unintentional POPs production. Countries shall achieve this goal by a set of measures such as elimination of sources; exchange of materials, products and/or processes; and above all, by introduction of BAT and BEP for activities contributing to POPs releases.

It is required to develop an implementation schedule for BAT and BEP use in new sources within the priority categories as identified by the respective country, focusing particularly on source categories as identified in Part II of Annex C to the Stockholm Convention.

For existing sources operation under best technically feasible conditions of the given technology is required. At the same time, countries should promote gradual implementation of BAT also for existing sources.

#### *2.2.1.3.3 Situation in Laos*

Present dioxin emissions are low, due to the limited industrial development in Lao P.D.R. According to the latest report on the factories in the Lao P.D.R, there are approximately 24,742 registered factories (Statistic industrial list of Ministry of Industry and commerce), listed by types, and consisted by three categories of industrial enterprises in 2002. There were 112 large scale, 604 medium scale, and 24,026 (97%) of which are very small scale. Around 200 factories are using imported chemical substances and producing chemicals in the country. Major factories mostly use sodium hydroxide, acetic acid, plastic and PVC granules.

Major sources are likely from combustion of fuels used for power generation in industries, forest fires/slash and burning cultivation, and solid waste burning. Impacts from industrial production of dioxins/furans are therefore limited to the core centers (Vientiane, Savannakhet, and Champassack). Hotspots possibly exist in Central and

Southern Lao P.D.R. from historical Agent Orange applications, but there is limited information on their locations or impacts. Field surveys and sampling have been carried out in January 2005.

Based on the inventory completed for each main source category and sub-category of PCDDs/PCDFs, it is estimated that a total of 102.2 g TEQ/a released to all environment compartments. Uncontrolled combustion processes accounted for the majority of PCDDs/PCDFs, with 90.7 g TEQ/a or 90% of the total annual releases. This is followed by power generation and heating (5.5 g TEQ/a), and miscellaneous sources at 2.2 g TEQ/a (see Table below).

**LAO P.D.R. NATIONAL PCDDs/PCDFs INVENTORY RESULTS (BASED ON 2002 INDUSTRY PRODUCTION DATA)**

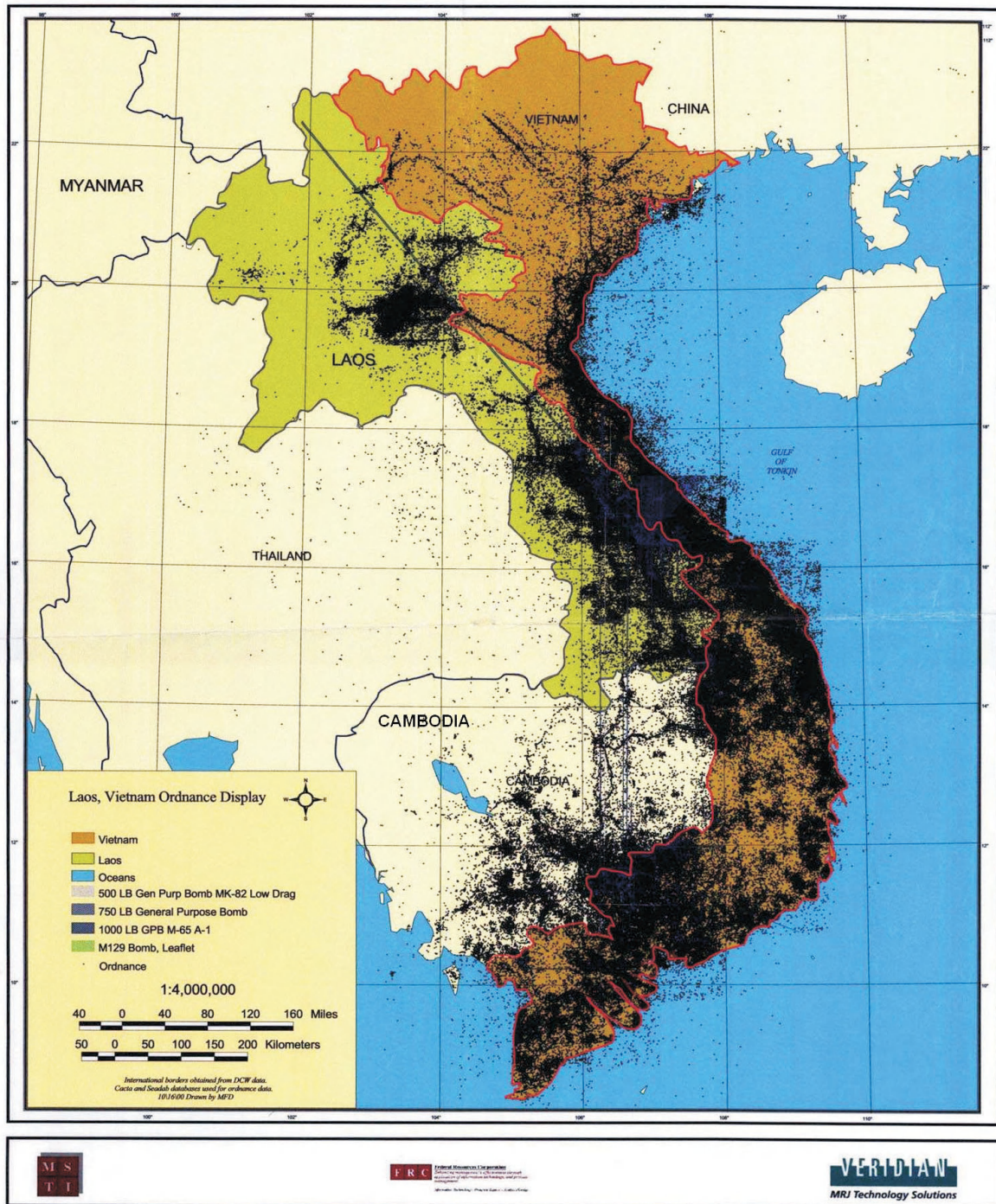
Sector	Source category	Annual Releases (g TEQ/a)					
		Air	Water	Land	Product	Residue	Total/s ector
1	Waste Incineration	0.448	0.000	0.000	0.000	0.001	0.449
2	Ferrous and Non-ferrous Metal Production	1.324	0.016	0.000	0.000	0.031	1.371
3	Power Generation and Heating	5.116	0.000	0.000	0.000	0.376	5.492
4	Production of Mineral Products	1.339	0.000	0.000	0.000	0.263	1.602
5	Transport	0.047	0.000	0.000	0.000	0.000	0.047
6	Uncontrolled Combustion Processes	35.990	0.000	18.752	0.000	36.000	90.742
7	Production and Use of Chemicals and Consumer Goods	0.000	0.000	0.000	0.321	0.013	0.334
8	Miscellaneous	2.162	0.000	0.000	0.000	0.000	2.162
9	Disposal	?	?	?	?	?	
10	Identification of Potential Hot Spots	?	?	*	?	?	
	TOTAL	46.426	0.016	18.752	0.321	36.684	102.19 9

? Indicates that the release route may be significant, but no data available.

\* Unquantifiable at the present time; primarily from Agent Orange Hot Spots

Surveys of Agent Orange impacted areas on the former Ho Chi Minh Trail were also carried out in January 2005 in Sekong, Saravane and Savannakhet Provinces. Historical herbicide sprays data (1965-1971), provided by the US Government (via UXO Laos), were analyzed and plotted on maps prior to conducting field investigations. Soil, sediment and fish samples were collected at 12 different sites (N=21 samples collected) to assess the current levels of dioxins and furans in these media. Hands-on training was provided to WERI/WREA and Ministry of Defense (Department of Chemical) field team members on procedures for collection of AOD samples as well as industrial dioxin/furan samples (WERI/WREA and the POPs Laos Team).





Overall dioxin levels recorded in soils, sediment and fish tissue samples were low, with 2 exceptions. Samples ranged in concentration from non-detectable (ND) to 37.8pg/g. The highest values were obtained from the former Javan army base in Dakcheung District, Sekong Province. According to veterans who were at the base during wartime, Agent Orange barrels were found at this site, although the exact location remains unclear.

The recorded values of 37.8pg/g and 31.5pg/g at this site were obtained from a very short sampling program (one hour on the site). It is likely that this site has much higher contamination, and should be investigated further, given the presence of two villages (Dak Laan and Dak Sieng) in close proximity to the former base. Elevated dioxin levels in spray plane crash sites (especially in Savannakhet, Saravane and Sekong) may have health implications for villagers retrieving metal scrap and for Lao/US missing in action (MIA) recovery teams working at these sites.

In 2007, WREA with the financial support from the Japanese Trust Fund through the World Bank implement the Project “Biological Monitoring of POPs in SE ASIA Task2: Dioxin and PCBs Monitoring in Lao PDR by World Bank”. 19 Agent Orange hotspots were surveyed in Vientiane, Sekong, Attapeu and Saravane provinces. The result of this study confirms the contamination areas found in the year 2005 survey with the high concentration in Dark Lan and Dark Pork districts, Sekong province with the data of 110pg-CALUX TEQ/g and 88 pg-CALUX TEQ/g respectively. This highlights the potential of serious Agent Orange contamination<sup>5</sup> and further landfill survey is strongly recommended.

In Lao P.D.R, unintentionally produced dioxins/furans releases generally are not managed in an environmentally sound manner, and legislation specifically targeting the management of dioxins/furans does not exist, except for some related statutory instruments such as the *Environmental Protection Law*. Lao P.D.R presently does not possess data/information dealing with threats to health and the environment caused by unintentionally produced dioxins/furans releases. There is an urgent need to improve the capacity of Lao PDR technical staff in environmental management and monitoring, particularly related to POPs and other hazardous chemicals. The potential health effects from POPs are a particular concern to the rural poor, who rely on the natural resource base of the country for their survival, and are also the most susceptible group to contamination.

The presence of unintentionally produced dioxins/furans is a new issue and concern to Lao P.D.R. The public and private sectors generally possess a very low level of awareness regarding dioxins/furans, especially in rural areas. The survey of national industries concluded that few industries in Lao PDR use air pollution control devices, recycling technology, or other measures to protect the environment and public health. People working in factories have generally limited awareness and knowledge regarding environmental protection and health care.

Knowledge of the potential harmful effects from Agent Orange dioxin applications is almost non-existent in the country. During the National Consultation Workshops on the NIP Draft (July 2005 and 2006), representatives of Provincial WREO offices cited the need for increased awareness raising at all levels of Lao society regarding potential dioxin hotspots related to Agent Orange, and the need for identification of appropriate mitigation measures aimed at reducing and/or eliminating releases of unintentionally produced dioxins/furans into the environment.

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<sup>5</sup> According to a Japanese soil environment standard, 250 pg-TEQ/g is the cut off figure for critical contamination

In conclusion, the preparation of the National Implementation Plan and guidelines for environmentally sound management of POPs is of the highest priority for protection of the Lao people from the effects of hazardous chemicals. Awareness raising campaigns should be undertaken at all levels of Lao society regarding the dangers of POPs, from national to the village level. Capacity building and institutional strengthening should also be a priority, including technology transfer and training through hands-on sampling and environmental monitoring, and also exchanges of information and site visits to countries which have dealt with POPs problems in the past.

#### **2.2.1.3.4 Identification of problems**

- Consistent enforcement of the environmental legislation
- BAT & BEP being applied in very limited number of industries and factories
- Uncontrolled combustion
- Waste incineration
- Handling of wastes containing or potentially releasing POPs
- Pulp and paper technologies utilizing chlorine and derivatives of chlorine as bleaching agent
- Secondary nonferrous metals production

#### **2.2.1.4 Information on Contaminated Sites/areas and Residue/wastes, Remediation Measures**

##### **2.2.1.4.1 Introduction**

Occurrence of POPs in the natural environment, polluted areas, or in different areas in general, is a function of technological development of the country and its past production infrastructure. In the past, POPs and their effects on human health and the environment were not sufficiently known yet, therefore no effective regulation for their production, spread, use and liquidation existed.

##### **2.2.1.4.2 Stockholm Convention requirements**

Obligations relevant to contaminated areas are listed in part 1.2 of the Convention. Stockholm Convention requires that all parties develop their own strategy for identification of areas contaminated by POPs compounds listed in Annexes A, B or C. Moreover, if remediation of these areas is planned, this should be carried out in an environmentally appropriate manner. The proposed Action plan (further only AP) is prepared in compliance with “Guidance on Planning and Developing NIPs under the Stockholm Convention”.

##### **2.2.1.4.3 Situation in Lao PDR**

The most significant group of pollutants contaminating areas in Laos and classified among chemical compounds called POPs are polychlorinated biphenyls (PCBs) and Dioxin/Furan from Agent Orange along the former Ho Chi Minh Trail. This conclusion is not surprising with regard to the history of its usage and distribution in Laos



and is supported by large amount of data from Preliminary Inventory in PCB and data research on Dioxin/Furan from Agent Orange in polluted areas.

The most substantial areas (or rather, region) polluted by POPs are likely to be: (i) the surrounding of the central and southern part of Laos, specifically the former Ho Chi Minh Trail which had been intensively sprayed more than 30 years ago; and (ii) Sok Pa Luang Transformer warehouse that contained PCBs.

#### *2.2.1.4.4 Identification of problems*

Based upon results from polluted areas field surveys/monitoring and laboratory analysis results, the following areas of concern have been identified:

##### 1. Ecological exploration of the areas identified by inventories

As there is insufficient relevant data on scope of pollution in individual areas, there are some uncertainties in quantification and further steps necessary for their remediation. To work out the expected polluted areas and estimated cost of exploration, the following issues need to be addressed:

- a. strategy of realization of the exploration activities
- b. exploration methodology
- c. unified analytical methodology of PCB detection in the matrix
- d. securing of exploration capacities
- e. cooperation with local specialized self-government
- f. execution of exploration activities
- g. monitoring of areas with identified PCB presence

##### 2. Strategy of remediation of contaminated areas

With regard to results of ecological exploration, the following issues have been identified:

- a. prioritization of the areas for decontamination; and
- b. processing of technical and economic aspects of remediation in individual areas.

##### 3. Execution of remediation activities

Following the results of addressing the issues described above, the following issues need to be looked into:

- a. financial backing of remediation activities
- b. technical and technological procedures for individual areas
- c. cooperation with local governments and universities
- d. cooperation with mass organizations (Lao Women Union, Lao Youth Union and Lao Trade Union), civil societies, and Lao National Industry and Trade Chamber, etc
- e. cooperation with the media



To secure an effective solution of the above mentioned tasks, there is a need to strengthen capacity of the existing POPs PCU of WREA and relevant ministries and institutions at the national level.

## **2.2.2 Existing programmes for monitoring releases and environmental and human health impacts/hazards**

### **2.2.2.1 Health Impacts of POPs**

#### *2.2.2.1.1 Introduction*

The obligation to undertake monitoring of the persistent organic compounds (POPs) group is specified in the Stockholm Convention. How the POPs should be monitored? In the Convention, there is general statement that monitoring programs should be methodologically harmonized by different parties to the Convention and should be carried out to the extent appropriate to possibilities of a given party to the Convention.

The obligation of monitoring of 12 compounds defined by the Convention (aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, PCB, DDT, PCDD/PCDF) has been extended/enlarged by proposal of the Regulation to include four compounds listed in POPs protocol to CTRLTAP (chlordecone, hexabromobiphenyl, HCH including lindane, poly-aromatic hydrocarbons). The subject of monitoring should be based on content levels of these compounds in human organism and in elements of the environment.

#### *2.2.2.1.2 Requirements of Stockholm Convention on POPs on monitoring*

The Stockholm Convention defines in its article 11 requirements for monitoring as follows:

1. The parties shall, within their capabilities, at the national and international levels, encourage and/or undertake appropriate research, development, monitoring and cooperation pertaining to persistent organic pollutants and, where relevant, to their alternatives and to candidate persistent organic pollutants, including on their:

- (a) Sources and releases into the environment
- (b) Presence, levels and trends in humans and the environment
- (c) Environmental transport, fate and transformation
- (d) Effects on human health and the environment
- (e) Release reduction and/or elimination
- (f) Harmonized methodologies for making inventories of generating sources and analytical techniques for the measurement of releases.

2. In undertaking action under paragraph 1, the parties shall, within their capabilities:

- (a) support and further develop, as appropriate, international programs, networks and organizations aimed at defining, conducting, assessing and financing research, data collection and monitoring, taking into account the need to minimize duplication of effort;

(b) support national and international efforts to strengthen national scientific and technical research capabilities, particularly in developing countries and countries with economies in transition, and promote access to, and the exchange of, data and analyses;

(c) take into account the concerns and needs, particularly in the field of financial and technical resources, of developing countries and countries with economies in transition and cooperate in improving their capability to participate in the efforts referred to in subparagraphs (a) and (b),

(d) undertake research work geared towards alleviating the effects of persistent organic pollutants on reproductive health;

(e) make the results of their research, development and monitoring activities referred to in this paragraph accessible to the public on a timely and regular basis;

(f) Encourage and/or undertake cooperation with regard to storage and maintenance of information generated from research, development and monitoring.

**Article 16 further states:**

1. Commencing four years after the date of entry into force of this Convention, and periodically thereafter at intervals to be decided by the Conference of the Parties, the Conference shall evaluate the effectiveness of this Convention.

2. In order to facilitate such evaluation, the Conference of the Parties shall, at its first meeting, initiate the establishment of arrangements to provide itself with comparable monitoring data on the presence of the chemicals listed in Annexes A, B and C as well as their regional and global environmental transport. These arrangements:

(a) Should be implemented by the parties on a regional basis when appropriate, in accordance with their technical and financial capabilities, using existing monitoring programs and mechanisms to the extent possible and promoting harmonization of approaches

(b) May be supplemented where necessary, taking into account the differences between regions and their capabilities to implement monitoring activities

(c) Shall include reports to the Conference of the Parties on the results of the monitoring activities on a regional and global basis at intervals to be specified by the Conference of the Parties.

3. The evaluation described in paragraph 1 shall be conducted on the basis of available scientific, environmental, technical and economic information, including:

(a) Reports and other monitoring information provided pursuant to paragraph 2

(b) National reports submitted pursuant to Article 15

(c) Non-compliance information provided pursuant to the procedures established under Article 17.

In Annex D the Convention further defines the obligation to submit evidence of bioaccumulation potential of any chemical compound that should be included in the list of chemical compounds in Annex A, B, or C. This evidence should be based on biota monitoring.

#### 2.2.2.1.3 *Situation in Lao P.D.R*

There is no monitoring program focused specifically on POPs in Laos. Despite this, POPs have been monitored in key elements of the environment and living organisms including humans, as well as in foodstuff, but in a non continuous and sustained manner.

#### 2.2.2.1.4 *Problem Identified*

The main problems in the area of monitoring are: (i) lack of resources (financial and qualified staff); (ii) POPs issue is new to even concerned government institutions, therefore, awareness related to this matter is very limited; and (iii) the insufficient communication between the Institutions methodologically coordinating and executing the partial monitoring programs. To achieve higher effectiveness of POPs occurrence evaluation in different matrices, following problem areas will have to be addressed:

- Focus of POPs monitoring on potential sources
- Coordination of POPs measurement in individual monitoring programs and their methodological direction
- Coordination of presentation of the measurement results
- Insufficient data base about the occurrence of PCDD/PCDF in all monitoring matrices
- Insufficient data on POPs occurrence in the air
- Limited capacity of relevant staff

### **2.2.3 Report and Information Exchange**

#### 2.2.3.1 Introduction

Lao People's Democratic Republic has just initiated a reporting system of some chemicals, as a result of their participation in several international conventions, such as Convention on Long-Range Tran boundary Air Pollution, Stockholm Convention, and Protocol on persistent organic pollutants (further referred to as POPs protocol) to this convention and Basel Convention on regulation of Tran boundary transfer of hazardous wastes and their disposal. The Stockholm Convention on POPs, ratified by Laos in June 2006, states general obligations of reporting to the Conference of Parties and Secretariat of the Stockholm Convention and information exchange through the national focal point without any further specific dates and procedures.

One of the measures Laos is to undertake based on Stockholm Convention and the Regulation, is to establish national focal point or National Competent Body for exchange of information and reporting on POPs. As the action plan for reporting is a part of the obligations following from the Stockholm Convention, the institution will be further referred to as national focal point (NFP-POPs) which will have functions according to Articles 9 and 15 of the Convention.

#### 2.2.3.2 Stockholm Convention Requirements

Stockholm Convention specifies duties for all its Parties relating to exchange of information and reporting (Articles 9 and 15). In terms of Article 9 of the Stockholm Convention, each Party shall:

a) Facilitate or undertake the exchange of information relevant to reduction or elimination of the production, use and release of POPs; alternatives to POPs including information relating to their risks as well as to their economic and social costs. The exchange of information will take place either directly or through the Secretariat.

b) Establish a national focal point for the purposes of subparagraph a);

c) For the purposes of the Convention, information on health and safety of humans and the environment shall not be regarded as confidential. Parties that exchange other information pursuant to this Convention shall protect any confidential information as mutually agreed.

According to Article 15 of the Convention Laos shall submit reports in regular intervals and in format decided by the Conference of Parties at its first meeting to:

*a) Conference of the Parties:*

- Measures taken to implement provisions of the Convention and on effectiveness of such measures in meeting the objectives of this Convention.

*b) the Secretariat:*

- Statistical data on its total quantities of production, import and export of each of the chemicals listed in Annexes A and B or a reasonable estimate of such data;

- To the extent practicable, a list of the states from which it has imported each such substance and the states to which it has exported each such substance.

According to Annex A, part II of the Stockholm Convention, Lao will every 5 years submit to Conference of the Parties reports on progress of PCB elimination.

#### *2.2.3.3 Situation in Lao PDR*

Institutional coverage of POPs management that can take care of reporting activities pursuant to the Stockholm Convention (Articles 9 and 15) is currently spread between several institutions under different ministries in Laos. Moreover, it must be noted that current reporting system on POPs which is a shared responsibility of these institutions is content wise not sufficient for the purposes of the Convention requirements.

As mentioned earlier, WREA serves as the National POPs Focal Point and Coordinator. Concerned ministries and institutions are also involved in POPs reduction and phased out related to their sector, namely the Ministry of Industry and Commerce is in charge of managing and solving POPs released from industrial development, promoting the use of BAT/BEP; the Ministry of Finance (Duty Department) in charge of controlling goods imports; the Ministry of Public Health in charge of environment health issue related to POPs; the Ministry of Defense in charge of monitoring Dioxin from Agent Orange; the Ministry of Information and Culture in charge of awareness building; the National Chamber of Industry and Trade in charge of encouraging the private sectors to apply the BAT/BEP, etc...

- Ministry of Industry and Commerce (MIC)
- Ministry of Agriculture and Forestry (MAF)
- Water Resources and Environment Administration (WREA)
- Ministry of Public Health (MoH)
- Ministry of Energy and Mine (MEM)
- Ministry of Planning and Investment (MPI)
- Ministry of Foreign Affairs (MOFA)
- Ministry of Finance (MoF)
- Ministry of Defense (MoD)
- Ministry of Culture and Information (MCI)
- Ministry of Education (MoE)
- National Chamber of Industry and Trade
- Mass Organizations
- Civil Societies

Consequently these concerned above mentioned ministries and institutions have managed their own data. The national POPs data base has not been set up yet in order to harmonize these data and information and ensure effective data and information sharing at the national level, which will also ease data and information exchange and sharing with other relevant institutions at the regional level.

Fulfillment of the SC requirements on provision of information and reporting in the area of import, export, use and releases of POPs (excluding production) in Laos is partially covered as a part of pursuing the obligation under international conventions and existing laws such as:

- Convention on Long-Range Tran boundary Air Pollution and Protocol on POPs to this convention;
- Convention on Biological Diversity (CBD);
- Climate Change Convention
- Stockholm Convention
- Desertification Convention
- Environmental Protection Law, 1999
- Water Resources Law, 1996
- Mining Law, 1997
- Land transportation Law, 1997
- Law on Manufacturing Industry, 1999
- Law on Hygiene and Health Promotion, 2001, etc.

In order to ensure more effective coordination at the national level, including data and information harmonization and sharing, there is a vital need to:

- (ii) Strengthen the capacity of the National POPs Coordination Unit (PCU); and
- (iii) Establish the national Chemical Data Center, including POPs.

#### **2.2.3.4 Problem identification**

Priority problems in the area of POPs reporting pursuant to the requirements of the Articles 9 and 15 of the Stockholm Convention are the absence of one single institution

that could supply comprehensive information and reports on POPs in Laos to the Stockholm Convention Secretariat. Priority problem areas include:

1. Upgrade the existing National Steering Committee of the POPs Enabling Activities Project to become the National POPs Steering Committee, (NPSC) which will report to the National Environment Committee being chaired by the Vice Prime Minister;
2. Establish relevant Technical Working Groups (POPs Pesticides, PCBs, Dioxin, etc...) (PTWG) as appropriate, which will report to the National POPs Steering Committee for guidance;
3. Capacity strengthening of the POPs National Focal Point and Coordinator including the National POPs Coordinating Unit for fulfillment of the requirements of Articles 9 and 15 of the Stockholm Convention, this being a part of already existing organization (or institution) keeping record on some POPs chemicals,
4. Establishment of a procedure and mechanism for flow of partial information on POPs from competent national institutions to NFP-POPs,
5. Obtaining complete and relevant data on production, imports, exports and use of POPs from the national relevant institutions; this data should follow appropriate format to ease further report processing and submission to the Stockholm Convention Secretariat,
6. Legal regulation for POPs specification and following possibility of their tracking in terms of appropriate law.



# Chapter 3





## **CHAPTER 3**

### **IMPLEMENTATION STRATEGY AND ACTION PLAN**

#### **3. THE NATIONAL IMPLEMENTATION PLAN (NIP)**

The NIP is designed to identify priority activities related to effective POPs management, and to seek technical and financial support to the Government and the people of Lao PDR in managing, reducing, and where possible phasing out and eliminating the release of POPs throughout the country. These priority activities are coherent with the National Socio-Economic Development Strategy (2020) and Five Years Plans, the Millennium Goals, the National Growth and Poverty Eradication Strategy – NGPES, the National Environment Strategy up to the year 2020 – NES, and the National Hazardous Chemicals and Substances Strategy. Consequently the NIP will no doubt contribute to the creation of a cleaner and safer natural environment for all Lao People.

#### **3.1 NATIONAL POPS POLICY**

Acknowledging the global apprehension related to the impacts of POPs to human health and the environment, the Government Lao of PDR is committed to join the international community to reduce and prevent the impacts of these toxic chemicals on human health and the environment. This dedication is clearly demonstrated by the Government's ratification to the Stockholm Convention on June 28 2006 and endorsement of the NIP in April 2010.

In response to declining environmental conditions, the Government of Lao PDR country has made important strides in instituting changes in partnership with local communities and international organizations. Over the past years, the country has invested millions of US dollars in improving environmental management, including chemicals, focusing on building capacity among Governmental institutions and raising awareness more broadly, establishing protocols for monitoring and managing environment indicators and making site-based investments. The results of these investments have been mixed. The challenges facing the environment, including hazardous chemicals and substances in Lao PDR are many and varied, requiring a more strategic approach.

Lao PDR's primary POPs management policy is to address general environmental problems, in combination with national efforts to achieve sustainable development and safeguard public health. The reduction and eventual elimination of POPs, and the special exemption of POPs use, will be met through the implementation of the SC. The Government of Lao PDR has also developed a supporting policy to facilitate POPs-related activities with donor agencies, non-governmental organizations and stakeholders through their networks, country offices or in the region as appropriate

Based on the national policy related to POPs and from the time of the signature of the Stockholm Convention on **5 March 2002**, the Government of Lao PDR delegated the Science Technology and Environment Agency (STEPA), actually is the Water Resources

and Environment Administration (WREA) to serve as the national focal point for coordinating the implementation of the Stockholm Convention (SC). In parallel, the National POPs Steering Committee<sup>6</sup> (NCSC) has been established with the aim to facilitate the implementation of the SC among relevant institutions and also for improving effective management of chemicals as well as POPs management. The Water Resources and Environment Administration, in collaboration with other governmental institutions and stakeholders, deals with human health and environmental protection, human capacity building, information dissemination and public awareness raised at the national level.

The Government of Lao PDR has prioritized the issues of chemicals management including POPs. The approval of the NIP plays a very important role as a national policy of POPs management and planning guidance for all relevant stakeholders to implement all actions contained in the document. This national plan shows also an initial direction for all concerned ministries and institutions on POPs management, to implement and update their activities for achieving the long term goal to reduce, and where possible, to eliminate POPs release and presence in the country.

This NIP has been developed at a very appropriate time, since the beginning of the Third Five-Year National Socio-Economic Development Plan (NSED) for the years 2006 – 2010. This national plan presents very specifically the various action plans and the policy response developed by the Government of Lao PDR to address and solve POPs problems. This NIP is the first national plan initiated for a four-year implementation (2010-2014), supporting the governmental policy framework, including Lao PDR's millennium development goals in the following areas:

- 1) Improvement of public health
- 2) Prevention of toxic chemical releases into the environment, and
- 3) Reduction of poverty through reducing cost of health services.

### **3.2 PRIORITY PROBLEMS RELATED WITH POPs**

Based on the results of identification and specific assessment of POPs related issues, the main areas of concern as followings:

- Institutional and regulatory framework;
- Public health and environment;
- Socio-economic aspects;
- Data and information framework;
- Human resources development; and
- Public awareness.

Identification and development of priority issues on POPs are built upon the participation of relevant institutions and stakeholders. Priority problems are: POPs pesticides, PCBs, unintentionally produced POPs, POPs Management, including strengthening of coordination at the national level, awareness building, information

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<sup>6</sup> There are representatives from key line ministries, institutions, mass organizations, national universities, private sectors, civil societies

dissemination. The result of priority setting of POPs related problems in Lao PDR has been used to provide basic input for the development of a national implementation plan and is summarized as follows:

### **National Prioritized Problems of POPs Pesticides**

1. The existing regulation has limited provision for complete management of pesticides used in agriculture and households, including the storage and disposal;
2. Lack of pesticide evaluation capacity and facilities for legislative enforcement;
3. Lack of qualified relevant staff in monitoring and assessing the effective storage, disposal and management of pesticides, including POPs,
4. Inadequate laboratory facilities for testing and analyzing pesticides, including POPs;
5. Lack of awareness and knowledge on safe and responsible use of POPs pesticides among workers in formulating units, retailers and users.
6. Lack of awareness and knowledge about the hazards associated with Pops pesticides.
7. Limited knowledge and insufficient monitoring of POPs pesticide residues in the environment, agricultural produce and human beings.
8. Lack of data records and a national database management system for management of pesticides especially POPs.
9. Lack of information exchange network and technology transfer.
10. Lack of pesticide disposal policy and disposal facilities.

### **National Prioritized Problems of PCBs**

1. Lack of both human resources and technical facilities to effectively manage and phase out PCBs;
2. Lack of specific laws and regulations on PCB management, including the use, storage and disposal of PCBs;
3. Lack of appropriate laboratory capacity;
4. Improper management of used and obsolete transformers and dielectric capacitors;
5. Lack of precaution and protection measures for handling PCB contaminated equipment and contaminated sites including workshops, warehouses, etc.;
6. Lack of awareness on PCBs hazards at all levels;
7. Lack of awareness on the technical safeguard and hazard of PCBs amongst employees and workers;
8. Lack of data records and database management system on PCBs; and
9. Lack of national as well as international mechanism for information exchange and technological transfer.

### **National Prioritized Problems of Unintentionally Produced-POPs**

1. Lack of technical expertise and technical guidelines for unintentional POPs by-products management;
2. Uncontrolled burning (waste at municipality and rural landfills, etc.);
3. Insufficient regulation related to by-products management and enforcement;
4. Lack of detailed information available on Agent Orange used in Lao PDR, including areas sprayed, former military installations where herbicides were stored, and spray plane crash sites;
5. Lack of awareness of potential dioxin generation sources, including open burning,

- factories, incinerators, clearing of land/forest fire;
6. Lack of public awareness on hazards associated with dioxins, and potential impacts on human health;
  7. No Public awareness on unintentional POPs by-products generation and associated health hazard;
  8. No control measures for reducing the release of by-products from all sources;
  9. No waste separation policy in practice (by interest groups like scavengers);
  10. No data records regarding the incidents from unintentional POPs by-products, and poor database management system and information exchange mechanism among the governmental agencies and stakeholders; and
  11. Lack of laboratory and equipment facilities for monitoring and analyzing POPs.

### **National Prioritized Problems of awareness raising / information dissemination - POPs**

1. Low awareness on POPs issues (technical and policy) among policy makers and general public;
2. Lack of data records, network and communication systems on both national and international levels regarding the POPs information exchange;
3. Lack of resources for promoting awareness on POPs at all levels of society;
4. Lack of awareness and education programs for management, employees and workers responsible for and exposed to PCBs;
5. Insufficient education and information dissemination on safe and responsible use of pesticides;
6. Lack of technical training on the hazards of unintentional POPs by-products;
7. Lack of comprehensive unintentional POPs by-products information disseminated through mass media; and
8. Lack of programs to promote public awareness on reduction of unintentionally produced POPs, including by-products released at source.

### **3.3 NATIONAL STRATEGY FOR IMPLEMENTATION OF NIP**

During the implementation phase of this NIP, the Water Resources and Environment Administration along with relevant line ministries will have to improve existing framework mechanisms for ensuring effective coordination and facilitating the realization of individual action plans; enhance partnership arrangements with concerned private sector and associations, civil society, mass organizations, and research institutes; and increase human resource capacity as well as financial resource development for all levels of society. The national implementation strategy and actions can be detailed as follows:

#### **3.3.1 Improve the Existing Institutions and Mechanisms Strategy**

The first important strategy is to consider the improvement of the existing institutional and structural mechanisms being established, namely the National Steering Committee, the Coordination Unit and the Technical Working Groups of the POPs Enabling Activities Project to respectively become the National POPs Steering Committee, the POPs Coordination Unit and the POPs Working Groups to coordinate the implementation of the Stockholm Convention at the national level. The following actions

are recommended:

1. Develop communication system and networks in the field of chemicals, especially on POPs related issues, among relevant ministries and governmental institutions in order to promote effective management and implementation of the NIP. These networks will also liaise with concerned universities, civil societies, private sectors, public interest groups at the local, regional and international level, and development partners;
2. Establish and strengthen capacity of the National POPs Steering Committee, National POPs Coordination Unit, and relevant POPs technical working groups to effectively fulfill their tasks;
3. Undertake supplementary activities needed to ensure good quality of project proposals, and organize periodic briefing sessions for key stakeholders related to the proposed project proposals or/and financial support to implement the NIP;
4. Develop and implement national guidelines according to the requirements of relevant international conventions; and
5. Regular reporting on the status of POPs management in the country, conduct monitoring and evaluation on the progress of NIP execution, and update the NIP every four years.

### **3.3.2 Human Resources Development Strategy**

To ensure the effective and sustained realization of the NIP, the Government of Lao PDR should promote the development of human resources in chemical management, specifically on POPs management practices: initiate new procedures and activities through providing trainings to managers, technical persons, trainers and mass media; conduct field work and laboratory trainings; regularly promote awareness on POPs to decision makers and the community; and carry out chemical engineering courses at national universities. The following actions are recommended:

#### **Actions:**

1. Identify and assess the capacity-building needs of governmental officers, private sectors, and other key stakeholders being and to be involved in all aspects of the NIP cycle;
2. Assess necessary external resources to meet the relevant capacity-building needs of Lao PDR and submit to concerned development partners;
3. Assess the commitment of key concerned governmental institutions, mass organizations, civil society and private sector or associations to strengthen and empower relevant local communities, and support capacity-building for these groups, as well as their own capacity-building activities at the community level;
4. Develop and conduct training courses on chemical management including POPs to concerned persons at the management and technical levels, including trainers and mass media. Conduct field works and laboratory trainings;
5. Establish mechanisms for the management and dissemination of information on POPs related issues to technical officers of relevant institutions, decision makers in particular, and other key stakeholders; and
6. Design, develop and conduct chemical engineering courses at the Lao National University and relevant academic institutes.

### **3.3.3 Improve Information Sharing and Participation Strategy**

There is a need to promote active participation of all key stakeholders, namely governmental institutions, private sectors, mass organizations, civil societies, and universities, etc. This participation will be efficient when information sharing is operational among public institutions and the private sector. The following actions are recommended:

#### **Actions:**

1. Opening up access to meet the obligations of the Stockholm Convention through the production of an annual national report on policies, legal framework, activities and plans for implementation of the NIP;
2. Support concerned stakeholders as executing agencies accordingly to their duties, encourage their involvement since the project proposals formulation; executing agency responsibilities should be given to competent institutions in order to avoid overlapping services, and time and resource waste for projects execution;
3. Promote participation of all key stakeholders in advising on the effective ways of the realization process of the NIP;
4. Develop new models within the framework of existing guidelines for the effective involvement of all key stakeholders; and
5. Disseminate information related to the implementation of the NIP and POPs management to key relevant ministries and government institutions, private sector, public interest groups, universities, and the public at large through mass media.

### **3.3.4 Improve Financial Mechanism Strategy**

The effective implementation of the NIP requires sustainable financial support from the government, private sectors and the international donor community. The following actions are therefore recommended:

#### **Actions:**

1. Organize inception meetings involving relevant ministries and government institutions, development partners and the private sector to consider strategies for developing private sector partnerships in POPs management;
2. Inform donor-country embassies and missions about Lao PDR projects and proposals related to the implementation of NIP. Involve representatives of bilateral agencies in national briefings and round tables on technical and financial assistance to Lao PDR. Explore possible opportunities for in-country collaboration between donors' projects and Lao PDR NIP, e.g., the GEF fund for POPs management, and related activities through bilateral aid agencies;
4. Develop relationships and exchange information with civil societies and other groups engaged in monitoring corporate environmental practices; and enhance co-implementation of the plan with civil societies and private sector; and
5. Promote the allocation of government and private funds for the NIP realization.

### **3.4 STRATEGY FOR THE IMPLEMENTATION OF THE STOCKHOLM CONVENTION**

In parallel with the above national strategy for the NIP realization and to the successful SC implementation, the Government of Lao PDR has also developed a direct implementation strategy. This strategy has been set under the SC: Identification, assessment and mitigation of the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs”; Improvement of POPs Information Exchange; and Promotion the Conduct of POPs Researches.

#### **3.4.1 Strategy: Identifying, Assessment and Mitigation of the Stockpiles, Articles In Use and Waste Consisting of, Containing and Contaminated with POPs”**

In order to manage the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs in a sound technical manner and to ensure safe environment and public health, Lao PDR needs to consider the following actions:

##### **Actions:**

- 1- Train technical staff of relevant institutions regularly and to combine with the “on the job training” on how to identify stockpiles, articles in use and waste consisting of, containing and contaminated with POPs, and safety measures;
- 2- Develop strategies, guidelines and safety measures related to the effective management, safety, healthcare and sound environmental management of stockpiles, articles in use and waste consisting of, containing and contaminated with POPs;
- 3- Develop identification process for stockpiles, articles in use and wastes consisting of, containing and contaminated with POPs;
- 4- Conduct an identification and assessment of stockpiles, articles in use and wastes consisting of, containing and contaminated with POPs;
- 5- Organize a series of workshops on reviewing strategy development and policy information for identifying stockpiles, articles in use and waste consisting of, containing and contaminated with POPs;
- 6- Conduct the collection, repackaging, temporary storage and transportation of articles in use and waste consisting of, containing and contaminated with POPs to a safe storage area for disposal;
- 7- Undertake disposal of the collected stockpiles, articles in use and waste consisting of, containing and contaminated with POPs within or outside Lao PDR, where facilities are appropriate; and
- 8- Look for possible technical and financial assistance to dispose stockpiles, articles in use and wastes consisting of, containing and contaminated with POPs in a safe and sound environmental manner.

#### **3.4.2 Strategy: Improvement of POPs Information Exchange**

POPs is a new issue for least developed countries, including Lao PDR. There is



little information available and no management measures/methods for handling POPs in a safe and sound environmental manner. To solve this issue, the Stockholm Convention has required all parties to consider POPs information exchange including results and experiences extracted from successful implementation of the convention between developed countries and developing countries. In parallel, local information exchange and dissemination between institutions, civil organizations, research institutions, private sector and vulnerable groups is also a requirement of the SC.

Therefore, the improvement of the POPs information exchange strategy will assist Lao PDR in developing an accurate POPs data and information system, enabling effective information exchange and sharing with concerned institutions in the region and around the world.

**Actions:**

1. Establish a process for information storage and access of data on POPs related issues in Lao PDR. This information would be available to government institutions and other key stakeholders to exchange information with all member parties of the convention;
2. Establish a National Chemical and POPs Information Centre under WREA (contact agency for the Stockholm Convention) to accommodate all database systems according to the SC reporting procedure;
3. Improve the government officers' knowledge on data collection techniques, dissemination, use, and analysis of information,
4. Encourage and facilitate the contribution of private sector and other stakeholders in POPs information exchange systems;
5. Develop a forum and lines of communication to extend the data collection and use; and
6. Promote public awareness on POPs reduction and elimination issues to stakeholders and interest groups, and provide accurate POPs information through mass media.

**3.4.3 Strategy: Promote the Conduct of POPs Research**

For least developing countries like Lao PDR, capacity to assess POPs hazards on human health and the environment is limited because of the lack of basic scientific information and data related with POPs releases, POPs concentrations in the environment and in food products. Therefore, the improvement of POPs management and having scientific evidence to assess the effective implementation of the SC urgently require the promotion and execution of a POPs research strategy.

**Actions:**

1. Promote and develop research in the areas of POPs; Strengthen capacity of relevant national staff to conduct POPs research;
2. Improve capacity of existing laboratories for enabling POPs analysis as needed;
3. Conduct technical research on POPs residues or/and magnitude of POPs substances in imported and exported consumer products and the environment and on human health affected by exposure to POPs; and

4. Initiate the development of alternatives management options in Lao PDR or other sources of the release of unintentionally produced POPs based on BAT/BEP guidelines in compliance with national conditions.

### **3.5 DETAILED ACTION PLANS**

To achieve the objectives of the NIP, and to respond to the requirements of the SC, detailed action plans related to the management and safe disposal of the 12 POPs substances set under the SC have been divided into three main sections accordingly to the group of POPs substances. In addition, to facilitate successful implementation of the NIP and to ensure smooth processing of the administrative management system, coordination for the implementation of the NIP is considered as a part of the action plan. Detailed action plans are divided into four main sections as following:

- Section 1 on POPs pesticides,
- Section 2 on PCBs,
- Section 3 on unintentionally produced POPs, and
- Section 4 on the management of the NIP implementation.

The objectives of each section are to focus on imperative national capacity building in the area of POPs management, reduction, and elimination. The outline of each section comprises the proposed goals, objectives, key problems, outputs, main activities, and detailed tasks to achieve the national objectives. Justification for the implementation of the activities is also provided. These objectives can be understood as the core functions of the proposed law development, amendment, and implementation in compliance with the obligations of the Convention. Other objectives provide general concept for project design and operation related to POPs management, reduction, and elimination.

### **3.6 SECTION 1: POPS PESTICIDES**

#### **3.6.1 Goals: Eliminate the import and use of POPs pesticides**

#### **3.6.2 Overall Objectives: Effectively implement law enforcement related to POPs pesticides**

#### **KEY PROBLEMS**

- There is still illegal import and use of banned agricultural pesticides including POPs in Lao PDR;
- The public at large is facing health risks caused by the use of agricultural pesticides including POPs;
- There is lack of good mechanisms and appropriate measures for protecting public health and the environment; and
- Short of comprehensive and basic data and information for managing agricultural pesticides including POPs.

### 3.6.3 Action Plans

#### 3.6.3.1 Objective 1: Amendment of existing legal instruments and strengthening effective pesticides (including POPs) law enforcement.

##### 3.6.3.1.1. Outputs:

- Existing legal instruments related to the managing of pesticides, including POPs being revised, amended and implemented; and
- Technical guidelines on the management of obsolete pesticides, including POPs being developed, introduced and implemented.

##### 3.6.3.1.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Undertake assessment of the existing laws and other technical standards for amendment and promotion of effective law enforcement.</b>	<b>24 Months</b>	<b>MAF</b>	<b>MOJ, WREA, MOH, Mass Organizations, and Private sector</b>
1-1-1	<i>Formulate legal team and review existing regulations on agricultural pesticides management</i>			
1-1-2	<i>Amend existing legislation and/or develop new legal instruments for pesticides (including POPs) management</i>			
1-1-3	<i>Develop rules and regulations for implementing the pesticides management legislation</i>			
1-1-4	<i>Develop technical guidelines on pesticides (including POPs) monitoring and inspection.</i>			

#### 3.6.3.2 Objective 2: Strengthen institutional capacity and raise public awareness on obsolete pesticides including POPs pesticides.

##### 3.6.3.2.1 Outputs:

- The capacity of institutions being strengthened and improved for the management of obsolete pesticides including POPs pesticides.
- The public at large, including policy and decision makers, will be aware of obsolete pesticides issues and will actively participate in the prevention and elimination of obsolete pesticides including POPs pesticides.

### 3.6.3.2 Activities:

Code	Activities/ Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>2-1</b>	<b>Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.</b>	<b>24 Months</b>	<b>MAF</b>	<b>WREA, MoH, MIC, MoF</b>
2-1-1	<i>Formulate and build national TOT capacity.</i>			
2-1-2	<i>Develop training material on the prevention of illegal import, trafficking and use of illegal pesticides, including POPs and other obsolete pesticides</i>			
2-1-3	<i>Organize and conduct training programs for officers, traders/sellers and other relevant stakeholders.</i>			
2-1-4	<i>Widely disseminate the contents of legal instruments on pesticides management to the officers, traders/sellers and stakeholders.</i>			
<b>2-2</b>	<b>Strengthen capacity on pesticides analysis focusing on POPs.</b>	<b>18 Months</b>	<b>MAF</b>	<b>WREA, MoH, National University of Laos – NUOL</b>
2-2-1	<i>Improve capacity of laboratory staff on pesticides analysis, with focus on POPs pesticides.</i>			
2-2-2	<i>Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.</i>			
<b>2-3</b>	<b>Raise public awareness on pesticides issues including POPs and other obsolete pesticides</b>	<b>24 Months</b>	<b>MAF</b>	<b>MIF, WREA, relevant civil society, mass organizations</b>
2-3-1	<i>Formulate and undertake dissemination campaigns on pesticides hazards and elimination of obsolete pesticides and POPs.</i>			
2-3-2	<i>Provide information to relevant target groups on alternative pesticides instead of POPs and obsolete pesticides</i>			
2-3-3	<i>Encourage alternatives pest control measures to reduce the use of pesticides.</i>			
2-3-4	<i>Improve extension worker's capacity and expand their activities on pesticides including obsolete pesticides and POPs issues.</i>			
<b>2-4</b>	<b>Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides</b>	<b>12 Months</b>	<b>MAF</b>	<b>WREA, MoH, MIC, Mass</b>

				<b>Organizations</b>
2-4-1	<i>Organize forums/workshops for policy and decision makers.</i>			
2-4-2	<i>Provide information on pesticides risk and hazard related issues including obsolete pesticides and POPs to policy and decision makers.</i>			

### 3.6.3.3 Objective 3: Undertake ecologically sound management measures related to obsolete pesticides including POPs pesticides.

#### 3.6.3.3.1 Outputs:

- Information on obsolete pesticides available;
- Illegal trade and domestic trafficking and using of pesticides including POPs reduced;
- Pesticide residues, including POPs in agricultural products and in the environment reduced;
- Pesticide (including POPs) concentrations in consumer products reduced; and
- Collection and safe storage of obsolete pesticides including POPs pesticides.

#### 3.6.3.3.2 Activities

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>3-1</b>	<b>Conduct comprehensive inventory on obsolete pesticides including POPs pesticides.</b>	<b>24 Months</b>	<b>MAF</b>	<b>WREA, MoH, MIC, National Statistic Department, Local authorities</b>
3-1-1	<i>Form obsolete (including POPs) pesticides inventory team.</i>			
3-1-2	<i>Organize inventory training of the team and develop inventory forms, guidelines and plan execution of the inventory.</i>			
3-1-3	<i>Undertake comprehensive inventory survey covering the whole country.</i>			
3-1-4	<i>Design standard obsolete pesticides and POPs pesticides database format and reporting.</i>			
3-1-5	<i>Training of technical staff on data entry.</i>			
3-1-6	<i>Set-up database management system with facilities and data entry.</i>			
3-1-7	<i>Develop database document on obsolete pesticides including POPs and publicizing.</i>			

3-2	<b>Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.</b>	<b>24 months</b>	<b>MAF</b>	<b>WREA, MoH, MIC, Local authorities</b>
3-2-1	<i>Develop plan for monitoring on import, domestic trafficking and trade of illegal pesticides.</i>			
3-2-2	<i>Undertake regular monitoring and inspection focusing on the presence of illegal pesticides.</i>			
3-2-3	<i>Undertake administrative measures (like confiscation of illegal products and storage in Government owned storage sites) for any illegal action related to illegal pesticides.</i>			
3-3	<b>Prepare collection campaign for temporary storage of the obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.</b>	<b>18 months</b>	<b>MAF</b>	<b>WREA, MoH, Local authorities</b>
3-3-1	<i>Undertake an environmental impact assessment on the collection and storage of obsolete pesticides including POPs pesticides.</i>			
3-3-2	<i>Prepare technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete pesticides including POPs.</i>			
3-3-3	<i>Establish or improve safe regional temporary storage facilities and area(s) for keeping obsolete pesticides including POPs.</i>			

#### 3.6.3.4 Objective 4: Eliminate stockpile of obsolete pesticides, including POPs pesticides

##### 3.6.3.4.1 Outputs:

- Pilot project concerning the disposal of obsolete pesticides in stockpiles completely implemented; and
- The identified stockpiles and wastes containing or contaminated with obsolete pesticides including POPs pesticides safely managed and disposed;

##### 3.6.3.4.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
4-2	<b>Design and execute a national wide Project for the disposal of all obsolete pesticides (including POPs)</b>	<b>36 Months</b>	<b>MAF, WREA</b>	<b>MoH, MPWT, MIC, MoF</b>
4-2-1	<i>Identify and purchase the required UN approved packaging materials.</i>			
4-2-2	<i>Organize training course for staff involved in the project.</i>			

4-2-3	<i>Develop a plan for repackaging and transport to regional temporarily storage depots.</i>			
4-2-4	<i>Repackage obsolete pesticides, clean all stores and transport the repackaged stockpiles (obsolete pesticides and wastes contaminating pesticides including POPs) to regional temporary storage depots.</i>			
4-2-5	<i>Select contractor for the international transport and disposal of all repackaged stocks.</i>			
4-1-6	<i>Export repackaged obsolete pesticides stockpile for safe disposal outside the country.</i>			

### **3.7 SECTION 2: PCBS SUBSTANCES**

**3.7.1 Goals: Reduce risks and minimize impacts caused by PCBs with sound economical and ecological management.**

**3.7.2 Overall Objectives: Proper economical and ecological management of PCBs and its contaminated article.**

#### **KEY PROBLEMS:**

- No specific PCBs regulation in force in Lao PDR;
- Based on economic situation of Lao PDR, no replacement of old transformers;
- Old transformers continue to be used in Lao PDR and are PCB contaminated;
- Lao PDR is still importing transformers without PCB controls;
- To date PCBs continue to be released to the environment as a result of lack of awareness of PCBs hazards;
- No appropriate & specific maintenance for PCB contaminated transformers;
- No PCBs disposal facilities available with safe environmental standards;
- Electrical workers face high risks caused by PCB associated work;
- No specific measures for health and environmental protection for people affected by PCBs;
- No supply of safe protective equipment for workers;
- Workers are not aware of the risks of PCBs on health;
- Lack of knowledge and understanding on the risks, safe and sound management of PCBs; and
- Lack of data and information for proper management of PCBs.

#### **3.7.3 Action Plans**

**3.7.3.1 Objective 1: Develop legal instruments and technical standards for managing equipment and articles contained and contaminated with**



## PCBs.

### 3.7.3.1.1 Outputs:

- PCBs management, including legal instruments and tools, adapted and available in Lao PDR;
- Technical guidelines for sound management of PCBs, dielectric capacitors, equipment and articles contained and contaminated with PCBs available;
- Stakeholders will be better aware of measures to protect their health and the environment from PCBs;
- Stakeholders (EDL and maintenance companies) will be aware of sound economical and ecological management of PCB transformers until the end of life;
- Professional workers' health and the environment protected; and
- Compliance with the obligations of the Stockholm Convention.

### 3.7.3.1.2 Activities:

Code	Activities / Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Develop legal instruments and technical guidelines for managing PCBs releases</b>	<b>12 months</b>	<b>MEM</b>	<b>WREA, MoJ, MIC, relevant private sector, concerned local authorities</b>
1-1-1	<i>Form legal and technical working group including all PCBs stakeholders.</i>			
1-1-2	<i>Study existing legal instruments and technical guidelines related to PCBs management.</i>			
1-1-3	<i>Develop legal instruments and technical guidelines and standards as necessary for PCBs management.</i>			
1-1-4	<i>Organize workshop for comments on the draft legal instruments before official approval.</i>			

### 3.7.3.2 Objective 2: Develop ESM of in-use electrical equipment and accessories /articles containing and/or contaminated with PCBs.

#### 3.7.3.2.1 Outputs:

- Adequate information and data on in-use electrical equipment and accessories/articles containing and/or contaminated with PCBs;
- In-use electrical equipment and articles containing or contaminated with PCBs identified, classified, labeled and registered;
- In-use electrical equipment and articles containing and/or contaminated with PCBs kept in use in an environmentally sound manner until the end of life; and
- Strategy for the reduction of in-use electrical equipment and articles containing and/or contaminated with PCBs prepared.

3.7.3.2.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
2-1	<b>Conduct full inventory (in use, waiting for use, and out of use) in order to identify equipment and articles containing and/or contaminated with PCBs.</b>	<b>18 months</b>	<b>WREA, MEM,</b>	<b>EDL, MIC, MPI, key stakeholders</b>
2-1-1	<i>Form team for inventory and study on existing inventory reports;</i>			
2-1-2	<i>Identify support tools and equipment for inventory, and develop plans to conduct PCBs inventory.</i>			
2-1-3	<i>Conduct comprehensive inventory (including testing, classifying, labeling, registering, etc.) of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-1-4	<i>Design and develop national database on electrical equipment and articles containing or contaminated with PCBs.</i>			
2-2	<b>Take measure to manage the in-use of electrical equipment and articles containing or contaminated with PCBs in an environmentally sound manner.</b>	<b>12 months</b>	<b>WREA, MEM</b>	<b>EDL, MPI stakeholders</b>
2-2-1	<i>Identify sites of electrical equipment and articles (including workshops, stations, substations, and pole mounted) for prioritization of management in an environmentally sound manner.</i>			
2-2-2	<i>Apply management in environmentally sound manner at selected sites.</i>			
2-2-3	<i>Take action to stop the intention for repairing transformers contaminated with PCBs (with high concentration &gt;10% next step with concentration &gt;0.05 %).</i>			
2-3	<b>Develop strategy to reduce the in-use electrical equipment and articles containing or contaminated with PCBs.</b>	<b>24 months</b>	<b>WREA, MIM</b>	<b>EDL, MIC, MoF, stakeholders</b>
2-3-1	<i>Initial assessment (current and future) of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-3-2	<i>Develop strategy for the reduction of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-3-3	<i>Develop and implement demonstration (pilot) project in PCBs reduction.</i>			

**3.7.3.3 Objective 3: Set up a management tool for transformers in use until the end of life considering the socio economic aspects (keep in use or phase out)**

**3.7.3.3.1 Output:**

- Strategy related to the socio-economic aspects of transformers in use in the country developed.

**3.7.3.3.2 Activities:**

<b>Code</b>	<b>Activities/Tasks</b>	<b>Timing</b>	<b>Responsible Institution</b>	<b>Cooperating Institutions</b>
<b>3-1</b>	<b>Pilot risk assessment</b>	<b>6 months</b>	<b>MEM</b>	<b>WREA, EDL, MIC, MoF, key stakeholders</b>
3-1-1	<i>Form a working group of different stakeholders.</i>			
3-1-2	<i>Prepare plan of pilot risk assessment project (selection of a representative population sample: 100 units).</i>			
3-1-3	<i>Conduct site assessment.</i>			
3-1-4	<i>Identify issues of risk assessment.</i>			
3-1-5	<i>Organize and conduct the conclusion workshop with stakeholders (legal issues, technical issues, financial issues).</i>			
<b>3-2</b>	<b>Complete assessment</b>	<b>24 months</b>	<b>MEM</b>	<b>EDL, MoH, WREA, Key stakeholders</b>
3-2-1	<i>Form a working group with the participation of different stakeholders</i>			
3-2-2	<i>Develop plan of complete risk assessment</i>			
3-2-3	<i>Conduct complete site assessment</i>			
3-2-4	<i>Identify issues of complete risk assessment</i>			
3-2-5	<i>Organize and conduct the national conclusion workshop with stakeholders (legal issues, technical issues, financial issues)</i>			
<b>3-3</b>	<b>Make measures to prevent PCBs infiltration and releases from electrical equipment</b>	<b>12 months</b>	<b>MEM</b>	<b>EDL, MIC, key stakeholders</b>
3-3-1	<i>Develop regular monitoring program to identify electrical equipment required to offer preventive facility of PCBs infiltration and release.</i>			
3-3-2	<i>Repair or offer preventive facility of PCBs infiltration and release in environmentally sound manner.</i>			

**3.7.3.4 Objective 4: ESM of out-of-use of equipment, articles and wastes containing and/or contaminated with PCBs (Handling, transportation, dismantling, pre-treatment, storage, final disposal)**

**3.7.3.4.1 Outputs:**

- Adequate information and data on out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs available
- ESM of Out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs implemented
- Strategy for the elimination of out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs implemented

**3.7.3.4.2 Activities:**

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
4-1	<b>Take measure to manage the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in environmentally sound manner.</b>	24 months	MEM	WREA,EDL, MIC, key stakeholders
4-1-1	<i>Training for ESM of out of use electrical equipment, articles and wastes containing or contaminated with PCBs (handling, transportation, storage, dismantling, pre-treatment, shipment of used PCB to the out of country disposal facilities).</i>			
4-1-2	<i>Form working group with participation of the stakeholders</i>			
4-1-3	<i>Identify storage sites and facilities for keeping out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-1-4	<i>Upgrade (or new establish if require) storage sites and installed facilities for keeping out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-1-5	<i>Take action to centralize the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-2	<b>Develop strategy for destroying the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in environmentally sound manner.</b>	12 months	MEM	EDL, MIC, WREA, key stakeholders

4-2-1	<i>Undertake assessment (current and future) of out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs for destruction including utilization of disposal facilities in the country; and evaluation of disposal facilities out of the country.</i>			
4-2-2	<i>Conduct assessment with participation of the stakeholders for the disposal of out of use equipment, articles containing or contaminated with PCB.</i>			
4-2-3	<i>Develop strategy for the destruction of the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs (Handling, transportation, storage, dismantling, pre-treatment and final disposal).</i>			
4-2-4	<i>Organize and conduct the national workshop for comments and approval of the draft strategy for the destruction of the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			

### **3.7.3.5 Objective 5: Strengthen capacity and enhance public awareness on PCBs issue**

#### **3.7.3.5.1 Outputs:**

- The capacity of electrical workers working with PCBs strengthened;
- Knowledge and information on PCB hazards and risks widely provided and disseminated;
- Personal protective equipment and a safe working environment help reducing the impact of PCBs; and
- Capacity of laboratory for analyzing PCBs strengthened.

#### **3.7.3.5.2 Activities:**

<b>Code</b>	<b>Activities/Tasks</b>	<b>Timing</b>	<b>Responsible Institution</b>	<b>Cooperating Institutions</b>
<b>5-1</b>	<b>Provide and strengthen capacity for managing PCBs dielectric and its contaminated articles.</b>	<b>12 months</b>	<b>WREA, MEM</b>	<b>EDL, Provincial Electricity, MIC, MoF, stakeholders</b>
5-1-1	<i>Develop materials on PCBs issues and publicize.</i>			
5-1-2	<i>Organize training on PCBs sound management related issues for national and provincial levels.</i>			
<b>5-2</b>	<b>Provide and strengthen laboratory capacity in analyzing PCBs.</b>	<b>18 months</b>	<b>MEM</b>	<b>WREA, MIC,</b>

				<b>stakeholders</b>
5-2-1	<i>Strengthen laboratory staff's capacity for PCBs analysis</i>			
5-2-2	<i>Assess existing lab facilities and analytical capacities</i>			
5-2-3	<i>Select appropriate PCB analytical techniques.</i>			
5-2-4	<i>Provide PCB analytical equipment</i>			
5-2-5	<i>Provide information to stakeholders</i>			
5-2-6	<i>Upgrade laboratory facilities for analyzing PCBs</i>			

### **3.8 SECTION 3: UNINTENTIONALLY PRODUCED POPs**

#### ***3.8.1 Goals: Reduce and eliminate the release of unintentionally produced POPs***

#### ***3.8.2 Overall Objectives: Proper management of the release of unintentionally produced POPs***

#### **KEY PROBLEMS**

- Lack of awareness building to all key stakeholders: ministries and governmental institutions, private sector, mass organizations, civil societies, academic institutions and community of unintentionally produced POPs, including generation and hazards;
- Insufficient regulations related to management of unintentionally produced POPs;
- Lack of technical expertise and technical guidelines for management of unintentionally produced POPs;
- Uncontrolled burning (waste at municipality and rural landfills, household, public areas, forests, etc);
- Lack of control measures for reducing the release of unintentionally produced POPs from all sources;
- Lack of technical facilities to reduce the release of unintentionally produced POPs;
- No waste separation policy and limited in practice (by interest groups like scavengers);
- No data records regarding the incidence of unintentionally produced POPs, namely dioxin from Agent Orange, poor database management system and information exchange mechanism among the government institutions and stakeholders; and
- Lack of laboratory and equipment facilities for appropriate monitoring and analyzing unintentionally produced POPs.



### 3.8.3 Action Plans

#### 3.8.3.1 Objective 1: Revise or develop legislation related to the sound management of unintentionally produced POPs.

##### 3.8.3.1.1 Outputs:

- Relevant legislation revised or developed;
- Unintentionally produced POPs management guidelines available;
- Legislation related to, and guidelines for, the management of unintentionally produced POPs enforced and widely implemented;
- Broad understanding and awareness about the relevant laws and other legal instruments disseminated and promoted; and
- The implementation of reduction measures for unintentionally produced POPs release will be effective.

##### 3.8.3.1.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>1-1</b>	<b>Undertake law and policy assessment related to the management of unintentionally produced POPs.</b>	<b>12 Months</b>	<b>WREA</b>	<b>MoD, MoJ , Local Authorities,</b>
1-1-1	<i>Review existing laws and legal instruments related to the management of unintentionally produced POPs</i>			
1-1-2	<i>Assess the legal instruments related to the management of Unintentionally Produced POPs</i>			
1-1-3	<i>Prepare assessment report on current situation; identify the gaps, and requirements for development of law on the management of unintentionally produced POPs</i>			
<b>1-2</b>	<b>Amend existing laws, or develop new law(s) where necessary related to the management of unintentionally produced POPs.</b>	<b>20 Months</b>	<b>WREA</b>	<b>MEM, MoJ , Local Authorities, Private Sectors</b>
Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
1-2-1	<i>Form legal team on the management of unintentionally produced POPs</i>			
1-2-2	<i>Conduct a training course on legislation for the management of unintentionally produced POPs</i>			
1-2-3	<i>Organize national workshop to discuss the current situation of laws and policies related to the management of unintentionally produced POPs</i>			

1-2-4	<i>Amend the existing laws, or develop new ones, and develop a policy on the management of unintentionally produced POPs. Disseminate, monitor, assess and report realization of this new regulation or policy</i>			
<b>1-3</b>	<b>Develop the national guidelines for the sound management of unintentionally produced POPs (BAT / BEP)</b>	<b>36 Months</b>	<b>WREA</b>	<b>MEM, MIC, MoH , key stakeholders</b>
1-3-1	<i>Form technical team for development of the national guidelines for the sound management of unintentionally produced POPs</i>			
1-3-2	<i>Identify and prioritize relevant unintentionally produced POPs release source categories</i>			
1-3-3	<i>Study the available relevant guidance documents on BAT &amp; BEP approved by COPs</i>			
1-3-4	<i>Develop national guidelines on the sound management of unintentionally produced POPs</i>			
1-3-5	<i>Introduce, disseminate, monitor, assess and report the implementation of the developed national guidelines to all stakeholders (through meetings or workshops)</i>			

**3.8.3.2 Objective2: Strengthen capacity and raise public awareness on unintentionally produced POPs issues and hazards.**

**3.8.3.2.1 Outputs:**

- Capacity for sound management of unintentionally produced POPs of the relevant institutional officers strengthened, and
- The public will be aware of the risks and hazards caused by unintentionally produced POPs and actively participate in the prevention of future releases.

**3.8.3.2.2 Activities:**

<b>Code</b>	<b>Activities/Tasks</b>	<b>Timing</b>	<b>Responsible Institution</b>	<b>Cooperating Institutions</b>
<b>2-1</b>	<b>Strengthen and develop the capacity to manage problems related to unintentionally produced POPs</b>	<b>36 Months</b>	<b>WREA</b>	<b>MoD,MIT, MEM, MoH, Key stakeholders</b>
2-1-1	<i>Form technical team and core trainer on unintentionally produced POPs.</i>			
2-1-2	<i>Develop training material on unintentionally produced POPs.</i>			
2-1-3	<i>Provide appropriate information on unintentionally produced POPs for decision makers.</i>			

2-1-4	<i>Strengthen capacity of institutional officers and authorities, including private sector responsible for implementation of legal documents and guidelines relevant to sound management of unintentionally produced POPs.</i>			
2-2	<b>Develop public awareness raising program on health and environmental impact affected by unintentionally produced POPs, and alternative uses.</b>	<b>36 Months</b>	<b>WREA</b>	<b>MIC, MEM, MoH, Key stakeholders</b>
2-2-1	<i>Develop awareness raising program on unintentionally produced POPs.</i>			
2-2-2	<i>Develop information material for public awareness raising on unintentionally produced POPs.</i>			
2-2-3	<i>Organize awareness raising campaigns on unintentionally produced POPs through mass media and direct actions to poor community and vulnerable people focusing in particular on uncontrolled burning of wastes, household cooking in using improper fuel and 3R principles (Reduce, Reuse, and Recycling).</i>			

### 3.8.3.3 Objective 3: Improve waste management practices and prevent uncontrolled burning of wastes

#### 3.8.3.3.1 Outputs:

- Improved waste management
- Reduced total amount of waste
- Reduced uncontrolled burning, and
- Improved capacity for environmentally sound waste incineration.

#### 3.8.3.3.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
3-1	Improve landfill management	18 Months	WREA, Selected Local Authorities	MoD, MPWC, MoH, MIC, Key stakeholders
3-1-1	<i>Form technical team for landfill assessment.</i>			
3-1-2	<i>Conduct selected municipality and provincial landfill assessment.</i>			
3-1-3	<i>Develop improved landfill management program.</i>			
3-1-4	<i>Conduct training course on landfills management for the municipality and provincial authorities.</i>			

3-1-5	<i>Design and implement municipal and provincial landfills management pilot project.</i>			
<b>3-2</b>	<b>Introduce and promote sound management of waste including 3R principles and waste separation practices</b>	<b>18 Months</b>	<b>WREA, Selected Local Authorities</b>	<b>MPWC, MoD, MoH, Key stakeholders</b>
3-2-1	<i>Establish technical team for sound waste management.</i>			
3-2-2	<i>Study available guidance documents on sound waste management practices set under the UNEP-Basel and the Stockholm Conventions.</i>			
3-2-3	<i>Elaborate waste management guidelines suitable for Lao PDR focusing on implementation of 3-R principles.</i>			
3-2-4	<i>Provide country-wide training on waste management guidelines implementation involving local authorities</i>			
3-2-5	<i>Design and implement pilot project on environmentally sound waste management</i>			
<b>3-3</b>	<b>Introduce and promote implementation of BAT &amp; BEP in existing waste incineration plants (municipal, hospital and industrial wastes)</b>	<b>18 Months</b>	<b>WREA</b>	<b>MPWC, MoD, MIC, MoH, CP Center</b>
3-3-1	<i>Establish technical team associated with the field of the waste incineration.</i>			
3-3-2	<i>Study existing guidelines and information related to BAT and BEP and other guidelines to be adopted by the COP for environmentally sound waste incineration (refer to activity 1-3)</i>			
3-3-3	<i>Undertake assessment of applicability of BAT and BEP (such as CP) in existing waste incineration plants including socio-economic assessment, cost- benefits and/or cost-effectiveness analysis</i>			
3-3-4	<i>Design and implement pilot project on the applicability of BAT and BEP (starting with CP) guidance in selected existing waste incineration plant</i>			
3-3-5	<i>Update the national guidelines on BAT/BEP if necessary</i>			
3-3-7	<i>Organize training for responsible institutional officers and authorities and for plant operators on BAT/BEP, including CP</i>			
<b>3-4</b>	<b>Evaluate the possibility of hazardous waste co-incineration in the newly constructed cement plant under BAT&amp; BEP conditions</b>	<b>18 Months</b>	<b>MIT, selected cement plant</b>	<b>WREA, MIT, PoH, MPWC, Key stakeholders</b>

3-4-1	<i>Establish technical team consisting of plant owners and relevant state authorities</i>			
3-4-2	<i>Evaluate the possibilities of alternative fuel use (used tires, PCBs contaminated oils etc.) in the newly constructed cement plant</i>			
3-4-3	<i>Perform cost-benefit analysis of hazardous waste co-incineration</i>			
3-4-4	<i>Identify necessary additional measures for environmentally sound hazardous waste co-incineration</i>			

### 3.8.3.4 Objective 4: Maintaining of comprehensive inventories of unintentionally produced POPs.

#### 3.8.3.4.1 Output:

- Adequate data on the release of unintentionally produced POPs is available.

#### 3.8.3.4.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
4-1	<b>Undertake comprehensive inventory on the release of unintentionally produced POPs.</b>	<b>24 Months</b>	<b>WREA</b>	<b>MoD, MPI (National Statistic Department), MoH, Local authorities, Key stakeholders</b>
4-1-1	<i>Form inventory team and review existing inventory report</i>			
4-1-2	<i>Identify support tools and equipment for inventory</i>			
4-1-3	<i>Conduct unintentionally produced POPs release inventory at national level</i>			
4-1-4	<i>Design national unintentionally produced POPs database</i>			
4-1-5	<i>Disseminate final result of unintentionally produced POPs release inventory</i>			
4-1-6	<i>Evaluate the situation of POPs reduction and elimination</i>			

**3.8.3.5 Objective 5: Implementation of guidelines on Best Available Techniques (BAT) and Best Environmental Practice (BEP) to prioritized sources of unintentionally produced POPs**

**3.8.3.5.1 Output:**

- Amount of release of unintentionally produced POPs reduced.

**3.8.3.5.2 Activities:**

5-2	<i>Promote the use of BAT/BEP in SMEs and establishment of BAT/BEP Fund</i>	36 months	MIT, and SMEs	WREA, Local authorities, Key stakeholders
5-2-1	<i>Create the national technical working group on BAT/BEP in close collaboration with key stakeholders: WREA, MIT, the National CP Center, the SME Office and National University; update the list of SMEs and select targeted SMEs to use BAT/BEP, starting with CP</i>			
5-2-2	<i>Design, test, conduct, assess and improve BAT/BEP (initiating CP) training material related to POPs</i>			
5-2-3	<i>Undertake cost-benefit and cost-effectiveness analysis on BAT/BEP, including CP related to POPs and its links with climate change requirements in order to promote the use of BAT/BEP, starting with CP in SMEs</i>			
5-2-4	<i>Establish BAT/BEP Fund in assisting SMEs on the use of BAT/BEP, including CP</i>			
5-2-5	<i>Monitor, assess, report and improve the performance of the established BAT/BEP Fund</i>			
5-2-6	<i>Monitor, assess, report and improve performance of SMEs on the use of BAT/BEP (including CP). Appropriate replication of BAT/BEP related to POPs, including CP trainings to SMEs at the national level; Continue to assist SMEs with the economic incentive</i>			

**3.9 SECTION 4: MANAGEMENT OF NIP IMPLEMENTATION**

**3.9.1 Goals: Support to Successful Implementation of the NIP**

**3.9.2 Overall Objectives: Develop a National Program for the management of NIP Implementation**



## KEY PROBLEMS

- The existing Project National Steering Committee and Coordination Unit for the NIP development process do not have clear mandate to coordinate the realization of the NIP;
- Weak coordination system and limited administrative and management capacity among stakeholders in particular for NIP's projects implementation;
- Insufficient capacity in POPs project for raising funds and POPs project proposal development;
- Lack of policy making evidence related to POPs reduction and elimination;
- Limited capacity in the NIP monitoring, evaluation and reporting system;
- Lack of database management system on chemical issues including POPs and PTS for information dissemination and distribution;
- Limited communication system related to chemical information exchange including POPs and PTS at the national, regional, and international level;
- Lack of specific regulation on chemical management including POPs and PTS; and
- No chemical engineering courses being fully conducted at any academic institution in the country

### 3.9.3 Action Plans

#### 3.9.3.1 *Objective 1: Strengthening the existing mechanism for efficient and effective management of NIP implementation.*

##### 3.9.3.1.1 *Outputs:*

- The national mechanism for the management of NIP implementation strengthened;
- The NIP implementation and management efficiently and effectively coordinated;
- The NIP reporting, evaluation and updating executed on time;
- The capacity of stakeholders relevant to NIP implementation promoted;
- The National Chemical Database will be developed and information exchange executed nationally and internationally;
- The Chemical Management Legislation will be developed and implemented; and
- The chemical engineering curriculum will be designed and fully conducted at the National University of Laos.

##### 3.9.3.1.2 *Activities:*

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation.</b>	<b>36 Months</b>	<b>WREA</b>	<b>MEM, MoH, MAF, MIT, MoD and key stakeholders</b>
1-1-1	<i>Coordinate policy development on sound management of chemicals including POPs and</i>			

	<i>PTS (Persistent Toxic Substance).</i>			
1-1-2	<i>Strengthen the administration management in POPs project implementation</i>			
1-1-3	<i>Assist and support stakeholders in development of project proposal for funding</i>			
1-1-4	<i>Communicate with stakeholders for NIP implementation</i>			
1-1-5	<i>Communicate with donor agencies for assisting NIP implementation</i>			
1-1-6	<i>Undertake NIP monitoring, evaluation, reporting, and updating</i>			
<b>1-2</b>	<b>Establish and design the National Chemical Database including POPs for centralization and exchanging of information</b>	<b>36 Months</b>	<b>WREA</b>	<b>MEM, MoH, MAF, Stakeholder</b>
1-2-1	<i>Identify the scope of the National Chemical Database and design for harmonious integration of information and dissemination related to chemical management</i>			
1-2-2	<i>Integrate the results of all three sections of POPs action plans implementation into a single and will be used as reference document.</i>			
1-2-3	<i>Integrate the existing information related to chemical management into the National Chemical Database</i>			
1-2-4	<i>Organize regular national workshops for presenting and integration of NIP project achievements into the National Chemical Database</i>			
1-2-5	<i>Strengthen capacity of relevant chemicals management including POPs action plan implementers how to access the communication system and how to share POPs information into the system</i>			
1-2-6	<i>Develop plan and apply chemicals data entry including POPs information exchange strategies and implementation of action plans regarding the Improvement and Updating of The National Chemical Database</i>			
1-2-7	<i>Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally</i>			
1-2-7	<i>Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally</i>			

<b>1-3</b>	<b>Develop Hazardous Chemicals and Substances Management Legislation</b>	<b>36 months</b>	<b>WREA</b>	<b>MoJ, MoH, MAF, MIT, MoD, and other key stakeholders</b>
1-3-1	<i>Form technical working group on the formulation of the Chemicals and hazardous substances Management Law of Decree; Assess existing regulation related to chemicals and hazardous substances management</i>			
1-3-2	<i>Design, test, conduct trainings, and assess appropriateness of training material related to the methodology on the formulation of “Hazardous Chemicals and Substances Management Decree or Law”</i>			
1-3-3	<i>Formulate “Hazardous Chemicals and Substances Management Decree or Law”; Conduct consultation workshops on the “Hazardous Chemicals and Substances Management Decree or Law Draft”</i>			
1-3-4	<i>Finalize and submit the final draft of “Hazardous Chemicals and Substances Management Decree or Law” for approval</i>			
1-3-5	<i>Publish and disseminate the approved legislation at the national level. Monitor and assess the implementation of this approved legislation</i>			
<b>1-4</b>	<b>Promote the conduct of chemical engineering course at targeted academic institutions</b>	<b>36 months</b>	<b>NUOL</b>	<b>WREA, Engineering Faculty, other key stakeholders</b>
1-4-1	<i>Form technical team on the design of chemical engineering curriculum to be fully delivered at the targeted academic institutions: National University of Laos</i>			
1-4-2	<i>Design, test, conduct, monitors, assess, report and improve the chemical engineering course</i>			
1-4-3	<i>Train trainers on chemical engineering course delivery</i>			
1-4-4	<i>Monitor, assess and report the efficiency of chemical engineering course being delivered</i>			
1-4-5	<i>Appropriate replication of chemical engineering course at other academic institutions as appropriate</i>			

### 3.10 REQUIREMENTS FOR ACHIEVING GOALS

This section identifies the requirements related to sound management of chemicals including POPs, but does not describe the common activities associated with each requirement. In practice, requirements should be considered as integrated into a sound management system for chemicals which improves public health and environmental quality, improves the socio-economic situation, enhances public awareness on POPs, and finally achieves the goals and objectives proposed in this document. The following points are identified as a commitment and basis of the Government of Lao PDR in an effort of total reduction and elimination of all POPs substances in the country:

- Creating the appropriate legal instruments and framework through which step by step elimination of POPs pesticides and PCBs, and reduction of unintentionally produced POPs releases, can occur including promotion of enforcement of existing laws and the development of POPs monitoring guidelines and development of POPs elimination laws;
- Institutional development and stakeholders' participation such as awareness raising among the public on POPs hazards, development of existing national laboratory capacity for POPs identification and analysis with contributions of the private sector for elimination efforts;
- Human resources development on POPs perception and hazards and POPs elimination aspects comprising of training and education at the farmer's level, local authorities' level, business level, and decision makers level, and permeating awareness about POPs into formal and non-formal education curriculum systems;
- Information development and management of POPs including POPs inventory, development and reviewing and conducting health and environmental impact assessments, and establishment of a POPs information center for accessing and exchange the information;
- Creating networks between local and national information centers and also between national, regional and international research centers in order to conduct research actions on POPs releases and impacts;
- Development of an action plan on POPs reduction and elimination where possible;
- Working with stakeholders and decisions makers to implement the NIP;
- Facilitate implementation of the NIP on POPs management, reduction, and elimination where possible;
- Encouraging all actions and initiatives to find suitable options and alternatives to POPs for which Lao PDR actions are being reduced and eliminated; and
- Offering an appropriate laboratory facility to identify and analyze POPs. Supply of field inventory equipment, technical survey equipment and transportation means and database management facilities are also required. Information exchange systems will be located at WREA.

Lao PDR is among the least developed countries. Effective management of POPs in a sound environmental manner must be combined with the continuous support and strong commitment of the international donor community to Lao PDR. For POPs reduction and elimination efforts under the obligations of the Stockholm Convention, Lao

PDR needs more financial support from external sources and to be combined with in-kind and cash contribution from the Government of Lao PDR. This financial requirement is used for supporting the costs for administration, materials, equipment, operation, and project management. The Government of Lao PDR will contribute additional technical staff for supportive activities related to the timely and effective implementation of the NIP. The Government of Lao PDR through the Focal Point of the Cabinet office, Water Resources and Environment Administration and through the cooperation of line ministries and all key stakeholders will provide the inputs for the effective execution of this NIP including office, stores, water and electricity supply, infrastructure, etc.

The GEF and bilateral donor governments are requested to provide inputs for the effective implementation of the NIP including experts, consultants, administrative support, office travel, contractual services, general operating expenses, supplies and materials, office and field equipment, specialized POPs laboratory equipment, training equipment, study tours, international conferences and meetings, and in-service and on-site trainings.

### **3.11 RESOURCE REQUIREMENTS**

For the implementation of this NIP, the total budget needed approximates USD 13,585,000 excluding budget for disposal of obsolete pesticides and PCBs. This budget will cover the management of POPs pesticides to an amount of USD 2,305,000, for PCBs to an amount of USD 2,230,000, for unintentionally produced POPs to an amount of USD 6,600,000 and for coordinating activities for NIP implementation to an amount of USD 2,450,000. The resource requirement is included in each priority project portfolio (See Part 3: Project Profiles). In accordance with Article 13 of the Convention, alternate sources of funding will be considered.

The Government of Lao PDR through the Water Resources and Environment Administration, the Ministry of Agriculture and Forestry, Ministry of Industry and Trade, Ministry of Energy and Mines, and other relevant Ministries would provide the following inputs for the effective implementation of the NIP: direct consultations through the technical departments and national consultants, additional technical staff at all levels as may be required, would be made available to the NIP. At the same time, the government would also contribute up to 5 percent (ceiling point) of total required budget respectively in cash and/or in-kind such as office accommodation, stores, infrastructure, salary and wages of the staff/scientists and other miscellaneous items associated with the NIP for its successful implementation.

The Donor input will ideally be provided through the Water Resources and Environment Administration, the National Focal Point. Both bilateral and multilateral assistance can be incorporated in the implementation of the NIP. The donor inputs for the effective implementation of the NIP should consider and envisage: experts, consultants, administrative support, official travel, service contract, general operating expenses, trainings, supplies and materials, equipment and other miscellaneous items for effective implementation of the NIP.

### 3.12 TIMETABLE FOR IMPLEMENTATION OF NIP, FIRST FOUR YEARS (2010-2014)

This National Plan for implementation of the Stockholm Convention is determined in four-year operation period (2010-2014) as in the following table. 2010 is a year of Connection Bridge for Lao PDR to prepare and be ready to implement the first national implementation plan. At this stage, Lao PDR is looking forward to secure funds through international, multilateral and or bilateral channels in order to implement the NIP. A summary of the goals contained in the detailed strategy with specific activities and milestones are described in the following table:

**Table1: Tentative Timetable for Implementation of National Plan**

STAGE	2010	2011	2012	2013	2014
<b>I- Priority Projects Proposal For Funding</b>					
Develop NIP project profiles and submit to GEF and other donor institutions					
<b>I-NIP Project Development Phase</b>					
1. Set-up the project implementation framework					
2. NIP staff selection					
3. Site selection for execution of the project					
<b>II- NIP Project Implementation Phase</b>					
1. Site preparation and budget for project operation					
2. Collect relevant data and establish the National Chemical Database					
3. Undertake training program					
4. Review and develop national laws, regulations related to chemical management including POPs					
5. Develop provisional national POPs management and elimination strategy					
6. Upgrade existing laboratories for enable POPs analysis					
7. Organize POPs awareness raising campaigns					
8. Conduct full POPs inventory					
9. Support sound disposal of POPs					
10. Support and conduct study and research on POPs related issues					
11. Working with stakeholders on sound management of POPs and support program					
12. Evaluate, report and update the NIP					



### **3.13 MONITORING, EVALUATION, REPORTING AND UPDATING NIP**

This National Implementation Plan (NIP) is directly aimed at implementing the provisions of the Stockholm Convention that is suitable and practical in Lao PDR for the four year time scale. The protection of human health and the environment in the longer term in the country through reduction and elimination of POPs will contribute to improve human health, improve local capacity and economic standards, and hence make a contribution to the implementation of the objectives under the framework of the Stockholm Convention on Persistent Organic Pollutants.

The Water Resources and Environment Administration is the lead agency managing the implementation of the NIP; the National Coordination Unit will act as a coordination body. The main role of this coordination body is to:

- Coordinate the execution of the National Action Plan,
- Facilitate the development of project proposals and fund raising for sound management of POPs,
- Communicate with donor agencies for assisting in NIP implementation, and
- Act as a central point for information exchange and national chemical database management.

### **3.14 MONITORING AND EVALUATION OF NIP IMPLEMENTATION**

Progress reporting will be based on the logical framework analysis, according to the performance measurement framework suggested in Annex 3. The Lao PDR POPs Coordination Unit, through the POPs National Focal Point and Coordinator will provide all reports to the Secretariat of the Stockholm Convention as scheduled including Progress Reports, an Annual Report at the completion of the first year, and a final report after completion of the NIP. To complement the National Report and Effective Assessment Report as well as Elimination of POPs Reports, it is also planned to conduct an evaluation of results and performance for inclusion in these reports.

The question to be asked in the evaluations is: Has Lao PDR succeeded in making a difference and if so, how much? It is not sufficient to simply measure the number and quantity of POPs eliminated, nor is it sufficient to measure the area cleared from POPs. What matters is to try and achieve the maximum social-environmental-economic benefits of the POPs elimination actions per dollar spent. In addition to a positive response to these questions, another question remains to be answered positively: have the technical assistance and resources provided from GEF been used in a sustainable manner, including resources from government and from donor agencies. This question also requires a more pertinent response than simply a measure of the number of persons completing training courses or gaining understanding about POPs hazards. What matters is a real change in mentality and behavior of people in all classes of society.

### **3.15 NIP REPORTING AND UPDATING**

Representatives of key stakeholders would review and assess the work completed to date at regular intervals. The NIP implementation results and progress reports regarding the implementation of the POPs elimination action plan will be reported by the

Government of Lao PDR representative to the Secretariat of the Stockholm Convention; the progress reports will be updated every year to provide a more current statement of the NIP operational status and results.

Each yearly report will contain a narrative assessment that highlights overall progress in relation to the POPs operational elimination plan. Any specific achievements and problems will be described in detail, and any situations requiring special attention from the Secretariat of the Stockholm Convention will also be noted in the report.

Baseline information and other activities will be managed by the Water Resources and Environment Administration. A schedule of release data for implementation of POPs elimination action plan reports would be made available to all stakeholders, and relevant results would be disseminated to all interested parties including local community representatives.

# *Chapter 4*



## **CHAPTER 4**

### **PROPOSED PRIORITY PROJECTS**

The main objective of the proposed priority projects is the development of effective governmental institutions and networks at all levels in realizing this NIP, which will contribute to the commitment of Lao PDR in implementing the SC. Local people and authorities will be directly involved in developing alternatives to the use of POPs, and in local health and environmental protection activities.

This NIP is a direct response to the lack of existing capacity at all levels in the government, private sector, and the population at large. It would assist in building capacity through professional and technical training, assistance with development and creating appropriate political and legal frameworks and enforcement systems. Management capacities and systems specifically in institutional development and public participation would be strengthened, and stakeholder capacity in terms of human resources and information systems development would be enhanced through improved information dissemination and management.

Specific components of the NIP such as training programs, POPs inventory, POPs technical research, and awareness raising programs are innovative, and would be implemented for the first time in Lao PDR. The objective of the NIP is to effectively utilize funding resources from the GEF, donor governments, and the Government of Lao PDR to help build national capacity on POPs reduction and elimination. Funding from GEF and the donor community is required to ensure POPs reduction and elimination in Lao PDR. The NIP is also intended to develop appropriate approaches to reconciling social, economic, health, and environmental objectives at the local and worker's level, and to help build community participation systems aimed at POPs elimination. In order to strengthen capacity for participation and implementation of the Stockholm Convention, the proposed priority projects for future implementation are:

#### **4.1 PRIORITY PROJECTS FOR POPS PESTICIDES REDUCTION AND ELIMINATION**

**Project A1:** Undertake assessment of existing laws and other technical standards for amendment, and promotion of effective law enforcement;

**Project A2:** Strengthening capacity of relevant institutions to prevent the import, trafficking and use of illegal pesticides;

**Project A3:** Strengthening capacity in analysis of pesticides focusing on POPs;

**Project A4:** Raising public awareness on pesticides issues, including POPs pesticides and other obsolete pesticides;

**Project A5:** Raising awareness of policy and decision-makers on pesticides issues, including obsolete pesticides and POPs pesticides;

**Project A6:** Comprehensive inventory on obsolete pesticides including POPs pesticides;

**Project A7:** Monitoring process on the trafficking of illegal pesticides, including POPs pesticides;

**Project A8:** Collecting campaign for temporary storage of obsolete pesticides, including POPs pesticides, in regional storage depots prior to disposal;

**Project A9:** Environmentally Sound Management of Obsolete Pesticides including Pops Pesticides through safe disposal; and

#### **4.2 PRIORITY PROJECTS FOR PCBS MANAGEMENT**

**Project B1:** Develop legal instruments or technical guidelines for managing PCBs;

**Project B2:** Comprehensive inventory of equipment and accessories containing and contaminated with PCBs;

**Project B3:** Environmentally Sound Management for “In Use” Equipment;

**Project B4:** Assessment of socio-economic aspects for phasing out of electrical equipment and accessories which contain or are contaminated with PCBs;

**Project B5:** ESM compliance of the maintenance and repair of electrical equipment;

**Project B6:** Strengthening laboratory capacity for PCBs analysis;

**Project B7:** Environmentally Sound Management of “out of use” equipment;

**Project B8:** Capacity Building and Public Awareness on PCBs issue

**Project B9:** Establishment of PCBs database management

#### **4.3 PRIORITY PROJECTS FOR THE MANAGEMENT OF UNINTENTIONALLY PRODUCED POPS**

**Project C1:** Legislation related to sound management of unintentionally produced POPs;

**Project C2:** Research on Health Risk Management of Unintentionally POPs Specifically on the Dioxin/Furan from Agent Orange and Industrial sectors and waste incinerators plants;

**Project C3:** Institutional strengthening and capacity building for Environmentally Sound Management of unintentionally produced POPs;

**Project C4:** Public awareness raising on unintentionally produced POPs;

**Project C5:** Promotion of sound waste management practices;

**Project C6:** Promotion of controlled landfills and prevention of uncontrolled burning of waste;

**Project C7:** Introduction and promotion of BAT & BEP in existing waste incineration plants;

**Project C8:** Application of BAT & BEP for unintentionally produced POPs operational release sources;

**Project C9:** Promotion the use of BAT/BEP, including CP in the SMEs;

**Project C10:** Improvement in medical waste management practices;

**Project C11:** Inventory of unintentionally produced POPs releases;

**Project C12:** Inventory of Dioxin and Furan Hot Spots, Raising Public Awareness to Protect Public from Exposure and Prioritization of Contaminated Sites; and

#### **4.4 MANAGEMENT OF NIP IMPLEMENTATION**

**Project D1:** Strengthening Capacity of POPs National Coordinating Unit for continuing the NIP Coordination and Implementation;

**Project D2:** Establish and design a Centralized National Chemicals Database including POPs for Effective Exchange of Information;

**Project D3:** Chemical Management Law

**Project D4:** Capacity Building of targeted academic institution on the delivery of chemical engineering course

All above mentioned priority projects are capacity building activities related to management of POPs. The profiles of each project are described below. In addition, a total of estimated budgets necessarily for effective implementation of these projects are summarized in Annex 1.



## A. PROJECT PROFILES FOR REDUCTION AND ELIMINATION OF POPS PESTICIDES

### 1. Project Profile A1: Assessment of Existing Laws

<b>1- Project Title</b>	<b>Assessment of existing laws and other technical standards for amendment, and promotion of effective law enforcement</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA, MoH, MoJ, and other key stakeholders
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	In Lao PDR, chemical pesticides are managed under Government Regulation No. 886/MAF dated March 10, 2000 on Management on Pesticide Usage in Lao PDR. This regulation focuses on pesticides management, especially importation and exportation. However, this Regulation does not provide the solid basis required for proper and environmentally-sound pesticide management.
<b>7- Project Rational</b>	Assess and recommend improvements to existing laws regulations. The current requirements for sound pesticide management have no strong formal status, because they are based on Government Regulation No. 886/MAF only. The MAF is responsible for deciding whether or not development requires a pesticides management law.
<b>8- Project Justification</b>	A sound legal basis is a must for sound pesticide management.
<b>9- Project Goal</b>	Eliminate the import and use of illegal pesticides including POPs.
<b>10- Objectives</b>	Create sound legal basis for pesticide management in Lao PDR through the amendment of existing legal instruments, or develop new laws to strengthen pesticide management (including POPs law enforcement)
<b>11- Beneficiaries</b>	MAF and other key stakeholders at the national level
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Formulate a team of legal and environmental specialists to review existing legislation, and to improve legal instruments related to pesticides issues;</li> <li>➤ Update existing legislation or develop new legal instruments for pesticide management, including POPs;</li> <li>➤ Develop rules and regulations for implementing the pesticides management legislation;</li> <li>➤ Develop technical guidelines on pesticides monitoring and inspection, including POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Vientiane Capital City and provincial-municipality areas.

## 2. Project Profile A2: Institutional Capacity Building

<b>1- Project Title</b>	<b>Strengthening capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.</b>
<b>2- Implementing Agency</b>	MAF
<b>3-Co-operational Agency</b>	WREA, MoH, MIC, MoF
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	The current capacity of relevant stakeholders responsible for the prevention of importation, trafficking and use of illegal pesticides is very limited. It is impossible to ensure adequate law enforcement under the current structure. Lao PDR has little recourse for the promotion of law enforcement programs, and government officials have limited capability in monitoring and inspecting illegal pesticide trade. Generally, Lao PDR has limited human resources and inadequate institutional capacity to prevent the import, trafficking and use of illegal pesticides. Therefore, in order to promote effective enforcement legislation, Lao PDR needs to strengthen capacity of government officials and competent authorities' to enforce the pesticide legislation.
<b>7- Project Rational</b>	Implementation of the NIP on a wider scale will be possible following improvement of capacity and functioning of the relevant stakeholders in law enforcement.
<b>8- Project Justification</b>	Adequate law enforcement is necessary before removal of unwanted obsolete pesticides stocks can occur in Lao PDR.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides, including POPs.
<b>10- Objectives</b>	Create and strengthen capacity of the relevant institutions dealing with obsolete pesticides, including POP pesticide issues in Lao PDR.
<b>11- Beneficiaries</b>	Relevant institutions and Laotian society.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Formulate and build national TOT capacity.</li> <li>➤ Develop training material on the prevention of import, trafficking and use of illegal pesticides, including POPs and other obsolete pesticides</li> <li>➤ Organize and conduct training programs for officers, traders and sellers and other relevant stakeholders.</li> <li>➤ Widely disseminate the contents of legal instruments on pesticides management to the officers, traders, sellers and other stakeholders.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 150,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide

### 3. Project Profile A3: Strengthening Lab Capacity

<b>1- Project Title</b>	<b>Strengthening capacity in analysis of pesticides focusing on POPs.</b>
<b>2- Implementing Agency</b>	MAF
<b>3-Co-operational Agency</b>	WREA, MoH, MIC
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Lao PDR has government laboratories and technical infrastructure for analyzing some parameters, but no capacity for analyzing POPs pesticides.
<b>7- Project Rational</b>	Strengthening and upgrading the capacity of laboratories is needed to allow for the assessment and control of chemicals, to ensure public health and help preserve the environment.
<b>8- Project Justification</b>	In order to be assessing pesticide levels in foods and other products, Lao PDR needs to be equipped with competent laboratory facilities. Lao PDR has focused on strengthening capacity for laboratory analyses through upgrading equipment and other facilities, human resource development, and promoting responsibility and accuracy in chemical analysis and management. Further improvements require assistance from the government and donor organizations, because of limited capacity in both laboratory facilities and technical analytical capabilities.
<b>9- Project Goal</b>	Establishment of a laboratory capable of conducting international-quality chemical analyses, including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Improve capacity of laboratories for pesticide analyses, focusing on POPs.</li> <li>➤ Strengthen institutional capacity on identification of obsolete pesticides, including POPs pesticides.</li> </ul>
<b>11- Beneficiaries</b>	Laboratory to be selected (to be identified), local Laotian company
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Improve capacity of laboratory staff in pesticides analysis, with focus on POPs.</li> <li>➤ Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 500,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Vientiane Capital City

#### 4. Project Profile A4: Public Awareness Raising

<b>1- Project Title</b>	<b>Raising public awareness on pesticides issues, including POPs pesticides and other obsolete pesticides.</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA and Relevant Civil Society Organizations
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City (and other key Provinces )
<b>6- Background</b>	General knowledge about pesticides applications, obsolete pesticides including POPs pesticides, their hazards and acute and chronic effects is lacking within the public, as information dissemination has not been broad.
<b>7- Project Rational</b>	Disseminate knowledge to farmers concerning proper pesticide use, obsolete pesticides, and alternatives to pesticides. Training on the key issues related to POPs pesticides will be provided to the governmental institution and civil society organizations.
<b>8- Project Justification</b>	If the general public remains unaware of basic issues related to pesticides use and alternatives to pesticides, the current situation of improper pesticide handling and use will continue. Lao PDR presently does not have any comprehensive POPs pesticides awareness raising programs, nor regulations requiring farmers to abide by proper procedures of handling, repackaging, transport and destruction of pesticides.
<b>9- Project Goal</b>	Improve knowledge and awareness of the dangers of POPs pesticides to decision-makers and the general public.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ The general public has a complete understanding of all issues related to pesticide use and handling.</li> <li>➤ Upgrade the level of understanding of the general public for all issues related to pesticide use.</li> </ul>
<b>11- Beneficiaries</b>	Farmers or users, general public, Lao society as a whole.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Formulate and undertake dissemination campaigns on pesticide hazards, and elimination of obsolete pesticides including POPs pesticides.</li> <li>➤ Provide information to relevant target groups on alternative pesticides.</li> <li>➤ Encourage alternative pest control measures to reduce the use of pesticides in general.</li> <li>➤ Improve extension workers' capacity and expand their extension activities on pesticides issues, including obsolete pesticides and POPs</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 150,000</b>

<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Country wide.

### 5. Project Profile A5: Awareness Raising for Decision Makers

<b>1- Project Title</b>	<b>Raising awareness of policy and decision-makers on pesticides issues, including obsolete pesticides and POPs pesticides</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA, MoH, MoE
<b>4- Duration</b>	12 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	High level policy and decision makers have received limited information about the impact of improper pesticide use on human health and the environment. Also, most decision-makers are not aware of the Government's obligation to comply with the Stockholm Convention. Most decision-makers have less awareness of the dangers of POPs pesticides than technical staff in their ministries.
<b>7- Project Rational</b>	This project will provide basic information in order to raise awareness for policy- and decision-makers on pesticide issues, including POPs pesticides. Comprehensive awareness amongst decision makers will help improve the country's ability to manage POPs pesticides.
<b>8- Project Justification</b>	The leaders of the country can only be effective decision-makers when they have sufficient knowledge about the relevant issues. The understanding and awareness of decision makers is very important in order to control the import, transport, use and release/disposal POPs pesticides.
<b>9- Project Goal</b>	Improve awareness of key decision-makers in the Government regarding the issue of POPs pesticides, as well as the required steps to ensure compliance with the Stockholm Convention
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ All relevant policy makers and decision makers have complete understanding of pesticide issues, the Stockholm Convention, and the need for controlling use and disposal of POPs.</li> <li>➤ Policy makers and decision makers' knowledge is improved on pesticides issues including obsolete pesticides and POPs pesticides</li> </ul>
<b>11- Beneficiaries</b>	Relevant policy makers and decision makers in a number of Government Ministries, at different levels.

<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Organize forums or workshops for policy- and decision-makers.</li> <li>➤ Provide information on pesticides risks and hazards to policy- and decision-makers through various media (PowerPoint, video, brochures, etc.).</li> <li>➤ Develop awareness campaigns that can be applied to the Provincial and District levels, as well as the National level.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 55,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Provinces and cities countrywide

#### **6. Project Profile A6: Obsolete Pesticides Inventory**

<b>1- Project Title</b>	<b>Comprehensive inventory on obsolete pesticides including POPs pesticides.</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA, MoH, MIC, Local Authorities
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City (Other provinces and cities as necessary)
<b>6- Background</b>	There is a lack of sufficient data concerning obsolete pesticides including POPs pesticides, resulting in the Government not being able to take adequate measures to protect human health and the environment.
<b>7- Project Rational</b>	Execute obsolete pesticides inventory according to international standards. The POPs pesticides inventory is an essential method to enhance public health and environmental quality countrywide, to encourage and recognize stakeholder's efforts to reduce obsolete pesticides including POPs pesticides from stockpiles and other sources, a tool to track environmental progress, and to develop a basis for further decision-making and cooperation between MAF, relevant organizations, farmers and other stakeholders.
<b>8- Project Justification</b>	With sufficient data, the relevant competent authorities will be able to properly plan and implement adequate actions to reduce the direct impact of obsolete pesticides on human health and the environment.
<b>9- Project Goal</b>	Identify all potential sources and stockpiles of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	Collect relevant information through an obsolete pesticides inventory according to UN standards.
<b>11- Beneficiaries</b>	MAF, WREA, MIC, MoH and Consumers



<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Form inventory team for obsolete pesticides including POPs.</li> <li>➤ Organize inventory training for the team and develop inventory forms, guidelines and plan execution of the inventory.</li> <li>➤ Undertake comprehensive inventory survey covering the whole country.</li> <li>➤ Design obsolete pesticides and POPs pesticides database format and reporting.</li> <li>➤ Training technical staff on database entry.</li> <li>➤ Set-up database management system with facilities and data entry.</li> <li>➤ Develop database document on obsolete pesticides including POPs pesticides and publicizing.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Potential Donors</b>	Government of Lao PDR 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide.

#### **7. Project Profile A7: Pesticide Monitoring**

<b>1-Project Title</b>	<b>Monitoring process on the trafficking of illegal pesticides, including POPs pesticides.</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA, MoH, MIC, MoF, Local Authorities
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Currently no legal measures can be taken against illegal pesticide use, as the monitoring of illegal pesticides (including POPs pesticides) is not undertaken. Existing chemical management, legal instruments and enforcement are limited; and. Lao PDR also lacks human resources and monitoring facilities, which results in ineffective law enforcement.
<b>7- Project Rational</b>	Legally sound monitoring will take place with regards to import, trafficking and trade of illegal pesticides. Administrative measures against illegal activities will be facilitated and executed.
<b>8- Project Justification</b>	In order to implement legally sound management measures, the current illegal practices and their size and impacts should be known to the decision-makers and local authorities. Information will enable them to take firm action.
<b>9- Project Goal</b>	Eliminate the import and trafficking of obsolete pesticides including POPs pesticides.

<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Illegal practices related to pesticide imports, trafficking and use will be banned.</li> <li>➤ Ecologically-sound measures related to pesticides management can then be fully implemented.</li> </ul>
<b>11- Beneficiaries</b>	Society at large
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Develop planning for monitoring of importation, trafficking and trade of illegal pesticides including POPs pesticides.</li> <li>➤ Undertake regular monitoring and inspection, focusing on the likely sources and entry points of illegal pesticides, including POPs pesticides.</li> <li>➤ Facilitate and support administrative measures, including confiscation of illegal products and storage in Government-owned storage sites, for any illegal action related to import/trafficking of pesticides banned by law.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide

#### **8. Project Profile A8: Temporary storage of obsolete pesticides**

<b>1-Project Title</b>	<b>Collection campaign for temporary storage of obsolete pesticides, including POPs pesticides, in regional storage depots prior to disposal.</b>
<b>2- Implementing Agency</b>	MAF
<b>3- Co-operational Agency</b>	WREA, MoH, Local Authorities
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	<p>The operational collection and storage of obsolete pesticides, including POPs pesticides, has not been put into practice. Obsolete pesticides are not currently disposed using sound environmental procedures. The provisions of regulation No 0886/MAF dated March 10, 2000 “does not include provisions for obsolete pesticide disposal.</p> <p>Lao PDR has not yet conducted detailed planning with regards to the obligations under the Stockholm Convention concerning preparation of collection campaigns for temporary storage of obsolete pesticides (including POPs pesticides) in regional storage depots prior to disposal. Planning is required for conducting environmental impact assessments, as well as for the repackaging, collection and transport of obsolete pesticides from individual storage sites to temporary regional depots.</p>

<b>7- Project Rational</b>	<p>Under the preparatory collection campaign for temporary storage of obsolete pesticides including POPs pesticides in regional storage depots prior to disposal, Lao PDR should consider and develop a detailed plan and recommendations with respect to:</p> <ul style="list-style-type: none"> <li>➤ Assessment of the environmental impact of proposed projects, subject to decision by a competent government authority and likeliness to cause significant adverse impact through the obsolete pesticides collection campaign,</li> <li>➤ Provide/receive information, study relevant information and consultation between parties with respect to such subjects; and</li> <li>➤ Costs for intensive field activities need to be properly planned and managed.</li> </ul>
<b>8- Project Justification</b>	Prior to collection and repackaging, a detailed intervention plan should be drawn up in order to carry out field activities in an efficient way.
<b>9- Project Goal</b>	Properly prepare for collection, storage and future disposal of obsolete pesticides, including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Ecologically sound management measures of obsolete pesticides including POPs pesticides can be determined and carried out by the relevant institutions.</li> <li>➤ A detailed work plan to repackage, collect and transport identified obsolete pesticides stocks is drawn up and supported by the relevant institutions.</li> </ul>
<b>11- Beneficiaries</b>	General public, especially those in rural agricultural areas
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Undertake an environmental impact assessment on the collection and storage of obsolete pesticides including POPs pesticides.</li> <li>➤ Prepare technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete pesticides, including POPs pesticides.</li> <li>➤ Establish or improve safe regional temporary storage facilities and area(s) for handling obsolete pesticides including POPs pesticides.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 500,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide.

## 9. Project Profile A9: National wide disposal of obsolete pesticides

<b>1-Project Title</b>	<b>Environmentally Sound Management of Obsolete Pesticides including Pops Pesticides through safe disposal</b>
<b>2- Implementing Agency</b>	MAF, MoE
<b>3- Co-operational Agency</b>	WREA, MoH, MoIC, MoPT
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Based on the pilot project achievements on the disposal of a limited amount of obsolete pesticides, Lao PDR seeks to promote the adoption of sound environmental cleaning and disposal technology to apply to the whole country. Identified obsolete pesticide storage areas will be cleaned up and repackaged obsolete pesticides will be eliminated.
<b>7- Project Rational</b>	All identified stores and locations containing obsolete pesticides including POPs pesticides in inappropriate disposal site will be cleaned up. The activities of the Lao pesticides management team are to promote and implement policies and practices for the disposal of all obsolete pesticides, including POPs pesticides. In the disposal process, the competent authority is empowered to consider and develop recommendations regarding clearing, repackaging, transporting and destruction.
<b>8- Project Justification</b>	Obsolete pesticides including POPs pesticide storage sites and inappropriate disposal sites are considered to be ‘hot spots’ with regards to potential environmental pollution and threat to human health. As such, these sites must be cleaned up and collected hazardous wastes should be adequately handled. This project is conducted at the national, provincial and local levels and involves governments, companies and NGOs. At the same time, there is also a very strong interest in promoting sound environmental technology and technological capacity throughout the country.
<b>9- Project Goal</b>	Dispose of existing POPs pesticides, and eliminate the import and use of obsolete pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Eliminate stockpiles of obsolete pesticides, including POPs pesticides.</li> <li>➤ Implement full commitments and obligations of Lao PDR under the Stockholm Convention in reduction and elimination of all obsolete pesticides including POPs pesticide stockpiles.</li> <li>➤ Assist government officials countrywide responsible for obsolete pesticide disposal to identify appropriate and environmentally-sound technology.</li> </ul>
<b>11- Beneficiaries</b>	The population of Lao PDR and the rest of the world community.

<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Provide training to staff involved in the project.</li> <li>➤ Identify and procure the required international standard packaging materials.</li> <li>➤ Develop a plan for repackaging and transport to regional temporary storage depots.</li> <li>➤ Repackage obsolete pesticides, clean up all stores and transport the repackaged stockpiles and wastes consisting of contaminated materials or obsolete pesticides, including POPs pesticides, to regional temporarily storage depots.</li> <li>➤ Select international contractor for the international transport and disposal of all repackaged pesticide stockpiles.</li> <li>➤ Export repackaged obsolete pesticides stockpile for elimination outside the country in a dedicated hazardous waste disposal facility.</li> </ul>
<b>13- Estimated Cost</b>	(Depending on the outcome of the inventory)
<b>14- Potential Donors</b>	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide

## B. PROJECT PROFILES FOR THE MANAGEMENT OF PCBS

### 1. Project Profile B1: Development of Legal Instruments

<b>1-Project Title</b>	<b>Develop legal instruments or technical guidelines for managing PCBs</b>
<b>2- Implementing Agency</b>	MEM
<b>3- Co-operational Agency</b>	WREA, MIC, Stakeholders
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	The Lao PDR recognizes that establishing legislation is critical component of an overall PCB management strategy. Lao PDR has not yet developed any regulations specifically targeted at managing PCBs. Presently, PCBs are managed according to provisions outlined in the hazardous waste section of the Environment Protection Law. Compliance with the Stockholm, Basel and Rotterdam conventions will require the enactment of new laws and technical guidelines in many areas of operation, including the management of PCBs.

<b>7- Project Rational</b>	Potentially exposed populations in Laos include workers in factories and workshops, warehouses, and electrical power plants, who may be exposed because of a lack of training and protective safety equipment. The health of individuals handling waste oil (potentially contaminated with PCBs) is also at risk. In general public awareness about the potential environmental and health hazards associated with PCB's needs to be raised. A safer and healthier work environment should result.
<b>8- Project Justification</b>	To date, compliance monitoring with respect to proper handling of PCBs has not been undertaken because existing legislation does not specifically cover PCBs or equipment contaminated with PCBs. There are no specific acts or legal instruments for the management of PCBs as it is a new environmental issue in Lao PDR. However, there are general provisions for the management of hazardous wastes as stated in Environment Protection Law. Better defined laws and regulations will assist authorities to develop more effective management plans.
<b>9- Project Goal</b>	Improve the environmental management of electrical equipment and accessories containing or contaminated by PCBs. Management strategies should include the entire life-cycle of process and products and comply with objectives as per the Stockholm Convention.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Develop specific regulations for the effective management of PCBs.</li> <li>➤ Regulate electrical equipment (new and used/decommissioned) and accessories that either contain or are contaminated with PCBs.</li> </ul>
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Form a legal and technical working group comprising all PCBs stakeholders.</li> <li>➤ Study existing legal instruments related to PCBs management for further development of legal instruments or guidelines.</li> <li>➤ Develop PCBs management legal instruments, guidelines or technical standards as necessary.</li> <li>➤ Organize a workshop for consultation and receipt of comments on draft legal instruments in advance of submission to the government for approval.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Vientiane Capital City and other Provinces-Cities



## 2. Project profile B2: PCBs Comprehensive Inventory

<b>1-Project Title</b>	<b>Comprehensive inventory of equipment and accessories containing and contaminated with PCBs.</b>
<b>2- Implementing Agency</b>	WREA & MoEM, EDL
<b>3- Co-operational Agency</b>	Provincial and municipality Electricity Unit, Lao Electricity Company (EDL), Private companies
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Based on a preliminary inventory, equipment and accessories that are potentially contaminated by PCB's have been identified. The preliminary inventory report consisted of a broad review of all potential problem areas but has not prioritized them yet because of time constraints, lack of trained personnel and other resources including analytical facilities. A comprehensive inventory will focus on public information dissemination, and improve the quality of information on the nature and quantity of PCBs in Lao PDR.
<b>7- Project Rational</b>	Completing a PCB inventory is important to reduce health risks and improve environmental quality in Laos, particularly given the large numbers of transformers and other electrical equipment in use throughout the country. A PCBs inventory will encourage and acknowledge stakeholder efforts to improve overall management of transformers and other potentially contaminated equipment, and develop a basis for further decision-making and future cooperation between MEM, relevant institutions, civil organizations, and workers.
<b>8- Project Justification</b>	Ensure compliance with obligations as per the Stockholm convention. A comprehensive inventory will improve the management of PCBs by providing accurate information on the extent and nature of the PCB contamination problem.
<b>9- Project Goal</b>	Improve management of electrical equipment and accessories that contain or are contaminated with PCBs, to ensure compliance with the Stockholm Convention.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Establish the extent of PCB contamination of electrical equipment and accessories in Laos.</li> <li>➤ Clearly identify the owners of transformers or contaminated electrical equipment and accessories.</li> <li>➤ Develop a database of information related to electrical equipment and accessories that may be contaminated with PCBs.</li> <li>➤ Establish environmentally sound management practices for contaminated equipment/oils.</li> </ul>
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.

<b>12- Activities</b>	<p><b>Pilot Project:</b></p> <ul style="list-style-type: none"> <li>➤ Form inventory team and review existing inventory report.</li> <li>➤ Develop methodology and identify gaps in preliminary inventory.</li> <li>➤ Develop a plan for a detailed inventory.</li> <li>➤ Conduct comprehensive inventory (including testing, classifying, labeling registering, etc.) of in-use electrical equipment and articles containing or contaminated with PCBs at selected pilot project areas.</li> <li>➤ Complete pilot inventory report.</li> <li>➤ Organize workshop for stakeholders to present findings of the pilot inventory</li> </ul> <p><b>Comprehensive Inventory Project:</b></p> <ul style="list-style-type: none"> <li>➤ The same process as for the pilot inventory project will apply for the comprehensive inventory project phase. Comprehensive inventory will cover all provinces and municipalities. Main activities will include designing inventory forms, site inspections and sampling, laboratory analysis.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	All provinces and municipalities

### 3. Project Profile B3: Management of PCB Equipment (in use)

<b>1-Project Title</b>	<b>Environmentally Sound Management for “In Use” Equipment</b>
<b>2- Implementing Agency</b>	MEM
<b>3- Co-operational Agency</b>	WREA, Provincial and Municipal Electricity Unit, EDL, and private companies
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	After conducting the national preliminary inventory, PCBs were predicted to be found in more than 50% of the transformers in use throughout the country. These transformers were imported at different periods, are different ages and continue to be used. In general, Lao PDR uses old transformers and the dielectric fluid from old transformers is sometimes used for retro-filling new transformers. The preliminary inventory also found evidence of leaking transformers that are not being managed properly to minimize potential PCB contamination. Most importantly, economic pressure results in the use

	of old transformers through repairing and recycling. Furthermore, there are neither specific institutions, policies or regulations dealing with ESM management of in-use electrical equipment and other devices containing or contaminated with PCBs.
<b>7- Project Rational</b>	Governmental officers and workers of relevant enterprises will be trained in ESM management. Transformers, workshops, warehouses, and power plants and all in-use equipment (including dielectric based equipment) will be managed according to ESM principles.
<b>8- Project Justification</b>	Ensure implementation of environmentally sound management practices to minimize environmental and health risks associated with PCB's including; using retention tanks to contain dielectric leaking, decommissioning of transformers with high corrosion, ensure dielectric fluids are analyzed for PCBs before repairs are made to old equipment. The project will provide practical ESM concepts and technology to improve compliance with obligations under the Stockholm Convention related to the management of PCBs.
<b>9- Project Goal</b>	Improve environmental management of electrical equipment and accessories containing or contaminated with PCBs to ensure compliance to obligations as per the Stockholm Convention.
<b>10- Objectives</b>	Extend lifetime of existing transformers with ESM compliance.
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Identify contaminated sites (including workshops, stations, substations, and pole mounts) for prioritizing ESM.</li> <li>➤ Undertake ESM at selected sites.</li> <li>➤ Develop protocols to avoid repair of transformers contaminated with PCBs.</li> <li>➤ Complete inventory of electrical equipment containing or contaminated with PCBs.</li> <li>➤ Develop strategy to reduce the number of electrical equipment containing or contaminated with PCBs.</li> <li>➤ Develop and implement PCBs reduction demonstration (pilot) project.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Countrywide

#### 4. Project profile B4: Socio-economic Assessment

<b>1-Project Title</b>	<b>Assessment of socio-economic aspects for phasing out of electrical equipment and accessories that contain or are contaminated with PCBs</b>
<b>2- Implementing</b>	MEM

<b>Agency</b>	
<b>3- Co-operational Agency</b>	WREA, EDL
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Due to economic constraints within Lao PDR there is pressure to keep old transformers in operation without proper maintenance at a high environmental risk. This project seeks to collect and exchange data related to (potential) PCB contamination, and develop and apply appropriate social mitigation strategies. This assessment project will be implemented based on experience gained during ESM, in particular findings from the PCBs inventory report.
<b>7- Project Rational</b>	To systematically identify the main risk elements associated with PCBs in Laos; and to prioritize potential problems related risk categories, describe consequences of PCBs use; provide basic information for ESM about the life cycle of PCBs.
<b>8- Project Justification</b>	Socio-economic assessments are an important tool for decision makers. They help to assess the social and economic costs and benefits of keeping transformers in use or phasing them out. This assessment project could improve the use of PCB equipment with and describe the socio economic costs and benefits. This project will assess possible PCBs management options by means of socio-economic cost/benefit analysis in order to ensure, that implementation of the Stockholm Convention in Lao PDR will be socially and economically feasible.
<b>9- Project Goal</b>	Environmentally effective management of electrical equipment and accessories that contain or are contaminated with PCBs as per the Stockholm Convention.
<b>10- Objectives</b>	Establish basic methods for decision-making related to the phasing out or continued use of PCB contaminated electrical based on a socio-economic analysis.
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<p>Phase 1: Pilot assessment phase</p> <ul style="list-style-type: none"> <li>➤ Form a working group of stakeholders.</li> <li>➤ Plan pilot risk assessment project by selection of a representative population sample.</li> <li>➤ Undertake socio economic and cost-benefit assessments at different sites.</li> <li>➤ Identify priority socio-economic risks.</li> <li>➤ Organize demonstration workshops to present risk assessment results to stakeholders in order to improve assessment methodology (see Phase 2).</li> </ul> <p>Phase 2: Full assessment</p>

	<ul style="list-style-type: none"> <li>➤ Form a working group of stakeholders</li> <li>➤ Develop plan for complete risk assessment</li> <li>➤ Conduct complete site assessment</li> <li>➤ Identify issues of complete risk assessment</li> <li>➤ Organize demonstration workshop to present risk assessment result to the stakeholders for comments.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	All provinces and municipalities

### 5. Project profile B5: ESM Compliance for electrical equipment

<b>1-Project Title</b>	<b>ESM compliance of the maintenance and repair of electrical equipment</b>
<b>2- Implementing Agency</b>	MEM
<b>3- Co-operational Agency</b>	WREA, EDL
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	In Lao PDR, PCBs have been detected in electrical equipment. The presence of PCBs in transformers and oil residues is a threat to both the human health and environment. In general, there is a lack of ESM and poor maintenance/repair of electrical equipment. Key problems identified so far are; contaminated dielectric oils that are used to refill old transformers without proper management, resulting in heating, spilling and leaking; improper disposal of equipment contaminated PCBs; and easily accessible PCBs contaminated sites (workshops, warehouses, etc). A primary cause for this situation is the lack of control mechanisms for PCBs in the workplace.
<b>7- Project Rational</b>	Maintenance and repair activities of electrical equipment containing or contaminated with PCBs requires sound management.
<b>8- Project Justification</b>	The project will conduct an assessment of maintenance and repair activities for electrical equipment, suggest mechanisms for upgrading or repairing facilities, recommend decontamination of specific PCB contaminated materials and contaminated sites.
<b>9- Project Goal</b>	Improve the environmental management of PCB contaminated equipment and/or sites as per the Stockholm Convention.

<b>10- Objectives</b>	Improvement of ESM for the repair and maintenance of electrical equipment
<b>11- Beneficiaries</b>	Countrywide
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Undertake assessment of decommissioned electrical equipment and other material that is potentially contaminated with PCB's, and prioritize what material should be targeted for destruction (either in-country or at a regional facility).</li> <li>➤ Undertake assessment of health and environmental impact issues.</li> <li>➤ Upgrade existing electrical equipment and investigate decontamination of existing equipment (if technically appropriate), recommend additional equipment to avoid PCB cross contamination and personal protective equipment (PPE).</li> <li>➤ Build institutional capacity, undertake training of maintenance and repair technicians related to PCB ESM issues (health, environment issues)</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Throughout Lao PDR

## 6. Project profile B6: Strengthening Laboratory Capacity

<b>1-Project Title</b>	<b>Strengthening laboratory capacity for PCBs analysis</b>
<b>2- Implementing Agency</b>	WREA –EDL
<b>3- Co-operational Agency</b>	WREA, MEM
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	In Lao PDR, no laboratory is currently able to analyze for PCBs. Human resources and facilities for PCB analyses are not available in Lao PDR. No laboratory in the country can determine PCBs concentrations or even positively verify the presence of PCBs. PCBs analyses require specialized analytical equipment and trained staff. During the preliminary inventory, Screening Test Kits were used to provide an overall concentration of chlorine in dielectric oil but could not identify the presence of individual PCB congeners.



<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>➤ The capacity of laboratory staff selected for PCBs analyses needs to be strengthened.</li> <li>➤ The capacity of laboratories (facilities, equipment and materials) needs to be strengthened in order to conduct PCB analyses.</li> <li>➤ Information on PCBs concentration in electrical equipment needs to be compiled, disseminated, and made available.</li> <li>➤ Laboratories are required to identify PCBs in electrical equipment and at contaminated sites for ESM, and also to support a comprehensive inventory.</li> </ul>
<b>8- Project Justification</b>	This project aims to improve the capacity of laboratories for PCB analyses, including staff training. This is required in order to manage PCB contamination issues in Lao PDR. In the absence of analytical capability, no monitoring is possible.
<b>9- Project Goal</b>	Enhance the health and safety of Lao residents by improving the management of PCB contaminated equipment and sites. Ensure compliance with the Stockholm Convention.
<b>10- Objectives</b>	Segregate PCB equipment into contaminated and non-contaminated groups. Ensure that maintenance and repair only occurs on non-contaminated equipment to ensure compliance with the Stockholm Convention.
<b>11- Beneficiaries</b>	EDL, electrical equipment holders, warehouses, and relevant governmental Institutions
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Provide and strengthen laboratory staff capacity for PCBs analysis</li> <li>➤ Assessment of existing laboratories and analysis capacities</li> <li>➤ Provide PCB analysis equipment</li> <li>➤ Provide information to stakeholders</li> <li>➤ Upgrade laboratory facilities for analyzing PCBs</li> </ul>
<b>13- Estimated Cost</b>	<b>US \$250,000</b>
<b>14- Donors</b>	Government of the Lao PDR : 5% of total budget (Maximum Level) Donor: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	National Laboratory (at WREA)

## 7. Project profile B7: ESM management for “out-of-use” equipment

<b>1-Project Title</b>	<b>Environmentally Sound Management of “out of use” equipment</b>
<b>2- Implementing Agency</b>	MEM
<b>3- Co-operational Agency</b>	WREA, MEM, EDL
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	Lao lacks appropriate management of out-of-use of equipment and wastes containing or contaminated with PCBs. Laos also lacks secure storage and disposal facilities. Activities causing the release of PCBs into the environment that have impacts on human health include the dismantling and sale of used transformers to scrap metal collectors. Furthermore, there is no secure storage for out-of-use equipment.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>➤ There is inadequate information and data for stakeholders on out-of-use electrical equipment and wastes contaminated with PCBs.</li> <li>➤ ESM of out-of-use of electrical equipment, articles and waste containing and/or contaminated with PCBs need to be developed.</li> <li>➤ A strategy for the elimination of out-of-use of electrical equipment and wastes contaminated with PCBs need to be developed and implemented.</li> </ul>
<b>8- Project Justification</b>	The project will collect data and undertake consultations with relevant parties on how to improve management of out-of-use of equipment and wastes contaminated with PCBs. The project will examine the potential for upgrading storage sites and operational facilities that are contaminated with PCBs. The final outcome of this project will be a comprehensive strategy for the elimination of out-of-use of electrical equipment and wastes contaminated with PCBs.
<b>9- Project Goal</b>	Manage in an environmentally sound manner all electrical equipment and accessories that contain or are contaminated with PCBs throughout their lifecycle as per the Stockholm Convention.
<b>10- Objectives</b>	Develop strategy for the elimination of out-of-use of electrical equipment and wastes contaminated with PCBs
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.

<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Form technical working group (stakeholders).</li> <li>➤ Train electrical officers and stakeholders in environmentally sound management practices for out-of-use equipment (handling, transportation, storage, dismantling, pre-treatment, shipment of used PCB to out of country disposal facilities).</li> <li>➤ Develop strategy for ESM destruction of out-of-use electrical equipment and wastes contaminated with PCBs (handling, transportation, storage, dismantling, pre-treatment and final disposal).</li> <li>➤ Identify storage sites and facilities for keeping out-of-use of electrical equipment and wastes containing or contaminated with PCBs in an environmentally sound manner.</li> <li>➤ Establish storage sites for keeping out-of-use of electrical equipment and wastes containing and/or contaminated with PCBs in an environmentally sound manner.</li> <li>➤ Take action to centralize the out-of-use of electrical equipment and wastes containing and/or contaminated with PCBs in an environmentally sound manner.</li> <li>➤ Quantify out-of-use electrical equipment and wastes containing or contaminated with PCBs that should be destroyed.</li> <li>➤ Conduct feasibility study for the destruction/disposal in the country or out of the country.</li> <li>➤ Organize national conclusion workshop (strategy, assessment result, financial mechanisms, evaluation cost...).</li> </ul>
<b>13- Estimated Cost</b>	<b>US \$350,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Electric utilities in Lao PDR

### 8. Project Profile B8: Capacity Building and Awareness Raising

<b>1-Project Title</b>	<b>Capacity Building and Public Awareness on PCBs issue</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MEM, EDL
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City

<b>6- Background</b>	Awareness of potential health and environmental concerns related to PCBs contamination is relatively new in Lao PDR. The country lacks of laws or guidelines for managing PCBs. Different stakeholders have different levels of awareness. Amongst electric managers and officers, knowledge of PCBs and principles for ESM are inadequate. The relevant electrical equipment users (both government and private) also lack capability to adequately maintain and manage in-use and out-of-use transformers (leak, spillage, etc.). Technical staff and workers are directly in contact with electrical equipment/materials containing dielectric fluid without personal protective equipment, and are not aware of the risks resulting from exposure to PCBs.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>➤ A manual on PCBs risk issues and personnel safety needs to be developed.</li> <li>➤ The capacity of electrical staff working with electrical equipment/ material containing dielectric fluid will be strengthened.</li> <li>➤ Knowledge and information on PCBs hazards and risks needs to be widely provided and disseminated.</li> </ul>
<b>8- Project Justification</b>	This project aims to comply with the Stockholm Convention with regards to public health and the environment. The project will raise PCBs awareness and promote awareness with policy makers in the government. Decisions are ultimately a political responsibility, but must be based on the best socio-economic choices. Stakeholders' participation in the action plan is also required.
<b>9- Project Goal</b>	Improve environmental management of electrical equipment and accessories containing or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention.
<b>10- Objectives</b>	Reduce the risk to health and environmental from PCB contamination for all electrical stakeholders and the public.
<b>11- Beneficiaries</b>	Electrical equipment users, stakeholders and the public.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Identify the fields of information and awareness to be provided to stakeholders.</li> <li>➤ Develop educational materials about the hazards of PCBs and how to manage PCB's and publicize.</li> <li>➤ Organize training on the sound management of PCBs at the national and provincial levels.</li> <li>➤ Organize workshops on PCBs issues for all stakeholders.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Potential Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Throughout Lao PDR

## 9. Project Profile B9: PCBs Database Management

<b>1- Project Title</b>	<b>Establishment of PCBs database management</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MEM, EDL
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	A PCBs database is a new concept and does not currently exist in Laos. However, the PCBs database experience from UNEP/GEF or from other countries may assist in verifying and crosschecking PCBs for ESM.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>➤ Access to information about PCB contaminated equipment needs to be improved.</li> <li>➤ In-use electrical equipment and materials that either contain or are contaminated with PCBs need to be properly identified, classified, labeled and registered.</li> <li>➤ Need to ensure that in-use electrical equipment and materials containing or contaminated with PCBs are stored in an environmentally sound manner.</li> <li>➤ Need to integrate the results of the PCB inventory and comprehensive assessment with other hazardous chemical inventories (e.g. dioxins).</li> </ul>
<b>8- Project Justification</b>	As Lao PDR has limited capacity in hazardous chemical management, establishing a database could offer significant benefits in terms of cost savings and access to information. Laos has limited capability in database design, so coordination and cooperation with existing reference PCBs databases should be investigated. In order to comply with the Stockholm convention, Lao PDR needs to improve awareness about and access to information about PCBs.
<b>9- Project Goal</b>	Improve environmental management of electrical equipment and accessories containing or contaminated with PCBs as per the Stockholm Convention.
<b>10- Objectives</b>	To ensure the efficient tracking and management of all PCB contaminated materials and equipment.
<b>11- Beneficiaries</b>	WREA, MEM, EDL, Research Institutions
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Design database framework.</li> <li>➤ Build and test database.</li> <li>➤ Input available data from inventory and assessment.</li> <li>➤ Network and integrate with other hazardous chemical programs.</li> <li>➤ Improve information sharing and distribution.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 180,000</b>

<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA
<b>15- Project Extent</b>	Vientiane Capital City

## C. PROJECT PROFILES FOR MANAGEMENT OF UNINTENTIONALLY PRODUCED POPs

### 1. Project Profile C1: Legislation Development for Unintentionally Produced POPs

<b>1- Project Title</b>	<b>Legislation related to sound management of unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MoJ, MIT, MEM, MoH, and other concerned stakeholders
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	<p>The Stockholm Convention aims to reduce unintentionally produced POPs releases, as well where feasible, ultimately to eliminate unintentionally produced POPs. Its major goal is to protect human health and the environment against the adverse effects of POPs. Lao PDR signed the Stockholm convention on 5 March 2002 and Ratified on June 28, 2006. A National Implementation Plan under the Stockholm Convention (NIP) has been developed with GEF/UNEP support, describing how Lao PDR will meet its obligations under the Convention.</p> <p>To date, Lao PDR has not enacted any specific regulations regarding the management of unintentionally produced POPs.</p>
<b>7- Project Rationale</b>	<p>Current legislation in Lao PDR is not sufficient for sound management of unintentionally produced POPs, as required under the Stockholm Convention. The project's rationale is:</p> <ul style="list-style-type: none"> <li>➤ Relevant legislation will be revised or developed.</li> <li>➤ Unintentionally produced POPs management guidelines are available.</li> <li>➤ Legislation related to, and guidelines for, the management of unintentionally produced POPs are enforced.</li> <li>➤ More understanding and awareness about the relevant laws and other legal instruments are disseminated and promoted.</li> <li>➤ The reduction of unintentionally-produced POPs releases will be more effective.</li> </ul>

<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Compliance with the Stockholm Convention's obligation with regards to unintentionally produced POPs releases.</li> <li>➤ Creation of the necessary legal framework, including procedures for inventory, monitoring, assessment and enforcement.</li> </ul>
<b>9- Project Goal</b>	Initially to reduce, and eventually to eliminate, the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Create legal framework for sound management of unintentionally produced POPs.</li> <li>➤ Undertake assessment of the existing legal framework.</li> <li>➤ Amend/develop relevant laws, regulations, and policies.</li> <li>➤ Develop necessary enforcement documents (guidelines)</li> <li>➤ Promote understanding and awareness raising on developed legal instruments relevant to sound management of unintentionally produced POPs.</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: state administration.</p> <p>Indirect beneficiaries: population of Lao PDR; also, contribution to global efforts to minimize releases of POPs.</p>
<b>12- Activities</b>	<p>Undertake assessment of laws and policies related to management of unintentionally produced POPs:</p> <ul style="list-style-type: none"> <li>➤ Review existing legal and policy instruments.</li> <li>➤ Assessment of legal and policy instruments.</li> <li>➤ Identify gaps, and requirements for development of laws and policies on management of unintentionally produced POPs. Amend existing laws related to the management of unintentionally produced POPs or develop new laws/policies.</li> <li>➤ Form legal team.</li> <li>➤ Conduct a training course on legislation for management of unintentionally-produced POPs.</li> <li>➤ Organize national workshop on current situation of laws and policies related to the management of unintentionally produced POPs.</li> <li>➤ Develop guidelines for the sound management of unintentionally produced POPs (BAT/BEP)</li> <li>➤ Study the available relevant guidance documents on BAT &amp; BEP.</li> <li>➤ Identify and prioritize relevant source categories.</li> <li>➤ Develop national guidelines on the sound management of unintentionally produced POPs.</li> <li>➤ Introduce and disseminate the developed guidelines to all stakeholders through meetings or workshops.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Country wide



**Project Profile C2: Research on Health Risk Management of Unintentionally POPs Specifically on the Dioxin/Furan from Agent Orange and Industrial sectors and waste incinerators plants.**

<b>1- Project Title</b>	<b>Research on Health Risk Management of Unintentionally POPs</b>
<b>2- Implementing Agency</b>	Ministry of Public Health and WREA
<b>3- Co-operational Agency</b>	NUOL, concerned research institutes, and key stakeholders at the central and provincial levels
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City and other major cities
<b>6- Background</b>	<p>In the Lao P.D.R, Unintentionally Produced Dioxins/Furans releases generally are not well understood. The presence of Unintentionally Produced Dioxins/Furans is a new issue and concern to Lao PDR. The public and private sectors generally have a very low level of awareness regarding dioxins/furans. The survey of national industries concluded that few industries in Lao PDR use air pollution control devices, recycling technology, or other measures to protect the environment and public health. Hospital and other hazardous waste incinerators and cremation practices in Lao PDR – potentially one of major sources of dioxin and furan releases, are poorly studied. People working in factories and incinerators have very limited knowledge on health environment and safety. In addition to that, knowledge of the potential harmful effects from Agent Orange dioxin applications is almost non-existent at the District and village level.</p> <p>Tons of domestic waste is generated annually and only parts of them are properly collected and dumped at the landfill sites. The uncontrolled burning of domestic and other waste is wide spread throughout the country. Most people use burning as the most convenient disposal method and therefore most of the waste that could be burnt ends up being burnt either at home or at the dump sites. It is also poorly studied about its total PCDD and PCDF release and impact on human health and environment.</p>
<b>7- Project Rationale</b>	PCDD/PCDF releases cannot be reduced without the requisite knowledge of the stakeholders whose collective actions are necessary to bring about the required changes in behavior and practice. Knowledge about the releases will lead to the better appreciation of the need for action. This should include willingness to commit needed resources - human, financial, institutional, material - necessary for the efficient management of PCDD/PCDF releases.

<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources, as well as with the obligation under the Basel Convention with regards to implementation of sound waste management practices. Availability of adequate data/information on unintentionally produced POPs releases to support the national policy related to POPs. Therefore, there is an imperative need to undertake research on health risk assessment related to UPPOPs for further providing scientific data/information and pertinent suggestions to policy makers on the appropriate ways to address the POPs issues in the country.
<b>9- Project Goal</b>	Reporting human health and environment risk from all key sources of PCDDs and PCDFs for further effective policy implication in addressing the POPs related problems.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Promote and develop methodology on the “human risk assessment and management” appropriately to the real needs and situation (socio-economic) of the country;</li> <li>➤ Build capacity of concerned Lao scientists and researchers in using the above mentioned methodology for further appropriate replication in the country and in hazardous chemicals and substances management in general; and</li> <li>➤ To provide scientific and pertinent suggestions to concerned policy makers for further appropriate decisions in proper POPs management and phasing out.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: Concerned Lao staff, scientists and researchers, relevant central and provincial authorities, affected people and targeted vulnerable groups</li> <li>➤ Indirect beneficiaries: Lao people, private sector, mass organizations and civil societies</li> </ul>
<b>12- Activities</b>	<p><b>Conduct preliminary human health and environment risk assessment:</b></p> <ul style="list-style-type: none"> <li>• For the research team</li> <li>• Desk study, selection of the study targeted areas and persons, preparation of the field work, test the field questionnaire form</li> <li>• Train the enumerators, test and improve the field questionnaire form</li> <li>• Conduct the field study. Assess what is the range of incremental health risk due to inhalation of ambient air to residents who live in an area influenced by a typical air emission. Define what is the range of incremental health risk to human receptors due to other indirect exposure pathways (e.g., soil ingestion, fugitive dust inhalation, dermal contact) arising from air contaminant emissions and deposition of contaminants from a typical emission source. Assess to what extent could the above</li> </ul>

	<p>mentioned parameters to be mitigated by implementing proposed mitigation and management measures.</p> <ul style="list-style-type: none"> <li>• Compile and analyze field data result</li> <li>• Report the study outputs. Conduct consultation workshop on the draft of the Study Report. Finalize, publish and disseminate the Study Report to key stakeholders through different means as appropriate; and</li> <li>• Monitor and assess the implication of the Study Report.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 400,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, GTZ, UNIDO, WB, FAO, UNEP
<b>15- Project Extent</b>	Countrywide

### Project Profile C3: Institutional Capacity Building

<b>1- Project Title</b>	<b>Institutional strengthening and capacity building for Environmentally Sound Management of unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MAF, MEM, MoH, MPI, NGOs,
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	Unintentionally produced POPs are a new concept for all management levels in Lao PDR. The country has no experts on unintentionally produced POPs. Presently, Laotian officials have only been trained to work in the field of Dioxin/Furan inventory. Capacity of all governmental institutions involved in unintentionally produced POPs management, as well as in implementation of international conventions, is poor (due to lack of human resources; technical guidelines, and monitoring laboratories). All levels of government, from technical staff to experts at the highest levels, including decision makers, have limited capacity and no technical skills related to POPs management. Lao PDR also lacks analytical capacity and adequate laboratory facilities for assessing and monitoring POPs.
<b>7- Project Rationale</b>	<ul style="list-style-type: none"> <li>➤ Institutional capacity building for sound management of unintentionally produced POPs will be strengthened at the national and provincial/municipality levels.</li> <li>➤ Technical skills of relevant competent institutional officers will be improved through training, meetings and dissemination</li> </ul>

	workshops.
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Need for compliance with the Stockholm Convention with regards to minimizing releases of unintentionally produced POPs.</li> <li>➤ Need to strengthen the capacity of the state administration to enforce the legislation related to sound management of unintentionally produced POPs.</li> </ul>
<b>9- Project Goal</b>	Improved capacity of national, provincial and local authorities for management of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Strengthen the institutions responsible for effective enforcement of legislation related to sound management of unintentionally produced POPs.</li> <li>➤ Strengthen the institutions and build capacity necessary for sound management of unintentionally produced POPs.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: state administration.</li> <li>➤ Indirect beneficiaries: population of Lao PDR; contribution to global efforts in reduction of unintentionally produced POPs.</li> </ul>
<b>12- Activities</b>	<p>Develop and strengthen the capacity to manage problems related to unintentionally-produced POPs:</p> <ul style="list-style-type: none"> <li>➤ Form technical team and core trainer on unintentionally produced POPs.</li> <li>➤ Develop training material.</li> <li>➤ Provide appropriate information on unintentionally produced POPs to decision-makers.</li> <li>➤ Strengthen institutional capacity of authorities responsible for implementation of legal instruments and guidelines relevant to sound management of unintentionally produced POPs.</li> <li>➤ Improve the technical skill of the technical team.</li> </ul>
<b>13- Estimated Costa</b>	<b>US\$ 450,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB)
<b>15- Project Extent</b>	In all provinces-cities of Lao PDR

### 3. Project Profile No C4: Public Awareness Raising

<b>1- Project Title</b>	<b>Public awareness raising on unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational</b>	MEM, MAF, MIC, MPI, MoH, MoE, NGOs, Private Sector.

<b>Agency</b>	
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	In Lao PDR, the raising of public awareness on unintentionally produced POPs has not been implemented yet in the print media, television, and radio. Information regarding unintentionally produced POPs, their release and hazards, are not covered in the news. At the same time, specialized education on the dangers of unintentionally produced POPs is not available. Informal education programs implemented by government institutions and civil organizations have included raising awareness of chemicals, risks and safe use of chemicals, including pesticides, chemicals fertilizers, and chemical substances accumulated in food. However, public awareness is low regarding unintentionally produced POPs and their impact on human health and the environment. Lao PDR recognizes that governmental institutions have little understanding about the potential hazards unintentionally produced POPs, and their impacts on human health and the environment.
<b>7- Project Rationale</b>	Lack of public awareness regarding potential POPs releases, and the hazards associated with practices such as uncontrolled open burning, use of waste materials as fuel for household cooking, etc. were recognized in the NIP as one of the priority environmental problems in Lao PDR. At the same time, indoor pollution is recognized also by WHO as one of the major health stressors in least-developed countries. Raising awareness with regards to potential hazards connected with these practices, as well as about possible alternatives, is essential to mitigate these hazards and to protect the affected public, in particular the most vulnerable population groups, such as women and children.
<b>8- Project Justification</b>	Need for compliance with obligations under the Stockholm Convention with regards to minimization of unintentionally produced POPs releases. Need for cessation of hazardous practices, such as uncontrolled burning of biomass and waste, as well as reduction of indoor pollution caused by using of improper fuels for household cooking.
<b>9- Project Goal</b>	Raise awareness amongst all levels of society, especially the rural poor, related to the need to reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Create awareness of the general public about potential hazards associated with uncontrolled burning and household cooking, as well as about possible alternatives, and mitigate the resulting adverse health effects.</li> <li>➤ Develop and implement awareness raising programs on potential health impacts of unintentionally produced POPs, and possible alternatives.</li> </ul>

<b>11- Beneficiaries</b>	Direct beneficiaries: General public, in particular the most vulnerable population groups, such as women and children.
<b>12- Activities</b>	<p>Develop and implement awareness raising program on health impact of unintentionally produced POPs, and possible alternatives:</p> <ul style="list-style-type: none"> <li>➤ Develop awareness raising program</li> <li>➤ Develop documents and information materials in Lao language and according to Lao culture.</li> <li>➤ Organize awareness raising campaigns on reduction of unintentionally produced POPs to be released through mass media and through community-based consultations. This includes working directly with poor communities, schools and vulnerable people, focusing in particular on uncontrolled burning of wastes, household cooking using improper fuel and waste management based on the 3R principles.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA
<b>15- Project Extent</b>	In all provinces-cities of Lao PDR

#### 4. Project Profile C5: Sound Waste Management

<b>1- Project Title</b>	<b>Promotion of sound waste management practices</b>
<b>2- Implementing Agency</b>	WREA, Selected Provinces and Cities
<b>3- Co-operational Agency</b>	MAF, MEM, MIC, MPWT, MoH, MPI, MoE
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	This project provides an introduction and encourages sound waste management practices in Lao PDR. It is intended as an introduction to environmental problems, waste management policy issues, and solutions associated with the Stockholm Convention requirements. The Stockholm Convention regulates the elimination of the POPs production and use, as well as ongoing minimization and, where feasible, ultimate elimination of unintentionally produced POPs. Its major goal is to protect human health and environment against adverse effects of POPs. Lao PDR signed the Stockholm convention on 5 March 2002 and ratified on June 28, 2006. Lao PDR's efforts to manage waste and reduce waste generation have made progress, but many problems of waste management practices still remain.
<b>7- Project Rationale</b>	Waste management is a dilemma which requires government's consideration. Pollution and waste management are serious emerging issues related to unintentionally produced POPs. Sound waste management practices will be undertaken in Lao PDR to meet its obligations under the Stockholm Convention. Poor waste management practices, such as uncontrolled open burning, are recognized as priority problems in Lao PDR. An effective alternative to waste burning is the overall reduction of the amount of produced waste through the implementation of sound waste management practices such as recovery, reuse and recycling, as well as through waste separation practices. Improving of landfill management practices and prevention of uncontrolled burning are undertaken in separate projects. This project focuses on the reduction of the overall amount of produced waste through the implementation of the 3R principles.
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Need for compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs release, as well as with the Basel Convention with regards to overall waste reduction and implementation of sound waste management practices.</li> <li>➤ It is essential that bad waste management practices, such as uncontrolled burning of waste in backyards and on landfills, be eliminated as soon as possible.</li> </ul>
<b>9- Project Goal</b>	Through sound waste management practices, reduce and eliminate the release of unintentionally produced POPs.



<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Overall reduction of the produced waste through implementation of sound waste management practices.</li> <li>➤ Develop guidelines on sound management of wastes (including 3R principles and waste separation practices)</li> </ul>
<b>11- Beneficiaries</b>	General public
<b>12- Activities</b>	<p>Introduce and encourage sound management of wastes including 3R principles and waste separation practices:</p> <ul style="list-style-type: none"> <li>➤ Establish technical team for sound waste management.</li> <li>➤ Study available guidance documents on sound waste management practices.</li> <li>➤ Provide countrywide training on waste management guidelines implementation involving local authorities and stakeholders.</li> <li>➤ Design and implement pilot project on environmentally sound waste management.</li> <li>➤ Revise the guidelines if necessary</li> <li>➤ Undertake awareness raising on 3R principles for the general public and at the grassroots level through integration into existing governmental and NGO programmes.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 400,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	In all provinces-cities of Lao PDR

### 5. Project Profile C6: Sound Management of Landfills

<b>1- Project Title</b>	<b>Promotion of controlled landfills and prevention of uncontrolled burning of waste</b>
<b>2- Implementing Agency</b>	MoE, Selected Provincial and Municipal Local Authorities
<b>3- Co-operational Agency</b>	MAF, MEM, MoH, MPWT, Private Sectors
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	Lao PDR has not developed any effective waste reduction policy and programs, and does not have an integrated system of treatment facilities. There remain critical waste management issues for which landfills are the only feasible disposal option. This project will promote the effective control of landfills and prevent the uncontrolled burning of waste. Lao PDR needs safe landfills as an important part of waste management policy. Presently, comprehensive facilities do not yet exist. Lao PDR intends to promote the role of controlled landfills as a proportionally greater interim method. Prevention of uncontrolled burning of waste by both the regulatory authorities and side

	management needs to be considered. Implementation of this project activity will reduce unintentionally produced POPs generation through the improvement of landfill management.
<b>7- Project Rationale</b>	<p>Poor waste management practices, such as uncontrolled open burning, are recognized as one of the priority problems in Lao PDR. Effective alternative to waste burning is the overall reduction of the amount of produced waste by implementation of sound waste management practices, such as recovery, reuse and recycling (the 3R principle), as well as through waste separation practices.</p> <p>To prevent uncontrolled burning of waste in the landfills, better management practices have to be implemented, aiming at conversion of uncontrolled landfills to controlled ones. This project focuses on improving landfill management practices, in particular prevention of uncontrolled burning.</p>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Need for compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs release, as well as with the Basel Convention with regards to the implementation of sound waste management practices.</li> <li>➤ Need for cessation of bad waste management practices, such as uncontrolled burning of waste in backyards and in landfills.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs through better waste management practices, recycling, and controlling burning of waste.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Prevention of bad waste management practices, in particular uncontrolled burning of wastes.</li> <li>➤ Convert uncontrolled landfills to controlled ones.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: General public and provincial and municipal authorities.
<b>12- Activities</b>	<p>Improve landfill management (prevent uncontrolled burning)</p> <ul style="list-style-type: none"> <li>➤ Establish technical team for landfill assessment</li> <li>➤ Conduct municipality and provincial landfill assessment</li> <li>➤ Develop landfill management program</li> <li>➤ Conduct training course on landfill management with the municipality and provincial authorities</li> <li>➤ Design and implement municipal and provincial landfill management pilot project</li> <li>➤ Revise the program if necessary <input type="checkbox"/></li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	Selected provincial and municipal landfills

## 6. Project Profile C7: Introduce BAT and BEP for Waste Incinerators

<b>1- Project Title</b>	<b>Introduction and promotion of BAT &amp; BEP in existing waste incineration plants</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MAF, MEM, MoH, MoPT, MoE, MoDF NGOs
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	The Stockholm Convention regulates the reduction of unintentionally produced POPs releases where feasible, with the ultimate goal of elimination of unintentionally produced POPs. Its major goal is to protect human health and the environment against the adverse effects of POPs. In order to prevent or minimize POPs releases, the following measures need to be promoted: proper waste handling, good combustion, avoidance of formation conditions, capturing of POPs that are formed and handling residues appropriately. BAT & BEP will introduce and promote implementation of existing waste incineration plants.
<b>7- Project Rationale</b>	<p>Presently, some waste incineration plants are in operation. These are located in major hospitals, garment factories and municipal landfills. Almost all of them utilize poor technology and follow poor environmental management practices. In some garment factories, heat is recovered to produce steam for ironing.</p> <p>This project focuses on best possible improvement of waste incineration and introduction of feasible environmental management practices in the existing waste incineration plants by introduction of suitable BAT &amp; BEP.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligations with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources, as well as with the obligation under the Basel Convention with regards to implementation of sound waste management practices.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs through application of BAT and BEP.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Improvement of waste incineration in existing facilities.</li> <li>➤ Introduction and promotion of BAT &amp; BEP in existing waste incineration plants.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: Operators of the waste incineration plants; neighboring residents</li> <li>➤ Indirect beneficiaries: General public (Contribution to global efforts of unintentionally produced POPs release minimization).</li> </ul>

<b>12- Activities</b>	Introduction and promotion of BAT & BEP in existing waste incineration plants (municipal and industrial waste) Establish technical team in waste incineration Study information and existing guidelines related to BAT and BEP and other guidelines to be adopted by the COP for environmentally sound waste incineration Undertake assessment of applicability of BAT and BEP in existing waste incineration plants (including socio-economic assessment) Design and implement a pilot project on the applicability of BAT and BEP guidelines in an existing waste incineration plant Update/amend the national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary Provide training to responsible governmental institutional officers and authorities on best available techniques (BAT) and best environmental practice (BEP).
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	Selected one province or city

### **7. Project Profile C8: Introduce BAT and BEP for POPs Releases**

<b>1- Project Title</b>	<b>Application of BAT &amp; BEP for unintentionally produced POPs operational release sources</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MAF, MEM, MIC, MoH, MPI, MoDF
<b>4- Duration</b>	30 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	<p>The Stockholm Convention regulates the elimination of POPs production and use, as well as ongoing minimization and, where feasible, ultimate elimination of unintentionally produced POPs. A preliminary POPs inventory in 2004-2005 identified significant unintentionally produced POPs release sources, such as uncontrolled waste burning, and small-scale fuel burning practices.</p> <p>This project focuses on unintentionally produced POPs release sources and considers ways on how to implement guidelines on BAT and BEP in safe landfills. This project will assist Lao PDR in controlling unintentionally produced POPs releases in a cost effective way for more effective protection of public health and the environment.</p>
<b>7- Project Rationale</b>	The industrial sector in Lao PDR is characterized mostly by small-scale industry, utilizing poor technologies and environmental management practices. Most factories are small-scale, and utilize wood as fuel. This project focuses on best possible improvement of the relevant processes and feasible environmental management practices in the existing installations by introduction of suitable BAT & BEP, in particular by promoting the most appropriate fuels. Socio-economic

	cost benefit analysis will be necessary to minimize the burden on the general public.
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Improvement of techniques and practices in existing facilities</li> <li>➤ Introduction and promotion of BAT &amp; BEP in existing industrial plants</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: Operators of the waste incineration plants; neighboring residents.</li> <li>➤ Indirect beneficiaries: General public (Contribution to global efforts of unintentionally produced POPs release minimization).</li> </ul>
<b>12- Activities</b>	<p>Introduce and effectively implement guidelines on best available techniques (BAT) and best environmental practices (BEP) to the release sources of unintentionally produced POPs:</p> <ul style="list-style-type: none"> <li>➤ Establish technical team in unintentionally produced POPs release management</li> <li>➤ Study information and existing guidelines related to BAT and BEP and other guidelines to be adopted by the COP</li> <li>➤ Undertake assessment of applicability of BAT and BEP in existing industries installations (including socio-economic assessment)</li> <li>➤ Design a pilot project on the applicability of BAT and BEP guidance in selected priority source categories</li> <li>➤ Implement the pilot project on the applicability of BAT and BEP guidance in selected industrial facilities</li> <li>➤ Update/amend national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary</li> <li>➤ Provide training to responsible authorities and to plant operators on best available techniques (BAT) and best environmental practice (BEP)</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 500,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	Selected province or city

**Project Profile C9: Promotion the use of BAT and BEP in the Small-Medium Enterprises (SMEs) trough the economic incentives**

<b>1. Project Title</b>	<b>Promotion the use of BAT/BEP in the SMEs and creation of BAT/BEP Fund</b>
<b>2. Implementing Agency</b>	WREA
<b>3. Co-operational Agency</b>	MIC, MoH, MAF, SMEs, LCoC
<b>4. Duration</b>	36 months
<b>5. Project Location</b>	Vientiane Capital City (Project coverage - Country-wide)
<b>6. Background</b>	The concept of BAT/BEP is new to Lao PDR to the Government and Private Sectors. This concept will be promoted and implemented as appropriate in the SMEs operation.
<b>7. Project Rationale</b>	In 2005, study showed that the release of unintentional POPs (UPOPs) was found in 3 main areas, namely steel manufacturing, textile, and recycle battery Recycling. Regardless of strong willingness to apply BAT/BEP, SMEs has never implemented any environmentally sound techniques in their process. This is due to the lack of capacity, resources and information as well as the absent POPs related regulations. Along with economic incentives, SMEs required assistance from the Government on the viable technologies on the minimization of POPs release, BAT/BEP information and Fund
<b>8. Project Justification</b>	The Revised Environmental Law promotes the application of Environmental Sound Technology such as Clean Technology and Clean Production in the SMEs. Therefore, it is essential to <ul style="list-style-type: none"> <li>➤ Strengthen capacity to the concerned government agencies as well as public sectors on the importance of BAT/BEP</li> <li>➤ Draft rules and regulations on POPs, especially on BAT/BEP.</li> <li>➤ Establish BAT/BEP Fund to assist SMEs carry out BAT/BEP</li> </ul>
<b>9. Project Goal</b>	To promote the use of BAT/BEP in SMEs at national level in order to ensure minimum release of POPs and impacts on health of the population, which will contribute to the implementation of the National Implementation Plan (NIP) as well as National Growth and Poverty Action Strategy (NGPAS)
<b>10. Objectives</b>	<ul style="list-style-type: none"> <li>➤ Strengthen SMEs' capacity on BAT/BEP</li> <li>➤ Formulation and adoption of regulations related to the use of BAT/BEP</li> <li>➤ Creation of the BAT/BEP Fund to support SMEs</li> </ul>
<b>11. Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct Beneficiaries: SMEs, Local Communities, and Concerned Government Agencies at Local and National Level</li> </ul>

	<ul style="list-style-type: none"> <li>➤ Indirect Beneficiaries: Contribution to global efforts of POPs release minimization and sustainable development.</li> </ul>
<b>12. Activities</b>	<ul style="list-style-type: none"> <li>➤ Key stakeholders consultation, formulation and undertake their capacity strengthening needs</li> <li>➤ Develop guidelines/training materials</li> <li>➤ Conduct trainings for various target groups ( management, levels, training of trainers and Public/Private Sector)</li> <li>➤ Evaluation of training</li> <li>➤ Improve training materials</li> <li>➤ Promote awareness raising program on POPs and BAT/BEP</li> <li>➤ Review existing BAT/BEP regulations</li> <li>➤ Formulation of BAT/BEP regulations related to all 3 sectors</li> <li>➤ Consultation workshops on the first and final drafts of the regulation.</li> <li>➤ Publication, dissemination and implementation of the regulations</li> <li>➤ Develop guidelines for BAT/BEP Fund establishment and Fund operationalization</li> <li>➤ Monitoring and Assessment of the Fund</li> <li>➤ Monitoring and Assessment of project implementation progress and reporting (quarterly)</li> <li>➤ Establish Steering Committee which will report to POP's Steering Committee</li> </ul>
<b>13. Estimated Cost</b>	<b>US \$ 1,000,000</b>

### 8. Project Profile No C10: Sound Management of Medical Waste

<b>1- Project Title</b>	<b>Improvement in medical waste management practices</b>
<b>2- Implementing Agency</b>	MoH
<b>3- Co-operational Agency</b>	WREA, MoDF, MoPT
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City; provinces
<b>6- Background</b>	Medical waste management in Lao PDR is a dilemma which requires initiative at the national level. Pollution and medical waste management are serious emerging matters which need to be solved urgently. Existing legislation and administration is inadequate and WREA, as well as the Ministry of Health, have made recommendations with respect to the transfer of responsibilities, possible management structure, legislation and administrative measures.



<b>7- Project Rationale</b>	<p>According to the NIP project findings, some level of medical waste management system is in place, implemented by the Ministry of Health. Hazardous medical waste such as infectious material, syringes, needles and surgical waste is segregated and incinerated at one major hospital facility, and at one minor facility. There are no medical waste incinerators outside of major city centres.</p> <p>This project aims at improving the current medical waste management practices, in particular to ensure efficient segregation of the hazardous portion at source, as well as disposal of medical waste under existing conditions in the best possible environmentally sound manner.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources, as well as with the Basel Convention with regards to implementation of sound waste management practices.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs associated with medical waste incineration.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Improvement of medical waste management practices.</li> <li>➤ Review and improvement of medical waste management plan.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Hospitals, general public
<b>12- Activities</b>	<p>Reviewing and improvement of current medical waste management practices:</p> <ul style="list-style-type: none"> <li>➤ Establish technical team in medical waste management</li> <li>➤ Study existing medical waste management guidelines and information related to BAT and BEP</li> <li>➤ Undertake review and assessment of existing medical waste management practices with regards to the above guidelines, including socio-economic analysis</li> <li>➤ Update medical waste management practices as necessary</li> <li>➤ Design a pilot project on the applicability of the updated guidelines for medical waste management</li> <li>➤ Implement the pilot project in selected hospitals</li> <li>➤ Revise the medical waste management plan if necessary</li> <li>➤ Provide training to relevant stakeholders to facilitate broad implementation of the medical waste management plan</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	Selected provinces or cities

## 9. Project Profile C11: Inventory of Unintentionally Produced POPs

<b>1- Project Title</b>	<b>Inventorisation of unintentionally produced POPs releases</b>
<b>2- Implementing agency</b>	WREA
<b>3- Co-operational Agency</b>	MAF, MEM, MoH, MPI
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Countrywide
<b>6- Background</b>	<p>The preliminary inventory of unintentionally produced POPs provided basic data and information related to the release sources and amounts released. The first inventory data and information is insufficient, as limited funding was available to do a thorough inventory of all possible release sources. This project will review the results from the first inventory, identify the potential of unintentionally produced POPs release sources, and determine more accurate release figures using comprehensive approaches and more inventory facilities. Currently the lack of sufficient data concerning unintentionally produced POPs results in the Government not being able to take adequate measures to protect human health and the environment. If this project is funded by donors, Lao PDR will be able to fulfill the gaps identified in the first inventory, create a new inventory to protect human health and the environment, and also to comply with the Stockholm Convention requirements. Note that a separate project specifically oriented towards dioxin/furan inventory, has been identified (Project #10 below); dioxins are treated separately, given the unique nature of dioxin exposure in Lao PDR from historical Agent Orange and other herbicide applications during the American war in the 1960's and 70's.</p>
<b>7- Project Rationale</b>	<ul style="list-style-type: none"> <li>➤ Unintentionally produced POPs release inventories are necessary to quantify the pressures on human beings and the environment, as well as to develop abatement strategies and priorities policies and measures for the main source categories (sectors) in a cost-effective way. They are also essential to monitor the effectiveness of implemented policies and measures in terms of reduced or avoided emissions. The unintentionally produced POPs release inventory was elaborated in 2004 within the NIP framework.</li> <li>➤ This preliminary inventory has to be revised with regards to the original data and information submitted to the Stockholm Convention secretariat, and to evaluate future unintentionally produced POPs release trends.</li> </ul>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Need for compliance with the Stockholm Convention obligation with regards to reporting about unintentionally produced POPs releases and their future trends.</li> <li>➤ Current lack of adequate (and updated) data on unintentionally produced POPs releases to support the national policy related to POPs.</li> </ul>
<b>9- Project Goal</b>	Collect accurate inventory data to help reduce and eliminate the release of unintentionally produced POPs.

<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Ensure adequate inventory data are available on unintentionally produced POPs releases, to verify main sources and future trends.</li> <li>➤ Undertake revision of the preliminary unintentionally produced POPs release inventory.</li> <li>➤ Update the unintentionally produced POPs release inventory and verify accuracy of data collected.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Governmental institutions and stakeholders
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Undertake comprehensive release inventory of unintentionally produced POPs (Note that dioxins/furans are to be addressed separately under a specific Project as described in #11 below).</li> <li>➤ Form inventory team</li> <li>➤ Review existing inventory reports</li> <li>➤ Identify support tools and equipment required for inventory</li> <li>➤ Conduct unintentionally produced POPs release inventory update</li> <li>➤ Design national unintentionally produced POPs database</li> <li>➤ Evaluation of unintentional POPs release reduction and elimination</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 400,000 (excluding costs for Dioxin/Furan inventory)</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA.
<b>15- Project Extent</b>	Countrywide

**11. Project Profile C12: Inventory of Dioxin and Furan Hot Spots, Raising Public Awareness to Protect Exposed Communities, and Identification of Clean-up Priorities for Contaminated Sites**

<b>1- Project Title</b>	<b>Inventory of Dioxin and Furan Hot Spots, Raising Public Awareness to Protect Public from Exposure and Prioritization of Contaminated Sites</b>
<b>2- Implementing Agency</b>	WREA, MOD
<b>3- Co-operational Agency</b>	Ministry of Defense (needed to assist with sample collection at current Lao PDR military installations, and former US military installations)
<b>4- Duration</b>	30 months
<b>5- Project Location</b>	Countrywide, with a focus on southern provinces. Preliminary sites that should be investigated include: Phongsaly, Luang Namtha, Oudomxay, Houa Phan, Xieng Khouang, Vientiane, Bolikhamxay, Khammouane, Savannakhet, Salavan, Sekong and Attapeu

## 6- Background

The preliminary inventory of dioxins and furans in Lao PDR identified a number of areas where Agent Orange applications occurred along the former Ho Chi Minh trail. Agent Orange was a 50/50 mixture of 2, 4, 5-dichlorophenoxyacetic acid (2, 4-D) and 2, 4, 5-trichlorophenoxyacetic acid (2, 4, 5-T) with TCDD being an initially unknown contaminant of the manufacturing process for 2, 4, 5-T. The TCDD congener was the only dioxin found in the contaminated 2, 4, 5-T production process, and is characteristic of Agent Orange and any other defoliant where 2, 4, 5-T was a constituent. Agent Orange and other herbicides were used extensively by US armed forces in Laos and Viet Nam, in the 1960s; the operation, code-named Ranch Hand, expanded in 1965 and 1966, and was terminated in 1971. Approximately 2,000,000 litres of herbicides, with the vast majority being Agent Orange, were applied over 163,000 acres of Laotian territory during the American War. Agents Blue, White and other unknown agents were also used during the war (quantities unknown).

Of primary concern is former military installations (bases, camps, staging areas) where Agent Orange and other herbicides were applied. Work conducted in Viet Nam has identified these areas as potential hotspots, requiring mitigation measures for protection of local communities, and public awareness campaigns to reduce exposure of potentially affected populations. A number of suspected hotspots exist in Lao PDR, based on the initial inventory. These include: Phongsaly, Luang Namtha, Oudomxay, Houa Phan, Xieng Khouang, Vientiane, Bolikhamxay, Khammouane, Savannakhet, Saravanh, Sekong and Attapeu

Further monitoring of environmental media (soils, sediments, and animal tissues such as fish and waterfowl) in suspected hotspot areas, in addition to collection of blood/breast milk samples and epidemiological data from local residents, is required in future to fully address this issue in Lao PDR. Current levels of awareness of the local population to dioxin contamination are low, and there is evidence that dioxin hotspots may exist in several areas of Lao PDR.

This project will review the results from the first dioxin/furan inventory conducted in Lao PDR, identify the potential of unintentionally produced dioxin and furan release sources, and determine exact locations of potential dioxin hotspots. The lack of data concerning potential dioxin hotspots results in the Government not being able to take adequate measures to protect human health and the environment. If this project is funded by donors, Lao PDR will be able to fulfill the gaps identified in the first inventory, develop a comprehensive inventory which would go a long way to protect human health and the environment, and also to comply with the Stockholm Convention requirements.

<b>7- Project Rationale</b>	<ul style="list-style-type: none"> <li>➤ More detailed dioxin/furan inventory data, particularly from suspected hotspots, is required to protect the rural poor from potential exposure to these toxic chemicals.</li> <li>➤ The preliminary dioxin/furan inventory needs to be revised with regards to the original data and information submitted to the Stockholm Convention secretariat, and to identify areas requiring remediation and clean-up;</li> <li>➤ Timing is critical for completion of detailed interviews with Lao war veterans regarding historical Agent Orange applications and locations of potential dioxin hot spots in Lao PDR. In five years, much information will be lost, as veterans are now in their 60's or older..</li> </ul>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>➤ Several areas of Lao PDR may contain dioxin hotspots, which must be identified to protect the local communities from further contamination. Many of these suspected hotspots are in rural areas where incidence of poverty is high, and awareness about potential contamination from dioxins is non-existent;</li> <li>➤ Need for compliance with the Stockholm Convention obligation with regards to reporting about dioxin and furan levels in the environment, and their future trends.</li> <li>➤ Current lack of adequate (and updated) data on dioxin/furan releases to support the national policy related to POPs.</li> </ul>
<b>9- Project Goal</b>	Collect accurate inventory data to help reduce and eliminate exposure of the rural population to dioxins and furans.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Ensure adequate inventory data are available on dioxins and furans, to verify main sources and future trends.</li> <li>➤ Undertake revision of the preliminary unintentionally dioxin and furan inventory.</li> <li>➤ Update the dioxin and furan inventory, identify suspected hotspots and verify accuracy of data collected.</li> <li>➤ Protect local communities, particularly rural poor, from potential exposure to dioxins and other toxic chemicals from the American war era.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Local communities living in suspected hotspot areas; Governmental institutions and other stakeholders
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Review existing data on dioxin/furan from the initial POPs inventory;</li> <li>➤ Work with Government stakeholders, including WREA and Ministry of Defense, to identify potential dioxin hotspots;</li> <li>➤ Conduct field investigations and sampling for dioxins and furans at a number of suspected hotspot locations, including: Dakcheung District (Sekong Province), in addition to former US bases in Savannakhet, Saysomboune District, and also in the provinces of Phongsaly, Luang Nam Tha, Oudomxay, Houa Phan, Xieng Khouang, Khammouane Bolikhamxay and Attapeu (areas not investigated in the initial inventory). Sampling will include soils, sediments, fish tissues, and potentially blood and breast milk from people residing in</li> </ul>

	<p>suspected hotspot areas;</p> <ul style="list-style-type: none"> <li>➤ Conduct detailed interviews with local residents in Central and Southern Lao PDR combined with additional site surveys of Agent Orange impacted areas to provide a comprehensive overview of the dioxin situation;</li> <li>➤ Elevated dioxin levels in spray plane crash sites (especially in Savannakhet, Saravane and Sekong) may have impacted health of villagers retrieving metal scrap and for Lao/US missing in action (MIA) recovery teams working at these sites</li> <li>➤ Should high dioxin levels be detected, mitigation measures will be needed to reduce potential exposure of the population to dioxins. This could include community awareness raising campaigns, and recommendations for physical remediation of sites;</li> <li>➤ Awareness raising programs will be conducted to help improve local people’s understanding of potential human health effects in dioxin hotspot areas of Lao PDR. Currently, most people are unaware of the historical or current health threats from exposure to Agent Orange dioxin hotspots</li> </ul>
<b>13- Estimated Cost</b>	<p><b>US\$ 2,000,000</b> – much of this cost is associated with analytical fees which are approximately \$1,000/sample analyzed. It is difficult to estimate the number of samples that will need to be analyzed for each identified contaminated site, but based on experience in Viet Nam, between 50-100 would be a minimum to delineate extent of contamination at each site. Sampling of food and people may also be necessary. Budget needs to be established to implement a monitoring program to verify effectiveness of the mitigation and remediation efforts. Remediation/mitigation costs are also highly site dependant.</p>
<b>14- Donors</b>	<p>Government of the Lao PDR: 5% of total budget (Maximum Level)  Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTZ, JICA, CIDA.</p>
<b>15- Project Extent</b>	<p>Countrywide, with particular emphasis on southern and north-eastern Lao PDR</p>

#### **D. PROJECT PROFILE FOR THE COORDINATION OF THE SC AND NIP IMPLEMENTATION**

**1. Project Profile D1:** Strengthen capacity of the established POPs National Steering Committee, Working Groups, and POPs Coordinating Unit to ensure effective coordination, monitoring and assessment of the SC and NIP implementation at the national level through regular discussion, study tours, forums, workshops, training courses, and increase awareness related to the impacts of POPs issues on Lao society.

<b>1- Project Title</b>	<b>Strengthening Capacity of POPs National Coordinating Unit for continuing the NIP coordination and implementation</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agencies</b>	MAF, MIT, MEM, MoH, MPI, MoD, Mass Organizations, Private sectors and key stakeholders
<b>4- Duration</b>	48 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	<p>The existing national POPs Steering Committee, POPs Coordinating unit, and Technical Working Groups were established during the NIP development process. These entities played very important roles in guiding, coordinating relevant stakeholders in all aspects of project management, development and submission of the NIP for Government approval. The existing staff has improved their capacity in many aspects of project management, project coordination, administration and organization as well as in the framework of NIP development. The role and responsibilities of these bodies will be improved after NIP development finishes. The Steering Committee has provided rational guidance to the Technical Working Groups and the Coordination Unit. The Technical Working Groups have been actively involved in the POPs inventory process and reporting, and the formulation of the NIP. The Coordinating Unit has good capacity to identify the minimum requirements for financial records, controls and financial reporting and auditing applicable to donor funded NIP projects. In order to follow-up the progress of NIP project implementation and to coordinate for the NIP project management aspects, including implementation, monitoring, evaluation, and updating the NIP, the improvement of the mandate of these existing national POPs entities is crucial.</p>
<b>7- Project Rationale</b>	<p>The Steering Committee will be more effective in guiding the Coordinating Unit and Technical Working Groups in successfully concretizing the NIP at the national level.</p> <p>The Technical Working Groups will enhance their duties, actively share their information and data, and learn from others in the area of POPs inventory, reporting, research and others.</p> <p>The national coordination unit will improve capacity in the coordination, monitoring and assessment of the SC and NIP implementation, and strengthen capability in the management of the NIP project to respond to the requirements of the Stockholm Convention. As a coordination unit of the NIP project implementation and appraisal process, the national coordination Unit requires an analysis of the managerial and administrative capacity of the recipient ministerial NIP implementing organization.</p> <p>Through the three year exercise of the Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention on POPs and through this proposed project proposal, the national POPs bodies' capacity will be strengthened and the national</p>



	<p>plan and project coordination capacity will be improved to some extent. Moreover, the awareness for chemicals information and data management will be increased; and coordination on POPs management will be strengthened at the national level. While the necessary for prompt implementation of the NIP is widely acknowledged and immediate actions are decisive to pave the way for sound chemical management including POPs, it is also true that Lao PDR still needs assistance in ensuring effective coordination, monitoring and assessing the overall SC and NIP implementation; project formulation and implementation; initiation of policy changes; monitoring the sectoral development; and regularly reporting the SC Secretariat.</p>
<b>8- Project Justification</b>	<p>The proposed project proposal is intended to strengthen the capacity and capability, including removal of constraints and problems faced by the institutions dealing with chemical management including POPs, to implement the projects proposed by the relevant ministries, guided by the National POPs Steering Committee, implemented by the Technical Working Groups, and coordinated, monitored and assessed by the National POPs Coordinating Unit. In order to promote the effective implementation of the SC and NIP, this project will mainly emphasize that while the implementation of most of the proposed projects can be specifically assigned to the executing institutions and can be coordinated by the national coordinating unit. This project also needs to ensure that the practices and management of all proposed projects supporting relevant actions on chemical management including POPs are in place, applicable, and effective responses to both existing issues in the country and anticipated issues from the Stockholm Convention.</p>
<b>9- Project Goal</b>	<p>To improve the quality of the NIP coordination and implementation, including monitoring and evaluation of NIP projects execution.</p>
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Improving the mandate of the National Steering Committee, Technical Working Groups, Coordination Unit in the NIP coordination and implementation;</li> <li>➤ Improving and developing the administrative management systems, guidelines, manuals and other project coordination and implementation tools;</li> <li>➤ Strengthening the capacity and capabilities for NIP project implementation covering data centralization, assessment, monitoring and evaluation.</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: National Steering Committee, Technical Working Groups, Coordinating Unit and line ministries involved. Indirect beneficiaries: Local community.</p>

<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ To strengthen capacity of the National POPs Coordinating Unit and the POPs Technical Working Groups</li> <li>➤ To plan and convene, in partnership with the relevant ministries on the chemical management and reduction and elimination of POPs;</li> <li>➤ To assist the relevant ministries and stakeholders in establishing a national network for sound chemical management and reduction and elimination of POPs and sound chemical based information;</li> <li>➤ To increase cooperation between the chemical management stakeholders and the institutions in Lao PDR and other countries in the region and international donor communities through project implementation and issues relevant to the NIP implementation and management;</li> <li>➤ To undertake the coordination with stakeholders on chemicals management, reduction and elimination of POPs including planning, the preparation of background papers and development of a framework for addressing the NIP project information needs, assessment, monitoring, evaluation, and management, and</li> <li>➤ To develop and maintain good working relationship between the WREA and the stakeholders and resource initiatives involving capacity building, administrative management, project design, project implementation, data gathering, chemicals analyzing, NIP evaluation, reporting and updating of the NIP.</li> <li>➤ To conduct study tours to POPs National Steering Committee, to organize technical Forum to the Technical Working Groups related to POPs management as needed.</li> <li>➤ To increase awareness related to POPs management to the Steering Committee, Working Groups and POPs Coordinating Unit.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 900,000</b>
<b>14- Donors</b>	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, , FAO, UNEP, ADB)
<b>15- Project Extent</b>	Provinces and Cities

**2. Project Profile D2:** Design and implement a National Chemicals Database and Information System that includes POPs to ensure effective exchange of information at the national level and Institute a national clearing-house center on chemicals toxicology and Best Available Technology and Best Environment Practices Guidelines to industry profiles, waste generation and characteristics, waste minimization options and financial evaluation of these option for executives and potential clients on the benefits of properly managing environmental impacts.

<b>1- Project Title</b>	<b>Establishment of National Chemicals Database including POPs for Effective Exchange of Information.</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MAF, MIC, MoH, MPI
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	The national coordinating unit has characterized and centralized the chemicals information (National Hazardous Chemical Inventory) including POPs (Inventory Report on POPs Pesticides, PCBs, and Unintentionally Produced POPs) as a primary means of the chemicals information dissemination and outreach objectives. The National Hazardous Chemical Inventory, inventory reports on POPs pesticides, PCBs, and unintentionally produced POPs and other chemicals information in Lao PDR was respectively published in 2006, 2007 and 2008. The national chemicals database is a new concept for centralization and exchanging of information of POPs.
<b>7- Project Rationale</b>	<p>Numerous public and private actors are developing internet sites that contain information with relevance to chemicals management, POPs reduction and elimination. Rational establishment of the national chemicals database is to build on those efforts to make information available in the technology and format compatible with the needs of the widest public possible.</p> <p>The national chemicals database is very useful and will provide on-line access and hard document distribution to relevant chemicals for the Laotian public, decision makers, environmental technicians, and chemical management officers. The national chemicals database is also a tool for chemicals management including POPs reduction and elimination, and will be designed in a manner which is easy to monitor, evaluate, consolidate and update.</p>
<b>8- Project Justification</b>	<p>In a country like Lao PDR, the national chemicals database is urgently needed for proper management of chemicals including POPs; unfortunately most chemical data and information are not centralized. The advent of geographical information systems (GIS) and internet mapping services now makes it possible to provide an easy-to-use overview of the chemicals management context.</p> <p>The national chemicals database will offer immense advantages over conventional chemical mapping systems. Linked with a GIS and displayed on an internet mapping and database service, the relevant ministries would provide information on important chemicals, including POPs, as well as providing highly efficient spatial information for the evaluation of chemicals management and POPs reduction and elimination. The national chemicals database would complement the</p>

	existing chemical information system as an important but separate, comprehensive, and chemically oriented database.
<b>9- Project Goal</b>	Centralize and provide comprehensive chemical concentration and distribution data and information (including POPs) to the stakeholders via an internet map service to achieve the main national objectives in chemical management, POPs reduction and elimination.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ To integrate the data of chemicals inventory and other information into a single spatially-oriented national chemicals database, and distributed via the internet;</li> <li>➤ To provide an appropriate context for assessing chemicals use, reduction, and elimination in terms of implementation of the provision of the Stockholm Convention.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: Lao government institutions; private sectors and stakeholders, the general public and the international community via the internet.</li> <li>➤ Indirect beneficiaries: Contribution to global efforts of POPs release minimization and sustainable development.</li> </ul>
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ Review and evaluate the existing chemical database and spatial information;</li> <li>➤ Assess various options for the national chemicals database design;</li> <li>➤ Design the national chemicals database; the expansion of the existing chemicals data and information will be considered after assessing expansion options and considering ongoing maintenance and operational costs of existing systems;</li> <li>➤ Establish a GIS based internet map service with a chemicals distribution information network to serve government sectors;</li> <li>➤ Conduct a pilot study for examination of selected chemicals including POPs areas to determine the database structure and mechanism for incorporating data from different sources;</li> <li>➤ Incorporate chemicals data and information including POPs from other institutional sources; and</li> <li>➤ Link between national chemicals database with the GIS proposed for managing chemicals including POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 1,000,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB.

<b>15- Project Extent</b>	Vientiane Capital City, Provinces and Cities
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**3. Project Profile D3: Formulate, promulgate and implement Hazardous Chemicals and Substances Management Law or Decree;**

<b>1- Project Title</b>	<b>Chemical Management Law</b>
<b>2- Implementing Agency</b>	WREA
<b>3- Co-operational Agency</b>	MIC, MEM, MoH, MAF, Relevant Governmental Institutions and Relevant Civil Organizations
<b>4- Duration</b>	30 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	<p>To date, Lao PDR does not have any legislation regarding the managing of hazardous chemicals and substances, including POPs. In general, some existing legal provisions related to managing chemicals are prepared by some governmental institutions, and the objectives of such provisions focus on the management and the use of hazardous chemicals and substances related with those individual governmental institutions.</p> <p>Lao PDR believes that legal instruments are very important for the management of hazardous chemicals and substances including POPs. Therefore, it is necessary to assess and prepare a preliminary law or decree responding to the needs of hazardous chemicals and substances management. These legal provisions must cover the management of chemicals as illustrated in various international conventions such as the Stockholm Convention, PIC Convention, Montreal Protocol, etc.</p>
<b>7- Project Rationale</b>	<p>Currently, existing legal instruments in Lao PDR are insufficient for the safe and sound management of hazardous chemicals and substances including POPs, as required under the Stockholm Convention. The project rationale is:</p> <ul style="list-style-type: none"> <li>➤ Relevant laws will be revised or prepared,</li> <li>➤ Managing of chemicals including POPs guideline will be developed and available for implementation,</li> <li>➤ Laws and guidelines related to the management of hazardous chemicals and substances including POPs will be enforced, and</li> <li>➤ Knowledge and awareness on the laws and relevant legal instruments will be disseminated and participation promoted to government agencies and the general public.</li> </ul>
<b>8- Project Justification</b>	There is a need to establish necessary legal framework for managing hazardous chemicals and substances including POPs in a safe and sound environmental manner.

<b>9- Project Goal</b>	Manage hazardous chemicals and substances including POPs in a safe and sound environmental manner and facilitate the development of alternative approaches through effective chemical law enforcement. Promote greater public participation in chemical management and decision-making.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Provide a forum for governmental institutions and stakeholders for development of Hazardous Chemicals and Substances Law/Decree</li> <li>➤ Support stakeholder’s initiatives for sharing law and policy development related strategies, expertise and technical knowledge,</li> <li>➤ Support joint training and capacity building related hazardous chemicals and Substances law/decree development including POPs, and</li> <li>➤ Establish and examine alternative mechanisms for hazardous chemicals and substances law/decree development and future compliance.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>➤ Direct beneficiaries: Lao government institutions;</li> <li>➤ Indirect beneficiaries: Lao people (Contribution to global efforts of chemicals waste release minimization including POPs).</li> </ul>
<b>12- Activities</b>	<p>Assessment of law and policy related to managing of chemicals including POPs:</p> <ul style="list-style-type: none"> <li>➤ Form legal team</li> <li>➤ Review legal instruments and policy,</li> <li>➤ Assess legal instruments and policy, and</li> <li>➤ Identify gap and requirement for law and policy development with a focus on the environment sound management of hazardous chemicals and substances including POPs.</li> </ul> <p>Develop hazardous chemicals and substances management law/decree including POPs:</p> <ul style="list-style-type: none"> <li>➤ Design, test, improve the training material related to the methodology of the law or decree formulation related to the management of hazardous chemicals and substances,</li> <li>➤ Deliver training course on the methodology of concerned law/decree drafting,</li> <li>➤ Formulate the law/decree on Hazardous Chemicals and Substances Management,</li> <li>➤ Organize consultation workshops on the drafts of the above mentioned law/decree for further appropriate finalization,</li> <li>➤ Finalize and submit the final draft of the law/decree for approval.</li> </ul> <p>Dissemination and follow up the implementation of the approved law/decree</p> <ul style="list-style-type: none"> <li>➤ Publish and disseminate the promulgated law/decree through different means at the national level, and</li> <li>➤ Monitor, assess and report the effectiveness of the realization of the law/decree.</li> </ul>

<b>13- Estimated Cost</b>	<b>US\$ 400,000</b>
<b>14- Donors</b>	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB.
<b>15- Project Extent</b>	Countrywide

4. **Project Profile D4:** Promote the conduct of chemical engineering course at the targeted academic institution for further supply of qualified human resources to relevant ministries and government institutions, private sector, and other key stakeholders involved in the realization of the NIP and SC requirements.

<b>1- Project Title</b>	<b>Capacity building of targeted academic institutions on the delivery of chemical engineering course</b>
<b>2- Implementing Agency</b>	NUOL
<b>3- Co-operational Agencies</b>	MoE, WREA, MoH, MIT, MEM, Private sectors and key stakeholders
<b>4- Duration</b>	40 months
<b>5- Project Location</b>	Vientiane Capital City
<b>6- Background</b>	There is a substantial lack of chemical engineers in the governmental bodies, academic institutions and private sector at the national level. Those who have the background were not directly involved in the chemical management and were assigned to other duties, which are not that consistent with their academic background. The country has to mostly rely on the external human resources, which are quite expensive. During the formulation of the NIP and the National Hazardous Chemical Strategy, relevant ministries and governmental institutions, private sectors and other key stakeholders have raised their concern related to the imperative need of having qualified staff to effectively address the chemical management problems, specifically the POPs issues. Suggested academic requirements are namely: chemical engineering, followed by chemical science, environment engineering, and others. There has been delivery of chemical science at the level of bachelor degree and environment engineering at the master degree at the respective faculties of Chemical and Engineering. However, there is no chemical engineering course being fully provided at the bachelor and master degree in the country yet.



<b>7- Project Rationale</b>	There is no doubt that chemical engineering is one of the first academic requirements of qualified staff to effectively address the chemical management issue, specifically in the area of POPs related concerns, namely BAT/BEP related to UPPOPs. The lack of qualified staff in the area of chemical engineering could impede the Government of Lao PDR to successfully and in a sustained manner fulfill its commitments to the Stockholm Convention. The continuous conduct of chemical engineering course will steadily provide sufficient qualified human resources to the local market. Concerned ministries and governmental institutions, and relevant private sector would be in a better position to respectively suggest policy makers on the must use of BAT/BEP related to POPs, including CP; and on the appropriate selection and use of BAT/BEP in their plants. This will contribute not only to the realization of the NIP but also of the Five Years National Socio-Economic Development Plan, the National Growth and Poverty Eradication Strategy, the National Environment Strategy up to the year 2020, and others.
<b>8- Project Justification</b>	There is a crucial need to deliver chemical engineering course at the targeted Lao academic institutions and to further appropriately replicate in the entire country. This will deeply contribute to the effective supply of qualified human resources to concerned government and private sectors in effectively addressing the chemical management issues, including POPs.
<b>9- Project Goal</b>	To provide sufficient and qualified chemical engineers to concerned ministries and governmental institutions at the national level, relevant private sector and other key stakeholders
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>➤ Capacity building and strengthening of targeted academic institutions on the delivery of chemical engineering courses in a sustained and effective manner;</li> <li>➤ Build and strengthen capacity of concerned trainers ; and</li> <li>➤ Replicate this course delivery at the national level as appropriate</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: relevant line ministries and governmental institutions, private sectors, and academic institutions. Indirect beneficiaries: local community

<b>12- Activities</b>	<ul style="list-style-type: none"> <li>➤ To plan and convene, in partnership with the key relevant stakeholders and competent universities in the region on the design of the chemical engineering curriculum, and training program of the trainers;</li> <li>➤ To test and improve the curriculum and the training program of the trainers;</li> <li>➤ To conduct, monitor, assess, report and improve the conduct of the chemical engineering course and training program of the trainers;</li> <li>➤ To strengthen capacity of trainers, such as getting their Ph.D, participating relevant trainings at the regional and international levels;</li> <li>➤ To conduct study tours or training of the trainers in the region in order to share experiences and learn from competent universities in the SEA as needed;</li> <li>➤ To develop and maintain good working relationship between the targeted academic institution, WREA, private sector and other key stakeholders;</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 1 500,000</b>
<b>14- Donors</b>	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, , FAO, UNEP, ADB)
<b>15- Project Extent</b>	Provinces and Cities

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