

**Lao People's Democratic Republic
National Implementation Plan Under
Stockholm Convention**

**Ministry of Natural Resources and Environment
Pollution Control Department**

Vientiane Capital City, March 2016

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Foreword

With nine more new chemicals having added to the POPs list, and recognizing the risk and growing threats of POPs chemicals to the human health and the environment, as well as the social need for a more effective management strategy for handling POPs and the contaminated sites, the Government of Lao PDR, represented by the Ministry of Natural Resources and Environment, with the financial and technical support from the Global Environmental Facility (GEF) and the United Nations Industry Development Organization (UNIDO) had conducted the inventory of POPs chemicals and eventually issued the Updated National Implementation Plan (NIP) in January 2016.

After the first NIP endorsement in 2009, priority activities have been carried out aiming to reduce and phase out the use of the listed twelve POPs chemicals. However, the implementation of the NIP faced several challenges including capacity limitation, the lack of regulatory framework and funding resources. Being aware of the need to continue the effective implementation of environmentally sound POPs chemical management, the updated NIP aims to present recent results of the POPs inventory and based on which, propose viable POPs management strategy and relevant action plans as well as priority projects.

The issuance of the updated NIP affirms the commitment of the Government of Lao PDR in effectively implement the Stockholm Convention for protect the Lao people's health and the national environment resources. In addition, the Government is fully aware of the limited capacity of its national chemical management agencies and institutions, the updated NIP will serve as guidelines to the relevant national agencies and institutions for future more effective POPs management include cooperation with relevant international organizations and institution.

On this occasion, I would like to express my heartfelt appreciation to relevant ministries, institutions, and individuals for their fruitful cooperation during the conduct of POPs chemicals inventory of this meaningful updated NIP formulation . Also on behalf of the Government of the Lao PDR, I would like to extend our sincere gratitude to all development partner, institutional organization and civil societies, notably the Global Environment Facility (GEF), the United Nations Industrial Development Organization (UNIDO) and others for their kind and effective support the Lao PDR in addressing the POPs issues.



Sommad PHOLSENA
Minister

Abbreviations and Acronyms

ADS	Agriculture Development Strategy
AEC	ASEAN Economic Community
AIP	Agriculture Investment Plan
AMP	Agricultural Mater Plan
AOD	Aerosol Optical Depth
ASEAN	Association of South East Asian Nations
BAT	Best Available Techniques
BDE	Bromodiphenyl ether
BEP	Best Environmental Practices
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
COP	Conference of the Parties
DDT	1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane
DDV.P	Dimethyl phosphate
DOA	Department of Agriculture of MAF
DOC	Department of Customs
EDL	Electricity du Laos
EEE	Electric and electronic equipment
EMMU	Environment Management and Monitoring Units
EoL	End-of-life
ESM	Environmentally Sound Management
E-Waste	Electronic waste
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOL	Government of Lao PDR
HBB	Hexabromobiphenyl
HBCD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HDAFO	District Agriculture and Forestry Office

IOMC	Inter-Organization Programme for the Sound Management of Chemicals
IPM	Integrated Pest Management
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
L/l	Liter
Lao PDR	Lao People's Democratic Republic
LCD	Liquid-Crystal Display
LDCs	Least Developed Countries
LNMCs	Lao National Mekong Committee Secretariat
LPRP	Lao People's Revolutionary Party
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mining
MoD	Ministry of Defense
MoF	Ministry of Finance
MoFA	Ministry of Foreign Affairs
MoH	Ministry of Public Health
MoIC	Ministry of Industry and Commerce
MoICT	Ministry of Information, Culture and Tourism
MoJ	Ministry of Justice
MoNRE	Ministry of Natural Resources and Environment
MoPS	Ministry of Public Security
MoST	Ministry of Science and Technology
MPI	Ministry of Planning and Investment
MPWT	Ministry of Public Works and Transport
NES	National Environment Strategy
NGOs	Non-Governmental Organizations
NGPES	National Growth and Poverty Eradication Strategy
NHCS	National Hazardous Chemicals and Substances Strategy
NIP	National Implementation Plan
NPA	National Protected Areas

NSEDP	National Socio-Economic Development Plan
NUOL	Nnational University of Laos
PAFO	Provincial Agriculture and Forestry Office
PBDEs	Polybrominated diphenyl ethers
PCBs	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzofurans
PCN	polychlorinatednaphthalenes
PeCBs	Pentachlorobenzene
PFOS	Perfluorooctane sulfonic acid
PFOSF	Perfluorooctane sulfonyl fluoride
PMO	Prime Minister's Office
POPs	Persistent Organic Pollutants
PTS	Persistent Toxic Substances
REDD	Deforestation and Forest Degradation
SC	Stockholm Convention
SCP	Sustainable Consumption and Production
STEA	Science, Technology, and Environment Agency
T	Tonnes
TEQ	Toxic equivalent
THB	Thai Baht
TVs	Televisions
TVs	Televisions
UNEP	United Nation Environment Programme
UNIDO	United Nation Industrial Development Organization
UPOPs	Unintentionally produced POPs
USD	US dollars
UXO Lao	Lao National Unexploded Ordnance Programme
WEEE	Electric and Electronic Equipment Waste
WHO	World Health Organization
WREA	Water Resources and Environmental Administration
WREI	Water Resources and Environment Institute

Executive Summary

Acknowledging the global apprehension related to the impacts of Persistent Organic Pollutants-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.

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 Stockholm Convention-SC.

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 (STEA), then the Water Resources and Environment Administration (WREA), the new established Ministry of Natural Resources and Environment (MoNRE) to serve as the national focal point for coordinating, monitoring and assessing the implementation of the Stockholm Convention (SC) and since 2010.

The approval of the first National Implementation Plan-NIP in 2009 plays a very important role as a national policy of POPs management and planning guidance for all relevant stakeholders to implement 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.

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 (2025) and Five Years Plans (2016-2020), the Millennium Goals, the National Growth and Poverty Eradication Strategy (NGPES), the National Environment Strategy up to the year 2020 (NES), and the Environmental Protection Law. Consequently the NIP will no doubt contribute to the creation of a cleaner and safer natural environment for all Lao People.

By 2013 twenty-three POP chemicals were listed in the Stockholm Convention whilst before 2009 there were only twelve POPs chemicals in the list. It became necessary to include the new listed POPs in project activities and generate an updated NIP. The initial Seminar for NIP update took place in October 2013 in Vientiane Capital. The Ministry of the Natural Resources and Environment (MoNRE) was the focal point of the NIP update project. This project was aimed to update the inventory initially endorsed in 2009 by adding the scope for the nine new listed POPs and endosulfan.

The process for developing the current NIP followed the guidelines of the “Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants” (UNEP, 2012). To support the drafting of the NIP, the following studies and inventories were carried out, consolidating important information on the POP situation in Laos:

- a) National inventory of sources and estimates of unintentional POPs emissions;
- b) National inventory of Polychlorinated Biphenyls (PCBs);
- c) National inventory of stockpiles and waste of POPs used as pesticides and for other uses;
- d) National inventory of industrial POPs (PBDEs and PFOS, its salts and derivatives); and
- e) National inventory of POPs contaminated sites.

By consolidating the results from the inventories and collected information, this National Implementation Plan provides an overview of the POPs situation in Lao PDR, and based on the information gathered in each inventory, action plans and priorities relating to each group of POPs chemicals are proposed and discussed.

The NIP consists of three chapters. Chapter 1 presents an overall introduction to the persistent organic pollutants and the Stockholm Convention and Lao PDR’s commitment to update the NIP. Gender issues in implementing NIP is also included to shed a light on challenges to effectively engaged in protecting them and their families from harm of POPs and gender issues to be reflected at both site and policy level interventions for sound chemical management.

Chapter 2 provides general information of geography and population, political profile, economic and environmental status of Laos. The most important part of this chapter consists of the results of the POPs inventory which are divided into various sections such as 1) current POPs situation and POPs management status in the country based on the results of the inventory of POPs pesticides, DDT, PCBs, PFOS and PFOFS, PBDES and unintentional POPs; 2) information on stockpiles, contaminated sites and relevant regulation, guidance, and remediation measures.

Based upon the results of POPs inventory, general information on future POPs management mechanisms including: i) information on future production, use and release of POPs; ii) existing programmes for monitoring of releases and environmental and human health impact; iii) current level of information, awareness, education among target groups and existing communication system; overview of the technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, management, research and development; Identification of impacted populations or environments, estimated scale and magnitude of threats to public health and environmental quality, and social implications for workers and local communities; chemical

management systems. In the end of this chapter, a brief summary of the first NIP implementation status is included.

Chapter 3 provides an overview on the GOL's policy to formulate strategy for implementing the NIP. Within the implementation strategy, detailed action plans or strategies to achieve convention obligations and any additional objectives set by the country. In light of strategy for the implementation of SC, three strategies are identified, they are: i) Identifying, assessment and mitigation of the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs"; ii) improvement of POPs information exchange; and iii) promote the conduct of POPs and persistent toxic substances research. There are total 62 action plans are proposed to be implemented for sound POPs chemicals management. In order to provide guidelines for implementing the NIP, necessary resources, timetable and method for monitoring and evaluation of NIP implementation as well as reporting systems are defined.

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CHAPTER 1. INTRODUCTION

1.1. THE STOCKHOLM CONVENTION

Persistent organic pollutants (POPs) are organic substances that possess various degree of stability to photolysis, biological and chemical degradation. These substances are semi-volatile and can be transported from their sources through air flow to all parts of the globe. The adverse health effects of POPs to humans and to the environment have been demonstrated in many scientific studies.

The Stockholm Convention (also referred to as the Convention) was adopted on 22 May 2001 and entered into force globally on 17 May 2004. Its main objective is to protect human health and the environment from POPs.

The Convention focuses initially on the following twelve chemicals that are grouped into three categories, namely:

- Pesticides – aldrin, chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, endrin, heptachlor, mirex, toxaphene, and hexachlorobenzene (HCB)
- Industrial chemicals - Polychlorinated biphenyls (PCBs), HCB, and mirex
- Unintended by-products – dioxins and furans, PCBs, and HCB

The Convention requires its Parties to take measures to reduce or eliminate releases from intentional and unintentional production and use of these chemicals. These measures include the development and implementation of action plans to be able to fulfill the Party's obligations to the Convention. In summary, Parties to the Convention are obligated to:

- Immediately ban production and use of all POPs pesticides except DDT
- Restrict the use of DDT for vector control and aim to phase it out over time
- Ban production and use of PCBs and hexachlorobenzene
- Phase out existing PCBs over the next 25 years
- Dispose stockpiles of unwanted POPs
- Reduce, with the ultimate aim of eliminating, unintentional POPs by-products (dioxins, furans, PCBs, hexachlorobenzene)
- Identify and manage contaminated sites.

In 2009, 2011 and 2013, new chemicals are covered by the Stockholm Convention. The Convention requires parties to comply with the Convention obligations specified in Table 1.1a

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Table 1.1a. Annexes to chemicals covered by the Stockholm Convention

Parties to the Convention are obligated to adopt additional measures to include the

2001			2009			2011	2013
Annex A For Elimination	Annex B For Restriction	Annex C Unintentional Production For Reduction	Annex A For Elimination	Annex B For Restriction	Annex C Unintentional Production For Reduction	Annex A For Elimination	Annex A For Elimination
Aldrin	DDT	Poly chlorinated dibenzo-p-dioxins and dibenzo furans	Alpha hexachloro-cyclohexane (α HCH) Beta hexachloro cyclohexane (β HCH)	Perfluoro octane sulfonic acid, its salts (PFOA) and perfluoro octanesulfonyl fluoride (PFOS)	Penta chlorobenzene (PeCB)	Endosulfan	Hexa bromo cyclo dodecane (HBD)
Chlordane		Hexachloro Benzene (HCB)	Chlordecone				
Dieldrin		Polychlorinated Biphenyls (PCBs)	Hexabromo Biphenyl				
Endrin			Hexabromo diphenyl ether and heptabromo diphenyl ether (commercial octa PBDE)				
Heptachlor			Lindane				
Hexachloro benzene			Pentachloro Benzene				
Toxaphene			Perfluorooctane sulfonic acid, its salts (PFOA) and Perfluorooctane sulfonyl fluoride (PFOS)				
Polychlorinated Biphenyls (PCBs)			Tetrabromo diphenyl ether and pentabromo diphenyl ether (commercial penta PBDE)				

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development and implementation of action plans to:

- Immediately ban production and use of all the new POPs pesticides in 2009 Annex A, 2011 Annex A and HBD in 2013 Annex A.
- Immediately ban production and use of PFOS and PFOA, Hexabromobiphenyl, Hexabromodiphenyl ether and heptabromodiphenyl ether (commercial octa PBDE) and Tetrabromodiphenyl ether and pentabromodiphenyl ether (commercial pentabromodiphenyl ether) in 2009 Annex A.
- Restrict the use PFOS and PFOA in 2009 Annex B
- Reduce, with the ultimate aim of eliminating, unintentional POPs pentachlorobenzene in 2009 Annex C
- Identify and manage contaminated sites

Parties are also obliged to share information, promote information dissemination and awareness, and undertake research, monitoring and surveillance of future POPs.

The Convention recognizes that many Parties will need technical and financial assistance to meet their obligations. Parties will establish appropriate arrangements to provide technical assistance and promote the transfer of technology to developing country Parties and Parties with economy in transition to assist them in fulfilling their obligations.

1.2. PURPOSE OF THE NATIONAL IMPLEMENTATION PLAN

Lao PDR signed the Stockholm Convention on Persistent Organic Pollutant (POPs) on 5th March 2002 and ratified on 28th 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.

The National Implementation Plan (NIP) is intended to develop appropriate approaches to build the national capacity on POPs reduction and elimination. The NIP defines the national policy on POPs management. It provides guidance and direction for all concerned ministries and institutions 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 is 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
- 3) Reduction of poverty through reducing cost of health services.

The NIP identifies priority activities related to effective POPs management, and the 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

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(NGPES), the National Environment Strategy up to the year 2020 (NES), and the National Hazardous Chemicals and Substances Strategy (NHCS). Consequently the NIP will contribute to the creation of a cleaner and safer natural environment for all Lao People.

One of the key objectives of the NIP is to effectively utilize funding resources from the GEF, donor governments, and the Government of Lao PDR in implementing strategies in managing chemicals including POPs, that will reconcile the social, economic, health, and environmental objectives of the country in the national and local levels. Action plans in ensuring sound management of chemicals would include the development and implementation of the government policies on environmental management and poverty reduction including the gender policy. Thus, to undertake all the necessary processes to elaborate this NIP, Lao PDR used funds from the GEF and was supported by UNIDO through an international cooperation project.

1.3 THE RATIONALE OF THE NIP REVIEW AND UPDATE

The first NIP published in 2010 included action plans to address the country's commitment to the Stockholm Convention on the 12 initially listed POPs. To comply with Article 7 of the Convention, it is necessary to update the NIP to include activities that will address the elimination or reduction of the new POPs listed in the Convention.

To update the NIP, a review of the progress of the government in achieving its set commitments in the 2010 NIP is necessary. Action plans to continue the activities that were not implemented in the first NIP and action plans to address the elimination and/or reduction of the new 11 chemicals listed in the Convention are included in the updated NIP.

1.4. METHODOLOGY IN FORMULATING THE NATIONAL IMPLEMENTATION PLAN

The process for developing the updated NIP followed the guidelines of the “Guidance for Developing a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants” (UNEP, 2012) and included the following stages:

- Stage 1: Establishment of the mechanisms for process coordination and organization;
- Stage 2: Development of POP inventories and analysis of national infrastructure and capacity;
- Stage 3: Establishment of priorities and objectives;
- Stage 4: Formulation of the National Implementation Plan and the specific POP Action Plans;
- Stage 5: Endorsement of the NIP by stakeholders.

The Ministry of Natural Resources and Environment acted as the project's executing agency, coordinating the development of the NIP, using the expertise of its technical staff and hiring consultants. The drafting of the updated NIP was developed in consultation with the National Steering Committee composed of the following key government agencies:

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- Ministry of Agriculture and Forestry;
- Ministry of Public Health;
- Ministry of Planning and Investment;
- Ministry of Industry and Commerce;
- Ministry of Defense;
- Ministry of Public Security;
- Ministry of Public Work and Transportation;
- Ministry of Finance,
- Ministry of Education and Sports;
- Ministry of Information, Culture and Tourism
- Ministry of Justice;

The actual development of the NIP was carried out by the following government agencies:

- Ministry of Natural Resources and Environment;
- Ministry of Agriculture and Forestry;
- Ministry of Public Health;
- Ministry of Industry and Commerce;
- Ministry of Defense;
- Ministry of Public Security;
- Ministry of Science and Technology;
- Ministry of Foreign Affairs;
- Electricity du Laos;
- Ministry of Planning and Investment;
- Ministry of Justice.

To support the drafting of the NIP, the national inventories on banned pesticides, unintentional POPs emissions, PCBs, PBDEs, PFOS and on POPs contaminated sites were carried out. Action plans for the management of POP pesticides, PCBs, contaminated sites, PFOS and PBDEs, and progressive reduction of unintentional releases of POPs were discussed and proposed in the updated NIP. Plans and measures to strengthen the legislative framework for the management of POPs, the dissemination of information, awareness and education of the public on POPs, and the national analytical capacity for monitoring POPs were included in the updated NIP. As the data gathered from the POPs inventories were short on information on the socio-economic aspects relevant to POPs, the socio-economic study is excluded from the scope of the NIP update project.

1.5. SUMMARY OF ISSUES ON POPS

Based on the results of identification and assessment of POPs related issues, the main areas of concern which need improvement to effectively manage POPs in Lao PDR are the following:

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

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Specific issues from the assessment of the different POPs chemicals are identified:

POPs Pesticides:

1. There is no comprehensive data base on the current importation, distribution and use of pesticides including POPs pesticides. One of the major problems in pesticide control is that the local retail shops are selling pesticides imported from neighboring countries without registering with the local authority. It can be expected that an unaccounted amount of illegally imported pesticides may have been widely distributed in the local markets.
2. The illegal sale of banned pesticides including POPs pesticides exists.
3. The analytical capability to carry out testing and analysis of pesticides including POPs pesticides does not exist.
4. There is lack of awareness about the health hazard of banned pesticides including POPs pesticides among the shop owners, local farmers and the general public.
5. The existing national inventory of banned pesticides including POPs pesticide is not complete.

PCBs:

1. No specific law/regulation for management of equipment contaminated with PCBs and PCB wastes exists. The strict management and control on the use, disposal and health risk prevention from PCBs are not yet systematically and comprehensively implemented.
2. Improper management of PCB contaminated dielectric oil and equipment pose big threats to public health and environment.
3. Recycling and export of transformers contaminated with PCBs are still practiced by private venders.
4. Records of transformers and capacitors are not systematically and effectively maintained.
5. The monitoring capacity to evaluate the presence of PCBs in dielectric oil, electric transformers and capacitors and in contaminated sites is limited.

Dioxins and Furans:

1. Laws and regulations on monitoring and management of dioxins/furans have not been enacted.
2. The inventory framework for inventory of dioxins and furans is incomplete due to unavailable or insufficient data on various sources of the dioxins/furans emissions.
3. The public awareness on the harmful effects of dioxins/furans to the environment and human health is very low.
4. Scientific investigation including monitoring and laboratory tests are needed to examine emissions and suspected contaminated sites.

PBDEs:

1. Laws and regulations on the management of PBDEs and articles containing PBDEs have not been enacted.
2. The initial inventory of PBDEs from available information on imported goods is limited.

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3. The improper disposal of wastes articles containing PBDEs by recycling and by open burning in households cause widespread contamination of the environment with PBDEs.
4. Public awareness on the harmful effects of PBDEs to the environment and human health is very low.
5. The national environmental agencies and institutes have very limited capacity for identification and monitoring of PBDEs in the sources, stockpiles and contaminated sites.

PFOS:

1. There are no existing laws and regulations on the restriction or management of PFOS and its related salts
2. Public awareness on the harmful effects of PFOS to environment and human health is very low.
3. Suspected PFOS containing products such as old firefighting foam concentration agent is misused by individuals.
4. Improper disposal of containers of PFOS based chemicals by mixing with common municipal waste and by incineration in households, accelerates widespread cumulative contaminated sites and emissions among residential areas.
5. Very limited capacity of national agencies to identify the PFOS sources, stockpiles and contaminated sites. Scientific investigation possibly including laboratory tests are needed to examine the suspected contaminated sites
6. Exclusion of PFOS from imported articles in the initial inventory of PFOS due to incomplete information on imported products from the DOC.

1.6. STRUCTURE OF THE NATIONAL IMPLEMENTATION PLAN

The NIP consists of three chapters:

Chapter 1 presents an overall introduction to the persistent organic pollutants, the Stockholm Convention and Lao PDR's commitment to the Convention.

Chapter 2 provides an overview of the country's geography, population, political, economic and environmental profiles. This chapter includes the present status of POPs in the country based on available information from surveys of POPs use, stockpiles, contaminated sites, and public awareness; and the relevant regulations and measures to manage POPs.

Chapter 3 provides a review of the implementation of the first NIP and presents the goals, strategy and action plans of the updated NIP and project proposals to generate financial resources to support the updated NIP. The details on the strategy of the implementation of the action plans including the timetable, necessary resources, methods of monitoring, evaluation and reporting are included in the action plans.

CHAPTER 2. COUNTRY BASELINE AND ASSESSMENT OF POPS ISSUES

2.1. COUNTRY BASELINE

2.1.1. GEOGRAPHIC AND POPULATION PROFILES

The Lao’s People Democratic Republic (Lao PDR), also known as Laos, is a land locked country located at the center of the Indochinese peninsula. Laos is bounded 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. Table 2.1.1a shows the geographic, administrative and population profiles of the country.

Table 2.1.1 Geographic, administrative and population profiles of Lao PDR

	<p>The Lao PDR was established on 2 December 1975 as a communist one state party, the Lao People’s Revolutionary Party (LPRP).</p> <p>The country is divided into three geographical zones: the Northern, the Central, and the Southern regions and administratively composed of 17 provinces consisting of 142 districts.</p> <p>Laos has a land area of 236,800 km² with 80% of the total area as mountainous with a large volume of 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.</p> <p>The total population is 6.5 million (MPI 2015) with a population density of 29 per km²</p> <p>Laos has 49 ethnic groups: Lao Loum (lowland) and Lao Theung (highland) (90%), Lao Sung (Hmong) (9%), Vietnamese and Chinese and other races (1%). The predominant religions are Buddhism (65%), Animism and others (33.7%) and Christianity (1.3%).</p>
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Figure 2.1.1 Map of Lao PDR

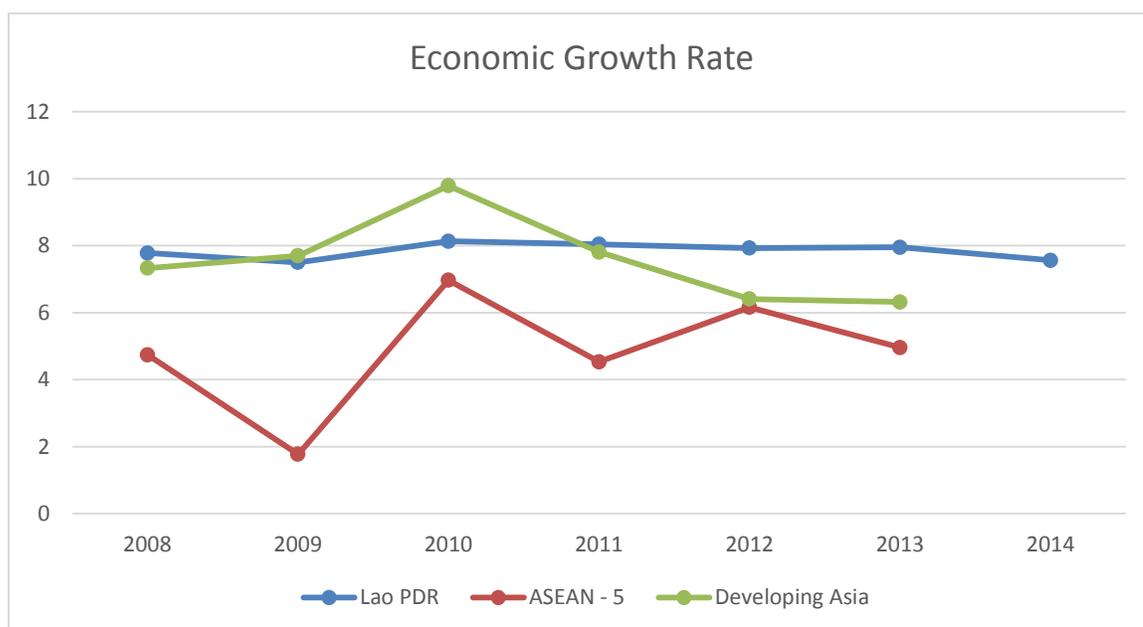
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2.1.2. ECONOMIC PROFILE

Lao PDR belongs to the group of Least Developed Countries (LDCs). The country has set its economic goal to exit LDCs by the year 2020. Lao PDR has a labor force of 3,409,503 with unemployment rate of 1.4% (World Bank, 2014). The major business centers are Vientiane Capital (Population 797,130) Luang Prabang (Population 463,485), Savannakhet (Population 937,907) and Champasack (Population 670,122).

2.1.2a. Economic Growth Rate

The economic growth of Lao PDR has been stable since the last two decades. In 2014, the per capita GDP of Lao PDR was 1,725 USD/person with an average of 7.56% growth rate. Figure 2.1.2a presents an overview of the economic growth from 2008-2014 compared to the regional growth.



Source: Bank of Lao PDR (Annual Economic Report 2014).

Figure 2.1.2a Economic growth rate of PDR from 2008-2014

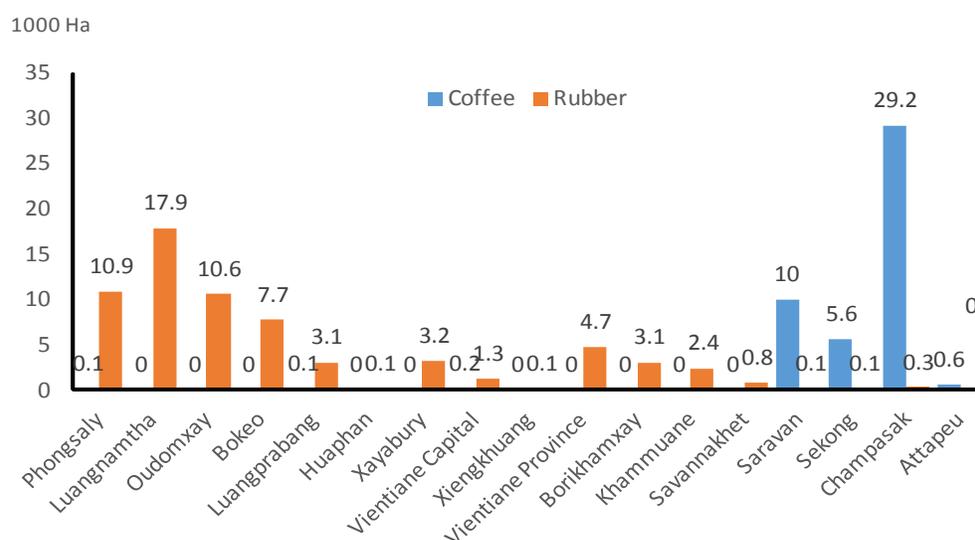
2.1.2b Economic Sectors

Agriculture

Based on the latest agricultural census carried out by the MAF in 2012, there were approximately 783,000 households engaged in agricultural sector mostly in the rural areas. In 2012, the output from agricultural sector contributed 26.90 percent to national economy, which slightly increased by 3.27 percent compared to 2011 [Bank of the Lao PDR, 2012]. With approximately 69% of households living in the rural areas, the economy of Lao PDR is still predominantly agricultural [Department of Planning, Ministry of Agriculture and Forestry (MAF), 2012]. The main agricultural

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products are rice, maize, vegetables, coffee, peanuts, sugarcane, soybean, tobacco. The plantation of rice and maize has been expanding considerably since 2005. Other cash crops such as coffee and rubber also have increasing production in the recent years (Figure 2.1.2b).



Source: MAF, 2012

Figure 1.1.2b. Permanent coffee and rubber plantation areas (hectares) by province in 2010/11

Industry

The main industries of Lao PDR are mining (mainly gold, copper, and coal), light processing industries, hydro and water, and construction. Industry has contributed an average of 30% to the country’s GDP (Table 2.1.2a)

Table 2.1.2a. Contribution of industry to GDP (in percentage) from 2009-2014

Industry	2009-10	2010-11	2011-12	2012-13	2013-14
Mining	9	11	10	6	6
Light processing industries	10	10	10	10	10
Hydropower and water	4	4	4	5	5
Construction	5	6	7	7	7
Total Industry	28	31	31	28	28

Source: Annual Economic Report 2014

Services

The services sector, comprising of trade, public services and transportation services, has maintained its contribution to the national economy at an average range of 35 to 37 percent since the beginning of 2000s. In the fiscal year of 2013-2014, the services sector contributed 39 percent of the GDP. Since 2007, trade had contributed approximately 19 percent, the public services sector approximately 7 percent and the transportation sector at approximately 5 percent to the GDP (Bank of Lao PDR (2014 Annual Report).

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Tourism

Lao PDR, which has closed its doors to the outside world for decades since its establishment in 1975, is not known to many tourists. Being located in the heart of the South East Asia peninsula, the Lao PDR has naturally become a passage way for tourists traveling to this region. The relatively undisturbed natural environment and the less known culture and history make the country increasingly attractive to tourists in the region. The increasing income from the tourism prompted the government to adopt policies and programs to develop this industry.

2.1.3. ENVIRONMENTAL PROFILE

Table 2.1.3a presents an overview of the status and management of the different components of the environment of Lao PDR.

Table 2.1.3a Present status of the environment and environmental management in Lao PDR

Environment Component	Present Status
Forest	Reduced forest cover from 70% in 1940's to 40% in 2010 due to deforestation (from expansion of agriculture, mining, logging, hydropower and urbanization)
Biodiversity	Rich in biodiversity (small population with a diverse ethnic groups, a multiple ecosystems, a low rate of natural resources exploitation) Some recorded animal, plant and fish species are classified as endangered. Protected areas and awareness programs on environment and wildlife protection were established by the government to conserve local biodiversity.
Air Quality	Limited and irregular monitoring of ambient air quality Concern on indoor air quality on use of firewood and charcoal for cooking and heating in poor households National Ambient Environment Quality Standards Regulation was approved in 2010
Water	Abundance of fresh water (annual fresh water supply of approximately 270 billion cubic meters) Concerns on : <ul style="list-style-type: none"> • incompatible legal and institutional capacity in water resources management against rapid economic development and population growth and urbanization • improvement of clean water supply systems particularly in the high populated urban areas • ground water contamination with waste, fertilizers and chemicals

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Waste generation and disposal	<p>Poor waste management system is an increasing threat to the quality of surface and ground water and contamination of soil:</p> <ul style="list-style-type: none"> • most common waste disposal methods are landfills and dumpsites • limited recycling activities of plastics, glass, iron and electronic and electric wastes; concern on pollution from recycling with simple technologies • unrecyclable hazardous and toxic wastes disposed of with municipal waste then finally piled up in landfill • available incineration facilities only in big cities such as Vientiane Capital for incinerating medical wastes (2,705 tonnes from 5 hospitals in 2013)
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Source : Environment Outlook published by the Ministry of Natural Resources and Environment with assistance from the United Nations Environment Programme (UNEP) in 2012 and other public reports.

2.2. EXISTING LEGISLATIONS AND REGULATIONS ADDRESSING POPS

The Environmental Protection Law promulgated in 1999 is the key legislation guiding the main policy for environmental protection. This law identifies the basic principles of environmental protection, components for environment protection, and different levels of environment management and monitoring units (EMMU). Under this law, there are four levels of EMMU namely: the Central EMMU (Ministry of Environment), Sectoral EMMU (in every other Ministries), Provincial EMMU (a department of Natural Resources and Environment in each province) and district EMMU (an Office of the Natural Resources and Environment in each district)

Several cross-sectional legislations, decrees and guidelines were issued by the government of Lao PDR that provide legal basis for all sectors that implement environmental management for the purposes of environmental protection and sustainability of natural resources. These legislations (Appendix 1) address air protection, energy regulations, forest and land use, agriculture, mining, water resources management, wildlife and fisheries conservation.

Lao PDR has not instituted any legislation or regulation that addresses POPs specifically. Since POPs are chemicals, the management and monitoring of POPs follow the scheme of chemicals management under the Environmental Protection Law of 1999.

All necessary chemical materials for product manufacturing and formulation in Lao PDR are imported. The management of importation and use of chemicals in Lao PDR is decentralized among the following key ministries which have the authority to implement legal measures to manage the various aspects of chemicals and hazardous substances, such as manufacture, trade, storage, transportation, use and disposal:

- Ministry of Agriculture and Forestry (MAF) for pesticide related chemicals
- Ministry of Health for DDT and a number of industry chemicals (mainly related to food and beverage, and medicine production)
- Ministry of Public Security and the Ministry of Industry and Commerce for firefighting foams and chemical powders

Diverse classes of chemicals, such as industrial and consumer chemicals not within the management of specific ministries are left without regulatory measures.

The absence of coordination among the various institutions is a major factor hindering the implementation and enforcement of almost all the legal measures on the management of chemicals and hazardous substances.

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**2.3. ROLES AND RESPONSIBILITIES GOVERNMENTAL INSTITUTIONS INVOLVED
IN POPS MANAGEMENT**

The responsibility for the management of POPs is distributed to the Ministries and Institutions listed in Table 2.3.

Table 2.3 Government institutions involved in POPs management

Ministry/ Agency	Responsibility for POPs Management
Ministry of Natural resources and Environment (MoNRE) formerly the Water Resources and Environment Administration (WREA)	<ul style="list-style-type: none"> • Overall coordination monitoring and assessment of the execution of the National Implementation Plan. • Facilitation of the development of project proposals for fund raising for sound management of POPs and communication with donor agencies assisting in NIP implementation. • Acts as the central point for information exchange and national chemical database management.
Ministry of Agriculture and Forestry (MAF)	<ul style="list-style-type: none"> • Importation, manufacture, and usage of pesticides • Administration of the “Regulation on Management and Usage of Pesticides in Lao PDR” (Law No. 0886/MAF, dated 10 March 2000 and amended in 2010).
Ministry of Industry and Commerce (MIC)	<ul style="list-style-type: none"> • Estimation of the inventory of dioxins and furans in industries • Implementation of <i>BAT/BEP</i> for reduction of dioxins and furans in industrial developments.
Ministry of Energy and Mines	<ul style="list-style-type: none"> • Responsibility on PCBs management in transformer
Ministry of Public Health	<ul style="list-style-type: none"> • Environment health issues related to POPs
Ministry of Defense	<ul style="list-style-type: none"> • Monitoring Dioxin/Furans from Agent Orange contamination
Ministry of Planning and Investment	<ul style="list-style-type: none"> • Oversees all international cooperation and monitoring investment and international inflow funding status
Ministry of Foreign Affairs	<ul style="list-style-type: none"> • Oversees all international cooperation and related protocols
Ministry of Finance	<ul style="list-style-type: none"> • Information on importation data on consumer, industrial goods
Ministry of Information, Culture and Tourism	<ul style="list-style-type: none"> • Awareness building
Ministry of National Science and Technology (MNST)	<ul style="list-style-type: none"> • Initial inventory of the polychlorinated dibenzo-<i>p</i>-dioxins (dioxins) and the polychlorinated dibenzofurans (furans) in May 2005 by the then Environment Research Institute
National Chamber of Industry and Trade	<ul style="list-style-type: none"> • Encouraging the private sectors to apply the <i>BAT/BEP</i>,
Pollution Control Department	<ul style="list-style-type: none"> • National POPs Focal Point and Coordinator will provide all reports to the Secretariat of the Stockholm Convention
Ministry of Public Security	<ul style="list-style-type: none"> • Environmental Inspection

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2.4. POPS FOREIGN ASSISTED PROJECTS IN THE LAO PDR

Table 2.4.1. List of foreign assisted POPS projects in Lao PDR

Funding Agency Name of Project/ Implementing Agency Date of Implementation	Objective(s)	Project Activities	Current Status	Planned Activities until the end of Project
<p>Assessment and Mitigation of an Agent Orange Dioxin and Landmine/UXO Hot Spot in Sekong Province (Green Cross Switzerland), Zurich, Switzerland</p>	<ul style="list-style-type: none"> -To help protect the Lao population from impacts related to historical Agent Orange use and from landmines and UXO; -To ensure use of the environment is sustainable, specifically soil and water; -Protect the health of the population living in the contaminated area of Dak Laan Village, and to raise awareness about impacts of dioxins and UXO/landmines; and -To develop a plan to clean up the dioxin hotspot at Javan Airbase in Dak Laan Village. 	<ul style="list-style-type: none"> - Examine U.S government historical wartime herbicide spray records and bombing/UXO record (UXO Lao); - Gather historical and present day information from Lao government and military sources through survey and interviews at the national level; - Gather historical and present day information from the resident population in Dak Laan village, both formal field questionnaire surveys and anecdotal information will be collected in a conversational atmosphere with local residents. - Inspect selected sites of potential dioxin contaminate hotspots and nearby villages to determine whether or not a potential requires scientific investigation; - Develop awareness raising materials to help protect human health in Dak Laan and other communities in the vicinity of Javan Airbase; - Develop a mitigation program for future clean-up of dioxin. 	<p>Completed</p>	

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<p>Regional Capacity Building Program for Health Risk Management of POPs (WB-GEF)</p>	<ul style="list-style-type: none"> - Prioritize among POPs issues; - Manage chemicals beyond POPs, and - Harness regional cooperation for managing POPs, as well as other chemical contaminants 	<ul style="list-style-type: none"> - Health risk assessment and management of environmental contamination; - POPs hot spots and vulnerability GIS-data needs and application of GIS in risk assessment and management; - Methodology, approach, and design of the web based POPs Toolkit and collaborative management tools; - Field sampling and laboratory analysis at hot spots; - Methodology and approach to economic valuation of health risk; - Case study on the human health risk assessment from Agent Orange dioxin contamination at Da Nang, Viet Nam; and 	<p>Completed</p>	
<p>Capacity Strengthening and Information Exchange on PCBs Management in Selected Asia Countries (GEF Trust Fund)</p>	<ul style="list-style-type: none"> - To strengthen national institutional capacity on PCBs management; - To facilitate the information exchange and experiences sharing on PCBs elimination and management at regional level. <p>Specific objectives:</p> <ul style="list-style-type: none"> - To organize the national expert meetings on status evaluation and national strategy of PCBs management and elimination. - To develop the regional strategy on PCBs management and elimination from desk study on regional information and case study. - To hold a regional workshop on exchange information and experience sharing on PCBs. 	<ul style="list-style-type: none"> - To develop the national PCBs management policies by four participating countries through comprehensive analysis on the status and necessary supplementary investigation based on available NIPs: Cambodia, Lao PDR, Pakistan and Sri Lanka. To organize a national experts meeting, including user, disposer of PCBs equipment to assess current management situation on PCBs and discuss national strategy on PCBs elimination in each of the four participating countries. - To collect and share regional information related to PCBs through legal framework research, identification of the technology options and organizing a regional workshop, and develop a 	<p>Completed</p>	

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	<ul style="list-style-type: none"> - To develop a regional exchange platform on PCBs at the website of BCRC China. 	<p>regional strategy on PCBs elimination and management through desk study and case study.</p> <ul style="list-style-type: none"> - To develop regional information exchange platform on PCBs through the website of BCRC China in English and other four languages of the participating countries, so as to develop a sustainable information exchange mechanism on PCBs. 		
<p>UNIDO-GEF National inventories of POPs for upgrading of the NIP</p>	<ul style="list-style-type: none"> - Prepare, endorse and submit the updated and reviewed NIP, including inventory, prioritization and action plans to the Stockholm Convention Secretariat; - Allow the country to fulfill its obligation under Article 7 of the SC and reporting requirements of the Convention; - Participating stakeholders to manage the additional POPs with newly developed technical skills, expertise and awareness; and - gain stakeholders' endorsement of the NIP including strategies and actions required by Nigeria, in meeting her obligations under the convention 	<ul style="list-style-type: none"> - Component 1 – Coordination mechanism and awareness raising; - Component 2 – Inventories of new POPs and NIP review - Component 3 – National capacities assessment and priority setting for management of new POPs - Component 4 – NIP formulation, endorsement and submissions 	<p>Preparing to submit to the SC</p>	<p>Follow up project priorities</p>

2.5. ASSESSMENT OF THE POPS ISSUE IN LAO PDR

This section provides information on the present status and progress of compliance of the country to its obligation to the SC.

2.5.1. PRESENT STATUS (2015) OF THE NINE INITIAL PESTICIDES

a. Regulatory Enforcement

- Pesticides are regulated according to the *Regulation on Management and Usage of Pesticides in Lao PDR* (Law No. 0886/MAF, dated 10 March 2000). The Regulation on Management.
- Amendment in 2010 Page 29 Usage of Pesticides clearly states which pesticides are permitted to be imported and used, and it also clearly states which pesticides are prohibited. The Pesticide Registration Unit under the DOA is mainly responsible for reviewing and verifying all the registration applications, as well as editing and approving labels of pesticide, and other related tasks. A pesticide registration certificate is valid for two years. The actual pesticide distribution activities are managed by the Provincial Agriculture and Forestry Office (PAFO). Any importers of pesticides and agricultural products should obtain import licenses from the PAFO. The District Agriculture and Forestry Office (DAFO) is in charge of implementing the regulations at the district level, which means that all local retail shops selling pesticides should be operating under the supervision of the DAFO.

b. Initial survey of banned pesticides

The initial survey of banned pesticides in retail shops and one farm was done in selected ten provinces that are most likely to have borders with neighboring countries. The survey did not find any of the initial nine POP pesticides that are listed in the Stockholm Convention but found the banned pesticides Paraquat Dichloride (herbicide), Methomyl (insecticide) and Chlorobenzilate (rodenticide) that are listed in the Rotterdam Convention.

c. Stockpile and Contaminated Sites

- The inventory on DDT stockpile was not conducted. According to information from the Ministry of Health, there was no importation in recent years; and for this reason, no inventory of DDT was done.
- Hatxayfong District Agriculture and Forestry Office (HDAFO) currently keeps the obsolete pesticides liquid dichlorvosor 2,2-dichlorovinyl dimethyl phosphate (DDV.P) packed in 20 containers with each container containing 20 liters of the liquid pesticides and MIPC 50 WP (Hexamicin, Mipcin) in 16 bags of 1 kg of the pesticides in powder form. These pesticides were provided by the government of Russia long time ago. The HDAFO is looking for support and technical assistance from the MAF to properly dispose those pesticides.
- In this preliminary survey, no assessment of POPs pesticide contaminated sites has been conducted due to limited human and financial resources, as well as due to lack of proper training.

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d. Importation

- Information from the Ministry of Health indicated that Lao PDR did not import DDT at all in the recent years.
- Information on the importation of the other eight POPs pesticides could not be obtained from available data.

e. Use

- Historical use of DDT: DDT had been used for malaria elimination since 1953. DDT was used in spraying programs for malaria control conducted in 1957- 1960, in 1969- 1973, and in 1977. The use of DDT for malaria control had been officially forbidden since 1990.
- DDT and chlordane are still being illegally used.

2.5.2. PRESENT STATUS (2015) OF PCBS

a. Regulatory Enforcement

Lao PDR does not have a specific law/regulation for management of PCBs in equipment and wastes.

b. Inventory of PCB

The preliminary survey of PCBs was limited to collecting data on the number of electric transformers in use and out of use and their date of manufacture in each regional Electricity du Laos (EDL) branch in seventeen provinces in the country. The limitation to this survey includes the unavailability of information on the actual quantity of dielectric oil in the transformers, such that an estimate of the quantity of dielectric oil with PCBs or contaminated with PCBs could not be done. Table 2.5.2 shows the result of the preliminary survey of electric transformers.

Table 2.5.2. Total number of in use electric transformers in Lao PDR

Region	Total number of in-use transformers found	Number of in use transformers produced before 1990
Southern provinces	7254	143
Northern provinces	3175	54
Vientiane capital	2341	59

c. Use

- An estimated 256 potentially PCB-containing transformers are still in service.
- Recycling and export of transformers potentially contaminated with PCBs are still practiced by private vendors.
- Discarded dielectric oil from transformers are still used as secondary fuel by households and small companies.

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d. Stockpile and Contaminated Sites

- In Lao PDR, the possible biggest stockpile of PCB contaminated transformers is located at the Transformer Maintenance Station of the Transformer Maintenance Sector of EDL located in Phontong Commune of Vientiane Capital City. This station is the only transformer maintenance station in the country where all defective transformers are sent for repair and maintenance. Most of the defective transformers, including those produced before 1990, are stocked at the Maintenance Station. PCB oil or PCB contaminated dielectric fluid emptied from retro filling of transformers is also stored in this station. From 2010 to 2014, there were 482 units of transformers sent to the station for maintenance, and 206 units are waiting for disposal. Out of the 35 fixed and returned transformers, 8 units are produced between the years from 1975-1989. As of 2014, the Maintenance Station keeps a stock of 6 barrels (45 gallons) of dielectric oil emptied from both old and new transformers.
- Once the oil stock exceeds the stocking capacity of the warehouse at the Station, some of the stocked oil is refilled into transformers that are waiting for disposal. The transformers with the old oil are sold to the recycling companies. With this practice, both the disposed transformer and old oil are transferred to the recycling companies. The disposed transformer and capacitors are usually sold to small recycling companies managed by individuals at Donnoun commune of Vientiane Capital. At the company premises, the contained oil is drained and sold to local residents and small factories as secondary fuel. The transformers were deconstructed at the recycling facility before they are exported to Vietnam for recovery of metals. The recycling premises are potential major contaminated sites as the PCBs oils or PCBs contaminated dielectric fluid can spill directly to the soil during draining.
- The detailed record on disposed old oil and parts are not available. For this reason, the inventories of regional PCBs stockpiles and contaminated sites were not carried out.

2.5.3. PRESENT STATUS (2015) OF DIOXINS AND FURANS

a. Regulatory Enforcement

Lao PDR has not enacted any laws and regulations on monitoring and management of dioxins/furans.

b. Inventory

The first inventory of emissions of dioxins/furans was carried out in 2005 using the UNEP Toolkit. Additional source categories extracted from existing statistics sources or estimated indirectly with relevant statistics on activities in 2005 were added to update the 2005 inventory. The updated 2005 inventory indicated a total release of 147.1 g TEQ/a (Table 2.5.3a) compared to 102.2 g TEQ/a as estimated in the initial inventory conducted in 2005.

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Table 2.5.3a. Summary of updated 2005 dioxins/furans inventory

Source Category	Annual Releases (g TEQ/a)					
	Air	Water	Land	Product	Residue	Total
Waste Incineration	34.3	0.0	0.0	0.0	0.3	34.66
Ferrous and Non-Ferrous Metal Production	10.4	0.0	0.0	0.0	0.6	10.95
Heat and Power Generation	1.9	0.0	0.0	0.0	0.0	1.89
Production of Mineral Products	3.8	0.0	0.0	0.0	0.0	3.83
Transportation	0.3	0.0	0.0	0.0	0.0	0.31
Open Burning Processes	40.6	0.0	2.3	0.0	0.0	42.89
Production of Chemicals and Consumer Goods	0.0	0.0	0.0	0.5	0.0	0.50
Miscellaneous	27.3	0.0	0.0	0.0	0.0	27.32
Disposal	0.0	0.2	0.0	0.0	24.5	24.74
Identification of Potential Hot-Spots	-	-	-	-	-	-
Total	118.7	0.2	2.3	0.5	25.4	147.1

Since the last dioxins and furans inventory in 2005, the number of industrial factories has increased from 24,742 to 38,126 in 2012 (MOIC)

The updated estimation of dioxins and furans emissions in 2015 was done using the UNEP-POPs Toolkit published in 2013 [UNEP, 2013]. Using available data on activities from each source category in 2012 to 2014, and the prescribed emission factors in the Toolkit, the annual releases from each main source category to air, land, water, residues and product are estimated. Through desk study, telephone interviews, and confirmation with related government agencies, the updated inventory of the dioxins/furans corresponding to each sub-category with available data are presented in Table 2.5.3b.

Table 2.5.3b Inventory of Dioxins and Furans by source category

Main Source Category	Sub Category	Estimated Annual Release (g TEQ/a)					
		Air	Water	Land	Product	Residue	
						Fly ash	Bottom ash
Waste Incineration	Medical Hospital waste incineration	51.5				2.49	0.3
Ferrous and Non Ferrous Metal Production	Iron and steel production	0.40					0.43
	Copper production	152.2	0.20				119.8
	Zinc production	0.23					0.002
Power generation and heating	Fossil fuel power plant	0.48					0.67

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Mineral industrial	Household heating and cooking	2.67		
	Cement kilns	0.12		
	Lime production	37.78		
	Brick production	0.05	0.01	
Transport	4-stroke engines	0.004		
	2-stroke engines	0.74		
	Diesel engines	0.07		
Uncontrolled combustion process	Biomass burning	11.14	1.67	
	Waste burning and accidental fires	35.06	0.88	
Production and use of chemicals and consumer goods	Leather plants		0.92	
Miscellaneous	Crematoria	4.7		
	Tobacco smoking	0.003		0.0003
Disposal	Landfills, waste dumps and landfill mining		0.284	28.38

Table 2.5.3c summarizes the dioxins/furans emission to the environmental media in the 2015 inventory. All source categories emitted most dioxins/furans to the air at a total of 339.8 g TEQ/a. The next highest release of dioxins and furans is in residues at 152.0 g TEQ/a. The release in land, product and water are much smaller compared to the release in air and residues. The total accounted dioxins/furans emissions of all source categories is 495.8 g TEQ/a.

Table 2.5.3c. National inventory of Dioxins and Furans in 2015

Source Category	Annual Releases (g TEQ/a) of Dioxins and Furans					
	Air	Water	Land	Product	Residue	Total
Waste Incineration	51.5	0.0	0.0	0.0	2.7	54.3
Ferrous and Non-Ferrous Metal Production	152.8	0.2	0.0	0.0	120.3	273.2
Heat and Power Generation	3.1	0.0	0.0	0.0	0.7	3.8
Production of Mineral Products	37.9	0.0	0.0	0.0	0.0	38.0
Transportation	0.8	0.0	0.0	0.0	0.0	0.8
Open Burning Processes	46.2	0.0	2.5	0.0	0.0	48.7
Production of Chemicals and Consumer Goods	0.0	0.0	0.0	0.9	0.0	0.9
Miscellaneous	47.4	0.0	0.0	0.0	0.0	47.4
Disposal	0.0	0.3	0.0	0.0	28.4	28.7
Total	339.8	0.5	2.5	0.9	152.0	495.8

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Figure 2.5.3a displays the contribution of the source categories to the total emission in the 2015 inventory. The major emission sources are ferrous and non-ferrous metal production (55%), waste incineration (11%) and open burning processes (10%). The miscellaneous sources (mainly represented by crematoria), production of mineral products and disposal each contributed less than 10% of the total emissions. Heat and power generation, transport and production of chemical and consumer goods have relatively very small contributions to the total amount of emissions.

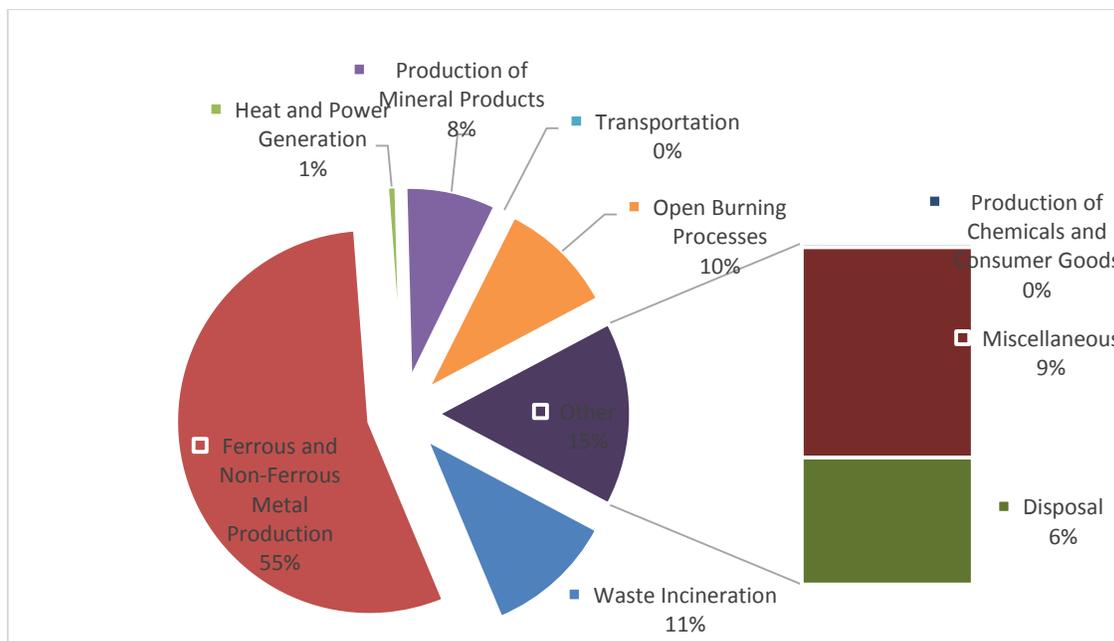


Figure 2.5.3a. The distribution of the contribution of source categories to the total emissions of dioxins and furan in the 2015 national inventory.

Figure 2.5.3b shows that the total emissions in the 2015 inventory (495.8 g TEQ/a) is approximately three times higher than the total emissions in the 2005 inventory (147.1 g TEQ/a). This increase is largely attributed to the significant increase in activities in ferrous and non-ferrous metal production, production of mineral products and in power generation within the last decade.

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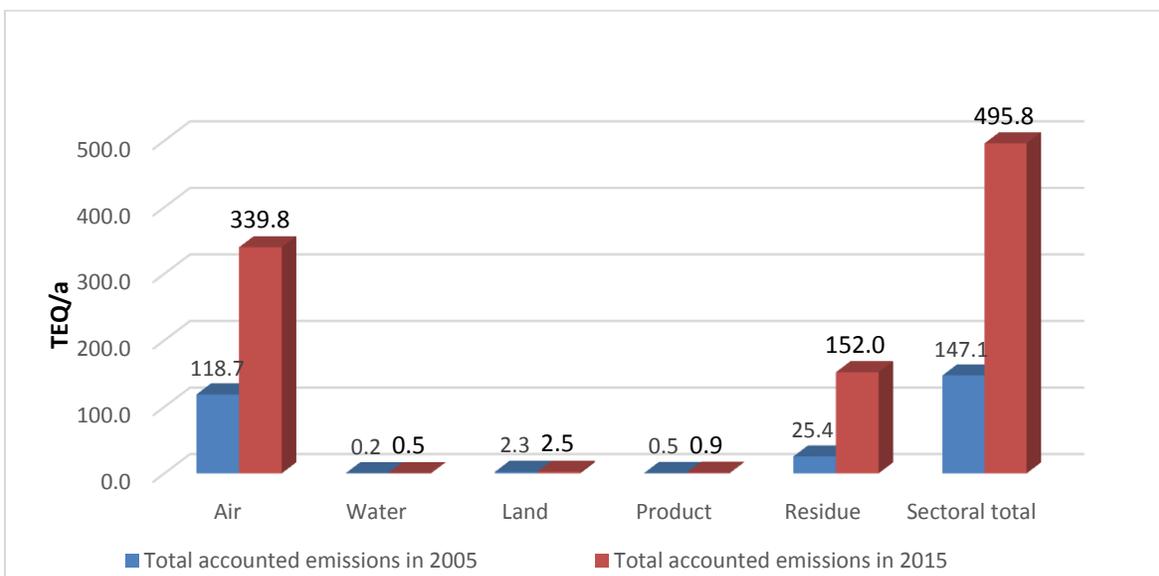


Figure 2.5.3b. Comparison of dioxin/furan inventories in 2005 and 2015

c. Contaminated sites

- Hotspots possibly exist in Central and Southern Lao P.D.R. from historical Agent Orange applications. Approximately 2,000,000 liters of herbicides, with the vast majority being Agent Orange, were applied over 163,000 acres of Laotian territory during the American War (Lao PDR NIP 2010; Stellmann et al. 2003). The dioxins contained in the herbicides were probably the largest amount which have been releases in Lao PDR in history. Possible impacted areas are in Sekong, Saravane and Savannakhet Provinces. The contamination in Dark Lan and Dark Pork districts in Sekong province was confirmed with analysis showing 110pg-CALUX TEQ/g and 88pg-CALUX TEQ/g, respectively in a biological monitoring study in 2007.
- The 2013 inventory of dioxins and furans indicated that the major sources of emissions are the metal industries, incinerators or disposal of solid residues. Important sources of emissions are also from combustion of solid waste, and burning for agricultural cultivation and for power generation. The core centers of industrial activities could (Vientiane, Savannakhet, and Champasack) be potential areas of contamination from industrial emissions.
- Textile and leather industries partly used/use potentially contaminated dioxin chemicals such as chloranil and pentachlorophenol. All textile factories and leather tanneries have no waste management system and dispose their waste water and the sludge around their installations. These areas could be considered as POPs potentially contaminated sites.

d. BAT/BEP activities

There are no BAT/BEP activities that have been done to manage the unintentional release of POPs.

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e. Environmental Monitoring

In 2007, WREA with the financial support from the Japanese Trust Fund through the World Bank implemented the Project “Biological Monitoring of POPs in South East 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. Soil, sediment and fish samples were collected at 12 different sites (N=21 samples collected). Hands-on training was provided to WERI/WREA and Ministry of Defense (Department of Chemical) to field team members on procedures for collection of AOD samples as well as industrial dioxin/furan samples (WERI/WREA and the POPs Laos Team). The result of this study confirmed the high concentrations of dioxins and furans in Dark Lan and Dark Pork districts, Sekong province with 110pg-CALUX TEQ/g and 88 pg-CALUX TEQ/g, respectively.

2.5.4 INITIAL ASSESSMENT OF THE FIVE NEW POPS PESTICIDES (2015)

There are five (5) new POPs pesticides namely alpha- and beta- hexachlorocyclohexane, (HCH), gamma HCH (lindane), chlordecone, and endosulfan that are listed by the Stockholm Convention. The alpha- and beta-HCH isomers are by-products of the manufacture of lindane.

a. Regulation on HCH, Endosulfan and Chlordecone

The ***Regulation on Management and Usage of Pesticides in Lao PDR*** (Law No. 0886/MAF, dated 10 March 2000) and its amended version apply to the newly listed POPs pesticides.

b. Stockpile of New POPs Pesticides

The initial inventory of the New POPs pesticides is still ongoing.

c. Importation of New POPs Pesticides

The record of importation of chemicals is still being organized, such that data on importation of pesticides is not readily available.

d. Use of Endosulfan in the Lao

Endosulfan is still being used.

2.5.5. INITIAL ASSESSMENT OF PBDEs (2015)

The brominated flame retardants (BFRs) Hexabromobiphenyl (HBB) and certain congeners/homologues of c-PentaBDE and c-OctaBDE two commercial polybrominated diphenyl ether mixtures including tetraBDE, pentaBDE, hexaBDE and heptaBDE (POP-PBDEs) were added to Annex A of the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2009, due to their toxic properties, persistence, and bioaccumulation. They are also transported through air, water and migratory species, across international boundaries and deposited far from their source of release and accumulate in terrestrial and aquatic ecosystems.

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Lao PDR neither produced nor used PBDEs in industrial production. As of 2005, Lao PDR had not yet established high tech industry that consumes or deals with these chemicals. PBDEs are introduced in Lao PDR through the consumption and import of PBDE containing products such as vehicles in transport sector, electrical and electronic equipment (EEE) and related wastes (WEEE).

a. Existing Regulations relevant to PBDEs

The risk of PBDEs on the environment and human health is not well known in Lao PDR, hence, there is no law or regulation for management, monitoring, use and disposal of PBDEs or PBDEs containing consumer products and wastes.

b. Preliminary Inventory

1. Preliminary Inventory of POP-PBDES in Electrical and Electronics Equipment (EEE)
 - Applying the Tier I approach in the UNEP guidance, an estimate of c-octaBDEs in the number of CRTs present in the country based on the penetration rate was obtained. With the estimated population in 2014 at 6,803,699, the c-octaBDEs in old TV casings are estimated to be between 7,550 kg to 22,000 kg from the total amount of polymer fraction of 8675 tonnes.
 - Through desk studies and consultations with relevant government agencies including the Department of Custom, Ministry of Finance and Ministry of Natural Resources and Environment, Tier II approach was applied to estimate the PBDEs embedded in the imported and household stockpiles. The availability of data limited the inventory on TV, computer, and vehicles.
 - With Tier II approach, more detailed estimation of PBDEs in electric/electrical equipment (EEE) and the waste of electric/electrical equipment (WEEE) were established. Table 2.5.5a shows the inventory of c-octaBDEs based on Tier II approach.

Table 2.5.5a. 2013 Inventory of c-octaBDEs in household stockpiles, imported electronic equipment and electronic wastes

Articles	Polymer in Articles, kg	c-octaBDEs in Articles, kg
Household stock (old EEE held in households)	12660	3800
Imported EEE (TV, PC/Laptop and Computer monitor)	61631	147
WEEE (old EEEs disposed as waste)	2223000	1934
Total accounted c- octaBDE		5881

2. Preliminary Inventory of POP-PBDEs from the transport sector

The inventory of c-pentaBDEs in the transport sector was focused only on vehicles imported in 2013, old vehicles registered to households in 2013, and those that entered into the waste cycle. The c-pentaBDEs in the inventory is shown in Table 2.5.5b.

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Table 2.5.5b. Inventory of c-pentaBDEs in old vehicles in use, imported and disposed vehicles in 2013

Vehicles	c-pentaBDEs, kg
Old vehicles based on 2013 registration	2444
Old vehicles based on 2013 importation data	65
Old vehicles disposed as waste	932
Total c-pentaBDEs	3441

c. Contaminated sites

The potential contaminated sites of PBDEs could be widely spread among the residential areas and landfills as Lao PDR has relatively low waste collection rate and most of municipal and industrial wastes are treated by open burning method or piled in landfills. Urban residential areas and industrial sites where electronic equipment and vehicles are concentrated and where recycling and disposal facilities are located are most likely to be contaminated with PBDEs. The lack of analytical capability could not validate the contamination of PBDEs in these locations.

2.5.6 INITIAL ASSESSMENT OF PFCs (PFOS and PFOA) (2015)

Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) are fully fluorinated compounds and generally known under the name of perfluorooctane sulfonate (PFOS). They are commonly used as salts or incorporated into larger polymers. Perfluorooctane sulfonyl fluoride (PFOSF) is used as an intermediate to produce different PFOS related substances. PFOS can be formed by degradation from a large group of derivative substances known as PFOS related substances.

a. Regulatory enforcement

There is no existing law or regulation for restriction, management and monitoring the use and disposal of PFOS or PFOS containing consumer products and wastes.

b. Initial Inventory of PFOS

- In October 2013, the Lao PDR launched the first Training for the Trainer on Nine New POPs inventory workshop. One year later, in collaboration with the Department of Customs (DOC), Ministry of Finance (MOF), and other potential PFOS end users such as the Department of Firefighting and Fire Prevention (DFFP), Ministry of Public Security, petroleum chemicals import companies and civil aviation company, the Lao National Mekong Commission Secretariat (LNMC) initiated the preliminary inventory of PFOS.
- The information obtained from the DOC was not sufficient to identify most imported articles that are known to contain PFOS as listed in the UNEP guidelines for inventory of PFOS; and such articles were not included in the inventory.
- The scope of this preliminary inventory using the UNEP Guideline for inventory of PFOS in imported articles was limited to synthetic textile, fibers, carpets and leather products. Table 2.5.6a shows the inventory of PFOS from these articles. However, the dates of manufacture of these synthetic materials were unknown, such that the

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materials which may have been produced after 2002 when PFOS was no longer used in these materials would no longer contain PFOS and would make the estimate inaccurate.

Table 2.5.6a Inventory of PFOS in Synthetic Materials

Synthetic Material	Amount of Material, kg	Estimated amount of PFOS,kg
Synthetic Textiles	1,244,292 kg	37329
Synthetic Fibers	10,925,715	327,771
Carpets	3,864,050	1,159
Leather products	4,507	2
Total PFOS		366,262

c. Stockpile and contaminated sites

The potential stockpiles of PFOs in firefighting foams and aviation hydraulic fluids were estimated based on historical information on these materials (Table 2.5.6b)

Table 2.5.6b. Inventory of Potential PFOS Stockpiles

Articles	Potential stockpile
Fire-fighting Foams	<ul style="list-style-type: none"> Information from the DFFP indicated that there were approximately 50 buckles (1 buckle = 19 liter, or 950 liters in total) of suspected PFOS based firefighting foam provided by the Government of Japan back in 1997 or 1998. The concentrated firefighting foams were distributed to the provincial Division of Firefighting and Fire Prevention. Three buckles each were distributed to the four big cities of Vientiane Capital City, Luangprabang, Pakse and Savannakhet and two buckles each to 13 provinces. The firefighting system at the Lao State Owned Petroleum Company, installed with support from the then USSR back to the late 1970s contain 42 containers of possibly still unused suspected PFOS based Ansul foam (798 liters)
Aviation Hydraulic Fluid	<ul style="list-style-type: none"> A survey at Lao Airlines Company in Wattay Airport showed that the company's 13 aircrafts had used 95.6 liters of hydraulic oil suspected to contain 0.05-0.09 kg PFOS in 2015.

A majority of the potential PFOS stockpile of firefighting foams could be held at major provincial fire stations. In the past two decades, there had been no report of major oil- induced fires, those old PFOS containing foams are therefore assumed not used. Other major PFOS contaminated sites may be in the maintenance site and the open landfill of Wattay airport. However, the unavailability of analytical capacity could not verify the presence of PFOS in these potential contaminated sites.

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2.5.7 SUMMARY OF THE PRESENT STAUS OF POPS CHEMICALS IN LAO PDR

The present status of the POPs chemicals listed in the Convention in Lao PDR is summarized in Table 2.5.7

Table 2.5.8 Summary of the present status (2015) of the POPs chemicals in Lao PDR

POPs listed in the Stockholm Convention and Management Requirements for COP	Present Status in Lao PDR
Initial 8 POPs pesticides (for Elimination)	<ul style="list-style-type: none"> • The eight POPs pesticides had been banned since 2010. Initial inventory in 89 pesticide retailer shops and one farm in 10 border provinces did not indicate that these POPs pesticides are legally sold in these places. • Illegal trade of pesticides exists and it is possible that these POPs pesticides are sold illegally. • Illegal trade of Chlordane exists.
DDT (for Restriction)	<ul style="list-style-type: none"> • The Ministry of Health stopped using DDT in 1990. DDT was banned in 2010. • Illegal trade of DDT exists. • Stockpile of DDT and contaminated sites are not determined.
PCBs (for Elimination)	<ul style="list-style-type: none"> • There is no regulation addressing the use and disposal of PCB oils, PCB contaminated oil, and electric equipment with PCB contaminated dielectric oil. • Current disposal of PCB oil and PCB contaminated oil from discarded transformers by recycling is environmentally unsafe and poses a serious threat to human health and the environment. • According to an initial inventory of transformers: <ol style="list-style-type: none"> i. 256 electric transformers manufactured before 1990 are still in use all over the country ii. 206 out of use transformers and 45 gallons of used dielectric oil (unclassified according to PCB contamination) are waiting for disposal at the Transformer Maintenance Station of EDL in Phontong Commune of Vientiane Capital City. iii. The unavailability of records of disposed dielectric oil in the Transformer Maintenance Station and in recycling facilities prevented the inventory of PCB oils or contaminated PCB oils in potential contaminated sites • Financial resources and training are needed to implement a program on the Environmentally Safe Disposal of PCBs.
Unintended production of Dioxins and Furans (for Reduction)	<ul style="list-style-type: none"> • There is no regulation addressing the unintended emissions of dioxins and furans. • Using the UNEP Toolkits for inventory of Dioxin and Furan emissions; <ol style="list-style-type: none"> i. An updated (revised) initial inventory of emissions in 2005 showed a total of 147.1 gTEQ/a. ii. The inventory of emissions in 2013 showed a total of 495.8 gTEQ/a. Ferrous and non ferrous production, waste incineration and open burning were the major sources of emissions. • The sites with the most contamination with dioxins and furans were identified as Dark Lan and Dark Pork districts in Sekong province, places that were sprayed with the herbicide Agent Orange during the American War. Biological assay of soil

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	<p>samples from Dark Lan and Dark Pork showed 110 pg CALUX TEQ/g and 88 pg CALUX TEQ/g respectively.</p> <ul style="list-style-type: none"> • BAT/BEP activities for treatment of contaminated sites require financial resources and training of personnel.
<p>Newly listed POPs pesticides namely alpha- and beta- hexachlorocyclohexane, (HCH), gamma HCH (lindane), chlordecone, and endosulfan (for Elimination) and POPs chemical Hexabromocyclododecane (HBD) (for Elimination) Newly listed POPs chemicals Pentachlorobenzene (PeCB) (for Reduction)</p>	<ul style="list-style-type: none"> • Authorities are still getting familiar with most of the newly listed pesticides and chemicals • Initial inventories for the newly listed chemicals are not done. • Endosulfan is still being used; there is a possibility for applying for exemption for this pesticide.
<p>PBDEs for Elimination</p>	<ul style="list-style-type: none"> • There is no regulation on the use, control and disposal of PBDEs. • The initial inventory of total c-octaBDEs and c-pentaBDEs using the UNEP Guidelines for inventory of PBDEs showed the following : <ol style="list-style-type: none"> a) 7,550 kg-22,000 kg c-octaBDEs from CRTs based on penetration rate; and 5,881 kg c-octaBDE based on imported and household EEE stockpile and vehicles b) 3,441 kg c-pentaBDEs from 2013 inventory of registered vehicles, imported vehicles and disposed vehicles. • The identified potential contaminated sites are residential sites that dispose waste by open burning, landfill and recycling facilities in major cities. • Financial resources and training are needed to start a program on the Environmentally Safe Disposal of PBDEs.
<p>PFOS (for Elimination)</p>	<ul style="list-style-type: none"> • There is no existing law or regulation for restriction, management and monitoring the use and disposal of PFOS or PFOS containing consumer products and wastes • The preliminary inventory of PFOS using the UNEP Guidelines for Inventory of PFOS and importation data was limited to synthetic articles (textiles, fibers, carpet and leather). The total PFOS estimated from these synthetic articles is 366261 kg PFOS. However, the non availability of the dates of manufacture of these materials could give an inaccurate inventory. • The preliminary inventory of stockpile of PFOS showed that there are stockpiles of firefighting foams and aviation hydraulic fluids. <ol style="list-style-type: none"> a) About 950 liters of concentrated firefighting foam donated by the government of Japan in 1997-98 were distributed to the firefighting divisions of four major cities and 13 provinces in the country. About 798 liters of Ansul firefighting foam was installed in the Lao State Owned Petroleum Company and believed to be unused up to the present. b) About 95.6 liters of hydraulic oil suspected to contain 0.05-0.09 kg PFOS had been used at the Lao Airlines Company in Wattay airport in the 1970's. The potential contaminated sites are the fire departments of the cities

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	and provinces and the maintenance site and the open landfill of Wattay airport. <ul style="list-style-type: none">• Financial resources and training are needed to start a program on the Environmentally Safe Disposal of PFOS.
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2.5.8. EXISTING PROGRAMS FOR MONITORING OF POP RELEASES AND ENVIRONMENTAL AND HUMAN HEALTH IMPACT

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.

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 that execute various monitoring programs.

To achieve higher effectiveness in monitoring POPs in different matrices, the 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 measurement methodologies
- 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 which remains a big challenge to the management and monitoring framework.

2.5.9. CURRENT LEVEL OF INFORMATION, AWARENESS, AND EDUCATION AMONG TARGET GROUPS

There is no system of inter-sectorial exchange of information or policies within the country and efforts towards legalizing the exchange of information have yet to start. Lao PDR has not yet built a national data base to incorporate national and international data bases on chemicals including POPs. Different types of data concerning chemicals are kept within different departments and access to some data is possible only with official written request.

It is possible that international organizations such as FAO and UNDP who supported the Lao PDR to conduct previous chemical inventory including pesticides and POPs chemicals have relatively a more comprehensive data base. The findings of many of the research efforts were published in local reports, thesis, proceedings of local meetings and seminars, therefore they are of limited access to analyzers, policy makers or international community.

Lao PDR has conducted several awareness raising workshops on UPOPs targeting all stakeholders in various states. Also the government has organized conferences on pesticide hazards. There is still a low level of awareness among the public on the hazards of POPs; the government is committed to conduct more public awareness programs on the hazards of pesticides and other POPs.

CHAPTER 3. GOALS AND ACTION PLANS

This chapter contains the review of the implementation of goals and action plans in the NIP 2010 and the presentation of the goals and action plans in the updated NIP of 2015. It also presents proposals to generate financial resources to implement the updated NIP.

3.1 REVIEW OF ACTION PLANS OF NIP 2010

In the NIP 2010, the detailed action plans related to the management and safe disposal of the initial 12 POPs set under the Convention were identified. In addition, action plans for the effective coordination of administrative, technical and communication activities deemed necessary for a successful implementation of the NIP were also included. The detailed action plans in the first NIP are divided into four main sections as follow:

- 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.

In this review, the first two columns in Tables 3.1a, 3.1b, 3.1c and 3.1d show the goals, the objectives and action plans for each identified section as presented in the NIP 2010. The third column in the tables indicates the assessment of the implementation for the action plans. The review of the action plans are as follows:

- Review of action plans addressing the initial POPs pesticides (Table 3.1a)
- Review of action plans addressing PCBs (Table 3.1b)
- Review of action plans addressing Dioxins and Furans (Table 3.1c)
- Review of action plans addressing the management of the NIP implementation (Table 3.1d)

Table 3.1a. Review of action plans for the initial POPs pesticides (Aldrin, Chlordane, Dieldrin, DDT, Endrin, Heptachlor, Hexachlorobenzene, Toxaphene and Mirex) in the NIP 2010

INITIAL PESTICIDES		
Goal : Eliminate the import and use of POPs pesticides		
Overall Objectives: Effectively implement law enforcement related to POPs pesticides		
Objective 1: Amendment of existing legal instruments and strengthening effective pesticides (including POPs) law enforcement.		
Action Plan	Activities	Assessment of the Implementation
1-1 Amendment of existing legal instruments and strengthening effective pesticides (including POPs) law enforcement	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</i>	In 2010, the list of banned pesticides was added as an amendment to the Regulations on Pesticides of 2000. All POPs pesticides in the initial list in the Convention including DDT are banned. The amendment also clarified

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	<i>pesticides (including POPs) monitoring and inspection.</i>	the responsibilities for implementation of the registration, licensing of retailers and distribution of the pesticides in different administration sectors.
Objective 2 Strengthen institutional capacity and raise public awareness on obsolete pesticides including POPs pesticides.		
Action Plan	Activities	Assessment of the Implementation
2-1 Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.	<p>2-1-1 <i>Formulate and build national TOT capacity.</i></p> <p>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></p> <p>2-1-3 <i>Organize and conduct training programs for officers, traders/sellers and other relevant stakeholders.</i></p> <p>2-1-4 <i>Widely disseminate the contents of legal instruments on pesticides management to the officers, traders/sellers and stakeholders.</i></p>	Several capacity trainings on pesticides inventory were conducted by the MFA through assistance of several international organizations such as FAO and IUCN. However, there is still no concrete improvement on illegal pesticide trade related measures.
2.2 Strengthen capacity on pesticides analysis focusing on POPs..	<p>2-2-1 <i>Improve capacity of laboratory staff on pesticides analysis, with focus on POPs pesticides.</i></p> <p>2-2-2 <i>Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.</i></p>	The MAF has basic lab facility under the management of the Department of Agriculture. However, the staff capacity and the lab facility are not sufficient for implementing complicated pesticide analysis including POPs.
2.3 Raise public awareness on pesticides issues including POPs and other obsolete pesticides	<p>2-3-1 <i>Formulate and undertake dissemination campaigns on pesticides hazards and elimination of obsolete pesticides and POPs.</i></p> <p>2-3-2 <i>Provide information to relevant target groups on alternative pesticides instead of POPs and obsolete pesticides</i></p> <p>2-3-3 <i>Encourage alternatives pest control measures to reduce the use of pesticides.</i></p> <p>2-3-4 <i>Improve extension worker's capacity and expand their activities on pesticides including obsolete pesticides and POPs issues.</i></p>	<p>Some conferences were organized nationwide on pesticides hazards.</p> <p>In 2011, the MAF has issued a Decision of the Minister on Good Agriculture Practices (GAP) for Environmental Management Standard No. 0538/MAF stipulating the regulation on use of reliable and licensed pesticides. In recent year, there is a booming on GAP and GAP products meaning that 2-3-3 has been introduced to some farmer groups. However, the project team is not aware of any detailed trainings, information on substituting the use of POPs and obsolete pesticides had been conducted.</p>

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<p>2-4 Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides</p>	<p>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></p>	<p>Activity 2-4-1 is not yet implemented while 2-4-2 can be expected after the NIP is finalized and disseminated among the relevant government agencies.</p>
<p>Objective 3: Undertake ecologically sound management measures related to obsolete pesticides including POPs pesticides.</p>		
<p align="center">Action Plan</p>	<p align="center">Activities</p>	<p align="center">Assessment of the Implementation</p>
<p>3-1 Conduct comprehensive inventory on obsolete pesticides including POPs pesticides.</p>	<p>3-1-1 <i>Form obsolete (including POPs) pesticide 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></p>	<p>Partial inventory of obsolete pesticides was done. No POPs pesticide was found in the inventory.</p> <p>To conduct the survey of obsolete pesticides, a survey team was established. The survey team was led by six officers from the DOA and other 31 officers from the PAFO of each province. All the officers from the team have received training on pesticide inspection organized by the FAO. Ten target provinces were selected for their involvement in pesticide imports, sales, and due to their large amount of pesticide use.</p> <p>3-1-3 to 3-1-7 activities not yet implemented.</p>
<p>3-2 Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.</p>	<p>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></p>	<p>Illegal use of DDT and chlordane was reported .</p> <p>Action Plan is not yet implemented. There is no guidance on implementing the monitoring and inspection of illegal pesticides trades. Furthermore, there is no concrete regulation and enforcement of illegal product confiscations in place.</p>
<p>3-3 Prepare collection campaign for temporary storage of the obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.</p>	<p>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</i></p>	<p>Action Plan is not yet implemented.</p>

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	<i>temporary storage facilities and area(s) for keeping obsolete pesticides including POPs.</i>	
Objective 4: Eliminate stockpile of obsolete pesticides, including POPs pesticides		
Action Plan	Activities	Assessment of the Implementation
4.1 Design and execute a national wide Project for the disposal of all obsolete pesticides (including POPs)	<p>4-1-1 <i>Identify and purchase the required UN approved packaging materials.</i></p> <p>4-1-2 <i>Organize training course for staff involved in the project.</i></p> <p>4-1-3 <i>Develop a plan for repackaging and transport to regional temporarily storage depots.</i></p> <p>4-1-4 <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></p> <p>4-1-5 <i>Select contractor for the international transport and disposal of all repackaged stocks.</i></p> <p>4-1-6 <i>Export repackaged obsolete pesticides stockpile for safe disposal outside the country.</i></p>	Action Plan is not yet implemented.

Table 3.1b. Review of action plans for PCBs

PCBs		
Goal:: Reduce risks and minimize impacts caused by PCBs with sound economical and ecological management.		
Overall Objectives: Proper economical and ecological management of PCBs and its contaminated article.		
Objective 1: Develop legal instruments and technical standards for managing equipment and articles contained and contaminated with PCBs.		
Action Plan	Activities	Assessment of the Implementation
1-1 Develop legal instruments and technical guidelines for managing PCBs releases	<p>1-1-1 <i>Form legal and technical working group including all PCBs stakeholders.</i></p> <p>1-1-2 <i>Study existing legal instruments and technical guidelines related to PCBs management.</i></p> <p>1-1-3 <i>Develop legal instruments and technical guidelines and standards as necessary for PCBs management.</i></p> <p>1-1-4 <i>Organize workshop for comments on the draft legal instruments before official approval.</i></p>	1-1-1 is currently undergoing through a GEF/UNIDO funded project, while activities 1-1-2 to 1-1-4 remain unimplemented.
Objective 2: Develop ESM of in-use electrical equipment and accessories/articles containing and/or contaminated with PCBs.		
Action Plan	Activities	Assessment of the Implementation
2-1 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.	<p>2-1-1 <i>Form team for inventory and study on existing inventory reports;</i></p> <p>2-1-2 <i>Identify support tools and equipment for inventory, and develop plans to conduct PCBs inventory.</i></p> <p>2-1-3 <i>Conduct comprehensive inventory</i></p>	Initial inventory of in-use transformers was done by survey questionnaires. The inventory of PCB oil or contaminated oil in the transformers was not done

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	<i>(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>	Action Plans for a comprehensive inventory and development of national data base are not yet implemented
2-2 Take measure to manage the in-use of electrical equipment and articles containing or contaminated with PCBs in an environmentally sound manner.	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 >10% next step with concentration >0.05 %).</i>	Action Plan for management is not yet implemented.
2-3 Develop strategy to reduce the in-use electrical equipment and articles containing or contaminated with PCBs.	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 PCB reduction</i>	Initial assessment was done on the number of in-use transformers and the number of potentially PCB containing transformers based on manufacturing date. However, actual contamination of the transformers with PCB oil or PCB contaminated oil was not determined. 2-3-2, 2-3-2 activities are not yet implemented.
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)		
Action Plan	Activities	Assessment of the Implementation
3-1 Pilot risk assessment	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>	Action Plan is not yet implemented
3-2 Complete assessment	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>	Action Plan is not yet implemented
3-3 Make measures to prevent PCBs infiltration	3-1 <i>Develop regular monitoring program to identify electrical equipment required to offer</i>	Action Plan is not yet implemented

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<p>and releases from electrical equipment</p>	<p><i>preventive facility of PCBs infiltration and release.</i> <i>3-3-2 Repair or offer preventive facility of PCBs infiltration and release in environmentally sound manner</i></p>	
<p>Objective 4: ESM of out-of-use of equipment, articles and wastes containing and/or contaminated with PCBs (Handling, transportation, dismantling, pretreatment, storage, final disposal)</p>		
<p>Action Plan</p>	<p>Activities</p>	<p>Assessment of the Implementation</p>
<p>4-1 Take measure to manage the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</p>	<p><i>4-1-1 Training for ESM of out of use electrical equipment, articles and wastes containing or contaminated with PCBs (handling, transportation, storage, dismantling, pretreatment, shipment of used PCB to the out of country disposal facilities).</i> <i>4-1-2 Form working group with participation of the stakeholders</i> <i>4-1-3 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> <i>4-1-4 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> <i>4-1-5 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></p>	<p>Out of use transformers for repair and maintenance from all districts are sent to the Maintenance Center of EDL. The process of disposal of transformers in this center is not environmentally safe.</p> <p>Activities for training on proper handling and disposal of PCB equipment are not yet implemented.</p>
<p>4-2 Develop strategy for destroying the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in environmentally sound manner.</p>	<p><i>4-2-1 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> <i>4-2-2 Conduct assessment with participation of the stakeholders for the disposal of out of use equipment, articles containing or contaminated with PCB.</i> <i>4-2-3 Develop strategy for the destruction of the out-of- use electrical equipment, articles and wastes containing or contaminated with PCBs (Handling, transportation, storage, dismantling, pre-treatment and final disposal).</i> <i>4-2-4 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></p>	<p>Action Plan is not yet implemented.</p>

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Objective 5: Strengthen capacity and enhance public awareness on PCBs issue		
Action Plan	Activities	Assessment of the Implementation
5-1 Provide and strengthen capacity for managing PCBs dielectric and its contaminated articles.	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>	Action Plan is not yet implemented.
5-2 Provide and strengthen laboratory capacity in analyzing PCBs.	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>	The Natural Resources and Environment Institute of MoNRE has a laboratory that used to conduct PCB analysis during the first PCBs back to 2005. However, due to lack of financial resources and continuous activity plans, the analysis practice was no longer continued since then.

Table 3.1c. Review of action plans for Dioxins and Furans

DIOXINS AND FURANS		
Goal: Reduce and eliminate the release of unintentionally produced POPs		
Overall Objective: Proper management of the release of unintentionally produced POPs		
Objective 1: Revise or develop legislation related to the sound management of unintentionally produced POPs.		
Action Plan	Activities	Assessment of the Implementation
1-1 Undertake law and policy assessment related to the management of unintentionally produced POPs.	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>	Action Plan is not yet implemented.
1-2 Amend existing laws, or develop new law	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 one, and develop a policy on the management of unintentionally produced POPs. Disseminate, monitor, assess and report realization of this new regulation or policy</i>	Action Plan is not yet implemented.

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<p>1-3 Develop the national guidelines for the sound management of unintentionally produced POPs (BAT / BEP)</p>	<p>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 & 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></p>	<p>Action Plan is not yet implemented.</p>
<p>Objective2: Strengthen capacity and raise public awareness on unintentionally produced POPs issues and hazards.</p>		
<p align="center">Action Plan</p>	<p align="center">Activities</p>	<p align="center">Assessment of the Implementation</p>
<p>2-1 Strengthen and develop the capacity to manage problems related to unintentionally produced POPs</p>	<p>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></p>	<p>Action Plan is not yet implemented.</p>
<p>2 -2Develop public awareness raising program on health and environmental impact affected by unintentionally produced POPs, and alternative uses.</p>	<p>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></p>	<p>Laos has conducted several awareness raising workshops on UPOPs targeting all stakeholders in various states.</p>
<p>Objective 3: Improve waste management practices and prevent uncontrolled burning of wastes</p>		
<p align="center">Action Plan</p>	<p align="center">Activities</p>	<p align="center">Assessment of the Implementation</p>
<p>3-1 Improve landfill management</p>	<p>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></p>	<p>Action Plan is not yet implemented</p>

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	<p>3-1-4 <i>Conduct training course on landfills management for the municipality and provincial authorities.</i></p> <p>3-1-5 <i>Design and implement municipal and provincial landfills management pilot project.</i></p>	
<p>3-2 Introduce and promote sound management of waste including 3R principles and waste separation practices</p>	<p>3-2-1 <i>Establish technical team for sound waste management.</i></p> <p>3-2-2 <i>Study available guidance documents on sound waste management practices set under the UNEP-Basel and the Stockholm Conventions.</i></p> <p>3-2-3 <i>Elaborate waste management guidelines suitable for Lao PDR focusing on implementation of 3-R principles.</i></p> <p>3-2-4 <i>Provide country-wide training on waste management guidelines implementation involving local authorities</i></p> <p>3-2-5 <i>Design and implement pilot project on environmentally sound waste management</i></p>	<p>Action Plan is not yet implemented</p>
<p>3-3 Introduce and promote implementation of BAT & BEP in existing waste incineration plants (municipal, hospital and industrial wastes)</p>	<p>3-3-1 <i>Establish technical team associated with the field of the waste incineration.</i></p> <p>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></p> <p>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></p> <p>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></p> <p>3-3-5 <i>Update the national guidelines on BAT/BEP if necessary</i></p> <p>3-3-7 <i>Organize training for responsible institutional officers and authorities and for plant operators on BAT/BEP, including CP</i></p>	<p>Action Plan is not yet implemented</p>
<p>Objective 4: Maintaining of comprehensive inventories of unintentionally produced POPs.</p>		
<p align="center">Action Plan</p>	<p align="center">Activities</p>	<p align="center">Assessment of the Implementation</p>
<p>4.1 Undertake comprehensive inventory on the release of unintentionally produced POPs.</p>	<p>4-1-1 <i>Form inventory team and review existing inventory report</i></p> <p>4-1-2 <i>Identify support tools and equipment for inventory</i></p> <p>4-1-3 <i>Conduct unintentionally produced POPs release inventory at national level</i></p> <p>4-1-4 <i>Design national unintentionally produced POPs database</i></p> <p>4-1-5 <i>Disseminate final result of unintentionally produced POPs release inventory</i></p> <p>4-1-6 <i>Evaluate the situation of POPs reduction and elimination</i></p>	<p>The 2005 initial inventory was reviewed and revised with the availability of new information on the additional sources of emission.</p> <p>The 2013 comprehensive inventory of emissions was done using the revised UNEP Toolkit (2013) The total emission was estimated using the suggested sources of emissions and emission</p>

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		factors.
Objective 5: Implementation of guidelines on Best Available Techniques (BAT) and Best Environmental Practice (BEP) to prioritized sources of unintentionally produced POPs		
Action Plan	Activities	Assessment of the Implementation
5-2 Promote the use of BAT/BEP in SMEs and establishment of BAT/BEP Fund	<p>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></p> <p>5-2-2 <i>Design, test, conduct, assess and improve BAT/BEP (initiating CP) training material related to POPs</i></p> <p>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></p> <p>5-2-4 <i>Establish BAT/BEP Fund in assisting SMEs on the use of BAT/BEP, including CP</i></p> <p>5-2-5 <i>Monitor, assess, report and improve the performance of the established BAT/BEP Fund</i></p> <p>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></p>	Action Plan is not yet implemented

Table 3.1d. Review of action plans for management of NIP implementation

Goal: Support to Successful Implementation of the NIP		
Overall Objective: Develop a National Program for the management of NIP		
Objective 1: Strengthening the existing mechanism for efficient and effective management of NIP implementation.		
Action Plan	Activities	Assessment of the Implementation
1-1 Improve mandate of the existing national coordinating monitoring and assessing unit for continuing the NIP coordination and implementation.	<p>1-1-1 <i>Coordinate policy development on sound management of chemicals including POPs and PTS (Persistent Toxic Substance).</i></p> <p>1-1-2 <i>Strengthen the administration management in POPs project implementation</i></p> <p>1-1-3 <i>Public and Dissemination update NIP to the stakeholder at the national level;</i></p> <p>1-1-4 <i>Promote and provide training to relevant stakeholder including private sectors;</i></p> <p>1-1-5 <i>Promote the awareness and dissemination on POP including BAT/BEP;</i></p>	Action Plan is not yet implemented

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	<p><i>Assist and support stakeholders in development of project proposal for funding</i></p> <p><i>1-1-6 Communicate with stakeholders for NIP implementation</i></p> <p><i>1-1-7 Communicate with donor agencies for assisting NIP implementation</i></p> <p><i>1-1-6 Undertake NIP monitoring, evaluation, reporting, and updating</i></p>	
<p>1-2 Establish and design the National Chemical Database including POPs for centralization and exchanging of information</p>	<p><i>1-2-1 Identify the scope of the National Chemical Database and design for harmonious integration of information and dissemination related to chemical management</i></p> <p><i>1-2-2 Integrate the results of all three sections of POPs action plans implementation into a single and will be used as reference document.</i></p> <p><i>1-2-3 Integrate the existing information related to chemical management into the National Chemical Database</i></p> <p><i>1-2-4 Organize regular national workshops for presenting and integration of NIP project achievements into the National Chemical Database</i></p> <p><i>1-2-5 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></p> <p><i>1-2-6 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></p> <p><i>1-2-7 Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally</i></p> <p><i>1-2-7 Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally</i></p>	<p>Action Plan is not yet implemented</p>
<p>1-3 Develop Hazardous Chemicals and Substances Management Legislation</p>	<p><i>1-3-1 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></p> <p><i>1-3-2 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></p> <p><i>1-3-3 Formulate “Hazardous Chemicals and Substances Management Decree or Law”; Conduct consultation workshops on the “Hazardous Chemicals and Substances</i></p>	<p>Action Plan is not yet implemented</p>

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	<p><i>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></p>	
<p>1-4 Promote the conduct of chemical engineering course at targeted academic institutions</p>	<p>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></p>	<p>Action Plan is not yet implemented</p>

3.2 THE UPDATED NIP OF 2016

3.2.1 STRATEGY IN THE DEVELOPMENT OF NIP 2016

The review of the implementation of the NIP 2010 showed very little achievement on the listed action plans and activities. Based on the results of the assessment of the prevailing status of issues related to POPs, the main areas of concern that need attention for the effective implementation of Lao PDR’s commitment to the Convention are the following:

- Institutional and regulatory framework;
 - o Strengthening of the capacity of relevant institutions and their coordination for more effective management of POPs in the national level
 - o Improvement of legal instruments for regulation, control and environmentally safe disposal POPs
 - o Improvement of the laboratory capacity for analysis of POPs
- Data and Information Network
 - o Strengthening the communication network among relevant institutions for a more comprehensive inventory of POPs
 - o Creation of a National Data Base for POPs
- Human Resources Development
 - o Increasing the awareness of policy decision makers on POPs and their management concerns such as trafficking, illegal sales and unsafe disposal

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- o Strengthening of training programs for administrative and technical personnel on inventory, identification of contaminated sites, environmentally safe disposal, BAT/BEP for POPs
- Public Awareness, Health and Environment
 - o Improvement of public awareness programs on the hazards of POPs chemicals
 - o Improvement of the participation of the public and other nongovernmental organizations on environmentally safe disposal of hazardous wastes and on BAT/BEP practices to lessen unintentional release of POPs
- Development of financial resources to implement identified action plans in the NIP

The improvement of the institutional and regulatory framework, data and information network human resources development, public awareness, health and environment and development of financial resources to implement identified action plans addressed to chemicals other than POPs are the same requirements to implement a more effective management of chemicals and waste disposal in the country. An important strategy to successfully implement the action plans for POPs is to integrate the action plans for POPs to the broader national programs on chemicals and waste management. Such integration will minimize policy fragmentation, reduce administrative burden, promote information exchange between relevant agencies involved in chemical management and streamline the spending of financial resources. Such integration will also improve the general legal and operational framework in chemical management while addressing the commitment of the country to the Stockholm Convention.

Under this strategy, action plans for these concerns to address the management of POPs could all be linked to the improvement of the general program of management of chemicals and wastes. The specific action plans and activities in the NIP for identification of articles containing POPs in use or in waste materials, for assessment and mitigation of the POPs stockpiles and contaminated sites, for improvement of POPs information exchange and for promotion and conduct of POPs researches can be linked to address similar issues in the management of other hazardous chemicals in general. A list of the action plans in the updated NIP that can be integrated to the programs on chemical management and waste disposal is attached in Appendix 1.

In addition to linking the NIP to the general program on chemical and waste management, some action plans in the updated NIP can be linked to the LAO PDR's Sustainable Development Goals and Gender Development Goals. In particular, action plans and activities on awareness raising on the hazards of POPs and other hazardous chemicals and on safe waste disposal, that include the participation of women, will promote the use of less hazardous chemicals in agricultural production and the practice of safe waste disposal in households and the community to sustain a more healthy environment.

3.2.2. GOALS, ACTION PLANS AND ACTIVITIES IN THE UPDATED NIP

The NIP 2010 resulted in some improvements in the organizational structure and operational framework for the implementation of the NIP (establishment of MOE, the National POPs Steering Committee, the POPs Coordination Unit and the POPs Working Group), the 2010 amendments in the legal instrument for the control of pesticides (responsibilities defined for

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registration, licensing distribution of pesticides) and in generation of initial inventories of POPs. However, there is a need to strengthen the capacity of the existing agencies to fulfill their mandates and to institute better coordination and communication among agencies to improve the implementation of the NIP.

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, including POPs management practices and the more active participation of the community in hazardous chemical management. Action plans in the NIP 2010 to initiate new procedures and activities in chemical management through trainings of managers and technical persons, including the development of chemical engineering courses and to promote awareness on hazardous chemicals for all key stakeholders including decision makers and the community were not implemented.

In the updated NIP, in addition to action plans to address the commitments on the newly listed POPs chemicals, many untouched components of the first NIP such as training programs, more comprehensive POPs inventory, implementation of environmentally safe waste disposal, mitigation of uncontrolled POPs release as well as POPs technical research, and awareness raising programs are reiterated.

The detailed action plans related to the management and safe disposal of the 12 original and 9 new POPs substances set under the SC are divided into six main sections as follows:

- Section 1 on POPs pesticides,
- Section 2 on PCBs,
- Section 3 on brominated POPs (PBDEs, HBB and HBCD)
- Section 4 on PFOS and related substances
- Section 5 on unintentionally produced POPs, and
- Section 6 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.

3.2.2.1. POPs pesticides

Goals: Eliminate the stockpiles, import and use of POPs pesticides, as well as to secure and remediate POPs pesticides contaminated sites

Overall Objectives: Development of appropriate regulatory framework and awareness to effectively implement law enforcement related to POPs pesticides

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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.
- Labeling of pesticides is often incomplete or in languages which cannot be understood by farmers.
- There is a lack of information on POPs pesticides contaminated sites, as well as on the major threats determined by it.

Table 3.2.2.1 Action plans addressing POPs Pesticides

Objective 1: Amendment of existing legal instruments and strengthening effective pesticides (including POPs) law enforcement.			
Action Plan 1-1 Undertake assessment of the existing laws and other technical standards for amendment and promotion of effective law enforcement.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>1-1-1 <i>Formulate legal team and review existing regulations on agricultural pesticides management.</i></p> <p>1-1-2 <i>Amend existing legislation and/or develop new legal instruments for pesticides (including POPs) management (including provisions on: mandatory registration of all the pesticides placed on the market, labeling, penalties for discouraging the illegal traffic and counterfight, setting up an empty container management system, avoiding reoccurrence of obsolete pesticides stocks.</i></p> <p>1-1-3 <i>Develop rules and regulations for implementing the pesticides management legislation (include periodic mandatory reporting for pesticides retailers on pesticides stocks).</i></p> <p>1-1-4 <i>Develop technical guidelines on pesticides (including POPs) monitoring and inspection.</i></p> <p>1-1-5 <i>Develop the relevant legislation on environment liability, site investigation and evaluation of the soil pollution (including limit</i></p>	<p>MAF/MOJ, MoNRE, MOH, mass organizations, and private sector</p>		<p>Appropriate regulatory framework for effective law enforcement.</p>

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<p><i>values setting), as well as relevant guidelines for identification and assessment of POPs pesticides contaminated sites and technical guidelines for contaminated sites remediation.</i></p> <p><i>Develop a strategy and action plan for the interventions during emergency situations (spillages, flooding)</i></p>			
<p>Objective 2 : Strengthen institutional capacity and raise public awareness on obsolete pesticides including POPs pesticides.</p>			
<p>Action Plan 2-1 Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p><i>2-1-1 Formulate and build national TOT capacity.</i></p> <p><i>2-1-2. Develop training material on the prevention of illegal import, trafficking and use of illegal pesticides, including POPs and other obsolete pesticides.</i></p> <p><i>2-1-3 Organize and disseminate information and conduct training programs for Government officers (including custom officers), retailers/traders/sellers and other relevant stakeholders on legislative and reporting requirements, pesticides management (use, storage, transport, disposal, empty containers management).</i></p>	<p>MAF/ MoNRE, MoH, MoIC, MoF</p>		<p>1. Trained personnel 2. Training materials for prevention of trafficking of illegal pesticides and POPs pesticides 3. Trained target groups on pesticide management</p>
<p>Action Plan 2-2 Strengthen capacity on pesticides analysis including POPs.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p><i>2.2-1 Improve capacity of laboratory staff on pesticides analysis, with focus on POPs pesticides, including from the perspective of food safety.</i></p> <p><i>2.2-2 Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.</i></p>	<p>MAF/ MoNRE, MoH, National University of Laos – NUOL</p>		<p>Upgraded laboratory facilities and staff for pesticides analysis with focus on POPs</p>
<p>Action Plan 2-3 Raise public awareness, including farmers, on pesticides issues including POPs and other obsolete pesticides.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p><i>2.3-1. Formulate and undertake dissemination campaigns on pesticides hazards and elimination of obsolete pesticides and POPs.</i></p>	<p>MAF/ MIF, MoNRE, relevant civil society, mass</p>		<p>1. Available Training materials on awareness of hazards of pesticides 2. Available trained</p>

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<p>2.3-2. <i>Provide information to relevant target groups on alternative pesticides instead of POPs and obsolete pesticides.</i></p> <p>2.3-3. <i>Encourage alternatives pest control measures to reduce the use of pesticides.</i></p> <p>2.3-4. <i>Improve extension worker's capacity and expand their activities on pesticides including obsolete pesticides and POPs issues.</i></p> <p>2.3-5. <i>Disseminate good agricultural practices and providing training for farmers in respect to the safe and sustainable use of available pesticides on the market, personal protective equipment, empty containers management.</i></p>	<p>organizations</p>		<p>trainers to conduct seminars</p> <p>3. Record of seminars, lectures organized and conducted for different target groups</p> <p>4. A list of Alternative pesticides or methods of pest control identified and disseminated to stakeholders</p> <p>5. a record of training of farmer groups on good agricultural practice</p>
<p>Action Plan 2.4 Raise the awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p>2.4-1 <i>Organize forums/workshops for policy and decision makers with the aim of integrating of obsolete POPs pesticides management issues in the broader context of hazardous waste management and receiving the necessary financial resources to deal with it; as well as to promote the ecological agriculture at national level.</i></p> <p>2.4-2. <i>Provide information on pesticides risk and hazard related issues including obsolete pesticides and POPs to policy and decision makers.</i></p>	<p>MAF/MoNRE, MoH, MIC, mass organizations</p>		<p>1. Record of seminars and lectures on risks of obsolete pesticides and on , integrated hazardous waste management for POPs and obsolete pesticides conducted for policy and decision makers</p>
<p>Objective 3: Undertake ecologically sound management measures related to obsolete pesticides including POPs pesticides.</p>			
<p>Action Plan 3-1 Conduct comprehensive inventory on obsolete pesticides and POPs pesticides, including POPs pesticides contaminated sites.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p>3-1-1 <i>Form obsolete (including POPs) pesticides inventory team and POPs pesticides contaminates sites inventory team.</i></p> <p>3-1-2 <i>Organize inventory training of the team and develop inventory forms, guidelines and plan execution of the inventory.</i></p> <p>3-1-3 <i>Undertake comprehensive inventory survey</i></p>	<p>MAF/ MoNRE, MoH, MoIC, National Statistic Bureau, local authorities</p>		<p>1. Trained inventory team and developed inventory forms.</p> <p>2. A comprehensive inventory of obsolete pesticides and POPs chemicals</p> <p>3. Data base of obsolete pesticides and POPs in FAO Pesticides Stocks format</p>

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<p><i>covering the whole country.</i></p> <p>3-1-4 <i>Implement FAO's Pesticides Stocks Management System (PSMS) database format and reporting, which includes a module for POPs pesticides contaminated sites.</i></p> <p>3-1-5 <i>Training, with the support of FAO's officers, of technical staff on data entry.</i></p> <p>3-1-6 <i>Set-up database management system with facilities and data entry.</i></p> <p>3-1-7 <i>Develop database document on obsolete pesticides including POPs/POPs pesticides contaminates sites and publicizing.</i></p>			<p>4. Data base of contaminated sites of obsolete pesticides and POPs</p>
<p>Action Plan 3.2 Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides and counterfeited products.</p>			
<p>Activities</p>	<p>Implementing/ Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p>3.2-1 <i>Develop plan for monitoring on import, domestic trafficking and trade of illegal/counterfeited pesticides.</i></p> <p>3.2-2 <i>Undertake regular monitoring and inspection focusing on the presence of illegal/counterfeited pesticides.</i></p> <p>3.2-3 <i>Undertake administrative measures (like confiscation of illegal/ counterfeited products and storage in Government owned storage sites, apply penalties/fines) for any illegal action related to illegal/ counterfeited pesticides.</i></p>	<p>MAF/ MoNRE, MoH, MoIC, local authorities</p>		<p>Record and reports on regular monitoring and inspection for import, domestic trafficking and trade of illegal/counterfeited pesticides</p> <p>Record of administrative measures done for trade of illegal pesticides</p>
<p>Action Plan 3-3. Prepare collection campaign for temporary storage of the obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.</p>			
<p>Activities</p>	<p>Implementing /Partner Agency</p>	<p>Time frame (No. of Years)</p>	<p>Performance Indicators</p>
<p>3.3-1 <i>Undertake an environmental impact assessment on setting up of regional storage depots and the collection and storage of obsolete pesticides including POPs pesticides.</i></p> <p>3.3-2 <i>Disseminate the FAO technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete pesticides including POPs to all relevant stakeholders.</i></p> <p>3.3-3 <i>Establish or improve safe regional temporary storage facilities (including obtaining the appropriate permit of their establishment based on EIA) and area(s) for keeping obsolete pesticides</i></p>	<p>MAF / MoNRE, MoH, local authorities</p>		<p>Document on Environmental Impact Assessment of identified storage of obsolete pesticides and POPs pesticides</p> <p>Documented Technical Guidance on environmentally sound collection, repackaging transportation and temporarily storage of obsolete pesticides including POPs</p>

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<i>including POPs.</i>			
Objective 4. Eliminate stockpile of obsolete pesticides, including POPs pesticides			
Action Plan 4.1. Design and execute a national wide Project for the disposal of all obsolete pesticides (including POPs).			
Activities	Implementing /Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>4.1-1 <i>Develop a plan for repackaging and transport to regional temporarily storage depots of all obsolete pesticides stocks identified during the inventory phase.</i></p> <p>4.1-2 <i>Organize training course for staff involved in the project on repackaging and transport.</i></p> <p>4.1-3 <i>Identify and purchase the required UN approved packaging materials.</i></p> <p>4.1-4 <i>Repackage obsolete pesticides, clean all stores and transport the repackaged stockpiles (obsolete pesticides and wastes contaminated pesticides including POPs) to regional temporary storage depots.</i></p> <p>4.1-5 <i>Select contractor for the international transport and disposal of all repackaged stocks.</i></p> <p>4.1-6 <i>Export repackaged obsolete pesticides stockpile for safe disposal outside the country.</i></p>	<p>MAF, MoNRE/ MoH, MPWT, MoIC, MoF</p>		<p>Trained staff for repacking of obsolete pesticides and POPs</p> <p>Stored or disposed repackaged obsolete pesticides and POPs</p>
Objective 5: Identification of POPs pesticides contaminated/potentially contaminated sites and initiation of remediation actions			
Action Plan 5.1. Design and execute a national projects for remediation of obsolete pesticides (including POPs) contaminated sites.			
Activities	Implementing /Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>5.1-1 <i>Identify all POPs pesticides contaminated sites and prioritize it based on the risk assessment evaluation.</i></p> <p>5.1-2 <i>Develop a strategy and action plan for cleaning up the sites with the highest risk.</i></p> <p>5.1-3 <i>Secure the national/international funding for starting the decontamination.</i></p> <p>5.1-4 <i>Identify the clean-up measures and initiate clean-up procedures.</i></p>	<p>MAF, MoNRE /MoH, MPWT, MoIC, MoF</p>		<p>List of priority contaminated sites for clean-up</p> <p>Documented strategy for clean-up</p>

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5.1-5Take measures to secure the contaminated sites waiting clean-up			
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3.2.2.2 PCBs

Goals: Reduce risks and minimize impacts caused by PCBs in an environmental sound manner.

Overall Objectives: Environment sound management of PCBs containing equipment (transformers and capacitors) and preliminary investigations on PCBs in open applications.

Key problems:

- No specific PCBs regulation in force in Lao PDR.
- There is no National PCBs Elimination Plan defining the tasks and liabilities for institutions and companies in respect to PCBs containing wastes management and disposal.
- Based on economic situation of Lao PDR, no replacement of old transformers took place.
- Old transformers continue to be used in Lao PDR and are potentially PCBs contaminated.
- Lao PDR is still importing transformers without PCBs 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 is implemented.
- No PCBs disposal facilities are available with safe environmental standards implemented.
- Electrical workers face high risks caused by PCB associated work.
- There are no specific measures for health and environmental protection for people affected by PCBs.
- There is no supply of safe protective equipment for workers.
- Workers are not aware of the risks of PCBs on health;
- There is a lack of knowledge and understanding on the risks, safe and sound management of PCBs.
- There is a lack of data and information for proper management of PCBs.
- There is a lack of information on PCBs contaminated sites, as well as on the major threats determined by it.

Table 3.2.2.2 Action plans addressing PCBs

Objective 1: Develop legal instruments and technical standards for managing equipment and articles containing and contaminated with PCBs and PCBs contaminates sites.			
Action Plan 1.1 Develop legal instruments and technical guidelines for managing PCBs stockpiles and releases			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
1.1-1 <i>Form legal and technical working group including all PCBs stakeholders.</i>	MEM / MoNRE, MoJ, MoIC, relevant		Clear in-charge government agency

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<p>1.1-2 <i>Study existing legal instruments and technical guidelines related to PCBs management and identify the gaps to be filled in.</i></p> <p>1.1-3 <i>Develop legal instruments and technical guidelines and standards as necessary for PCBs management.</i></p> <p>1.1-4 <i>Draft legal instruments are made publically available for comments/proposals before official approval.</i></p> <p>1.1-5 <i>Develop the relevant legislation on environment liability, site investigation and evaluation of the soil pollution (including limit values setting), as well as relevant guidelines for identification and assessment of PCBs contaminated sites and technical guidelines for contaminated sites remediation.</i></p> <p>1.1-6 <i>Develop a strategy and action plan for the interventions during emergency situations (spillages, flooding etc)</i></p>	<p>private sector, concerned local authorities</p>		<p>assignment, legal instruments and technical guidelines for management of PCBs</p> <p>Guidelines for actions during emergency situations like spillages of PCBs and flooding</p>
<p>Objective 2: Conduct inventory of in-use and out-of-use electrical equipment and accessories /articles containing and/or contaminated with PCBs, initiate preliminary inventory of PCBs in open application and conduct preliminary inventory of PCBs contaminated sites.</p>			
<p>Action Plan 2.1 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</p>			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>2.1-1 <i>Form team for inventory and study on existing inventory reports.</i></p> <p>2.1-2 <i>Identify support tools and equipment for inventory, and develop plans to conduct PCBs inventory.</i></p> <p>2.1-3 <i>Conduct comprehensive inventory (including testing, classifying, labeling, registering, etc.) of electrical equipment and articles containing or contaminated with PCBs.</i></p> <p>2.1-4 <i>Design and develop national database on electrical equipment and articles containing or contaminated with PCBs</i></p>	<p>MoNRE, MEM, EDL, MoIC, MPI, key stakeholders</p>		<p>Comprehensive inventory (including testing, classifying, labeling, registering, data input and data management etc.) of electrical equipment and articles containing or contaminated with PCBs.</p> <p>National database on electrical equipment and articles containing or contaminated with PCBs</p>

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Action Plan 2.2 Conduct preliminary inventory on PCBs in hydraulic oil and open applications.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>2.2-1 <i>Form team for inventory and identify support tools, equipment for inventory, and develop plans to conduct PCBs inventory on hydraulic oil and open applications.</i></p> <p>2.2-2 <i>Conduct preliminary inventory of PCBs on hydraulic oil and open applications.</i></p> <p>2.2-3 <i>Include the results of the inventory within the national database developed for PCBs equipment.</i></p>	MoNRE, MEM, EDL, MoIC, MPI, key stakeholders		Preliminary inventory of PCBs on hydraulic oil and open applications.
Action Plan 2.3. Conduct preliminary inventory of PCBs contaminated sites.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>2.3-1 <i>Form team for inventory and identify support tools, equipment for inventory, and develop plans to conduct PCBs contaminated sites inventory.</i></p> <p>2.3-2 <i>Conduct preliminary inventory of PCBs contaminated sites and prioritize it based on the risk assessment.</i></p> <p>2.3-3 <i>Include the results of the inventory within a national database.</i></p>	MoNRE, MEM, EDL, MoIC, MPI, key stakeholders		Preliminary inventory of PCBs contaminated sites
Objective 3: Develop ESM of in-use electrical equipment and accessories /articles containing and/or contaminated with PCBs.			
Action Plan 3.1 Take measure to manage the in-use of electrical equipment and articles containing or contaminated with PCBs in an environmentally sound manner.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>3.1-1 <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></p> <p>3.1-2 <i>Apply management in environmentally sound manner at selected sites.</i></p> <p>3.1-3 <i>Take action to stop the intention for repairing transformers contaminated with PCBs (with high concentration >10% next step with concentration >0.05 %).</i></p>	MoNRE, MEM/ EDL, MPI stakeholderS		List of priority sites for environmentally sound management of PCBs

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Action Plan 3.2. Develop strategy to reduce the in-use electrical equipment and articles containing or contaminated with PCBs.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>3.2-1 <i>Initial assessment (current and future) of electrical equipment and articles containing or contaminated with PCBs.</i></p> <p>3.2-2 <i>Develop strategy for the reduction of in-use electrical equipment and articles containing or contaminated with PCBs (part of the National PCBs Elimination Plan).</i></p> <p>3.2-31 <i>Develop and implement demonstration (pilot) project in PCBs reduction</i></p>	<p>MoNRE, MEM/ EDL, MPI stakeholders</p>		<p>Documented strategy for reduction of in-use electrical equipment with PCBs</p>
Objective 4: 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)			
Action Plan 4.1 Pilot risk assessment			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>4.1-1 <i>Form a working group of different stakeholders.</i></p> <p>4.1-2 <i>Prepare plan of pilot risk assessment project (selection of a representative population sample: 100 units).</i></p> <p>4.1-3 <i>Conduct site assessment.</i></p> <p>4.1-4 <i>Identify issues of risk assessment.</i></p> <p>4.1-5 <i>Organize and conduct the conclusion workshop with stakeholders (legal issues, technical issues, financial issues).</i></p>	<p>MEM / MoNRE, EDL, MoIC, MoF, key stakeholders</p>		<p>Identified issues for pilot site risk assessment</p> <p>Documented guidelines for pilot site risk assessment</p> <p>Workshops conducted for stakeholders to discuss relevant issues on risk assessment</p>

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Action Plan 4.2. Complete risk assessment			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>4.2-1 <i>Form a working group with the participation of different stakeholders.</i></p> <p>4.2-2 <i>Develop plan of complete risk assessment.</i></p> <p>4.2-3 <i>Conduct complete site assessment.</i></p> <p>4.2-4 <i>Identify issues of complete risk assessment.</i></p> <p>4.2-5 <i>Organize and conduct the national conclusion workshop with stakeholders (legal issues, technical issues, financial issues).</i></p>	MEM / EDL, MoH, MoNRE,,Key stakeholders		<p>Complete risk assessment of priority sites</p> <p>Workshops conducted for stakeholders to discuss relevant issues on complete risk assessment</p>
Action Plan 4.3.Make measures to prevent PCBs infiltration and releases from electrical equipment.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>4.3-1 <i>Develop regular monitoring program to identify electrical equipment required to offer preventive facility of PCBs infiltration and release.</i></p> <p>4.2-2 <i>Repair or offer preventive facility of PCBs infiltration and release in environmentally sound manner.</i></p>	MEM / EDL, MoIC, key stakeholders		<p>Guideline for routine monitoring of electrical equipment for releases of PCBs.</p> <p>Procedure for environmentally sound repair of electrical equipment to prevent PCB releases.</p>
Objective 5: ESM of out-of-use of equipment, articles and wastes containing and/or contaminated with PCBs (Handling, transportation, dismantling, pretreatment, storage, final disposal)			
Action Plan 5.1 Take measure to manage the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in environmentally sound manner.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>5.1-1 <i>Training for ESM of out of use electrical equipment, articles and wastes containing or contaminated with PCBs (handling, transportation, storage, dismantling, pretreatment, shipment of used PCB to the out of country disposal facilities).</i></p> <p>5.1-2 <i>Form working group with participation of the stakeholders</i></p> <p>5.1-3 <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></p>	MEM / MONRE,EDL, MIC, key stakeholders		<p>Guidelines for identifying and classifying PCB contaminated out of use electrical equipment.</p> <p>Training materials and trained trainers for ESM of out of use electrical equipment.</p> <p>Identified storage sites for out of use equipment contaminated with PCBs and PCB waste</p>

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<p>5.1-4 Upgrade (or new establish if require), based on an EIA and subject to permitting, 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.</p> <p>5.1-5 Take action to centralize the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs waiting for destruction in an environmentally sound manner.</p>			
<p>Action Plan 5.2. Develop 5 years plan for destroying the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in environmentally sound manner.</p>			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>5.2-1 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.</p> <p>5.2-2 Conduct assessment with participation of the stakeholders for the disposal of out of use equipment, articles containing or contaminated with PCB.</p> <p>5.2-3 Develop strategy for the destruction of the out-of-use of electrical equipment (part of the National PCBs Elimination Plan), articles and wastes containing or contaminated with PCBs (Handling, transportation, storage, dismantling, pre-treatment and final disposal).</p> <p>5.2-4 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. Publication and dissemination of the concerned strategy.</p>	<p>MEM/ EDL, MIC, MoNRE, key stakeholders</p>		<p>Guidelines for assessment and destruction of out of use electrical equipment in an ESM</p>

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Objective 6: Strengthen capacity and enhance public awareness on PCBs issue			
Action Plan 6.1 Provide and strengthen capacity for managing PCBs dielectric and its contaminated articles.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>6.1-1 <i>Develop materials on PCBs issues and publicize.</i></p> <p>6.1-2 <i>Organize training on PCBs sound management related issues for national and provincial levels.</i></p>	<p>MoNRE, MEM / EDL, Provincial Electricity , MoIC, MoF, stakeholders</p>	<p>Short term (within GEF PCBs project</p>	<p>Training materials and trained trainers for public awareness on PCBs and ESD of PCBs. Seminars conducted on PCBs in national and provincial levels Dissemination of inventory report to the policy makers and public.</p>
6.2 Provide and strengthen laboratory capacity in analyzing PCBs.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>6.2-1 <i>Strengthen laboratory staff's capacity for PCBs analysis.</i></p> <p>6.2-2 <i>Assess existing lab facilities and analytical capacities.</i></p> <p>6.2-3 <i>Select appropriate PCB analytical techniques.</i></p> <p>6.2-4 <i>Provide PCB analytical equipment.</i></p> <p>6.2-5 <i>Provide information to stakeholders.</i></p> <p>6.2-6 <i>Upgrade laboratory facilities for analyzing PCBs.</i></p>	<p>MEM / MONRE, MIC, stakeholders</p>	<p>Short term (within GEF PCBs project</p>	<p>PCB laboratory (ies) equipped with analytical equipment, methodology and trained staff for analysis of PCBs</p>
Objective 7: Identification of PCBs contaminated/potentially contaminated sites and initiation of remediation actions			
Action Plan 7.1 Design and execute a national project for assessment and securing/remediating of PCB contaminated sites.			
Activities	Implementing/ Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>7.1-1 <i>Identify all PCBs contaminated/potentially contaminated sites and prioritize it based on the risk assessment evaluation.</i></p> <p>7.1-2 <i>Develop a strategy and action plan for cleaning up the sites with the highest risk.</i></p> <p>7.1-3 <i>Secure the national/international funding for</i></p>	<p>MAF, MoNRE/ MoH, MPWT, MoIC, MoF</p>		<p>List of contaminated sites for priority remediation actions</p> <p>Guideline for securing contaminated sites while waiting for clean-up</p> <p>Guidelines for cleaning up</p>

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<i>starting the securing and decontamination.</i>			PCB contaminated sites.
7.1-4 <i>Identify the clean-up measures and initiate clean-up procedures.</i>			
7.1-5 <i>Take measures to secure the contaminated sites waiting clean-up.</i>			

3.2.2.3. LISTED BROMINATED FLAME RETARDANTS (POP-PBDES, HBB AND HBCD)

Goals: Eliminate the use and manage materials containing listed brominated flame retardants (POP-PBDEs, HBB and HBCD)

Overall Objectives: Proper management of the materials containing POP-PBDEs, HBB and HBCD, and protection of related recycling flows

Key Problems:

- Information on total amount of PBDE and HBCD containing material flows is very weak;
- Currently there is no regulatory frame for the waste and resource management of important waste categories (Waste of Electrical and Electronic Equipment-WEEE, end of life vehicles, insulation and);
- There is no waste management scheme and technology in place for environmentally sound management of brominated POP containing waste categories;
- An assessment of technologies for the management of brominated POPs containing material in Lao does not exist;
- Information on alternatives to PBDEs, HBCD and their appropriate assessment is weak.

Table 3.2.2.3 Action plans addressing POP-PBDEs, HBB and HBCD

Objective 1: Development of regulatory frame for brominated POP containing materials.			
Action Plan1.1 Set up a legislative framework for the management of WEEE and of life vehicles in the overall frame of waste management regulation. The concerned private sectors (e.g. EEE and vehicle producers and importers including extended producer responsibility, WEEE collectors and recycling shops) to report periodically to the MONRE on the status of treated WEEE and end-of-use vehicles.			
Activities	Implementing /Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
1.1-1 <i>Assessment of regulatory framework for WEEE and end-of-life vehicle management and particular regulations on brominated POPs in other countries.</i>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Medium term 2-5 years 30,000 \$US	A regulatory framework for management of EEE/WEEE A regulatory framework for management of end of life
1.1-2 <i>Development of regulatory framework for</i>			

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<i>EEE/WEEE management possibly including extended producer responsibility.</i>			vehicles
<i>1.1-3 Development of regulatory framework for end of life vehicle management possibly including extended producer responsibility</i>			
Objective 2. Improve inventories of brominated POPs containing material flows.			
Action Plan 2.1 Development of a comprehensive national EEE/WEEE and vehicle inventory/database by MONRE in collaboration with stakeholders (importers, distributors and providers) which can be used for PBDE but also on other tasks such as developing a WEEE and end of life vehicle management scheme.			
Activities	Implementing /Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<i>2.1-1 Development and conduct of a comprehensive national EEE/WEEE inventory including PBDE and other PTS and valuable resources.</i>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Short term 1-2 years 50,000 \$US	A comprehensive national inventory of EEE/WEEE including PBDEs and other PTS substances. A comprehensive national inventory of the transport sector and end of life vehicles with PBDE and other PTS substances.
<i>2.1-2 Development of a material flow analysis and substance flow analysis for EEE/WEEE and related PBDE and other substances of interest.</i>			
<i>2.1-3 Development and conduct of a comprehensive national inventory of the transport sector and end of life vehicle inventory and related brominated POP and other PTS inventory.</i>			
<i>2.1-4 Development of a material flow analysis and substance flow analysis for the transport sector.</i>			
Action Plan 2.2 Inventory of HBCD containing materials			
Activities	Implementing /Partner Agency	Time frame (No. of Years)	Performance Indicators
<i>2.2-1 Assessment of the use of HBCD containing foams in construction and inventory of including polystyrene in construction.</i>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Short term 1-2 years 7,000 \$US	Documented assessment of the use of HBCD containing foams in construction Inventory of HBCD containing foams in construction and assessment for possible exemption
<i>2.2-2 Assessment if an exemption for HBCD in insulation in construction is needed.</i>			
Action Plan 2.3 Expand inventory scope to cover articles and life cycles (e.g. recycling process) that were not included in the inventory.			
Activities	Implementing /Partner Agency	Time frame (No. of Years)	Performance Indicators
<i>2.3-1 Assessment and inventory of PBDE and HBCD in polyurethane or polystyrene in furniture and mattresses.</i>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Medium term 2-5 years 15,000 \$US	Documented assessment of the use of PBDEs and HBCD containing foams in furniture and mattresses and textiles . Inventory of PBDEs and
<i>2.3-2 Assessment of the presence of PBDE and</i>			

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<p><i>HBCD in textiles and inventory in case.</i></p> <p><i>2.3-3 Assessment of the presence of PBDE and HBCD in products manufactured from recycled materials.</i></p>			<p>HBCD containing foams in furniture, mattresses and textiles .</p> <p>Dissemination of inventory report to the policy makers and public.</p> <p>Documented assessment of the presence of PBDEs and HBCD in products using recycled materials.</p>
<p>Objective 3: Environmentally sound management of PBDEs and HBCD containing materials and wastes.</p>			
<p>Action Plan 3.1 Assessment of end of life management and recycling activities of WEEE plastic and other brominated POP containing plastic/polymers in the country, the technologies used and the pollutant levels present.</p>			
<p>Activities</p>	<p>Implementing /Partner Agency</p>	<p>Time frame (No. of Yrs)/ Estimated Cost</p>	<p>Performance Indicators</p>
<p><i>3.1-1 Assessment of end of life management and recycling activities of WEEE plastic in the country and technologies used and the pollutant levels present.</i></p> <p><i>3.1-2 Assessment of end of life management and recycling activities of WEEE plastic in the country and technologies used and the pollutant levels present.</i></p> <p><i>3.1-3 Assessment of end of life management and recycling activities of polymers from the transport sector and the pollutant levels present.</i></p> <p><i>3.1-4 Assessment of end of life management and recycling activities of potentially PBDE/HBCD containing materials from other sector and the pollutant levels present.</i></p> <p><i>3.1-5 Assessment of the risk by these treatments for workers, the environment and for consumers of the recycled products.</i></p>	<p>MoIC/ MoNRE, MPWT, MPI, MoF, private sector</p>	<p>Short term 1-2 years</p> <p>25,000 \$US</p>	<p>Guidelines for assessment of end of life management and recycling activities of WEEE in plastics</p> <p>A report on the assessment of the end of life management and recycling and the risk of these treatments to workers and consumers of recycled products</p>

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Action Plan 3.2 Assessment of and implementation of BAT/BEP for recovery of resources and environmentally sound management of PBDE containing waste categories considering the waste hierarchy and life cycle assessment.*			
Activities	Implementing /Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>3.2-1 <i>Assessment of BAT/BEP for recycling and recovery of material containing PBDEs and HBCD (including separation).</i></p> <p>3.2-2 <i>Assessment of BAT/BEP for destruction and disposal of PBDE and HBCD containing wastes.</i></p> <p>3.2-3 <i>Life Cycle Assessment of the different waste hierarchy options and selection of the best choice considering the national situation.</i></p>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Short term 1-2 years 50,000 \$US	Assessment of the different waste disposal hierarchy options for PBDEs and HBCD and the most applicable BAT/BEP for the national situation
Action Plan 3.3. Incorporate EEE/WEEE and end of life vehicles and possibly other waste categories such as demolition waste from construction (including PBDEs, HBCD and other pollutants but also resource) management into national environment protection and waste/resource management plan.			
Activities	Implementing /Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>3.3-1 <i>Assessment of the need and options to include PBDE and HBCD containing wastes into national environment protection and waste/resource management plan.</i></p> <p>3.3-2 <i>Inclusion of those affected waste categories into the national environment protection and waste/resource management plan where the usefulness for a listing have been shown.</i></p>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Short term 1-2 years 2,000 \$US	A report on the assessment of the need and options to include PBDE and HBCD into the national environment protection and waste/ resource management plan

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Action Plan 3.4 Assessment of the possibilities and feasibility in setting up waste management and disposal facility in the Lao PDR territory for managing of major waste types containing PBDEs (WEEE plastic, polymers from transport, polymers from construction) or to manage the wastes through regional cooperation.			
Activities	Implementing /Partner Agency	Time frame (No. of Years)	Performance Indicators
<p>3.4-1 <i>Assessment of setting up recycling facilities for different waste categories.</i></p> <p>3.4-2 <i>Assessment of the destruction and energy recovery of PBDE containing wastes in existing cement kilns.</i></p> <p>3.4-3 <i>Assessment of the use or construction of incinerators or other thermal destruction.</i></p> <p>3.4-4 <i>Assessment of disposal of wastes in engineered landfills and assessment of possible future landfilling mining of these materials.</i></p>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	<p>Medium term 2-5 years</p> <p>100,000 \$US</p>	A report on the assessment of different waste disposal facilities for PBDE and HBCD containing materials
Action Plan 3.5 Environmental Sound Management (ESM) of brominated POP containing wastes*			
3.5-x All activities for ESD	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Long term 5-10 years	
Objective 4: Capacity building of various stakeholders to control and manage PBDE containing articles and wastes.			
Action Plan 4.1 Strengthen the capacities of the environment authorities’ dealing with the EEE/WEEE and end of life vehicle (including inventory) at the national level in respect to pollutants (PBDEs, HBCD, heavy metals, waste oils, CFCs, HCFCs and others) and resources in these wastes.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>4.1-1 <i>Compilation of available information materials and best practice cases.</i></p> <p>4.1-2 <i>Training of the environment authorities’ dealing with the EEE/WEEE and end of life vehicle (including inventory) at the national level in respect to pollutants.</i></p> <p>4.1-3 <i>Conducting necessary capacity building for central and regional relevant staff to investigate the stockpiles and potentially contaminated sites.</i></p> <p>4.1-4 <i>Training of the custom authorities to enhance the traceability of the PBDEs containing articles within education on WEEE and scrap vehicle imports considering also Basel Convention guidelines..</i></p>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	<p>Medium term 2 to 5 years</p> <p>100,000 \$US</p>	<p>A compilation of the best practices in dealing with EEE/WEE</p> <p>Training materials and trained trainors for capacity building of environment authorities at the national level on management of EEE/WEEE and end of life vehicles.</p> <p>Training materials and trained trainors for capacity building of central and regional relevant staff on pollutants, investigation of stockpiles and contaminated sites</p> <p>Training materials and trained</p>

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			trainors for capacity building of custom authorities on imports containing PBDEs
Action Plan 4.2. Development of analytical capacity for investigating and assessing PBDEs contamination and content, when there is such need.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
4.2-1 <i>Assessment of the need for development of monitoring capacity for PBDE and HBCD or the use of (regional)cooperations.</i> 4.2-2 <i>Possible development of the monitoring capacity.</i>	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Medium term 2-5 years 300,000 \$US	A report on the assessment of the need for development of capacity to monitor PBDE and HBCD
Action Plan 4.3 Monitoring and assessment of contaminated sites, in particular e-waste treatment sites using open burning			
4.3-x All activities	MoIC/ MoNRE, MPWT, MPI, MoF, private sector	Medium term 2-5 years Estimate of cost will be done after more information are obtained	A report on the assessment of contaminated sites in particular e-waste treatment using open burning

3.2.2.4: PFOS, PFOSF AND RELATED SUBSTANCES

Goals: Eliminate the use and manage materials containing PFOS, PFOSF and related substances

Overall Objectives: Phase out of PFOS uses and management of stockpiles and contaminated sites

Key problems

- Information on total amount of PFOS use and PFOS and related substances containing materials is very weak;
- Currently there is no regulatory frame for the use, release and management of PFOS and related substances;
- Information and assessment of contaminated sites including ground and related drinking water contamination from former fire-fighting foam use and other uses does not exist;
- Information on the use of alternatives to PFOS in the different application and their appropriate assessment is weak.

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Table 3.2.2.4. Action plans addressing PFOS

Objective 1: Development of policy and regulatory frame for PFOS and related substances.			
Action Plan 1.1 Develop a regulatory frame to stop the use of PFOS and related substances and listing of exemptions.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>1.1-1 <i>Ban the use of PFOS and related substances with possible exemptions and define the respective time frame.</i></p> <p>1.1-2 <i>Incorporate PFOS control and elimination into national environment protection plan.</i></p> <p>1.1-3 <i>Assessment of PFOS use in plating industry, aviation hydraulic fluids and other exempted uses and the need for listing of exemptions.</i></p> <p>1.1-4 <i>Assess legislation for low POPs content in articles and drinking water levels and other relevant limits in other countries and decide on possible inclusion in national regulation.</i></p>	<p>MoIC/ MoNRE, MPWT, MPI, MoF, private sector</p>	<p>Short term 1 year</p> <p>15,000 \$US</p>	<p>A report on the assessment of PFOS use in plating industry aviation fluids and other exempted uses.</p> <p>A report on the assessment of incorporating PFOS in the national environmental protection plan</p> <p>A report on legislation or standards for articles containing low levels of PFOS in other countries</p>
Objective 2: Improve inventories of PFOS containing articles and products.			
Action Plan 2.1 Improvement of PFOS and related substances inventory			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>2.1-1 <i>Detailed inventory of PFOS currently present in fire-fighting foams and aviation hydraulic fluid and stock.</i></p> <p>2.1-2 <i>Detailed inventory of PFOS in synthetic carpets (produced before 2002 & recently produced).</i></p> <p>2.1-3 <i>Inventory of other uses if their relevance in the region has been demonstrated (considering also other inventory findings in the region).</i></p>	<p>MoNRE/ MoIC, MoF</p>	<p>Short term (1-2 years)</p> <p>10,000 \$US</p>	<p>Detailed inventory of PFOS in fire fighting foams, carpets and other uses</p>

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Objective 3: Environmentally sound management (ESM) of PFOS containing products and wastes			
Action Plan 3.1 Apply BAT/BEP and ensure ESM in the end of life in case of using PFOS in an exempted uses.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
3.1-1 <i>Assessment of BAT/BEP for managing of PFOS in case of using PFOS in an exempted use</i> 3.1-2 <i>Awareness of stakeholders on the importance to control PFOS releases and wastes</i> 3.1-3 <i>Implementation of BAT/BEP in the exempted uses (in case of exemption needed)</i>	MoIC/ MoNRE, MoST, MPWT, private sector	Short term; 1-2 years Estimated Cost undetermined yet, more information is needed.	Guidelines for ESM of PFOS and BAT/BEP for PFOS with exempted use
Action Plan 3.2 Assessment of the possibilities and feasibility in to destroy or dispose PFOS containing wastes and disposal.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
3.2-1 <i>Assessment of the destruction of PFOS containing wastes in existing cement kilns.</i> 3.2-2 <i>Assessment of the use of incinerators or other thermal destruction technologies.</i> 3.2-3 <i>Critical assessment and possible restriction of landfilling of PFOS containing wastes (considering the high persistence and water solubility of the compounds).</i>	MoIC/ MoNRE, MoST, MPWT, private sector		A report on environmentally sound methods of destruction of PFOS
Action Plan 3.3 Disposal of PFOS containing wastes in an environmentally sound manner			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
All Activities	MoIC/ MoNRE, MoST, MPWT, private sector	Medium term 2-5 years/ Estimated Cost undetermined yet, more information is needed.	Articles containing PFOS disposed in an environmentally sound manner A report on the disposal of articles containing PFOS

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Objective 4. Capacity building and awareness on PFOS and related substances.			
Action Plan 4.1 Development of information and awareness raising materials on PFOS and related substances.			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
4.1-1 <i>Compilation and development of information and awareness materials for individual stakeholder groups (policy makers and public authorities; potential users and the consumers)</i> 4.1-2 <i>Dissemination of information to the stakeholder groups</i>	MoIC, MoNRE/ MoF, MoST	Short term 1-2 years 20,000 \$US	Training materials for awareness on PFOS for different stakeholder groups A report on seminars conducted for stakeholder groups
Action Plan 4.2 Assessment of alternatives to PFOS and promotion of the most sustainable alternatives.			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
4.2-1 <i>Information on alternatives to PFOS and related substances in the current and former applications are compiled (see POPRC documents) and assessed.</i> 4.2-2 <i>Promotions of sustainable alternatives by incentives.</i>	MoIC, MoNRE/ MoF, MoST	Short term 1-2 years 20,000 \$US	List of alternatives for uses of PFOS in different articles List of possible incentives for use of alternatives for PFOS
Action Plan 4.3 Assessment of the need and options of establishing analytical capacity and possibly development of capacity or establish cooperation for assessment.			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
4.3-1 <i>Assessment of the need and option to establish PFOS and related substance analysis.</i> 4.3-2 <i>Assessment of alternative options to generate data on PFOS and related substances in the country, including research cooperation and regional projects.</i>	MoIC, MoNRE/ MoF, MoST	Short term 1-2 years 10,000 \$US 500,000 \$US for establishment of analytical capability	Analytical capability for analysis of PFOS in different articles established including analytical equipment, methods of analysis and trained personnel

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Objective 5: Assessment of PFOS contaminated sites and securing and possibly remediation of sites.			
Action Plan 5.1 Assessment of PFOS contaminated sites			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>5.1-1 <i>Improvement of inventory of potentially PFOS contaminated sites.</i></p> <p>5.1-2 <i>Compilation of information on PFOS contaminated sites in other countries (assessment strategies, control, remediation)</i></p>	MoNRE/ MoIC, MoF, Private sector	Medium term 2-5 years/ 100,000 \$US * *Indicative only, may change depending on the number of sites	<p>Inventory of PFOS contaminated sites</p> <p>A report on the assessment and remediation of PFOS contaminated sites in other countries</p>
Action Plan 5.2 Control of PFOS contaminated sites.			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>5.2-1 <i>Stop PFOS exposure of population via drinking water.</i></p> <p>5.2-2 <i>Stop exposure of population from contaminated food (fish or food animals or plants) from impacted areas.</i></p>	MoNRE/ MoIC, MoF, Private sector	Medium term 2-5 years/ Millions of \$US ** ** Indicative only, may change after site inventory and assessment	A report on controls to protect the population from exposure to PFOS
Action Plan 5.3 Remediation of PFOS contaminated sites.			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost	Performance Indicators
<p>5.3-1 <i>Compilation of information of remediation of PFOS contaminated sites.</i></p> <p>5.3-1 <i>Assessment of the need of remediation of PFOS contaminated sites.</i></p> <p>5.3-1 <i>Remediation of PFOS contaminated sites based on ranking of exposure risk.</i></p>	MoNRE/ MoIC, MoF, Private sector	Long term 5-10 years/ Millions of \$US ** ** Indicative only, may change after site inventory and assessment	A report on remediation of PFOS contaminated sites

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3.2.2.5. ACTION PLANS ADDRESSING UNINTENTIONALLY PRODUCED POPS

Goals: Reduce and eliminate the release of unintentionally produced POPs

Overall Objectives: Proper management of the release of unintentionally produced POPs, through BAT/BEP implementation

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.

Table 3.2.2.5. Action Plans for Unintentionally Produced POPs (UPOPs)

Objective 1: Revise or develop legislation related to the sound management of unintentionally produced POPs.			
Action Plan 1.1 Undertake law and policy assessment related to the management of unintentionally produced POPs			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
1.1-1 <i>Review existing laws and legal instruments related to industrial releases in the country and 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</i>	MoNRE/ MoD, MoJ , local authorities,	Short term 1-2 years 10,000 \$US	A report on the review of existing legal instruments pertaining to UPOPs including gaps to develop a law on the management of UPOPs.

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<i>unintentionally produced POPs.</i>			
Action Plan 1.2 Amend existing laws, or develop new law(s) where necessary related to the reduction of unintentionally produced POPs.			
Restriction of open burning			
(update) Regulation for landfills			
Regulations of operation of incinerators			
BAT/BEP regulation for emitting industries			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>1.2-1 <i>Form legal team on the management of unintentionally produced POPs Assessment of other country approaches for regulations and enforcement on open burning, landfills, incinerators and other emitting industries.</i></p> <p>1.2-2 <i>Conduct a training course on legislation for the management of unintentionally produced POPs Amend the existing laws, or develop new regulations on open burning, landfills, incinerators and BAT/BEP for other relevant industries.</i></p> <p>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></p> <p>1.2-4 <i>Disseminate, monitor, assess and report realization of the updated regulations or policies.</i></p>	<p>MoNRE/ MEM, MoJ ,local authorities, private sectors</p>	<p>Short term 1-2 years/ 20,000 \$US</p>	<p>A report on the review of existing legal instruments pertaining to UPOPs in other countries, including regulations and enforcement on open burning , landfills, incinerators and other emissions</p> <p>A new legal instrument for management of UPOPs in the country</p> <p>Training materials and trained personnel on the new legal instrument for management of UPOPs.</p> <p>A report on seminars conducted on the new legal instrument for management of UPOPs for different stakeholder groups.</p> <p>A report on the dissemination of the new legal instrument to different stakeholders including the general public</p>

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Action Plan 1.3 Integrate the reduction of unintentionally produced POPs in general BAT/ BEP (including CP) of related industries (SC Annex 2 and 3 facilities)			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>1.3-1 <i>Form technical team for development of the national guidelines for BAT/BEP and integrated pollution prevention for related industries and incinerators considering unintentional POPs and other relevant releases.</i></p> <p>1.3-2 <i>Prioritize relevant unintentionally produced POPs release source categories and industries.</i></p> <p>1.3-3 <i>Study the available relevant guidance documents on BAT & BEP approved by COPs and the BAT Reference documents from the EU and other relevant documents.</i></p> <p>1.3-4 <i>Develop national guidelines on BAT/BEP for relevant industries, including POPs and other relevant pollutants (integrated approach).</i></p> <p>1.3-5 <i>Introduce, disseminate, monitor, assess and report the implementation of the developed national BAT/BEP guidelines to all stakeholders (through meetings or workshops).</i></p>	<p>MoNRE/ MEM, MIC, MoH , key stakeholders</p>	<p>Medium term 2-5 years/ 250,000 \$US</p>	<p>A report on the review of existing guidelines on BAT/BEP for UPOPs release in other countries.</p> <p>A report on the BAT/BEP for priority sources of UPOPs emissions in the country</p> <p>National Guidelines for BAT/BEP and integrated pollution prevention for UPOPs and other releases</p>
Objective2: Strengthen capacity and raise awareness of the public and policy makers on pollution releases including unintentionally produced POPs.			
Action Plan 2.1 Strengthen and develop the capacity to reduce releases related to unintentionally POPs			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>2.1-1 <i>Develop capacity to reduce unintentionally produced POPs.</i></p> <p>2.1-2 <i>Develop training material on awareness of unintentionally produced POPs.</i></p> <p>2.1-3 <i>Provide appropriate information on unintentionally produced POPs for decision makers.</i></p> <p>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></p>	<p>Mo MoD,MoIT,/M EM, MoH, key stakeholders NRE</p>	<p>36 Months</p>	<p>Training materials and trained trainers on awareness on UPOPs, on reduction of UPOPs and on the new legal instrument to reduce UPOPs for training of decision makers.</p> <p>A report on the activities to strengthen the capacity of institutional officers and concerned personnel in the private sector to implement the new legal instrument for management of UPOPs</p>

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			and other releases.
Action Plan 2.2 Develop public awareness raising program on health and environmental impact affected by unintentionally produced POPs for the different stakeholders.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>2.2-1 <i>Develop awareness raising program on releases from open burning and from industrial emissions including unintentional POPs.</i></p> <p>2.2-2 <i>Develop information material for:</i></p> <ul style="list-style-type: none"> - <i>public awareness raising on unintentionally produced POPs//PTS (with emphasis on open waste burning and cooking);</i> - <i>information and awareness materials for related industries and operators of incinerators.</i> <p>2.2-3 <i>Organize awareness raising campaigns on unintentionally produced POPs through mass media and direct actions to the public and vulnerable community on open burning of wastes and household cooking in using improper fuel and the use of improved stoves.</i></p>	<p>MoNRE/ MoIC, MEM, MoH, key stakeholders</p>	<p>36 Months</p>	<p>Information materials and trained trainers on the awareness on UPOPs, release of UPOPs from open burning and from industrial emissions and the new legal instrument to reduce UPOPs for training of households and operators of incinerators, dumpsites and landfills , power plants, and other personnel involved in releasing UPOPs.</p> <p>A report on awareness raising campaigns on UPOPs through media and direct actions to the communities.</p>
Objective 3: Improve waste management practices and prevent uncontrolled burning of wastes			
Action Plan 3.1 Improve landfill management			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>3.1-1 <i>Develop technical guidances for landfills considering already available technical guidances and related capacity building.</i></p> <p>3.1-2 <i>Develop improved landfill management program including trainings.</i></p> <p>3.1-3 <i>Develop improved landfill management program.</i></p> <p>3.1-4 <i>Design and implement municipal and provincial landfills management pilot project.</i></p>	<p>MoNRE, selected local authorities/ MoD, MPWT, MoH, MoIC, key stakeholders</p>	<p>Short and medium term 1-5 years (General waste management budget)</p>	<p>Technical manuals for improvement of landfill management to prevent the release of UPOPs.</p> <p>A report on the implementation of improved municipal and provincial landfill management pilot project.</p>

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Action Plan 3.2. Introduce and promote sound management of waste including the waste hierarchy and 3R principles			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>3.2-1 <i>Establish technical team for sound waste management.</i></p> <p>3.2-2 <i>Study available guidance documents on sound waste management practices from UNITAR-UNEO, ISWA, the EU and materials from the Basel and the Stockholm Conventions.</i></p> <p>3.2-3 <i>Develop a waste catalogue and waste management guidelines suitable for Lao PDR focusing on implementation of the waste hierarchy and 3-R principles (considering the activities of Japan).</i></p> <p>3.2-4 <i>Provide country-wide training on waste management guidelines implementation involving local authorities.</i></p> <p>3.2-5 <i>Design and implement pilot project on environmentally sound waste management.</i></p>	<p>MoNRE, selected local authorities/ MPWT, MoD, MoH, Key stakeholders</p>	<p>Short and long term 1-10 years/ Waste management budget</p>	<p>A report on the study of available guidance documents on sound management practices from established agencies that deal with waste management</p> <p>Environmentally sound Waste Management Guidelines that is suitable for Lao PDR</p> <p>Trained local authorities on the environmentally sound Waste Management Guidelines</p> <p>A report on the Implementation of a pilot project on the environmentally sound waste management</p>

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Action Plan 3.3 Introduce and promote implementation of BAT & BEP in existing waste incineration plants (municipal, hospital and industrial wastes)			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>3.3-1 <i>Establish technical team associated with the field of thermal waste treatment.</i></p> <p>3.3-2 <i>Compilation of information material on BAT/BEP on incineration and other thermal waste treatment and associated.</i></p> <p><i>Undertake assessment of applicability of BAT and BEP 3.3-3 in existing waste incineration plants including socio-economic assessment, cost- benefits and/or cost-effectiveness analysis.</i></p> <p>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></p> <p>3.3-5 <i>Update the national guidelines on BAT/BEP if necessary</i></p> <p>3.3-6 <i>Organize training for responsible institutional officers and authorities and for plant operators on BAT/BEP, including CP</i></p>	<p>MoNRE/ MPWT, MoD, MIC, MoH, CP Center</p>	<p>18 Months, Medium term 2-5 years/ Waste management budget</p>	<p>A compilation of the BAT/BEP on incineration and other thermal waste treatment</p> <p>A report on the assessment of the applicable BAT/BEP on the existing waste incineration plant including cost effectiveness and social impacts</p> <p>A report on the implementation of a pilot project on the application of BAT/BEP on a selected existing waste incineration facility.</p> <p>A report on the trainings for institutional officers and authorities of plant operators on BAT/BEP</p>
Action Plan 3.4 Evaluate the possibility of hazardous waste co-incineration in cement plant under BAT& BEP conditions mercury, GHG, ODS)			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>3.4-1 <i>Establish technical team consisting of plant owners and relevant state authorities.</i></p> <p>3.4-2 <i>Evaluate the possibilities of alternative fuel use (used tires, PCBs contaminated oils etc.) in the newly constructed cement plant.</i></p> <p>3.4-3 <i>Perform cost-benefit analysis of hazardous waste co-incineration.</i></p> <p>3.4-4 <i>Identify necessary additional measures for environmentally sound hazardous waste co-incineration.</i></p>	<p>MoIT, selected cement plant/ MoNRE, MoIT,PoH, MPWT, key stakeholders</p>	<p>Short term 1-2 years/ 100,000 \$US</p>	<p>A report on the evaluation of the use of alternative fuels such as used tires, PCB contaminated oil , etc in a newly constructed cement plant including cost benefit analysis</p> <p>A report on identification of additional measures for environmentally sound hazardous waste co-incineration</p>

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Objective 4: Integrate the unintentional POPs inventory in a general emission inventory and assess the options of development of a Pollution Release Transfer Register			
Action Plan 4.1 Assessment and potential integration of emission inventories in one database (unintentional POPs, mercury, GHG, ODS)			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>4.1-1 <i>Assessment of the options of a common emission inventories in one database (unintentional POPs, mercury, GHG, ODS)including the option of developing a Pollution Release Transfer Register (PRTR)</i></p> <p>4.1-2 <i>Identify support tools and equipment for an integrated inventory database.</i></p> <p>4.1-3 <i>Assess other countries experience.</i></p> <p>4.1-4 <i>Design a national integrated database on industrial and other releases including unintentionally produced POPs</i></p> <p>4.1-5 <i>Update unintentionally produced POPs release inventory at national level for next reporting period and submit results and disseminate final result of unintentionally produced POPs release inventory</i></p> <p>4.1-6 <i>Evaluate the situation of POPs reduction and elimination within general control and reduction of industrial and other emissions</i></p>	<p>MoNRE/ MoD, MPI (National Statistic Bureau), MoH, Local authorities, Key stakeholders</p>	<p>Medium term 2-5 years</p> <p>100,000 \$US</p> <p>Here other activities such as e.g. mercury inventory and update GHG inventory should cover much of the activity and funding</p>	<p>A report on the assessment of the option to have a common emission inventory for UPOPs, mercury, GHG, ODS in one data base</p> <p>A report on the design of a national integrated database on industrial and other releases including UPOPs</p> <p>An updated inventory of UPOPs at a national level</p>
Objective 5: Implementation of guidelines on Best Available Techniques (BAT) and Best Environmental Practice (BEP) to prioritized sources of unintentionally produced POPs			
Action Plan 5.1 Promote the use of general BAT/BEP in industries (including POPs)and establishment of BAT/BEP Fund			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>5.1-1 <i>Create the national technical working group on general BAT/BEP and integrated pollution prevention and control (IPPC) in close collaboration with key stakeholders: MoNRE, NREI, MoIT, the National clean production (CP) Center, the SME Office and National University; update the list of industriesand select priority industries to use BAT/BEP, starting with CP.</i></p> <p>5.1-2 <i>Design, test, conduct, assess and improve BAT/BEP(initiating CP) training material related to UPOPs.</i></p>	<p>MIT, and SMEs/ MONRE, Local authorities, Key stakeholders</p>	<p>Medium term 2-5 years*</p> <p>Budget will be calculated after selecting individual industries and BAT/BEP projects</p>	<p>An updated list of industries and select priority industries to use general BAT/BEP and integrated pollution prevention and control</p> <p>Training materials on the design, testing, and implementation of improved BAT/BEP related to UPOPs</p>

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<p>5.1-3 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, including CP in SMEs</p> <p>5.1-4 Establish BAT/BEP Fund on window under the Environment Protection Fund in assisting SMEs on the use of BAT/BEP, including CP.</p> <p>5.1-5 Monitor, assess, report and improve the performance of the established BAT/BEP Fund.</p> <p>5.1-6 Monitor, assess, report and improve performance of industries 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.</p>			<p>Cost analysis and cost effectiveness analysis on BAT/BEP related to UPOPs and its links to climate change</p> <p>A BAT/BEP fund established to assist SMEs on the use of BAT/BEP and a system of monitoring and assessment of the performance of the Fund.</p> <p>A report on the performance of industries in reducing UPOPs release with the use of improved BAT/BEP practices</p>
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3.2.2.6. CROSSCUTTING ISSUES AND MANAGEMENT OF NIP IMPLEMENTATION

Goals: Support to Successful Implementation of the NIP

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.

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Table 3.2.2.6. Action plans for crosscutting issues in management of the NIP

Objective 1: Strengthening the existing mechanism for efficient and effective management of NIP implementation.			
Action Plan 1.1 Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation.			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>1.1-1 <i>Coordinate policy development on sound management of chemicals including POPs and PTS (Persistent Toxic Substance).</i></p> <p>1.1-2 <i>Strengthen the administration management in POPs project implementation.</i></p> <p>1.1-3 <i>Assist and support stakeholders in development of project proposal for funding.</i></p> <p>1.1-4 <i>Communicate with stakeholders for NIP implementation.</i></p> <p>1.1-5 <i>Communicate with donor agencies for assisting NIP implementation.</i></p> <p>1.1-6 <i>Undertake NIP monitoring, evaluation, reporting, and updating.</i></p>	<p>MoNRE/ MEM, MoH, MAF, MoIT, MoD and key stakeholders</p>	<p>36 Months</p>	<p>A coordination policy for sound management of chemicals including POPs and PTS</p> <p>Trained personnel in administration management, in providing assistance to stakeholders in development of project proposals, in communication with stakeholders and donors.</p> <p>Trained personnel in NIP monitoring, evaluation, reporting and updating the NIP</p>
Action Plan 1.2 Establish and design the National Databases for chemicals, releases (PRTR), wastes and contaminated sites, including POPs for centralization and exchanging of information			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>1.2-1 <i>Identify the scope of a National Chemical Database and design for harmonious integration of information and dissemination related to chemical management</i></p> <p>1.2-2 <i>Centralize release inventories (GHG, POPs, mercury, ODS and other) in one database (pollution release transfer register).</i></p> <p>1.2-3 <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></p> <p>1.2-4 <i>Develop plan and apply chemicals data</i></p>	<p>MoNRE/ MEM, MoH, MAF, Stakeholder</p>	<p>36 Months</p>	<p>Defined scope and design of a National Chemical Database.</p> <p>Centralized data on inventories of release of chemicals including POPs.</p> <p>Trained personnel from relevant institutions involved in chemical management in using the National Chemical Data</p>

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<p><i>entry including POPs information exchange strategies and implementation of action plans regarding the Improvement and Updating of The National Chemical Database</i></p> <p><i>1.2-5 Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally</i></p> <p><i>1.2-6 Development of contaminated site database (POPs, heavy metals, PAHs, oil).</i></p>			Base.
<p>Action Plan 1.3 Develop Chemicals and Substances Management Legislation (Refer to Inter-Organization Programme for the Sound Management of Chemicals)</p>			
Activities	Implementing / Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p><i>1.3-1 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></p> <p><i>1.3-2 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></p> <p><i>1.3-3 Formulate “Hazardous Chemicals and Substances Management Decree or Law”; Conduct consultation workshops on the “Hazardous Chemicals and Substances Management Decree or Law Draft”.</i></p> <p><i>1.3-4 Finalize and submit the final draft of “Hazardous Chemicals and Substances Management Decree or Law” for approval .</i></p> <p><i>1.3-5 Publish and disseminate the approved legislation at the national level. Monitor and assess the implementation of this approved legislation.</i></p>	<p>MoNRE/ MoJ, MoH, MAF, MoIT, MoD, and other key stakeholders</p>	<p>36 months</p>	<p>A report of the TWG on existing regulations on chemicals and hazardous substances management.</p> <p>A report of the TWG on the formulation (design, methodology, appropriate personnel and training needs) of the Hazardous Chemicals and Substances Management Decree Law).</p> <p>Trained personnel to formulate the Law.</p> <p>Draft of formulated Hazardous Chemicals and Substances Management Law.</p> <p>A report on public consultation on the draft of the proposed Law.</p> <p>Finalized version of the proposed Law for submission for legislation</p>

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Action Plan 1.4 Promote the conduct of chemical engineering course at targeted academic institutions			
Activities	Implementing/ Partner Agency	Time frame (No. of Yrs)/ Estimated Cost)	Performance Indicators
<p>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></p> <p>1.4-2 <i>Design, test, conduct, monitors, assess, report and improve the chemical engineering course.</i></p> <p>1.4-3 <i>Train trainers on chemical engineering course delivery.</i></p> <p>1.4-4 <i>Monitor, assess and report the efficiency of chemical engineering course being delivered.</i></p> <p>1.4-5 <i>Appropriate replication of chemical engineering course at other academic institutions as appropriate.</i></p>	<p>NUOL/ MoNRE, Engineering Faculty, other key stakeholders</p>	<p>36 Months</p>	<p>A report of the TWG on the design of chemical engineering curriculum at selected academic institutions to improve chemical management</p> <p>Trained trainers to deliver the chemical engineering courses</p> <p>A report on the efficiency of the chemical engineering courses in achieving their objectives</p>

3.3 REQUIREMENTS FOR THE IMPLEMENTATION OF NIP 2016

Lao PDR is among the least developed countries. Effective management of POPs in a sound environmental manner can be done only 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 financial support from external sources to augment the in-kind and cash contribution from the Government of Lao PDR. This financial requirement will support the costs for administration, materials, equipment, operation, and project management.

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 onsite trainings.

In order to improve the capability of Lao PDR to implement its program for the Stockholm Convention, the government proposed priority projects for capacity building and for reduction and elimination of POPs (Appendix 2)

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3.3.1 RESOURCE REQUIREMENTS

For the implementation of untouched activities in the NIP 2010, the total budget needed is estimated at US Dollars 13,585,000 (Table 3.3.1a) excluding the budget for disposal of obsolete pesticides and PCBs. In accordance with Article 13 of the Convention, alternate sources of funding will be considered. Project proposals for the priority action plans in the NIP 2010 have been prepared. (Appendix 2: Project Profiles for possible technical and financial assistance).

Table 3.3.1. Approximate budget for implementation of action plans in the NIP 2010

Items	Approximate Cost, US Dollars
Management of POPs pesticides	2,305,000
Management of PCBs	2,230,000
Management of Unintentionally Produced POPs	6,600,000
Coordination of activities for NIP implementation	2,450,000
Total Budget	13,585,000

For the implementation of some action plans listed for PBDEs and PFOS in the NIP 2016, an initial estimate of additional 679,000 US Dollars and 690,000 US Dollars would be required respectively. The project profiles for the management of these two newly listed POPs will still have to be prepared. (Note: the figures were culled from the action plan tables)

The Donor input will ideally be provided through the Ministry of Natural Resources and Environment, 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.

The Government of Lao PDR through the Ministry of Natural Resources and Environment, the Ministry of Agriculture and Forestry, Ministry of Industry and Trade, Ministry of Energy and Mines, and other relevant Ministries will provide the following inputs for the effective implementation of the NIP:

1. Direct consultations through the technical departments and national consultants
2. Additional technical staff at all levels as may be required
3. Contribution up to 5 percent (ceiling point) of total required budget in cash and/or in-kind such as office accommodation, stores, infrastructure, salary and wages of the staff/scientists and other miscellaneous items

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3.3.2 TIMETABLE FOR IMPLEMENTATION OF NIP, SECOND FIVE YEARS (2016-2020)

Table 3.3.2 shows a tentative schedule developed for the implementation of the updated NIP. This schedule is subject to change later when more concrete work plan are discussed among the steering committee.

Table 3.3.2. Tentative schedule of the implementation of NIP 2015

STAGE	2016	2017	2018	2019	2020
I. Priority Projects Proposal For Funding					
Develop new NIP project profiles and submit to GEF and other donor institutions					
II. NIP Project Development Phase					
1. Set-up the project implementation framework					
2. NIP staff selection					
3. Site selection for execution of the project					
II. NIP Project Implementation Phase					
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					

APPENDICES:

APPENDIX 1. STRATEGY AND ACTION PLANS FOR THE IMPLEMENTATION OF THE STOCKHOLM CONVENTION LINKED TO THE IMPROVEMENT OF THE GENERAL CHEMICAL WASTE MANAGEMENT

1. Strategy: Identifying, assessment and mitigation of the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs

Considering the GEF 6 strategies and GEF 2020 POPs, the management of the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs in a sound technical manner to ensure safe environment and public health, should be linked to the management of other hazardous chemicals (mercury, ODS and others Persistent Toxic Substances (PTS):

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 and other hazardous chemicals;
 - 3- Develop identification process for stockpiles, articles in use and wastes consisting of, containing and contaminated with POPs and other hazardous chemicals;
 - 4- Conduct an identification and assessment of stockpiles, articles in use and wastes consisting of, containing and contaminated with POPs and other hazardous chemicals;
 - 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 and other hazardous chemicals;
 - 6- Conduct the collection, repackaging, temporary storage and transportation of articles in use and waste consisting of, containing and contaminated with POPs and other hazardous chemicals 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 and other hazardous chemicals 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, PTS and other hazardous chemicals in a safe and sound environmental manner.
- 2 Strategy: Improvement of POPs information exchange

The improvement of the POPs information and information exchange within the national data system on chemicals 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. The improvement in the data collection and

storage of POPs data will result in the improvement of the infrastructure and operation for collection of data on other chemicals.

Actions:

1. Establish a process for information storage and access of data on POPs related issues in Lao PDR. This information storage should be within general database of chemicals and wastes. 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 (including POPs), Waste and Resource Information Centre under MONRE (contact agency for the Stockholm Convention) to accommodate all database systems (chemicals, releases/PRTR, wastes/resources). The information storage should allow the international (including 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 this 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 and other hazardous chemical exposure and reduction and elimination issues to stakeholders and interest groups, and provide accurate POPs information through mass media.

3 Strategy: Promote the conduct of POPs and Persistent Toxic Substances (PTS) research

For least developing countries like Lao PDR, capacity to assess POPs and other Persistent Toxic Substances (PTS) hazards on human health and the environment is limited because of the lack of basic scientific information and data related with POPs/PTS 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 and PTS; 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.

APPENDIX 2. PRIORITY PROJECTS FOR CAPACITY BUILDING AND FOR REDUCTION AND ELIMINATION OF POPS

A. 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

B. 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

C. Priority projects for PBDEs and HBCD containing material management

Project C1: Develop legal instruments or technical guidelines for managing PBDEs and HBCD containing material;

Project C2: Comprehensive inventory of PBDEs and HBCD containing material including relating hot spots and contaminated sites;

Project C3: Legislation related to sound management of PBDEs and HBCD containing waste (including import and dispose of old electric/electronic equipment, E-waste and old/out-of-use vehicles);

Project C4: Public awareness raising on PBDEs and HBCD

D. Priority projects for elimination of use and management of materials containing PFOS, PFOSF and related substances

Project D1: Develop legislation for managing materials containing PFOS, PFOSF and related substances

Project D2: Comprehensive inventory of PFOS and PFOSF containing material including hotspots and contaminated sites;

Project D3: Sound management of import and use of PFOS containing materials such as firefighting forms and hydraulic oils;

Project D4: Legislation and sound management of old hydraulic oil waste (disposal and treatment); and

Project D5: Public awareness raising on PFOS and PFOSF; and

E. Priority projects for the management of unintentionally produced POPs

Project E1: Legislation related to sound management of unintentionally produced POPs;

Project E2: Research on Health Risk Management of Unintentionally POPs Specifically on the Dioxin/Furan from Agent Orange and Industrial sectors and waste incinerators plants;

Project E3: Institutional strengthening and capacity building for Environmentally Sound Management of unintentionally produced POPs;

Project E4: Public awareness raising on unintentionally produced POPs;

Project E5: Promotion of sound waste management practices;

Project E6: Promotion of controlled landfills and prevention of uncontrolled burning of waste;

Project E7: Introduction and promotion of BAT & BEP in existing waste incineration plants;

Project E8: Application of BAT & BEP for unintentionally produced POPs operational release sources;

Project E9: Promotion the use of BAT/BEP, including CP in the SMEs;

Project E10: Improvement in medical waste management practices;

Project E11: Inventory of unintentionally produced POPs releases; and

Project E12: Inventory of dioxin and furan hot spots, raising public awareness to protect public from exposure and prioritization of contaminated sites;

F. Priority projects for the management of POPs contaminated sites

Project F1: Formulation of regulatory framework for managing POPs contaminated sites;

Project F2: Establish data base of all existing and potential POPs contaminated sites at nationwide;

Project F3: Capacity assessment for POPs contaminated sites assessment and clean-up program;

Project F4: Conducting remediation studies of POPs chemical contaminated sites; and

Project F5: Carry out clean-up activity of POPs contaminates sites in pilot scale;

Project F6: Public awareness raising on the danger of POPs contaminated sites and possible method to guide public to avoid health impact from the sites.

G. Management of NIP implementation

Project G1: Strengthening Capacity of POPs National Coordinating Unit for continuing the NIP Coordination and Implementation;

Project G2: Establish and design a Centralized National Chemicals Database including POPs for Effective Exchange of Information;

Project G3: Chemical Management Law

Project G4: Capacity Building of targeted academic institution on the delivery of chemical engineering course

APPENDIX 3: PROJECT PROFILES FOR POSSIBLE TECHNICAL AND FINANCIAL ASSISTANCE

A. Project Profiles for Reduction and Elimination of POPs Pesticides

1. Project Profile A1: Assessment of Existing Laws

1- Project Title	Assessment of existing laws and other technical standards for amendment, and promotion of effective law enforcement
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE, MoH, MoJ, and other key stakeholders
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	A sound legal basis is a must for sound pesticide management.
9- Project Goal	Eliminate the import and use of illegal pesticides including POPs.
10- Objectives	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)
11- Beneficiaries	MAF and other key stakeholders at the national level
12- Activities	<ul style="list-style-type: none"> ➤ Formulate a team of legal and environmental specialists to review existing legislation, and to improve legal instruments related to pesticides issues; ➤ Update existing legislation or develop new legal instruments for pesticide management, including POPs; ➤ Develop rules and regulations for implementing the pesticides management legislation; ➤ Develop technical guidelines on pesticides monitoring and inspection, including POPs.
13- Estimated Cost	US\$ 250,000
14- Potential Donors	Government of the Lao PDR 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB

15- Project Extent	Vientiane Capital City and provincial-municipality areas.
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2. Project Profile A2: Institutional Capacity Building

1- Project Title	Strengthening capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.
2- Implementing Agency	MAF
3-Co-operational Agency	MONRE, MoH, MIC, MoF
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	Implementation of the NIP on a wider scale will be possible following improvement of capacity and functioning of the relevant stakeholders in law enforcement.
8- Project Justification	Adequate law enforcement is necessary before removal of unwanted obsolete pesticides stocks can occur in Lao PDR.
9- Project Goal	Eliminate the import and use of obsolete pesticides, including POPs.
10- Objectives	Create and strengthen capacity of the relevant institutions dealing with obsolete pesticides, including POP pesticide issues in Lao PDR.
11- Beneficiaries	Relevant institutions and Laotian society.
12- Activities	<ul style="list-style-type: none"> ➤ Formulate and build national TOT capacity. ➤ Develop training material on the prevention of import, trafficking and use of illegal pesticides, including POPs and other obsolete pesticides ➤ Organize and conduct training programs for officers, traders and sellers and other relevant stakeholders. ➤ Widely disseminate the contents of legal instruments on pesticides management to the officers, traders, sellers and other stakeholders.
13- Estimated Cost	US\$ 150,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Countrywide

3. Project Profile A3: Strengthening Lab Capacity

1- Project Title	Strengthening capacity in analysis of pesticides focusing on POPs.
2- Implementing Agency	MAF
3-Co-operational Agency	MONRE, MoH, MIC
4- Duration	18 months
5- Project Location	Vientiane Capital City
6- Background	Lao PDR has government laboratories and technical infrastructure for analyzing some parameters, but no capacity for analyzing POPs pesticides.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Establishment of a laboratory capable of conducting international-quality chemical analyses, including POPs pesticides.
10- Objectives	<ul style="list-style-type: none"> ➤ Improve capacity of laboratories for pesticide analyses, focusing on POPs. ➤ Strengthen institutional capacity on identification of obsolete pesticides, including POPs pesticides.
11- Beneficiaries	Laboratory to be selected (to be identified), local Laotian company
12- Activities	<ul style="list-style-type: none"> ➤ Improve capacity of laboratory staff in pesticides analysis, with focus on POPs. ➤ Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.
13- Estimated Cost	US\$ 500,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Vientiane Capital City

4. Project Profile A4: Public Awareness Raising

1- Project Title	Raising public awareness on pesticides issues, including POPs pesticides and other obsolete pesticides.
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE and Relevant Civil Society Organizations
4- Duration	24 months
5- Project Location	Vientiane Capital City (and other key Provinces)
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Improve knowledge and awareness of the dangers of POPs pesticides to decision-makers and the general public.
10- Objectives	<ul style="list-style-type: none"> ➤ The general public has a complete understanding of all issues related to pesticide use and handling. ➤ Upgrade the level of understanding of the general public for all issues related to pesticide use.
11- Beneficiaries	Farmers or users, general public, Lao society as a whole.
12- Activities	<ul style="list-style-type: none"> ➤ Formulate and undertake dissemination campaigns on pesticide hazards, and elimination of obsolete pesticides including POPs pesticides. ➤ Provide information to relevant target groups on alternative pesticides. ➤ Encourage alternative pest control measures to reduce the use of pesticides in general. ➤ Improve extension workers' capacity and expand their extension activities on pesticides issues, including obsolete pesticides and POPs
13- Estimated Cost	US\$ 150,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Country wide.

5. Project Profile A5: Awareness Raising for Decision Makers

1- Project Title	Raising awareness of policy and decision-makers on pesticides issues, including obsolete pesticides and POPs pesticides
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE, MoH, MoE
4- Duration	12 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	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
10- Objectives	<ul style="list-style-type: none"> ➤ 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. ➤ Policy makers and decision makers' knowledge is improved on pesticides issues including obsolete pesticides and POPs pesticides
11- Beneficiaries	Relevant policy makers and decision makers in a number of Government Ministries, at different levels.
12- Activities	<ul style="list-style-type: none"> ➤ Organize forums or workshops for policy- and decision-makers. ➤ Provide information on pesticides risks and hazards to policy- and decision-makers through various media (PowerPoint, video, brochures, etc.). ➤ Develop awareness campaigns that can be applied to the Provincial and District levels, as well as the National level.
13- Estimated Cost	US\$ 55,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Provinces and cities countrywide

6. Project Profile A6: Obsolete Pesticides Inventory

1- Project Title	Comprehensive inventory on obsolete pesticides including POPs pesticides.
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE, MoH, MIC, Local Authorities
4- Duration	24 months
5- Project Location	Vientiane Capital City (Other provinces and cities as necessary)
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Identify all potential sources and stockpiles of obsolete pesticides including POPs pesticides.
10- Objectives	Collect relevant information through an obsolete pesticides inventory according to UN standards.
11- Beneficiaries	MAF, MONRE, MIC, MoH and Consumers
12- Activities	<ul style="list-style-type: none"> ➤ Form inventory team for obsolete pesticides including POPs. ➤ Organize inventory training for the team and develop inventory forms, guidelines and plan execution of the inventory. ➤ Undertake comprehensive inventory survey covering the whole country. ➤ Design obsolete pesticides and POPs pesticides database format and reporting. ➤ Training technical staff on database entry. ➤ Set-up database management system with facilities and data entry. ➤ Develop database document on obsolete pesticides including POPs pesticides and publicizing.
13- Estimated Cost	US\$ 350,000
14- Potential Donors	Government of Lao PDR 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Countrywide.

7. Project Profile A7: Pesticide Monitoring

1-Project Title	Monitoring process on the trafficking of illegal pesticides, including POPs pesticides.
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE, MoH, MIC, MoF, Local Authorities
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Eliminate the import and trafficking of obsolete pesticides including POPs pesticides.
10- Objectives	<ul style="list-style-type: none"> ➤ Illegal practices related to pesticide imports, trafficking and use will be banned. ➤ Ecologically-sound measures related to pesticides management can then be fully implemented.
11- Beneficiaries	Society at large
12- Activities	<ul style="list-style-type: none"> ➤ Develop planning for monitoring of importation, trafficking and trade of illegal pesticides including POPs pesticides. ➤ Undertake regular monitoring and inspection, focusing on the likely sources and entry points of illegal pesticides, including POPs pesticides. ➤ 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.
13- Estimated Cost	US\$ 350,000
14- Potential Donors	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Countrywide

8. Project Profile A8: Temporary storage of obsolete pesticides

1-Project Title	Collection campaign for temporary storage of obsolete pesticides, including POPs pesticides, in regional storage depots prior to disposal.
2- Implementing Agency	MAF
3- Co-operational Agency	MONRE, MoH, Local Authorities
4- Duration	18 months
5- Project Location	Vientiane Capital City
6- Background	<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>
7- Project Rational	<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"> ➤ 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, ➤ Provide/receive information, study relevant information and consultation between parties with respect to such subjects; and ➤ Costs for intensive field activities need to be properly planned and managed.
8- Project Justification	Prior to collection and repackaging, a detailed intervention plan should be drawn up in order to carry out field activities in an efficient way.
9- Project Goal	Properly prepare for collection, storage and future disposal of obsolete pesticides, including POPs pesticides.
10- Objectives	<ul style="list-style-type: none"> ➤ Ecologically sound management measures of obsolete pesticides including POPs pesticides can be determined and carried out by the relevant institutions. ➤ A detailed work plan to repackage, collect and transport identified obsolete pesticides stocks is drawn up and supported by the relevant institutions.
11- Beneficiaries	General public, especially those in rural agricultural areas
12- Activities	<ul style="list-style-type: none"> ➤ Undertake an environmental impact assessment on the collection and storage of obsolete pesticides including POPs pesticides. ➤ Prepare technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete

	<p>pesticides, including POPs pesticides.</p> <ul style="list-style-type: none"> ➤ Establish or improve safe regional temporary storage facilities and area(s) for handling obsolete pesticides including POPs pesticides
13- Estimated Cost	US\$ 500,000
14- Potential Donors	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
15- Project Extent	Countrywide.

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

1-Project Title	Environmentally Sound Management of Obsolete Pesticides including Pops Pesticides through safe disposal
2- Implementing Agency	MAF, MoE
3- Co-operational Agency	MONRE, MoH, MoIC, MoPT
4- Duration	36 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Dispose of existing POPs pesticides, and eliminate the import and use of obsolete pesticides.
10- Objectives	<ul style="list-style-type: none"> ➤ Eliminate stockpiles of obsolete pesticides, including POPs pesticides. ➤ Implement full commitments and obligations of Lao PDR under the Stockholm Convention in reduction and elimination of all obsolete pesticides including POPs pesticide stockpiles. ➤ Assist government officials countrywide responsible for obsolete pesticide disposal to identify appropriate and environmentally-sound technology.

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

B. Project Profiles for the Management of PCBs

1. Project Profile B1: Development of Legal Instruments

1-Project Title	Develop legal instruments or technical guidelines for managing PCBs
2- Implementing Agency	MEM
3- Co-operational Agency	MONRE, MIC, Stakeholders
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	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.
10- Objectives	<ul style="list-style-type: none"> ➤ Develop specific regulations for the effective management of PCBs. ➤ Regulate electrical equipment (new and used/decommissioned) and accessories that either contain or are contaminated with PCBs.
11- Beneficiaries	Electrical equipment users and stakeholders.
12- Activities	<ul style="list-style-type: none"> ➤ Form a legal and technical working group comprising all PCBs stakeholders. ➤ Study existing legal instruments related to PCBs management for further development of legal instruments or guidelines. ➤ Develop PCBs management legal instruments, guidelines or technical standards as necessary. ➤ Organize a workshop for consultation and receipt of comments on draft legal instruments in advance of submission to the government for approval.
13- Estimated Cost	US\$ 250,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Vientiane Capital City and other Provinces-Cities

2. Project profile B2: PCBs Comprehensive Inventory

1-Project Title	Comprehensive inventory of equipment and accessories containing and contaminated with PCBs.
2- Implementing Agency	MONRE & MoEM, EDL
3- Co-operational Agency	Provincial and municipality Electricity Unit, Lao Electricity Company (EDL), Private companies
4- Duration	24 months

5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Improve management of electrical equipment and accessories that contain or are contaminated with PCBs, to ensure compliance with the Stockholm Convention.
10- Objectives	<ul style="list-style-type: none"> ➤ Establish the extent of PCB contamination of electrical equipment and accessories in Laos. ➤ Clearly identify the owners of transformers or contaminated electrical equipment and accessories. ➤ Develop a database of information related to electrical equipment and accessories that may be contaminated with PCBs. ➤ Establish environmentally sound management practices for contaminated equipment/oils.
11- Beneficiaries	Electrical equipment users and stakeholders.
12- Activities	<p>Pilot Project:</p> <ul style="list-style-type: none"> ➤ Form inventory team and review existing inventory report. ➤ Develop methodology and identify gaps in preliminary inventory. ➤ Develop a plan for a detailed inventory. ➤ 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. ➤ Complete pilot inventory report. ➤ Organize workshop for stakeholders to present findings of the pilot inventory <p>Comprehensive Inventory Project:</p> <ul style="list-style-type: none"> ➤ 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.

13- Estimated Cost	US\$ 250,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	All provinces and municipalities

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

1-Project Title	Environmentally Sound Management for “In Use” Equipment
2- Implementing Agency	MEM
3- Co-operational Agency	MONRE, Provincial and Municipal Electricity Unit, EDL, and private companies
4- Duration	18 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Improve environmental management of electrical equipment and accessories containing or contaminated with PCBs to ensure compliance to obligations as per the Stockholm Convention.
10- Objectives	Extend lifetime of existing transformers with ESM compliance.
11- Beneficiaries	Electrical equipment users and stakeholders.

12- Activities	<ul style="list-style-type: none"> ➤ Identify contaminated sites (including workshops, stations, substations, and pole mounts) for prioritizing ESM. ➤ Undertake ESM at selected sites. ➤ Develop protocols to avoid repair of transformers contaminated with PCBs. ➤ Complete inventory of electrical equipment containing or contaminated with PCBs. ➤ Develop strategy to reduce the number of electrical equipment containing or contaminated with PCBs. ➤ Develop and implement PCBs reduction demonstration (pilot) project.
13- Estimated Cost	US\$ 250,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Countrywide

4. Project profile B4: Socio-economic Assessment

1-Project Title	Assessment of socio-economic aspects for phasing out of electrical equipment and accessories that contain or are contaminated with PCBs
2- Implementing Agency	MEM
3- Co-operational Agency	MONRE, EDL
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	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.
8- Project Justification	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.
9- Project Goal	Environmentally effective management of electrical equipment and accessories that contain or are contaminated with PCBs as per the Stockholm Convention.

10- Objectives	Establish basic methods for decision-making related to the phasing out or continued use of PCB contaminated electrical based on a socio-economic analysis.
11- Beneficiaries	Electrical equipment users and stakeholders.
12- Activities	<p>Phase 1: Pilot assessment phase</p> <ul style="list-style-type: none"> ➤ Form a working group of stakeholders. ➤ Plan pilot risk assessment project by selection of a representative population sample. ➤ Undertake socio economic and cost-benefit assessments at different sites. ➤ Identify priority socio-economic risks. ➤ Organize demonstration workshops to present risk assessment results to stakeholders in order to improve assessment methodology (see Phase 2). <p>Phase 2: Full assessment</p> <ul style="list-style-type: none"> ➤ Form a working group of stakeholders ➤ Develop plan for complete risk assessment ➤ Conduct complete site assessment ➤ Identify issues of complete risk assessment ➤ Organize demonstration workshop to present risk assessment result to the stakeholders for comments.
13- Estimated Cost	US\$ 200,000
14- Donors	Government of the Lao PDR : 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	All provinces and municipalities

5. Project profile B5: ESM Compliance for electrical equipment

1-Project Title	ESM compliance of the maintenance and repair of electrical equipment
2- Implementing Agency	MEM
3- Co-operational Agency	MONRE, EDL
4- Duration	18 months
5- Project Location	Vientiane Capital City
6- Background	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.

7- Project Rational	Maintenance and repair activities of electrical equipment containing or contaminated with PCBs requires sound management.
8- Project Justification	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.
9- Project Goal	Improve the environmental management of PCB contaminated equipment and/or sites as per the Stockholm Convention.
10- Objectives	Improvement of ESM for the repair and maintenance of electrical equipment
11- Beneficiaries	Countrywide
12- Activities	<ul style="list-style-type: none"> ➤ 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). ➤ Undertake assessment of health and environmental impact issues. ➤ 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). ➤ Build institutional capacity, undertake training of maintenance and repair technicians related to PCB ESM issues (health, environment issues)
13- Estimated Cost	US\$ 300,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Throughout Lao PDR

6. Project profile B6: Strengthening Laboratory Capacity

1-Project Title	Strengthening laboratory capacity for PCBs analysis
2- Implementing Agency	MONRE –EDL
3- Co-operational Agency	MONRE, MEM
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.

7- Project Rational	<ul style="list-style-type: none"> ➤ The capacity of laboratory staff selected for PCBs analyses needs to be strengthened. ➤ The capacity of laboratories (facilities, equipment and materials) needs to be strengthened in order to conduct PCB analyses. ➤ Information on PCBs concentration in electrical equipment needs to be compiled, disseminated, and made available. ➤ Laboratories are required to identify PCBs in electrical equipment and at contaminated sites for ESM, and also to support a comprehensive inventory.
8- Project Justification	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.
9- Project Goal	Enhance the health and safety of Lao residents by improving the management of PCB contaminated equipment and sites. Ensure compliance with the Stockholm Convention.
10- Objectives	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.
11- Beneficiaries	EDL, electrical equipment holders, warehouses, and relevant governmental Institutions
12- Activities	<ul style="list-style-type: none"> ➤ Provide and strengthen laboratory staff capacity for PCBs analysis ➤ Assessment of existing laboratories and analysis capacities ➤ Provide PCB analysis equipment ➤ Provide information to stakeholders ➤ Upgrade laboratory facilities for analyzing PCBs
13- Estimated Cost	US \$250,000
14- Donors	Government of the Lao PDR : 5% of total budget (Maximum Level) Donor: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA)
15- Project Extent	National Laboratory (at WREA)

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

1-Project Title	Environmentally Sound Management of “out of use” equipment
2- Implementing Agency	MEM
3- Co-operational Agency	MONRE, MEM, EDL
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	<ul style="list-style-type: none"> ➤ There is inadequate information and data for stakeholders on out-of-use electrical equipment and wastes contaminated with PCBs. ➤ ESM of out-of-use of electrical equipment, articles and waste containing and/or contaminated with PCBs need to be developed. ➤ A strategy for the elimination of out-of-use of electrical equipment and wastes contaminated with PCBs need to be developed and implemented.
8- Project Justification	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.
9- Project Goal	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.
10- Objectives	Develop strategy for the elimination of out-of-use of electrical equipment and wastes contaminated with PCBs
11- Beneficiaries	Electrical equipment users and stakeholders.
12- Activities	<ul style="list-style-type: none"> ➤ Form technical working group (stakeholders). ➤ 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). ➤ 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). ➤ 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. ➤ Establish storage sites for keeping out-of-use of electrical equipment and wastes containing and/or contaminated with PCBs in an

	<p>environmentally sound manner.</p> <ul style="list-style-type: none"> ➤ Take action to centralize the out-of-use of electrical equipment and wastes containing and/or contaminated with PCBs in an environmentally sound manner. ➤ Quantify out-of-use electrical equipment and wastes containing or contaminated with PCBs that should be destroyed. ➤ Conduct feasibility study for the destruction/disposal in the country or out of the country. ➤ Organize national conclusion workshop (strategy, assessment result, financial mechanisms, evaluation cost...).
13- Estimated Cost	US \$350,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Electric utilities in Lao PDR

8. Project Profile B8: Capacity Building and Awareness Raising

1-Project Title	Capacity Building and Public Awareness on PCBs issue
2- Implementing Agency	MONRE
3- Co-operational Agency	MEM, EDL
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	<ul style="list-style-type: none"> ➤ A manual on PCBs risk issues and personnel safety needs to be developed. ➤ The capacity of electrical staff working with electrical equipment/ material containing dielectric fluid will be strengthened. ➤ Knowledge and information on PCBs hazards and risks needs to be widely provided and disseminated.
8- Project Justification	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.

9- Project Goal	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.
10- Objectives	Reduce the risk to health and environmental from PCB contamination for all electrical stakeholders and the public.
11- Beneficiaries	Electrical equipment users, stakeholders and the public.
12- Activities	<ul style="list-style-type: none"> ➤ Identify the fields of information and awareness to be provided to stakeholders. ➤ Develop educational materials about the hazards of PCBs and how to manage PCB's and publicize. ➤ Organize training on the sound management of PCBs at the national and provincial levels. ➤ Organize workshops on PCBs issues for all stakeholders.
13- Estimated Cost	US\$ 200,000
14- Potential Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Throughout Lao PDR

9. Project Profile B9: PCBs Database Management

1- Project Title	Establishment of PCBs database management
2- Implementing Agency	MONRE
3- Co-operational Agency	MEM, EDL
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rational	<ul style="list-style-type: none"> ➤ Access to information about PCB contaminated equipment needs to be improved. ➤ In-use electrical equipment and materials that either contain or are contaminated with PCBs need to be properly identified, classified, labeled and registered. ➤ Need to ensure that in-use electrical equipment and materials containing or contaminated with PCBs are stored in an environmentally sound manner. ➤ Need to integrate the results of the PCB inventory and comprehensive assessment with other hazardous chemical inventories (e.g. dioxins).
8- Project Justification	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.

9- Project Goal	Improve environmental management of electrical equipment and accessories containing or contaminated with PCBs as per the Stockholm Convention.
10- Objectives	To ensure the efficient tracking and management of all PCB contaminated materials and equipment.
11- Beneficiaries	MONRE, MEM, EDL, Research Institutions
12- Activities	<ul style="list-style-type: none"> ➤ Design database framework. ➤ Build and test database. ➤ Input available data from inventory and assessment. ➤ Network and integrate with other hazardous chemical programs. ➤ Improve information sharing and distribution.
13- Estimated Cost	US\$ 180,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, EU, ADB, WB, Canada POPs Fund, GTI, and JICA
15- Project Extent	Vientiane Capital City

C. Project profiles for the management of unintentionally produced POPs

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

1- Project Title	Legislation related to sound management of unintentionally produced POPs
2- Implementing Agency	MONRE
3- Co-operational Agency	MoJ, MIT, MEM, MoH, and other concerned stakeholders
4- Duration	36 months
5- Project Location	Vientiane Capital City
6- Background	<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>
7- Project Rationale	<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"> ➤ Relevant legislation will be revised or developed. ➤ Unintentionally produced POPs management guidelines are available. ➤ Legislation related to, and guidelines for, the management of unintentionally produced POPs are enforced. ➤ More understanding and awareness about the relevant laws and other legal instruments are disseminated and promoted. ➤ The reduction of unintentionally-produced POPs releases will be more effective.

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

1- Project Title	Research on Health Risk Management of Unintentionally POPs
2- Implementing Agency	Ministry of Public Health and MONRE
3- Co-operational Agency	NUOL, concerned research institutes, and key stakeholders at the central and provincial levels
4- Duration	24 months
5- Project Location	Vientiane Capital City and other major cities
6- Background	<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>
7- Project Rationale	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.
8- Project Justification	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.

9- Project Goal	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.
10- Objectives	<ul style="list-style-type: none"> ➤ Promote and develop methodology on the “human risk assessment and management” appropriately to the real needs and situation (socio-economic) of the country; ➤ 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 ➤ To provide scientific and pertinent suggestions to concerned policy makers for further appropriate decisions in proper POPs management and phasing out.
11- Beneficiaries	<ul style="list-style-type: none"> ➤ Direct beneficiaries: Concerned Lao staff, scientists and researchers, relevant central and provincial authorities, affected people and targeted vulnerable groups ➤ Indirect beneficiaries: Lao people, private sector, mass organizations and civil societies
12- Activities	<p>Conduct preliminary human health and environment risk assessment:</p> <ul style="list-style-type: none"> • For the research team • Desk study, selection of the study targeted areas and persons, preparation of the field work, test the field questionnaire form • Train the enumerators, test and improve the field questionnaire form • 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 mentioned parameters to be mitigated by implementing proposed mitigation and management measures. • Compile and analyze field data result • 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 • Monitor and assess the implication of the Study Report.
13- Estimated Cost	US\$ 400,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, GTI, UNIDO, WB, FAO, UNEP
15- Project Extent	Countrywide

Project Profile C3: Institutional Capacity Building

1- Project Title	Institutional strengthening and capacity building for Environmentally Sound Management of unintentionally produced POPs
2- Implementing Agency	MONRE
3- Co-operational Agency	MAF, MEM, MoH, MPI, NGOs,
4- Duration	36 months
5- Project Location	Vientiane Capital City; provinces
6- Background	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.
7- Project Rationale	<ul style="list-style-type: none"> ➤ Institutional capacity building for sound management of unintentionally produced POPs will be strengthened at the national and provincial/municipality levels. ➤ Technical skills of relevant competent institutional officers will be improved through training, meetings and dissemination workshops.
8- Project Justification	<ul style="list-style-type: none"> ➤ Need for compliance with the Stockholm Convention with regards to minimizing releases of unintentionally produced POPs. ➤ Need to strengthen the capacity of the state administration to enforce the legislation related to sound management of unintentionally produced POPs.
9- Project Goal	Improved capacity of national, provincial and local authorities for management of unintentionally produced POPs.
10- Objectives	<ul style="list-style-type: none"> ➤ Strengthen the institutions responsible for effective enforcement of legislation related to sound management of unintentionally produced POPs. ➤ Strengthen the institutions and build capacity necessary for sound management of unintentionally produced POPs.
11- Beneficiaries	<ul style="list-style-type: none"> ➤ Direct beneficiaries: state administration. ➤ Indirect beneficiaries: population of Lao PDR; contribution to global efforts in reduction of unintentionally produced POPs.

12- Activities	Develop and strengthen the capacity to manage problems related to unintentionally-produced POPs: <ul style="list-style-type: none"> ➤ Form technical team and core trainer on unintentionally produced POPs. ➤ Develop training material. ➤ Provide appropriate information on unintentionally produced POPs to decision-makers. ➤ Strengthen institutional capacity of authorities responsible for implementation of legal instruments and guidelines relevant to sound management of unintentionally produced POPs. ➤ Improve the technical skill of the technical team.
13- Estimated Costa	US\$ 450,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB)
15- Project Extent	In all provinces-cities of Lao PDR

3. Project Profile No C4: Public Awareness Raising

1- Project Title	Public awareness raising on unintentionally produced POPs
2- Implementing Agency	MONRE
3- Co-operational Agency	MEM, MAF, MIC, MPI, MoH, MoE, NGOs, Private Sector.
4- Duration	24 months
5- Project Location	Vientiane Capital City; provinces
6- Background	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.

7- Project Rationale	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.
8- Project Justification	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.
9- Project Goal	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.
10- Objectives	<ul style="list-style-type: none"> ➤ 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. ➤ Develop and implement awareness raising programs on potential health impacts of unintentionally produced POPs, and possible alternatives.
11- Beneficiaries	Direct beneficiaries: General public, in particular the most vulnerable population groups, such as women and children.
12- Activities	Develop and implement awareness raising program on health impact of unintentionally produced POPs, and possible alternatives: <ul style="list-style-type: none"> ➤ Develop awareness raising program ➤ Develop documents and information materials in Lao language and according to Lao culture. ➤ 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.
13- Estimated Cost	US\$ 300,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA
15- Project Extent	In all provinces-cities of Lao PDR

4. Project Profile C5: Sound Waste Management

1- Project Title	Promotion of sound waste management practices
2- Implementing Agency	MONRE, Selected Provinces and Cities
3- Co-operational Agency	MAF, MEM, MOIC, MPWT, MoH, MPI, MoE
4- Duration	24 months
5- Project Location	Vientiane Capital City; provinces
6- Background	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.
7- Project Rationale	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.
8- Project Justification	<ul style="list-style-type: none"> ➤ 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. ➤ 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.
9- Project Goal	Through sound waste management practices, reduce and eliminate the release of unintentionally produced POPs.
10- Objectives	<ul style="list-style-type: none"> ➤ Overall reduction of the produced waste through implementation of sound waste management practices. ➤ Develop guidelines on sound management of wastes (including 3R principles and waste separation practices)
11- Beneficiaries	General public

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

5. Project Profile C6: Sound Management of Landfills

1- Project Title	Promotion of controlled landfills and prevention of uncontrolled burning of waste
2- Implementing Agency	MONRE-DPC, Selected Provincial and Municipal Local Authorities
3- Co-operational Agency	MAF, MEM, MoH, MPWT, Private Sectors
4- Duration	24 months
5- Project Location	Vientiane Capital City; provinces
6- Background	<p>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.</p>

7- Project Rationale	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. 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.
8- Project Justification	<ul style="list-style-type: none"> ➤ 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. ➤ Need for cessation of bad waste management practices, such as uncontrolled burning of waste in backyards and in landfills.
9- Project Goal	Reduce and eliminate the release of unintentionally produced POPs through better waste management practices, recycling, and controlling burning of waste.
10- Objectives	<ul style="list-style-type: none"> ➤ Prevention of bad waste management practices, in particular uncontrolled burning of wastes. ➤ Convert uncontrolled landfills to controlled ones.
11- Beneficiaries	Direct beneficiaries: General public and provincial and municipal authorities.
12- Activities	<p>Improve landfill management (prevent uncontrolled burning)</p> <ul style="list-style-type: none"> ➤ Establish technical team for landfill assessment ➤ Conduct municipality and provincial landfill assessment ➤ Develop landfill management program ➤ Conduct training course on landfill management with the municipality and provincial authorities ➤ Design and implement municipal and provincial landfill management pilot project ➤ Revise the program if necessary □
13- Estimated Cost	US\$ 350,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA.
15- Project Extent	Selected provincial and municipal landfills

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

1- Project Title	Introduction and promotion of BAT & BEP in existing waste incineration plants
2- Implementing Agency	MONRE
3- Co-operational Agency	MAF, MEM, MoH, MoPT, MoE, MoDF NGOs
4- Duration	24 months
5- Project Location	Vientiane Capital City; provinces
6- Background	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.
7- Project Rationale	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. 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 & BEP.
8- Project Justification	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.
9- Project Goal	Reduce and eliminate the release of unintentionally produced POPs through application of BAT and BEP.
10- Objectives	<ul style="list-style-type: none"> ➤ Improvement of waste incineration in existing facilities. ➤ Introduction and promotion of BAT & BEP in existing waste incineration plants.
11- Beneficiaries	<ul style="list-style-type: none"> ➤ Direct beneficiaries: Operators of the waste incineration plants; neighboring residents ➤ Indirect beneficiaries: General public (Contribution to global efforts of unintentionally produced POPs release minimization).
12- Activities	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).
13- Estimated Cost	US\$ 200,000
14- Donors	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA.
15- Project Extent	Selected one province or city

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

1- Project Title	Application of BAT & BEP for unintentionally produced POPs operational release sources
2- Implementing Agency	MONRE
3- Co-operational Agency	MAF, MEM, MOIC, MoH, MPI, MoD
4- Duration	30 months
5- Project Location	Vientiane Capital City; provinces
6- Background	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. 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.
7- Project Rationale	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.

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

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

1. Project Title	Promotion the use of BAT/BEP in the SMEs and creation of BAT/BEP Fund
2. Implementing Agency	MONRE
3. Co-operational Agency	MOIC, MoH, MAF, SMEs, LCoC
4. Duration	36 months
5. Project Location	Vientiane Capital City (Project coverage - Country-wide)
6. Background	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.
7. Project Rationale	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
8. Project Justification	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 <i>a. Strengthen capacity to the concerned government agencies as well as public sectors on the importance of BAT/BEP b. Draft rules and regulations on POPs, especially on BAT/BEP. c Establish BAT/BEP Fund to assist SMEs carry out BAT/BEP</i>
9. Project Goal	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
10.Objectives	<ul style="list-style-type: none"> ➤ Strengthen SMEs' capacity on BAT/BEP ➤ Formulation and adoption of regulations related to the use of BAT/BEP ➤ Creation of the BAT/BEP Fund to support SMEs
11.Beneficiaries	<ul style="list-style-type: none"> ➤ Direct Beneficiaries: SMEs, Local Communities, and Concerned Government Agencies at Local and National Level ➤ Indirect Beneficiaries: Contribution to global efforts of POPs release minimization and sustainable development.
12.Activities	<ul style="list-style-type: none"> ➤ Key stakeholders consultation, formulation and undertake their capacity strengthening needs ➤ Develop guidelines/training materials ➤ Conduct trainings for various target groups (management, levels,

	<p>training of trainers and Public/Private Sector)</p> <ul style="list-style-type: none"> ➤ Evaluation of training ➤ Improve training materials ➤ Promote awareness raising program on POPs and BAT/BEP ➤ Review existing BAT/BEP regulations ➤ Formulation of BAT/BEP regulations related to all 3 sectors ➤ Consultation workshops on the first and final drafts of the regulation. ➤ Publication, dissemination and implementation of the regulations ➤ Develop guidelines for BAT/BEP Fund establishment and Fund operationalization ➤ Monitoring and Assessment of the Fund ➤ Monitoring and Assessment of project implementation progress and reporting (quarterly) ➤ Establish Steering Committee which will report to POP's Steering Committee
13. Estimated Cost	US \$ 1,000,000

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

1- Project Title	Improvement in medical waste management practices
2- Implementing Agency	MoH
3- Co-operational Agency	MONRE, MoD, MoPWT
4- Duration	24 months
5- Project Location	Vientiane Capital City; provinces
6- Background	<p>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.</p>
7- Project Rationale	<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>

8- Project Justification	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.
9- Project Goal	Reduce and eliminate the release of unintentionally produced POPs associated with medical waste incineration.
10- Objectives	<ul style="list-style-type: none"> ➤ Improvement of medical waste management practices. ➤ Review and improvement of medical waste management plan.
11- Beneficiaries	Direct beneficiaries: Hospitals, general public
12- Activities	<p>Reviewing and improvement of current medical waste management practices:</p> <ul style="list-style-type: none"> ➤ Establish technical team in medical waste management ➤ Study existing medical waste management guidelines and information related to BAT and BEP ➤ Undertake review and assessment of existing medical waste management practices with regards to the above guidelines, including socio-economic analysis ➤ Update medical waste management practices as necessary ➤ Design a pilot project on the applicability of the updated guidelines for medical waste management ➤ Implement the pilot project in selected hospitals ➤ Revise the medical waste management plan if necessary ➤ Provide training to relevant stakeholders to facilitate broad implementation of the medical waste management plan
13- Estimated Cost	US\$ 300,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA.
15- Project Extent	Selected provinces or cities

9. Project Profile C11: Inventory of Unintentionally Produced POPs

1- Project Title	Inventorisation of unintentionally produced POPs releases
2- Implementing agency	MONRE
3- Co-operational Agency	MAF, MEM, MoH, MPI
4- Duration	24 months
5- Project Location	Countrywide
6- Background	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

	<p>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>
7- Project Rationale	<ul style="list-style-type: none"> ➤ 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. ➤ 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.
8- Project Justification	<ul style="list-style-type: none"> ➤ Need for compliance with the Stockholm Convention obligation with regards to reporting about unintentionally produced POPs releases and their future trends. ➤ Current lack of adequate (and updated) data on unintentionally produced POPs releases to support the national policy related to POPs.
9- Project Goal	Collect accurate inventory data to help reduce and eliminate the release of unintentionally produced POPs.
10- Objectives	<ul style="list-style-type: none"> ➤ Ensure adequate inventory data are available on unintentionally produced POPs releases, to verify main sources and future trends. ➤ Undertake revision of the preliminary unintentionally produced POPs release inventory. ➤ Update the unintentionally produced POPs release inventory and verify accuracy of data collected.
11- Beneficiaries	Direct beneficiaries: Governmental institutions and stakeholders
12- Activities	<ul style="list-style-type: none"> ➤ 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). ➤ Form inventory team ➤ Review existing inventory reports ➤ Identify support tools and equipment required for inventory ➤ Conduct unintentionally produced POPs release inventory update ➤ Design national unintentionally produced POPs database ➤ Evaluation of unintentional POPs release reduction and elimination
13- Estimated Cost	US\$ 400,000 (excluding costs for Dioxin/Furan inventory)
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA.
15- Project Extent	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

1- Project Title	Inventory of Dioxin and Furan Hot Spots, Raising Public Awareness to Protect Public from Exposure and Prioritization of Contaminated Sites
2- Implementing Agency	MONRE, MOD
3- Co-operational Agency	Ministry of Defense (needed to assist with sample collection at current Lao PDR military installations, and former US military installations)
4- Duration	30 months
5- Project Location	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	<p>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).</p> <p>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</p> <p>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.</p> <p>This project will review the results from the first dioxin/furan inventory conducted in Lao PDR, identify the potential of unintentionally produced</p>

	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.
7- Project Rationale	<ul style="list-style-type: none"> ➤ More detailed dioxin/furan inventory data, particularly from suspected hotspots, is required to protect the rural poor from potential exposure to these toxic chemicals. ➤ 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; ➤ 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.
8- Project Justification	<ul style="list-style-type: none"> ➤ 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; ➤ Need for compliance with the Stockholm Convention obligation with regards to reporting about dioxin and furan levels in the environment, and their future trends. ➤ Current lack of adequate (and updated) data on dioxin/furan releases to support the national policy related to POPs.
9- Project Goal	Collect accurate inventory data to help reduce and eliminate exposure of the rural population to dioxins and furans.
10- Objectives	<ul style="list-style-type: none"> ➤ Ensure adequate inventory data are available on dioxins and furans, to verify main sources and future trends. ➤ Undertake revision of the preliminary unintentionally dioxin and furan inventory. ➤ Update the dioxin and furan inventory, identify suspected hotspots and verify accuracy of data collected. ➤ Protect local communities, particularly rural poor, from potential exposure to dioxins and other toxic chemicals from the American war era.
11- Beneficiaries	Direct beneficiaries: Local communities living in suspected hotspot areas; Governmental institutions and other stakeholders
12- Activities	<ul style="list-style-type: none"> ➤ Review existing data on dioxin/furan from the initial POPs inventory; ➤ Work with Government stakeholders, including WREA and Ministry of Defense, to identify potential dioxin hotspots; ➤ 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

	<p>Nam Tha, Oudomxay, Houa Phanh, 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 suspected hotspot areas;</p> <ul style="list-style-type: none"> ➤ 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; ➤ 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 ➤ 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; ➤ 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
13- Estimated Cost	<p>US\$ 2,000,000 – 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>
14- Donors	<p>Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, EU, FAO, UNEP, ADB, GTI, JICA, CIDA.</p>
15- Project Extent	<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.

1- Project Title	Strengthening Capacity of National POPs Coordination System
2- Implementing Agency	MONRE
3- Co-operational Agencies	MAF, MITC, MEM, MoH, MPI, MoD, Mass Organizations, Private sectors and key stakeholders
4- Duration	48 months
5- Project Location	Vientiane Capital City
6- Background	<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>
7- Project Rationale	<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</p>

	<p>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 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>
8- Project Justification	<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>
9- Project Goal	<p>To improve the quality of the NIP coordination and implementation, including monitoring and evaluation of NIP projects execution.</p>
10- Objectives	<ul style="list-style-type: none"> ➤ Improving the mandate of the National Steering Committee, Technical Working Groups, Coordination Unit in the NIP coordination and implementation; ➤ Improving and developing the administrative management systems, guidelines, manuals and other project coordination and implementation tools; ➤ Strengthening the capacity and capabilities for NIP project implementation covering data centralization, assessment, monitoring and evaluation.
11- Beneficiaries	<p>Direct beneficiaries: National Steering Committee, Technical Working Groups, Coordinating Unit and line ministries involved. Indirect beneficiaries: Local community.</p>
12- Activities	<ul style="list-style-type: none"> ➤ To strengthen capacity of the National POPs Coordinating Unit and the POPs Technical Working Groups ➤ To plan and convene, in partnership with the relevant ministries on the chemical management and reduction and elimination of POPs; ➤ 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; ➤ To increase cooperation between the chemical management stakeholders and the institutions in Lao PDR and other countries in

	<p>the region and international donor communities through project implementation and issues relevant to the NIP implementation and management;</p> <ul style="list-style-type: none"> ➤ 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 ➤ 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. ➤ To conduct study tours to POPs National Steering Committee, to organize technical Forum to the Technical Working Groups related to POPs management as needed. ➤ To increase awareness related to POPs management to the Steering Committee, Working Groups and POPs Coordinating Unit.
13- Estimated Cost	US\$ 900,000
14- Donors	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, FAO, UNEP, ADB)
15- Project Extent	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.

1- Project Title	Establishment of National Chemicals Database including POPs for Effective Exchange of Information.
2- Implementing Agency	MONRE
3- Co-operational Agency	MAF, MoIC, MoH, MPI
4- Duration	24 months
5- Project Location	Vientiane Capital City
6- Background	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.

7- Project Rationale	<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>
8- Project Justification	<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 existing chemical information system as an important but separate, comprehensive, and chemically oriented database.</p>
9- Project Goal	<p>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.</p>
10- Objectives	<ul style="list-style-type: none"> ➤ To integrate the data of chemicals inventory and other information into a single spatially-oriented national chemicals database, and distributed via the internet; ➤ To provide an appropriate context for assessing chemicals use, reduction, and elimination in terms of implementation of the provision of the Stockholm Convention.
11- Beneficiaries	<ul style="list-style-type: none"> ➤ Direct beneficiaries: Lao government institutions; private sectors and stakeholders, the general public and the international community via the internet. ➤ Indirect beneficiaries: Contribution to global efforts of POPs release minimization and sustainable development.
12- Activities	<ul style="list-style-type: none"> ➤ Review and evaluate the existing chemical database and spatial information; ➤ Assess various options for the national chemicals database design; ➤ 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; ➤ Establish a GIS based internet map service with a chemicals distribution information network to serve government sectors; ➤ Conduct a pilot study for examination of selected chemicals

	<p>including POPs areas to determine the database structure and mechanism for incorporating data from different sources;</p> <ul style="list-style-type: none"> ➤ Incorporate chemicals data and information including POPs from other institutional sources; and ➤ Link between national chemicals database with the GIS proposed for managing chemicals including POPs.
13- Estimated Cost	US\$ 1,000,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB.
15- Project Extent	Vientiane Capital City, Provinces and Cities

3. Project Profile D3: Formulate, promulgate and implement Hazardous Chemicals and Substances Management Law / Decree;

1- Project Title	Hazardous Chemical and Substances Management Law /Decree
2- Implementing Agency	MONRE
3- Co-operational Agency	MIC, MEM, MoH, MAF, Relevant Governmental Institutions and Relevant Civil Organizations
4- Duration	30 months
5- Project Location	Vientiane Capital City
6- Background	<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>
7- Project Rationale	<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"> ➤ Relevant laws will be revised or prepared, ➤ Managing of chemicals including POPs guideline will be developed and available for implementation, ➤ Laws and guidelines related to the management of hazardous chemicals and substances including POPs will be enforced, and ➤ Knowledge and awareness on the laws and relevant legal instruments will be disseminated and participation promoted to government agencies and the general public.
8- Project Justification	There is a need to establish necessary legal framework for managing hazardous chemicals and substances including POPs in a safe and sound environmental manner.

9- Project Goal	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.
10- Objectives	<ul style="list-style-type: none"> ➤ Provide a forum for governmental institutions and stakeholders for development of Hazardous Chemicals and Substances Law/Decree ➤ Support stakeholder's initiatives for sharing law and policy development related strategies, expertise and technical knowledge, ➤ Support joint training and capacity building related hazardous chemicals and Substances law/decree development including POPs, and ➤ Establish and examine alternative mechanisms for hazardous chemicals and substances law/decree development and future compliance.
11- Beneficiaries	<ul style="list-style-type: none"> ➤ Direct beneficiaries: Lao government institutions; ➤ Indirect beneficiaries: Lao people (Contribution to global efforts of chemicals waste release minimization including POPs).
12- Activities	<p>Assessment of law and policy related to managing of chemicals including POPs:</p> <ul style="list-style-type: none"> ➤ Form legal team ➤ Review legal instruments and policy, ➤ Assess legal instruments and policy, and ➤ Identify gap and requirement for law and policy development with a focus on the environment sound management of hazardous chemicals and substances including POPs. <p>Develop hazardous chemicals and substances management law/decree including POPs:</p> <ul style="list-style-type: none"> ➤ 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, ➤ Deliver training course on the methodology of concerned law/decree drafting, ➤ Formulate the law/decree on Hazardous Chemicals and Substances Management, ➤ Organize consultation workshops on the drafts of the above mentioned law/decree for further appropriate finalization, ➤ Finalize and submit the final draft of the law/decree for approval. <p>Dissemination and follow up the implementation of the approved law/decree</p> <ul style="list-style-type: none"> ➤ Publish and disseminate the promulgated law/decree through different means at the national level, and ➤ Monitor, assess and report the effectiveness of the realization of the law/decree.
13- Estimated Cost	US\$ 400,000
14- Donors	Government of the Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, WB, FAO, UNEP, ADB.
15- Project Extent	Countrywide

- 1. 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.

1- Project Title	Capacity building of targeted academic institutions on the delivery of chemical engineering course
2- Implementing Agency	NUOL
3- Co-operational Agencies	MoE, MONRE, MoH, MIT, MEM, Private sectors and key stakeholders
4- Duration	40 months
5- Project Location	Vientiane Capital City
6- Background	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.
7- Project Rationale	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.
8- Project Justification	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.

9- Project Goal	To provide sufficient and qualified chemical engineers to concerned ministries and governmental institutions at the national level, relevant private sector and other key stakeholders
10- Objectives	<ul style="list-style-type: none"> ➤ Capacity building and strengthening of targeted academic institutions on the delivery of chemical engineering courses in a sustained and effective manner; ➤ Build and strengthen capacity of concerned trainers ; and ➤ Replicate this course delivery at the national level as appropriate
11- Beneficiaries	Direct beneficiaries: relevant line ministries and governmental institutions, private sectors, and academic institutions. Indirect beneficiaries: local community
12- Activities	<ul style="list-style-type: none"> ➤ 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; ➤ To test and improve the curriculum and the training program of the trainers; ➤ To conduct, monitor, assess, report and improve the conduct of the chemical engineering course and training program of the trainers; ➤ To strengthen capacity of trainers, such as getting their Ph.D, participating relevant trainings at the regional and international levels; ➤ 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; ➤ To develop and maintain good working relationship between the targeted academic institution, WREA, private sector and other key stakeholders;
13- Estimated Cost	US\$ 1, 500,000
14- Donors	Government of Lao PDR: 5% of total budget (Maximum Level) Donors: GEF, UNIDO, , FAO, UNEP, ADB)
15- Project Extent	Provinces and Cities