



Kingdom of Cambodia  
Nation Religion King

**ROYAL GOVERNMENT OF  
CAMBODIA**

# **NATIONAL IMPLEMENTATION PLAN FOR THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS**

Had been endorsed by the Council of Ministers during its meeting held on 2<sup>nd</sup> June 2006

Prepared by: Ministry of Environment, Project Coordination Unit for the Development of National Implementation Plan

Supported by: United Nations Environmental Program (UENP) and Global Environment Facility (GEF)



**MOE**



**UNEP**



**GEF**

Ministry of Environment

June 2006

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PLAN FOR THE STOCKHOLM  
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**Prepared by:  
Project Coordination Unit,  
Enabling Activities for Development of a National Plan for Implementation  
of the Stockholm Convention on POPs**

**Supported by: UNEP/GEF**

**Ministry of Environment  
Phnom Penh, June 2006**

This document was prepared by a team of national consultants under supervision of the Project Coordination Unit (PCU) of the Enabling Activities for the Development of a National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs), the Ministry of Environment (herein after called NIP Project). This project is technically supported by UNEP and financed by the Global Environment Facility (GEF) with in-kind contributions from the Royal Government of Cambodia for the preparation of the National Implementation Plan (NIP) on POPs.

This report has been developed and published in Khmer and English by the NIP project of the Ministry of Environment (MoE), the Royal Government of Cambodia (RGC), to provide information on the situation and management frameworks of POPs-pesticides being used for agricultural purposes, DDT for disease vector control, PCB dielectric fluid, and the formation and release of unintentionally produced POPs. Most information for this report is taken from POPs inventory's reports (the POPs-pesticides and DDT, the PCB and Unintentionally Produced POPs inventories), which inventory activities undertaken from January to April 2004. In addition, comments, feedback and recommendations from various national workshops and meetings related to chemicals management including POPs in particular, have also been elaborated in this document. Furthermore, three international professional experts in the field of obsolete pesticides and DDT, PCBs, and unintentionally produced POPs were recruited to provide knowledge and experiences in the sound management of POPs and to support officers of governmental ministries, institutions, academic institutes, NGOs, and stakeholders. In addition, these international experts, recognized by the UNEP, assisted the national consultant team to develop the NIP document.

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## **Acknowledgement Message** **of H.E. Dr. Mok Mareth, Senior Minister, Minister for the Environment**

The safe and environmentally sound management of chemicals becomes a high consideration around the globe after the World Summit was held in Rio, Brazil in 1992 (Rio Declaration on the Environment and Development), by setting up strategy for the environmentally sound management of hazardous chemicals including the prevention of illegal trade of hazardous chemicals products and its hazards as was stated in Chapter 19 of the Agenda 21.

With willingness for environmentally sound management of chemicals, the world community has undertaken many measures, including the Stockholm Convention on Persistent Organic Pollutants (POPs) was produced and adopted on 22<sup>nd</sup> May 2001 and then entered into force on 17<sup>th</sup> May 2004, with an aim to protect human health and the environment from the adverse impact of POPs.

Within the transition period for implementing the Stockholm Convention effectively, particularly the elimination of POPs, Cambodia has prepared a National Implementation Plan (NIP) for the Stockholm Convention on Persistent Organic Pollutants, which illustrates the commitment of the Royal Government of Cambodia in joining with the world community to reduce the use of POPs as well as to eliminate the release of POPs including POPs-pesticides, PCBs, and unintentionally produced POPs (Dioxins and Furans) as stated in the Stockholm Convention and the NIP document was adapted by council of ministers on the 2<sup>nd</sup> June 2006. In addition, on the 24<sup>th</sup> April 2006, the National Assembly had enacted the legal instrument for allowing Government of Cambodia to ratify the Stockholm Convention on POPs.

The National Implementation Plan for the Stockholm Convention is a master plan for fostering the safe and sound management of POPs in Cambodia. This means that relevant ministries, institutions as well as civil society organizations shall implement this plan in compliance with their own professional standards to contribute to the prevention, reduction and if possible the elimination of the use and release of POPs. In particular, the execution of POPs environmentally sound management is a great action that helps promote public health and environmental quality, and in general, it will help Cambodia fulfill its obligation under the Stockholm Convention by joining with the world community to prevent the release of POPs into the environment, to reduce the negative impact on human health and the environment and to ensure food safety.

The preparation and development procedures of the National Implementation Plan for the Stockholm Convention is based on the guidelines of the United Nations Environment Program (UNEP) under the financial support provided by the Global Environment Facilities (GEF) and in compliance with comments and recommendations provided by ministries, institutions, civil societies and NGOs and the advices provided by international and national experts. So, in this occasion, I would like to express my gratitude to the Royal Government of Cambodia for highly considering public health and the environment by committing to eliminate the use of POPs and preventing the release of such substances into the environment. I would also thank relevant ministries, institutions, the National Coordinating Committee (NCC), professional officers from relevant ministries, institutions, civil society, and national and international experts for ideas, comments, information and data and recommendations to this national implementation plan. Together, especially, I would like to thank the Global Environment Facility that provided financial support for the execution of the enabling activities for the development of a National Implementation Plan for the Stockholm Convention and would like also thank to United Nations Environment Program and United Nations Institute for Training and Research (UNITAR) that provided technical support for the project execution and NIP development. Finally, I also thank the project coordination team for their efforts in the preparation of this National Implementation Plan for the Stockholm Convention with fruitful results.

Phnom Penh, Date 5th June, 2006  
Senior Minister, Minister for the Environment



**Dr. Mok Mareth**

## Preface

The Stockholm Convention on Persistent Organic Pollutants (POPs) requests member states to prepare national implementation plans for the Stockholm Convention with the objectives to phase out the production, use and the release of POPs. National implementation plans are to be submitted to the conference of the parties within 2 years of states becoming members. Although still waiting to become party to the Stockholm Convention, Cambodia is trying to fulfill the first obligation of the convention, by completing the National Implementation Plan for the Stockholm Convention document.

Cambodia National Implementation Plan for the Stockholm Convention is undertaken under the execution project on the Enabling Activities for the Development of a National Plan for Implementation (NIP) of the Stockholm Convention on Persistence Organic Pollutants (POPs) of the Ministry of Environment in cooperation with relevant institutions, civil societies, research institutes and the private sector. Financial support is provided by the Global Environmental Facilities (GEF) and technical support by the United Nations Environment Program (UNEP). The project was started in mid 2003. This NIP document was prepared by national consultants with technical support provided by UNEP and international experts and other supports from all stakeholders through a three-day national endorsement workshop and was adopted by council of ministers of the Royal Government of Cambodia on 2<sup>nd</sup> June 2006.

The National Implementation Plan for the Stockholm Convention is a paper that illustrates the historical, current, and future status of the production, trafficking, use, and disposal of POPs in Cambodia. At the same time, the assessment on the status of POPs related to institutional capacity, technical capacity, legal framework, public awareness, impact on human health, the environment and socials caused by POPs has also elaborated in this NIP document.

The assessment on national priority setting and objectives for the management of POPs in Cambodia for the future, is a central element of this NIP document, which contributes towards the identification of a national strategy for environmentally sound management of POPs as well as determines the national action plan responding to the obligations set under the Stockholm Convention, which Cambodia has to carry out as a party to the convention. At the same time, 32 initiated priority projects have been proposed, which assists Cambodia to identify the specific needs for implementing the Stockholm Convention effectively.

The National Implementation Plan for the Stockholm Convention is publicized in both Khmer and English languages and will be revised every 4 years.

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## Abbreviations and Acronyms

Abbreviation / Acronym	Meaning
ADB	Asian Development Bank
AFD	Agence Française du Developpement
APCS	Air Pollution Control System
APIP	Agricultural Productivity Improvement Project
BAMS	Bureau of Agricultural Material Standard
BAT	Best Available Techniques
BEP	Best Environmental Practice
CEE	Compagnie des Eaux et Electricité
CFKE	Compagnie Franco-Khmer d' Electricité
COCMA	Compagnie Centrale des Materiels Agricoles
DAALI	Department of Agronomy and Agricultural Land Improvement
DDT	Dichlorodiphenyl trichloroethane
DDVP	Dichlorvos, sometimes called DDVP, is the common name of dimethyl 2,2dichlorovinyl phosphate
EAC	Electricity Authority of Cambodia
EDC	Electricité du Cambodge
EDP	Electricité de Phnom Penh
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESM	Environmentally Sound Management
ETAP	Environmental Technical Advisory Programme
FAO	Food and Agricultural Organization
fat wt	fat weight
g.TEQ	gram Toxic Equivalent
g.TEQ/a	gram Toxic Equivalent per annum
GDP	Gross Domestic Products
GEF	Global Environmental Facility
GIS	Geographic Information System
GPS	Geographic Positioning System
GSP	Generalized System of Preference
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HPLC	High Performance Liquid Chromatography
IPM	Integrated Pest Management
JICA	Japan International Cooperation Agency
KWH	Kilo-Watt Hour
LAB	Laboratory
LFA	Logical Framework Approach
LPG	Liquefied Petroleum Gas
MAFF	Ministry of Agriculture, Forestry and Fisheries
mg/ha	Milligram per hectare
MIME	Ministry of Industry, Mines and Energy
ml/ha	Milliliter per hectare
MoC	Ministry of Commerce
MOCRA	Ministry of Cults and Religious Affairs
MoE	Ministry of Environment
MoEF	Ministry of Economy and Finance
MOEYS	Ministry of Education Youth and Sports
MoH	Ministry of Health
Mol	Ministry of Interior
Molnf	Ministry of Information
MoJ	Ministry of Justice
MOWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MW	Mega Watt Hours
NCC	National Coordinating Committee

<b>Abbreviation / Acronym</b>	<b>Meaning</b>
NCMP&E	National Center for Malaria Control, Parasitology and Entomology
NDF	Nordic Development Fund
ng/g	Nanogram per gram
NGO	Non-Governmental Organization
NIP	National Implementation Plan (or National Plan for Implementation)
NSDP	National Strategic Development Plan
PCB or PCBs	Polychlorinated Biphenyl(s)
PCDD	Polychlorinated Dibenzo-para-dioxins
PCDF	Polychlorinated Dibenzofuran
PCU	Project Coordinating Unit
PEU	Provincial Electrical Utility
PFL	Pesticide Formulation Laboratory
PIC	Prior Informed Consent (Rotterdam Convention)
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
ppm	part per million
PRL	Pesticide Residue Laboratory
PTS	Persistent Toxic Substances
RGC	Royal Government of Cambodia
RPE	Respiratory protective equipment
SARUP	Safe and Responsible Use of Pesticides
TLC	Thin Layer Chromatography
TV	Television
UCP	Uncontrolled Combustion Process
U.S	United States
UNDP	United Nations Development Programme
UNEDI	Union d'Electricité d'Indochine
UNEP	United Nations Environmental Programme
UNEP/GEF	United Nations Environment Programme/Global Environment Facility
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
WB	World Bank
wet wt	wet weight
WHO	World Health Organization

## Executive Summary

The Stockholm Convention on Persistent Organic Pollutants (POPs) was officially agreed upon and signed by most of the member states to the United Nations on 23 May 2001 and entered into force on 17 May 2004. By March 2006, 120 member states had provided their ratification, acceptance, approval, or accession to this convention. Cambodia signed the Stockholm Convention on 23 May 2001 in Stockholm, Sweden, and is in the process of preparing an accession instrument to the convention.

The Royal Government of Cambodia is committed to joining with the international community to take action in the reduction and where possible the elimination of the release of POPs to the environment. Such commitment is clearly stated in the national profile on chemicals management which states that "*The Royal Government of Cambodia strongly and fully supports this National Profile on Chemicals Management and safety chemicals management policy, responding to the obligations set under the Stockholm Convention*". (Message of His Excellency Samdech Hun Sen, Prime Minister of the Royal Government of Cambodia, January 18, 2005, in his address to support the National Profile on Chemicals Management, publicized in January 2005).

More importantly, the Royal Government of Cambodia assigned the Ministry of Environment to be the National Focal Point for the Stockholm Convention in order to share and exchange information related to the country's POPs related issues with other parties to the convention. In addition, a National Coordinating Committee (NCC) which comprises members from line governmental ministries, institutions, academia and NGOs, was also established to advise and steer the execution of the Stockholm Convention as well as to coordinate such implementation among involved stakeholders. The NCC plays an important role in coordinating the development of the National Implementation Plan (NIP) for the Stockholm Convention on POPs.

The NIP document is a guidance paper that illustrates the country's planning for sound environmental management of intentionally and unintentionally produced POPs. The Royal Government of Cambodia is committed to joining with international communities to reduce the use and where possible the elimination of POPs releases including POPs-pesticides, PCBs and unintentionally produced POPs. Major provisions set under the convention require member states to carry out the following:

- ❖ Take measure to reduce or eliminate releases from intentional production and use, importation and exportation of chemicals listed in Annex A; or take any measure to ensure the disposal of chemicals listed in Annex A or Annex B with environmentally sound management. (Article 3),
- ❖ Take measure to reduce or eliminate releases from unintentional production derived from anthropogenic sources of each of the chemical listed in Annex C; with the goal of their continuing minimization and where feasible, ultimate elimination. (Article 5),
- ❖ Take measure to reduce or eliminate releases from stockpiles and waste consisting of or containing chemicals listed either in Annex A or Annex B and waste, including products and articles upon becoming wastes, consisting of, containing or contaminated with a chemicals listed in Annex A, B or C, are managed in a manner protective of human health and the environment. (Article 6)

Chemicals listed in Annex A include aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, and polychlorinated biphenyls (PCB); while DDT substances listed in Annex B and Annex C include the following chemicals: polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans (PCDD/PCDF), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs).

In response to the above provisions, the Royal Government of Cambodia with the support provided by the UNEP/GEF and technical advice by international experts, has undertaken a study on the historical, current and future trends of the use and the release of POPs substances. The development of a national profile on chemicals management and the inventory of four groups of POPs have allowed the specific assessment of POPs use and the setting of national priorities and objectives for the sound management of POPs. Results from the specific assessment of POPs and national priorities and objectives provided the foundation for the development of a national implementation plan for the Stockholm Convention on POPs, in order to achieve the goal of the convention on the reduction and where possible the elimination of POPs uses and releases.

This National Implementation Plan is a direct response to the lack of existing capacity at all levels in both the government and non-government sectors. This plan will assist in building capacity through professional and technical training, assistance with development and creating the appropriate political and legal frameworks and enforcement systems, development in field management capacities and systems especially in institutional development and public participation, building of stakeholders' capacity in terms of human resources development, and systems development through practical studies in term of information development and management.

Individual components of the NIP such as training programs, POPs inventory, POPs technical research, and awareness raising program are to be implemented for the first time in Cambodia. The NIP provides an urgent kick-start to building national capacity in Cambodia from its current low baseline capacity on POPs reduction and elimination. The funding from GEF and the donor community is the appropriate solution in the current efforts of Cambodia in POPs reduction and elimination. The NIP is also intended to develop innovative and appropriate approaches to reconciling social, economic, health, and environmental objectives at farmers and workers levels, and to help build community participation systems aiming at POPs elimination. To achieve the national objectives related to all means of POPs management, the initiative priority activity projects that have been proposed are:

### **1. POPs-pesticides Reduction and Elimination Area**

- Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement,
- Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.
- Strengthen capacity on pesticides analysis focusing on POPs-pesticides,
- Raise public awareness on pesticides issues including POPs-pesticides and other obsolete pesticides,
- Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs-pesticides,
- Conduct full inventory on obsolete pesticides including POPs-pesticides,
- Undertake monitoring process on the trafficking of illegal pesticides including POPs-pesticides,
- Prepare a collection campaign for temporarily storage of the obsolete pesticides (including POPs-pesticides) in regional storage depots prior to disposal,
- Execute a Pilot Project for the disposal of a limited amount of obsolete pesticides,
- Execute a nation wide project for the disposal of all obsolete pesticides (including POPs-pesticides),

### **2. PCBs Management Area**

- Develop legal instruments and/or technical guidelines for managing PCBs release,
- Comprehensive Inventory of PCBs contaminated equipment and articles for environmentally sound management (ESM),
- ESM Management for “in use” equipment,
- Comprehensive assessment of socio-economic aspect project,
- ESM compliance of the maintenance and repairing activities of electrical equipment,
- Strengthen Lab capacities for PCBs analysis,
- ESM Management for “out of use” equipment,
- Provide and strengthen capacity and enhance public awareness on PCBs issue,
- PCBs database management,

### **3. Unintentionally Produced POPs Management Area**

- Revise or develop the legislations related to sound management of unintentionally produced POPs,
- Institutional strengthening and capacity building for sound management of unintentionally produced POPs,
- Develop programs for public awareness raising on unintended POPs by-products,
- Introduce and encourage sound waste management practices,
- Promote controlling landfills and prevention of uncontrolled burning of waste,
- Introduce and promote Best Available Techniques (BAT) & Best Environmental Practice (BEP) in existing waste incineration plants,
- Implement guidelines on BAT & BEP in existing unintentionally produced POPs release sources,
- Improve medical waste management practices,
- Inventory of unintentionally produced POPs releases,
- Evaluate the possibility of hazardous waste co-incineration in newly constructed cement kiln under BAT and BEP conditions,

### **4. Management of NIP Implementation**

- Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation,
- Establish and design the National Chemicals Database including POPs and persistent toxic substances (PTS) for centralization and exchanging of information,
- Develop draft law on chemicals management.

The above activities are to be undertaken over 20 years, but are divided into periods of five years, for the sound

management of and total disposal of POPs substances particularly pesticides and PCBs. The first four-year implementation of NIP will be set from 2007 to 2010. It is not possible to provide a precise total budget necessary for the planned activities to be executed within this period. Nevertheless it is possible to determine priority activities to be carried out in the first term of NIP execution. Priority activities are related to the capacity building of institutions, public awareness raising campaigns, the understanding on current trends of the traffic and release of POPs (full inventory of all groups of POPs), etc. The implementation of the above activities would be carried out by line ministries, particularly the Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Environment (MoE), and Ministry of Industry, Mines and Energy (MIME), under coordination support provided by the National Coordination Unit of the National Focal Point for the convention. The intended activities will then be to elaborate project proposals for funding, where the support will be from the government as well as from donor agencies.

The Royal Government of Cambodia is able to provide support for the implementation of the above priority projects including office space, utilities, some support staff, and some budget. In fact, this support alone is inadequate for the implementation of the Stockholm Convention. Thus, international assistance is needed to enable Cambodia to undertake the reduction and where as possible the elimination of POPs and manage them in an environmentally sound manner.

In conclusion, the implementation of the Stockholm Convention will be carried out within four years based on the identified priority activities/projects. The successful implementation of the above mentioned projects is based on the support provided by the government as an in kind contribution and international assistance.

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## **CHAPTER 1 : INTRODUCTION AND NATIONAL PROFILE**

## A. Introduction

Cambodia is a signatory state to the Stockholm Convention on Persistent Organic Pollutant (POPs); signed this convention on 23 May 2001 at Stockholm, Sweden. Bound by this convention, Cambodia affirmed its full commitment to cooperation with the international community for the reduction and elimination of POPs as regulated by the provisions of the convention based on the capacity of the country. Since Cambodia is a least developed country, the Royal Government of Cambodia has received financial assistance from the Global Environment Facility (GEF) through the United Nations Environmental Program (UNEP) for the preparation of the national implementation plan (NIP) for the Stockholm Convention, which was undertaken from 2003 through 2005. The UNEP suggested that Cambodia should pay attention to chemicals data collection (including POPs) in order to support chemicals management actions for safe public health and environment in the preparation of their national action plan. As a result, a National Profile on Chemicals Management was preliminary developed in 2005. This profile was prepared by the Ministry of Environment, with the support from main line ministries under supervision from the national consultant and technical consultants provided by the United Nations Institute for Training and Research (UNITAR).

Even if Cambodia has a National Profile on Chemicals Management, it does not mean that the overall trafficking of chemicals in Cambodia including POPs is properly managed with safe and sound environment safeguards throughout their lifecycles. In this regard and as bound by the convention, Cambodia has to have a proper plan for controlling the trafficking of chemicals particularly POPs to avoid harm to affect human health and the environment. This plan shall be in compliance with the goals/aims of the Stockholm Convention on POPs. The main provisions of the Stockholm Convention are:

- ❖ Prohibition/elimination the production and use of POPs,
- ❖ Encouraging the alternative use of other chemicals instead of POPs,
- ❖ Putting (listing) other hazardous (persistent) chemicals into new POPs group,
- ❖ Sound management of stockpile and other equipment contaminating POPs, and disposal in with sound environmental manner, and
- ❖ Encouraging participation for a POPs free future

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

- ❖ Strengthening institutional capacity for POPs managing and monitoring,
- ❖ Promotion of education and dissemination of POPs issues to the public and stakeholders,
- ❖ Develop/amend legal and policy frameworks related to POPs sound management, and provoke law enforcement,
- ❖ Develop a national action plan for the reduction and, where as possible, the elimination of POPs and effectively implement such legal instruments, and
- ❖ Strengthening mechanism for information exchange and research,

*Having seen the global concerns on the protection of human health and the environment affected by chemicals particularly the persistent organic pollutants (POPs) release into the environment, the Royal Government of Cambodia is committed in joining with the global communities to reduce and where possible to eliminate the release of POPs into environment within the country. Such commitment is clearly stated in the national profile on chemicals management which states that "The Royal Government of Cambodia strongly and fully supports this National Profile on Chemicals Management and safety chemicals management policy, responding to the obligations set under the Stockholm Convention". (Message of His Excellency Samdech Hun Sen, Prime Minister of the Royal Government of Cambodia, January 18, 2005, in his address to support the National Profile on Chemicals Management, publicized in January 2005).*

Responding to this commitment and as assigned by the Royal Government of Cambodia, the Ministry of Environment, as a National Focal Point for the Stockholm Convention, and with assistance provided by the UNEP/GEF, has prepared a National Implementation Plan for the Stockholm Convention on POPs, here in after called "NIP".

The outline of the NIP document is divided into four main parts: the Introduction and Background (Part 1), the National Action Plan (Part 2), the Proposed Priority Projects (Part 3) and Annexes (Part 4).

Part 1 of the NIP document describes the country's baseline including socio-economic profile (geography,

population, political and economic profiles, profile of economic sectors, and environmental overview, mainly focusing on POPs), institutional, policy and regulatory frameworks related to chemicals management including POPs, and assessment of the POPs issues in the country. The assessment of the POPs issues in the country is discussed as follows:

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

Part 2 of the NIP document is mainly focused on the strategy and action plan for implementation of the Stockholm Convention and setting up of goals, objectives, activities and tasks related to the sound management of POPs as well as responding to the issues addressed within the convention. Key problems associated with POPs issues in Cambodia are also mentioned in this part.

In order to solve POPs related issues in Cambodia, a number of actions have been identified and such actions are then grouped into four main sections which the first three sections addressing the three main groups of POPs (POPs-pesticides, PCBs, and unintentionally produced POPs) and the last section describing the coordination activities for NIP implementation.

Based on the identified activities, there are 32 proposed projects profiles elaborated in order to carry out the implementation of the Stockholm Convention on POPs effectively. The proposed project profile documents are written in the same format of contents including project name, goal, objectives, activities, key responsible agency, etc. (part 3). In addition, beside the three main parts, annexes (part 4) are also enclosed to provide supporting information.

The development of the NIP document is primarily based on the comments and feedbacks from key government institutions involved in chemicals management in Cambodia and from stakeholders who were invited to participate in various workshops including endorsement of national profiles on chemicals management, specific assessment of POPs, priority setting and national objectives determination, etc. More importantly, a number of meetings among the key governmental institutions (NCC meetings) were also set up to identify the key problems of POPs related issues and find out possible measure for addressing such problems.

## **B. Country Profile**

### **1. Social and Economical Profile**

#### **1.1 Geography and Population**

##### **1.1.1 Physical Geography**

Cambodia is a tropical country situated in South East Asia between latitudes 10° to 15° north and longitudes 102° and 108° east, where the length from north to south is 480 km and the length from west to east is 580 km. It shares borders with Laos to the North, Thailand to the North and West, and Vietnam to the East and South. Cambodia has a total area of 181,035 Km<sup>2</sup> territories with a coastline of about 435 Km.

Cambodia has a tropical monsoon climate with pronounced wet and dry seasons. The wet season lasts from May to October, with rainfall derived from the southwest monsoon drawn landward from the Indian Ocean. The dry season, from November to April, is associated with the northeast monsoon, which brings cooler air. From late July there may be periods without significant rainfall for ten or fifteen days or more at a time, referred to as the short dry season.

Most of Cambodia can be described as under sub humid climate. The wet season accounts for 80% of the annual rainfall. The average annual rainfall varies considerably across the country. Rainfall in the central area, covering the Tonle Sap Basin and Lower Mekong valley, averages 1,200 mm. The heaviest rainfall, over 3,000 mm per year, occurs along the coastal lowland in the west. Precipitation also varies widely from year to year.

Cambodia's topography comprises 4 main areas: the mountainous, plateau, floodplain and coastal zones. The mountainous area is situated at the border, mostly at the west and northern parts of the country, while the plateau area is located in north-east. The floodplain area is situated in the central part of the country surrounding the Tonle Sap great lake and Mekong River, while the coastal zone is located in the south-west.

### **1.1.2 Population**

The 2003 population of Cambodia is estimated at 13.77 million, of which 52% are women, with an estimated annual growth rate of 2.5% per annum (projected from the General Population Census of Cambodia 1998). About 84% of the populations live in rural areas and another 16% live in urban areas. Phnom Penh has an estimated population of 8.74% (about 1.3 million) and an annual growth rate of 3.5%.

Population density varies widely across the country with a national average of 76 persons per square kilometer. Six provinces located in the central plains and around the capital account for close to 60% of the total population; Battambang and Banteay Meanchey provinces, bordering Thailand in the west, account for a further 10% of the total population and Svay Rieng province, bordering Vietnam in the south-east, for another 5%. In contrast, other provinces, in particular Ratanakiri and Mondolkiri in the northeast, are only very sparsely populated (about 2% of total population).

## **1.2 Political Profile**

The Kingdom of Cambodia is a constitutional monarchy, and its constitution provides for a multiparty democracy. The constitution of the Kingdom of Cambodia officially entered into force on 24 September 1993 based on the results of national wide elections organized by the United Nations.

The King is a head of state as a symbol of state consolidation. Legislative, executive and judiciary powers are separated. Legislative power includes the senate, which consists of 61 members and the national assembly consisting of 123 members (third term of government). The executive branch comprises the prime minister supported by deputy prime ministers, senior ministers, ministers, and secretaries of state. The judiciary is an independent power and includes Provincial and Municipal Courts (lower courts), Military Courts, Appeals Court, and Supreme Court. Land administration comprises 20 provinces and 4 municipalities.

Cambodia's first commune elections were held in February 2002 to select chiefs and members of 1,621 commune (municipality) councils. The election results were largely acceptable to the major parties, but administrative procedures and commune development activities of the new local councils have not been fully implemented.

The Third National Assembly elections were held in July 2003. Two out of three parties that gained seats at the National Assembly formed the government. The Royal Government of Cambodia comprises 28 ministries and secretariats. Each Ministry is headed by a Minister supported by Secretaries and Under Secretaries of State; and each Secretariat is headed by a Secretary of State supported by Under Secretaries of State.

The constitution provides for a wide range of internationally recognized human rights, including freedom of the press. While limitations still exist on mass media, freedom of the press has improved markedly in Cambodia since the adoption of the 1993 constitution, which grants a certain degree of freedom to the media. The written press, while considered largely free, has ties to individual political parties or factions and does not seek to provide objective reporting or analysis. Cambodia has an estimated 20 Khmer-language newspapers that are published regularly. Of these, eight are published daily. There are two major English-language newspapers, one of which is produced daily.

Radio is a cost effective and influential medium with a vast reach into rural areas. The lack of an electrical network in most rural areas does not obstruct the distribution of information by radio, as batteries are commonly used in these areas. The size of radio audience in Cambodia is unknown but radio ownership is high. Radio programs therefore reach a large intersection of the public and it seems to be an opportune time to introduce programs relating to environmental issues. There are about 10 radio stations in operation but only two stations are regularly broadcasting environmental programs/news twice a week (the National Radio and Radio FM-103MHz).

Television (transmitting and cable TV) is becoming more widespread in large cities such as Phnom Penh, Siem Reap, Sihanoukville, and Battambang. There are 7 TV stations and a few TV cable stations are currently in operation. Most TV programs broadcasting can reach major high rural population areas including the northeast part of the country.

### 1.3 Economic Profile

#### 1.3.1 General economic profile

In spite of recent progress, per capita income and education levels are lower than in most neighboring countries and infrastructure remains inadequate. Most rural households depend on agriculture and its related subsectors. Manufacturing output is concentrated in the garment-manufacturing sector. This sector started to expand rapidly in the mid-1990s and employs more than 200,000 workers. The other main foreign currency earner is tourism. Angkor area is one of the country's national and international tourist attractions. The service sector is heavily concentrated in trading activities, hotels and catering-related services.

In 2004 (at constant 2000 prices), real GDP grew by 10.0%, as compared to the revised GDP growth of 8.6% in 2003 and 6.2% in 2002. Cambodia economy has strong grown by 13.4% in 2005 (at constant 2000 prices)<sup>1</sup>, reflecting stronger growth in the agriculture sector, continued expansion of exports, tourism and construction activities. The total GDP for 2004 and 2005 was 21,141 billion Cambodian Riels (approximately US\$ 5.265 billion), and 25,350 billion Cambodian Riels (approximately US\$ 6.195 billion). The economy is heavily dollarized. Other major macro economic indicators are shown in the below table.

**Table 1: Major macro economic indicators**

Indicators	2001	2002	2003	2004	2005
* GDP (thousand riels, current rate)	15,579	16,768	18,250	21,141	25,350
* GDP (thousand dollars, current rate)	3,970	4,276	4,591	5,265	6,195
<b>* Growth GDP by sectors and in total (at constant 2000 prices)</b>					
1 Agriculture	5.4%	-2.2%	12.1%	1.2%	16.6%
2 Industry	11.4%	17.3%	12.1%	16.4%	12.1%
3 Service	8.7%	6.3%	4.4%	11.7%	12.1%
4 Total GDP	7.7%	6.2%	8.6%	10.0%	13.4%
* GDP per capita (dollars)	<b>308</b>	<b>326</b>	<b>345</b>	<b>389</b>	<b>448</b>
<b>** Total investment (million dollars)</b>					
- Public investment	<b>280.7</b>	<b>354.4</b>	<b>298.3</b>	<b>304.7</b>	<b>283.9</b>
- National financing	58.3	40.9	48.8	62.8	66.8
- Oversea financing	222.4	313.5	249.5	241.8	217.1
- Private investment	<b>422.6</b>	<b>452.3</b>	<b>432.4</b>	<b>462.8</b>	<b>652.6</b>
- National financing	280.6	313.3	355.1	341.8	436.6
- Oversea financing	142	139	77.3	121	216
<b>** Total investment in percentage of GDP</b>					
- Public investment	7.4%	8.7%	6.9%	6.2%	5.3%
- Private investment	10.2%	12.2%	9.6%	9.5%	12.2%

Source: \* National Statistic Institute, Ministry of Planning, (June 2006)

\*\* Royal Government of Cambodia "Enhancing development cooperation effectiveness to implement the National Strategic Development Plan: 2006-2010", March 2006.

#### 1.3.2 Agricultural profile

Cambodia is an agricultural economy. Between 80% and 85% of the labor force is engaged in agriculture and related sub-sectors (fisheries and forestry), which contribute to about half of the country's GDP. Cambodia's main agricultural crop is rice, which is growing on over 90% of the currently cropped area. The second most important crop is rubber. However, favorable prospects are believed to exist for the production of other crops such as maize, soybeans, mung-bean, pepper and tobacco. Two main types of farming systems can be distinguished: rice-based systems and multi cropping systems. Five major rice growing systems exist in Cambodia: rain fed lowland rice system, dry season flood recession rice system, floating rice system, dry season lowland irrigated rice system, and upland rice system. Multi cropping systems predominate among the agricultural systems near the Mekong River, the upland brown and red soils systems, the black clay systems and the slash-and-burn systems.

The agricultural sector has much potential and provides the basis for the country's development. Wise management of Cambodia's rice and natural resource base is crucial for sustainable and equitable development. The principal goals of the government in the agricultural sector are the following: to ensure available food at both the national and household levels; to produce surpluses for export; to expand rubber production for increased foreign exchange earnings; to encourage the production of raw materials for local agro-industries; and to improve the well-being and income of the rural population.

<sup>1</sup> Data provided by National Statistic Institute, Ministry of Planning, June 2006

The status of agricultural cultivation areas and yields including crops, livestock and poultries, fisheries, and rubber are shown in the below table.

**Table 2: Crops production and area, 2001-2004**

Products	Area (Ha)				Production (Tons)			
	2001	2002	2003	2004	2001	2002	2003	204
<b>Crops</b>								
Rice	2,240,917	2,137,125	2,315,853	2,374,175	4,099,016	3,822,509	4,710,957	4,170,284
Maize	80,215	80,470	93,362	99,203	185,589	148,897	314,601	256,665
Yellow Maize	55,147	54,657	73,039	69,689	157,652	117,344	287,484	223,656
Cassava	14,239	19,563	25,740	22,749	142,262	122,014	330,649	362,050
Sweet Potato	7,225	8,136	8,717	7,316	26,252	31,530	34,897	35,138
Vegetable	35,311	34,433	36,090	32,604	184,640	143,175	139,626	179,050
Mung Bean	29,431	39,802	44,940	39,089	17,153	23,925	31,815	45,253
Pea Nut	11,913	13,840	14,563	19,213	8,913	9,738	18,483	21,543
Soya Bean	31,997	33,613	53,064	84,886	24,658	38,801	63,188	110,305
Sugar Cane	7,854	9,473	9,581	6,788	169,302	208,819	173,105	130,363
Sesame	20,158	20,852	33,991	64,470	8,957	10,157	21,957	54,954
Tobacco	8,554	4,078	6,407	1,708	4,662	2,501	7,601	2,479
Jute	203	485	490	633	203	636	561	880
<b>Total</b>	<b>2,543,164</b>	<b>2,456,527</b>	<b>2,715,837</b>	<b>2,822,523</b>	<b>5,029,259</b>	<b>4,680,046</b>	<b>6,134,924</b>	<b>5,592,620</b>
<b>Rubber</b>								
Rubber	2,165.35	29,118.61	-	23 786.93	43,054.00	32,774.00	-	26,056.03
<b>Livestock and poultry</b>								
Cattle (heads)					2,868,827	2,924,457	2,985,416	3,039,945
Buffalo (heads)					626,016	625,912	660,493	650,572
Pig (heads)					2,114,524	2,105,435	2,304,248	2,428,566
Poultry (heads)					15,249,447	16,677,864	16,013,713	13,990,592
<b>Total</b>					<b>20,858,814</b>	<b>22,333,668</b>	<b>21,963,870</b>	<b>20,109,675</b>
<b>Fisheries</b>								
Inland Fishery Capture					345,000	360,300	308,750	250,000
Marine Fishery Capture					40,000	45,850	54,750	55,800
Aquaculture					30,500	18,500	13,085	20,835
<b>Total</b>					<b>415,500</b>	<b>424,650</b>	<b>376,585</b>	<b>326,635</b>

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, April 2005

### 1.3.3 Industrial profile

Before 1993, Cambodia had very limited industrial investment. The investment in the industrial sector has improved since 1993, which is considered the basis year for industrial development in Cambodia. According to the stability of socio-economical development policy in Cambodia, other appropriate regulations particularly investment law, and Generalized System of Preference (GSP) provided by industrial countries; industrial development has rapidly increased, especially for textiles and wearing apparel. Textile and wearing apparel, dressing, dyeing of fur, food and beverages are the main industrial products, amounting to 11.4% of 2001 GDP (at constant 2000 prices). However, Cambodia's industrial sector is small-scale and is now looking forward to large-scale development in the near future.

#### 1.3.3.1 Manufacturing

According to the Ministry of Industry, Mines and Energy registration data, approximately 25,985 manufacturing operations (small and medium sizes) and about 371 manufacturing operations were active in Cambodia in 2003. Those manufactures provide approximately 260,061 jobs. The value of production for registered establishments in 2003 was estimated at \$US 1,711.59 million dollars. The value of production by textile, wearing apparel, and footwear is the major revenue and is followed by food, beverages, and tobacco.

**Table 3: Status of manufactures, employees and revenue, 2000-2003**

Industrial sectors	Unit	2000	2001	2001	2003
<b>Status of large manufactures</b>					
Food, beverage, tobacco	unit	31	31	31	34
Textile, garments, and leather products	unit	256	240	255	283
Wood and non-wood products	unit	12	07	07	07

Industrial sectors	Unit	2000	2001	2001	2003
Paper, paper products, and printing	unit	04	03	03	05
Chemistry and rubber products	unit	16	16	16	18
Inorganic mineral production	unit	10	11	11	11
Metal industries	unit	10	11	12	12
Other industries	unit	01	01	01	01
<b>Total</b>	<b>unit</b>	<b>340</b>	<b>320</b>	<b>336</b>	<b>371</b>
<b>Status of employees working for large manufactures</b>					
Garment sector	person	137,048	190,000	228,340	247,533
Other manufactures (excludes garment)	person	14,103	14,688	12,210	12,528
<b>Total</b>	<b>person</b>	<b>151,151</b>	<b>204,688</b>	<b>240,550</b>	<b>260,061</b>
<b>Total production by large manufactures</b>					
Food, beverage, tobacco	million US\$	53.20	55.14	32.68	35.88
Textile, garments, and leather products	million US\$	1,092.00	1,122.75	1,430.00	1,665.00
Wood and non-wood products	million US\$	-	-	-	-
Paper, paper products, and printing	million US\$	113.63	17.43	13.99	-
Chemistry and rubber products	million US\$	3.21	2.34	1.80	-
Inorganic mineral production	million US\$	-	-	-	-
Metal industries	million US\$	6.70	1.47	1.44	10.71
Other industries	million US\$	-	-	-	-
<b>Total</b>	<b>million US\$</b>	<b>1,268.74</b>	<b>1,199.13</b>	<b>1,479.91</b>	<b>1,711.59</b>

*Source: Annual Report of the Ministry of Industry, Mines and Energy, for five year planning (1998-2003), July, 2004*

### 1.3.3.2 Minerals

The most recent review of minerals in Cambodia was carried out by ESCAP in 1993 and confirmed the studies of the 1950's, which indicated the existence of significant mineral deposits in Cambodia, include sapphires, rubies, alluvial gold, alluvial cassiterite, silica, bauxite, manganese, slate, kaolin, coal, peat, lignite, pagodite, and phosphatide.

Mineral resources could play a significant role in the country's economic development. The mining industry in Cambodia is, at present, under-developed with little resource exploitation. The exception to this is the uncontrolled gem mining in the northwest. Excessive mining in the Pailin region has degraded the land and is assumed to be the main cause of increased siltation of the Sangké River in Battambang.

The first mining law was enacted in 1968. A new mineral law was approved and brought in official use on July 13, 2001. The establishment of an official mineral policy and legislation is an essential step in the development of Cambodia's mineral resources.

### 1.3.3.3 Energy

Main energy sources in Cambodia include petroleum products, gas, wood, biogas, draft animals, and biomass. Energy from coal has been used in small amounts in Cambodia's industrial sector. In the last several years, energy demand in Cambodia has increased due to the rapid growth of the economy and industrial production including transportation, services, and electrical power generation growth. Cambodia is a net importer of petroleum products and gas.

In Cambodia, the high volumes of petroleum products are used for electricity production purposes, industrial production processes, and in all means of transportation. Beside this, small amounts of petroleum product have been used for household cooking and lighting in rural areas. The specific data regarding petroleum use by the above categories is not available. Data recorded for petroleum imported in 2002 is 688,000 tons, including diesel at 53.4%, gasoline 14.6%, and fuel oil at 13.9%.

Cambodia began to use imported gas as an energy resource for cooking in 1992. Approximately 27,000 tons of gas was imported in 2002. This energy source is only used in urban areas and provincial towns; for poor people in rural areas, gas is beyond their reach due to high costs.

Firewood is the main energy source for Cambodian people. Firewood is used for household cooking, providing



about 90% of total household energy. Beside this, firewood is inherently linked to all other economic activity such as sugar palm production, alcohol production, drying agricultural products, and brick production. The trend of firewood demand in Cambodia was brought to national concerns regarding forest resource degradation and loss of multi-function forest reserves for this and next generations. Biomass, other than firewood, has been used as a part of energy supply sources in rural areas in order to reduce the use of firewood. Draft animal and biogas have been used mostly for cooking and a little bit for sugar palm production and alcohol production at the family level.

In Cambodia, the electricity generated from electrical power plants is supplied by fuel energy, hydropower plants, and renewable energy. Most of electrical power plants use diesel and heavy fuel oil which generate about 210 MW, or 83% of total electrical supply. Hydropower plants account for approximately 13 MW. Electricity generated from renewable energy is small, mostly used for public light and rural household use.

Regarding electricity supply for households, only 17% of Cambodian households (2,188,663 households) appear to have electricity. For Phnom Penh, about 133 MW of electricity supply was used in 2004 and the demand is expected to increase to 200 MW in 2006. Beside this, electricity supply for provincial towns and cities was 50 MW, provided by local production plus another 20 MW, imported from neighboring countries (Thailand and Vietnam) in 2004, which is expected to increase to 200 MW by 2010.

## 1.4 Environmental Overview Related to POPs Substances

### 1.4.1 POPs-Pesticides

#### 1.4.1.1 Pesticides background

There is no statistical data and information related to the import and use of pesticides in agricultural production from the time they were first introduced into Cambodia in the 1950s to 1984. The reason for not having such information is mostly related to the destruction of all administrative records and documents in Cambodia during the Khmer Rouge Regime.

During the period from 1985 to 1992, pesticides have been imported and distributed by the Government under the supervision of Compagnie Centrale des Matériels Agricoles (COCMA) of the Ministry of Agriculture, Forestry and Fisheries (MAFF) from the former Soviet Union and Eastern European countries. Some of these pesticides were already banned for use in some countries, such as DDT, endrin, etc., which are known to be hazardous. Most of the pesticides shown in the table below were imported not only by the government but also received as international aid assistance. There were only two POPs-pesticides which were imported during this period: DDT and endrin (reported by COCMA/MAFF). This distribution was made only when an outbreak of pests occur. In addition, farmers were also unable to get pesticides due to economic embargo in force at the time. Thus, the amount of imported pesticides was small, approximately 121.91 tons of powder pesticides and 264,640 liters of liquid pesticides during the period from 1985 to 1992, used over cultivation areas of about 1,700,000 ha throughout the country. All of these imported pesticides were brought to the country by donor agencies under aid assistance.

**Table 4: Pesticides imported by the government of Cambodia, (1985-1992)**

PESTICIDES		Quantity of Pesticides Imported							Total	
		1985	1986	1987	1988	1989	1990	1991		1992
POWDER (tones)	aluminium phosphate (gastoxin)							2	13.37	15.37
	copper ii sulphate 5h <sub>2</sub> o			3.69	2.9	3.02				9.61
	DDT	0.23	0.14	0.07	0.6		0.18			0.18
	trichlorfon (chlorophos)				24.02	14.54	5.27	2.66	0.01	46.5
	zinc phosphide	11.23	4.3	5.49	4.12	5.95	2.14			33.23
	zineb			3.01	2.9	3		7.07		7.07
	<b>TOTAL</b>	<b>11.46</b>	<b>4.44</b>	<b>12.26</b>	<b>34.54</b>	<b>26.51</b>	<b>7.59</b>	<b>11.73</b>	<b>13.38</b>	<b>121.91</b>
LIQUID (thousand liters)	azodrin ( <i>monocrotophos</i> )			4.29	21.07	16.54	21.45	1.83	0.41	65.59
	cypermethrin								8.23	8.23
	diazinon								1	1
	dichlorfos ( <i>dichlovos/ddvp</i> )			9.03		8.99			0.8	0.8
	endrin	1.898	0.024							1.922
	fenvaterate								4	4
	<i>filitox (methamidophos)</i>						11.71	2.82		14.53
	malathion	7.04	0.43							7.47
	meliphos			2.05						2.05

	<i>metaphos (methyl parathion)</i>	24.99	43.63	35.28	21.04	6.77				131.71
	sumicidin								2.56	2.56
	<i>wofatox (methyl parathion)</i>							6.76		6.76
	<b>TOTAL</b>	<b>33.93</b>	<b>44.08</b>	<b>50.65</b>	<b>42.11</b>	<b>32.3</b>	<b>33.16</b>	<b>11.41</b>	<b>17</b>	<b>264.64</b>
<b>Cultivated Areas (thousand Ha)</b>		<b>1,462</b>	<b>1,535</b>	<b>1,215</b>	<b>1,764</b>	<b>1,646</b>	<b>1,497</b>	<b>1,890</b>	<b>1,701</b>	<b>----</b>

Source: *Agricultural Statistics, 1993*, Compagnie Centrale des Matériels Agricoles, MAFF.

After 1992, information related to the precise use of pesticides throughout Cambodia is still not available as no institution is accountable for the distribution of pesticides. All imported pesticides are distributed by the private sectors and there is no reporting and monitoring system in place on the distribution of pesticides.

It is known, however, that the Khmer Rouge Regime imported 840 tons DDT and 1250 sprayers from Hong Kong in late December 1976<sup>2</sup>, but there is no information on where DDT applications were made and for what purposes. Approximately 23 tons of DDT remains from the Khmer Rouge Regime. Further imports of about 120 tons were made between 1981 and 1987 under a donation program by WHO, the Red Cross from Holland and the former Soviet Union as humanitarian aid for the public health sector. No imports were reported after 1987 for public health, except for use at a rubber plantation which halted its imports in 1991.

Since 1993 up to the present some POPs-pesticides are still used to protect crops and mainly for termite control in constructions. However, there is no official record and/or precise data and information to support the above claims regarding the amount of POPs-pesticide imported and used during this recent period. Nevertheless, the last official import of DDT for the agricultural sector was registered in 1991 (by MAFF). For endrin the last import took place in 1992.

A recent preliminary inventory on POPs-pesticides (First quarter of 2004) showed that some amounts of DDT powder and chlordane can be found in local markets. Some observed DDT powder could be a fraud as it was formulated in Cambodia using some kind of mineral (white) powder with methamidophos. In addition, the POP pesticide "dieldrin" was also tracked in consumer products, i.e. mosquito coils. (Message after analysis of sample, by Jan Betlem)

#### 1.4.1.2 POPs-pesticide residues in fish and mussels in Cambodia

Cambodia does not have the ability to examine POPs-pesticides residues in biological samples, including fish or mussels, due to the lack of expertise, professional officers as well as lack of laboratory facilities.

However, from 1996 to 1998, scientific research on residues of POPs-pesticides contamination in fish or mussels in Cambodia was carried out by the Japanese Research Group from Yokohama City University and Ehime University, in cooperation with the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries. For the survey, freshwater and marine water fishes and mussels were collected to be analyzed in Japan. The research aimed to examine the levels of contamination of DDT and chlordane in fish and mussels. Results of this research are shown in the tables below.

**Table 5: Concentration of POPs-pesticides (ng/g) in fish and mussels in Cambodia (1997-98)**

Sample	DDT		Chlordane	
	(fat wt)	(wet wt)	(fat wt)	(wet wt)
Fish	300	8.1* (0.51-25)**	3.4	0.11 (0.03-0.34)
Mussel	-	0.5 (0.25-1.6)	-	0.12 (0.06-0.16)

Note: \* mean / \*\* range

Source: *Organochlorine Contamination in Fish and Mussels from Cambodia and Other Asian Developing Countries*, Shinsuke Tanabe, In Monirith, Haruhiko Nakat, Mafumi Watanabe, Shin Takahashi, and Touch Seang Tana

<sup>2</sup> Ben Kiernan (1996) "The Pol Pot Regime: race, power, and genocides in Cambodia under the Khmer Rouge, 1975-1979". Yale University, ISBN: 974-7100-43-6. (See p.146).

**Table 6: Concentration of POPs-pesticides (ng/g) in fish in Cambodia (JSRC, 1996)**

Location	DDT	Chlordane
	(fat wt)	(fat wt)
Marine:		
- Koh Kong	79* (14 - 140)**	3.2 (0.1 - 7.4)
- Sihanouk Ville	68 (8 - 240)	2.2 (0.2 - 6.3)
Inland:		
- Tonle Sap	450 (11 - 2000)	4.6 (0.5 - 16)
- Up Mekong	290 (25 - 840)	3.0 (1 - 6)
- Low Mekong	100 (34 - 270)	2.1 (1 - 4.1)

**Note:** \* mean / \*\* range

**Source:** *Organochlorine Contamination in Fish and Mussels from Cambodia and Other Asian Developing Countries, Shinsuke Tanabe, In Monirith, Haruhiko Nakat, Mafumi Watanabe, Shin Takahashi, and Touch Seang Tana*

According to the survey results, it was shown that:

1. DDT was the most detected compound in both fish and mussel samples, with concentrations ranging from 0.51 to 25 ng/g wet wt. in fish and 0.2 to 1.6 ng/g wet wt. in mussels. Chlordane contamination was also found at lower levels in fish ranging from 0.03 to 0.34 ng/g wet wt., and in mussels ranging from 0.06 to 0.16 ng/g wet wt.;
2. DDT was found to have higher contamination levels in freshwater fish (450 ng/g fat wt.) than in marine water fish (80 ng/g fat wt.). This suggests that the usage of DDT in inland areas which belong to the Mekong and Tonle Sap River Basin and are used for agriculture and aquaculture purposes is more frequent; and
3. There was no significant difference between chlordane concentration in both freshwater fish (4.6 ng/g fat wt.) and seawater fish (3.2 ng/g fat wt.), which suggests less usage of this pesticide.

According to the study on pesticide residues in fish samples in Cambodia, the concentration of the residues in fish still seem to be low compared with values from other Asian countries and pelagic countries.

#### 1.4.1.3 POPs-pesticide residues in ground water

Recently a survey on pesticide residues contaminated ground water (well water) was conducted by the World Health Organization (WHO) in cooperation with the Ministry of Rural Development. The location of the survey concerned well water in rural areas where pesticides have been used predominantly for agricultural purposes. In this survey, 46 pesticides including five POPs-pesticides (aldrin, chlordane, DDT, dieldrin and heptachlor) were targeted for analysis with the laboratory tests taking place in Australia. The final results showed that there were no pesticides (including POPs-pesticides) detected in any of the samples collected (Drinking Water Quality Assessment in Cambodia, 2001).

#### 1.4.2 PCBs Dielectric Fluid

##### 1.4.2.1 Electrical background

Electricity was first introduced to Cambodia in 1906 by the Compagnie des Eaux et Electricité (CEE), Union d'Electricité d'Indochine (UNEDI) and Compagnie Franco-Khmer d'Electricité (CFKE). CEE was responsible for supplying electricity to Phnom Penh and its vicinities, while UNEDI operated throughout the country with the exception of Battambang province which was supplied by CFKE.

In 1958, the Cambodian government purchased the CEE's and UNEDI's concession rights to form the Electricité du Cambodge (EDC) to generate, transmit and distribute electricity in Phnom Penh and provinces throughout Cambodia. From 1970 to 1979, EDC's facilities were destroyed. After 1979, EDC was rehabilitated and re-integrated into an administrative structure under the Ministry of Industry and was then transferred to be under the management of Phnom Penh municipality in 1991, under the name of Electricité de Phnom Penh (EDP) to manage the electricity supply in Phnom Penh while the electricity generations in the provinces were managed by the Provincial Department of Industry. In 1992, EDP was again renamed Electricité du Cambodge and was transferred to the Ministry of Industry. After the national election in 1993, EDC was restructured under the Ministry of Industry, Mines and Energy (MIME), former Ministry of Industry, and was responsible for the development, management and operation of power system in Phnom Penh. Power utilities units in the provinces are under the control of provincial authorities, which receive budgetary support through MIME.

In March 1996, by Royal Decree No Nor.Sor/96 (dated on 9 March 1996), EDC became a wholly state-owned

limited liability company to generate, transmit and distribute electricity in Phnom Penh and some provinces. EDC is responsible for its profit and losses and liable for its debts to the extent of the value of its assets. At the moment EDC controls the power supply systems in 14 provincial towns including Phnom Penh Municipality. The remaining provincial towns are under the control of the Provincial Department of Industry, Mines and Energy (DIME) and some are under the responsibility of the private sector.

The largest power system is Phnom Penh, which has a population of 1.3 million and more than 149,922 electricity customers (in 2004). It accounts almost for 70 per cent of the country's electricity consumption, with a peak production of 133 MW (of which EDC provided 62 MW and IPPs provided 71 MW). The peak demand is expected to increase to 200 MW in 2006 and to 649 MW in 2020. As of 2004, the total energy generation was 642 GWh, including power from IPPs CUPL, Jupiter and CETIC (Hydropower Kirirrom I). The total installed capacity for provincial towns is estimated to be about 50 MW with plant sizes ranging from 0.3 MW to 10 MW. Peak demand is expected to increase to 200 MW in 2010 and to 342 MW in 2020.

#### **1.4.2.2 PCBs dielectric use's trend**

Since 1906, transformers, other equipment, and some electrical accessories have also been used for the purpose of power generation, transmission and distribution to the consumers which can be categorized as: domestic, services and industry. Up to the present, electricity is concentrated in the load centers to be used for domestic, services and industry consumers. The agricultural sector is typically located in the rural areas where, up to this time, the electricity grid cannot be extended to serve it due to the lack of funds.

Experience in the past showed that dielectric fluid was reused through the use of a purifying transformer oil machine owned by the EDC workshop. This also continues today, but the reused dielectric fluid is now used mainly as refill oil for old transformers, especially for the provincial utilities and local private power suppliers which have limited funds.

Two workshops currently exist for repairing transformers: one belonging to the EDC for repairing transformers under the control of EDC or from other private utilities or enterprises upon request; and one run by a local private company which primarily repairs transformers for provincial power utilities and private power suppliers in the small towns or at the district level. Regarding the repairs, the transformers were damaged by short circuit currents or overloads or sometimes they required changing voltages for adapting to the distribution systems (from 15 kV to 22 kV). In general the transformers had to have the dielectric fluids drained and the covers opened. The dielectric fluids were put through purified oil transformer machines for refilling. It is worth noting, however, that the workshop staffs were unaware of the negative impacts of dielectric fluids that sometimes contaminated PCBs.

There are various types of power transformers, classified by voltages, used in Cambodia: 115/22 kV; 22/0.4 kV; 15/0.4 kV; 10/0.4 kV; and 6.3/0.4 kV.

After the training provided by the Ministry of Environment in cooperation with UNEP/GEF under the National Implementation Plan Project in early January 2004, all stakeholders gained greater understanding about the negative impacts of PCBs. They have not, however, had the chance to convert to the use of the new transformers with mineral oil dielectric fluid, except for the state owned utility EDC, which has the opportunity to reverse the use of PCBs in transformers through new projects supported by the World Bank (WB), Asian Development Bank (ADB), Japanese Grant, Agence Française du Développement (AFD), and Nordic Development Fund (NDF). Generally these all offer transformers or capacitors free of PCBs. The rest of the transformers with PCBs-contaminated dielectric fluid could be used up to the end of their lives; this can be seen as the green light for stopping the use of PCBs.

Based on inventory records, it was known that there are projected 1600 transformers available in Cambodia, of which 1343 units had been inspected and recorded. Among the recorded transformers, there are about 465 transformers that are PCBs-free, while about 762 units were regarded as PCBs assumed, and the remaining 116 units fall into the PCBs-contaminated category.

#### **1.4.3 Unintentionally Produced POPs Substances**

Cambodia is not an industrialized country and is mainly agriculture base. However, livelihood activities involved in the contribution of pollutants release into the environment include unintentionally produced POPs resulting from burnings and emission at various sources including cooking, transportation, power generation, incineration of wastes at dumping sites and backyards, crematories, secondary metal smoldering, etc.

In this regard, Cambodia has a different and complex situation regarding the generation of unintentionally produced POPs (dioxins/furans) compared to other developed and developing countries. The estimation of the generation and

release of dioxins/furans into the environment in Cambodia is based on the UNEP Toolkit. Based on this toolkits and the inventory survey, the release of dioxin/furan was approximately **606.664 g.TEQ** discharged into the environment every year. Most of the releases come from uncontrolled combustion process and wastes incineration, which contributed to about 97% of the total releases. There are 10 categories of the release sources of unintentionally produced POPs, based on the UNEP Toolkit namely:

1. Waste incineration
2. Ferrous and non-ferrous metal production
3. Power generation and heating
4. Production of mineral products
5. Transport
6. Uncontrolled combustion processes
7. Production of chemicals and consumer goods
8. Miscellaneous
9. Disposal/Landfill
10. Potential Hot-Spots

The reason why the release of dioxins/furan into the environment is quite large from uncontrolled combustion and wastes incineration process is that first of all, POPs issues particularly dioxin/furan are relatively new subjects for Cambodia. Most Cambodian citizens as well as officials are not aware of how the dioxin/furan is generated/formed, what kind of burnable materials and combusting process cause the formation and release of such pollutants.

Secondly, about 34.7% of Cambodian people (NSDP: 2006-2010, p.13) are below the poverty line (income less than half dollar a day). In this regards, those people are looking for extreme low cost and/or free of charge burnable materials, i.e. wastes (garment wastes, used tires, used oil, etc.), for cooking energy, instead of firewood. There is a lack of alternative energy sources to be used for cooking and other purposes. When such alternatives are available, local people cannot afford them.

Another factor leading to the release of dioxin/furan into the environment is the lack of national regulations controlling combustion in all forms, including vehicles, power plants, factories, handicraft, etc. In addition, sources of burning materials are not adequately regulated for the protection of the environment and public health from impacts of pollutants release via emission.

Burning of wastes whether at landfills, backyards, and in agricultural fields are the most common practices. At dumping sites, landfill managers neglect to control fire and burn waste to reduce volume. Burning of waste in backyards is always done by the population, generally those living in suburbs. Such burning, in practice, never separates the wastes but instead, incinerate all burnable materials including plastic, unused clothes, garden wastes, unused household things, etc. Sometimes, garden waste and agricultural wastes may be contaminated with pesticides as well. There is no information related to the sources and quantity of the release of such substances into the environment.

## **2. Institutional, Policy and Regulatory Framework**

### ***2.1 Environmental Sustainable Development Policy and General Legislative Framework***

The issues of the environment was stated within the national constitution under article 59, describing that *“the State shall protect the environment and balance of abundant natural resources and establish a precise plan of management of land, water, air, wind, geology, ecological system, mines, energy, petrol and gas, rocks and sand, gems, forests and forestry products, wildlife, fish and aquatic resources”* and article 64 stated that *“the State shall ban and severely punish those who import, manufacture, and sell illicit drugs and counterfeit and expired goods which affect the health and life of the consumer.”*

The environmental law called the “Law on Environmental Protection and Natural Resources Management” was adopted by the National Assembly on 24 December 1996. This law contains 11 chapters and 27 articles, but it does not intend to provide specific environmental management systems, codes and standards. However, it is a fundamental framework for the development of environmental regulation such as sub-decrees, ministerial declarations, circulations, codes and standards for environmental quality protection and natural resources management in the Kingdom of Cambodia.

The main purposes of this law are to protect environmental quality from polluting by chemicals and other hazardous wastes through inventory and environmentally sound management of pollutants. This law also focuses on the sustainable management of natural resources in order to promote the socio-economic development of the country. Furthermore, the law on environmental protection and natural resources management also mentions some points

related to the marine environmental management including coastal resources management.

Nevertheless, during the second term of the Royal Government of Cambodia (1998-2003) a number of environmental legislations and legal instruments were developed and approved, aiming to support the effectiveness of the implementation and enforcement of the Law on Environmental Protection and Natural Resources Management. The approved environmental legislation and other laws related to natural resources management are the following:

- Sub-decree No.27 Or-Nor-Kror.Bor-Kor on water pollution control, issued on 6 April 1999.
- Sub-decree No.36 Or-Nor-Kror.Bor-Kor on solid waste management, issued on 27 April 1999.
- Sub-decree No.42 Or-Nor-Kror.Bor-Kor on air pollution and noise disturbance, issued on 10 July 2000.
- Sub-decree No.72 Or-Nor-Kror.Bor-Kor on environmental impact assessment, issued on 11 August 1999.
- Law on the management and exploitation of mines resources, adopted on 13 July 2001
- Law on the management of quality and safety of products and services, adopted on 21 June 2000,
- Law on pharmaceutical management, adopted on 09 May 1996,
- Decree law on fisheries management, adopted on 09 March 1987,
- Sub-decree No.69 Or-Nor-Kror.Bor-Kor on standard and management of agricultural materials, issued on 28 October 1998,
- Forest Law adopted on 31 August, 2002

Besides the national legal instruments, a number of international conventions/treaties and protocols related to environmental management and protection were also signed, accessed and ratified by the Royal Government of Cambodia. These conventions/treaties and protocols include:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, entered into force on 5 May 1992 (Cambodia accessed on 02 March 2001)
- United Nations Framework Convention on Climate Change, 1992, entered into force on 21 March 1994 (Cambodia ratified on 18 December 1995)
- Kyoto Protocol 1997, entered into force on 16 February 2005 (Cambodia accessed on 4 July 2002)
- Vienna Convention for the Protection of the Ozone Layer, entered into force on 22 September 1988 (Cambodia accessed on 27 June 2001)
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, entered into force on 1 January 1989 (Cambodia accessed on 27 June 2001)
- The International Convention for the Prevention of Marine Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto "MARPOL 73/78", fully entered into force on 2 October 1983 (Cambodia ratified on 1994)
- The Stockholm Convention on Persistent Organic Pollutants, entered into force on 17 May 2004 (Cambodia signed on 23 May 2001)
- United Nations Convention to Combat Desertification, entered into force on 26 December 1996 (Cambodia ratified on 18 August 1997).

The above are the national and international legal instruments adopted and ratified by the Royal Government of Cambodia with aim to protect Cambodia's environment from chemicals pollution and prevent adverse effects on human health and the environment.

## ***2.2 Principles of Existing Legislation and Regulations Addressing POPs (manufactured chemicals and unintentionally produced POPs)***

Based on the above legal instruments, there are few laws and regulations addressing POPs issues such as the ban of POPs-pesticides, limits PCBs waste in liquid discharge standards, etc. Nevertheless, these regulations do not describe in detail measures to deal with POPs substances related issues as well as management procedures for the protection of human health and the environment from adverse impacts of POPs. In general, still present, Cambodia does not have any law that deal with the management of POPs in detail with regards to the production, transportation, distribution, use and final disposal.

Because of the absence of laws and regulations dealing with POPs, Cambodia has not yet prepared law for the management of chemicals. If Cambodia had a law for managing chemicals, thus provisions dealing with POPs substances would be integrated in such a law.

### 2.3 Role and responsibility of governmental institutions in lifecycle management of POPs

Until now, the Royal Government of Cambodia has only been considering the management of persistent organic pollutants and the safe use of chemicals including pesticides. Thus, non governmental institutions have been more involved for the sound management of POPs. There are four main ministries involved in the sound management of POPs: the Ministry of Environment (MoE), the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Health (MoH), and the Ministry of Industry, Mines and Energy (MIME). The activities of these ministries are described below:

**Table 7: Responsibilities of Government Institutions in lifecycle management of POPs**

Governmental Institutions	Stages of Chemicals Life-Cycle							
	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/Handling	Emergencies	Disposal
Ministry of Environment	x	x	x	x	x	x	x	x
Ministry of Agriculture Forestry and Fisheries	x	x	x	x	x	x	x	x
Ministry of Health	x	x	x	x	x	x	x	x
Ministry of Industry Mine and Energy	x	x	x	x	x	x	x	x

The main four governmental institutions described above have different roles and responsibilities for managing chemicals including POPs determined by the Royal Government of Cambodia as summary below.

#### 2.3.1 Ministry of Environment

The Ministry of Environment is an institution under the Royal Government of Cambodia responsible for promoting environmental protection and conservation of natural resources throughout the Kingdom, thus contributing to improving environmental quality, public welfare, national culture and the economy. The Ministry facilitates the development and implementation of policies, plans and legal instruments to promote and ensure the rational use of and management of the country's natural resources. Simultaneously, the Ministry has the role of motivating and supporting public participation in decision-making to resolve environmental and natural resource use issues. In carrying out its mission, the Ministry collaborates with other Ministries of the Royal Government, other institutions, national and international organizations, non-government, the private sector and the people of Cambodia.

The role and responsibilities of the MoE are determined by Sub-decree No. 57 on the Organization and Functions of the Ministry of Environment, approved by the Council of the Ministers on 25 September 1997. Pursuant to this sub-decree, the MoE's functions can be divided into four main parts: Policy Development Function, Implementation Function, Management Function, and Coordination Function.

The ministry's frameworks and its functions were determined under article 3 of the Sub-decree on the Organization and Functioning of the Ministry of Environment as mentioned in the following point.

- To exercise environmental policy with sustainable development and to propose the National and Regional Environmental Action Plans in cooperation with other ministries,
- To prepare and implement environmental legal instruments aiming to ensure sustainable development,
- To review and evaluate the Environmental Impact Assessment (EIA) of all proposed existing and on-going projects and activities, both public and private,
- To advise relevant ministries on the conservation, development, and management of natural resources as prescribed in Article 59 of the Constitution,
- To administer the National Project Areas System (following the Royal Decree on the "Creation and Designation of Protected Areas") and to propose new areas to be put in the system,
- To prepare inventories, which describe the source, nature and amount of pollutants, and to take measures to prevent, reduce, and control environmental pollution,
- To prepare inspection procedures, as mentioned in Article 19 of the Law on Environmental Protection and Natural Resources Management,
- To prepare and conduct environmental educational programs applying to all levels, including to local communities in cooperation with relevant ministries, national and international organizations,
- To compile, analyze and manage environmental data,

- To initiate and prepare any proposals to the Government to reach the goals of international agreements, conventions, and memorandum of understandings related to environmental protection, and to implement such international instruments,
- To promote incentives to those investments which facilitate environmental protection and nature conservation,
- To cooperate with National Organizations, NGOs, foreign governments and local communities in order to ensure the environmental protection in the Kingdom of Cambodia.

The management structure of the MoE is divided into central and provincial administrations. The central administration is the core ministry, which is composed of seven main technical departments. These departments are responsible for the environmental issues including environmental policy and legal affairs, nature conservation and protection, pollution control management, natural resources assessment and environmental data management, environmental education and communication, environmental impact assessment, and international relation on environment. Furthermore, the provincial administrations are located within 24 provinces and municipalities, which are called Provincial Environmental Department (PED). These are responsible for provincial environmental management within their own territory.

The Ministry of Environment had not begun to manage unintentionally produced POPs until the Royal Government of Cambodia signed the Stockholm Convention on 23 May 2001. As a result, a national policy for unintentionally produced POPs management has been prepared.

Regarding chemicals management, the Ministry of Environment cooperates with other governmental institutions, national and international organizations, non-governmental organizations, and private sectors for monitoring environmental quality (water, soil, and air), controlling sources and the release of environmental pollutants, and participates in collecting, compiling, and managing data related to toxic and hazardous chemicals, and managing all kinds of waste for a safe environment.

### **2.3.2 Ministry of Agriculture Forestry and Fisheries**

The national policies for the management of chemicals are stated in the Constitution of the Kingdom of Cambodia under Articles 59 and 64. Under this national umbrella law, many provisions for chemicals management including pesticides and fertilizers have been developed and adopted for use. The main provisions related to the management of POPs-pesticides including DDT used for combating malaria have been specified in Governmental Ordinance No. 69 on "Standards and Management of Agricultural Materials", issued on 28 October 1998.

Related to chemicals management, the Ministry of Agriculture, Forestry, and Fisheries has responsibilities for the management of agricultural materials including the four main sectors of pesticides, chemical fertilizers, veterinary medicines, and feed stuffs through controlling import, trading, use and disposal within the Kingdom of Cambodia. The Ministry has obligations to develop agricultural materials, management policy and legal frameworks, and promote public awareness in the safe use of agricultural materials in order to improve agricultural productivity, food safety, food security, and public welfare.

Based on Government Ordinance No. 69 on "Standards and Management of Agricultural Materials", MAFF was assigned its role and function to manage all kinds of pesticides-related issues in Cambodia. So, the management of POPs-pesticides seems to be also under the responsibility of the MAFF. In addition, recognizing the serious hazards that POPs and the application of POPs-pesticides pose to human health and the environment, MAFF, as the responsible ministry for the management of pesticides, has issued guidance and controls on pesticides (Article 34/GR No.69) by producing a ban list of pesticides including POPs-pesticides used in the Kingdom of Cambodia.

Furthermore, the declaration on the creation of the Bureau of Agricultural Material Standards No. 038-MAFF (dated 21 January 1999) in Article 2 states that "the Bureau of Agricultural Material Standards (BAMS)", with technical advice from concerned institutions, acts as the assisting unit to the Ministry of Agriculture, Forestry and Fisheries, and is responsible for registering and enforcing measures to control the quality of agricultural materials, such as pesticides, criteria fertilizers, seeds and planting materials, veterinary medicines, feed stuffs and feed additives. The function and duties of the BAMS are indicated below:

- to register and issue permission for agricultural material exploitation;
- to register or annul the registration or revoke the permission for agricultural material exploitation;
- to promulgate guidelines on registration of agricultural materials;
- to establish quality standards according to the specifications of each agricultural material to be exploited or used;
- to control agricultural material exploitations; and
- to cooperate with concerned ministries, and to determine and control agricultural exploitation and their compounds.



In addition, technical advice for registering and enforcing measures to control pesticides is the responsibility of the Department of Agronomy and Agricultural Land Improvement (DAALI), of which the Plant Protection and Phytosanitary Office is an implementation organization. Article 1, Paragraph 3 of MAFF Ministerial Prakas No. 522 issued on 30 September 2003 states that: DAALI has a mandate to follow up on crop production and analyze the technical factors related to agricultural materials supporting crop production or to trade, which affect crop production development. Paragraph 8 of the same Article also mentions DAALI's mandate to control the quality of agricultural material used in crop production and measure its application.

However, a policy has yet to be developed regarding the safe and sound management of POPs-pesticides (as a final product or as contamination in other products such as mosquito coil). Nevertheless, all POPs-pesticides are included in the "Ban List of Pesticides" for use in the Kingdom of Cambodia. In addition, 116 common names of pesticides including all POP and PIC pesticides are found in this Ban List that prohibit use in Cambodia. The government has also encouraged the use of pesticide alternatives in plant and crop protection through the implementation of IPM (Integrated Pest Management) and SARUP (Safe and Responsible Use of Pesticide).

Besides the above mentioned governmental ordinance, there are other national legal instruments for the management of POPs-pesticides. The following list applies:

- MAFF Ministerial Declaration No. 038 MAFF, dated 21 January 1999, on the creation of the Bureau of Agricultural Material Standards. The Bureau of Agricultural Material Standards, with technical advice from concerned institutions, acts as the assisting unit to the Ministry of Agriculture, Forestry and Fisheries, and is responsible for registering and enforcing measures to control the quality of agricultural material such as criteria for fertilizers, pesticides, seeds and planting materials, veterinary medicines, feed stuffs, and feed additives.
- MAFF Ministerial Guideline No. 345, dated 21 October 2002, on implementation of Governmental Ordinance No. 69 on "Standards and Management of Agricultural Materials". This Guideline clarifies the procedure of exploitation; registration; import-export; annulment of exploitation or registration; packaging and labeling; disposal of waste or packaging material and banned pesticide; storage and continued selling of pesticide; prohibition of exploitation; pesticide advertising; duties of exploiter; management and control.
- MAFF Ministerial Prakas No. 598, dated 15 December 2003, on the list of pesticides in the Kingdom of Cambodia. The Prakas has formulated three lists of pesticides relevant to the Kingdom of Cambodia, namely: (1) List of pesticides banned for use; (2) List of pesticides restricted for use; and (3) List of pesticides permitted for use in the Kingdom of Cambodia.

### **2.3.3 Ministry of Health**

The Ministry of Health is responsible for the development of overall health policy direction, regulation and legislation based on the governmental policy goals to improve health, managing the systems of pharmaceutical production, business and distribution of medical and paramedical equipment to all private and public units, and examining and following-up of food safety. In addition, MoH is also responsible for hospital waste management including waste separation and incineration of infectious waste including plastic.

Concerning the use of chemicals for the public health sector, the MoH have the right to import, distribute and use chemicals for vector born disease including DDT and spraying applications. The use of DDT primarily falls under the mandate of two ministries: the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Health (MoH). However, the management of DDT regarding the import license, registration, storage, and disposal seems to be the responsibility of only the MAFF. In general, the import, distribution, and use of DDT for other purposes rather than public health are under the responsibility of the MoH.

Based on articles 59 and 64 of the national constitution, many provisions for chemicals management including DDT have been covered in national laws, governmental ordinances, circulations, and related Prakas. The main provisions concerning the direct management of pesticides including DDT substances are specified in:

- Governmental Ordinance No. 69 Or-Nor-Kror/Bor-Kor on "*Standards and Management of Agricultural Materials*", issued on 28 October 1998;
- Governmental Ordinance No. 27 Or-Nor-Kror/Bor-Kor on "*Water Pollution Control*", issued on 6 April 1999;
- Governmental Ordinance No. 36 Or-Nor-Kror/Bor-Kor on "*Solid Waste Management*", issued on April 27, 1999; and
- Other circulations issued by concerned ministries to improve the enforcement of the above regulations that indicated the management of chemicals including DDT substance.

Key provisions related to the management of DDT are mainly stated in Articles 11 to 23 of the Governmental Ordinance No. 69, Articles 15 to 21 of the Governmental Ordinance No. 36, and Articles 6 to 11 and Annex 2 and 5 of the Governmental Ordinance No. 27 for the purpose of agricultural and environmental protection only.

Besides the above three Ordinances, no other regulation thus far has been developed for the management of DDT being used for public health whether in the form of a final product or as contamination in other products such as mosquito coil. The MoH has one governmental law on “Pharmaceuticals Management” that was issued on 9 May 1996. However, this law fails to address the use of DDT and its application for safe and sound environmental management.

Nevertheless, the last import and use of DDT for public health took place in the late 1980s. The Ministry of Health itself is committed to no longer use or reuse DDT for vector born disease control in the future due to its ban under the governmental ordinance 69, as well as there are many alternative chemicals to be used in the public health sector.

### **2.3.4 Ministry of Industry Mines and Energy**

The Ministry of Industry, Mines and Energy is responsible for promoting the development of industrial activities, and for producing and using chemicals in the industrial sector. This Ministry also plays the important role of promoting mineral exploration and exploitation activities, and power sector development. Most importantly, the Ministry has the obligation to create the development of legislation, policy, and planning related to industrial aspects including industrial chemical management.

The issue of PCBs-generated risk to the environment and human health was brought for consideration in Cambodia in mid-2003. That is why it is hard to say which governmental ministry is responsible for the management of PCBs, as this chemical substance has been used mainly in the power sector. In fact, the management of PCBs and its contaminated materials and equipment in Cambodia appears not to be the sole responsibility of one particular ministry, but instead requires joint management. This refers to the mandate of governmental ministries regarding chemicals management issue.

To date, there is no restriction pertaining to the importation of PCBs oil or PCBs containing equipment under MIME responsibility. However, in Cambodia, many provisions for chemicals management including PCBs substance exist in other related laws, decrees, sub-decrees etc.. Provisions related to the management of chemicals and chemicals wastes including PCBs was specified in sub-decree No. 27 on Water Pollution Control issued on April 6, 1999 and under sub-decree No. 37 on Solid Waste Management, issued on April 27, 1999. Such regulations do not detail the management of PCBs and its release into the environment. No policy, however, has been developed yet for the management of PCBs substance whether in the form of a final product or as contamination in other products like dielectric fluid.

It is recognized that there are no clearly assigned duties for one particular ministry/institution to be responsible for the management of PCBs as used in dielectric fluid. However, the Ministry of Environment seems to be a lead agency for managing PCBs wastes while MIME seems to be responsible for the use of PCBs in dielectric fluid.

## **2.4 Relevant International Commitments and Obligations**

International legal instruments seem to be ahead of related national legal instruments as POPs are a global issue. There are some international conventions that have addressed the proper management of POPs substances whether as production, import, export, use, or disposal of. These conventions include:

### **2.4.1 Stockholm Convention**

The Stockholm Convention on Persistent Organic Pollutants (POPs) entered force on 17 May 2004. Cambodia has not ratified or accessed this convention yet. The main concept of the Stockholm Convention on POPs refers to the precautionary approach as set forth in Chapter 19 of the Rio Declaration on Environment and Development. The objective of this Convention is to protect human health and the environment from POPs. There are 12 persistent toxic substances currently addressed by this Convention, among them 9 chemical substances are used as pesticides, 1 chemical is used in industrial sector (electrical sector), and 2 chemicals are intentionally produced POPs or (POPs by-products).

The main provisions of the Stockholm Convention are:

- ❖ Measures to reduce or eliminate releases from intentional production and use, importation and exportation of chemicals listed in **Annex A**; or take any measure to ensure the disposal of chemicals listed in **Annex A** or **Annex B** with environmental sound management. (**Article 3**),
- ❖ Measures to reduce or eliminate releases from unintentional production derived from anthropogenic sources of each of the chemicals listed in **Annex C**; with the goal of their continuing minimization and where feasible,

ultimate elimination. (**Article 5**),

- ❖ Measures to reduce or eliminate releases from stockpiles and waste consisting of or containing chemicals listed either in **Annex A** or **Annex B** and waste, including produced and articles upon becoming wastes, consisting of, containing or contaminated with a chemicals listed in **Annex A, B** or **C**, are managed in a manner protective of human health and the environment. (**Article 6**)
- ❖ Chemicals listed in **Annex A** including aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, and polychlorinated biphenyls (PCBs); while DDT substance was listed in **Annex B** and **Annex C** listing the following chemicals: polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans (PCDD/PCDF), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs).

### **2.4.2 Basel Convention**

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989 and entered into force on 5 May 1992. Cambodia accessed the Basel Convention on 2 March 2001. By 8 April 2005, there 165 countries ratified this convention. The main purpose of this convention is to control the “transboundary” movements of hazardous wastes, that is, the movement of hazardous wastes across international frontiers. This convention also developed criteria hazardous wastes and guideline for “environmentally sound management”. In addition, a Control System, based on prior written notification, was also put into place.

The Basel Convention is a global instrument for minimizing and controlling international trade in transboundary hazardous wastes. This Convention also mentions hazardous wastes, which belong to the categories listed in Annex I to the Convention or those that are considered as hazardous by the domestic legislation of either the Party of export, import or transit (Article 1.1).

This Convention provides a shared responsibility of exporting and importing states for environmentally sound management and disposal of such wastes. The term of “environmentally sound management” is defined under Article 2.8.

The Basel Convention outlines the general obligations for contracting states. It provides, inter alia, that Parties must not export wastes to another Party, which has declared a prohibition on the import of such waste (Article 4.1). The Convention also requires contracting states to take the appropriate measures to minimize the generation of hazardous and other wastes, and ensures that they have adequate disposal facilities for environmentally sound management (Article 4.5).

If the wastes need to be transported, they must be packaged and labeled (Article 4.7). Furthermore, written notifications, documents and permission of wastes movement must be developed and distributed among export, import and transit states in accordance with Annex V(A) of the Convention before the movement of wastes take place (Articles 6.1, 6.2 & 6.4).

### **2.4.3 Rotterdam Convention**

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC Convention) was adopted on 10 September 1998 and entered into force on 24 February 2004. Cambodia has not accessed this convention yet. This convention has the objective to promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export, and by disseminating these decisions to the Convention’s Parties.

In addition, the PIC also addressed the Scope of the Convention (Article 3), which is:

- Applies to banned or severely restricted chemicals; and severely hazardous pesticide formulations, and
- Does not apply to narcotic drugs and psychotropic substances; radioactive materials; wastes; chemical weapons; pharmaceuticals (including human and veterinary drugs); chemicals used as food additives; food; and chemicals in quantities not likely to affect human health or the environment provided they are imported (for the purpose of research or analysis; or by an individual for his or her own personal use in quantities reasonable for such use).

The subject of POPs substance was also addressed in the PIC Convention and this substance was listed in Annex III: chemicals subject to the prior informed consent procedure. This provision does not explicitly make any statement about POPs contaminated in equipment like transformers and capacitors.

To sum up the above, these three conventions deal with different aspects related to the sound management of POPs substances. The Basel Convention addresses the transboundary movement of wastes while the PIC

Convention deals with informing Member States involved with import, export and transit of chemicals. Aside from these two conventions, the Stockholm Convention intends to eliminate the use of and the stockpile of POPs substance by taking legal and administrative restricted measure on the importation, exportation, production and use. The import, export, produce and/or use of POPs substances by contracting state can be applicable unless they obtain special exemption or approval for acceptable purposes to protect public health or to dispose of with environmentally sound manners.

## **2.5 Summary Description of Key Approaches and Procedures for Managing Chemicals**

There are no specific main solutions and measures for POPs management yet, but the same solutions and measures as for other general chemicals may apply. Main measure for managing general chemicals in Cambodia as the following:

- Procedure for controlling general chemicals importation,
- Procedure for controlling fertilizer and pesticides importation and exploitation,
- Procedure for controlling banned pesticides, and
- Procedure for controlling chemicals severely restricted for use

The above four procedures are determined by law and declarations to ensure effective management of chemicals without negative impact on public health and the environment. However, these procedures general focus on the management of general chemicals. But for POPs, there has been less consideration and interest, with the exception of the procedure for controlling exploitation of fertilizers and pesticides, which describe some banned and used of pesticides including POPs. The import of PCBs has to comply with the procedures for general chemicals importation. These procedures are described hereafter.

### **2.5.1 Procedure for controlling general chemicals importation (declaration of import as for quality and safety issues)**

The importation of chemicals and products is managed under other technical provisions, which generally complies with customs procedures, but ought to be monitored for their conformity related to quality and safety of the products by a specific institution, currently, the CAMCONTROL Department of the Ministry of Commerce. This additional control by this institution complies with the following procedure:

#### **2.5.1.1 Controlling the import application (document verification):**

This procedure aims to control the import application form that importers have to submit to the competent authority for cross border permission. The import application form for cross border permission and related documents must be submitted to the competent authority at least one week in advance before goods arrive at the border. The documents to be submitted to the competent authority consist of:

- Certificate of quality specification issued by the competent authority of the exporting country;
- Export license;
- Import permit from relevant government agencies regulated products;
- Chemical safety card of the imported substances;
- Bill of lading;
- Invoice;
- Packing list; and
- Declaration on the intended uses in Cambodia.

After receiving the import application form, the competent authority will control all importation documents; investigate the import company's background, and verify that the chemical substances and products comply with national and international technical regulations and standards.

#### **2.5.1.2 Controlling Products at Border Checkpoint**

When the import license is granted, the companies or transportation service agencies take the documents related to the imported goods and actual goods for the competent authority at the border to control goods. The controlling of the goods, before receiving a permit to import, aims to conduct basic examination including existing documents and chemical law and regulation requirements, and control on product labels, formulation packaging, physical characteristics of substances packaged.

In some cases, the importation of goods has temporary entry permission with conditions as follows:

- Examine the quality and safety of chemicals products by taking samples for analysis and comparing such results with national and international regulations after the goods were temporary permitted to be imported and stocked,
- Analyze the quality and safety of chemical products which can be conducted in both internal and external laboratories as applicable,
- Return to imported source origin in cases where the chemical substances and safety products contained are of unacceptable quality or are unsafe products as illustrated by laboratory analysis results with respect to national and international regulation requirements,
- Provide legal import authorization to importers in cases where the chemical substances and safety products are appropriate with national and international regulatory requirements supported by results of laboratory analysis.

### **2.5.2 Procedure for controlling fertilizers and pesticides importation and exploitation**

The main objectives of this procedure are to promote the legal compliance related to the improvement of fertilizers and pesticides management in Cambodia and for enhancing people's health and the economic sector. The Ministry of Agriculture, Forestry and Fisheries is the authority responsible for implementation of procedures in pesticides and chemical fertilizers exploitation and trade. In addition, the Ministry of Environment is responsible for collaboration in managing the disposal of chemical fertilizers and pesticides in terms of safety for the environment.

In order to receive the right to import chemical fertilizers and pesticides, the importers are required to submit the application to the competent authority for registration. Physical or legal persons who are or want to be in the business of pesticides shall be registered and authorized by the Ministry of Agriculture, Forestry and Fisheries. Pesticides that do not register or do not permit temporary use by the Ministry of Agriculture, Forestry and Fisheries will be prohibited from import, production, formulation, packaging, wholesale, etc.

#### **2.5.2.1 Registration**

There are 4 kinds of registration for pesticides:

- **Temporary Registration:** This registration shall be made for all categories of pesticides mentioned in the notice of authorization for temporary use by the Ministry of Agriculture, Forestry, and Fisheries and being circulated for sale in markets,
- **Registration with Conditions:** This registration shall be made for any pesticides for which the initial registration is requested but the data or other necessary conditions shall be additionally provided according to the technical requirements of the Ministry of Agriculture, Forestry and Fisheries,
- **Full Registration:** This registration shall be made for any pesticides for which the registration applicant has fulfilled every technical requirement of the Ministry of Agriculture, Forestry and Fisheries,
- **Authorization to Use for Experimentation:** This authorization to import pesticides which have not yet been authorized for use, with the purpose to carry out research only.

The registration validity is 3 years in cases where there is no withdrawal or cancellation. The new authorization will be provided within the same period. In case of failure to ask for new registration, the validity will be automatically cancelled. The extended registration certificate can be provided for a one-year period in cases of reasonable cause.

#### **2.5.2.2 Permitted Use**

- For pesticides with packaging label written in Khmer,
- Every pesticides packaging material shall correspond to the standard fixed by Ministry of Agriculture, Forestry, and Fisheries.
- Manners and conditions to keep pesticides shall be determined by Ministry of Agriculture, Forestry and Fisheries and for the installation of warehouse for keeping pesticides shall be authorized by the Ministry of Agriculture, Forestry, and Fisheries with approval from the Ministry of Environment.
- For the disposal and destruction of remnants or materials for wrapping up pesticides shall be authorized by the Ministry of Agriculture, Forestry, and Fisheries with approval from the Ministry of Environment.
- All advertisements on pesticides through any means shall be authorized by Ministry of Agriculture, Forestry, and Fisheries. Advertisement can be authorized only for pesticides that have already been fully registered.

### **2.5.3 Procedure for controlling banned pesticides**

This procedure primarily focuses on banned chemicals for use for the purposes to protect public health and environmental quality by avoiding the danger of highly toxic pesticides according to WHO and FAO guidelines on

classification of pesticides hazards. The Government of Cambodia has banned 116 chemical substances included 9 POPs-pesticides (Government Ordinance No. 69 on Standard and Management of Agricultural Materials):

### **2.5.4 Procedure for controlling chemicals severely restricted for use**

This procedure primarily focuses on combating narcotic drugs production. The Royal Government of Cambodia has restricted certain chemical substances that could be used as raw materials for drug production through the declaration of the Ministry of Industry, Mines and Energy No 110, dated February 11, 2004, on management and control of import-export and distribution of industrial chemical substances that could be used as raw materials for drug production. However, this procedure does not describe the management of POPs including PCBs substances.

## **3. Assessment of the POPs Issue in the country**

### **3.1 Assessment for Annex A Part I chemicals (POPs-pesticides)**

#### **3.1.1 Production, import-export and use**

Cambodia, so far, is an agricultural based country and for industrial sector is mainly depend on garment and food processing. That is why no local production and formulation of pesticides, including POPs, in Cambodia have been registered up to now. Exporting of POPs pesticides is also unavailable. All pesticides, including POPs, which have been used in Cambodia, are imported from abroad.

It is known that the use of POPs-pesticides in Cambodia began a long time ago (perhaps since the 1960s) and still continues today. However, there are no records with regards to when POPs-pesticides were initially applied in Cambodia until the beginning of the 1980s, but we do know that POPs-pesticides, such as DDT and endrin, are the most common ones known by Cambodia's older generations. From 1985 to 1992 these two POPs were imported and distributed by the governmental company COCMA/MAFF to be used in the agricultural sector of Cambodia. Within this period, COCMA imported approximately 121.91 tons of powder pesticides and 264,640 liters of liquid pesticides to be used for pest control over cultivation areas of about 1,700,000 ha throughout the country, of which there were about 1.22 tons of DDT and 1922 liters of endrin.

The findings of the recent POPs-pesticides inventory (2004) have shown that there are about 450 kg of powder called DDT and 53.7 kg of chlordane available on Cambodian markets. Some DDT powder could be a fraud as it was formulated in Cambodia by using some kind of mineral powder with probably methamidophos. Most likely, these amounts are actually higher as only a limited and preliminary inventory could be carried out at this stage. Such POPs chemicals are generally used for pest control in the field as well as for termite control to protect buildings. In addition, the dieldrin was tracked to consumer products, i.e. mosquito coils<sup>3</sup>.

The government regulation related to the management of pesticides (Sub-Decree 69 on Standards and Management of Agricultural Materials) has been enacted since October 1998. A set of detailed guidelines to implement this basic regulation was prepared and the POPs-pesticides were banned from use in December 2003 by MAFF Ministerial Prakas No. 598 on the three pesticides lists for the Kingdom of Cambodia. In this regard, Cambodia has no intention to use POPs-pesticides for agricultural purposes. However, due to the weakness of law enforcement and other constraints, practical application of these legislative instruments has not really happened up to date.

Legislation related to the management of pesticides banned for importation and use of severely toxic pesticides including POPs is not implemented. Illegal import, distribution and use of POPs-pesticides is still happening in Cambodia. The reason are legislations recently enacted and inadequate monitoring and law enforcement mechanisms including capacity, experience, techniques, facilities...etc.

#### **3.1.2 Stockpiles, Contaminated Sites and Wastes, identification,**

##### **3.1.2.1 Stockpile**

Based on the POPs-pesticides inventory undertaken, about 450 kg of DDT and 53.7 kg of chlordane are available in large markets. Among these figures, it was observed that the DDT was available in the markets of Kampong Cham province with amount of 100 kg, Kandal province with 180 kg, Phnom Penh capital city with 160 kg, and Kampong Thom with 10 kg. The DDT products were generally packaged in aluminum tanks (jars) with no labels attached. No

<sup>3</sup> Samples of mosquito coil was brought for analysis in the Netherlands by international expert on pesticides (Mr. Jan Betlem) in early 2004 during field practice on pesticide inventory.

information related to these powders is available (including information related to the active ingredient, trade name, manufacturing name, company, etc.). However, local people including the seller, and the task team confirmed that the material consisted of DDT. Other products packaged in small boxes are also called DDT by local people, but in fact, they contain carbaryl substance.

Although only small amount of POPs-pesticides (DDT and chlordane) are available on markets, it was assumed that such POPs-pesticides may exist in larger quantities and may be kept at private stores for distribution. However, due to lack of cooperation from the public and sellers in giving information, the POPs-pesticides inventory team could not find storage sites or distribution sources of these two POPs-pesticides and others.

Along with POPs-pesticides available on markets, there were also about 24,841 kg and 100 liters of obsolete pesticides stored in the warehouses of the Department of Agronomy and Agricultural Land Improvement (DAALI) of the Ministry of Agriculture Forestry and Fisheries (MAFF) located in Obek-Kaom district, Phnom Penh. Among the 16 groups of obsolete pesticides, none belongs to POPs-pesticides. Currently such obsolete pesticides are waiting to be disposed. Detailed information on the obsolete pesticides observed during the inventory is shown in the below table.

**Table 8: The obsolete pesticides stored in DAALI's Warehouse (April 2004)**

No	Names		Formulation	Container			Quantity		Year Mgt / Batch / lot No	Country Mgt, donor, source
	Common	Commercial		Type	Condition	No.	Kg	Liters		
1	2,4,5 T	2,4,5 T	20 WP	Paper	Bad	340	5279		1986	Russia
2	Aluminum phosphine	Celphos	tablet	Aluminum	Good		1182		1995	India
3	Cabaryl	CABARYL	WP	Plastic sack	Bad	16	381		1982	Russia
4	Carbofuran	Furadan 3 H	WP	Paper sack	Bad	60	300		1987	Vietnam
5	Carbofuran	Furadan 3 H	WP	Plastic sack	Good & bad		210		1988	Thai. (CWS)
6	Diazinon	Diazinon	30 EC	Glass	Good	16		16	1987	CWS
7	Diazinon	Basudin	WP	Paper	Bad	6	29		1985	Vietnam
8	Diphenamid	Enid	WP	Aluminum	Bad		5		1988	CWS
9	Fenitrothion	Sumibass	WP	Metal drum	Bad	1		21	1987	OXFARM
10	fluometuron	COTORAN	80 WP	Paper drum	Good	136	2001		1985	Russia
11	Formothion	Anthio	EC	Metal drum	Good			63	1987	Bulgaria
12	TCA-sodium	TCA-sodium	20 WP	Plastic sack	Bad	716	14899		1986	Russia
13	Thiobencarb	Saturn	WP	Paper	Bad	101	505		1987	Vietnam
14	Unknown	Caratan	WP	Paper	Bad		15		1985	Bulgaria
15	Unknown	Peroxin	WP	Paper	Bad		20		1987	Bulgaria
16	Unknown	Fondasol	WP	Paper	Bad		15		1985	Bulgaria
<b>TOTAL:</b>							<b>24841</b>	<b>100</b>		

**Source:** Inventory report on Agricultural POPs-pesticides, Ministry of Environment, 2004

### 3.1.2.2 Contaminated sites

Without experienced and/or laboratory analysis activities, research and evaluation, it is hard to identify which soils and sites are contaminated by pesticides including POPs-pesticides. However, based on local knowledge, there are three main groups of target areas that are regarded as potentially contaminated by pesticides (including POPs-pesticides) such as warehouses, plantation areas, and lowland exposure areas. The information below has been obtained from local-knowledge sources and could be verified in the field during the inventory activities.

#### (a) Warehouses

Warehouses in Cambodia are where repackaging of pesticides take place before distribution to clients. Such repackaging activities lead to spillage and leakage of pesticides, both powders and liquids. There are currently about 25 warehouses operating in Cambodia and most of them are public warehouses that are operated by the MAFF. Other pesticides warehouses have been turned to construction sites or abandoned.

Both the existing and abandoned warehouses could be classified as potentially contaminated sites due to their history of spillage and leakage. Sometimes the smell of chemicals can be detected at former warehouses used to stock DDT for the healthcare sector. Based on limited search activities undertaken during the inventory, three public

(government) warehouses could be registered as contaminated sites. Based on experience in other countries, not professionally cleaned-up warehouses should be considered as contaminated sites.

### **(b) Plantation areas**

Some plantation areas are also assumed to be pesticides-contaminated sites, due to the use of pesticides for crop protection. The types of plantation that can be considered to be the most contaminated site by pesticides are the vegetables plantation where farmers strive to ensure that vegetables are of excellent quality. With limited knowledge on the safety and efficient use of pesticides and no knowledge on sound environmental management, farmers are happy to use a large number of pesticides mixed together in an attempt to kill all pests simultaneously. Sometimes the pesticides have been applied just before the rain, and re-applied after the rain. The second class of potential pesticides-contaminated sites includes crop (grain) plantations, fruit plantations, and flower plantations.

Part of Cambodia's paddy fields may be considered as minimally contaminated by pesticides because in general most rice farmers do not want to use pesticides because rainfed farming is generally not threatened by pest (contrary to dry based rice farming). In addition, the price for pesticide is high, making them unaffordable for farmers.

### **(c) Exposure areas (water reservoir)**

Another type of potentially contaminated site by pesticides is exposure areas (water sources: reservoirs, lakes, ponds, canals...etc.) where rainwater brings pesticides residues from surrounding agricultural sites. Sometimes people use water downstream from plantations and can identify pesticides in the water by smell, indicating that such water is seriously contaminated by pesticides.

In conclusion, among the three areas of pesticides-contaminated sites, it can be assumed that warehouses (old sites) and plantation areas, particularly vegetable areas, are the most heavily contaminated sites requiring further consideration. Exposure areas follow this. However, it is difficult to produce information on the level of contamination, type of contaminating chemicals, and the grade of impact on human health and the environment at these areas due to the fact that no scientific research or study about these issues has been undertaken. Nevertheless, contamination can sometimes be detected in these areas due to smell, color, etc. even a very long time after storage and/or use of the pesticides.

## **3.1.2.3 Waste management**

### **(a) Waste management policy**

The waste management of obsolete pesticides is generally addressed under Governmental Ordinance No. 69 on "Standard and Management of Agricultural Materials". However, there is no specific waste management policy in Cambodia for obsolete POPs-pesticides. Obsolete pesticides waste disposal in general has been specified in article 23 to the Governmental Ordinance No. 69 (dated 28 October 1998). The article states that "*any disposal of or destruction of waste or material wrapping of pesticides of businessmen shall be authorized by the Ministry of Agriculture, Forestry and Fisheries with approval from the Ministry of Environment*". In addition, MAFF has issued Ministerial Ordinance No. 345 (dated 21 October 2002) on "Implementation of Government Regulation No. 69 Standards and Management of Agricultural Materials".

Furthermore, obsolete pesticides are regarded as hazardous waste by Governmental Ordinance No. 36 on "Solid Waste Management" issued on 27 April 1999, which states that the disposal or destruction of hazardous waste shall be made separately from other wastes including general wastes.

### **(b) Waste reception/disposal facilities**

No wastes reception or disposal facility for (POPs-) pesticides exists in Cambodia. In general, the obsolete pesticides, most likely packaging and contaminating materials, are practically wasted away in the environment surrounding application areas or burnt down in backyards with other domestic waste. This is because of no requirement for returning obsolete pesticides including packaging materials and empty containers to the suppliers. As a result, empty containers and obsolete pesticides are wasted away in backyards (on agricultural farmland) and sometimes dumped with municipal waste.

## **3.1.3 Future Production, Use and Releases of POPs – requirements for exemptions**

Cambodia has only small and light industries generally associated with crops processing and garment. This means that Cambodia is not a heavy or chemically industrialized country. Most of chemical products, including pesticides, are imported. Currently, neither pesticides production nor formulation takes place in Cambodia.



It is clear that in the medium-term, there will be no production or formulation of POPs-pesticides in Cambodia for agricultural purposes. Furthermore, Cambodia has banned the use of 116 chemical pesticides, which includes all 9 POPs-pesticides. As such, there is no future requirement of POPs-pesticides for use in the agricultural sector.

According to the legal binding limit by regulation of all POPs-pesticide in the Ban List, Cambodia does not require any requests for specific exemption of POPs-pesticides for agricultural use in the future.

### **3.1.4 Existing programs for Monitoring of Releases and Environmental and Human Health Impacts**

There are currently no scientifically based programs monitoring the use of POPs-pesticides in Cambodia because Cambodia does not have the ability and capacity of observing, monitoring, and analyzing POPs-pesticides in the environment as well as in agricultural products. No information and data was recorded on the residue of pesticides in the environment and agricultural consumer products as well as their impacts on human health.

Some NGOs have drawn attention on collecting POPs-pesticides through limited questionnaires and have asked for information from the public. However, such activities just undertaken at some hot spots where there is some concern regarding the use of POPs-pesticides particularly vegetable planting.

The limited pesticides imports and use in Cambodia so far (1980s) have lead to negligence in setting up a monitoring program. Secondly, the institutional capacity at both human recourse and facilities for this type of work is very limited as well as budget allocation for monitoring operations.

Eventhough we do not have any study on the impacts on the environment and human health caused by POPs-pesticides, research conducted by the Japanese Research Institute in collaboration with relevant ministries has confirmed that POPs-pesticides residues are found in agricultural products (fishes and mussels). The results of the research has shown that fish contains DDT approximately 300 ng/g (fat wt.) or about 8.1 ng/g (wet wt.) while mussel contains only 0.5ng/g (wet wt.), (Source: *Organochlorine Contamination in Fish and Mussels from Cambodia and Other Asian Developing Countries*, Shinsuke Tanabe, In Monirith, Haruhiko Nakat, Mafumi Watanabe, Shin Takahashi, and Touch Seang Tana, 1997-1998.).

### **3.1.5 Awareness, education and mechanism for information exchange**

POPs are a relatively new subject for Cambodia so that no information about this issue has been disseminated so far. Furthermore, neither an educational program nor public awareness campaigns have been introduced this issue yet. After Cambodia signed the Stockholm Convention, and started the formulation of the NIP, awareness raising on POPs issues started via trainings/workshops, meetings, printed materials and media to key stakeholders (only for relevant ministries, academic institutes, NGOs, local authorities).

In addition, there is no existing educational curriculum related to pesticides including POPs yet in Cambodia, but some extension programs such as IPM and SARUP have set up their own approach to minimize the use of pesticides in crops production. Their programs aim to educate the farmers on the following issues:

- The use of alternative measures for controlling pests;
- The cause of hazards related to the use of pesticides;
- The use of low toxicity pesticides with less impact to non-targeted pests (friendly insects); and
- The use of pesticides judiciously with the intention to protect human health and the environment.

These programs have limited activities due to limited resources including financial support. Nevertheless, the IMP and SARUP programs have managed to broadcast on television and radio.

The general public has, in general, no knowledge/awareness on POPs-pesticides issues. This is due to the fact that the mass media sector is not disseminating information about POPs issues related implications for human health and the environment to the general public.

### **3.1.6 Technical infrastructure for assessment, measurement, analysis, management, and research of POPs-pesticides**

The Department of Agronomy and Agricultural Land Improvement of the Ministry of Agriculture, Forestry and Fisheries established a pesticide analysis laboratory in 2001 to serve as a pesticides evaluation tool for implementing its duty on pesticides management in the country. Unfortunately, this laboratory is unable to analyze POPs-pesticides due to lack of equipment, facilities and capacity.

Some staff working in the pesticide analysis laboratory have been supported by the Agricultural Productive

Improvement Project (APIP) to undertake a short term training course on pesticides analysis in Australia and obtained experience from technical assistance through on-the-job and in-service training for one year in Cambodia. However, this is insufficient capacity to deal with the POPs-pesticides problem in Cambodia. Staffs have reported that they need additional training from other projects to gain capacity for POPs-pesticides analysis.

Until now the laboratory, which has been set up at a temporary location, does not have enough facilities to undertake multi-range analyses of pesticide problems. The existing equipment is as follows:

- HPLC (High Performance Liquid Chromatography);
- TLC (Thin Layer Chromatography);
- GC (Gas Chromatography); and
- Xhoclet

However, due to the shortage of financial support and human resources, the above-mentioned laboratory still cannot operate at the moment. A detailed assessment should be made to identify the capacity and shortages of the laboratory.

The pesticide analysis laboratory of DAALI/MAFF is not part of any group or organization and not accredited with any regional or international organization.

### **3.1.7 Identification of impact on public health and the environment**

Scientific information or statistic data related to the impact of POPs on human health and the environment has never been compiled. However, based on the survey made by international experts, it was concluded that some Cambodian people may be affected by POPs-pesticides due to residues of DDT found in fishes and mussel.

The identification of impacted populations or environment by POPs as well as estimated scale and magnitude of threats to public health and environmental quality is not available due to the fact that there is no scientific research yet undertaken. However, also based on international available information, it can be concluded that public health might be impacted.

There is still not enough data for identification of POPs-pesticides impacts on human health and the environment, but some priority concerns or risks have been observed during the survey conducted by the plant protection and phytosanitary office. They are as follows:

- The main crop cultivation area, where most pesticides including POPs are applied, are located on both sides of the Mekong River and around the Tonle Sap lake basin. Those areas have been flooded each rainy season by the Mekong River flood;
- There is no monitoring and evaluation system which can ensure that the level of contamination in all water sources (open water and underground water) surrounding crop cultivation areas is acceptable or safe to drink by humans and animals (included wildlife);
- Farmers in general have very limited knowledge on pesticide toxicity and hazards, which could be a risk to the applicator, consumer and environment. More than two-thirds of pesticide applicators are still not accompanied by proper use of personal protection equipment. Some surveys have reported on the use of pesticides to protect salted fish (as food) from fly larva. In addition, regarding the understanding on the importance of labels, there is no attention from the farmers and applicators, in one hand, and on the other hand, most labels are written in foreign languages, which farmers could not understand leading to improper use, under dose use, and improper time for collecting products...etc. These problems contribute to health risks to pesticides applicators, agricultural products consumers, and the environment;
- Low levels of awareness of pesticide sellers on technical properties of pesticides and regulation on pesticide management lead to fraudulent trade (for example, selling some other powder or formulating false products) and may provide recommendations on non-scientifically mixed pesticide cocktails to solve a pest problem;

Other concerns or problems that can be identified include:

- Lack of specific institutional structure and related mandate for POPs-pesticide management;
- DAALI, the organization that has mandatory responsibility as the technical adviser to MAFF on pesticide evaluation in pesticide management, has limited capacity;
- Complicated and long process of pesticide registration in Cambodia which could lead to unclear responsibility of the related organizations;
- Lack of specific national policies for POPs-pesticide management;

- Banning of a pesticide that is still permitted to be used in neighboring countries may lead to difficulty in managing the smuggling trade;

To conclude, the real impact on the environment and human health could not be assessed within the time and means provided for this preliminary survey. A longer and more detailed project or program in collaboration with national stakeholders (governmental and non-governmental) should be formulated and implemented. Such a project or program should include all important aspects of awareness raising, prevention (including revision of existing laws and regulations), institutional strengthening and capacity building of all relevant institutions, and disposal of all obsolete pesticides stocks.

## **3.2 Assessment for Annex A, Part II Chemicals (PCBs)**

### **3.2.1 Production, import-export and use**

Cambodia is not an industrial country. So, all electrical equipment including lamps, cable, and transformers are not produced in Cambodia. There is no export of such electrical products.

The use of electrical equipment containing dielectric fluid (transformers, capacitors, circuit breakers, etc.) begun in 1906 when Cambodia started using electricity. The investment on electricity was first introduced to Cambodia by the Compagnie des Eaux et Electricité (CEE), Union d' Electricité d'Indochine (UNEDI) and Compagnie Franco-Khmer d'Electricité (CFKE). Since the demand of electricity has become wider, the electrical network has also been expanded and along with this process, many transformers have been imported to secure supply.

There is no information on the date and numbers of equipment imported to Cambodia. Based on information from the Électricité du Cambodge (EDC), before 1975, electrical equipment was imported from Japan, and Yugoslavia; between 1975-1979 from China; and between 1979 to 1992 from former Soviet Unions and East European countries, and after 1992 until now from Thailand, South Korea, Germany, ...etc.

Transformers produced in the 1950s and 1960s are still in operation. In addition, there are about 1600 transformers available in Cambodia, of which 1343 units inspected and recorded during the preliminary inventory. Among the recorded 1343 transformers, only 988 units have been inspected and the rest was recorded via self-reporting by the owners responding to questionnaires, of which 350 transformers are in operation and could not be inspected.

During the inventory, it was noticed that there are about 465 transformers that are PCBs-free, while about 762 units were regarded as PCBs assumed, and the remaining 116 units fall into the PCBs-contaminated category. 56 transformers were sampled for chlorine testing by using screening test kits (50 ppm) and of which 32 units were found to be contaminated by PCBs. In addition, the total weight of transformers is about 1550 tons and the total weight of dielectric fluid is about 400 tons excluding the weight of dielectric fluid trapped in 283 transformers which are missing nameplates and in 350 transformers which are in operation.

Furthermore, it is recognized that among the 1343 transformers recorded, about 498 units are being used within provinces and municipalities (excluding Phnom Penh, the capital city) which represents 37% of total distribution throughout the country. However, about 50% of transformers with missing nameplates are also being used within the provinces and municipalities (excluding Phnom Penh, the capital city). Regarding stockpiles, about 358 transformers require close attention. Among these, 274 units are waiting for disposal and 84 units are standing-by for repair. Among those waiting for disposal, about 83% of transformers are stocked in Phnom Penh while the remaining 17% are located in other provinces and municipalities.

It will also be important to consider the equipment that was produced after 1983 with nameplates (on dielectric fluid) marked as PCBs-free. The inventory team found that some equipment states that they are PCBs-free transformers, but testing results confirmed that their dielectric fluids were PCBs-contaminated. Generally, these units are owned by the private sector.

The inventory records showed that about 34% of total recorded transformers (1343 units) are PCBs-free, about 57% are PCBs assumed, and the remaining 9% are in the PCBs-contaminated category, throughout Cambodia. Among these figures, there are about 41% of pure PCBs transformers being used in Phnom Penh, while the remaining 59% are being used in 16 provinces and municipalities. In Phnom Penh, there are only 15 pure PCBs transformers currently being used at the distribution network, while most of PCBs contaminated equipment remains mostly at warehouses (30 units).

Regarding the above, the status of transformers classified by age, user population, dielectric weight, PCBs-contaminated based on screening kits, PCBs-contaminated based on UNEP's PCBs assumed rules, and dielectric classification are summarized in the following tables.

**Table 9: Summary information on the status of transformers**

No	Category of transformer	Units	Quantity
<b>I</b>	<b>Status of transformers population related to use</b>		
	<i>In-use</i>	unit	836
	<i>Standing-by for use</i>	unit	149
	<i>Standing-by for repairing</i>	unit	84
	<i>Waiting for disposal</i>	unit	274
<b>II</b>	<b>Status of transformers by dielectric weight</b>		
	<i>All total weight (equipment's body and dielectric)</i>	ton	1553.208
	<i>All total dielectric weight</i>	ton	401.264
	<i>Num. of transformer with dielectric weight &gt;30%,</i>	unit	116
	<i>Num. of transformer with dielectric weight &lt;30%,</i>	unit	595
	<i>Unknown units</i>	unit	632
<b>III</b>	<b>Status of transformers by PCBs contaminated based on screening kits</b>		
	<i>Total transformers</i>	unit	1343
	<i>Number of equipment took sampling</i>	unit	56
	<i>Number of equipment found PCBs contaminated</i>	unit	32
<b>IV</b>	<b>Status of transformers by PCBs contaminated based on UNEP's PCBs assumption rules</b>		
	<i>PCBs free</i>	unit	465
	<i>PCBs assumed</i>	unit	762
	<i>PCBs dielectric</i>	unit	116
<b>V</b>	<b>Status of transformers based on dielectric liquid classification related to use</b>		
	<b><i>In-use</i></b>	<b><i>unit</i></b>	<b><i>836</i></b>
	<i>PCBs free</i>	unit	284
	<i>PCBs assumed</i>	unit	481
	<i>PCBs dielectric</i>	unit	71
	<b><i>Standby for use</i></b>	<b><i>unit</i></b>	<b><i>149</i></b>
	<i>PCBs free</i>	unit	102
	<i>PCBs assumed</i>	unit	37
	<i>PCBs dielectric</i>	unit	10
	<b><i>Standby for repairing</i></b>	<b><i>unit</i></b>	<b><i>84</i></b>
	<i>PCBs free</i>	unit	52
	<i>PCBs assumed</i>	unit	31
	<i>PCBs dielectric</i>	unit	1
	<b><i>Waiting for disposal</i></b>	<b><i>unit</i></b>	<b><i>274</i></b>
	<i>PCBs free</i>	unit	27
	<i>PCBs assumed</i>	unit	213
	<i>PCBs dielectric</i>	unit	34

**Source:** *Inventory survey records, January to April 2004, PCBs Inventory task team, Ministry of Industry, Mines, and Energy*

**Table 10: Summary status of transformers related to age, leaking, and in use**

No	Status of transformers	Quantity	Remark
1.	Number of transformers leaking, in use, and over aged (>35 years)	1	In Kampot province.
2.	Number of transformers over aged (>35 years) and in use	21	6 units in Battambang, 1 unit in Kampong Cham, 1 unit in Kampong Chhnang, 3 units in Kampot, 3 units in Kratie, 1 unit in Svay Rieng, and 6 units in Phnom Penh (Power plant C2)
3.	Number of transformers over aged (>35 years) and unknown	396	113 units are over aged (>35 years), and 283 units have unknown manufacturing dates

**Source:** *Inventory survey records, January to April 2004, PCBs Inventory task team, Ministry of Industry, Mines, and Energy*

**Table 11: Summary of transformers related to PCBs-contamination associated with in use, age and leaking**

No	Status of transformers	Non PCBs	PCBs Assumed	PCBs	Total
1	In use	284	481	71	836
2	Not in use	181	281	45	507
3	Over aged in use	0	10	14	24
4	Leaking	4	12	4	20

**Source:** *Inventory survey records, January to April 2004, PCBs Inventory task team, Ministry of Industry, Mines, and Energy*

Concerning problems in PCBs management, some challenges have been identified during the inventory undertaken including: a lack of awareness and capacity on PCBs risks management; poor management on all types of transformers; retro-filling of purified dielectric fluid is common; very old transformers (aged over 30 years) are still in use; improper disposal of equipment including one contaminated by PCBs; employees and workers are currently working at PCBs contaminated site without adequate personnel protective equipment; PCBs contaminated sites can be easily and freely accessed by the public; and a lack of treatment and storage facilities for PCBs-contaminated dielectric fluid and PCBs-contaminated materials. Furthermore, knowledge of government officers and stakeholders on PCBs management is still limited and provisions for safe and sound management of PCBs substance and contaminated materials are inadequate. In addition, infrastructure for the management, controlling and monitoring of used PCBs equipment is very limited and some challenges exist including findings and chemicals reagents.

### **3.2.2 Stockpiles, contaminated sites and wastes management**

#### **3.2.2.1 Stockpile of transformers**

This section on the stockpile of transformers focuses on the equipment that is waiting for disposal and on standby for repairing. Problems related to the stockpile of transformers are focusing on two points: (1)safety i.e. fire risk, and (2) environmentally sound management of transformers as most of these are contaminated by PCBs. The status of transformers contaminated by PCBs could not be judged only on the production year, because based on the manufacturing date, any transformer produced after 1983 are PCBs-free equipment. However, in Cambodia based on screening kits it was found that some transformers manufactured after 1983 still contain PCBs substance. The reason that those transformers are contaminated by PCBs is that most of the equipment that has been repaired has been retro-filled with used dielectric fluids which contains or are contaminated by PCBs. In addition, the exposure of PCBs to other transformers would be caused by purification (filtration) machine, the only one available at workshop and has been used for purifying all types of dielectric fluid.

Therefore, any transformers targeted for repair are also regarded as contaminated by PCBs because they will be retro-filled with dielectric fluid usually purified by a unique filtration machine. In this regard, the dielectric fluid will more or less be contaminated by PCBs, which then also contaminates the repaired equipment.

To prevent further release of PCBs, it is necessary to pay strong attention on the stockpile of transformers, particularly the aging one waiting for disposal and repairing, and assumed as contaminated by PCBs. In addition, measures to prevent the sale of transformers waiting for disposal and repairing should be considered for the purpose of environmentally sound management of PCBs.

Therefore, about 358 transformers must be controlled among which 274 units are waiting for disposal and 84 units are in standby for repairing. Among those waiting for disposal, about 83% of the transformers are stocked in Phnom Penh and the remaining 17% are located in provinces and municipalities.

The 274 transformer units waiting for disposal belong to EDC and are currently stored at the warehouses of Sambour and Toeuk Thla. So far, transformers waiting for disposal have been sold by the owner for cost recovery as scavengers can recycle the copper. The dielectric fluid has generally been sold to tailors for sewing machines as it provides good lubricant oil, and to small handicrafts to be used as secondary fuel. However, there were no records, statistical data or information on the number of units that had been sold.

#### **3.2.2.2 Contaminated sites**

The knowledge of risk caused by PCBs in Cambodia is relatively new and most people including officials did not know about it until the NIP project started in mid 2003. No attention had been paid to the spillage or leakage of PCBs from transformers (in-use, standby, repairing and disposing of), and other transformers and capacitors that had caught fire. These are the reasons that have lead to no information on contaminated sites related to PCBs until

the present. However, there are four main areas that are considered to be contaminated sites –workshops, warehouses, leaking transformers, and fired transformers – but the degree and risk of such contamination could not be evaluated due to the lack of capacity and ability.

**The first type** (workshop): Two workshops (transformer workshops run by EDC and the private sector) were contaminated by PCBs. One workshop is located downtown of the capital city and close to the Main River and residential areas. The grounds of this workshop (storage, dismantling, and repairing areas ...) are soaked with spilled dielectric fluid due to the lack of facilities and spill recovery measures. At the same time, the old-aged filtration machine and operational negligence have lead this area to be soaked by oil. At this workshop, it was found that PCBs dielectric fluid was contained in the drums, confirmed by density testing. Based on this finding, this workshop has been considered as a contaminated site by PCBs and clean up operation would be necessary in the near future. Furthermore, another workshop owned by the private sector is in the same operational conditions as the first workshop and contaminated by dielectric fluid.

**The second type** (warehouse): There are two permanent storage sites under supervision by the EDC located in Phnom Penh (Sambour and Toeuk Thla warehouses), currently being used for storing electrical equipment including transformers: new transformers, repaired transformers, and broken transformers (waiting for disposals or sale). For storage conditions, some transformers have been kept in warehouses paved by concrete and some transformers were kept outside the warehouse's building. In addition, leaking dielectric fluid was observed as some transformers have no caps and valves.

In addition, there is another kind of storage site for temporarily stored electrical equipment and transformers at provincial electrical utility units and electrical companies,. These units have been kept right away next to working buildings and under the trees. Such storage can never be considered safe on environmental issues because it was observed that some transformers have no valves, some have been leaking and spilling fluid on the grounds and drains to a nearby canal. Such transformers are generally waiting to be sold.

**The third type** (substations, cabins and poles mounts): until now, leaking transformers have been used at some cabins, poles mounts and substations. Those transformers are old and usually require fluid retrofill. At the same time, leakage is found in cabins, on poles mounts, and in substations. Thus, those areas are contaminated or polluted by PCBs. Based on the inventory activities (sites inspection) that took place from January to April 2004; it was observed that there are about 20 transformers leaking dielectric fluid, all of them located in provinces and municipalities.

**The fourth type** (the area where transformers have caught fire): The last contaminated site by PCBs is the area where transformers have caught fire. It was reported that a number of transformers had caught fire but there are no records about the location of such cases or on the number of units destroyed. This is because no safe and sound management procedure was in place to manage such equipment when accidents/incidents occur. It is recognized that such areas are freely and easily accessible by the public and domestic animals.

### **3.2.2.3 Waste management**

#### **(a) Storage facilities**

Similar to waste reception facilities, Cambodia does not have storage facilities for chemical hazardous wastes and other hydrocarbon wastes like used-lubricant oil. Generally, in practice, used lubricant oil is not thrown away, but instead sold for other purposes including use for secondary fuel (burning), or refining for local use.

Unlike lubricant oil, dielectric fluid whether containing PCBs or PCBs-free is discharged and then stored in metallic drums and generally kept at the workshop or warehouses. This discharged fluid is then reused as additional fluid to retro-fill other transformers after it is purified. Furthermore, if it does not meet the dielectric fluid criteria any longer (e.g. in cases where it was mixed with other substances), then such fluids would be sold for local needs/use and may be used as secondary fuel, for wood treatment, as lubricant for sewing machines, and other purposes.

However, even though Cambodia does not have waste reception facilities or storage facilities for the time being, it is necessarily to consider such facilities for the future, which are required in order to:

- Prevent further risk to public health, animals and the environment caused by PCBs-contaminated dielectric fluid spillage, mismanagement and misuse,
- Compliance with the international movement and the Stockholm Convention for the safe and sound environmental management of PCBs substance,
- Further action on the disposal of and/or treatment hazard substances including PCBs and related contaminated items.

Responding to this concept, Cambodia should have proper storage tanks and facilities for the temporary discharge

of PCBs-contaminated dielectric fluid from transformers undergoing repair. Furthermore, the MIME should provide a technical guidance to the public and private sectors on safe management, with a particular focus on the management of PCBs transformers before decommissioning. In addition, temporary or permanent storage sites should be assigned to keep PCBs and assumed PCBs-contaminated transformers that are no longer used. These sites should be located away from sensitive areas including schools, hospitals, markets, residential areas, etc. and should also be equipped with fire-fighting equipment and other emergency response items.

### **(b) Disposal facilities**

No disposal facilities have been designed yet for PCBs substances and for other chemical hazardous wastes. In addition, as used-lubricants and dielectric fluid still have economic value at local markets, there exist incentives to prevent dielectric fluid from being dumped. In general, no proper place exists or facilities for receiving PCBs dielectric fluid in Cambodia. Further consideration on the establishment of hazardous waste storage and reception facilities is underway.

The competent authorities should pay attention to establishing storage and/or disposal facilities to keep aged/broken transformers, PCBs dielectric fluid and other contaminated materials away from other tools and sensitive areas. This work should involve the collaboration of relevant government line ministries in order to harmonize efforts and emergency response.

### **3.2.3 Future production, use and releases of PCBs – requirements for exemptions**

All electrical equipment related to the use of dielectric fluid such as transformers, capacitors ... are never produced in Cambodia, but all are imported from overseas.

Considering the international trend of producing PCBs-free transformers since 1983, the PCBs electrical equipment is no longer available on the international market. As Cambodia is completely dependent on the import of transformers, this provides a good chance for Cambodia to phase out PCBs use for electrical purposes, especially for new electrical devices.

Furthermore, the existing transformers that are using mineral oil without PCBs would not be retro-filled with PCBs-contaminated dielectric fluid. This is because:

- Cambodia is aware of the risk of PCBs substance to human health and the environment,
- Cambodia is willing to cooperate with other countries to eliminate the use of PCBs from its electrical systems, and
- Cambodia is using old transformers (some produced since 1958), for which spare parts are unavailable. Therefore, decommissioning such transformers is the only option available.

Therefore, for future choices, Cambodia has only an option to follow, which is to purchase and import new types of transformers and dielectric fluid that are PCBs-free. The existing transformers and dielectric fluid will still be kept in use until the end of their lives or by 2025 with no further repairs.

### **3.2.4 Existing programs for monitoring of releases and environmental and human health impacts**

It is recognized that the amount of transformers contaminated by PCBs is relatively high at provincial electricity utilities units that continue using aged transformers because of lacking fund for replacing new one. Based on the screening kits analysis during inventory, it was found that 32 units among the 56 transformers sampled for analysis were contaminated by PCBs, which represents about 60% of the analyzed equipment. Furthermore, the contaminated sites and cases of PCBs were also identified and can be classified as shown in the table below.

**Table 12: PCBs Contaminated Sites**

No	Contaminated Sites	Cases of PCBs Release	Contaminant
1	Workshops	Spills and leaks	PCBs
2	Warehouses	Spills and leaks	PCBs
3	Power plants	Burned/fired transformer, spills and leaks	PCBs, Dioxins and Furans
4	Substations, cabins, and pole mounted	Burned/fired transformer, spills and leaks	PCBs, Dioxins and Furans

**Source:** *Inventory survey records, January to April 2004, PCBs Inventory task team, Ministry of Industry, Mines, and Energy (MIME)*

Although PCBs-contaminated dielectric fluid can be identified and found to exist in Cambodia, the monitoring program/activities for safe and sound environmental management of PCBs related materials and equipments have not yet been designed. The reason for this is that the PCBs risk issue just was just introduced in Cambodia in the

beginning of the 21<sup>st</sup> century. In addition, there are also no regulations or guidelines on the management of such PCBs equipment as well as restricted access to where PCBs transformers have been installed or have caught fire. All people and animals can be freely and easily access places where dielectric fluid has spilled, leaked and/or been discharged. Furthermore, Cambodia has not yet considered a ban of import and use of equipment, dielectric fluid, and other oils contaminated by PCBs.

For health issues, it can be seen that those who can get easy exposure to PCBs are the workers and employees at the workshops, warehouses, and power plants. They may be critically affected by PCBs due to a lack of personal protective equipment and awareness. The people who are dealing with the used-oil contaminated by PCBs may face the negative impacts from PCBs and those who live close to contaminated areas may also be affected by PCBs.

It is hard to assess the impact on the environment and human health as Cambodia does not know the negative impacts of PCBs. In addition, there is no available medical facility for assessing the impacts of PCBs on human health for the time being. Furthermore, there is also no method or facilities for assessing the impact of PCBs on the environment.

### ***3.2.5 Awareness, education, and mechanism for information exchange***

It is understood that neither general education nor the professional education system in Cambodia integrates subjects related to health issues affected by PCBs into the educational curriculum, neither do the mass media for the general public. This result is no one understanding the risks of PCBs substance that affect human health and the environment. Furthermore, there is also a lack of understanding by decision makers, government officers, and electrical utility workers about PCBs and the way it can impact human health and the environment. That is why there has been incorrect use of dielectric fluid such as secondary fuel, for wood treatment, lubricant for sewing machines, cooking oil and other purposes.

However, some governmental officers have just begun to learn about and gain awareness on the PCBs issue when the NIP project started. In addition, through some training workshops with the assistance of international experts, PCBs awareness raising has improved to some extent. Some governmental officers from the Ministry of Environment, Ministry of Industry, Mines and Energy, EDC staff, and staff of some provincial and municipality electricity utilities have been trained.

The knowledge management of the concerned enterprises related to PCBs hazards and the negative impact by PCBs is generally low. In addition, at the management level, both government and private sectors have not done anything regarding the preparation of PCBs management regulation, health protection regulation, PCBs hazard training programs, and awareness raising on PCBs safe use guidelines. However, several decision makers of the concerned enterprises have now been trained under the support from NIP project.

Although, some governmental officials and managers of the concerned enterprises have been trained but the exposed employees and workers have not. The exposed employees and workers who work in transformer workshops, warehouses, and power plants are unaware of PCBs hazard. For instance, they have pumped PCBs oil from container to transformer, and pumped used PCBs oil from one broken transformer to another by siphoning by mouth. In addition, employees and workers have often used PCBs oil to paint furniture and to sell to other people for various uses.

A lack of awareness by the public regarding PCBs hazards is extremely dangerous. Many cases have been identified where the public have purchased PCBs oil from the relevant employees and workers to polish wooden furniture and to treat wooden materials. In general, the exposed general public has not been provided with any education on such matters. Indeed, very limited information has been disseminated for public awareness. Hazards and perceptions of PCBs have been promoted through the mass media for public understanding and raising awareness only during the preparation phase of the NIP. Other than this, the mass media sector has been absent on this issue as they too have no knowledge about PCBs.

Some problems related to public awareness on PCBs can be identified as follows:

- Technical training on PCBs perception and hazards has not yet become widely available;
- Education programs on safe and sound environmental management for exposed employees and workers is inadequate;
- Comprehensive PCBs training through mass media is still not available;
- Supporting programs for the promotion of public awareness on PCBs are not available;



- National as well as international mechanisms for information exchange and technological transfer are limited; and
- Data records and database management systems on PCBs issues are absent.

To improve the current situation, appropriate measures must be taken in order to increase public awareness of the PCBs problem. These measures have to be applied to the different target groups, such as the public, schools, industry, importers, waste producers, recyclers, dismantlers, etc.

### **3.2.6 *Technical infrastructure for assessment, measurement, analysis, management, and research of PCBs***

In Cambodia, there are several laboratories belonging to governmental institutions and which work for specific parameters and purposes. The following provides information on these laboratories:

- Laboratory of the Ministry of Industry, Mines and Energy works on analyzing industrial chemicals substances that will be used for producing goods and items and then checks to verify standard limits in the industrial products;
- Laboratory of the Ministry of Agriculture, Forestry and Fisheries works on analyzing chemical fertilizers and pesticides;
- Laboratory of the Ministry of Commerce works on controlling and verifying chemicals limits in all kinds of goods that are trafficking and marketing throughout Cambodia and for import and export purposes;
- Laboratory of the Ministry of Environment works on analyzing pollutant substances containing in wastes and effluent;
- Laboratory of the Ministry of Health has the capacity to analyze chemical substances in medical drug and cosmetic products; and
- Other laboratories within universities and institutions.

Event though Cambodia has some laboratories, the capacity and ability to analyze chemicals is still limited due to inadequate and out of date analysis equipment, lack of reagents, limited analysis capacity and experiences. All laboratories have been used for supporting the technical work of their own institutions such as analyzing import-export products or waste analysis. However, monitoring or scientific research work related to the impact of chemicals including POPs on human health and the environment has never been undertaken

Nevertheless, none of these laboratories target analysis of PCBs substance whether contained in products or in by-products or in waste forms. Facilities for PCBs analysis are not yet available in Cambodia.

Due to the lack of experiences and analysis capacity of the laboratories, Cambodia has not joined any regional or international laboratory network with other laboratories.

To overcome the current situation, the capacity building of laboratory and human resources development is a need for Cambodia toward chemicals management including POPs in order to secure to a safe environment and public health.

### **3.2.7 *Identification of impact on public health and the environment***

The understanding on the risks and impacts of PCBs grew after Cambodia signed the Stockholm Convention on 23 May 2001. This understanding, however, is not widespread among the public, governmental officers, workers, and communities. The studies and identification on the risks of PCBs on human health and the environment has never taken place before. Therefore, no data on the risks to human health, to the environment, and to food safety regarding the exposure of PCBs is available.

Even the study on the impact of PCBs has never been undertaken. However, based on the current operation and use of electrical equipment including transformers and dielectric fluid, it may be concluded that there are some cases of impacts on human health and the environment caused by PCBs:

- All workers involved with dielectric fluid (particularly PCBs contaminated oil) are not aware at all of PCBs hazard and risk to health, leading to no safeguard instruction and protected equipment,
- Used PCBs dielectric was used for household purposes as secondary fuel, lighting, and cooking (frying fishes and vegetable) coating, etc...
- The spillage and discharge of PCBs dielectric oil at workshop and warehouse are commonly seen,

### 3.2.7.1 *The impact on human health*

The major target groups of impacts on human health would be the electrical workers (transformers' workshop workers) and those using PCBs dielectric fluid as secondary materials (e.g. lubricant oil and energy) without knowing the risk hazards posed by PCBs. These people would likely face greater health impacts due to the fact that they work with PCBs-contaminated dielectric fluid that is generally spilled during transformer repairs without knowing about the risk hazards caused by such substances. Furthermore, at the transformers' workshops there is no personal protective equipment to shield human health from any risks that may occur. In addition, knowledge of safe and sound use of dielectric fluid that contains PCBs seems to be nonexistent among the officers, workers, and the public.

### 3.2.7.2 *The impact on the environment*

In general, the spillage and leakage of dielectric fluid through using and repairing old transformers contaminated by PCBs is cause of the release of PCBs into the environment. Significant amounts of PCBs were and are still released due to inappropriate disposal practices, accidents, and leakage from equipment that is in poor condition. PCBs releases into the environment also occur due to the negligence of workers and a lack of consideration of related hazards.

Major causes of the release of PCBs into the environment could be identified as follows:

- A lack of safe and sound procedures in use regarding PCBs management (in dielectric fluid);
- PCBs waste (i.e. no longer used in dielectric fluid) has been sold to other users (e.g. tailors and small handicraft firms to be used as lubricant oil and secondary fuel (energy));
- Old transformers have leaked dielectric fluid but they are still in use without measures in place to prevent the release of oil into the environment; and
- Areas where transformers have caught fire are not under restriction from access by people and animals. They typically remain opened, unfenced areas that are freely and easily accessible by all.

In conclusion, it is difficult to identify the level of risk that affects human health and the environment due to data availability in Cambodia on the exposure of PCBs in the environment and among human beings. Furthermore, no feasibility study on the impact of PCBs has been undertaken.

## 3.3 *Assessment for Annex B Chemicals (DDT)*

DDT for controlling malaria vector has been applied since 1950s and continued until the early 1990s. Information and data about the amount of DDT, its origins, and sources of import are unclear because most documents were destroyed during the Khmer Rouge Regime. However, some information related to the import and use of DDT from 1975 to 1990 is available.

Based on the preliminary inventory which took place from January to April 2004 within the 24 provinces and municipality and one rubber plantation area, a task team on DDT (comprising officers from the Ministry of Health) discovered that 143 tons of DDT was used in Cambodia between 1979 and 1991. Of this amount, about 120 tons of DDT was imported from the Netherlands and the former Soviet Union and the other 20 tons remained from the Khmer Rouge Regime. The total amount was distributed in the 24 provinces and one-rubber plantation area, with a range of some 3 to 10 tons per province. Each province gradually applied the distributed DDT every year with the last use of DDT occurring in 1991 at the rubber plantation. Based on secondary information<sup>4</sup>, about 840 tons of DDT was imported from Hong Kong in 1976 by the Khmer Rouge Regime, but the purpose and location of the use remains unknown as no data was recorded.

Based on POPs-pesticides inventory's result, there is some DDT trafficking in markets, however, this DDT was assumed not to apply for the health sector, but instead supplied for agricultural purposes.

Currently, no stockpiles of DDT (including obsolete stocks) have been found as the use of DDT has been suspended since 1991. Similarly, contaminated sites (or formers warehouses) are difficult to identify as most of them were destroyed and have been replaced. Some former DDT warehouses were removed and replaced with new constructions.

Cambodia stopped using DDT for vector born disease control in 1991, and there is no monitoring system or laboratory capacity to analyze DDT. Furthermore, Cambodia has no intention of reintroducing the use of DDT for

<sup>4</sup> Ben Kiernan (1996) *"The Pol Pot Regime: race, power, and genocides in Cambodia under the Khmer Rouge, 1975-1979"*. Yale University, ISBN: 974-7100-43-6. (See p.146).

the public health sector as many alternative chemicals including K-Othrin, Fendona, K-O Tab, K-Othrin 10ULV, and Abate 1 ppm, are available for use to control vector born diseases.

In conclusion, it can be said that Cambodian people have very limited (or no) knowledge or awareness on DDT and other products containing DDT, which may cause harm to human health and the environment.

Some concerns exist related to public health and environment, which are associated with the use of POPs, including DDT in other products for household use. These concerns include:

- Products that have been mixed with other banned insecticides, such as DDVP, DDT, etc;
- Products that have no manufacturing name, or indication of active ingredients;
- Products that do not include safety use instruction material; and
- The misuse of or lack of awareness on the risk of using such products, for example, too much use of the product in closed areas, use of the product by vulnerable groups such as pregnant women, small children, etc.

In conclusion, the use of DDT has been abandoned since the early 1990s. It is clear that Cambodia will no longer use or require an exemption of DDT for use as an insecticide for vector diseases control. Moreover, the National Center for Malaria Control, Parasitology and Entomology (NCMP&E), Ministry of Health has stated that Cambodia is committed to not using or reintroducing DDT for vector disease control in the public health sector in the future, except if outbreak of malaria were to occur.

### 3.4 Assessment of Releases from Unintentional Production of Annex C Chemicals (PCDD/PCDF, HCB and PCBs)

#### 3.4.1 Production, import-export and use

This is the first time that Cambodia has considered and undertaken the inventory on the generation and release of dioxins/furans throughout the country and that information from the inventory has been used for the development of NIP. The inventory was undertaken in cooperation with concerned ministries and line agencies to gather information on dioxin/furan generation sources in order to determine related data on unintentionally produced POPs releases, and human health and environmental concerns as well as the gaps in any related sectors.

While carrying out the survey at the concerned ministries, provincial departments, local authorities, etc. and at various sites, many critical gaps were discovered in the management of unintentionally produced POPs, such as a lack of awareness about the generation/release of dioxins/furans by both private and public sectors and a shortage of reliable data and information from the various generating sources. In this regard, most data/information was obtained by estimations made by local line institutions. As a result, the amounts of unintentionally produced POPs released into the environment can be calculated. Results from estimations and calculations are shown in the table below which summarized data of the release from the 10 categories sources classified by the UNEP toolkit.

**Table 13: Result of national inventory of unintentionally produced POPs in Cambodia, 2004**

Category	Source Categories	Annual Releases (g TEQ/a)					Total
		Air	Water	Land	Product	Residues	
1	Waste incineration	40.73	0.00	0.00	0.00	0.781	41.511
2	Ferrous and non-ferrous metal production	0.41	0.00	0.00	0.00	1.0	1.41
3	Power generation and heating	10.275	0.00	0.00	0.00	1.692	11.967
4	Production of mineral products	0.099	0.00	0.00	0.00	0.00	0.099
5	Transport	0.005	0.00	0.00	0.00	0.00	0.005
6	Uncontrolled combustion processes	217.871	0.00	14.56	0.00	315.60	548.031
7	Production of chemicals and consumer goods	0	0	0	0	0	0
8	Miscellaneous	3.641	0.00	0.00	0.00	0.00	3.641
9	Disposal/Landfill	0	0	0	0	0	0
10	Potential Hot-Spots	0	0	0	0	0	0
<b>Total</b>		<b>273.031</b>	<b>0.00</b>	<b>14.56</b>	<b>0.00</b>	<b>319.073</b>	<b>606.664</b>

**Source:** Inventory report on unintentionally produced POPs, Ministry of Environment, 2004

From the figures above, the quantity of the release of unintentionally produced POPs can be estimated and calculated, however, it can be assumed that more dioxins/furans will be released in the near future due to the

growth of small and medium industries, agricultural activities, transportation, tourist and other infrastructure. There is no legal instruments and technical guidelines in place yet related to the requirement for installing air control system (air cleaning equipment/devices) at potential release sources of unintentionally produced POPs. Nevertheless, few legal instruments have addressed limits on the release of small particles into the environment.

Capital, human resources and technology are the main obstacles for Cambodia to take effective measures for prevention and reduction of the release of unintentionally produced POPs. Small and medium industrial enterprises often face financing challenges which forces them to find low cost energy instead of electrical power. For example, brick kilns use used-oil, garment wastes, used-tires, and other low cost energy to produce bricks and their outlet emission is not controlled or treated at all. Furthermore, there is no basic air cleaning technology or equipment available in Cambodia, at a cost affordable by existing industries. The limited awareness of the public on the formation and release of unintentionally produced POPs is also contributing to the more release of unintentionally produced POPs, particularly through their backyard burning, where all wastes including plastics are burnt together.

### **3.4.2 Contaminated sites and the management of the formation and release of unintentionally produced POPs**

With reference to the unintentionally produced POPs survey throughout the country, it can be concluded that the mostly likely contaminated sites of unintentionally produced POPs are:

- ❖ Areas surrounding dumping sites (caused by uncontrolled waste burning), because dumping sites, generally under fire due to self burning of waste in one hand, and on the other hand, the wastes have been burned down for the purposes of reducing the wastes' volume. In addition, wastes entering dumping have not been separated for specific groups including plastic materials, papers, PVC cables, tires ... Those materials cause the formation and release of unintentionally produced POPs. The areas surrounding dumping sites may be regarded as highly contaminated by unintentionally produced POPs.
- ❖ Areas surrounding incineration locations (hospital and industrial) and crematories. Small waste incinerators that do not install air-cleaning facilities (sample incinerators made locally) have been used by hospitals and provincial health centers for incinerating medical wastes particularly plastic syringes and needles. Besides, simple incinerators have been used at garment factories to incinerate garment wastes and other residential wastes to recover heat for use within the factories. The absence of air cleaning facilities at those incinerators including improper practices (no combustion control system, no waste separation and drying, improper storage of ashes...) is the main factor for the high formation and release of unintentionally produced POPs.

Based on the inventory, the total dioxin/furan releases into the environment in Cambodia may be 606.664 g TEQ/a. Of this amount, the release of dioxins/furans into the air is 273.031 g TEQ/a (45%); to lands is 14.56 g TEQ/a (2.42%); and the remaining in residues is about 319.073 g TEQ/a (52.58%).

If looking in detail at various sources of releases, we know that the uncontrolled combustion process (UCP) is the source that generates and releases dioxins/furans in the amount of 548.031 g TEQ/a; considerably more than other sources. This figure indicates the occurrence of potential risks/hazards to environment and human health resulting from the high emissions of dioxins/furans from this uncontrolled combustion process.

The second in rank of dioxin/furan releases is waste incinerations at 41.511 g TEQ/a. This figure is obtained from calculation (estimation) based on data and information provided by stakeholders who are involved with waste incineration.

The release of dioxins/furans in the power generation and heating sector is estimated to be 11.967 g TEQ/a; third in rank after uncontrolled combustion process (UCP) and waste incinerations. Certainly, related data for fossil fuel consumption provided by concerned institutions seemed to be insufficient. In this regard, some parts of the calculation of releases of dioxins/furans were based on estimated data as for other sources.

Although the release of dioxins/furans from the miscellaneous sector is about 3.641 g.TEQ/a, and is followed by the ferrous and non-ferrous metal production at only 1.41 g TEQ/a. However, because of the lack of data, only available sectors could be estimated.

### **3.4.3 Future formation and releases of unintentionally produced POPs**

Unintentionally produced POPs substance is continuously released to the environment, caused by burning of wastes and others combustion processes and in all kinds of public and development activities. In this regards, it can be foreseen that in the future, the release of unintentionally produced POPs in Cambodia would be increasing due to a number of factors:

- ❖ The growing of industrial sectors may be a factor for increasing the formation and releasing of unintentionally produced POPs due to inadequate air cleaning facilities installed at industrial firms and handicraft to clean the air emission before releasing into the environment. In addition, the competent authorities have limited capacity to monitor air emission released from the industrial sector as well as facilities to perform their duties,
- ❖ Poverty is the major factor of releasing of unintentionally produced POPs as people are unable to afford alternative energy like gas, electricity, coal, firewood, etc. In practice, the poor use very low cost materials for burning, including garment wastes (clothes), plastic wastes, tires, and oily wastes. Not only the poor, but small scale industries like brick producers, brown sugar producers, and wine producers have been using inappropriate sources of energy instead of environmentally safe energy,
- ❖ Imbalance between wastes management facilities and waste generation. The demand of materials used will highly increase (modernization) which will lead to increase wastes, particularly synthetic wastes including plastics, PVC tubes, plastic furniture, media material (plastic slogans, banner) etc. In particular, the investment on waste management is less interested which does not respond to the increase of wastes,
- ❖ The awareness on the formation of unintentionally produced POPs is low within the national context, due to limited mass media coverage for the public. . Secondly, people are obviously more concerned about livelihoods than environmental problems and health. Common practice is burning in backyards and open fields.

In conclusion, it can be assumed that the future release of unintentionally produced POPs in Cambodia would be increase but it is impossible to project how much the quantity of dioxins and furan would be and the locations that would be exposed to such pollutants. \

#### ***3.4.4 Existing programs for monitoring of releases and environmental and human health impacts***

To date, Cambodia does not have any program for monitoring the release of unintentionally produced POPs because it is a new issue for Cambodia. In addition, the lack of experience, expertise, and facilities for monitoring are the main causes for not considering this matter.

However, Cambodia has few policies related to the management of wastes and air emission control, but limited action has been taken. There are several factors for the limited action on the sound management of wastes and air emission control, including lack of public participation in waste separation and duty performance, weak institutional capacity (human resources and facilities) in program management, and lack of operational planning.

At the same time, there is no equipment for analysis and assessment of harmful impacts on environment, ecology and public health. Furthermore, a specific legal tool for unintentionally produced POPs does not exist. In this regard, unintentionally produced POPs release and their negative consequences is a new theme for Cambodia, which requires capacity building and institutional strengthening in order to reach related goals.

#### ***3.4.5 Awareness, education and information exchange***

Both the public and private sectors are little aware at all about unintentionally produced POPs, so far. In addition, there are no reports or documents addressing this matter in Cambodia.

The understanding on unintentionally produced POPs among officers has just been increased through a series of training courses organized by the NIP project (since the middle of 2003) and as a result, they have acquired a broad understanding on the formation and the release of dioxins and furans into the environment and their potential impacts on the environment and human health. However, this knowledge has been only offered to those involved in the project implementation. Other relevant parties particularly local authorities have not yet received any training on this matters due to the lack of funding and time limit of the project. Awareness raising on unintentionally produced POPs to be provided to relevant stakeholders, and the public is a priority within the process of implementation under the Stockholm Convention which Cambodia shall execute as a member.

There is currently no information exchange mechanisms related to unintentionally produced POPs for both gathering and distribution of information at the national level (between institution and institutions, institutions and research institutes, and institutions and NGOs, etc.) as well at the regional and global levels. This is because Cambodia has never compiled information on unintentionally produced POPs as well as the lack of information about distribution networks.

#### ***3.4.6 Technical infrastructure for assessment, measurement, analysis, management, and research of unintentionally produced POPs***

There is no government institution engaged in setting up working groups or action plans to monitor, control, or analyze unintentionally produced POPs and generation/release sources. The laboratories of MoE, MIME,

MOWRAM, MoC, and MoH, do not have the capability to analyze unintentionally produced POPs parameters, especially dioxins and furans.

Cambodia does not have the capability to analyze unintentionally produced POPs parameters because of the inadequacy of analytical equipment including a lack of staff skilled in this area. In addition, resources matters are the main obstacle, which leaves Cambodia unable and incapable of undertaking analysis and research on such POPs related matters.

Due to the high cost of analyzing unintentionally produced POPs, Cambodia hopes of regional cooperation under support projects provided by international organizations and donor countries in order to implement future reduction measures.

### **3.4.7 Identification of impact on public health and the environment**

As mentioned above, the unintentionally produced POPs are a relatively new subject for Cambodia thus there is no report addressing the adverse impacts of such POPs on human health and the environment. However, this does not mean that Cambodian people are not affected by the POPs. Based on the conclusion of international experts, Cambodian people may be affected by unintentionally produced POPs due to such substances' release sources found in the country as follows:

- Open burning fields at both backyards and landfills,
- Small incinerators generally hospital wastes and garment wastes,
- Metal smoldering (recovery) by smoldering metals for further production and by burning scavenged materials including electrical wire, tires,

Such open burning does not consider at all the release of any air pollutants including POPs. More importantly, secondary fuels are the major and favorite source of energy used for metal recovery.

In conclusion, the impact of unintentionally produced POPs may affect firstly those who operate the open burning and secondly those living close to open burning areas. In addition, public awareness on the formation of unintentionally produced POPs and their adverse impacts on human health and the environment are not easily observable, which causes risks to human health to be relatively high.

### **3.5 Relevant Activities of Non-governmental stakeholders**

Non-governmental stakeholders (including NGOs, academic institutes, workers unions, industrial and trade associations, farmer communities, etc) are generally interested in pesticides advocacy and quite active in information dissemination on the adverse impacts of pesticides on human health and the environment. Beside pesticides, non-governmental stakeholders have limited knowledge on POPs substances including DDT endrin, chlordane, PCBs, Dioxins etc, which results in no advocacy program on this issue for raising public awareness on the adverse impacts of such chemicals on human health and the environment.

The most active non-governmental stakeholders, i.e. NGOs and academic institutes, are active in providing recommendations to the competent authorities on the adverse impacts of the use of pesticides including POPs substances on human health and the environment as well as alternative chemicals. Furthermore, they have undertaken research on pesticide use, trafficking, and acute impacts on human health and provide knowledge to farmers and pesticides applicators on how to protect their health and the environment from the impacts of pesticides. Integrated pest management (IPM) including the importance of friendly insects and animals, botanical pesticide for controlling pests and multi-culture approaches has been undertaken by NGOs and academic institutions. Positive results are then compiled and disseminated to farmers via awareness raising campaigns including meetings, workshops, farmer field schools, campaigns/events (no pesticides day), media, etc.

### **3.6 Details of any relevant system on assessment and listing of new chemicals**

Cambodia is a least developed country with inadequate infrastructure for the management and research on chemicals including POPs. Cambodia does not have a well working system for assessment and classification of chemicals regarding their risk characteristics on human health and the environment for suggesting new POPs. At the same time, Cambodia has no criteria in place for listing new chemicals as well as classified their potential risk levels.



## **CHAPTER 2 : IMPLEMENTATION STRATEGY AND ACTION PLAN**



The National Implementation Plan (NIP) to implement the Stockholm Convention is to identify the priority activities related to POPs management and to seek funding to support the operation of Cambodia's institutions which have a primary obligation and aim to assist the Royal Government of Cambodia and the people of Cambodia to manage, reduce, and eliminate POPs and to protect human health and the environment.

## A- National POPs Policy Statement

Based on the position of Cambodia for participation with the international community in the prevention of chemical impact on human health and the environment, the Royal Government of Cambodia was pleased to participate in and signed the Stockholm Convention on POPs on May 23, 2001. The message from Samdech Hun Sen, Prime Minister of the Royal Government of Cambodia dated January 18, 2005 clearly showed Cambodia's policy commitment and support to chemicals management "**The Royal Government of Cambodia has full commitment to ratify the Stockholm Convention soon**". To date (as of third quarter of year 2005), the draft law on accession for the Royal Government of Cambodia to be a member of the Stockholm Convention has already been put into waiting list for formal discussion and approval on the agenda of the national assembly.

The Royal Government of Cambodia has established a general partnership for mobilizing funding and action to manage the Cambodian environment. Cambodia's primary formal POPs management policy is to address general environmental problems in combination with national efforts to achieve sustainable development and a safe public health including the reduction and elimination of POPs and for the special exemption of POPs use will be implemented by the determination of the Stockholm Convention. At the mean time, the Royal Government of Cambodia has developed supporting policy as a convincer facilitator for all donor agencies, non-governmental organizations and stakeholders through their network of Cambodia country offices.

Based on the national policy related to POPs and from the time of the signature of the Stockholm Convention in May 23, 2001, the Royal Government of Cambodia delegated the ministry of environment to play a role as a national focal point for the Stockholm Convention. At the same time, in order to facilitate the implementation of the Stockholm Convention among relevant institutions and also for improving effective management of chemicals as well as POPs management, the Inter-Ministerial Coordination Sub-Committees (known as National Coordinating Committee – NCC) have been established with membership of governmental institutions, NGOs, and national institutes. The Ministry of Environment, in association with other governmental institutions and stakeholders, deals with human health protection, environmental protection, human capacity building, and information dissemination and public awareness raising in Cambodia, a country where both human and natural resources have been devastated by years of civil war.

Besides, the Royal Government of Cambodia has strong will to contribute to chemical management including POPs. According to the message from Samdech Hun Sen, Prime Minister of the Royal Government of Cambodia, "*The Royal Government of Cambodia proudly announces and strongly and fully supports the first National Profile on Chemicals Management to ensure the safety of chemicals management, and all other Cambodian activities responding to the obligations under the Stockholm Convention to achieve the goals of the Convention*". (National Profile on Chemicals Management, January 2005).

The approval of this National Implementation Plan (NIP) means that, the Royal Government of Cambodia has full commitment to implement the provisions set under the Stockholm Convention. After approval, this National Implementation Plan will play a very important role as a national policy for POPs management and planning guidance for the stakeholders to implement all actions contained in the document. This national plan shows also an initial direction for all agencies concerned with POPs management in Cambodia to implement and update their activities for achieving the long term goal to reduce and where possible step forward to eliminate POPs in Cambodia.

This National Implementation Plan is developed at a very appropriate time, in the beginning of the third mandate (2003-2008) of the Government of Cambodia. This national plan presents very specifically the various action plans and the policy response developed by the Royal Government of Cambodia to address and solve POPs problems. This NIP is the first national plan initiated for a four-year implementation (2007-2010). Nevertheless, the third five-year National Strategic Development Plan (NSDP) of the Royal Government of Cambodia is also set 2006 - 2010. Therefore, the NIP supports the governmental policy framework and Cambodia's millennium development goals in the following areas:

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

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

## **B- Priority Problems Related with POPs**

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

- ▶ Institutional and regulatory framework.
- ▶ Public health and environment.
- ▶ Socio-economic aspects.
- ▶ Public awareness.

Identification and development of priority problems on POPs, built upon the participation of relevant institution and stakeholders. Priority problems are POPs pesticides, PCBs, unintentionally produced POPs and awareness raising / information dissemination. The result of priority setting of POPs related problems in Cambodia will be used in order to provide basic input for the development of a national implementation plan to implement the Stockholm Convention and will be summarized as follow:

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

1. Lack of regulation and the existing regulation has limited provision for full management of pesticides used in agriculture and household.
2. Lack of pesticides evaluation capacity and facilities for legislative enforcement.
3. Lack of awareness and knowledge on safe and responsible use of POPs pesticides among users as well as retailers and formulating shop workers, and hazard of POPs pesticides.
4. Limited/insufficient monitoring of POPs pesticides residues in environment and agricultural products, and human health.
5. Lack of data records and national database management system for management of pesticides especially on POPs.
6. Lack of information exchange network and technology transfer.
7. Lack of pesticides disposal policy and disposal facilities.

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

1. Lack of both human resources and technical facilities to implement the international conventions Cambodia has signed, ratified, and acceded;
2. Lack of specific law and legislation on PCBs management and specifically lack of regulatory framework for PCBs use and disposal;
3. Lack of appropriate laboratory capacity;
4. Improper management of used and obsolete transformers and dielectric;
5. No safety precaution and protection measure for handling PCBs equipment and contaminated sites (workshop, warehouse...);
6. Lack of awareness on PCBs perception of hazard at all levels;
7. All employees and workers have no awareness on the technical safeguard and hazard of PCBs;
8. Lack of data records and database management system on PCBs; and
9. Lack of national as well as international mechanism for information exchange and technological transfer.

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

1. Lack of technical experts and technical guideline for unintentional POPs by-products management;
2. Uncontrolled burning (waste at municipality and rural landfills...etc);
3. Insufficient regulation related to by-product management and enforcement;
4. No Public awareness on unintentional POPs by-products generation and hazard;
5. No control measures for reducing the release of by-products from all sources;
6. No waste separation policy but limited in practice (by interest groups like scavengers);
7. No data records regarding the incidents from unintentional POPs by-products and poor database management system and information exchange mechanism among the governmental agencies and stakeholders; and
8. Lack of laboratory capacity and equipment for monitoring and analyzing.

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

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

## **C- National Strategy for Implementation of NIP**

In the implementation phase of this NIP, the Ministry of Environment and line governmental ministries have to improve existing framework mechanism in order to coordinate and facilitate implementation of individual action plans, improve partnership arrangements with organizations of the civil society including public interest groups, local and national NGOs, international NGOs operating in Cambodia, and research institutes, and improve human resource and financial resource development for all levels of society. The national implementation strategy and actions can be detailed as the following:

### **1. Improve the Existing Institutions and Mechanisms Strategy**

The first important strategy should be consider the improvement of the existing institutional and structural mechanisms established by the Royal Government of Cambodia including National Coordinating Sub-Committee to coordinate the implementation of the Stockholm Convention, Governmental Ministries and Institutions, and Relevant Organizations. The following actions are recommended:

#### **Action:**

1. Develop communication system and networks, in the field of chemicals especially on POPs related issues, among relevant institutions in order to promote effective management and implementation of NIP. Besides, the networks must liaise with NGOs, private sectors, public interest groups and donor community;
2. Designate a competent agency to be the focal point on sound chemicals management including POPs for all donors related matters including relations with donor agencies. At the same time, mechanisms and procedures for receiving project proposals have been established for receiving the proposed proposals; and reporting to government and donors on proposals received and dealt with;
3. Undertake supplementary activities needed to assure good quality proposals including organizing periodic information briefing sessions for Governmental ministries and institutions, National Coordinating Committee responsible for coordinating implementation of the Stockholm Convention on POPs and relevant NGOs regarding the proposed project proposal or/and financial supporting from the government in order to implement NIP;
4. Develop and implement national guideline according to the requirement of relevant international conventions and those guidelines developed under the conventions; and
5. Regular reporting on the status of POPs management in the country and conduct the monitoring and evaluation on the progress of NIP implementation and update this NIP every 4 years.

### **2. Human Resources Development Strategy**

Successful implementation of the NIP, the Royal Government of Cambodia must prompt development of human resource on chemical management, especially on POPs management practices, initiate new procedures and activities through providing technical trainings, field work, and laboratory trainings and regularly promote public awareness on POPs perception and hazard for decision maker. The following actions are recommended:

#### **Action:**

1. Identify and assess the capacity-building needs of governmental officers, private groups, NGOs and stakeholders involved in any aspect of the NIP cycles;

2. Assess necessary external resources to meet the relevant capacity-building needs of Cambodia participating in donors' activities;
3. Assess the commitment of particular intermediary governmental institutions, NGOs to strengthen and empower relevant local communities; support capacity-building for these groups as well as their own capacity-building activities at community level;
4. Develop and conduct technical skill training course on chemical management including POPs; and
5. Establish mechanism for the management and dissemination of information on POPs related issues to technical officers of relevant institutions, decision makers in particular, and to the relevant NGOs as well.

### **3. Improve the Information Sharing and Participation Strategy**

In order to promote the execution of the national implementation plan, there needs to be participation of governmental institutions, NGOs etc. This collaboration will smoothly operate when information sharing is sufficient and on time among public institutions and the private sector. The following actions are recommended:

#### **Action:**

1. Opening up access to meet the obligation of the Stockholm Convention through the production of annual national report on policies, legal framework, activities and plans for implementation of the NIP;
2. Support NGOs, private sector, public interest groups, and stakeholders as executing agencies by participating in the proposed project proposal; executing agency responsibilities should be given to competent institutions in order to avoid overlapping services, and time and resource waste for project implementation;
3. Promote participation of NGOs, private sector, public interest groups, and stakeholders in advising the implementation process of NIP;
4. Devise new models, within the framework of existing guidelines, for involving NGOs and stakeholders effectively; and
5. Disseminate information regarding the implementation of NIP and POPs management to the governmental institutions, NGOs, private sectors, public interest groups, and public at large through mass media.

### **4. Improve Financial Mechanism Strategy**

The implementation of NIP requires having sustainable financial support from government and other programs of the United Nations and the international donor community. In order to meet the sustainable financial support, the following actions are recommended:

#### **Action:**

1. Organize initiative meeting involving donor agencies and private sector to consider strategies for developing private sector partnerships in POPs management;
2. Strengthen efforts to inform donor-country embassies and missions about Cambodia projects and proposal related with the implementation of NIP;
3. Involve representatives of bilateral agencies in national briefings and round tables on technical and financial assistance in Cambodia. Explore possible opportunities for in-country collaboration between donors' projects and Cambodia NIP, e.g., the GEF fund for POPs management, and related activities by bilateral aid agencies;
4. Develop relationships, and exchange information, with NGOs and other groups engaged in monitoring corporate environmental practices; and enhance co-implementation of the plan with NGOs and private sector; and
5. Promote the allocation of government funds for NIP implementation.

## **D- Strategy for Implementation of the Stockholm Convention**

Paralleled with the above national strategy for implementation of NIP and in order to successfully implement the Stockholm Convention, the Royal Government of Cambodia has also a developed direct implementation strategy for the Stockholm Convention, those strategies have been set under the Stockholm Convention including: Identifying, Assessment and Mitigation of the Stockpiles, Articles in Use and Waste Consisting of, Containing and Contaminated with POPs; Improvement of POPs Information Exchange; and Promotion and Conducting POPs Research.

## **1. Strategy: Identifying, Assessment and Mitigation of the Stockpiles, Articles in Use and Waste Consisting of, Containing and Contaminated with POPs.**

In order to manage the stockpiles, articles in use and waste consisting of, containing and contaminated with POPs in a sound technical manner and to ensure safe environment and public health, the strategy on identifying and mitigation of articles and waste consisting of, containing and contaminated with POPs is a key element of successful implementation of the Stockholm Convention and needs to consider the following actions:

### **Actions:**

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

## **2. Strategy: Improvement of POPs Information Exchange**

As POPs is a new issue for the least developing countries including Cambodia, there is little information available and no management measure/method for managing POPs in safe and sound environmental manners. To solve this issue, the Stockholm Convention has required all parties to consider POPs information exchange including results and experiences extracted from successful implementation of the convention between developed countries and developing countries. At the same time, local information exchange and dissemination between institutions, institutions and civil organizations, research institutions, private sectors and vulnerable groups is a requirement of the Stockholm Convention.

Therefore, the improvement of POPs information exchange strategy will assist Cambodia with collectable and combinable POPs data and information system, making it possible for exchanging information with all parties in the region and in the world.

### **Actions:**

- 1- Establish a process for information storage and access of data on POPs related issues in Cambodia. This information is available for all government institutions and stakeholder to exchange information with the convention of all member parties;
- 2- Establish a National Chemical and POPs Information Centre under the Ministry of Environment (contact agency for the Stockholm Convention) to accommodate all database system for responding to the Stockholm Convention reporting procedure;
- 3- Improve the government officers' knowledge on the data collection technique, dissemination, the use, collection approach and analysis of information,
- 4- Encourage and facilitate the contribution of NGOs and the stakeholders in POPs information exchange systems;
- 5- Develop a forum and lines of communication to extend the data collection and the use; and
- 6- Promote public awareness on POPs reduction and elimination issues to stakeholders and interest groups, and provide up to date POPs information through mass media.

### 3. Strategy: Promotion and Conducting POPs Research

For least developing countries like Cambodia, capacity to assess POPs hazard on human health and environment is unavailable because of the lack of basic scientific information and data related with POPs release, POPs residue accumulated in the environment and in food products. Therefore, in order to improve POPs management and have evidence to assess the effective implementation of the Stockholm Convention, the promotion and conducting of POPs research strategy is an urgent option and requirement of Cambodia in implementation of the Stockholm Convention.

#### Actions:

- 1- Strengthen capacity of national and local technical staffs for POPs research;
- 2- Improve capacity of existing laboratories for enabling POPs analysis;
- 3- Conduct technical research on POPs residues or/and magnitude of POPs substances containing in import and export of consumer products and the environment and on human health affected by exposure to POPs;
- 4- Initiate the development of alternatives management options for other sources of the release of unintentionally produced POPs based on BAT and BEP guideline in compliance with national conditions.

### E- Detailed Action Plans

In order to achieve the objectives of the NIP as well as to respond to the requirements of the Stockholm Convention, detailed action plans related to the management and safe disposal of the 12 POPs substances set under the Stockholm Convention have been divided into three main sections according to the group of POPs substances. At the same time, in order to facilitate successful implementation of NIP and the ensuring smooth processing of the administrative management system, the coordination for implementation of NIP is considered as a part of the action plans. Detailed action plans are divided into four main sections remain in this NIP including:

- 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.

Objectives of each section are aimed at fundamental and urgent national capacity building for POPs management, reduction, and elimination actions in the government institutions and non-governmental organizations. In each section the outline comprises the proposed goals, objectives, key problems, outputs, and the main activities and detailed tasks to achieve the national objectives. The justifications for implementation of the activities are included as well. Such objectives can be seen as the core functions of the proposed law development, amendment, and enforcement in compliance with the obligations of the convention. Some other objectives provide a general concept for project design and operation related to POPs management, reduction, and elimination.

#### 1. SECTION 1: POPs PESTICIDES

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

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

#### KEY PROBLEMS

- Cambodia is still importing and using banned agricultural pesticides including POPs;
- The public at large is facing health risks caused by using agricultural pesticides including POPs;
- Cambodia lacks good mechanisms and appropriate measures for protecting public health and the environment; and
- Cambodia lacks comprehensive and basic data and information for managing agricultural pesticides including POPs.

##### 1.3 *Action Plans*

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

**1.3.1.1 Output:**

- › Existing legal instruments related to the managing of pesticides (including POPs) will be revised, amended and effectively implemented.
- › Technical guidelines on the management of obsolete pesticides (including POPs) are developed, introduced and effectively implemented.

**1.3.1.2 Activities:**

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>1-1</b>	<b>Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement.</b>	<b>18 Months</b>	<b>MAFF</b>	<b>MoE, MoH, MoC, NGOs, MoJ</b>
1-1-1	<i>Formulate legal team and review existing regulation on agricultural pesticides management</i>			
1-1-2	<i>Amend existing legislation and/or develop new legal instruments for pesticides (including POPs) management</i>			
1-1-3	<i>Develop rules and regulations for implementing the pesticides management legislation</i>			
1-1-4	<i>Develop technical guidelines on pesticides (including POPs) monitoring and inspection.</i>			

**1.3.2 Objective 2: Strengthen institutional capacity and raise public awareness on obsolete pesticides including POPs pesticides.****1.3.2.1 Output:**

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

**1.3.2.2 Activities:**

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

Code	Activities/ Tasks	Timing	Responsible Institution	Cooperating Institutions
2-4-1	Organize forums/workshops for policy and decision makers.			
2-4-2	Provide information on pesticides risk and hazard related issue including obsolete pesticides and POPs to policy and decision makers.			

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

#### 1.3.3.1 Output:

- › Information on obsolete pesticides is available.
- › Illegal trade and domestic trafficking and using of pesticides including POPs will be seriously reduced.
- › Pesticides residues including POPs in agricultural products and in the environment are reduced.
- › Pesticides (including POPs) concentrations in consumer products are reduced.
- › Collection action and safe storage of obsolete pesticides including POPs pesticides are applied

#### 1.3.3.2 Activities

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>3-1</b>	<b>Conduct full inventory (including pilot inventory process) on obsolete pesticides including POPs.</b>	<b>24 Months</b>	<b>MAFF</b>	<b>MoE, MoH, MoC, MoEF</b>
3-1-1	Form obsolete (including POPs) pesticides inventory team.			
3-1-2	Organize inventory training of the team and develop inventory forms, guidelines and plan execution of the inventory.			
3-1-3	Undertake comprehensive inventory survey covering the whole country.			
3-1-4	Design standard obsolete pesticides and POPs pesticides database format and reporting.			
3-1-5	Training of technical staff on data entry.			
3-1-6	Set-up database management system with facilities and data entry.			
3-1-7	Develop database document on obsolete pesticides including POPs and publicizing.			
<b>3-2</b>	<b>Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.</b>	<b>24 months</b>	<b>MAFF</b>	<b>MoH, MoE, MoC, MoEF</b>
3-2-1	Develop plan for monitoring on import, domestic trafficking and trade of illegal pesticides.			
3-2-2	Undertake regular monitoring and inspection focusing on the presence of illegal pesticides.			
3-2-3	Undertake administrative measures (like confiscation of illegal products and storage in Government owned storage sites) for any illegal action related to illegal pesticides.			
<b>3-3</b>	<b>Prepare collection campaign for temporarily storage of the obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.</b>	<b>12 months</b>	<b>MAFF</b>	<b>MoE, MoEF</b>
3-3-1	Undertake the environmental impact assessment on the collection and storage of obsolete pesticides including POPs pesticides.			
3-3-2	Prepare technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete pesticides including POPs.			
3-3-3	Establish or improve safe regional temporary storage facilities and area(s) for keeping obsolete pesticides including POPs.			

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

#### 1.3.4.1 Output:

- › Pilot project concerning the disposal of already observed obsolete pesticides in stockpile is completely implemented.
- › The identified stockpiles and wastes containing or contaminated with obsolete pesticides including POPs pesticides are sound and safely managed and disposed of.



**1.3.4.2 Activities:**

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>4-1</b>	<b>Execute a Pilot Project for the disposal of obsolete pesticides founded in stockpile.</b>	<b>18 Months</b>	<b>MAFF, MoE</b>	<b>MoH, MoC, MoEF</b>
4-1-1	<i>Organize training course for staff involved in the project.</i>			
4-1-2	<i>Purchase UN approved packaging materials and undertake repackaging of the relevant obsolete pesticides.</i>			
4-1-3	<i>Clean the storage facility.</i>			
4-1-4	<i>Select contractor for the international transport and disposal of all repackaged stocks.</i>			
4-1-5	<i>Export repackaged obsolete pesticides for elimination outside the country.</i>			
<b>4-2</b>	<b>Execute a nation wide project for the disposal of all obsolete pesticides.</b>	<b>36 Months</b>	<b>MAFF, MoE</b>	<b>MoH, MoC, MoEF</b>
4-2-1	<i>Identify and purchase the required UN approved packaging materials.</i>			
4-2-2	<i>Organize training course for staff involved in the project.</i>			
4-2-3	<i>Develop a plan for repackaging and transport to regional temporarily storage depots.</i>			
4-2-4	<i>Repackage obsolete pesticides, clean all stores and transport the repackaged stockpiles (obsolete pesticides and wastes contaminating pesticides including POPs) to regional temporary storage depots.</i>			
4-2-5	<i>Select contractor for the international transport and disposal of all repackaged stocks.</i>			
4-1-6	<i>Export repackaged obsolete pesticides stockpile for elimination outside the country.</i>			

**2. SECTION 2: PCBs SUBSTANCES**

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

**2.2 Overall Objectives: Proper economical and ecological management of PCBs and its contaminated articles.**

**KEY PROBLEMS:**

- No specific PCBs regulation in force in Cambodia;
- Based on economical situation of Cambodia, no replacement of old transformers;
- Old transformers are continuing to be used in Cambodia and are PCBs contaminated;
- Average of transformer and distribution of population per period in comparison with the deadline of Stockholm is too old;
- Cambodia is still importing transformers without PCBs control;
- To date PCBs released to the environment caused by lack of awareness of PCBs hazard ;
- No appropriate & specific maintenance for PCBs contaminated transformers;
- No PCBs disposal facilities available with safe environmental standards;
- Electrical workers face high risks caused by PCBs associated work;
- No specific measure for health and environmental protection affected by PCBs;
- No supply of safe protective equipment for workers;
- Workers are not aware of the risk of PCBs health impact.
- Lack of knowledge and understanding on the risks, safe and sound management of PCBs; and
- Lack of data and information for proper management of PCBs.

**2.3 Action Plans**

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

**2.3.1.1 Output:**

- › PCBs management legal instruments tools will be adapted and available in Cambodia;

- › Technical guidelines for sound management of PCBs dielectric, equipment and articles contained and contaminated with PCBs are available;
- › Stakeholders will be better aware about measures to protect their health and the environment from PCBs affect;
- › Stakeholders (EDC and maintenance companies) will be aware of sound economical and ecological management of PCB transformers until the end of life;
- › Professional workers health and the environment will be protected; and
- › Compliance with the obligations of the Stockholm Convention.

### 2.3.1.2 Activities:

Code	Activities / Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Develop legal instruments and technical guidelines for PCBs ESM</b>	12 months	MIME,	MoE EAC, EDC, MoC, MoEF,
1-1-1	<i>Form legal and technical working group including all PCBs stakeholders.</i>			
1-1-2	<i>Study existing legal instruments and technical guidelines related to PCBs management.</i>			
1-1-3	<i>Develop legal instruments and technical guidelines and standards as necessary for PCBs management.</i>			
1-1-4	<i>Organize workshop for comments of the draft legal instruments before official approval.</i>			

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

#### 2.3.2.1 Output:

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

#### 2.3.2.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
2-1	<b>Conduct full inventory (in use, waiting for use, and out of use) in order to identify equipment and articles containing and/or contaminated with PCBs.</b>	18 months	MIME, MoE	EAC, EDC, MoC, MoEF, stakeholders
2-1-1	<i>Form team for inventory and study on existing inventory report;</i>			
2-1-2	<i>Identify support tools and equipment for inventory, and develop plans to conduct PCBs inventory.</i>			
2-1-3	<i>Conduct comprehensive inventory (including testing, classifying, labeling, registering, etc.) of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-1-4	<i>Design and develop national database on electrical equipment and articles containing or contaminated with PCBs.</i>			
2-2	<b>Take measure to manage the in-use electrical equipment and articles containing or contaminated with PCBs in an environmentally sound manner.</b>	12 months	MIME	MoE, EDC, EAC, MoC, MoEF, stakeholders
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</i>			

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
	<i>contaminated with PCBs (with high concentration &gt;10% next step with concentration &gt;0.05 %).</i>			
<b>2-3</b>	<b>Develop strategy to reduce the in-use electrical equipment and articles containing or contaminated with PCBs.</b>	<b>24 months</b>	<b>MIME</b>	<b>MoE, EDC, EAC, MoC, MoEF, stakeholders</b>
2-3-1	<i>Initial assessment (current and future) of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-3-1	<i>Develop strategy for the reduction of electrical equipment and articles containing or contaminated with PCBs.</i>			
2-3-1	<i>Develop and implement demonstration (pilot) project in PCBs reduction.</i>			

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

#### 2.3.3.1 Output:

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

#### 2.3.3.2 Activities:

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

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

#### 2.3.4.1 Output:

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

contaminated with PCBs will be developed.

#### 2.3.4.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
4-1	<b>Take measure to manage the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs with environmental sound manner.</b>	24 months	MIME, MoE	EDC, MoC, MoEF, stakeholders
4-1-1	<i>Training for ESM of out of use electrical equipment, articles and wastes containing or contaminated with PCBs (handling, transportation, storage, dismantling, pre-treatment, shipment of used PCB out of country disposal facilities).</i>			
4-1-2	<i>Form working group with participation of the stakeholders</i>			
4-1-3	<i>Identify storage sites and facilities for keeping out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-1-4	<i>Upgrade (or new establish if require) storage sites and installed facilities for keeping out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-1-5	<i>Take action to centralize the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			
4-2	<b>Develop strategy for destroying the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs with environmental sound manner.</b>	12 months	MIME, MoE	EDC, MoC, MoEF, stakeholders
4-2-1	<i>Undertake assessment (current and future) of out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs for destruction including utilization of disposal facilities in the country; and evaluation of disposal facilities out of the country.</i>			
4-2-2	<i>Conduct assessment with participation of the stakeholders for the disposal of used equipment, articles containing or contaminated with PCB.</i>			
4-2-3	<i>Develop strategy for the destruction of the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs (Handling, transportation, storage, dismantling, pre-treatment and final disposal).</i>			
4-2-4	<i>Organize and conduct the national workshop for comments and approval of the draft strategy for the destruction of the out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</i>			

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

##### 2.3.5.1 Output:

- › The capacity of electrical workers working with PCBs associated issues will be strengthened.
- › Knowledge and information on PCBs hazards and risks is widely provided and disseminated.
- › Personal protective equipment and safety environment from the impact of PCBs are considered.
- › Capacity of laboratory in analyzing PCBs shall be strengthened.

##### 2.3.5.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
5-1	<b>Provide and strengthen capacity for managing PCBs dielectric and its contaminated articles.</b>	12 months	MIME, MoE	EDC, Provincial Electricity Utilities (PEU), MoC, MoEF, stakeholders
5-1-1	<i>Develop materials on PCBs issues and publicize.</i>			
5-1-2	<i>Organize trainings on PCBs sound management related issues for national and provincial levels.</i>			
5-2	<b>Provide and strengthen laboratory capacity in analyzing PCBs.</b>	18 months	MIME	MoE, MoC, stakeholders

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

### 3. SECTION 3: UNINTENTIONALLY PRODUCED POPs

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

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

#### KEY PROBLEMS

- No Public awareness of unintentionally produced POPs generation and hazard;
- Insufficient regulation related to unintentionally produced POPs management;
- Lack of technical experts and technical guidelines for unintentional produced POPs management;
- Uncontrolled burning (waste at municipality and rural landfills, household, public areas...etc);
- Lack of control measures for reducing the release of unintentionally produced POPs from all sources;
- No 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 from unintentionally produced POPs and poor database management system and information exchange mechanism among the governmental institutions and stakeholders; and
- Lack of laboratory capacity and equipment for monitoring and analyzing unintentionally produced POPs.

#### 3.3 *Action Plans*

##### 3.3.1 *Objective 1: Revise or develop the legislations related to the sound management of unintentionally produced POPs.*

##### 3.3.1.1 *Output:*

- › Relevant legislations 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 and widely implemented;
- › Broad understanding and awareness about the relevant laws and other legal instruments are disseminated and promoted; and
- › The implementation of reduction measure of unintentionally produced POPs release will be most effective.

##### 3.3.1.2 *Activities:*

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Undertake law and policy assessment related to the management of unintentionally produced POPs.</b>	12 Months	MoE	MIME, MoH MAFF, Local Authorities, MPWT, NGOs, Private Sectors
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>			
1-2	<b>Amend existing laws, or develop new law where necessary related to the management of unintentionally produced POPs.</b>	18 Months	MoE	MIME, MoH MAFF, Local Authorities, MPWT, MoJ NGOs, Private Sectors
1-2-1	<i>Form legal team on the management of unintentionally</i>			

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
	<i>produced POPs.</i>			
1-2-2	<i>Conduct the training course on legislation for the management of unintentionally produced POPs.</i>			
1-2-3	<i>Organize national workshop to discuss current situation of laws and policy related to the management of unintentionally produced POPs.</i>			
1-2-4	<i>Amend the existing laws or develop new ones and develop policy on the management of unintentionally produced POPs.</i>			
<b>1-3</b>	<b>Develop the national guidelines for the sound management of unintentionally produced POPs (BAT / BEP).</b>	<b>18 Months</b>	<b>MoE</b>	<b>MIME, MoH MAFF, Local Authorities, MPWT, MoJ, NGOs, Private Sectors</b>
1-3-1	<i>Form technical team for development of the national guidelines for the sound management of unintentionally produced POPs.</i>			
1-3-2	<i>Identify and prioritize relevant unintentionally produced POPs release source categories.</i>			
1-3-3	<i>Study the available relevant guidance documents on BAT &amp; BEP approved by COPs.</i>			
1-3-4	<i>Develop national guidelines (Prakas) on the sound management of unintentionally produced POPs.</i>			
1-3-5	<i>Introduce and disseminate the developed national guidelines to all stakeholders (through meetings or workshops).</i>			

### 3.3.2 Objective 2: Strengthen capacity and raise public awareness on unintentionally produced POPs issues and hazard.

#### 3.3.2.1 Output:

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

#### 3.3.2.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>2-1</b>	<b>Strengthen and develop the capacity to manage problems related to unintentionally produced POPs</b>	<b>18 Months</b>	<b>MoE</b>	<b>MIME, MoI, MAFF, MoH, MoInf, MPWT, NGOs, MoEYS</b>
2-1-1	<i>Form technical team and core trainer on unintentionally produced POPs.</i>			
2-1-2	<i>Develop training material on unintentionally produced POPs.</i>			
2-1-3	<i>Provide appropriate information on unintentionally produced POPs for decision makers.</i>			
2-1-4	<i>Strengthen capacity of institutional officers and authorities responsible for implementation of legal documents and guidelines relevant to sound management of unintentionally produced POPs.</i>			
<b>2-2</b>	<b>Develop public awareness raising program on health and environmental impact affected by unintentionally produced POPs, and alternative uses.</b>	<b>24 Months</b>	<b>MoE</b>	<b>MIME, MoI, MAFF, MoH, MoInf, NGOs, MPWT, MoEYS, Private Sectors.</b>
2-2-1	<i>Develop awareness raising program on unintentionally produced POPs.</i>			
2-2-2	<i>Develop information material for public awareness raising on unintentionally produced POPs.</i>			
2-2-3	<i>Organize awareness raising campaigns on unintentionally produced POPs through mass media and direct actions to poor community and vulnerable people focusing in particular on uncontrolled burning of wastes, household cooking in using improper fuel and 3R principles (Reduce, Reuse, and Recycling).</i>			

**3.3.3 Objective 3: Improve waste management practices and prevent uncontrolled burning of wastes****3.3.3.1 Output:**

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

**3.3.3.2 Activities:**

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
<b>3-1</b>	<b>Improve landfill management</b>	<b>18 Months</b>	<b>MoE, Selected Local Authorities</b>	<b>MIME, MoH, MAFF, MPWT, NGOs, Private Sectors,</b>
3-1-1	<i>Form technical team for land field assessment.</i>			
3-1-2	<i>Conduct selected municipality and provincial landfill assessment.</i>			
3-1-3	<i>Develop landfill management program.</i>			
3-1-4	<i>Conduct training course on landfills management for the municipality and provincial authorities.</i>			
3-1-5	<i>Design and implement municipal and provincial landfills management pilot project.</i>			
<b>3-2</b>	<b>Introduce and promote sound management of waste including 3R principles and waste separation practices</b>	<b>18 Months</b>	<b>MoE, Selected Local Authorities</b>	<b>MAFF, MIME, MoH, MPWT, MoEYS, MoCRA, Molnf</b>
3-2-1	<i>Establish technical team for sound waste management.</i>			
3-2-2	<i>Study available guidance documents on sound waste management practices set under the UNEP-Basel and the Stockholm Conventions.</i>			
3-2-3	<i>Elaborate waste management guidelines suitable for Cambodia focusing on implementation of 3-R principles.</i>			
3-2-4	<i>Provide country-wide training on waste management guidelines implementation involving local authorities</i>			
3-2-5	<i>Design and implement pilot project on environmentally sound waste management</i>			
<b>3-3</b>	<b>Introduce and promote implementation of BAT &amp; BEP in existing waste incineration plants (municipal, hospital and industrial wastes)</b>	<b>18 Months</b>	<b>MoE</b>	<b>MAFF, MoH, MIME, MPWT, MoEYS, MoCRA, Molnf, NGOs, Private Sector</b>
3-3-1	<i>Establish technical team associated with the field of the waste incineration.</i>			
3-3-2	<i>Study existing guidelines and information related to BAT and BEP and other guidelines to be adopted by the COP for environmentally sound waste incineration (refer to activity 1-3).</i>			
3-3-3	<i>Undertake assessment of applicability of BAT and BEP in existing waste incineration plants including socio-economic assessment.</i>			
3-3-4	<i>Design and implement pilot project on the applicability of BAT and BEP guidance in selected existing waste incineration plant.</i>			
3-3-5	<i>Update the national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary.</i>			
3-3-7	<i>Organize training for responsible institutional officers and authorities and for plant operators on best available techniques (BAT) and best environmental practice (BEP).</i>			
<b>3-4</b>	<b>Evaluate the possibility of hazardous waste co-incineration in the newly constructed cement plant under BAT&amp; BEP conditions</b>	<b>18 Months</b>	<b>MIME, MoE, Selected private sectors</b>	<b>MoH, CDC, Private Sector</b>
3-4-1	<i>Establish technical team consisting of plant owners and relevant state authorities</i>			
3-4-2	<i>Evaluate the possibilities of alternative fuel use (used tires, PCBs contaminated oils etc.) in the newly constructed</i>			

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
	<i>cement plant</i>			
3-4-3	<i>Perform cost-benefit analysis of hazardous waste co-incineration</i>			
3-4-4	<i>Identify necessary additional measures for environmentally sound hazardous waste co-incineration</i>			

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

#### 3.3.4.1 Output:

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

#### 3.3.4.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
4-1	<b>Undertake comprehensive inventory on the release of unintentionally produced POPs.</b>	12 Months	MoE	MIME, MoH, MAFF, Local authority, MPWT, NGOs, Private Sectors, NGOs.
4-1-1	<i>Form inventory team and review existing inventory report.</i>			
4-1-2	<i>Identify support tools and equipment for inventory.</i>			
4-1-3	<i>Conduct unintentionally produced POPs release inventory.</i>			
4-1-4	<i>Design national unintentionally produced POPs database.</i>			
4-1-5	<i>Disseminate final result of unintentionally produced POPs release inventory.</i>			
4-1-6	<i>Evaluate the situation of POPs reduction and elimination.</i>			

### 3.3.5 Objective 5: Implementation of guidelines on best available techniques (BAT) and best environmental practice (BEP) to prioritized sources of unintentionally produced POPs

#### 3.3.5.1 Output:

- › Amount of release of unintentionally produced POPs will be reduced.

#### 3.3.5.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
5-1	<b>Introduce and effectively implement guidelines on best available techniques (BAT) and best environmental practice (BEP) to the release sources of unintentionally produced POPs (Existing and New).</b>	24 Months	MoE, MIME, MoH, Local Authorities	MAFF, MoC, MPWT, Private sectors, NGOs,
5-1-1	<i>Form technical team associated with the field of unintentionally produced POPs release management.</i>			
5-1-2	<i>Review existing guidelines and information related to BAT and BEP for the prioritized release source categories</i>			
5-1-3	<i>Update the national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary.</i>			
5-1-4	<i>Organize training course for competent officers, responsible authorities and for plant operators on best available techniques (BAT) and best environmental practice (BEP).</i>			
5-1-5	<i>Promote implementation of the guidelines on best available techniques (BAT) and best environmental practice (BEP) in the prioritized release sources.</i>			



## 4. SECTION 4: MANAGEMENT OF NIP IMPLEMENTATION

### 4.1 Goals: Support to Successful Implementation of the NIP

### 4.2 Overall Objectives: Develop a National Program for the Management of NIP Implementation

#### KEY PROBLEMS

- The existing Project Coordination Unit for the NIP development process does not have further mandate yet for coordinating the implementation of NIP;
- Limited administrative and management of NIP among stakeholders in particular for project implementation;
- Insufficient capacity in POPs project raising funds and POPs project proposal development;
- Lack of policy making evidence related to POPs reduction and elimination;
- Limited capacity and ability in NIP reporting procedure, evaluation and updating;
- 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 in national, regional, and international level; and
- Lack of specific law on chemical management including POPs and PTS.

### 4.3 Action Plans

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

##### 4.3.1.1 Output:

- The national mechanism for the management of NIP implementation is strengthened
- The NIP implementation and management will be efficiently and effectively coordinated;
- The NIP reporting, evaluation and updating is executed on time;
- The capacity of stakeholders relevant to NIP implementation will be promoted; and
- The National Chemical Database will be developed and information exchange will be executed nationally and internationally.

##### 4.3.1.2 Activities:

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
1-1	<b>Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation.</b>	36 Months	MoE	MIME, MoH, MAFF
1-1-1	<i>Coordinate in policy development on sound management of chemical including POPs and PTS (Persistent Toxic Substance).</i>			
1-1-2	<i>Strengthen the administration management in POPs project implementation.</i>			
1-1-3	<i>Assist and support stakeholders in development of project proposal for funding.</i>			
1-1-4	<i>Communicate with stakeholders for NIP implementation.</i>			
1-1-5	<i>Communicate with donor agencies for assisting NIP implementation.</i>			
1-1-6	<i>Undertake NIP reporting, evaluation and updating.</i>			
1-2	<b>Establish and design the National Chemical Database including POPs and PTS for centralization and exchanging of information.</b>	24 Months	MoE	MIME, MoH, MAFF, Stakeholder
1-2-1	<i>Identify the scope of the National Chemical Database and design for harmonious integration of information and dissemination related to chemical management.</i>			
1-2-2	<i>Integrate the results of all three sections of POPs action plans implementation into a single and will be used as reference document.</i>			
1-2-3	<i>Integrate the existing information related to chemical management into the National Chemical Database.</i>			
1-2-4	<i>Organize regular national workshops for presenting and integration of NIP project achievements into the National Chemical Database.</i>			
1-2-5	<i>Strengthen capacity of relevant chemicals management</i>			

Code	Activities/Tasks	Timing	Responsible Institution	Cooperating Institutions
	<i>including POPs action plan implementers how to access the communication system and how to share POPs information into the system.</i>			
1-2-6	<i>Develop plan and apply chemicals data entry including POPs information exchange strategies and implementation of action plans regarding the Improvement and Updating of The National Chemical Database.</i>			
1-2-7	<i>Disseminate and exchange information on chemicals management including POPs and PTS with the stakeholders nationally and internationally.</i>			

## F- Requirements for Achieving Goals

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

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

Cambodia is a poor country. Effective management of POPs in a sound environmental manner must be combined with the continuous support and strong commitment of the international donor community. For POPs reduction and elimination efforts under the obligations of the Stockholm Convention, Cambodia needs more financial support from external sources with in kind contribution from the Royal Government of Cambodia. This financial requirement is used for supporting the costs for administration, materials, equipment, operation, and project management. The Royal Government of Cambodia will contribute additional technical staff for supportive activities related to the timely and effective implementation of the NIP. The Government of Cambodia through the Focal Point of the Ministry of Environment and through cooperation with line ministries will provide the inputs for the effective implementation of this NIP including office, stores, water and electricity supply, infrastructure...etc.

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

## 1. Resource Requirements

In the implementation of this NIP, the total budget needed approximates USD \$7,245,000 excluding budget for disposal of obsolete pesticides and PCBs. Such budget will cover the management of POPs pesticides in amount of USD \$2,355,000, for PCBs in amount of USD \$2,030,000, for unintentionally produced POPs in amount of USD \$2,180,000 and for coordinating activities for NIP implementation in amount of USD \$680,000. The resource requirement is included in each priority project portfolio (See Part 3: Project Profiles). In accordance with Article 13 of the Convention, alternate sources of funding will be considered.

The Government of Cambodia through the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Industry Mines and Energy and other relevant Ministries will provide the following inputs for the effective implementation of the NIP project: direct consultations through the technical departments and national consultants, additional technical staff at all levels, as may be required will be made available to the NIP for supportive and protective activities related to the timely and effective implementation of the project. At the same time, the government will also contribute up to 20% (ceiling point) of total required budgets respectively to in cash and/or other in kind such as office accommodation, stores, infrastructure and other miscellaneous items associated with the NIP for its successful implementation.

The Donor input will ideally be provided through the Ministry of Environment as a 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 be considered and are envisaged: experts, consultants, administrative support, official travel, service contract, general operating expenses, training, supplies and materials, equipment and other miscellaneous items for effective implementation of the NIP.

## 2. Timetable for Implementation of NIP, First Four Years (2007-2010)

This National Plan for implementation of the Stockholm Convention is determined in four-year operation period (2007-2010) as in the following table. 2006 is a year of Connection Bridge for Cambodia to prepare and be ready to implement the first national implementation plan. In this stage, Cambodia faces two main tasks, first the approval of NIP, second funding in order to implement NIP. Summary of the goals contained in the detailed strategy with specific activities and milestones are described in the following table:

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

STAGE	2006	2007	2008	2009	2010
<b>I- NIP Approval And Proposed Priority Projects Proposal For Funding</b>					
1. Submit NIP to the Royal Government of Cambodia for approval.	■				
2. Develop NIP project profiles and submit to GEF and other donor institutions.	■	■			
<b>II- NIP Project Development Phase</b>					
1. Set-up the project implementation framework.		■	■		
2. NIP staff selection.		■	■		
3. Site selection for execution of the project.		■	■		
<b>III- NIP Project Implementation Phase</b>					
1. Site preparation and budget for project operation.		■	■		
2. Collect relevant data and establish the National Chemical Database.		■	■		
3. Undertake training program.		■	■	■	■
4. Review and develop national laws, regulations related to chemical management including POPs.		■	■	■	■
5. Develop provisional national POPs management and elimination strategy.		■	■	■	■
6. Upgrade existing laboratories for enable POPs analysis.		■	■	■	■
7. Organize POPs awareness raising campaigns.		■	■	■	■
8. Conduct full POPs inventory.		■	■	■	■
9. Support sound disposal of POPs.		■	■	■	■
10. Support and conduct study and research on POPs related issues.		■	■	■	■
11. Work with stakeholders on sound management of POPs and support program.		■	■	■	■
12. Evaluate, report and update the NIP		■	■	■	■

## **G- Monitoring, Evaluation and Updating NIP**

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

The Ministry of Environment is the lead agency managing the implementation of the NIP, particularly the National Coordination Unit, will act as a coordination body. The main role of this coordination body is

- Coordinate the execution of the national action plan,
- Facilitate in the development of project proposal and fund raising for sound management of POPs,
- Communicate with donor agencies for assisting NIP implementation,
- Act as central point of information exchange and national chemical database management,

### **3. Monitoring and Evaluation of NIP Implementation**

Progress reporting will be based on the logical framework analysis, and the performance measurement framework suggested in annex 3. Cambodia NIP is to provide all reports to the Secretariat of the Stockholm Convention as scheduled such as a Progress Report, an Annual Report at the completion of the first year and after completion of the NIP. To complement the National Report and Effective Assessment Report as well as Elimination of POPs Reports we also plan to conduct an evaluation of results and performance for inclusion in those reports.

The question to be asked in the evaluations is: Has Cambodia succeeded in making a difference? and if so, how much? It is not sufficient to measure the number and quantity of POPs elimination nor is it sufficient to measure the area cleared from POPs. What matters is to try and achieve the maximum social-environmental-economic benefits for the POPs elimination action per spent resources. In addition to a positive response to these questions, another question has also to be answered positively to the technical assistance that resources provided from GEF in sustainable manner, from government and from any other donor. This question also requires a more sophisticated response than a count of numbers of persons completing training courses or gaining understanding about POPs hazards. What matter is a real change in mentality and behavior of people in all classes of society?

### **4. NIP Updating and Report**

Representatives of the stakeholders will review and assess the work completed to date on regular intervals. The NIP implementation results and progress report regarding the implementation of the POPs elimination action plan will be reported by the Royal Government of Cambodia representative to the Secretariat of the Stockholm Convention and the progress reports will be updated every year to provide a more current statement of the NIP operational status and results.

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

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



## **CHAPTER 3 : PROPOSED PRIORITY PROJECTS**

The key objective of the proposed priority projects is the development of effective governmental institutions and networks at all levels. Local people and authorities will be directly involved in sectional designs to develop alternatives to the POPs substances, and in local health and environmental protection activities.

This NIP for the implementation of the Stockholm Convention is a direct response to the lack of existing capacity at all levels in both the government and non-government sectors. This plan will assist in building capacity through professional and technical training, assistance with development and creating the appropriate political and legal frameworks and enforcement systems, development in the field of management capacities and systems especially in institutional development and public participation, building of stakeholders' capacity in terms of human resources development, and systems development through practical studies in terms of information development and management.

Some individual components of the NIP such as training programs, POPs inventory, POPs technical research, and awareness raising program are particularly innovative and for the first time to be implemented in Cambodia. The nature of the NIP is related more to its basic objective of using GEF funding resources, donor government funding resources, and the Royal Government of Cambodia funding resources to provide an urgent kick-start to building national capacity from Cambodia current low baseline capacity on POPs reduction and elimination. The funding from GEF and the donor community is the appropriate solution in the current effort of Cambodia in POPs reduction and elimination. The NIP is also intended to develop innovative and appropriate approaches to reconciling social, economic, health, and environmental objectives at farmers and workers level, and to help build community participation systems aiming at POPs elimination. In order to strengthen capacity for participation and implementation of the Stockholm Convention, the proposed priority projects for future implementation are:

#### **Priority Projects for POPs Pesticides Reduction and Elimination**

- *Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement.*
- *Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.*
- *Strengthen capacity on pesticides analysis focusing on POPs pesticides.*
- *Raise public awareness on pesticides issues including POPs pesticides and other obsolete pesticides.*
- *Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides.*
- *Conduct full inventory on obsolete pesticides including POPs pesticides.*
- *Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.*
- *Prepare collection campaign for temporarily storage of the obsolete pesticides including POPs pesticides) in regional storage depots prior to disposal.*
- *Formulate and execute a Pilot Project for the disposal of a limited amount of obsolete pesticides.*
- *Formulate and execute a nation wide project for the disposal of all obsolete pesticides including POPs.*

#### **Priority Projects for PCBs Management**

- *Develop legal instruments or technical guidelines for managing PCBs release.*
- *Comprehensive inventory of PCBs contained and contaminated equipment and articles for ESM.*
- *ESM Management for "in use" electrical equipment.*
- *Assessment of Socio economic aspect regarding the stop use of electrical equipment and articles containing or contaminated with PCBs.*
- *ESM compliance of the maintenance and repairing activities of electrical equipment.*
- *Strengthen Lab capacities for PCBs analysis.*
- *ESM Management for "out of use" of electrical equipment.*
- *Provide and strengthen capacity and enhance public awareness on PCBs issue.*
- *PCB Database management.*

#### **Priority Projects for the Management of Unintentionally Produced POPs**

- *Revise or develop the legislations related to sound management of unintentionally produced POPs.*
- *Institutional strengthening and capacity building for sound management of unintentionally produced POPs.*
- *Public awareness raising program on unintentionally produced POPs.*
- *Introduce and encourage sound waste management practices.*
- *Promotion of controlled landfills and prevention of uncontrolled burning of waste.*
- *Introduction and promotion of BAT & BEP in existing waste incineration plants.*

- *Implement guidelines on BAT & BEP in existing POPs release sources.*
- *Improvement of medical waste management practices.*
- *Inventory of unintentionally produced POPs releases.*
- *Evaluate the possibility of hazardous waste co-incineration in the newly constructed cement kiln under BAT and BEP conditions.*

#### **Management of NIP Implementation**

- *Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation.*
- *Establish and design the National Chemicals Database including POPs and PTS for centralization and exchanging of information.*
- *Develop draft law on Chemical Management.*

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



## A. Project Profiles for the Reduction and Elimination of POPs Pesticides

### 1. Project Profile No 1: Assessment of the existing laws

<b>1- Project Title</b>	<b>Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH, MoC, MoJ, NGOs,
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	In Cambodia, chemical pesticides are not developed as a specific act yet. It is a Governmental Ordinance No 69 dated October 28, 1998 on Standards and Management of Agricultural Materials. A part of this regulation focused on fertilizers and pesticides management, especially in importation and exploitation. However, this sub-decree does not provide a good basis provision for proper and environmentally sound pesticides management.
<b>7- Project Rational</b>	Assess and recommend the improvement of existing laws and other standards. The current requirements for sound pesticide management have no strong formal status because they are sub-decrees and ministerial ordinances only. The MAFF has the task of deciding whether or not development requires a pesticides management law.
<b>8- Project Justification</b>	A sound legal basis is a must for sound pesticide management.
<b>9- Project Goal</b>	Eliminate the import and use of illegal pesticides including POPs.
<b>10- Objectives</b>	Create sound legal basis for pesticide management in Cambodia through the amendment of existing legal instruments or develop new law and strengthening effective pesticides including POPs law enforcement.
<b>11- Beneficiaries</b>	Cambodian society
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Formulate legal team and review existing legislation to improve legal instruments related to pesticides issues;</li> <li>• Update existing legislation or develop new legal instruments for pesticides management including POPs;</li> <li>• Develop rules and regulations for implementing of the pesticides management legislation;</li> <li>• Develop technical guidelines on pesticides monitoring and inspection including POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Phnom Penh and provincial-municipality areas.

## 2. Project Profile No 2: Institutional capacity building

<b>1- Project Title</b>	<b>Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH, MoC, MoEF,
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	The current capacity of relevant stakeholders responsible for the prevention of import, trafficking and use of illegal pesticides is very limited. It is impossible to ensure adequate law enforcement. Cambodia has little recourse for the promotion of law enforcement programs and government officials have limited capability in playing roles in monitoring and inspecting illegal pesticides trade. Generally, Cambodia has very limited human resource and inadequate capability of institutional capacity. Cambodia's inadequate capacity to prevent the import, trafficking and use of illegal pesticides. Therefore, in order to promote effective enforcement legislation, Cambodia needs to strengthen capacity of government officials and competent authorities' to enforce pesticides legislation.
<b>7- Project Rational</b>	Implementation of the NIP will be successful to a large scale following the quick improvement of capacity and functioning of the relevant stakeholders in order to assist the institutions in adequate and effective law enforcement.
<b>8- Project Justification</b>	Adequate law enforcement is necessary before the removal of unwanted obsolete pesticides stocks can take place in Cambodia.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Create and strengthen capacity of the relevant institutions dealing with obsolete pesticides including POPs pesticides issues in Cambodia.</li> </ul>
<b>11- Beneficiaries</b>	Relevant institutions and Cambodian society.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Formulate and build national TOT capacity.</li> <li>• Develop training material on the prevention of import, trafficking and use of illegal pesticides, including POPs and other obsolete pesticides</li> <li>• Organize and conduct training programs for officers, traders and sellers and other relevant stakeholders.</li> <li>• Widely disseminate the contents of legal instruments on pesticides management to the officers, traders and sellers and stakeholders.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 150,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Country wide

### 3. Project Profile No 3: Strengthening lab capacity

<b>1- Project Title</b>	<b>Strengthen capacity on pesticides analysis focusing on POPs.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH, MoC, MoEF,
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	With regards to the technical infrastructure for analyzing pesticides including POPs, Cambodia has governmental laboratories but no capacity in analyzing POPs pesticides.
<b>7- Project Rational</b>	Strengthening and upgrading the capacity of laboratories is needed urgently to allow for the controlling and managing of chemicals and to ensure public health and preserve the environment.
<b>8- Project Justification</b>	In order to be aware of pesticide levels in food and other products, Cambodia needs well equipped and competent laboratory facilities. Cambodia has been focusing on strengthening capacity for laboratory through upgrading equipment and other facilities, human resource development, and promoting responsibility and accuracy in chemicals analysis and management. Capability improvements require assistance from the government and donor organizations because of limited capacity of both laboratory facilities and technical analysis.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Improve capacity of laboratories on pesticides analysis focusing on POPs.</li> <li>• Strengthen institutional capacity on obsolete pesticides including POPs pesticides.</li> </ul>
<b>11- Beneficiaries</b>	Laboratory to be selected (to be identified), local Cambodian company
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Improve capacity of laboratory staff on pesticides analysis, with focus on POPs pesticides.</li> <li>• Upgrade laboratory facilities for pesticides analysis, with focus on POPs pesticides.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Phnom Penh

#### 4. Project Profile No 4: Awareness raising for the public

<b>1- Project Title</b>	<b>Raise public awareness on pesticides issues including POPs pesticides and other obsolete pesticides.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE and Relevant Civil Society Organizations
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh (Provinces and municipalities if necessary)
<b>6- Background</b>	General knowledge about pesticides application, obsolete pesticides including POPs pesticides, their hazards and acute and chronic effects is lacking within the public as information dissemination has not been broad.
<b>7- Project Rational</b>	Disseminate knowledge concerning proper pesticide use, obsolete pesticides, and alternatives for pesticides to farmers. General concept on POPs pesticides will be provided to the governmental institutions and civil society organizations.
<b>8- Project Justification</b>	If the general public remains unaware of basic issues related to pesticides use and alternatives for pesticides, the current situation of improper pesticide handling including the current level of pesticides use will remain unchanged. Cambodia has not prepared any comprehensive POPs pesticides awareness raising programs as well as regulation that require the farmers to be aware and abide by proper procedures of handling, repackaging, transport and destruction of pesticides.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• The general public has a complete understanding of all issues related to pesticide use and handling.</li> <li>• Upgrade the level of understanding of the general public for all issues related to pesticide use.</li> </ul>
<b>11- Beneficiaries</b>	Farmers or users, general public.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Formulate and undertake dissemination campaigns on pesticides hazards and elimination of obsolete pesticides including POPs pesticides.</li> <li>• Provide information to relevant target groups on alternative pesticides instead of POPs pesticides.</li> <li>• Encourage alternatives pest control measures to reduce the use of pesticides.</li> <li>• Improve extension workers capacity and expand their extension activities on pesticides issues including obsolete pesticides and POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 150,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Country wide.

## 5. Project Profile No 5: Awareness raising for decision makers

<b>1- Project Title</b>	<b>Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH
<b>4- Duration</b>	12 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	High level policy and decision makers have received limited information about the impact of improper pesticides use on human health and the environment. At the same time, almost all decision makers have not received information regarding POPs pesticides issues and the obligation to comply with the Stockholm Convention because it is a new concept in Cambodia. The decision makers have been received low awareness of the dangers of POPs pesticides than technical staffs who have been trained.
<b>7- Project Rational</b>	This project will provide basic information in order to raise awareness for policy and decision makers on pesticides issues, including POPs pesticides. Comprehensive awareness among decision makers will contribute to varying degrees of managing POPs pesticides.
<b>8- Project Justification</b>	The leaders of the country can only be effective decision makers when they have sufficient knowledge about the relevant issues. The understanding and awareness of decision makers is very important regarding the importing, transporting, using and releasing/disposal POPs pesticides.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• All relevant policy makers and decision makers have complete understanding on all pesticides issues.</li> <li>• Policy makers and decision makers' knowledge is upgraded on pesticides issues including obsolete pesticides and POPs pesticides.</li> </ul>
<b>11- Beneficiaries</b>	Relevant policy makers and decision makers.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Organize forums or workshops for policy and decision makers.</li> <li>• Provide information on pesticides risk and hazard related issue including obsolete pesticides and POPs pesticides to policy and decision maker through various media.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 55,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Provinces and cities countrywide

## 6. Project Profile No 6: Obsolete pesticides inventory

<b>1- Project Title</b>	<b>Conduct comprehensive inventory on obsolete pesticides including POPs pesticides.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH, MoC, MoEF, Local Authorities
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh city (Other provinces and cities as necessary)
<b>6- Background</b>	There is a lack of sufficient data concerning obsolete pesticides including POPs pesticides resulting in the Government not being able to take adequate measures to protect human health and the environment.
<b>7- Project Rational</b>	Execute obsolete pesticides inventory according to international standard. The POPs pesticides inventory is an essential method to enhance public health and environmental quality countrywide, a method to encourage and recognize stakeholders efforts to reduce obsolete pesticides including POPs pesticides from stockpiles and other sources, a tool to track environmental progress and develop a basis for further decision-making and cooperation between MAFF, relevant organizations, farmer and the stakeholders.
<b>8- Project Justification</b>	With sufficient data, the relevant competent authorities will be able to properly plan and implement adequate actions to reduce the direct impact of obsolete pesticides on human health and the environment.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Ecologically sound management of obsolete pesticides including POPs pesticides can take place in Cambodia.</li> <li>• Collect relevant information through an obsolete pesticides inventory according to UN standards.</li> </ul>
<b>11- Beneficiaries</b>	MAFF, MoE, MoC, MoH and Consumers
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Form inventory team for obsolete pesticides including POPs.</li> <li>• Organize inventory training for the team and develop inventory forms, guidelines and plan execution of the inventory.</li> <li>• Undertake comprehensive inventory survey covering the whole country.</li> <li>• Design obsolete pesticides and POPs pesticides database format and reporting.</li> <li>• Training technical staff on database entry.</li> <li>• Set-up database management system with facilities and data entry.</li> <li>• Develop database document on obsolete pesticides including POPs pesticides and publicizing.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide.

## 7. Project Profile No 7: Pesticides monitoring

<b>1- Project Title</b>	<b>Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoH, MoC, MoEF, Local Authorities
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	Currently no adequate measures can be taken against illegal practices, as the monitoring of illegal pesticides including POPs pesticides is not implemented. Existing relevant chemicals management legal instruments and enforcement are limited. Pesticides, including POPs, problem solving is also limited in terms of both technical and relevant implementation aspects which encompasses laws and regulations. Cambodia also lacks human resources and monitoring facilities, which causes ineffective law enforcement.
<b>7- Project Rational</b>	Sound monitoring will take place with regards to import, trafficking and trade of illegal pesticides. Administrative measures against illegal activities will be facilitated and executed.
<b>8- Project Justification</b>	In order to implement ecologically sound management measures, the current illegal practices and their size and impacts should be known to the competent and local authorities. Information will enable them to take firm action.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Illegal practices related to pesticides import, trafficking and use will be banned.</li> <li>• Ecologically sound measures related to pesticides management can be fully implemented.</li> </ul>
<b>11- Beneficiaries</b>	Society at large
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Develop planning for monitoring on import, trafficking and trade of illegal pesticides including POPs pesticides.</li> <li>• Undertake regular monitoring and inspection focusing on the presence of illegal pesticides including POPs pesticides.</li> <li>• Facilitate and support administrative measures like confiscation of illegal products and storage in Government owned storage sites for any illegal action related to pesticides banned by law.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 350,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide

## 8. Project Profile No 8: Temporary storage of obsolete pesticides

<b>1- Project Title</b>	<b>Prepare collection campaign for temporarily storage of obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.</b>
<b>2- Implementing Agency</b>	MAFF
<b>3- Co-operational Agency</b>	MoE, MoEF, MoH, Local Authorities
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	<p>The operational collection and storage of obsolete pesticides including POPs pesticides has not been put into practice. Obsolete pesticides are disposed of but not according to sound environmental procedures. The provisions of sub-decree 69 dated on October 28, 1998 "On Standard and Management of Agricultural Materials" which puts obsolete pesticide disposal under the MAFF and the MoE, has not been implemented yet.</p> <p>With regards to the obligation under the Stockholm Convention especially for the preparing of collection campaigns for temporary storage of obsolete pesticides including POPs pesticides in regional storage depots prior to disposal, Cambodia has no detailed planning (including environmental impact assessment process) for the repackaging, collection and transport of obsolete pesticides from individual storage sites to temporary regional depots.</p>
<b>7- Project Rational</b>	<p>Under the preparatory collection campaign for temporary storage of obsolete pesticides including POPs pesticides in regional storage depots prior to disposal, Cambodia should consider and develop a detailed plan and recommendations with respect to:</p> <ul style="list-style-type: none"> <li>• Assess the environmental impact of proposed projects subject to decision by a competent government authority and likeliness to cause significant adverse impact within obsolete pesticides collection campaign,</li> <li>• Provide/receive information, study relevant information and consultation between parties with respect to such subjects, and</li> <li>• Cost intensive field activities need to be properly planned for.</li> </ul>
<b>8- Project Justification</b>	Prior to collection and repackaging, a detailed intervention plan should be drawn up in order to carry out field activities in an efficient way.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Ecologically sound management measures of obsolete pesticides including POPs pesticides can be determined and carried out by the relevant institutions.</li> <li>• A detailed work plan to repackaging, collect and transport identified obsolete pesticides stocks is drawn up and supported by the relevant institutions.</li> </ul>
<b>11- Beneficiaries</b>	Relevant institutions involved in the collection of obsolete pesticides from up-country stores.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Undertake the environmental impact assessment on the collection and storage of obsolete pesticides including POPs pesticides.</li> <li>• Prepare technical guidelines on the environmentally sound collection, repackaging, transportation and temporarily storage of obsolete pesticides including POPs pesticides.</li> <li>• Establish or improve safe regional temporary storage facilities and area(s) for keeping obsolete pesticides including POPs pesticides.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 500,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide.



## 9. Project Profile No 9: Pilot disposal of obsolete pesticides

<b>1- Project Title</b>	<b>Design and execute a pilot project for the disposal of a limited amount of obsolete pesticides.</b>
<b>2- Implementing Agency</b>	MAFF, MoE
<b>3- Co-operational Agency</b>	MoH, MoC, MoEF
<b>4- Duration</b>	18 month
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	25 tons of obsolete pesticides were discovered during the POPs pesticides inventory process in 2004. With the aim of sound environmental disposal the Royal Government of Cambodia intends to execute a first pilot project in destruction of the obsolete pesticides. While addressing various elements of the cleaning, repackaging, transporting for shipping, and destruction, there is a need to consider economic efficiency including technical training and project financing aspects. This pilot project aims to improve the availability of pesticides disposal efficiency technology and know-how, while creating incentives for farmers, traders, and stakeholders to participate in voluntary obsolete pesticides disposal.
<b>7- Project Rational</b>	Government officials, business companies, and stakeholders have frequently identified lack of information, clearing technology, repackaging, transporting and destruction as major barriers to successful disposal of obsolete pesticides. The problems that are particularly serious in targeted areas will be solved if this pilot project can be implemented. A specific obsolete pesticides store close to Phnom Penh will be cleaned up.
<b>8- Project Justification</b>	Small-scale pilot activities allow the relevant government institutions to gain experience in obsolete pesticides handling prior to the start of a nationwide campaign with many stores. This pilot project also provides job training to gather information on available environmental technologies and to make environmentally and economically preferred choices for Cambodia. Field demonstration of applied new environmental technologies in obsolete pesticides disposal.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Eliminate stockpile of obsolete pesticides, including POPs pesticides.</li> <li>• To assist government officials responsible for obsolete pesticides disposal to find appropriate sound environmental technology for countrywide obsolete pesticides disposal.</li> </ul>
<b>11- Beneficiaries</b>	The population of Cambodia and the rest of the world community.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Provide training course for staff involved in the project.</li> <li>• Purchase international standard packaging materials and undertake repackaging of obsolete pesticides.</li> <li>• Clean storage facility.</li> <li>• Export repackaged obsolete pesticides stockpile for elimination outside Cambodia.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Phnom Penh

## 10. Project Profile No 10: Nationwide disposal of obsolete pesticides

<b>1- Project Title</b>	<b>Design and execute a nation wide project for the disposal of all obsolete pesticides (including POPs).</b>
<b>2- Implementing Agency</b>	MAFF, MoE
<b>3- Co-operational Agency</b>	MoH, MoC, MoEF
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	Based on the pilot project achievements on the disposal of a limited amount of obsolete pesticides, Cambodia seeks to promote the adoption of sound environmental cleaning and disposal technology to apply to the whole country. Identified obsolete pesticides storage sites (see previous proposed projects) will be cleaned up and repackaged obsolete pesticides will be eliminated.
<b>7- Project Rational</b>	All identified stores and locations containing obsolete pesticides including POPs pesticides in the whole of Cambodia will be cleaned up. The activities of the Cambodian pesticides management team are to promote and implement the disposal of all obsolete pesticides including POPs pesticide policies and practices. In the disposal process, the competent authority is empowered to consider and develop recommendations regarding clearing, repackaging, transporting and destruction.
<b>8- Project Justification</b>	Obsolete pesticides including POPs pesticides storage 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 dealt with. This project is conducted at the national, provincial and local levels and involves governments, companies and NGOs. At the same time, there is also a very strong interest in promoting sound environmental technology and technological capacity throughout the country.
<b>9- Project Goal</b>	Eliminate the import and use of obsolete pesticides including POPs pesticides.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Eliminate stockpiles of obsolete pesticides, including POPs pesticides.</li> <li>• Implement full commitments and obligation of Cambodia under the Stockholm Convention in reduction and elimination of all obsolete pesticides including POPs pesticides stockpiles.</li> <li>• Assist government officials responsible for the obsolete pesticides disposal to find the appropriate sound environmental technology for countrywide obsolete pesticides disposal.</li> </ul>
<b>11- Beneficiaries</b>	The population of Cambodia and the rest of the world community.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Provide training course for staff involved in the project.</li> <li>• Identify and purchase the required international standard packaging materials.</li> <li>• Develop a plan for repackaging and transport to regional temporary storage depots.</li> <li>• Repackage obsolete pesticides, clean all stores and transport the repackaged stockpiles and wastes consisting of or contaminating obsolete pesticides including POPs pesticides to regional temporarily storage depots.</li> <li>• Select international contractor for the international transport and disposal of all repackaged stocks.</li> <li>• Export repackaged obsolete pesticides stockpile for elimination outside the country in a dedicated hazardous waste disposal facility.</li> </ul>
<b>13- Estimated Cost</b>	(Depending on the outcome of the inventory)
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: GEF, WB, FAO, UNEP, ADB
<b>15- Project Extent</b>	Countrywide

## B. Project Profiles for the Management of PCBs

### 1. Project Profile No 1: Legal instrument development

<b>1- Project Title</b>	<b>Develop legal instruments or technical guidelines for managing PCBs release</b>
<b>2- Implementing Agency</b>	MIME
<b>3- Co-operational Agency</b>	MoE, EAC, EDC, MoC, MOEF, Stakeholders
<b>4- Duration</b>	12 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	The Kingdom of Cambodia recognizes that legislation is an important element of PCBs management action. But to date, Cambodia does not have any regulations that address the specific managing of PCBs substance; PCBs related problems are addressed in provisions of solid waste and liquid waste standards of sub-decree 36 on Solid Waste Management and sub-decree 27 on Water Pollution Control, and are described in the electrical system development policy. For this reason, it is necessary to develop legislation concerned with PCBs management. Compliance with the Stockholm, Basel and Rotterdam convention will require the enactment of new laws and technical guidelines in many areas of operation.
<b>7- Project Rational</b>	The main potentially exposed population includes workers and employees in workshops, warehouses, and electrical power plants, who may be critically affected by PCBs due to lack of protective materials. People who deal with used oil contaminated PCBs face negative impacts from PCBs, and will also be informed about sound environmental management and protected by legal instruments and technical guidelines for managing PCBs release. Finally, public health, environmental quality and economy will improve.
<b>8- Project Justification</b>	To date, inspection of technical safety compliance has not been implemented because legislation does not cover aspects of PCBs and equipment contaminated PCBs. Environmental inspection does not currently require control of water contamination or solid waste contamination by PCBs.  There is no specific act or legal instrument for the management of PCBs as it is a new environmental issue in Cambodia. However, there are general provisions for the management of chemicals waste substances and hazardous waste including PCBs as stated in sub-decree No. 27 on Water Pollution Control and sub-decree No. 36 on Solid Waste Management.
<b>9- Project Goal</b>	Manage in sound environmental manner electrical equipment and accessories containing or contaminated by PCBs until their end of life or the deadline set under the Stockholm Convention based on socio-economical aspects and situation.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Develop specific regulation on PCBs management.</li> <li>• Regulate the in-use and out-of-use of electrical equipment and accessories / articles containing or contaminated with PCBs for ESM purpose.</li> </ul>
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Form a legal and technical working group comprising all PCBs stakeholders.</li> <li>• Study existing legal instruments related to PCBs management for further development of legal instruments or guidelines.</li> <li>• Develop PCBs management legal instruments, guidelines or technical standards as necessary.</li> <li>• Organize a workshop for consultation and comment on the draft of legal instruments for submission to the government for approval.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 150,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Phnom Penh and other Provinces-Cities

## 2. Project Profile No 2: PCBs comprehensive inventory

<b>1- Project Title</b>	<b>Comprehensive Inventory of equipment and accessories/articles containing and contaminated with PCB for ESM</b>
<b>2- Implementing Agency</b>	MoE & MIME
<b>3- Co-operational Agency</b>	Provincial and municipality Electricity Unit, EDC, EAC, Private companies
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	Based on the preliminary inventory report, which was prepared in early July 2004, Cambodia has identified existing PCBs to be considered for future ESM. The preliminary inventory report concentrated on all relevant problems of PCBs but has not prioritized them yet because of time constraints, lack of technicians, lack of experiences, and lack of resources in the inventory process. This project will focus on several aspects of PCBs comprehensive inventory. Comprehensive inventory will focus on aspects of public information dissemination, available information on the quantity of PCBs substances in Cambodia, technical availability related to equipment and accessories containing or contaminated PCBs and SEM issues related PCBs.
<b>7- Project Rational</b>	Execute PCBs inventory procedures according to preliminary inventory methodology. The PCBs inventory is essential as a method to enhance health and environmental quality in a manageable area in particular with transformers and electrical equipment throughout the country. The PCBs inventory is a method to encourage and recognize stockholder's efforts to reduce and eliminate transformers use containing or contaminated by PCBs from stockpiles and other sources, and develop a basis for further decision-making and future cooperation between MIME, relevant institutions, civil organizations, and workers.
<b>8- Project Justification</b>	Compliance with the obligations under the Stockholm convention, this comprehensive inventory will ensure ESM of PCBs by providing broader environmental and technological national scope. Information collected from the inventory process provided by the relevant stakeholders will be analyzed. Comprehensive inventory provides precise information for long-term ESM management of equipment and accessories/articles containing or contaminated PCBs.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories contained or contaminated by PCBs until their end of life or the deadline set under the Stockholm Convention based on socio-economic aspects.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Evaluate the quantities of electrical equipment and accessories contained or contaminated by PCB in Cambodia.</li> <li>• Identify the owners of transformers or electrical equipment and accessories containing or contaminated by PCBs.</li> <li>• Develop technical data related to electrical equipment and accessories contained or contaminated by PCB.</li> <li>• Manage ESM issues related to electrical equipment and accessories contained or contaminated by PCB.</li> </ul>
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<b>Pilot Project:</b> <ul style="list-style-type: none"> <li>• Form inventory team and study existing inventory report.</li> <li>• Develop method and identify support tool and equipment for inventory, and develop inventory plan.</li> <li>• Conduct comprehensive inventory (including testing, classifying, labeling,</li> </ul>

	<p>registering, etc.) of in-use electrical equipment and articles containing or contaminated with PCBs at selected pilot project areas.</p> <ul style="list-style-type: none"> <li>• Develop inventory report.</li> <li>• Organize workshop with stakeholders to introduce the findings and lessons learned from pilot stage and modify the inventory format and procedures for comprehensive inventory.</li> </ul> <p><b>Comprehensive inventory Project:</b></p> <ul style="list-style-type: none"> <li>• The same process as for the pilot inventory project will apply for the comprehensive inventory project phase. Comprehensive inventory will cover all provincial and municipalities. Main activities include designing inventory forms, site inspections and sampling,, laboratory analysis, database, and technical report write-up.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	All provinces and municipalities

### 3. Project Profile No 3: Management of PCB equipment (in use)

<b>1- Project Title</b>	<b>ESM Management for “in use” equipment</b>
<b>2- Implementing Agency</b>	MIME
<b>3- Co-operational Agency</b>	MoE, EAC, Provincial and municipality Electricity Unit, EDC, and private companies
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	<p>After conducting the national preliminary inventory, PCBs were found (assume) in more than 50% of the 1,600 transformers in use throughout the country. These transformers were imported during different periods, are different ages and continue to be used. In general, Cambodia uses old transformers and dielectric fluid from old transformers for retro-filling into new ones and leaking transformers without regard for PCBs hazard and proper management. Most importantly, economic pressure keeps in use old transformers through repairing and recycling.</p> <p>Furthermore, there is neither specific institution nor policy or regulation dealing with ESM management of in-use electrical equipment and other devices containing and contaminated with PCBs.</p>
<b>7- Project Rational</b>	Governmental officers and workers of concerned enterprises will be trained on ESM management. The transformers, workshops, warehouses, and power plants and all in use equipment (including dielectric based equipment) will be managed according to ESM principles.
<b>8- Project Justification</b>	Ensure ESM of PCBs by providing broader environmental and technological processes including retention tank for dielectric leaking, removing transformers with high corrosion, stopping repairs of PCB transformers and analysis of dielectric for PCBs before repairing or replacement. The project will provide practical ESM concepts and technology for compliance with the obligations under the Stockholm Convention related to the management of PCBs substance.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories containing or contaminated with PCBs until their end of life or the dead line set under the Stockholm Convention based on socio-economic aspects.
<b>10- Objectives</b>	Extend lifetime of existing transformers with ESM compliance.
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Identify sites (including workshops, stations, substations, and pole mounts) for prioritizing ESM.</li> <li>• Undertake ESM at selected sites.</li> <li>• Take action to prevent repairing transformers contaminated with PCBs (with high concentration).</li> <li>• Initial assessment (current and future) of electrical equipment and articles containing or contaminated with PCBs.</li> <li>• Develop strategy for the reduction of electrical equipment and articles containing or contaminated with PCBs.</li> <li>• Develop and implement PCBs reduction demonstration (pilot) project.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Countrywide

#### 4. Project Profile No 4: Socio-economic assessment

<b>1- Project Title</b>	<b>Assessment of socio-economic aspects for phasing out of electrical equipment and accessories contained or contaminated by PCBs</b>
<b>2- Implementing Agency</b>	MIME
<b>3- Co-operational Agency</b>	MoE, EAC, EDC
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	<p>Cambodia faces economic constrains keep over aged transformers in use without proper maintenance and high environmental risk. This project seeks to develop a participatory long-term assessment of socio-economic aspects in Cambodia trough the collection and exchange of appropriate data, and the development and application of appropriate assessment techniques.</p> <p>This assessment project will be implemented mainly on the base of experience acquired during SEM in-use equipment, in particular during elaboration of the PCBs inventories report and its main outputs. PCBs socio-economic assessment methods will be chosen in order to integrate in the most efficient way the relatively scarce information and knowledge, available with particular stakeholders in Cambodia.</p>
<b>7- Project Rational</b>	To systematically identify the main elements of PCBs risk; to prioritize potential problems related categories of targets in Cambodia, and possible consequences of PCBs use; to provide basic information for SEM of PCBs until the end of life of transformers.
<b>8- Project Justification</b>	PCBs socio-economic assessment is an important tool for decision makers. It helps them 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 ESM socio economic 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 Cambodia will be socially and economically feasible.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories containing or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention based on the socio-economic aspects.
<b>10- Objectives</b>	Establish basic methods for decision-making related with the phasing out or continued use of electrical equipment and accessories containing or contaminated with PCBs while considering socio economic aspects.
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<p>Phase 1: Pilot assessment phase</p> <ul style="list-style-type: none"> <li>• Form a working group of stakeholders.</li> <li>• Plan pilot risk assessment project by selection of a representative population sample (at least 100 units).</li> <li>• Site assessment on risk and socio economical cost-benefit assessment.</li> <li>• Identify issues of risk assessment</li> <li>• Organize demonstration workshop to present risk assessment results to the stakeholders in order to improve assessment methodology for applying full assessment process.</li> </ul> <p>Phase 2: Full assessment</p> <ul style="list-style-type: none"> <li>• Form a working group of stakeholders</li> <li>• Develop plan for full risk assessment</li> <li>• Conduct full site assessment</li> <li>• Identify issues of full risk assessment</li> <li>• Organize demonstration workshop to present risk assessment result to the stakeholders for comments.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	All provinces and municipalities

## 5. Project Profile No 5: ESM compliance for electrical equipment

<b>1- Project Title</b>	<b>ESM compliance of the maintenance and repair of electrical equipment</b>
<b>2- Implementing Agency</b>	MIME
<b>3- Co-operational Agency</b>	MoE, EAC, EDC
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	In Cambodia, PCBs are identified and found in electrical equipment. The presence of PCBs in use transformers and PCBs oil residues is a source of threat to the health and environment due to the lack of ESM compliance of the maintenance and repair activities of electrical equipment. In general, the key problems identified are dielectric oil contaminated PCBs reused as retro-filling for old transformers without proper management, resulting in heating, spilling and leaking; improper disposal of equipment contaminated PCBs in the environment; and easily accessible PCBs contaminated sites (workshops, warehouses...). The main cause for this situation is the lack of control mechanism for PCBs in maintenance and repair,.
<b>7- Project Rational</b>	Maintenance and repair activities of electrical equipment containing or contaminated with PCBs requires sound management.
<b>8- Project Justification</b>	The project will conduct an assessment regarding the maintenance and repairing activities of electrical equipment, upgrading of repairing facilities, decontamination of PCB contaminated material and contaminated sites.
<b>9- Project Goal</b>	Manage in sound environmental manner electrical equipment and accessories contained or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention based on socio-economical aspects.
<b>10- Objectives</b>	Improvement of ESM for the repairing and maintenance of electrical equipment
<b>11- Beneficiaries</b>	Countrywide
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Undertake assessment (current and future) of the out-of-use of electrical equipment and material containing or contaminated with PCBs for destruction including implementation of disposal facilities in the country and evaluation of disposal facilities out of the country.</li> <li>• Undertake assessment (current and future) of health and environmental impact issues.</li> <li>• Upgrading equipment including decontamination of existing equipment (if technically appropriate), additional equipment to avoid PCB cross contamination and protective equipment and personal protective equipment (PPE).</li> <li>• Building capacities, training of maintenance and repairing technician related to PCB ESM issues (health, environment issues)</li> <li>•</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Throughout Cambodia



## 6. Project Profile No 6: Strengthening laboratory capacity

<b>1- Project Title</b>	<b>Strengthen laboratory capacity for PCBs analysis</b>
<b>2- Implementing Agency</b>	MIME – EDC
<b>3- Co-operational Agency</b>	MoE, EAC, EDC
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	In Cambodia, no laboratory is able to analyze PCBs substances whether contained in products or in waste. Human resources and facilities for PCBs analysis is not available in Cambodia. Cambodian laboratories cannot provide actual PCBs concentration and positive verification of PCBs presence. PCBs analysis requires specific testing equipment and materials and should be conducted by persons trained in their use. During the PCBs preliminary inventory, Screening Test Kits were used to provide only an overall concentration of chlorine in dielectric oil and cannot identify the presence of individual PCB congeners.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>▪ The capacity of laboratory staff selected for PCBs analysis will be strengthened.</li> <li>▪ The capacity of laboratories (facilities, equipment and materials) will be strengthened conduct analysis of PCBs presence and concentration.</li> <li>▪ Information on PCBs presence and concentration in electrical equipment will be compiled, disseminated, and available.</li> <li>▪ The laboratories will be used as a supporting base to identify PCBs presence in electrical equipment and PCBs contaminated sites for ESM, and also support comprehensive inventory process.</li> </ul>
<b>8- Project Justification</b>	This project aims to improve the capacity of Cambodia's laboratories in PCBs analysis. The actual implementation of this project will cover all the processes in improvement of laboratory officers' capacity and capacity in PCBs analysis of all electrical equipment and materials in use and out of use waiting for disposal.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories containing or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention based on socio-economic aspects.
<b>10- Objectives</b>	Full segregation of PCB and non PCB electrical equipment and materials in use, for maintenance and out of use to be in compliance with ESM and the Stockholm Convention.
<b>11- Beneficiaries</b>	EDC, electrical equipment holders, warehouses, and relevant governmental institutions
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Provide and strengthen laboratory staff's capacity for PCBs analysis</li> <li>• Assessment of existing laboratories and analysis capacities</li> <li>• Provide PCB analysis equipment</li> <li>• Provide information to stakeholders</li> <li>• Upgrade laboratory facilities for analyzing PCBs</li> </ul>
<b>13- Estimated Cost</b>	<b>US \$150,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	National Laboratory (at the Ministry of Industry, Mines and Energy)

## 7. Project Profile No 7: ESM management for “out-of-use” equipment

<b>1- Project Title</b>	<b>ESM Management for “out of use” equipment</b>
<b>2- Implementing Agency</b>	MIME
<b>3- Co-operational Agency</b>	MoE, EDC
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	Cambodia lacks appropriate management of out-of-use of equipment, articles and wastes containing or contaminated with PCBs and disposal facilities. Activities causing the release of PCBs into the environment that have impacts on human health would be the dismantling and sale of used transformers to metal scraps collector. Furthermore, there is no available temporary storage for out of used equipment.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>• Adequate information and data for the stakeholders on out-of-use of electrical equipment, articles and waste containing or contaminated with PCBs.</li> <li>• ESM of out-of-use of electrical equipment, articles and waste containing and/or contaminated with PCBs will be applied.</li> <li>• Strategy for the elimination of out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs will be developed and implemented.</li> </ul>
<b>8- Project Justification</b>	The project will undertake an assessment regarding the data collection and further consultation with relevant parties on the improvement of management of out of use of equipment articles and wastes containing or contaminated with PCBs and disposal facilities. Examine the potential for upgrade storage sites and installed facilities with PCBs ESM. The final product of this project is the comprehensive strategy for elimination of out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories contained or contaminated PCBs until their end of life or the dead line set under the Stockholm Convention based on socio-economic aspects and situation.
<b>10- Objectives</b>	Develop strategy for the elimination of out-of-use of electrical equipment, articles and waste containing or contaminated with PCBs
<b>11- Beneficiaries</b>	Electrical equipment users and stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Form technical working group (stakeholders).</li> <li>• Train electrical officers and stakeholders for ESM of out of used equipment (handling, transportation, storage, dismantling, pre-treatment, shipment of used PCB to out of country disposal facilities).</li> <li>• Develop strategy for ESM destruction of the out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs (handling, transportation, storage, dismantling, pre-treatment and final disposal).</li> <li>• Identify storage sites and facilities for keeping out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs in an environmentally sound manner.</li> <li>• Upgrade (or establish if required) storage sites and installed facilities for keeping out-of-use of electrical equipment, articles and wastes containing and/or contaminated with PCBs in an environmentally sound manner.</li> <li>• Take action to centralize the out-of-use of electrical equipment, articles and wastes containing and/or contaminated with PCBs in an environmentally sound manner.</li> </ul>

	<ul style="list-style-type: none"><li>• Undertake assessment (current and future) of out-of-use electrical equipment, articles and wastes containing or contaminated with PCBs and used PCBs dielectric oil for destruction including (in the country or out of the country).</li><li>• Conduct feasibility study for the destruction/disposal in the country or out of the country.</li><li>• Organize national conclusion workshop (strategy, assessment result, financial mechanisms, evaluation cost...).</li></ul>
<b>13- Estimated Cost</b>	<b>US \$350,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Electric utilities in Cambodia

## 8. Project Profile No 8: Capacity building and awareness raising

<b>1- Project Title</b>	<b>Provide and strengthen capacity and enhance public awareness on PCBs issue.</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MIME, EAC
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	PCBs risk problem is a relatively new issue for Cambodia. Cambodia also lacks of laws or guidelines for managing PCBs. Different stakeholders have different levels of awareness. Among electric managers and officers, knowledge of PCBs and principles for ESM is inadequate. The relevant electrical equipment users (both government and private) also lack capability in maintaining and managing in-use and out of use transformers (leak, spillage, etc.). The technical staff as well as the workers are directly in contact with electrical equipment/material containing dielectric fluid without personal protective equipment, and are not aware of the risks caused by PCBs because they are not used to dealing with these issues.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>• A manual on PCBs risk issues and personnel safety will be developed.</li> <li>• The capacity of electrical staff working with electrical equipment/material containing dielectric fluid will be strengthened.</li> <li>• Knowledge and Information on PCBs hazards and risks will be widely provided and disseminated.</li> </ul>
<b>8- Project Justification</b>	This project aims to comply with the Stockholm Convention with regards to public health and the environment. This project is to raise PCBs awareness and to promote action in increasing PCBs impact prevention among top policy makers in the government. Decisions are ultimately a political responsibility, but must be based on the best socio-economic choices. Stakeholders participation in the action plan is also required.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories containing or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention based socio-economic aspects.
<b>10- Objectives</b>	Improving the protection of health and the environment from PCBs for all electrical stakeholders and the public.
<b>11- Beneficiaries</b>	Electrical equipment users, stakeholders and the public.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Identify the fields of information and awareness to be provided to the stakeholders.</li> <li>• Develop materials on PCBs issues and publicize.</li> <li>• Organize trainings on PCBs sound management related issues for national and provincial levels.</li> <li>• Organize workshop on PCBs issues for all stakeholders.</li> <li>• Conduct action media campaign for information &amp; awareness on PCBs issues.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Potential Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Throughout Cambodia

## 9. Project Profile No 9: PCBs database management

<b>1- Project Title</b>	<b>PCBs database management</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MIME, EDC, EAC
<b>4- Duration</b>	12 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	As a result of various programs carried out across Cambodia a number of databases for verification and cross checking for reliability of data are available in different sectors. The PCBs database is a new concept and does not currently exist. However, the PCBs database experience from UNEP/GEF or from other countries may assist in verifying and crosschecking PCBs for ESM.
<b>7- Project Rational</b>	<ul style="list-style-type: none"> <li>• Adequate information and data on in-use electrical equipment and articles containing or PCBs contaminated.</li> <li>• In-use electrical equipment and articles containing or contaminated with PCBs are identified, classified, labeled and registered.</li> <li>• In-use electrical equipment and articles containing or contaminated with PCBs are kept in use in an environmentally sound manner until their end of life.</li> <li>• Integrate the results of PCBs inventory and comprehensive assessment.</li> </ul>
<b>8- Project Justification</b>	As Cambodia has poor capability in database design, a good coordination and cooperation with reference PCBs database would offer immense advantages over limited local information management systems. In order to comply with the Stockholm convention, Cambodia needs important PCBs information and database designers. Data can be provided by voluntarily sources for efficient ESM.
<b>9- Project Goal</b>	Manage in a sound environmental manner electrical equipment and accessories containing or contaminated with PCBs until their end of life or the deadline set under the Stockholm Convention based on socio-economic aspects.
<b>10- Objectives</b>	To ensure the tracking of all PCB material and equipment until their end of life
<b>11- Beneficiaries</b>	MoE, MIME, EDC, Research Institutions
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Design of the database framework</li> <li>• Test the database</li> <li>• Input available data from inventory and assessment</li> <li>• Test declaration process with PCB stakeholders</li> <li>• Network with others POPs program</li> <li>• Information sharing and distribution</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 180,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, EU, ADB, WB, Canada POPs Fund, GTZ, and JICA)
<b>15- Project Extent</b>	Phnom Penh

## C. Project Profiles for the Management of Unintentionally Produced POPs

### 1. Project Profile No 1: Legislation Development for Unintentionally Produced POPs

<b>1- Project Title</b>	<b>Revising or developing legislation related to sound management of unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT, NGOs, Local Authorities. Private Sectors
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	<p>The Stockholm Convention aims to reduce unintentionally produced POPs release, as well where feasible ultimate to eliminate unintentionally produced POPs. Its major goal is to protect human health and environment against the adverse effects of POPs. Cambodia signed the Stockholm convention on 23 May 2001 and is in the process of ratifying it. A National Implementation Plan under the Stockholm Convention (NIP) was developed with GEF/UNEP support, describing how Cambodia will meet its obligations under the Convention.</p> <p>To date, Cambodia has not enacted any specific regulation regarding the management of unintentionally produced POPs. Sub-decree No 36, on Solid Waste Management and Sub-decree No 42, on Air and Noise Pollution Control do not emphasize regulatory mechanisms to reduce or eliminate Dioxins and Furans.</p>
<b>7- Project Rationale</b>	<p>Current legislation in Cambodia is not sufficient for sound management of unintentionally produced POPs, as required under the Stockholm Convention. The project's rationales are:</p> <ul style="list-style-type: none"> <li>› Relevant legislations will be revised or developed.</li> <li>› Unintentionally produced POPs management guidelines are available.</li> <li>› Legislation related to and guidelines for the management of unintentionally produced POPs are enforced.</li> <li>› More understanding and awareness about the relevant laws and other legal instruments are disseminated, promoted.</li> <li>› The reduction of unintentionally produced POPs release will be more effective.</li> </ul>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>• Compliance with the Stockholm Convention obligation with regard to unintentionally produced POPs release.</li> <li>• Creation of the necessary legal framework.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Create legal framework for sound management of unintentionally produced POPs.</li> <li>• Undertake assessment of the existing legal framework</li> <li>• Amend/develop relevant law</li> <li>• Develop necessary enforcement documents (guidelines)</li> <li>• Promote understanding and awareness raising on developed legal instruments relevant to sound management of unintentionally produced POPs</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: state administration</p> <p>Indirect beneficiaries: population of Cambodia; contribution to global efforts of POPs release minimization</p>
<b>12- Activities</b>	<p>Undertake law and policy assessment related to management of unintentionally produced POPs:</p> <ul style="list-style-type: none"> <li>• Review existing legal and policy instruments.</li> <li>• Assessment of legal and policy instruments.</li> <li>• Identify gaps, and requirements for development of law and policy on management of unintentionally produced POPs.</li> </ul> <p>Amend existing laws, related to the management of unintentionally produced POPs or develop new law</p> <ul style="list-style-type: none"> <li>• Form legal team.</li> <li>• Conduct a training course on legislation for management of unintentionally</li> </ul>

	<p>produced POPs.</p> <ul style="list-style-type: none"> <li>• Organize national workshop on current situation of laws and policy related to the management of unintentionally produced POPs.</li> <li>• Amend the existing laws or develop new ones and develop policy on the management of unintentionally produced POPs.</li> </ul> <p>Develop guidelines for the sound management of unintentionally produced POPs (BAT/BEP)</p> <ul style="list-style-type: none"> <li>• Study the available relevant guidance documents on BAT &amp; BEP.</li> <li>• Identify and prioritize relevant source categories.</li> <li>• Develop national guidelines (Prakas) on the sound management of unintentionally produced POPs.</li> <li>• Introduce and disseminate the developed guidelines to all stakeholders through meetings or workshops.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, FAO, UNEP, ADB)
<b>15- Project Extent</b>	Countrywide

## 2. Project Profile No 2: Institutional capacity building

<b>1- Project Title</b>	<b>Institutional strengthening and capacity building for sound management of unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	<b>MoE</b>
<b>3- Co-operational Agency</b>	MAFF, MIME, Mol, MoH, MPWT, MoEYS, NGOs,
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	Unintentionally produced POPs are a new concept for all management levels in Cambodia. The country has no experts on unintentionally produced POPs. The task team inventory (Unintentionally produced POPs inventory team) is composed of the first targeted Cambodian officials to be trained and to work in the field of Dioxins/Furans inventory. Capacity of all governmental institutions involved in unintentionally produced POPs management as well as in implementation of international convention is poor (human resources; technical guidelines, and monitoring laboratories...). All levels starting from basic employees and workers; technical staff; experts to the highest levels of decision makers have inadequate capacity and have no technical skill in unintentionally produced POPs management. Cambodia not only lacks human resources but also technical guidelines related to unintentionally produced POPs management. Cambodia also lacks analytical capacity and monitoring laboratory for unintentionally produced POPs monitoring and management.
<b>7- Project Rationale</b>	<ul style="list-style-type: none"> <li>• Institutional and capacity building for sound management of unintentionally produced POPs will be strengthened at national and provincial-municipality levels.</li> <li>• Technical skills of relevant competent institutional officers' will be improved through training, meetings and dissemination workshops.</li> </ul>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>• Compliance with the Stockholm Convention with regards to unintentionally produced POPs release minimization.</li> <li>• Strengthening the capacity of the state administration to enforce the legislation related to sound management of unintentionally produced POPs.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Strengthen the institutions responsible for effective enforcement of legislation related to sound management of unintentionally produced POPs.</li> <li>• Strengthen the institutions and build capacity necessary for sound management of unintentionally produced POPs.</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>• Direct beneficiaries: state administration.</li> <li>• Indirect beneficiaries: population of Cambodia; contribution to global efforts in reduction of unintentionally produced POPs.</li> </ul>
<b>12- Activities</b>	Develop and strengthen the capacity to manage problems related to unintentionally produced POPs: <ul style="list-style-type: none"> <li>• Form technical team and core trainer on unintentionally produced POPs.</li> <li>• Develop training material.</li> <li>• Provide appropriate information on unintentionally produced POPs to decision makers.</li> <li>• Strengthen institutional capacity of authorities responsible for implementation of legal instruments and guidelines relevant to sound management of unintentionally produced POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, FAO, UNEP, ADB)
<b>15- Project Extent</b>	In all provinces-cities of Cambodia



### 3. Project Profile No 3: Awareness raising for the public

<b>1- Project Title</b>	<b>Programme for public awareness raising on unintentionally produced POPs</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MIME, MAFF, MoI, MoInf, MPWT, MoH, MoEYS, NGOs, Private Sectors.
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	In Cambodia, the raising of public awareness on unintentionally produced POPs has not been implemented yet in the print media, television, and radio. News never cover information regarding unintentionally produced POPs release and its hazards. At the same time, specialized education on unintentionally produced POPs is not available. Remarkably, the informal education programs implemented by governmental institutions and civil organizations have been focusing on awareness of chemicals risk and safe use of chemicals, especially awareness on pesticides, chemicals fertilizers, and chemical substances accumulated in food. In general, public awareness is low regarding unintentionally produced POPs and their impact on human health and the environment. Cambodia recognizes that governmental institutions have little understanding about unintentionally produced POPs hazard on human health and the environment and cannot promote public awareness on ESM.
<b>7- Project Rational</b>	<p>Non-existing public awareness about potential POPs release and resulting hazards connected with bad practices, such as uncontrolled open burning as well as use of all kind of wastes as fuel for household cooking, was recognized in the NIP as one of the priority problems in Cambodia. At the same time, indoor pollution is recognized also by WHO as one of the major health stressor in least developed countries.</p> <p>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.</p>
<b>8- Project Justification</b>	<p>Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs release.</p> <p>Cessation of bad 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.</p>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Create awareness of the general public about potential hazards connected with uncontrolled burning and household cooking, as well as about possible alternatives, and mitigate the resulting adverse health effects.</li> <li>• Develop and implement awareness raising program on health impacts of unintentionally produced POPs, and possible alternatives.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: General public, in particular the most vulnerable population groups such as women and children.
<b>12- Activities</b>	<p>Develop and implement awareness raising program on health impact of unintentionally produced POPs, and possible alternatives:</p> <ul style="list-style-type: none"> <li>• Develop awareness raising program</li> <li>• Develop documents and information materials.</li> <li>• Organize awareness raising campaigns on reduction of unintentionally produced POPs release through mass media and direct action with poor community, school and vulnerable people focusing in particular on uncontrolled burning of wastes, household cooking using improper fuel and waste management based on 3R principles.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA)
<b>15- Project Extent</b>	In all provinces-cities of Cambodia

#### 4. Project Profile No 4: Sound waste management

<b>1- Project Title</b>	<b>Introduce and encourage sound waste management practices</b>
<b>2- Implementing Agency</b>	MoE, Selected Provinces and Cities
<b>3- Co-operational Agency</b>	MAFF, MIME, MoInf, MoH, MPWT, MoEYS
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	This project provides an introduction and encourages sound waste management practices in Cambodia. 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. Cambodia signed the Stockholm convention on 23 May 2001 and is in the process of ratifying it. While Cambodia efforts to manage waste and reduce waste generation have made progress, many problems of waste management practices still remain. This project is developed in Cambodia with GEF/UNEP support, and allows Cambodia to meet its obligation under the Stockholm Convention.
<b>7- Project Rationale</b>	<p>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 Cambodia under the Stockholm Convention. Bad waste management practices, such as uncontrolled open burning, are recognized as priority problems in Cambodia. An effective alternative to waste burning is the overall reduction of the amount of produced waste by the implementation of sound waste management practices such as recovery, reuse and recycling, as well as through waste separation practices.</p> <p>Improving of landfill management practices and prevention of uncontrolled burning are undertaken in a separate project. This project focuses on the reduction of the overall amount of produced waste through the implementation of the 3R principles.</p>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>• Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs release, as well as with the Basel Convention with regards to overall waste reduction and implementation of sound waste management practices.</li> <li>• Cessation of bad waste management practices, such as uncontrolled burning of waste in backyards and on landfills.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Overall reduction of the produced waste through implementation of sound waste management practices.</li> <li>• Develop guidelines on sound management of wastes (including 3R principles and waste separation practices)</li> </ul>
<b>11- Beneficiaries</b>	<ul style="list-style-type: none"> <li>• General public</li> </ul>
<b>12- Activities</b>	<p>Introduce and encourage sound management of wastes including 3R principles and waste separation practices:</p> <ul style="list-style-type: none"> <li>• Establish technical team for sound waste management</li> <li>• Study available guidance documents on sound waste management practices.</li> <li>• Provide countrywide training on waste management guidelines implementation involving local authorities and stakeholders.</li> <li>• Design and implement pilot project on environmentally sound waste management.</li> <li>• Revise the guidelines if necessary</li> <li>• Undertake awareness raising on 3R principles for the general public and at the grassroots level through integration into existing governmental and NGO programmes.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	In all provinces-cities of Cambodia

## 5. Project Profile No 5: Sound management of landfills

<b>1- Project Title</b>	<b>Promotion of controlled landfills and prevention of uncontrolled burning of waste</b>
<b>2- Implementing Agency</b>	MoE, Selected Provincial and Municipal Local Authorities
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT, Private Sectors
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	Cambodia has not developed any effective waste reduction policy and programs and does not have an integrated system of treatment facilities. There are remaining critical wastes 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. Cambodia needs safe landfills as an important part of waste management policy. Presently, comprehensive facilities do not yet exist. Cambodia intends to promote the role of controlled landfills as a proportionally greater interim method. Prevention of uncontrolled burning of waste by both the regulatory authorities and side management needs to be considered. Implementation of this project activity will reduce unintentionally produced POPs generation through the improvement of landfill management.
<b>7- Project Rationale</b>	<p>Poor waste management practices, such as uncontrolled open burning, are recognized as one of the priority problems in Cambodia. Effective alternative to waste burning is the overall reduction of the amount of produced waste by implementation of sound waste management practices, such as recovery, reuse and recycling (the 3R principle), as well as through waste separation practices.</p> <p>To prevent uncontrolled burning of waste in the landfills, better management practices have to be implemented, aiming at conversion of uncontrolled landfills to controlled ones. This project focuses on improving landfill management practices, in particular prevention of uncontrolled burning.</p>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>• Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs release, as well as with the Basel Convention with regards to the implementation of sound waste management practices.</li> <li>• Cessation of bad waste management practices, such as uncontrolled burning of waste in backyards and in landfills.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Prevention of bad waste management practices, in particular uncontrolled burning of wastes.</li> <li>• Convert uncontrolled landfills to controlled ones.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: General public and provincial and municipal authorities.
<b>12- Activities</b>	<p>Improve landfill management (prevent uncontrolled burning)</p> <ul style="list-style-type: none"> <li>• Establish technical team for landfill assessment</li> <li>• Conduct municipality and provincial landfill assessment</li> <li>• Develop landfill management program</li> <li>• Conduct training course on landfill management with the municipality and provincial authorities</li> <li>• Design and implement municipal and provincial landfill management pilot project</li> <li>• Revise the program if necessary</li> <li>•</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 250,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Selected provincial and municipal landfills

## 6. Project Profile No 6: Introduce BAT and BEP for wastes incinerators

<b>1- Project Title</b>	<b>Introduction and promotion of BAT &amp; BEP in existing waste incineration plants</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT, NGOs
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	The Stockholm Convention regulates the reduction of unintentionally produced POPs release where feasible, ultimate elimination of unintentionally produced POPs. Its major goal is to protect human health and the environment against the adverse effects of POPs. In order to prevent or minimize POPs releases, the following measures need to be promoted: proper waste handling, good combustion, avoidance of formation conditions, capturing of POPs that are formed and handling residues appropriately. BAT & BEP will introduce and promote implementation of existing waste incineration plants.
<b>7- Project Rationale</b>	<p>Presently, some waste incineration plants are in operation. Most of them are located in garment factories and burn waste-garments and municipal waste. Almost all of them utilize poor technology and follow bad environmental management practices. In some cases heat is recovered to produce steam for ironing.</p> <p>This project focuses on best possible improvement of waste incineration and introduction of feasible environmental management practices in the existing waste incineration plants by introduction of suitable BAT &amp; BEP.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention 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.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>Improvement of waste incineration in existing facilities.</li> <li>Introduction and promotion of BAT &amp; BEP in existing waste incineration plants.</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: Operators of the waste incineration plants; neighboring residents</p> <p>Indirect beneficiaries: General public (Contribution to global efforts of unintentionally produced POPs release minimization).</p>
<b>12- Activities</b>	<p>Introduction and promotion of BAT &amp; BEP in existing waste incineration plants (municipal and industrial waste)</p> <ul style="list-style-type: none"> <li>Establish technical team in waste incineration</li> <li>Study information and existing guidelines related to BAT and BEP and other guidelines to be adopted by the COP for environmentally sound waste incineration</li> <li>Undertake assessment of applicability of BAT and BEP in existing waste incineration plants (including socio-economic assessment)</li> <li>Design and implement a pilot project on the applicability of BAT and BEP guidelines in an existing waste incineration plant</li> <li>Update/amend the national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary</li> </ul> <p>Provide training to responsible governmental institutional officers and authorities on best available techniques (BAT) and best environmental practice (BEP).</p>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Selected one province or city

## 7. Project Profile No 7: Introduce BAT and BEP for POPs releases

<b>1- Project Title</b>	<b>Application of BAT &amp; BEP for unintentionally produced POPs operational release sources</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoC, MoH, MPWT, MoEF
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	<p>The Stockholm Convention regulates the elimination of POPs production and use, as well as ongoing minimization and, where feasible, ultimate elimination of unintentionally produced POPs. A preliminary POPs inventory in early 2004 identified significant unintentionally produced POPs release sources, such as uncontrolled waste burning, bad residential and small scale handicraft fuel burning practices.</p> <p>This project focuses on unintentionally produced POPs release sources and considers ways to on how to implement guidelines on BAT and BEP in safe landfills. This project will assist Cambodia in controlling unintentionally produced POPs releases in a cost effective way for more effective protection of public health and the environment.</p>
<b>7- Project Rationale</b>	<p>The industrial sector in Cambodia is characterized mostly by small-scale industry, utilizing poor technologies and environmental management practices. About 582 brick kilns located throughout the country utilize wood as fuel. However, government policy for forest protection resulted in wood price increases, pushing of those factories to use high-calorific waste as alternative fuel.</p> <p>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 &amp; BEP, in particular by promoting the most appropriate fuels. Socio-economic cost benefit analysis will be necessary to minimize the burden for the general public.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Improvement of techniques and practices in existing facilities</li> <li>• Introduction and promotion of BAT &amp; BEP in existing industrial plants</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: Operators of the waste incineration plants; neighboring residents</p> <p>Indirect beneficiaries: General public (Contribution to global efforts of unintentionally produced POPs release minimization).</p>
<b>12- Activities</b>	<p>Introduce and effectively implement guidelines on best available techniques (BAT) and best environmental practices (BEP) to the release sources of unintentionally produced POPs:</p> <ul style="list-style-type: none"> <li>• Establish technical team in unintentionally produced POPs release management</li> <li>• Study information and existing guidelines related to BAT and BEP and other guidelines to be adopted by the COP</li> <li>• Undertake assessment of applicability of BAT and BEP in existing industries installations (including socio-economic assessment)</li> </ul>

	<ul style="list-style-type: none"><li>• Design a pilot project on the applicability of BAT and BEP guidance in selected priority source categories</li><li>• Implement the pilot project on the applicability of BAT and BEP guidance in selected industrial facilities</li><li>• Update/amend national guidelines on best available techniques (BAT) and best environmental practice (BEP) if necessary</li><li>• Provide training to responsible authorities and to plant operators on best available techniques (BAT) and best environmental practice (BEP)</li></ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Selected province or city

## 8. Project Profile No 8: Sound management of medical waste

<b>1- Project Title</b>	<b>Improvement of medical waste management practices</b>
<b>2- Implementing Agency</b>	MoH
<b>3- Co-operational Agency</b>	MoE, NGOs
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	<p>Medical waste management in Cambodia 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 the Ministry of Environment, the Ministry of Health as well as the WHO have made substantive recommendations with respect to the transfer of responsibilities, possible management structure, legislation and administrative measures. To date, these initiatives need to be examined in detail with concurrent government, WHO, and private sector consultation to formulate a detailed implementation strategy of actual practices for improvement of medical waste management in Cambodia.</p> <p>Medical waste incinerators have been introduced to most of the provincial/municipal and district health care centers throughout the country. Yet, the application of medical waste incineration is still in practice for some big hospital without air pollution control facilities installed.</p>
<b>7- Project Rationale</b>	<p>According to the NIP project findings, some level of medical waste management system is in place, developed with WHO assistance and implemented by the Ministry of Health. Hazardous medical waste such as infectious material, syringes, needles and surgical waste is segregated and incinerated. Non-hazardous medical waste, which may be considered as municipal waste, is mostly disposed of by incineration. Two types of incineration facilities are in operation:</p> <ul style="list-style-type: none"> <li>• (1) Simple concrete kilns (approximately 670) relatively lower burning conditions;</li> <li>• (2) SICIM incinerators (approximately 25), which were provided by WHO, small and relatively better burning conditions. There are two more modern incinerators with two combustion chambers but without air pollution control facilities.</li> </ul> <p>This project aims at improving the current medical waste management practices, in particular to ensure efficient segregation of the hazardous portion at source, as well as disposal of medical waste under existing conditions in the best possible environmentally sound manner.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources, as well as with the Basel Convention with regards to implementation of sound waste management practices.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Improvement of medical waste management practices.</li> <li>• Review and improvement of medical waste management plan.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Hospitals, general public
<b>12- Activities</b>	<p>Reviewing and improvement of current medical waste management practices:</p> <ul style="list-style-type: none"> <li>• Establish technical team in medical waste management</li> <li>• Study existing medical waste management guidelines and information</li> </ul>

	<p>related to BAT and BEP</p> <ul style="list-style-type: none"> <li>• Undertake review and assessment of existing medical waste management practices with regards to the above guidelines, including socio-economic analysis</li> <li>• Update medical waste management practices as necessary</li> <li>• Design a pilot project on the applicability of the updated guidelines for medical waste management</li> <li>• Implement the pilot project in selected hospitals</li> <li>• Revise the medical waste management plan if necessary</li> <li>• Provide training to relevant stakeholders to facilitate broad implementation of the medical waste management plan</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Selected provinces or cities



## 9. Project Profile No 9: Inventory of unintentionally produced POPs

<b>1- Project Title</b>	<b>Inventory of unintentionally produced POPs releases</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT
<b>4- Duration</b>	12 months
<b>5- Project Location</b>	Countrywide
<b>6- Background</b>	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. This project will review the results from the first inventory and identify the new potential of unintentionally produced POPs release sources and amounts with 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, Cambodia will be able to fulfill the gap of the first inventory and create a new inventory to protect human health and the environment and also to comply with the Stockholm Convention requirements.
<b>7- Project Rationale</b>	<p>Unintentionally produced POPs release inventories are necessary to quantify the pressures on humans 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.</p> <p>This preliminary inventory has to be revised with regards to the additionally acquired information for submission to the Stockholm Convention secretariat and to evaluate future unintentionally produced POPs release trends.</p>
<b>8- Project Justification</b>	<ul style="list-style-type: none"> <li>• Compliance with the Stockholm Convention obligation with regards to reporting about unintentionally produced POPs releases and their future trends.</li> <li>• Availability of adequate data on unintentionally produced POPs releases to support the national policy related to POPs.</li> </ul>
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Availability of adequate data on unintentionally produced POPs releases and their future trends.</li> <li>• Undertake revision of the preliminary unintentionally produced POPs release inventory.</li> <li>• Elaborate an update of the unintentionally produced POPs release inventory.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Governmental institutions and stakeholders
<b>12- Activities</b>	<p>Undertake comprehensive release inventory of unintentionally produced POPs.</p> <ul style="list-style-type: none"> <li>• Form inventory team</li> <li>• Review existing inventory report</li> <li>• Identify support tool and equipment for inventory</li> <li>• Conduct unintentionally produced POPs release inventory update</li> <li>• Design national unintentionally produced POPs database</li> <li>• Evaluation of unintentional POPs release reduction and elimination</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 180,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Countrywide

**10. Project Profile No 10: Hazardous waste co-incineration in cement factory**

<b>1- Project Title</b>	<b>Evaluate the possibility of hazardous waste co-incineration in the newly constructed cement factory</b>
<b>2- Implementing Agency</b>	MoE, MIME, Selected Private Company
<b>3- Co-operational Agency</b>	CDC, MoH
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh; provinces
<b>6- Background</b>	Hazardous waste management is a critical problem in Cambodia because of the lack storage and disposal facilities. Destruction of bad quality chemical products such as medical waste and consumer material through open burning is carried out without awareness of the release of dioxin and furan. The signature of the Stockholm Convention by Cambodia has lead to a new evaluation of co-incineration possibilities for newly built cement factories. Cambodia has poor facilities resulting in some municipal/industrial waste incineration plants burning both waste-garments and municipal waste. To minimize impacts on the environment and human health, the Cambodian government has attempted to control and assess cost effective environmental options of hazardous co-incineration.
<b>7- Project Rationale</b>	<p>Cambodia does not have appropriate facilities for environmentally sound land filling, nor for incineration of hazardous waste. Most of incineration plants are located in garment factories and burn waste-garments but also regular municipal waste. Almost all of them utilize poor technology and follow bad environmental management practices, inappropriate for the environmentally sound incineration of hazardous wastes such as used/contaminated oil, tires, plastics etc. This kind of high-calorific hazardous waste could be most effectively co-incinerated in the newly constructed cement plant with the double benefits of energy recovery and final disposal of these wastes.</p> <p>This project is focusing on evaluation of this possibility, including elaboration of a benefit-cost analysis and proposal of necessary environmental measures to comply with BAT &amp; BEP for this source category. Optionally, a project proposal to seek donor funds to cover the necessary incremental costs may be elaborated.</p>
<b>8- Project Justification</b>	Compliance with the Stockholm Convention obligation with regards to minimization of unintentionally produced POPs releases, and promotion of BAT & BEP in existing sources, as well as with the Basel Convention with regards to the implementation of sound waste management practices. Waste energy recovery and saving of fossil fuels.
<b>9- Project Goal</b>	Reduce and eliminate the release of unintentionally produced POPs.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Energy recovery from high-calorific waste and its environmentally sound disposal.</li> <li>• Evaluation of the possible co-incineration of high-calorific hazardous waste in newly constructed cement plants in compliance with BAT &amp; BEP.</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: Relevant institutions responsible for hazardous management and operators of cement plants;</p> <p>Indirect beneficiaries: General public (Contribution to global efforts of POPs release minimization and sustainable development)</p>
<b>12- Activities</b>	<p>Evaluate the possibility of hazardous high-calorific waste co-incineration in newly constructed cement plants under BAT&amp; BEP conditions.</p> <ul style="list-style-type: none"> <li>• Establish technical team consisting of plant owners and relevant government</li> </ul>

	<p>authorities</p> <ul style="list-style-type: none"><li>• Evaluate the possibilities of alternative fuel use (used tires, contaminated oils etc.) in newly constructed cement plants</li><li>• Perform cost-benefit analysis of hazardous waste co-incineration</li><li>• Identify necessary additional measures for environmentally sound hazardous waste co-incineration</li><li>• Elaborate a project proposal to seek donor funds to cover the necessary incremental costs</li></ul>
<b>13- Estimated Cost</b>	<b>US\$ 50,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, EU, FAO, UNEP, ADB, GTZ, JICA).
<b>15- Project Extent</b>	Selected province

## D. Project Profile for the Coordination of NIP Implementation

### 1. Project Profile No 1: Coordination Activities of the National Coordination Unit

<b>1- Project Title</b>	<b>Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation.</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT, NGOs
<b>4- Duration</b>	36 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	The existing national coordinating unit was established during the NIP development process. This unit played very important roles in coordinating the relevant stakeholders in all aspects of project management and development of NIP. The existing staffs have improved their capacity in many aspects of project management, project coordination, administration and organization as well as in the framework of NIP development. The national coordinating unit role and responsibility will be suspended after NIP development finish. The coordination unit has high capacity to identify the minimum requirements for financial records, controls and financial reporting and auditing applicable to donor funded NIP projects. The UNEP has directly participated in the NIP project because it has received assurance that the national coordination unit as the executive agency would comply with the UNEP procedures. 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 the existing national coordinating unit is very necessary.
<b>7- Project Rationale</b>	The national coordination unit will improve capacity in the coordination of the 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. Through the two year exercise of the Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention on POPs and through this proposed project proposal, the national coordinating unit 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. At the same time, however, the formidability of the future task is also recognized. While the essential and 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 Cambodia still needs assistance at central level in coordination of the overall implementation, project formulation and implementation, initiation of policy changes and monitoring the sectoral development.
<b>8- Project Justification</b>	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 and coordinated by the national coordinating unit. In order to promote the effective implementation of the 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.
<b>9- Project Goal</b>	To improve the quality of the NIP coordination, implementation and management of projects proposal proposed by the Cambodian government.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Improving the mandate of the national coordination unit in the NIP coordination and implementation;</li> <li>• Improving and developing the administrative management systems, guidelines, manuals and other project coordination and implementation tools;</li> <li>• Strengthening the capacity and capabilities for NIP project implementation covering data centralization, assessment, monitoring and evaluation.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: National Coordinating Unit and line ministries involved. Indirect beneficiaries: Stakeholders.
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• To plan and convene, in partnership with the relevant ministries on the chemical management and reduction and elimination of POPs;</li> <li>• To assist the relevant ministries and stakeholders in establishing a national network for sound chemical management and reduction and elimination of POPs and sound chemical based information;</li> <li>• To increase cooperation between the chemical management stakeholders and the institutions in Cambodia and other countries in the region and international donor communities through project implementation and issues relevant to the NIP implementation and management;</li> <li>• To undertake the coordination with stakeholders on chemicals management, reduction and elimination of POPs including planning, the preparation of background papers and development of a framework for addressing the NIP project information needs, assessment, monitoring, evaluation, and management, and</li> <li>• To develop and maintain good working relationship between the Ministry of Environment and the stakeholders and resource initiatives involving capacity building, administrative management, project design, project implementation, data gathering, chemicals analyzing, NIP evaluation, reporting and updating of the NIP.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 200,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, FAO, UNEP, ADB)
<b>15- Project Extent</b>	Provinces and Cities

## 2. Project Profile No 2: National Chemicals Database management

<b>1- Project Title</b>	<b>Establish and design the National Chemicals Database including POPs and PTS for centralization and exchanging of information.</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MAFF, MIME, MoH, MPWT
<b>4- Duration</b>	24 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	The national coordinating unit has characterized and centralized the chemicals information (National Profile on Chemicals Management) including POPs (Inventory Report on POPs Pesticides, PCBs, and Unintentionally Produced POPs) as a primary means of the chemicals information dissemination and outreach objectives. In 2004, the national coordination unit established the first website, which posting national profile on chemicals management in Cambodia, inventory reports on POPs pesticides, PCBs, and unintentionally produced POPs and other chemicals information in Cambodia and has created hyperlinks to access other relevant information on internet. The national chemicals database is a new concept for centralization and exchanging of information of POPs and PTS.
<b>7- Project Rationale</b>	<p>Numerous public and private actors are developing internet sites that contain information with relevance to chemicals management, POPs reduction and elimination. Rational establishment of the national chemicals database is to build on those efforts to make information available in the technology and format compatible with the needs of the widest public possible.</p> <p>The national chemicals database is very useful and will provide on-line access and hard document distribution to relevant chemicals for the Cambodian public, decision makers, environmental technicians, chemicals officers. The national chemicals database is also a tool for chemicals management including POPs reduction and elimination, it is easy to monitor, evaluate, consolidate and update.</p>
<b>8- Project Justification</b>	<p>In a country like Cambodia, the national chemicals database is urgently needed for proper management of chemicals including POPs but unfortunately most chemicals data and information effect of poor practices are not centralized. The advent of geographical information systems now makes possible an overview of the chemicals management context.</p> <p>The national chemicals database would offer immense advantages over chemicals mapping system. Linked with a GIS, the relevant ministries would provide important chemicals including POPs information 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 chemicals information system as an important but separate, comprehensive, and chemically oriented database.</p>
<b>9- Project Goal</b>	Centralize and provide comprehensive chemicals data and information including POPs to the stakeholders to achieve the main national objectives in chemicals management, POPs reduction and elimination.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• To integrate the results of chemicals data inventory and other information into a single spatially national chemicals database;</li> <li>• To provide an appropriate context for assessing chemicals use, reduction, and elimination in terms of implementation of the provision of the Stockholm Convention.</li> </ul>
<b>11- Beneficiaries</b>	Direct beneficiaries: Cambodian government institutions; private sectors and

	<p>stakeholders.</p> <p>Indirect beneficiaries: Contribution to global efforts of POPs release minimization and sustainable development.</p>
<b>12- Activities</b>	<ul style="list-style-type: none"> <li>• Review and evaluate the existing chemicals data and information;</li> <li>• Assess various options for the national chemicals database design;</li> <li>• Design the national chemicals database and the expansion of the existing chemicals data and information will be considered after assessing expansion options and considering ongoing maintenance and operational costs of existing systems;</li> <li>• Establish a GIS based, chemicals information network to serve government sectors;</li> <li>• Conduct a pilot study for examination of selected chemicals including POPs areas to determine the database structure and mechanism for incorporating data from different sources;</li> <li>• Incorporate chemicals data and information including POPs from other institutional sources; and</li> <li>• Link between national chemicals database with the GIS proposed for managing chemicals including POPs.</li> </ul>
<b>13- Estimated Cost</b>	<b>US\$ 180,000</b>
<b>14- Donors</b>	<p>Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level)</p> <p>Donors: 80% of total budget (GEF, WB, FAO, UNEP, ADB)</p>
<b>15- Project Extent</b>	Phnom Penh, Provinces and Cities

### 3. Project Profile No 3: Develop Draft Law on Chemical Management

<b>1- Project Title</b>	<b>Develop Law on Chemical Management</b>
<b>2- Implementing Agency</b>	MoE
<b>3- Co-operational Agency</b>	MIME, MoH, MAFF, MoC, Relevant Governmental Institutions and Relevant Civil Organizations
<b>4- Duration</b>	18 months
<b>5- Project Location</b>	Phnom Penh
<b>6- Background</b>	<p>To date, Cambodia does not have any legislation regarding the managing of chemicals 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 chemicals related with those individual governmental institutions.</p> <p>Cambodia believes that legal instruments are very important for the management of chemicals including POPs. Therefore, it is necessary to assess and prepare a preliminary law or sub-decree responding to the needs of general chemicals management. These legal provisions must cover the management of chemicals as illustrated in various international conventions such as the Stockholm Convention, PIC Convention, Montreal Protocol...etc.</p>
<b>7- Project Rationale</b>	<p>Currently, existing legal instruments in Cambodia are insufficient for safe and sound management of chemicals including POPs as required under the Stockholm Convention. The project rationale is:</p> <ul style="list-style-type: none"> <li>• Relevant laws will be revised or prepared,</li> <li>• Managing of chemicals including POPs guideline will be developed and available for use,</li> <li>• Law and guideline related with the managing of chemicals including POPs will be enforced, and</li> <li>• Knowledge and awareness on the law and relevant legal instruments will be disseminated and participation promoted.</li> </ul>
<b>8- Project Justification</b>	Establish necessary legal framework for the managing of chemicals including POPs in a safe and sound environmental manner of chemicals life cycle.
<b>9- Project Goal</b>	Manage chemicals including POPs in a safe and sound environmental manner of chemicals life cycle and facilitate the development of alternative approaches to achieving future effective chemicals law enforcement and promote greater public participation in chemical management and decision making.
<b>10- Objectives</b>	<ul style="list-style-type: none"> <li>• Provide a forum for governmental institutions and stakeholders in chemicals law development including POPs,</li> <li>• Support stakeholders initiatives for sharing law development related strategies, expertise and technical knowledge,</li> <li>• Support joint training and capacity building related chemicals law development including POPs and</li> <li>• Establish and examine alternative mechanism for chemicals law development and future compliance.</li> </ul>
<b>11- Beneficiaries</b>	<p>Direct beneficiaries: Cambodian government institutions;          Indirect beneficiaries: Cambodian people (Contribution to global efforts of chemicals waste release minimization including POPs).</p>
<b>12- Activities</b>	<p>Assessment of law and policy related with the managing of chemicals including POPs:</p> <ul style="list-style-type: none"> <li>• Review legal instruments and policy,</li> </ul>



	<ul style="list-style-type: none"><li>• Assess legal instruments and policy, and</li><li>• Identify gap and requirement for law and policy development in focus on the managing of chemicals including POPs.</li></ul> Develop chemicals management laws related with the managing of chemicals including POPs or develop a new law: <ul style="list-style-type: none"><li>• Form legal team,</li><li>• Organize training course on law for managing chemicals including POPs,</li><li>• Organize national workshop on current status of law and policy related with the managing of chemicals including POPs, and</li><li>• Develop chemicals management law and policy for managing chemicals including POPs.</li></ul>
<b>13- Estimated Cost</b>	<b>US\$ 300,000</b>
<b>14- Donors</b>	Government of the Kingdom of Cambodia: 20% of total budget (Maximum Level) Donors: 80% of total budget (GEF, WB, FAO, UNEP, ADB)
<b>15- Project Extent</b>	Countrywide

**CHAPTER 4 :  
ANNEXES**

**A. Annex 1: Summary of estimated budgets**

<b>No</b>	<b>Proposed Priority Projects/Activities</b>	<b>Duration, months</b>	<b>Estimated budgets, USD</b>
<b>I</b>	<b>POPs Pesticides Reduction and Elimination Area</b>		<b>\$2,355,000</b>
1.	Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement.	18	\$200,000
2.	Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides.	18	\$150,000
3.	Strengthen capacity on pesticides analysis focusing on POPs.	18	\$350,000
4.	Raise public awareness on pesticides issues including POPs pesticides and other obsolete pesticides	24	\$150,000
5.	Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides	12	\$55,000
6.	Conduct Comprehensive inventory on obsolete pesticides including POPs pesticides.	24	\$350,000
7.	Undertake monitoring process on the trafficking of illegal pesticides including POPs pesticides.	24	\$350,000
8.	Prepare collection campaign for temporarily storage of the obsolete pesticides including POPs pesticides in regional storage depots prior to disposal.	18	\$500,000
9.	Design and execute a Pilot Project for the disposal of a limited amount of obsolete pesticides.	18	\$250,000
10.	Design and execute a nation wide project for the disposal of all obsolete pesticides (including POPs).	36	depending on the outcome of the inventory
<b>II</b>	<b>PCBs Management Area</b>		<b>\$2,030,000</b>
11.	Develop legal instruments or technical guidelines for managing PCBs release	12	\$150,000
12.	Comprehensive Inventory of equipment and accessories/articles containing and contaminated with PCB for ESM	24	\$250,000
13.	ESM Management for "in use" electrical equipment	18	\$250,000
14.	Assessment of socio-economic aspect for phase out of electrical equipment and accessories contained or contaminated PCBs	24	\$200,000
15.	ESM compliance of the maintenance and repairing activities of electrical equipment	18	\$300,000
16.	Strengthen Lab capacities for PCB analysis	18	\$150,000
17.	ESM Management for "out of use" equipment	24	\$350,000.
18.	Provide and strengthen capacity and enhance public awareness on PCBs issue	18	\$200,000
19.	PCB Database management	12	\$180,000
<b>III</b>	<b>Unintentionally Produced POPs Management Area</b>		<b>\$2,180,000</b>
20.	Revising or Developing the legislations related to sound management of unintentionally produced POPs	36	\$300,000
21.	Institutional strengthening and capacity building for sound management of unintentionally produced POPs	18	\$200,000
22.	Programme for public awareness raising on unintentionally produced POPs	24	\$300,000
23.	Introduce and encourage sound waste management practices	18	\$300,000
24.	Promotion of controlled landfills and prevention of uncontrolled burning of waste	18	\$250,000
25.	Introduction and promotion of BAT & BEP in existing waste incineration plants	18	\$200,000
26.	Application of BAT & BEP for unintentionally produced POPs operational release sources	24	\$200,000
27.	Improvement of medical waste management practices	24	\$200,000
28.	Inventory of unintentionally produced POPs by-products releases	12	\$180,000
29.	Evaluate the possibility of hazardous waste co-incineration in the newly constructed cement kiln	18	\$50,000
<b>IV</b>	<b>Management of NIP Implementation</b>		<b>\$680,000</b>
30.	Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation	36	\$200,000
31.	Establish and design the National Chemicals Database including POPs and PTS for centralization and exchanging of information	24	\$180,000
32.	Draft Law on Chemical Management	18	\$300,000
	<b>Total</b>		<b>\$7,245,000</b>

## B. Annex 2: The Logical Framework Analysis

### 1. POPs Pesticides and DDT

Narrative Summary	Performance Indicator	Assumptions and Risks
<p><b>Goal: Eliminate the import and use of POPs pesticides</b></p>	<ul style="list-style-type: none"> <li>› Identified POPs pesticides contaminated area.</li> <li>› POPs pesticides reduction and elimination strategy fully integrated with third five years of the (NSDP).</li> <li>› Farmer and people health is improved and rural economical growth rate is increased.</li> </ul>	<ul style="list-style-type: none"> <li>› POPs pesticides action plan remain the MoE and MAFF responsibility supported by the RGC.</li> <li>› Law enforcement commitment is limited.</li> <li>› Decision making is centralized.</li> <li>› Financial support for NIP implementation is not clear potential donor funding yet.</li> </ul>
<p><b>Objectives:</b></p> <ol style="list-style-type: none"> <li>1- Amendment of existing legal instruments and strengthening effective pesticides (including POPs) law enforcement.</li> <li>2- Strengthen institutional capacity and raise public awareness on obsolete pesticides including POPs pesticides.</li> <li>3- Undertake ecologically sound management measures related to obsolete pesticides including POPs pesticides.</li> <li>4- Eliminate stockpile of obsolete pesticides, including POPs pesticides.</li> </ol>	<ul style="list-style-type: none"> <li>› The MoE and MAFF staff can manage effectively POPs pesticides.</li> <li>› Farmer and traders actively participate in establishing POPs pesticides elimination decision support facility.</li> <li>› The MoE and MAFF stakeholders are able to participate in POPs pesticides elimination with a safety environmental manner.</li> <li>› No stockpile, article in use and waste consisting POPs pesticides have been found.</li> </ul>	<ul style="list-style-type: none"> <li>› Sufficient resources are available to the MoE and MAFF.</li> <li>› Lack of interest in participatory POPs reduction and elimination by the local farmers. Estimated agricultural production is low to medium.</li> <li>› Lack of high-tech to clean-up agricultural pesticides residue including POPs from Cambodia</li> <li>› Donor community will provide both technical and financial support to mitigate and clean up stockpiles, articles in use and wastes consisting POPs pesticides.</li> </ul>
<p><b>Outputs:</b></p> <ul style="list-style-type: none"> <li>› Existing legal instruments related to the managing of pesticides (including POPs) will be revised, amended and effectively implemented.</li> <li>› Technical guidelines on the management of obsolete pesticides (including POPs) are developed, introduced and effectively implemented.</li> <li>› The capacity of institutions will be strengthened and improved for the management of obsolete pesticides including POPs pesticides.</li> <li>› The public at large including policy and decision makers will be aware of obsolete pesticides issues and will actively participate in the prevention and elimination of obsolete pesticides including POPs pesticides.</li> <li>› Information on obsolete pesticides is available.</li> <li>› Illegal trade and domestic trafficking and using of pesticides including POPs will be seriously reduced.</li> <li>› Pesticides residues including POPs in agricultural products and in the environment are reduced.</li> <li>› Pesticides (including POPs) concentrations in consumer products are reduced.</li> </ul>	<ul style="list-style-type: none"> <li>› The government agrees that the updated legal instrument is useful for managing POPs pesticides.</li> <li>› The MoE and MAFF staff can assemble required data for multi criteria analysis decision support system to elimination of POPs pesticides.</li> <li>› Trained governmental officials can conduct and monitor the NIP implementation and law enforcement.</li> <li>› POPs pesticides inventory provides very comprehensive data and information regarding the volume of POPs pesticides residues and stockpiles, articles in use and waste consisting of POPs pesticides throughout the country.</li> <li>› The strategies on identification of stockpiles, articles in use and waste consisting of POPs pesticides, information exchange, research and development proposed results in sustainable action in reduction and elimination of POPs pesticides.</li> <li>› The governmental fund to fully support the POPs pesticides action plan implementation.</li> </ul>	<ul style="list-style-type: none"> <li>› Poor interaction between government administration and local community representatives estimated law enforcement is low.</li> <li>› Lack of coordination between major participating department of the ministry of agriculture forestry and fisheries and other ministries estimated law development is slow.</li> <li>› The local trader is fully aware and concerned about the unsustainable income levels of their business. The degree of success of people's participation will depend in part on the motivation provided.</li> <li>› Private sector and farmers do not accept a more rational and approach to POPs pesticides action plan.</li> <li>› Development of national strategies for assessment and mitigation of stockpile, article in use and waste consisting POPs pesticides as well as information exchange and research development with suitable data will continue to be available in a timely and useful manner.</li> </ul>

Narrative Summary	Performance Indicator	Assumptions and Risks
<ul style="list-style-type: none"> <li>› Collection and safe storage of obsolete pesticides including POPs pesticides are applied</li> <li>› Pilot project concerning the disposal of already observed obsolete pesticides in stockpile is completely implemented.</li> <li>› The identified stockpiles and wastes containing or contaminated with obsolete pesticides including POPs pesticides are sound and safely managed and disposed.</li> </ul>		

## 2. PCBs

Narrative Summary	Performance Indicator	Assumptions and Risks
<p><b>Goal: Reduce risks and minimize impacts caused by PCBs with sound economic and ecological management.</b></p>	<ul style="list-style-type: none"> <li>› Reduce and eliminate all equipment and articles containing and contaminated PCBs.</li> <li>› Raise awareness on risk, protective method, and safe health through using personal protective equipment.</li> <li>› Improved sound economical growth by alternatives to the PCBs.</li> </ul>	<ul style="list-style-type: none"> <li>› Developed PCBs action plan will be supported by the RGC.</li> <li>› Long-term reduction and elimination strategies will be supported and approved by the RGC for implementation.</li> <li>› Financial support for NIP implementation is not having potential donor funding yet.</li> </ul>
<p><b>Objectives:</b></p> <ol style="list-style-type: none"> <li>1- Develop legal instruments and technical standards for managing equipment and articles contained and contaminated with PCBs</li> <li>2- Develop ESM of in-use electrical equipment and accessories/articles containing and/or contaminated with PCBs</li> <li>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)</li> <li>4- ESM of out-of-use of equipment, articles and wastes containing and/or contaminated with PCBs (Handling, transportation, dismantling, pre-treatment, storage, final disposal)</li> <li>5- Strengthen capacity and enhance public awareness on PCBs issue</li> </ol>	<ul style="list-style-type: none"> <li>› The MIME staff can manage effectively PCBs.</li> <li>› Workers, traders, and stakeholders actively participate in PCBs elimination.</li> <li>› The MIME and stakeholders are able to participate in PCBs elimination in a safe environmentally sound manner.</li> <li>› No stockpile, article in use and waste consisting PCBs have been found.</li> </ul>	<ul style="list-style-type: none"> <li>› Sufficient resources are available to the MIME and MoE for development of legal instruments and technical standards for managing equipment and articles contained and contaminated with PCBs.</li> <li>› Lack of interest in participatory PCBs reduction and elimination by the local traders.</li> <li>› Lack of commitment and economical failure will not able to manage properly PCBs.</li> </ul>
<p><b>Outputs:</b></p> <ul style="list-style-type: none"> <li>› PCBs management legal instruments tools will be adapted and available in Cambodia;</li> <li>› Technical guidelines for sound management of PCBs dielectric, equipment and articles contained and contaminated with PCBs are available;</li> </ul>	<ul style="list-style-type: none"> <li>› The government agrees that the updated legal instrument is useful for managing PCBs.</li> <li>› The MIME and MoE staff can apply the guidelines for proper management of equipment and articles contained and contaminated with PCBs.</li> </ul>	<ul style="list-style-type: none"> <li>› Poor interaction between government administration and donor community.</li> <li>› Lack of coordination between MIME and other ministries estimated legal instruments development is slow.</li> </ul>

Narrative Summary	Performance Indicator	Assumptions and Risks
<ul style="list-style-type: none"> <li>▶ Stakeholders will be better aware of measures to protect their health and the environment from PCBs affect;</li> <li>▶ Stakeholders (EDC and maintenance companies) will be aware of sound economical and ecological management of PCB transformers until the end of life;</li> <li>▶ Professional workers health and healthy environment will be protected; and</li> <li>▶ Comply with the obligation of Stockholm Convention.</li> <li>▶ Adequate information and data on in-use electrical equipment and accessories/articles containing and/or PCBs contaminated;</li> <li>▶ In-use electrical equipment and articles containing or contaminated with PCBs are identified, classified, labeled and registered;</li> <li>▶ In-use electrical equipment and articles containing and/or contaminated with PCBs are kept in use with environmental sound manner until the end of life; and</li> <li>▶ Strategy for the reduction of in-use electrical equipment and articles containing and/or contaminated with PCBs is prepared.</li> <li>▶ Strategy related to the socio economic aspects of transformers in use in the country is developed.</li> <li>▶ Adequate information and data on out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs.</li> <li>▶ ESM of Out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs will be implemented.</li> <li>▶ Strategy for the elimination of out-of-use of electrical equipment, articles and wastes containing or contaminated with PCBs will be developed.</li> <li>▶ The capacity of electrical workers working with PCBs associated issues will be strengthened.</li> <li>▶ Knowledge and information on PCBs hazards and risks is widely provided and disseminated.</li> <li>▶ Personal protective equipment and safety environment from the impact of PCBs are considered.</li> <li>▶ Capacity of laboratory in analyzing PCBs shall be strengthened.</li> <li>▶</li> </ul>	<ul style="list-style-type: none"> <li>▶ Trained governmental officials and stakeholders are aware of the effects of PCBs.</li> <li>▶ 90% of governmental workers and officers fully aware of PCBs hazards and risks at the end of 2010.</li> <li>▶ Personal protection facility will be provided for Cambodian workers associated with PCBs in 2007.</li> <li>▶ In-use electrical equipment and articles containing and/or contaminated with PCBs will be identified, labeled, and registered in 2008.</li> <li>▶ The strategies on identification of stockpiles, articles in use and waste consisting of PCBs, information exchange, research and development proposed results in sustainable action in reduction and elimination of PCBs.</li> <li>▶ The governmental fund to fully support the PCBs action plan implementation.</li> <li>▶ All out-of-use of electrical equipment, articles and wastes containing and/or contaminated with PCBs will not be permitted for reuse.</li> <li>▶ Alternatives to PCBs substances are 25% available in the year of 2010.</li> </ul>	<ul style="list-style-type: none"> <li>▶ The trader is fully aware and concerned about the unsustainable income levels of their business on PCBs. The degree of success of private's participation will depend in part on the motivation provided.</li> <li>▶ Private sector and governmental high range officers do not accept a more rational and approaches to reduction and elimination plan and alternative to PCBs.</li> <li>▶ The governmental funding will not enough for PCBs action plan implementation.</li> <li>▶ Some clients are concerned that the electrical services model ties the success (risk) of their businesses too closely with that of legal enforcement; service and business plans neither well linked nor integrated; critical expertise transferred to governmental agency may no longer be accessible.</li> <li>▶ Procurement barriers appear to exist between users and some suppliers of electrical equipment, in use articles and waste consisting PCBs (rediscovery, sourcing, arrangements and delivery).</li> </ul>

### 3. Unintentionally Produced POPs

Narrative Summary	Performance Indicator	Assumptions and Risks
<p><b>Goal: Reduce and eliminate the release of unintentionally produced POPs.</b></p>	<ul style="list-style-type: none"> <li>› New willingness to implement and accept change and a political commitment to innovation;</li> <li>› New focus to create a framework for the successful use of new technology for unintentionally produced POPs management, reduction and elimination where it can be more effective and more efficient</li> </ul>	<ul style="list-style-type: none"> <li>› No previous cross-government plan to identify the need, use, cost, benefit or operability of alternative to the unintentionally produced POPs management technologies within government.</li> <li>› No identifiable community of practice on unintentionally produced POPs management and reduction technology. The reduction concepts are not co-coordinated across governments, local authorities and people.</li> </ul>
<p><b>Objectives:</b></p> <ol style="list-style-type: none"> <li>1- Revise or develop legislations related to sound management of unintentionally produced POPs.</li> <li>2- Strengthen capacity and raise public awareness on unintentionally produced POPs issues and its hazards.</li> <li>3- Improve waste management practices and prevent uncontrolled burning of wastes</li> <li>4- Maintaining of comprehensive inventories of unintentionally produced POPs.</li> <li>5- Implementation of guidelines on best available techniques (BAT) and best environmental practice (BEP) to prioritized sources of unintentionally produced POPs</li> </ol>	<ul style="list-style-type: none"> <li>› Shift towards monitoring what others do and not away from the collection and management of detailed unintentionally produced POPs inventories</li> <li>› Government recognizes value in improving capacity from uncontrollable burning to controllable burning.</li> <li>› Establishment of the measures as the means to consolidate POPs information.</li> <li>› Government willingness to enter into new, innovative and collaborative unintentionally produced POPs reduction arrangements, such as partnerships, to the benefit of many parties.</li> </ul>	<ul style="list-style-type: none"> <li>› Qualified personnel are dispersed throughout government and do not always communicate well between themselves.</li> <li>› There is no extant methodology to determine, understand and collaborate to meet particular convention requirements.</li> <li>› Roles and responsibilities in governmental institution are not particularly clear related to unintentionally produced POPs reduction; and co-ordination between provincial authorities and private sector and offices operations is inconsistent.</li> <li>› Potential distrust between NGOs and government.</li> <li>› Some private and NGO appear reluctant to draw upon expertise and tools from BAT and BEP to further exploit the relationships with governmental agencies.</li> </ul>
<p><b>Outputs:</b></p> <ul style="list-style-type: none"> <li>› Relevant legislations will be revised or developed;</li> <li>› Unintentionally produced POPs management guidelines are available;</li> <li>› Legislation related to and guidelines for the management of unintentionally produced POPs are enforced and widely implemented;</li> <li>› Broad understanding and awareness about the relevant laws and other legal instruments are disseminated, promoted; and</li> <li>› The implementation of reduction measures of unintentionally produced POPs release will be most effective.</li> <li>› Capacity for sound management of unintentionally</li> </ul>	<ul style="list-style-type: none"> <li>› New ways of organizing governmental staff to meet client requirements in unintentionally produced POPs management.</li> <li>› New procurement and delivery models in order to increase accessibility and availability and to minimize costs in unintentionally produced POPs management.</li> <li>› Alternate service delivery approaches in unintentionally produced POPs management may enlist the aid of the resource to drive program delivery opportunities.</li> <li>› Methodologies used in unintentionally produced POPs management have not kept pace with improved quality of acquisition and technology advances.</li> <li>› Cambodia government has a strong body of technical</li> </ul>	<ul style="list-style-type: none"> <li>› Cambodia competent authority is not experienced with new alternative service delivery approaches such as in unintentionally produced POPs management.</li> <li>› Public at large may be reluctant to draw upon expertise and tools from outside the targeted areas.</li> <li>› Term political objectives in governments have created uncertainties in the past and may continue to poor unintentionally produced POPs management.</li> </ul>

Narrative Summary	Performance Indicator	Assumptions and Risks
<p>produced POPs of the relevant institutional officers will be strengthened, and</p> <ul style="list-style-type: none"> <li>‣ The public will be aware of the risks and hazards caused by unintentionally produced POPs and actively participate in the prevention of future releases.</li> <li>‣ Improved waste management;</li> <li>‣ Reduced total amount of waste;</li> <li>‣ Reduced uncontrolled burning; and</li> <li>‣ Improved capacity for environmentally sound waste incineration.</li> <li>‣ Adequate data on the release of unintentionally produced POPs is available.</li> <li>‣ Amount of release of unintentionally produced POPs will be reduced.</li> </ul>	<p>expertise to grow from in terms of experience, methodology and analytical expertise within government, but is strong only in certain sectors; others sectors are weak.</p> <ul style="list-style-type: none"> <li>‣ Government officials capacity has been skewed toward historical technical issues related to unintentionally produced POPs management and does not reflect the broader information needs of integrated, local community management of unintentionally produced POPs release.</li> </ul>	

#### 4. Management of NIP Implementation

Narrative Summary	Performance Indicator	Assumptions and Risks
<p><b>Goal: Support to Successful Implementation of the NIP</b></p>	<ul style="list-style-type: none"> <li>‣ The National Implementation Plan fully implemented and integrated with national and local development plans.</li> <li>‣ Minimize the problems related to the coordination of the NIP implementation.</li> </ul>	<ul style="list-style-type: none"> <li>‣ The sectoral action plan in the NIP remains the relevant ministerial responsibility coordinated and administrative supported by the Ministry of Environment.</li> <li>‣ Implementation of the NIP is separation between the ministerial responsibility and constraining with centralization of data and information related to the managing of chemicals specifically including POPs.</li> </ul>
<p><b>Objectives:</b></p> <p>1- Strengthening the existing mechanism for efficient and effective management of NIP implementation.</p>	<ul style="list-style-type: none"> <li>‣ The relevant ministerial officer and technical staff can manage the NIP implementation process.</li> <li>‣ Stakeholders' actively participate in implementing and managing chemicals including POPs management and decision support tool.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Sufficient resources are available to the relevant ministries for implementing the NIP.</li> <li>‣ NGOs, donors and the Royal Government of Cambodia inadequate or/and cease providing support to ministerial responsibility on POPs.</li> </ul>
<p><b>Outputs:</b></p> <ul style="list-style-type: none"> <li>‣ The national mechanism for the management of NIP implementation is strengthened</li> <li>‣ The NIP implementation and management will be efficiently and effectively coordinated;</li> <li>‣ The NIP reporting, evaluation and updating is executed on time;</li> <li>‣ The capacity of stakeholders relevant to NIP</li> </ul>	<ul style="list-style-type: none"> <li>‣ Governmental stakeholders are able to participate in the NIP implementation in a transparent manner.</li> <li>‣ Ministerial officers and technical staff can assemble required data for POPs information analysis for decision support system</li> <li>‣ Stakeholders agree the new National Chemical Database is useful for effective POPs management and elimination.</li> </ul>	<ul style="list-style-type: none"> <li>‣ The relevant ministries will cooperate with the Ministry of Environment on the NIP implementation and POPs data and information centralization, management and distribution.</li> <li>‣ An agreement mechanism will be reached at the Ministry of Environment with relevant ministries and all stakeholders to implement the NIP and to</li> </ul>



Narrative Summary	Performance Indicator	Assumptions and Risks
<p>implementation will be promoted; and</p> <ul style="list-style-type: none"> <li>➤ The National Chemical Database will be developed and information exchange will be executed nationally and internationally.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The National Chemical Database center is able to provide up to date information to local authorities and stakeholder regarding chemicals issues including POPs.</li> <li>➤ The government institutions and all interested stakeholders are able to operate and manage data and information of chemicals issues including POPs without the need for external technical advisors.</li> <li>➤ The Ministry of Environment is able to play very important role in communication and responding to the Stockholm requirement.</li> </ul>	<ul style="list-style-type: none"> <li>➤ centralize and use the National Chemical Database. Sufficient budget will be available.</li> <li>➤ Suitable data will continue to be available in a timely and useful manner.</li> <li>➤ The relevant ministerial officers and staff has the necessary pre-requisite skills to understand POPs management and POPs elimination technology.</li> </ul>

## C. Annex 3: The Problems Analysis Framework

### 1. POPs Pesticides and DDT

Problems	Causes	Consequences	Requirement of the convention	Solutions
<ul style="list-style-type: none"> <li>‣ Cambodia is still trafficking and using banned agricultural pesticides including POPs pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Existing law and regulation have some gaps causing difficulty in implementation,</li> <li>‣ Capacity and ability in law enforcement has some how limited and gaps,</li> <li>‣ Laboratory capacity for analyzing pesticides is limited,</li> <li>‣ Lack of regular monitoring mechanism on the trafficking of pesticides, and</li> <li>‣ Limited awareness raising on problems and risks of pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impact on human health, animals and the environment,</li> <li>‣ Impact on social economic and families,</li> <li>‣ Unable to manage the trafficking of pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Undertake legal and administrative measure to eliminate the production, use, export and import (article 3.1)</li> <li>‣ Manage the production in stockpile and waste with safe and sound environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Amendment law and prepare technical guideline and administrative code to reinforce law implementation,</li> <li>‣ Strengthen capacity in pesticides management (for all relevant institutions),</li> <li>‣ Strengthen laboratory capacity in POPs pesticides analysis.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Public at large faces health risks caused by using agricultural pesticides including POPs.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Pesticides users do not aware of any kind of pesticides, using method, and risks caused by pesticides,</li> <li>‣ There is wrong use and misuse of pesticides,</li> <li>‣ Lack of mechanism and facilities for managing pesticides' packages and waste,</li> <li>‣ Pesticides' labels and use instruction were written in foreign languages or no labels and instruction paper at all.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impact on human health, animals and the environment,</li> <li>‣ Impact on social economic and families,</li> <li>‣ Unable to manage the trafficking of pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Public information, knowledge and education to be provided (article 10)</li> </ul>	<ul style="list-style-type: none"> <li>‣ Develop program for enhancing public awareness on the risks of pesticides,</li> <li>‣ Undertake research and evaluate the accidental rate caused by the use of pesticides including POPs.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Cambodia lacks good mechanisms and measures for protecting public health and the environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Existing laws unclear addressing measure for ensuring the protection of environment and public health,</li> <li>‣ Lack of mechanism and facilities for managing pesticides' packages and waste,</li> <li>‣ Mechanism for monitoring traffic and import of pesticides is limited,</li> <li>‣ Participation from relevant institutions and public in the protection of public health and the environment is limited,</li> <li>‣ Lack of information sharing and delivering.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Decrease of the quality of environment and human health,</li> <li>‣ Negative Impact on social economic level and population.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Article 6 and 10</li> </ul>	<ul style="list-style-type: none"> <li>‣ Develop public awareness raising program on storage of pesticides packages and wastes,</li> <li>‣ Strengthen capacity in monitoring of trafficking and import of pesticides.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Cambodia lacks comprehensive and basic data and information for managing agricultural pesticides including POPs.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Lack of mechanism for collecting compiling and disseminating information and data,</li> <li>‣ Never undertake Comprehensive inventory on pesticides including POPs</li> </ul>	<ul style="list-style-type: none"> <li>‣ Unable to manage pesticides including POPs</li> </ul>	<ul style="list-style-type: none"> <li>‣ Shall be shared information (article 9)</li> </ul>	<ul style="list-style-type: none"> <li>‣ Undertake Comprehensive inventory on POPs pesticides,</li> <li>‣ Establish data and information sharing system,</li> <li>‣ Establish data system for the management of POPs</li> </ul>

## 2. PCBs

Problems	Causes	Consequences	Requirement of the convention	Solutions
<ul style="list-style-type: none"> <li>‣ No specific PCB regulation in force in Cambodia.</li> </ul>	<ul style="list-style-type: none"> <li>‣ PCBs is relatively new issue for Cambodia, just aware in late 2001,</li> <li>‣ Still using aged transformers and using dielectric fluid from aged transformers for retro-filling into new one,</li> <li>‣ No law or guideline for managing PCBs,</li> <li>‣ Economic pressure forced to keep in use of aged transformers through repairing and recycling.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Damage human health and the environment,</li> <li>‣ Economic issues</li> </ul>	<ul style="list-style-type: none"> <li>‣ Stop export-import PCBs transformers,</li> <li>‣ Continue using existing transformers with sound environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Develop management law on PCBs</li> <li>‣ Enhance the management of in-use transformers and in stock with sound environment,</li> <li>‣ Encourage the use of non-base PCBs transformers.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Economic situation of Cambodia: no replacement of old transformers,</li> <li>‣ Old transformers in use in Cambodia are PCBs contaminated.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Economic pressure forced to keep in use of aged transformers through repairing and recycling,</li> <li>‣ Dielectric fluid are used for retro-filling after filtration,</li> <li>‣ Dielectric fluid has been sole for household use,</li> <li>‣ The awareness of electrical managers and officer on PCBs issue is nearly nothing,</li> <li>‣ Lack of maintenance and management of in-use transformers (leak, spill, ...),</li> <li>‣ Aged and broken transformers were sold for cost recovering,</li> <li>‣ Average of transformer, distribution of population per period in comparison with the deadline of Stockholm,</li> <li>‣ Cambodia has import transformers without PCB control.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Damage human health and the environment,</li> <li>‣ Economic issues.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Stop export - import PCBs transformers,</li> <li>‣ Continue using existing transformers with sound environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Raise awareness on PCBs issue,</li> <li>‣ Must have technical guideline for the management of dielectric and electrical equipment contaminated with PCBs.</li> </ul>
<ul style="list-style-type: none"> <li>‣ PCBs released to the environment caused by lack of consideration,</li> <li>‣ Electrical workers facing high risks caused by PCBs.</li> </ul>	<ul style="list-style-type: none"> <li>‣ No aware of PCB in electrical network,</li> <li>‣ No appropriate &amp; specific maintenance for PCB contaminated transformers,</li> <li>‣ No PCB disposal facilities available in Cambodia,</li> <li>‣ No specific regulation for health and environmental protection.</li> <li>‣ No supply of safe protective equipment for workers.</li> <li>‣ Workers do not aware of the risk of PCB health impact,</li> <li>‣ Workers who work directly with dielectric fluid used to use transformers fluid as cooking oil,</li> </ul>	<ul style="list-style-type: none"> <li>‣ Damage human health and the environment,</li> <li>‣ Economic issues.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Stop export - import PCBs transformers,</li> <li>‣ Continue using existing transformers with sound environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Educate and raise awareness on PCBs issue to public, professional workers and managers,</li> <li>‣ Shall have personal protected equipment.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Lack of knowledge and understanding on the risks, safe and sound management of PCBs;</li> <li>‣ Lack of data and information for proper</li> </ul>	<ul style="list-style-type: none"> <li>‣ Ever has program or training dealing with risks caused by PCBs and safety precaution measure,</li> <li>‣ There is no requirement for registration of transformers and electrical equipment,</li> <li>‣ Ever had Comprehensive inventory undertaken,</li> <li>‣ Consideration on management system for electrical equipment</li> </ul>	<ul style="list-style-type: none"> <li>‣ Lack of basic information for risk assessment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Shall be shared information and data,</li> <li>‣ Provide information and knowledge to the public.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Strengthen laboratory capacity in analyzing for PCBs,</li> <li>‣ Undertake Comprehensive inventory for PCBs equipment,</li> <li>‣ Strengthen the capacity of professional staff,</li> <li>‣ Government shall assign institution for</li> </ul>

Problems	Causes	Consequences	Requirement of the convention	Solutions
management of PCBs.	with safe environment is still limited, <ul style="list-style-type: none"> <li>‣ There is no institution responsible for the management of information and data on transformers and electrical equipment,</li> <li>‣ There is no capacity in analyzing for PCBs.</li> </ul>			responsible the management of information and data related to PCBs, <ul style="list-style-type: none"> <li>‣ Establish mechanism for sharing information, experiences, and the management of PCBs, nationally and internationally,</li> <li>‣ Participation of stakeholders.</li> </ul>

### 3. Unintentionally Produced POPs

Problems	Causes	Consequences	Requirement of the convention	Solutions
‣ Uncontrolled burning wastes (at home, public area, landfill, etc.).	<ul style="list-style-type: none"> <li>‣ Law related to the waste management does not detail on the ban of waste burning,</li> <li>‣ Ability of waste collection and the management of waste at landfill is limited,</li> <li>‣ Understanding of public on risk to human health caused by waste burning is nearly nothing.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impact on human health, particularly to those who living nearby landfill,</li> <li>‣ Pollute environment particularly areas surrounding landfill.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Reduce sources or activities contributing to the release of dioxins,</li> <li>‣ Provide education and raise awareness on the release of dioxins.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Amend law related to the management of waste,</li> <li>‣ Improve landfills from uncontrolled to controlled landfills,</li> <li>‣ Raise public awareness on waste management and risk caused by burning waste.</li> </ul>
‣ Level of risk caused by the exposure of dioxins and furans is high.	<ul style="list-style-type: none"> <li>‣ Waste burning activities (plastic, rubber, papers, ...) and other products at home is quite large,</li> <li>‣ Cooking food by firewood, agricultural wastes, and other plastic product is quite large at rural areas,</li> <li>‣ Public do not aware of the formation and risk of unintentionally produced POPs.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impact on public health, particularly women and children,</li> <li>‣ Pollute environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Reduce sources or activities contributing to the release of dioxins,</li> <li>‣ Provide education and raise awareness on the release of dioxins.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Raise public awareness on the risk caused by and reduction activities on the source of dioxins release,</li> <li>‣ Strengthen the monitoring activities on the source of dioxins releases.</li> </ul>
‣ Most of dioxins release sources have no measures and tools to reduce the quantity of releases.	<ul style="list-style-type: none"> <li>‣ It is relatively new subject for Cambodia,</li> <li>‣ Lack of legal instrument for the management of releasing,</li> <li>‣ Lack of technology and professional for the management of the release of unintentionally produced POPs,</li> <li>‣ Lack of experiences in action plan development.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impact on public health, particularly women and children,</li> <li>‣ Pollute environment.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Prepare strategy for reducing the release,</li> <li>‣ Disseminate counter-measures to the public.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Train professional,</li> <li>‣ Develop action plan for the reduction and elimination of the release of unintentionally produced POPs.</li> </ul>
‣ Lack of information gathering, compiling and disseminating on unintentionally produced POPs.	<ul style="list-style-type: none"> <li>‣ It is relatively new subject for Cambodia,</li> <li>‣ Lack of resource (technical, human and financial) for undertaking research.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Unable to develop measure for the management of reduction of the release.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Shall be shared information and data,</li> <li>‣ Provide information and knowledge to the public.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Strengthen and enhance institutional structure,</li> <li>‣ Develop action plan,</li> <li>‣ Encourage participation.</li> </ul>

#### 4. Management of NIP Implementation

Problems	Causes	Consequences	Requirement of the convention	Solutions
<ul style="list-style-type: none"> <li>‣ Unit for the coordination of NIP implementation not in place yet.</li> </ul>	<ul style="list-style-type: none"> <li>‣ NIP not yet finish in preparation;</li> <li>‣ Not yet clear about the role of the coordination unit in NIP implementation.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Poor communication system and coordination mechanism related to the NIP implementation.</li> </ul>	<ul style="list-style-type: none"> <li>‣</li> </ul>	<ul style="list-style-type: none"> <li>‣ Approve the NIP</li> <li>‣ Set-up the unit for the coordination of NIP implementation</li> <li>‣ Propose the project proposal for strengthening the unit.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Limited administrative and management of NIP among stakeholders in particular of project implementation.</li> </ul>	<ul style="list-style-type: none"> <li>‣ The NIP implementation and responsibility is separately among governmental ministries,</li> <li>‣ Administrative system among governmental institutions still applied with bureaucratic management style,</li> <li>‣ The mechanism for NIP management is not yet clear among stakeholders regarding POPs management and elimination.</li> </ul>	<ul style="list-style-type: none"> <li>‣ The project management and NIP implementation is absolutely ineffectiveness,</li> <li>‣ Cambodia can not fully be able to implement the obligation under the Stockholm Convention.</li> </ul>	<ul style="list-style-type: none"> <li>‣</li> </ul>	<ul style="list-style-type: none"> <li>‣ Strengthen existing mechanism and administrative system in management of NIP among stakeholders,</li> <li>‣ Establish the new administrative coordination team or committee in NIP implementation and management,</li> <li>‣ Set-up the institutional agreement in NIP implementation and management.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Insufficient capacity in POPs project raising funds and POPs project proposal development.</li> </ul>	<ul style="list-style-type: none"> <li>‣ This is the first time of Cambodia in POPs management and creation of the mechanism for POPs raising fund,</li> <li>‣ Ever never training on POPs project proposal development,</li> <li>‣ POPs project proposal development need both English and Khmer languages. Cambodia government officers are lack of proper and fluent English language in POPs project proposal development.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Difficult to get fund,</li> <li>‣ Late for funding from the donor</li> <li>‣ Unachieved the objective of the NIP each sectional action plan is calamity in implementation</li> </ul>	<ul style="list-style-type: none"> <li>‣</li> </ul>	<ul style="list-style-type: none"> <li>‣ Provide training to relevant ministerial officers in POPs project proposal development,</li> <li>‣ Identify the international consultants to assist Cambodia in POPs project proposal development,</li> <li>‣ Communicate with donor governments and donor's community in POPs project raising funds and formulation of POPs project proposal.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Lack of policy making proof related to POPs reduction and elimination.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Cambodia government not yet ready in providing clear POPs reduction and elimination policy coz lack of data and information from relevant ministries and stakeholders,</li> <li>‣ The POPs reduction and elimination might not be the top priority of the Royal Government of Cambodia's policy. So, the policy making process and proof related to POPs reduction and elimination is bumpy.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Slowly implement the NIP</li> <li>‣ Ineffective laws enforcement and policy compliance related to POPs reduction and elimination,</li> <li>‣ Positive impact is going on the human health, the national environment and the economic.</li> </ul>	<ul style="list-style-type: none"> <li>‣</li> </ul>	<ul style="list-style-type: none"> <li>‣ Provide comprehensive proof for policy makers related to POPs reduction and elimination,</li> <li>‣ Approve the NIP and recognize as a basic POPs reduction and elimination policy,</li> <li>‣ Centralize the POPs data and information to assist policy makers in POPs reduction and elimination,</li> <li>‣ Provide policy making proof related to POPs reduction and elimination to all stakeholders.</li> </ul>
<ul style="list-style-type: none"> <li>‣ Limited capacity and</li> </ul>	<ul style="list-style-type: none"> <li>‣ The new responsibility for the Ministry of Environment in</li> </ul>	<ul style="list-style-type: none"> <li>‣ NIP reporting, evaluation</li> </ul>	<ul style="list-style-type: none"> <li>‣</li> </ul>	<ul style="list-style-type: none"> <li>‣ Strengthen capacity and provide more</li> </ul>

<b>Problems</b>	<b>Causes</b>	<b>Consequences</b>	<b>Requirement of the convention</b>	<b>Solutions</b>
ability in NIP reporting procedure, evaluation and updating.	term of provisional focal point with the Stockholm Convention, <ul style="list-style-type: none"> <li>‣ Lack of capacity and inadequate resource is a main constrain in NIP reporting, evaluation and updating.</li> </ul>	and updating will not be so good and lost economical development opportunity.		resources to the focal point in participatory NIP reporting, evaluation and updating.
‣ Lack of database management system on POPs for centralized information and dissemination.	<ul style="list-style-type: none"> <li>‣ The National Chemical Database is not yet in place,</li> <li>‣ Existing POPs data and information is separation at all management and technical levels in the country,</li> <li>‣ Unavailable POPs data and information can be disseminated to the stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Impossible to manage POPs,</li> <li>‣ High negative impact on human health and environment.</li> </ul>	‣	<ul style="list-style-type: none"> <li>‣ Establish the National Chemical Database and set-up comprehensive management system at the Ministry of Environment,</li> <li>‣ Develop clear guidance on POPs data and information centralization and dissemination.</li> </ul>
‣ Poor communication system related to POPs information exchange at national, regional, and international levels.	<ul style="list-style-type: none"> <li>‣ POPs information exchange strategy not yet developed,</li> <li>‣ Cambodia is not created the national, regional, and international networking on POPs yet,</li> <li>‣ POPs communication plan is not yet been developed and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>‣ Lack of cooperation at all level of communication,</li> <li>‣ Delay in intervention and assistance regarding POPs reduction and elimination.</li> </ul>	‣	<ul style="list-style-type: none"> <li>‣ Set-up the national, regional and international network on POPs,</li> <li>‣ Promote POPs data and information exchange at all level of communication.</li> </ul>

**D. Annex 4: Government and Key Stakeholder Endorsement NIP Documents**

No	Governmental Institutions and Stakeholders
1	Ministry of Foreign Affairs and International Cooperation
2	Ministry of Economic and Finance
3	Ministry of Environment
4	Ministry of Agriculture, Forestry and Fisheries
5	Ministry of Industry, Mines and Energy
6	Ministry of Health
7	Ministry of Commerce
8	Ministry of Public Work and Transport
9	Cambodia Development Council
10	Customs and Excise Office
11	National Center for Malaria Control, Parasitology, and Entomology
12	Electricite du Cambodge
13	Cambodia Electrical Authority
14	Calumet Hospital
15	Royal Academy
16	Cambodia Agriculture Research and Development Institute
17	Royal University of Agriculture
18	Royal University of Phnom Penh
19	Cambodia Institute of Technology
20	Prek Leap Agricultural College
21	Cambodia Agriculture Study and Development Center
22	NGOs Forum
23	Mlop Baitong Organization
24	Phnom Penh Municipality Sewage and Pump
25	Phnom Penh Municipality Waste Management Excise Office
26	Provincial Environmental Department of Takeo, Siem Reap, and Battambang
27	Provincial Department of Agriculture of Svay Rieng, bantey Meanchey, and Kampong Cham
28	Provincial Department of Health of Siem Reap and Battambang
29	Provincial and Municipality Electricity of Battambang and Sihanouk Ville
30	The Stockholm Convention Coordinating Sub-Committee

## **E. Annex 5: References**

- 1- Inventory Report on PCBs Dielectric Fluid for Transformers in Cambodia. Prepared by: Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention, the Ministry of Environment. Published on November 2004.
- 2- Inventory Report on Agricultural POPs Pesticides and DDT for Malaria Control in Cambodia. Prepared by: Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention, the Ministry of Environment. Published on November 2004.
- 3- Inventory Report on Unintentionally Produced POPs in Cambodia. Prepared by: Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention, the Ministry of Environment. Published on November 2004.
- 4- National Profile on Chemicals Management in Cambodia. Prepared by: Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention, the Ministry of Environment. Published on December 2004.
- 5- Annual Conference Report on Agriculture Forestry, and Fisheries 2004-2005 and Annual Plan 2005-2006. Prepared by: Ministry of Agriculture, Forestry and Fisheries. Published on 2005.
- 6- Five Years Report on Industry Mines and Energy (1998-2003) and Continuous Development Vision. Prepared by: Ministry of Industry Mine and Energy. Published on 2004.
- 7- Implementation of the Rectangular Strategies and Development Assistances Requirement. Prepared by: The Royal Government of Cambodia, November 2004.
- 8- Enhancing development cooperation effectiveness to implement the National Strategic Development Plan: 2006-2010. Prepared by the Royal Government of Cambodia, March 2006.

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