

FOREWORD

The Stockholm Convention on Persistent Organic Pollutants (POPs) marks the global commitment to protect human health and the environment from POPs. Considered as another milestone in combating the adverse impacts of organic pollutants, the Convention calls for government commitment to take measures to eliminate or reduce the releases of these chemicals into the environment. Nations are obliged to establish national mechanisms to formulate and implement their own blueprint of actions for a sustainable healthy environment.

The Philippines takes pride in being a champion of protecting the environmental and human health. We proudly embrace and humbly accept the Convention's challenges. We commit ourselves to the Convention's requirements not because we were asked to BUT because of our firm belief and commitment to always prioritize the welfare of our citizen.

The Philippine government officially declared its commitment to the Convention when it ratified the convention in 2004. One of our foremost obligations, as a Party, is to develop a National Implementation Plan on Persistent Organic Pollutants (NIP).

As the nation's stalwart leader for environmental protection, I am proud to share with you our blueprint for reducing if not eliminating the releases of POPs into the environment. This document imbues the spirit of solidarity, convergence of keen minds, and the passion to always protect human health and the environment.

A result of collaborative efforts among various government and non-government agencies, the NIP came to be a comprehensive document addressing multi-faceted issues relevant to POPs. It was created such that its activities are aligned with the National Government's short- and medium-term plans, hence could serve as roadmap for future national undertakings pertaining to POPs and other chemicals of similar characteristics.

The NIP is our framework – addressing core issues in policy deployment for chemicals management in general and POPs in particular; and providing short-term actions to build our capability to formulate, enforce, and monitor effective systems in protecting the health and the environment. It tackles the interlinked economic, demographic, environmental, scientific and technological, cultural, and political challenges faced by our country in enforcing our environmental rules and regulations. Unquestionably, the tasks are daunting. BUT with the fierce commitment from all stakeholders, I believe we CAN do this. Again, not because the Convention ask for it BUT because we believe in protecting our children's future.

The ratification of the Convention signals for the commencement of our commitment... while this National Implementation Plan embodies our intent in pursuing an environment worthy of our children.

ANGELO T. REYES
Secretary
Department of Environment and
Natural Resources

TABLE OF CONTENTS

Section	Page
FOREWORD	
EXECUTIVE SUMMARY	ES-1
CHAPTER 1.0 INTRODUCTION	1
1.1 PURPOSE OF THE NATIONAL IMPLEMENTATION	2
1.2 SUMMARY OF THE CONVENTION	3
1.3 METHODOLOGY IN DRAFTING THE NATIONAL IMPLEMENTATION	4
1.4 SUMMARY OF ISSUES ON POPS	5
1.5 STRUCTURE OF THE NATIONAL IMPLEMENTATION PLAN.....	6
CHAPTER 2.0 COUNTRY BASELINE.....	1
2.1 COUNTRY PROFILE	2
2.1.1 Geography and Population.....	2
2.1.2 Political and Economic Profile	3
2.1.3 Profiles of Economic Sectors	9
2.1.4 Environmental Overview	10
2.2 INSTITUTIONAL, POLICY AND REGULATORY FRAMEWORK	16
2.2.1 Environmental Policy, Sustainable Development Policy and General Legislative Framework	16
2.2.2 Description of Existing Legislation and Regulations Addressing POPs (Manufactured Chemicals and Unintentionally Produced POPs).....	17
2.2.3 Roles and Responsibilities of Ministries, Agencies, and Other Governmental Institutions Involved in POPs Life Cycles (from Source to Disposal, Environmental Fate, and Health Monitoring)	19
2.2.4 Relevant International Commitments and Obligations	20
2.3 ASSESSMENT OF THE POPS ISSUE IN THE PHILIPPINES	24
2.3.1 Assessment with Respect to Annex A, Part I Chemicals (POPs Pesticides)	24
2.3.2 Assessment with Respect to Annex B Chemicals (DDT).....	28
2.3.3 Assessment with Respect to Annex A, Part II Chemicals (PCBs).....	29
2.3.4 Assessment of Releases from Unintentional Production of Annex C Chemicals (PCDD/PCDF, HCB and PCBs)	32
2.3.5 Information on the State of Knowledge on Stockpiles and Contaminated Sites	35
2.3.6 Summary of Future Production, Use and Releases of POPs (Requirements for Exemptions)	37
2.3.7 Existing Programs for Monitoring Releases and Environmental and Human Health Impacts.....	38
2.3.8 Knowledge and Awareness Level.....	40

2.3.9 Overview of Technical Infrastructure for Persistent Organic Pollutants	44
2.3.10 Activities of Non-Government Organization.....	46
2.3.11 Socio-Economic Assessment.....	49
2.3.12 System for Managing Chemicals	52

CHAPTER 3.0 STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN.....1

3.1 POLICY STATEMENT	2
3.2 IMPLEMENTATION STRATEGY	3
3.3 ACTIVITIES, STRATEGIES AND ACTION PLANS	4
3.3.1 Action Plan Addressing Annex A, Part I Chemicals (POPs Pesticides).....	6
3.3.2 Action Plan Addressing Annex A, Part II Chemicals (PCBs)	10
3.3.3 Measures to Reduce Releases from Unintentional Production (Article 5)	16
3.3.4 Action Plan to Identify Contaminated Sites (Annex A, B, and C Chemicals).....	22
3.3.5 Action Plan for Public Awareness, Information and Education (Articles 10)	25
3.4 DEVELOPMENT AND CAPACITY BUILDING PROPOSALS AND PRIORITIES	30
3.5 DETAILED ACTION PLANS, TIMELINES, RESOURCE REQUIREMENTS AND PERFORMANCE MEASURES.....	31
3.6 RESOURCE REQUIREMENTS AND 5-YEAR FINANCIAL PLAN	58
3.7 SOCIO-ECONOMIC EVALUATION	84
3.7.1 Rationale	84
3.7.2 Conceptual Framework.....	84
3.7.3 Economic Cost of POPs Phase-Out	85
3.7.4 Economic Cost of POP Pesticide Phase-Out	85
3.7.5 Economic Cost of PCBs Phase-Out	86
3.7.6 Economic Cost of Reducing or Eliminating Releases of Dioxins/Furans	86
3.7.7 Economic Cost of Managing POPs Contaminated Sites.....	86
3.7.8 Economic Cost of Integrated Communication Framework and Plan for Mobilizing Action and Resources Towards POPs Reduction and Elimination	87
3.7.9 Summary Estimates of 5-Year Defensive Expenditures.....	87
3.7.10 Economic Benefits of POPs Phase-Out	88

ANNEXES

Attendance
Priority Setting Workshop
FGD Goals and Objective
Action Planning Workshop
FGD on Action Planning Matrices

LIST OF FIGURES

2-1	Map of the Philippines
2-2	Population Levels and Growth Rate
2-3	Annual Growth Rate and Share to Gross Domestic Product
2-4	Agriculture, Fishery, and Forestry Value of Production (2003)
2-5	Manufacturing Facilities (2003)
2-6	Employment per Sector
2-7	Interagency Consultative Committee's Functions
2-8	Process for Identifying, Screening, and Evaluating New Chemicals
2-9	Detailed Life Cycle of Pesticides
3-1	General Framework for NIP Implementation Plans

LIST OF TABLES

2-1	Key Macroeconomic Indicators 2002–2003: MTPDP Targets vs. Actual Performance
2-2	Real Growth Rates, 2002–2003: MTPDP Targets vs. Actual Performance (Supply Side)
2-3	Annual Growth Rates of the Service Sector's Output and Share to Gross Domestic Product, 2002-2003
2-4	Annual Growth Rates of the Industry Sector's Output and Share to Gross Domestic Product, 2002-2003
2-5	Real Growth Rates, 2002–2003: MTPDP Targets vs. Actual Performance (Demand Side)
2-6	Economic Profiles of Affected Sectors
2-8	Philippine Membership in International Organizations, Programmes, and Bodies
2-9	Participation in International Agreements/Procedures Related to Chemicals Management
2-9	History of Use and Current Status of POPs Pesticides in the Philippines
2-11	Summary of Equipment Surveyed
2-12	Status of Transformer Equipment
2-13	Previous Studies Pertaining to PCBs' Environmental and Health Impacts
2-14	Philippine National Source Inventory of Dioxins and Furans, 1999
2-15	Confiscated Pesticides By FPA In 2001
2-16	Summary of PCB Stockpile
2-17	Chemicals that May Be Potentially Classified as POPs
2-18	Monitoring Programs
2-19	Information, Education, and Communication Activities of Various Agencies
2-20	Types of Messages Used by Various Groups on POPs
2-21	Summary POPs Activities Conducted by NGOs
2-22	Health Impacts of POPs Chemicals and Current Status in the Philippines
2-23	Philippine First Priority Chemicals List
2-24	Proposed Second Priority Chemicals List
3-1	Summary Action Plan Addressing POPs Pesticides
3-2	Summary Action Plan Addressing PCBs
3-3	Summary Action Plan Addressing Unintentional POPs
3-4	Summary Action Plan Addressing POPs Contaminated Sites
3-5	Summary Action Plan Addressing Public Awareness, Information and Education
3-6	Capability Building Priorities
3-7	Strategies and Actions Plans Addressing POPs Pesticides
3-8	Strategies and Actions Plans Addressing PCBs

3-9	Strategies and Actions Plans Addressing Dioxins and Furans
3-10	Strategies and Actions Plans Addressing Contaminated Sites
3-11	Strategies and Actions Plans Addressing Information, Education and Communication
3-12	Estimated Defensive Expenditure for Pesticides
3-13	Estimated Defensive Expenditure for PCBs
3-14	Estimated Defensive Expenditure for Dioxins and Furans
3-15	Estimated Defensive Expenditure for Contaminated Sites
3-16	Estimated Defensive Expenditure for Integrated Information, Education and Communication Program
3-17	Summary of Estimated Defensive Expenditures for POPs Phase-Out in the Philippines

LIST OF ACRONYMS

ABP	Association of Banana Plantations
BAI	Bureau of Animal Industry
BFAD	Bureau of Food and Drugs
BOC	Bureau of Customs
BOI	Board of Investment
BPI	Bureau of Plant and Industry
BWC	Bureau of Working Conditions
CCO	Chemical Control Order
CHED	Commission on Higher Education
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOH	Department of Health
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DOTC	Department of Transportation and Communications
DOTC-LTO	Department of Transportation and Communication-Land Transportation Organization
DTI	Department of Trade and Industry
EMB	Environmental Management Bureau
EMB-EQD	Environmental Management Bureau-Environmental Quality Division
EQD	Environmental Quality Division
FAO	Food and Agriculture Organization
FGA	Flower Growers Association
FPA	Fertilizer and Pesticide Authority
GFI	Government Financial Institution
IPCPT-DOST	Integrated Program on Cleaner Production Technologies – Department of Science and Technology
ITDI	Industrial Technology and Development Institute
LGUs	Local Government Units
MGB	Mines and Geo-Sciences Bureau
MMDA	Metro Manila Development Authority
MWSS	Metro Manila Water and Sewerage System
NEA	National Energy Administration
NEMC	National Environmental Monitoring Conference
NGOs	Non-Governmental Organizations
NPMC	National Poison Management Center
OSHC	Occupational Safety and Health Center
PCL	Priority Chemicals List
PIA	Philippine Information Agency
POPS	Persistent Organic Pollutants
PPA	Philippine Ports Authority
PPAF	Philippine Pesticides Applicators Foundation
PPDC	Pesticide Program Dialogue Committee
PPTAC	Pesticide Policy and Technical Advisory Committee

RDD	Research and Development Division
TESDA	Technical Education and Skills Development Authority
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UP-NPCIS	University of the Philippines-National Poison Control and Information Service
UP-NSRI	University of the Philippines-Natural Science Research Institute
WHO	World Health Organization

EXECUTIVE SUMMARY

The Philippines is a party to the Stockholm Convention on Persistent Organic Pollutants (the Convention) and as part of its commitment to the Convention, the Philippine government has drafted a National Implementation Plan that outlines its programs to meet its obligations under the Convention. This same plan was likewise drafted to address the specific issues on POPs in the country. Specifically, the National Implementation Plan aims to:

- Outline the country's National Objectives for the reduction and elimination of POPs production, importation, use, and releases
- Define the country's priorities and position to reduce and eliminate POPs releases
- Design programs to remove barriers to the effective implementation of POPs phase out and release reduction measures under the Convention
- Plan programs for information exchange, public education, communication, and awareness raising
- Enhance capacity through capability building as required, including institutional strengthening, training, equipment, legal and regulatory measures, enforcement, monitoring, etc.
- Design programs to identify the need for any country-specific exemptions and, if necessary, prepare a report to the Convention justifying this need
- Outline the needs for transfer of technology and know-how and/or enhanced use and development of indigenous knowledge and alternatives and the estimated costs of needed investments

With the assistance of the Global Environment Facility and the United Nations Development Programme, the Philippines, through the Environmental Management Bureau of the Department of Environment and Natural Resources implemented the three components of an enabling activity project, namely: (a) Initial Inventory of POPs, (b) Capacity and Needs Assessment for the Implementation of the Convention on POPs, and (c) Public Awareness Campaign Program for the Convention on POPs. The formulation of the National Implementation Plan is largely based on the findings of the above studies and from relevant comments and inputs received from public consultations.

The National Implementation Plan was prepared taking into consideration the needs of the Philippines in addressing POPs issues in the country. It is formulated taking due account of the overall aims of sustainable development in the sense of socially, economically and environmentally appropriate policies and actions. Where appropriate, the National Implementation Plan is linked to related initiatives to ensure maximum efficiency and reduce duplication of effort.

In preparation for the development of the National Implementation Plan, the Environmental Management Bureau – Department of Environment and Natural Resources set up the POPs Project Management Office tasked primarily to establish a coordinating mechanism for the development of the National Implementation Plan. As a result, an Inter-Agency Consultative Committee was formed through the DENR Special Order No. 351, Series of 2004. The POPs Inter-Agency Consultative Committee members are representatives from various government agencies and non-government agencies who have direct and indirect involvement in the management and control of chemicals in the Philippines.

Members of the Inter-Agency Consultative Committee and the POPs Project Management Office, through the assistance of the Global Environment Facility and the United Nations Development Programme, participated in the prioritization/objective setting and action planning workshops. They also attended a series of focus group discussions to assist in the formulation of strategies and action plans to address the POPs issues in the country.

Prior to the action planning workshops baseline information on the issue on POPs in the Philippines have been identified by the preceding study “Capacity and Needs Assessment for the Implementation of the Convention on POPs”. The said study has identified the following issues on POPs in the country:

- Incomplete inventories of POPs (import, transport, use, and disposal)
- Identification and management of POPs-contaminated sites
- Monitoring and surveillance of population health status relevant to potential impacts of POPs
- Screening, enforcement, and monitoring of present and future POPs control and use
- Management and disposal of POPs-contaminated equipment (PCBs)
- Insufficient legislation for dioxins and furans
- Lack of understanding and knowledge on unintentional POPs, and options for reductions

These issues are attributed to weak enforcement of the existing policy and legal requirements, thereby resulting in a lack of compliance by the regulated communities. Weak enforcement has been attributed to lack of *RESOURCES*, namely: sufficient, knowledgeable, and skilled manpower, physical infrastructures, and most importantly financial resources. The low level of compliance, on the other hand, is rooted to the lack of awareness, knowledge, and competence of the regulated communities.

With these data forming the basic impression on the POPs issues in the country, specific strategies and action plans for a 5-year implementation period were drafted for each POPs category.

The entire Draft Philippine National Implementation Plan (NIP) for the Stockholm Convention on POPs was discussed and presented by EMB before the Inter-Agency Consultative Committee during its meeting on November 17, 2005. Upon deliberation and minor revision of the draft by the said committee, it was recommended for adoption and approval to the Secretary of the DENR.

The succeeding articles present the action plans - goals, objectives, and management options for each POPs category. Specific activities per objective are detailed in the main text of this report.

Action Plans Addressing Pesticides

Under Article 3 and Annexes A and B of the Convention, Parties must:

- Restrict and/or eliminate the production, use, and release of nine intentionally produced POPs pesticides (two of which may also occur as intermediates of some specific industrial processes), and
- Regulate any trade in these POPs with both Parties and Non-parties

The Fertilizer and Pesticide Authority, by virtue of Presidential Decree 1144, is the government agency that has the mandate for control of all pesticides. It has issued a number of circulars since 1983 that banned the following POPs pesticides in the Philippines: Aldrin, Dieldrin, Endrin, Heptachlor, Toxaphene, and Chlordane. However, there is a limited amount of evidence that suggests that some continue to be available illegally on the open market. This fact points to a need for better monitoring and enforcement of the Pesticide regulations.

The Fertilizer and Pesticide Authority has also restricted the use of DDT since 1978 for malaria vector mosquito control. In addition, the Department of Health issued an order in 1992 canceling the use of DDT because of its reported environmental and health effects and the availability of alternatives.

Nonetheless, the Fertilizer and Pesticide Authority has indicated an unwillingness to completely discount the possible use of DDT in the future, in the event of a serious malaria outbreak. Further assessments therefore are required to determine whether the Philippines should register its need for an exemption under Annex B of the Convention, for continued use of DDT.

Mirex and hexachlorobenzene are listed as Priority Chemicals by the Department of Environment and Natural Resources, under Republic Act 6969. This means that any intended imports and/or use of these chemicals must be registered and approved by the Department of Environment and Natural Resources. However, it is not known whether these chemicals are actually being used in the Philippines. This issue requires further investigation before a decision can be made to formally ban the import and use of mirex and hexachlorobenzene (or register for specific exemptions) as required under the Convention.

As a result of the above controls on POPs pesticides, there are some 21,500 liters of banned, obsolete, and/or unwanted pesticides confiscated by the Fertilizer and Pesticide Authority and stored in their regional warehouses (as of 2001). Action is required to ensure that these stockpiles are properly managed, and ultimately disposed, in an environmentally sound manner.

The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPs project. These are intended to address the highest priority issues.

Goal:

Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the continuous monitoring of the impacts to health and environment

Objectives and Management Options:

1. Complete a review of the most appropriate and effective ways for improving monitoring and enforcement of the existing regulatory controls on POPs pesticides by the end of the 2nd year

This objective aims to address the current deficiencies in monitoring and enforcement of the controls on POPs pesticides. However, because the extent of these deficiencies is not well documented, the chosen approach is to first carry out an in-depth review of the situation. This may lead to a number of possible management options for addressing the problems, but these cannot be determined until the review is complete. As such, the only real options to be considered at present are operational ones; i.e., whether to carry out the review using internal (departmental) resources only, or by a process involving much wider participation, including the possible use of external consultants. The latter approach is potentially more expensive, but is the preferred one because it will allow consideration of a much wider range of views and is more likely to lead to solutions acceptable to all stakeholders, rather than just the Fertilizer and Pesticide Authority.

2. Implement a programme that will inspect, retrieve, and properly dispose of POPs pesticides from year 1 up to the 2nd year

Once again, the options available here are limited. The Fertilizer and Pesticide Authority has legal responsibility for all stockpiles in its possession and must therefore undertake actions to manage and dispose stockpiles in a cost-effective and environmentally sound manner. The only options that will need to be resolved are operational ones, such as whether to relocate all

stockpiles to a central storage facility and selection of the most suitable disposal method (including whether to dispose locally or off-shore). These latter aspects will be addressed in the planning for follow-on activities (i.e. disposal) to this current action plan.

The other aspect addressed in the planning for this objective, is how to identify other stockpiles that are currently not known to the Fertilizer and Pesticide Authority. It is proposed that this be tackled through a combination of awareness activities (for both the general public and industry) and the routine inspection activities carried out by staff of the Fertilizer and Pesticide Authority. These are considered the only two viable ways of addressing these issues, and the combination of the two is believed to be the most cost effective approach. The alternatives of a greatly increased inspection programme and sole reliance on an awareness campaign were rejected on the basis of greater costs for the former and a probably lower response rate for the latter.

3. Develop and implement continuous environmental and health monitoring program from year 1 onwards

There are a number of monitoring activities done by both government and non-government sectors, especially the academe in monitoring the health and environmental impacts of POPs pesticides in the Philippines. There are a number of options that could be considered in attaining this objective. One is status quo – meaning continue encouraging various sectors to do their own monitoring. Second is have one sole agency that will develop and implement an integrated monitoring program to avoid duplication and sometimes misrepresentation of monitoring results. The third option, which is being considered is having a multi partite monitoring group coming from the inter agency consultative committee but the leadership is through the academe. Having an academe leading the group will remove the bias, which is highly possible if the lead is either from the government, non-government sectors, or the private entity.

4. Complete an assessment of the effectiveness of current practices for the control of malaria in the Philippines, and options for improvements including the use of Integrated Vector Management strategies, and the need for DDT by the end of the 2nd year

The options here are as follows:

- i. Assume DDT is no longer required and have the Fertilizer and Pesticide Authority issue a formal ban
- ii. Assume that DDT is still required and register an exemption under the Convention
- iii. Proactively investigate the efficacy of current malaria control measures and hence establish the need for DDT either now or in the future

Option (i) is by far the easiest and cheapest option, but runs the risk that DDT may not be available in the event of a sudden and serious outbreak of malaria. Option (ii) is also very easy to implement, but there are potential hidden costs as Annex 3 of the Convention would then require a report every three years on the continuing need for DDT and progress being made in the development of alternative malaria development strategies. This is in effect not much different from the work proposed in option (iii). The benefit of the latter is that this one-off in-depth investigation is likely to establish once and for all that DDT is no longer required, and no further actions need be taken (at least under the Convention).

5. Initiate all actions (as required under all relevant regulations) by the end of year 1, with a view to ban mirex and hexachlorobenzene

This objective has a very straightforward outcome in the banning of mirex and hexachlorobenzene. This is a simple administrative/regulatory procedure and no other options need to be considered, with the exception of an initial operational measure to establish the current status of mirex or hexachlorobenzene use in the country. This will allow an assessment of any potential impacts on the users, prior to imposition of a ban.

The Fertilizer and Pesticide Authority shall spearhead most of the activities. Meanwhile, the combined cost of all the objectives pertaining to POPs pesticides is estimated at US\$ 6,890,000.

Action Plans Addressing PCBs

The Convention requires each Party to prohibit the production, import, export, and use of all PCBs. It also requires the elimination of the use of PCBs in equipment by 2025, and promotion of measures to reduce exposures and risk to control the use of PCBs. In addition, PCB-containing equipment and PCB liquids should not be exported except for the purpose of environmentally sound waste management, and all such liquids and equipment are to be disposed by 2028. Parties are also required to submit a report every five years on progress in eliminating PCBs.

The Philippines has existing policies and a legal and regulatory framework to manage PCBs. In 1990, Republic Act No. 6969, otherwise known as the Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 was issued to regulate the importation, manufacture, processing, handling, storage, transportation, sale, distribution, use, and disposal of all unregulated chemical substances and mixtures in the Philippines. Its implementing rules and regulations identified and listed PCBs and other related materials as prescribed wastes. Furthermore, PCBs were classified under the Priority Chemicals List in 1998, thus, requiring users or generators of PCBs to submit a Hazardous Waste Registration Form and Biennial Report to the Environmental Management Bureau.

In compliance with the country's commitment to the Convention, a Chemical Control Order on PCBs was issued. Under the Chemical Control Order, responsibilities and liabilities for the improper management and handling of PCB and its wastes will be established. It also provides specific requirements for annual reporting, inventory, phase-out, storage, treatment, and disposal. The Chemical Control Order covers those for enclosed applications, partially enclosed applications, and open-ended applications. This CCO also applies to the generation, storage, transport, treatment and disposal of PCB wastes, including those done by contractors, transporters and disposers.

1. The following Enclosed Applications are covered:
 - a. Transformers
 - b. Capacitors
 - c. Voltage regulators
 - d. Liquid filled circuit breakers
 - e. Other electrical equipment containing dielectric fluids

2. The following Partially Enclosed Applications are covered:
 - a. Hydraulic fluids
 - b. Heat transfer fluids

3. The following Open- Ended Applications are covered:
 - a. Lubricants
 - b. Casting waxes
 - c. Surface coatings
 - d. Adhesives
 - e. Plasticizers
 - f. Inks
 - g. Other uses

4. The following PCB Wastes are covered:
 - a. Contaminated solvents/waters
 - b. Used oil and waste oil
 - c. Sludge's and slurries
 - d. Dredged spoils
 - e. Contaminated soils/sediments
 - f. By products e.g. Scraps
 - h. Ballasts and capacitors
 - i. Other materials contaminated with PCBs as a result of spills, decommissioning and other demolition activities.

The Chemical Control Order also specifies the phase-out of PCBs in the country by year 2014 which is way ahead of the requirements outlined in the Convention.

The Philippines was never a producer of PCBs. The main source of entry of PCBs into the country is through importation as part of electrical transformers. The amount of PCB transformers imported over the years could not be estimated reliably due to the absence of proper records. There is little or no information on PCBs in use other than transformers and capacitors.

Based on the initial inventory of PCBs, there are PCB wastes and equipment contained in the electric utility sector, manufacturing sector, old commercial buildings, and in transformer servicing facilities. The majority of the inventoried equipment are transformers with 97.16 percent, while 113 units or 2.57 percent are capacitors. The rest are oil circuit breakers.

As disclosed by electric utilities, transformer equipment in the country usually undergoes repair and refilling through equipment servicing facilities. The initial inventory activity identified the servicing facilities as a major depository of PCB contaminated equipment. With the current standard of small-scale refilling facilities, there is a strong probability that the mineral oil currently used in refilled transformers have been contaminated with PCB.

The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPs project. These are intended to address the highest priority issues.

Goal:

Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes.

Objectives and Management Options:

1. Prepare a comprehensive and complete national inventory of PCBs, PCB containing materials, and PCB wastes from year 0 to year 2 of the National Implementation Plan

This objective aims to characterize the scope of the PCB problem in the country and to establish an information base that can serve as basis for tracking the movement of PCB wastes and materials, assist the Environmental Management Bureau in the implementation of the Chemical Control Order on PCBs, and help in the improvement of policies and management options for the total elimination of PCBs in the country. Guidelines from the United Nations Environment Programme, US Environmental Protection Agency, and other countries are useful starting points that will assist the country in the conduct of the complete and comprehensive inventory. The inventory policies and procedures and the inventory forms developed during the initial inventory will be further improved to encourage disclosure of information by stakeholders. The inventory will also help monitor continued progress at reducing the risk of PCB wastes.

In support to the implementation of the Chemical Control Order, the PCB inventory will be conducted through the regulatory reporting procedure outlined in the Chemical Control Order wherein specific requirements for annual reporting and inventory of PCBs are included. The detailed and comprehensive inventory of PCB is also implied in the Convention provisions.

There is a need to strengthen the registration of servicing facilities which were identified as potential sources of PCB wastes since these establishments are engaged in the refilling and repair of equipment. A code of practice and mechanism for the accreditation of servicing facilities will be developed to achieve the following:

- Ensure that removal of PCBs from equipment is carried out in an appropriate manner
- Increase the level of awareness of refilling operators in the proper handling of PCBs
- Improve the standard of operation of facilities engaged in the repair and maintenance of PCB equipment so that appropriate controls against contamination of non-PCB equipment are guaranteed
- Initiate a plan for industry self-regulation towards improving compliance of refillers and generators with the Chemical Control Order on PCBs

With the inventory of equipment, the means for testing and monitoring should also be enhanced. There are some laboratories capable of analyzing PCBs but mostly are located in the industrial regions such as Metro Manila. Likewise, PCB concentration analysis in laboratories and the PCB test kits are quite costly. By strengthening the PCB inventory, resources for the inspection, testing, and analysis should also be strengthened. This would require upgrading the laboratory of the Environmental Management Bureau as well as improving other private laboratories that would help in the analysis of PCBs. The cost of sampling and analysis for regulatory and validation purposes of the Environmental Management Bureau should be shouldered by the government agency itself. However, since generators, users, or importers of equipment are required to submit a Certificate of PCB Analysis, annual reports, and inventory reports to the Environmental Management Bureau; the cost for analysis by a competent laboratory should be shouldered by the submitting entity.

2. Establish and implement a program on safe handling, storage, and transport of PCBs, PCB-containing materials and PCB wastes from year 1 to year 3

Simultaneous with the inventory of PCBs, a program on the safe handling, storage, and transport of PCBs, PCB-containing materials, and PCB wastes should be undertaken within a period of three years. This objective aims to formulate guidance on the appropriate management of PCB-containing equipment to minimize hazards due to chemical exposure as well as reduce environmental risk from PCB leakage.

The formulation of guidelines on the management of PCBs is envisioned to strengthen the existing regulatory requirements of the Chemical Control Order. This would be carried out as a means of improving the knowledge and awareness of users on the methodologies and processes that need to be undertaken for the safe handling, storage, and transport of PCBs. The guidelines would be distributed and disseminated to users of PCBs during the inventory process.

3. Develop and implement continuous integrated environmental and health monitoring program from year 1 onwards.

There are a number of monitoring activities done by both government and non government sectors, especially the academe in monitoring the health and environmental impacts of PCBs in the Philippines. There are a number of options that could be considered in attaining this objective. One is status quo – meaning continue encouraging various sectors to do their own monitoring. Second is have one sole agency that will develop and implement an integrated monitoring program to avoid duplication and sometimes misrepresentation of monitoring results. The third option, which is being considered is having a multi partite monitoring group coming from the inter agency consultative committee but the leadership is through the academe. Having an academe leading the group will remove the bias, which is highly possible if the lead is either from the government, non-government sectors, or the private entity.

4. Eliminate and destroy all PCBs, PCB-containing materials, and PCB wastes not later than 2025

This objective aims to develop strategies for the total elimination of PCBs in the country. The availability of treatment and disposal technologies will be presented as a support to PCB waste generators in complying with the Chemical Control Order.

The Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead agency in most of the actions that will address the key issues on PCBs. It shall be supported by a PCB inventory inter-agency committee and a technical working group on PCB destruction. The combined cost of all the objectives pertaining to PCBs is estimated at US\$ 16,664,000 which includes US\$ 7,000,000 of investment from the private sector on the non-combustion PCB destruction facility.

Action Plan Addressing Unintentional POPS

Under the Convention, the Philippines is obliged to take measures to reduce total releases of dioxins and furans, and other unintentional POPS, with the goal of continuing minimization and, where feasible, ultimate elimination. The starting point will be for the Philippines to develop action plans that will evaluate current and projected dioxin and furan releases; review existing laws and policies; and develop strategies. More importantly, the Convention calls for actions to reduce or minimize the releases of unintentional production through the following initiatives:

- Promote or require substitute or modified materials, products, or processes to prevent the formation and release of unintentional POPS

- Require the use of Best Available Techniques (BAT) for new sources in categories specified in the action plan and for all new sources in certain categories specified in Annex C of the Convention
- Promote BAT and Best Environmental Practices (BEP) for new sources in other categories and for all existing sources

Draft guidance on the application of BAT/BEP has been prepared by an Expert Group established by the sixth session of the International Negotiating Committee and will be considered for adoption and/or further development during the first Conference of Parties (see www.pops.int).

The Convention further provides general guidelines on preventing or reducing unintentional POPs formation and release particularly through the use of BAT and BEP. These are:

- Use of low-waste technology
- Use of less hazardous substances
- Promotion of the recovery and recycling of waste and of substances generated and used in a process
- Replacement of feed materials which are POPs or where there is a direct link between the materials and releases of POPs from the source
- Good housekeeping and preventive maintenance programs
- Improvements in waste management with the aim of the cessation of open and other uncontrolled burning of wastes, including the burning of landfill sites
- Minimization of these chemicals as contaminants in products
- Avoiding elemental chlorine or chemicals generating elemental chlorine for bleaching

The issue of dioxins and furans, and other unintentional POPs, is far from being understood by potential generators, for the reason that public awareness is still limited and there is a need for continuing education regarding their sources and environmental and health impacts. The existing policies, laws, and regulations, on the other hand, do provide the necessary framework for the implementation of the Convention for unintentional releases, although the specific policies and regulations needed to address these pollutants are currently lacking. There are three major Philippine laws that relate to the management of dioxins and furans, namely, Republic Act 8749 otherwise known as the Philippine Clean Air Act of 1999; Republic Act 6969 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990; and Republic Act 9003 known as the Ecological Solid Wastes Management Act of 2000.

The absence of specific policies also reduces the support required for research and development, which would serve as a basis for the formulation of legal standards and setting reduction or elimination targets. This is compounded by insufficient capability of the concerned agencies to utilize monitoring and assessment tools such as ecological and health risk assessment, food chain analysis, life cycle analysis, fate and transport modeling, and other analytical techniques that could provide the data and information used in setting up standards for animals, food, and other receptors or media.

Another issue is the lack of proper coordination among the various government and private sectors on their activities related to dioxins and furans, and other unintentional POPs. This hampers the gathering of data and information. The roles of each support agency and other institutions that could be tapped to implement other provisions of the Convention are not well defined.

Information, education, and communication campaigns involving training and education of individuals potentially exposed to unintentional POPs are a critical component of an effective national action plan.

Lack of understanding of these substances with regards to environmental and health impacts is prevalent among the stakeholders. This is due to poor education about these compounds as well as limited availability of the means through which information about these products can be disseminated.

Overall, the establishment and maintenance of effective legal, scientific, economic, and political institutions for unintentional POPs are significantly hampered because of insufficient human and financial resources. This deficiency is further compounded by the lack of appropriate administrative infrastructures needed to design, implement, monitor, and enforce relevant policies and programs that are vital in the implementation of the Convention.

The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPs project. These are intended to address the highest priority issues as identified.

Goal:

Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge

Objectives and Management Options:

1. Prepare an updated inventory of dioxin and furan releases for all significant sources by obtaining best-estimate nationwide activity data and most appropriate emission factors within three years from the approval of the National Implementation Plan

This objective aims to establish a more appropriate and efficient inventory procedure as well as a comprehensive and institutionalized data collection and monitoring system. The emission factors used in the United Nations Environment Programme Toolkit are based on the inventory made by advanced and developed countries. In this regard, gap analysis will be performed to know which areas need reconciliation in the Toolkit's data requirement and actual available data reported in the country. Validating the emission factors under local conditions will further strengthen the results of the previous inventory.

2. Develop and implement BAT/BEP promotion, adoption and monitoring programmes within three years across the most significant dioxin and furan source categories (based on updated inventory)

This objective is directed at achieving the application of BAT/BEP across the major sources of unintentional POPs. The key management options for doing so are direct regulation and enforcement, or the application of education, awareness, and information programmes. The latter option is considered the most suitable and effective approach for the Philippines given the current low levels of knowledge and understanding and also the lack of significant capacity for enforcement. The regulatory approach will be more appropriately considered at some time in the future when our knowledge and capacity has increased to more viable levels.

Government and private sectors have limited knowledge and understanding regarding BAT/BEP application. Capacitating them through the conduct of lectures, seminars, and training are vital measures that could be implemented. In this regard, BAT/BEP information, education, and communication materials have to be developed and implemented for public release. In addition, BAT/BEP will be integrated in the curricula and extracurricular activities of secondary and college educational levels.

Some industries in the Philippines have been adopting BAT/BEP to lessen the production or release of dioxins and furans into the environment. Wastewater containing dioxins and furans could be prevalent among pulp and paper mill manufacturers because of the utilization of chlorinated bleaching agents (e.g., chlorine, hypochlorite, and chlorine dioxide) during process operation. Alternative non-chlorinated bleaching agents in the form of peroxide and per acetic acid could be used to make the effluent almost chlorine free. The cost of adopting these alternatives may be prohibitive on the part of the manufacturers. Wastewater leachate generated in the landfill and waste dumps are also contaminated with dioxins and furans as a result of their deposition in wastes, and often also from chlorinated materials. To lessen the impact of dioxin and furan contamination in groundwater and other bodies of water, appropriate BAT/BEP shall be implemented in the landfill sites.

There is also a need to strengthen the institutional capability to support the promotion, adoption, and monitoring of BAT/BEP. Sampling and analysis capability for dioxins and furans have to be developed through the establishment of a sampling and analytical laboratory. Due to the high cost of setting up this type of facility, a needs assessment will first be conducted to determine the viability of the facility.

3. Formulate by the end of year 3 and continuously enforce thereafter appropriate policies and regulations to control dioxins and furans releases

The existing policies, laws, and regulations in the Philippines do provide an overall framework for the implementation of this part of the Convention. However, there are no specific provisions on the reduction or management of unintentional POPs. This deficiency could be addressed through either regulatory or non-regulatory methods, or possibly a combination of the two. Either of these approaches may be effective. However, the first requirement is to carry out a full assessment of how the specific requirements can be best addressed within the policy and regulatory framework. Decisions on the most appropriate management options will be made on completion of the review. This will address the need for specific actions in the following areas:

- The requirement for new sources of unintentional POPs to adopt BAT/BEP, possibly under the Environmental Impact Statement System
 - Preventive measures for occupational health and safety
 - Recognition of BAT/BEP in the occupational health and safety standards
 - A requirement for industrial establishments to include in the self-monitoring report potential sources of unintentional POPs
 - Methods for encouraging inter-agency cooperation and sharing of data
 - Enhancement of the capacity of the National Statistics Coordination Board as repository of national information for the inventory of dioxins and furans
 - Methods for regulating the releases of unintentional POPs in all environmental media considering the socio-economic impacts of such activities
 - The possible adoption of ambient criteria and standards in all environmental media including animals and food. (The current dioxins and furans standard is only imposed on non-burn technology)
4. Develop and implement a programme for information on the prevention of environmental and health effects of dioxin and furan by then end of year 2

Government and private sectors have limited knowledge and understanding regarding the environmental and health effects of dioxins and furans. Capacitating them through the conduct of lectures, seminars, and training are vital measures that could be implemented. In this regard, information, education, and communication materials on the environmental and health effects of dioxins and furans have to be developed and implemented for public release. In addition, the environmental and health effects of dioxins and furans will be integrated in the curricula and extracurricular activities of secondary and college educational levels.

The Industrial Technology Development Institute of the Department of Science and Technology and the Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead implementing agencies for this undertaking which will be supported by a Project Advisory Committee and other expert groups. The combined cost of all the objectives pertaining to dioxins and furans is estimated at US\$ 7,239,500.

Action Plans Addressing POPs Contaminated Sites

One of the provisions of the Convention is for Parties to develop strategies for identifying POPs contaminated sites (Article 6 (1e)). The prevalent use of POPs pesticides and the improper handling of PCB transformer oils in the Philippines have led to speculations that there are sites which have been contaminated by these substances. A series of studies have been conducted to validate these speculations including the following:

- Weston International Study for Clark Development Center [Aldrin, Dieldrin, Chlordane, Heptachlor, hexachlorobenzene, and PCBs]
- Sampling and Analysis of PCBs Based on an Inventory of PCB-Contaminated Sites in Clark Special Economic Zone - Asian Regional Research Programme on Environmental Technology – De La Salle University

Results of the studies asserted that there are indeed POPs contaminated sites present in the country.

The following goal and objectives were developed as a result of the priority setting exercise of the Philippine POPs project. These are intended to address the highest priority issues as identified.

Goal:

Complete identification of all contaminated sites and hotspots with corresponding appropriate management strategies to protect public health and the environment

Objectives and Management Options:

1. Establish criteria for the identification of contaminated sites by the end of year 1

One of the initial requirements for contaminated site identification is a set of national criteria for (un)acceptable contamination levels. The simplest approach is to adopt criteria applied in other countries. However, this would have minimal benefit in developing local capacity. In addition, the criteria may not be relevant to local conditions. Hence, it is proposed that the work be done locally to establish a set of guidelines with criteria for the identification of contaminated sites. The Environmental Management Bureau of the Department of Environment and Natural Resources could oversee the process of preparing the guidelines. Consultations with experts and stakeholders should also be done to solicit broader views.

2. Establish a group and a pool of trained personnel by the end of year 1, with the appropriate mandate for the identification, assessment, and management of contaminated sites

This objective aims to address the current insufficiency in the technical capabilities of field personnel in identifying and managing contaminated sites in the country. Since there is an apparent shortage of employees in the department level, local government units and non-government representatives would be trained as well. Several management options could be designed for this purpose; however, a single task force, mandated to function specifically for this purpose would put more bearing towards achieving this objective.

3. Identify potentially contaminated sites throughout the Philippines based on historical information, including an initial ranking of possible priorities for assessment from year 1 to year 3

The same task force created to manage the contaminated sites could take the management responsibility for this activity. The trained personnel will be expected to conduct an extensive desk review to establish a baseline, followed by actual field sampling and testing to validate the preliminary data gathered through desk reviews. The identified sites will then be prioritized using environmental risk assessment methods.

4. Complete expedited assessment (at least 100 priority sites) by the end of year 5, and come up with recommendations to manage these contaminated sites

The task force should be able to come up with a report by middle of the 3rd year detailing their assessment and recommendations on the first 100 priority contaminated sites. In addition, the task force would also be expected to recommend programs or activities geared towards managing these sites.

The management options for identifying contaminated sites would include industry self-reporting (via regulatory or non-regulatory methods), or a nationally driven programme using government expertise augmented as necessary with local or international consultants. However, there is currently little or no expertise in this subject area, within the Philippines. Hence, the preferred approach is the one which will have the greatest impact on developing national capacity; i.e. development of a government-led programme supported by international expertise as necessary.

The Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead agency in most of the activities for contaminated sites. To ensure that planned activities and programs for contaminated sites are executed as scheduled, a technical working group shall be created and made to operate. The combined cost of all the objectives pertaining to contaminated sites is estimated at US\$ 2,627,000.

Action Plans Addressing Public Awareness, Information and Education

The Convention contains at least two Articles that highlight the importance of information, education, and communication in achieving the goals of the Convention. These are:

- Article 9 Information Exchange, which calls upon parties to facilitate, or undertake exchange of information relevant to reduction or elimination of POPs and alternatives to POPs, including their risks as well as economic and social costs. It establishes the kinds of information that need to be exchanged between Parties and the mechanisms of this exchange.

- Article 10 Public Information, Awareness and Education, which calls upon parties to promote and facilitate awareness of POPs among policy and decision makers, industry and professional users, and the general public (especially women, children, and the least educated) and to encourage public participation in addressing POP effects on health and environment. The Article also emphasizes the need to store, maintain, and make accessible information generated from research, development, and monitoring.

In addition, the Convention contains some other references on the role of information, education, and communication in the implementation of the Convention. Article 5 has a provision on the need to include in the action plan “steps to promote education and training with regard to, and awareness of, strategies” adopted to meet the objective of reducing or eliminating releases from chemicals identified in Annex C of the Convention. The same article also includes provisions to promote the use of BAT/BEP. Article 11 requires that results of research, development, and monitoring activities be made accessible to the public on a timely and regular basis and that signatories undertake cooperation with regard to storage and maintenance of information generated from these activities. Article 13 discusses the promotion of multiple-source funding approaches, mechanisms and arrangements, including information on available sources of funds.

The foregoing Articles and specific provisions show that information, education, and communication needs to go beyond creating awareness of what POPs are and how they can be managed, reduced, or eliminated. The articles provide that information, education, and communication must include information exchange, management information systems, appropriate technology promotion and transfer, advocacy (for appropriate structures and policies), and resource mobilization.

On the other hand, the Philippines still requires tremendous effort to improve the level of knowledge and awareness across all sectors on POPs. Though a number of efforts pertaining to increasing the level of awareness have been conducted, especially by a number of non government organizations, several studies and reports showed that most of the issues on POPs are rooted to low levels of knowledge and awareness. The Enabling Activity Project on Public Awareness and Information Campaign has documented issues on the level of awareness and knowledge. Most significant issues include:

- Lack of advertising responsibility of pesticide companies
- Lack of neutral source of information on POPs
- Gaps in knowledge, awareness, and practices by farmers
- Scarcity of information
- Need for local epidemiological studies and lack of proper documentation

To address the above issues, a Communication Plan was developed as part of the Enabling Activity Project on Public Awareness and Information Campaign. A number of activities under the said Communication Plan have been initiated primarily by the Environmental Management Bureau, some of which are being co-implemented by other partner government agencies and non-government organizations.

The set goals and objective presented herein are incremental activities to promote awareness, enhance knowledge level, and secure support from higher officials. These activities are under the framework of the set Communication Plan.

Goal:

Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan

Objectives and Implementation Strategy:

1. Develop and implement a program to sustain awareness and understanding of the health, environmental risks, and economic impact of POPs from year 0 to year 5
 - Setting up of databank/library on POPs that would be the source of information for the continuous public dissemination. This would include:
 - Research studies
 - Testimonials from victims of POPs and those who shifted to alternatives
 - Technical reports
 - Production and dissemination of Information, Education, and Communication materials based on documented testimonials and popularized technical reports and risk studies.
 - Focused distribution, leafleting, placement of posters and billboards at work places and offices, barangay halls, schools, health centers, local markets, shops, etc.
 - Posting of general information and updates on web page
 - Conduct of series of seminars and lectures to various organizations both formal and non formal organizations
 - Creation and mobilization of Speakers Bureau
 - Development of pro forma presentation materials – power point presentation and videos
 - Sustain media coverage through:
 - Preparation of local media directory
 - Writing and placement of regular news releases
 - Conduct of regular press conference
 - Radio-television guestings by government officials
 - Use of existing radio and television government programs
 - Tapping of public affairs programs for integration of POPs messages
 - Recognition of journalists & media organizations that regularly cover POPs and related issues
 - Organization/ coordination of special events pertaining to POPs
2. Create and implement educational programs on POPs from year 1 onwards
 - Coordination with the Department of Education and the Commission on Higher Education to integrate POPs in the curricula and/or extra curricular activities
 - Review of the existing curriculum on environmental education
 - Creation of a Committee on the Development of Integration Plan and Templates of Prototype lesson plan and modules on POPs
 - Conduct of National Orientation seminar and training of potential trainers among teachers and student leaders from different schools nationwide.
 - Involvement of research students (special science curriculum) in survey research as enumerators or tabulators and in the verification of existing data inventories on POPs.
 - Requiring schools to have one of its Outreach Program the conduct of orientation seminars of the environmental and health effects of POPs in their respective communities
 - Working with the national television networks to include POPs as one topic in their regular morning educational TV shows for kids (Batibot, ATBP, Hiraya Manawari, etc.)

- Develop the concept for the TV shows
 - Run the TV shows
3. Develop and implement political lobbying programs to sustain POPs reduction and elimination as a public health priority, environmental issue, and priority action agenda
- Identification of target political groups and development of specific/key messages and delivery methods per group
 - Conduct of series of lobbying activities for legislative and budgetary support for the reduction & elimination of POPs
 - Integration of POPs reduction and elimination in agency's plans, programs, services, and resource allocation and be able to present effectively during regular Congress/Senate hearings on government program and budget allocations
 - Establishment and maintenance of an intra-agency and Local Government Unit reporting/information exchange system
 - Enlistment of journalists, media agencies and associations and environment-friendly journalist associations (e.g., Philippine Center for Investigative Journalism, Philippine Center for Photo Journalism, Philippine Agricultural Journalists, Environmental Broadcasters Circle) in committees or task forces
4. Build and sustain network for information exchange and communication on POPs and the National Implementation Plan from year 1 onwards
- Survey of partner stakeholders to establish common interest and preferred communication mechanisms
 - Set schedule for regular coordinative meetings, including reporting on POPs updates and the activities under the National Implementation Plan
 - Development and maintenance of information clearing house that would serve as the focal center for POPs information such as BAT/BEP practices, results of environment and health monitoring, international updates on POPs, and POPs issues, etc.
 - Participation in local, national, and international forums on POPs
 - Presentations during regular meetings of business associations

Promoting initial and sustained environmental awareness requires purposeful communication. Purposeful communication is essential to the success of the National Implementation Plan programs, requirements, and activities. The environmental awareness aspects of those programs, requirements, and activities require pragmatic, value-laden and strategic use of Information, Education, and Communication approaches, tools, and techniques.

The Information, Education, and Communication framework set forth in this action plan hinges on the need to inform, educate, motivate, and mobilize stakeholders—particularly government agencies and target corporations and private citizens. Key strategies in the action plan include:

- Social Mobilization — encouraging total, active and sustained involvement, and participation of all offices and program units of the government, as well as the private corporations and citizens mutually reinforcing communication activities to achieve program objectives. This concerns mobilizing human and technical resources; hence the use of interpersonal communication, opinion leaders (environmental consultants, cause champions, non-government organizations etc.), consultations, assemblies, and other means.

- Social Marketing — making use of the Information, Education, and Communication outputs (for example, pamphlets, posters, guides, primers, magazines, articles, video cassettes, etc.) as support strategy for employing all types of available media.
- Advocacy — using the focus group discussions/mini-seminars and related activities, lobbying/campaigning for environmental awareness and understanding of the program.
- Alliance Building and Networking — solidifying intra-sectoral coordination through such activities as strengthening the hub of the community where the installations are located.

The Environmental Management Bureau of the Department of Environment and Natural Resources and the Philippine Information Agency shall be the lead agencies. The combined cost of all the objectives pertaining to increasing the level of awareness and knowledge and ensuring full support from all partner stakeholders is US\$ 1,341,000.

The action plans were developed on the basis of agreed priorities for implementation of the Stockholm Convention in the Philippines. As indicated in those plans, much of the work will be carried out by local personnel, but with recourse to international expertise as and when required. This approach is intended to assist in developing local capacity for POPs management and implementation of the Convention. The specific priority areas where capacity building activities have been proposed are as follows:

POPs Pesticides

- Training of field inspectors on how to conduct inspection and identification of POPs pesticides (including health and safety measures)
- Formulate methodologies and guidelines for inspection, retrieval, and proper disposal of POPs pesticides

PCBs

- Preparation of guidelines for PCB inventories, including standard protocols for sampling and test methods
- Training on identification and sampling
- Guidelines on storage and safe handling, transportation, servicing/retrofilling and repair
- Training of TSD facility operators
- Inventory of PCBs
- Code of practice and mechanism for accreditation of servicing facilities
- Enhancement of testing and monitoring, including analysis

Dioxin and Furans

- On-going work on improved inventory procedures
- Emission factor validation
- Development of sampling and analytical capability
- Development and demonstration of BAT/BEP
- Assessment of command-and-control and market-based instrument policies

POPs Contaminated Sites

- Identification and management of contaminated sites

- Development of guidelines with criteria for contaminated sites identification
- Development of measures for management and clean-up of contaminated sites

For all the identified POPs sources, the total amount of US\$ 32.25 million will be needed to implement all the identified defensive or abatement programs and activities. Most of this will need to be funded through external sources.

By sector, the cost of PCB containment accounts for 50 percent of the total, while the total abatement cost for dioxins and furans consist of 22 percent of the total. The combined defensive expenditures estimated for POPs pesticides and PCB contaminated sites accounts for the least at 25 percent of the total preventive cost for all sectors.

While there were exhaustive attempts to fully identify the needed abatement programs and activities and accordingly impute costs on them, the derived defensive expenditure estimate is considered a lower-bound estimate of what is perceived to be the real economic cost. A very basic reason for this is that the cost estimated for each POPs source failed to include the costs of initiatives that may solely be undertaken by the private sector as well the non-government organizations and private organizations. For instance, the cost estimate does not include the cost for replacing PCB in the power sector. Likewise, possible local government unit initiatives and their corresponding values were not taken into account. Also unaccounted in the total estimate is the possible cost of public-private partnership initiative for the reduction or elimination of POPs in the Philippines.

Health impacts are no doubt the most compelling reason for such actions. Improved health of the population is a critical factor in high productivity. Keeping the workforce and society healthy would eliminate income losses due to sickness and medical expenses. A healthy workforce would promote labor productivity and encourage investments in the various sectors of the economy like industry, manufacturing, services, infrastructure, and tourism.

Aside from the socio-economic benefits, non-health or environmental externalities associated with the POPs reduction or elimination are also significant.

CHAPTER 1.0 INTRODUCTION

1.1 PURPOSE OF THE NATIONAL IMPLEMENTATION PLAN

As a party to the Stockholm Convention on Persistent Organic Pollutants (the Convention), the Philippines has prepared this comprehensive National Implementation Plan that outlines the Government's programs to meet its obligations under the Convention, as well as addressing the specific issues on POPs in the country. Specifically, the National Implementation Plan aims to:

- Outline the country's National Objectives for the reduction and elimination of POPs production, importation, use, and releases
- Define the country's priorities and position to reduce and eliminate POPs releases
- Design programs to remove barriers to the effective implementation of POPs phase out and release reduction measures under the Convention
- Plan programs for information exchange, public education, communication, and awareness raising
- Enhance capacity through capability building as required, including institutional strengthening, training, equipment, legal and regulatory measures, enforcement, monitoring, etc.
- Design programs to identify the need for any country-specific exemptions and, if necessary, prepare a report to the Convention justifying this need
- Outline the needs for transfer of technology and know-how and/or enhanced use and development of indigenous knowledge and alternatives and the estimated costs of needed investments

With the assistance of the Global Environment Facility and the United Nations Development Programme, the Philippines, through the Environmental Management Bureau of the Department of Environment and Natural Resources implemented the three components of an enabling activity project, namely: (a) Initial Inventory of POPs, (b) Capacity and Needs Assessment for the Implementation of the Convention on POPs, and (c) Public Awareness Campaign Program for the Convention on POPs. One important output of the enabling activity was the establishment of a coordinating mechanism for the implementation of the Convention. The formulation of the National Implementation Plan is largely based on the findings of the above studies and from relevant comments and inputs received from public consultations while the established coordinating mechanism was leveraged in coming out with a consensus action plans.

1.2 SUMMARY OF THE CONVENTION

The Convention was adopted on 22 May 2001 and entered into force globally on 17 May 2004. Its main objective is to protect human health and the environment from POPs. The Convention focuses initially on the following twelve chemicals that are grouped into three categories, namely:

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

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

- Immediately ban production and use of all POPs pesticides except DDT¹
- Restrict the use of DDT for vector control and aim to phase it out over time
- Ban production and use of PCBs and hexachlorobenzene
- Phase out existing PCBs over the next 25 years
- Dispose stockpiles of unwanted POPs
- Reduce, with the ultimate aim of eliminating, unintentional POPs by-products (dioxins, furans, PCBs, hexachlorobenzene)
- Identify and manage contaminated sites

Parties are also obliged to share information, promote information dissemination and awareness, and undertake research, development, and monitoring of POPs and their alternatives. The Convention also requires Parties to set up infrastructures for the monitoring and surveillance of future POPs.

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

¹ Some specific exemptions are available, as detailed in Annex A to the Convention.

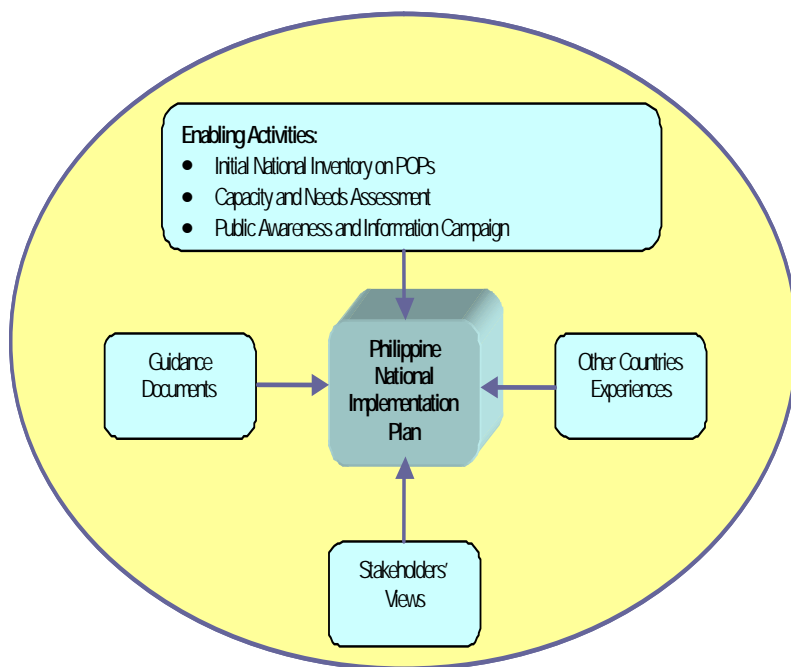
1.3 METHODOLOGY IN DRAFTING THE NATIONAL IMPLEMENTATION PLAN

Building upon the results of the POPs Enabling Activities, the National Implementation Plan was prepared taking into consideration the needs of the Philippines in addressing POPs issues in the country. It is formulated taking due account of the overall aims of sustainable development in the sense of socially, economically, and environmentally appropriate policies and actions. Where appropriate, the National Implementation Plan is linked to related initiatives to ensure maximum efficiency and reduce duplication of effort. Figure 1-1 presents the framework used in the preparation of the National Implementation Plan.

In preparation for the development of the NIP, the EMB-DENR set up the POPs Project Management Office tasked primarily to establish a coordinating mechanism for the development of the National Implementation Plan. As a result, an Inter-Agency Consultative Committee was formed through the DENR Special Order No. 351, Series of 2004. The POPs Inter-Agency Consultative Committee members are representatives from various government agencies and non-government agencies who have direct and indirect involvement in the management and control of chemicals in the Philippines.

Members of the Inter-Agency Consultative Committee, Technical Working Group, Regional Inter-agency Committee, and the POPs Project Management Office, through the assistance of the Global Environment Facility and the United Nations Development Programme, participated in the prioritization/objective setting and action planning workshops. They also attended a series of focus group discussions to assist in the formulation of strategies and action plans to address the POPs issues in the country.

Figure 1-1 National Implementation Plan Framework



1.4 SUMMARY OF ISSUES ON POPS

As documented in the report on Capacity and Needs Assessment for the Implementation of the Convention on POPS, the most important POPS issues are:

- Completion of the inventory of POPS including stockpiles and wastes
- Identification and management of POPS-contaminated sites
- Monitoring and surveillance of health status relevant to potential impacts of POPS
- Screening, enforcement, and monitoring of present and potential POPS chemicals
- Management and disposal of POPS-contaminated equipment (PCBs)
- Enforcement of existing laws relative to dioxin and furan emissions
- Lack of understanding and knowledge on POPS
- Limited capacity to monitor dioxins and furans releases

These issues are attributed to weak enforcement of the existing policy and legal requirements, thereby resulting in a lack of compliance by the regulated communities. Weak enforcement has been attributed to lack of *RESOURCES*, namely: sufficient, knowledgeable, and skilled manpower, physical infrastructures, and most importantly financial resources. The low level of compliance, on the other hand, is rooted to the lack of awareness, knowledge, and competence of the regulated communities.

1.5 STRUCTURE OF THE NATIONAL IMPLEMENTATION PLAN

This document is divided into three parts. Chapter 1 – “Introduction”, provides brief information about the current commitments of the Philippines to the Convention. Chapter 2 – “Country Baseline”, describes the present situation in the Philippines with regard to POPs. Chapter 3 – “Strategy and Action Plans”, consists of action plans and strategies for the following:

- POPs Pesticides
- DDT
- PCBs
- Dioxins and furans
- POPs-contaminated sites
- Information/awareness campaign on POPs

CHAPTER 2.0 COUNTRY BASELINE

2.1 COUNTRY PROFILE

2.1.1 GEOGRAPHY AND POPULATION

The Philippines is an independent republic in the southeast rim of Asia with a land area of 300,400 sq. km. It is an archipelago of over 7,000 islands, of which only 400 are permanently inhabited, lying about 966 km off the southern coast of Asia. The archipelago is bounded by South China Sea, Pacific Ocean, Sulu Sea, and Celebes Sea.

The islands are grouped into three geographic regions, namely: Luzon, Visayas, and Mindanao. For administrative purposes, the country is divided into 16 regions. Figure 2-1 shows the map of the Philippines.

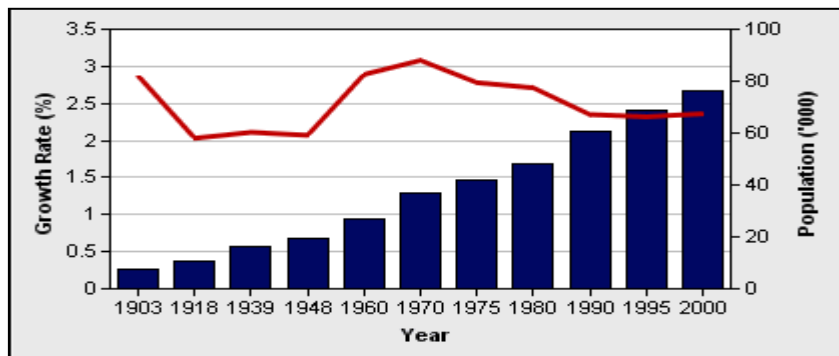
The Philippines has the longest discontinuous coastline in the world – around 34,600 km. Marine life and coral reefs are abundant in the waters around the Philippines, supporting a major fishing industry in the coastal waters. There are 132 rivers and 59 lakes, which serve as valuable sources of fish, transportation, and irrigation water.

The population is estimated at 82.3 million as of 2003, and is steadily increasing. The country's population density is estimated at 274 persons per square kilometer as of mid-year 2003. Large populations are centered in major cities especially in the Metro Manila Area, the center for education, industry, and commerce. Figure 2-2 presents the population levels and growth rate of the country for the last century.

Figure 2-1 Map of the Philippines



Figure 2-2 Population Levels and Growth Rate



Source: National Statistics Office

2.1.2 POLITICAL AND ECONOMIC PROFILE

The three (3) geographic regions of the country are Luzon in the north, Visayas in the central region, and Mindanao in the south. It has 17 political regions, 79 provinces, 115 cities, 1,495 municipalities, and 41,956 barangays or villages.

Executive authority is vested on the President of the Philippines. Legislative authority is vested on the Congress of the Philippines, which consists of the Senate and the House of Representatives, except to the extent reserved to the people by the provision on initiative and referendum. The Senate is composed of 24 members elected nationwide and limited to two consecutive six-year terms while the House of Representatives consists of 195 elected members and 17 sectoral representatives. They are limited to three consecutive three-year terms. Judicial authority is vested on the Supreme Court and such lower courts as may be established by law.

The Philippine economy, notwithstanding adverse domestic and external concerns, displayed remarkable resilience by posting a gross domestic product growth rate of 4.7 percent in 2003. This was, however, only marginally higher than the 4.3 percent registered in 2002. The gross national product growth in 2003 was significantly higher at 5.6 percent, but this was only because the 2002 initial growth estimate was trimmed down from 5.2 percent to 4.3 percent. Table 2-1 presents the basic macroeconomic indicators for the year 2002 and 2003 compared to targets set through the Medium Term Philippine Development Plan.

Table 2-1 Key Macroeconomic Indicators 2002–2003: MTPDP* Targets vs. Actual Performance

Particulars	2002		2003	
	MTPDP* Targets	Actual	MTPDP* Targets	Actual
Gross National Product (growth rate in %)	4.1 - 4.6	4.3	5.5 - 6.0	5.6
Gross Domestic Product (growth rate in %)	4.0 - 4.5	4.3	5.4 - 5.9	4.7
Inflation rate	5.0 - 6.0	3.0	4.5 - 5.5	3.0
91-day T-Bill rate	10.0 – 11.0	5.4	9.5 – 10.5	6.0
National Government Fiscal Deficit (as % of GDP)	-3.3	-5.2	-2.3	-4.6
Consolidated Public Sector Deficit (as % of Gross Domestic Product)	-3.5	-5.5	-2.2	-5.5
Public Debt (as % of Gross Domestic Product)	n.a.	130.39	n.a.	137.5
Current Account (as % of Gross Domestic Product)	3.2	5.7	2.7	4.2
Gross International Reserves (US\$ Bn) (No. of months in imports)	14.4 4.2	16.2 4.7	15.3 4.1	16.9 4.7
Employment generation (in thousands)	874- 953	907	1030 – 1116	566
Unemployment rate (in %)	9.98 - 10.51	11.42	8.82 – 9.63.	11.38

* MTPDP – Medium Term Philippine Development Plan

Source: National Economic Development Authority

Domestic factors such as early problems with El Niño and the slow implementation of economic reforms, punctuated by cases of policy reversals and the uncertainty spawned by political crises, weighed heavily on the economy during 2002 and 2003. The government also built up a large public sector deficit

resulting in the downgrades in the country's credit ratings, the latter effectively creating a serious dent on investors' confidence.

The slowdown in the global economy and the successive oil price increases in the aftermath of the September 11, 2001 attack on the US and the ensuing US-Iraq conflict were the external shocks which likewise caused the Philippine economy not to achieve its targets. These were compounded by the severe inventory drawdown in the high technology sector which affected electronics exports. Then in 2002, the unfavorable global impact of the severe acute respiratory syndrome scare dealt a blow to Asian tourism-related sectors.

The country's unemployment rate has barely moved from its 2002 level and remained high at more than 11 percent as the number of jobs generated has not been sufficient to absorb the influx of labor entrants. Inflation, though, was a source of good news as it has remained benign during the last two years. Inflation rate remained under control at 3 percent despite the increase in world oil prices and the depreciation of the Peso¹ largely on account of the timely importation of oil, solid agricultural growth, and the reduction in electricity prices under the Electricity and Power Industry Reform Act legislated in 2002.

The 91-day Treasury bill rate also stayed within target notwithstanding the fiscal deficit owing to the below-target inflation rate. The fiscal deficit continued to be a major macroeconomic concern among policy makers. Its performance in 2003 was severely off target and this thereafter figured prominently in the downgrades of the country's credit ratings.

The combination of fiscal weakness, modest recovery in exports due to the rebound in the global information technology industry, and the deterioration in foreign direct investment resulted to a gradual deterioration in the external accounts position and to current account balances that were below targets. The country's gross international reserves though, are at a level that could sufficiently cover external debt payments over the next 12 months.

In terms of sources of growth, the difference between 2002 and 2003 was hardly noticeable as summarized in Table 2-2 below. This implies that no significant policy changes were introduced during the period. Economic growth of the country in large part continued to be consumer-led rather than investment-driven.

Table 2-2 - Real Growth Rates, 2002–2003: MTPDP* Targets vs. Actual Performance (Supply Side)

Particulars	2002		2003	
	MTPDP* Targets	Actual	MTPDP* Targets	Actual
Gross National Product	4.1 - 4.6	4.5	5.5 - 6.0	5.5
Gross Domestic Product	4.0 - 4.5	4.4	5.4 - 5.9	4.5
Agriculture, Fishery & Forestry	2.7 - 3.6	3.3	3.4 - 4.3	3.9
Industry	4.0 - 4.3	3.7	5.8 - 6.2	3.0
Services	4.5 - 5.0	5.4	5.8 - 6.3	5.9
Net Factor Income from Abroad	n.a.	5.1	n.a.	18.9

* MTPDP – Medium Term Philippine Development Plan

Source: National Economic Development Authority

¹ Refers to the Philippine Peso (PhP); its exchange rate as of 2005 is 55 Philippine Peso to 1 US Dollar.

Agriculture, Fishery and Forestry Sector

The Philippines has an agriculture-based economy. Its vast farmlands are planted in such staples as rice and corn. It is the world's largest producer of coconuts. Contributing an average of 20 percent to national income and accounting for about 40 percent of the national labor force, the agriculture, fishery, and forestry sector has a strong multiplier effect on the whole economy. Figures 2-3 presents the annual growth rates of the agriculture, fishery, and forestry sector's output and their share to Gross Domestic Product for 2003.

The sector performed creditably well posting an average growth rate of close to 4 percent (at constant 1985 prices) during the period 2002 – 2003. Favorable weather conditions and the sound policies to improve agricultural productivity enunciated in the Agriculture and Fisheries Modernization Act accounted for the sector's modest growth.

As shown in Figure 2-4 cereals accounted for almost a fourth of the sector's output during the period in review. Plantation crops like coconut, sugarcane, banana, and pineapple contributed about 15 percent to the production of the sector. The latter three plantation crops, along with cereals, are heavy users of fertilizers and pesticides in Philippine agriculture.

Service Sector

The Philippine service sector is undoubtedly the largest in the domestic economy and may be considered as the country's engine of growth. Its share to Gross Domestic Product climbed from 36 percent in 1980 to 46 percent in 2003. In 2003, the sector posted a growth rate of 5.9 percent as it benefited from sustained investments made in the telecommunications sector mainly for cellular phone services, information technology-related services such as call centers and business process outsourcing (Table 2-3). Other service sectors such as medical and health services, personal services, and recreational services expanded on the strength of large remittances from overseas workers. The housing and real estate sector, supported by declining interest rates and affordable home-financing packages from banks, contributed positively to the robust performance of the service sector. Ironically, though, services are usually perceived as dependent on agriculture and industry for survival.

Figure 2-3 Annual Growth Rate and Share to Gross Domestic Product

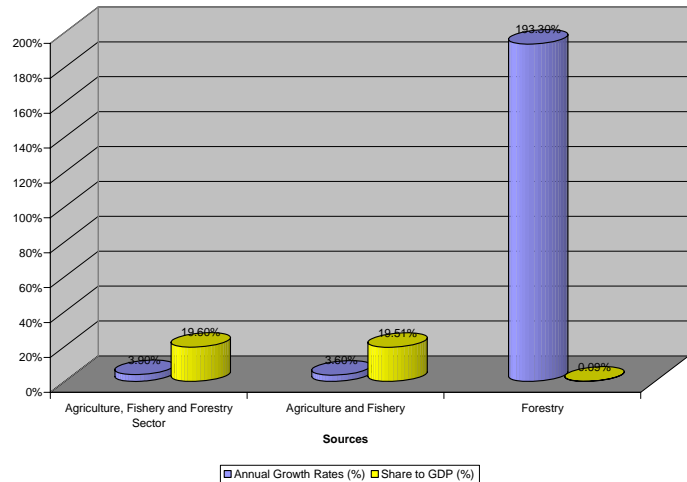
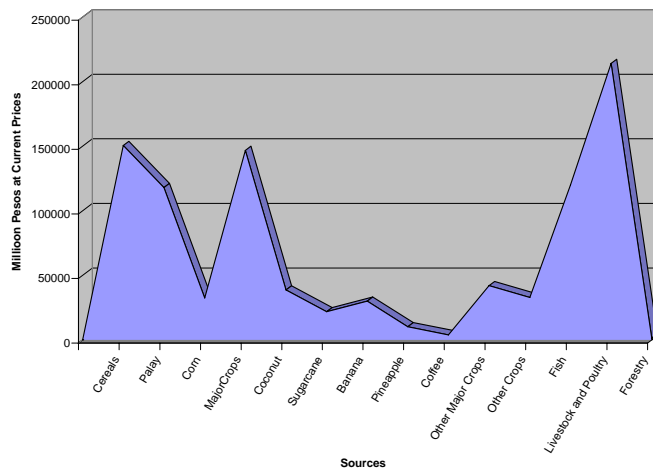


Figure 2-4 Agriculture, Fishery, and Forestry Value of Production (2003)



Wholesale and retail trade still accounts for a huge portion of the service sector's output followed by private services, transportation, communication, and storage. In terms of growth, however, the financial services sector has been moving fastest in recent years – thanks to the structural reforms in the Philippine banking industry. The telecommunications sector also benefited from similar reforms.

Table 2-3 Annual Growth Rates of the Service Sector's Output and Share to Gross Domestic Product, 2002-2003

Particulars	Annual Growth Rates (%)		Share to GDP* (%)	
	2003	2002	2003	2002
<i>Service Sector</i>	5.9	5.4	46.37	45.76
Transport, Communication and Storage	8.6	8.9	8.03	7.72
Trade	5.8	5.8	16.53	16.33
Finance	6.9	3.4	4.78	4.68
Ownership of Dwellings and Real Estate	3.8	1.7	4.65	4.68
Private Services	5.3	5.5	7.51	7.46
Government Services	3.8	4.7	4.90	4.88

* GDP – Gross Domestic Product

Source: National Accounts of the Philippines, National Statistics Coordination Board; and Selected Philippine Economic Indicators, Central Bank of the Philippines

Industry Sector

The industry sector's share to the total national output is declining (Table 2-4). Some of the major factors that have dulled the competitive edge of Philippine manufacturers are: (a) the faster legislated wage increases; (b) infrastructure bottlenecks; (c) inadequate telecommunications and higher power costs which have made the transport of people, goods, and services more expensive than in other Asian economies; (d) government “red tape” and graft and corruption; (e) inconsistent government policies; and (e) weak linkages within the domestic economy. Unfortunately, all of this developed amid the globalization of business and the liberalization of markets.

Table 2-4 Annual Growth Rates of the Industry Sector's Output and Share to Gross Domestic Product, 2002-2003

Particulars	Annual Growth Rates (%)		Share to GDP (%)	
	2003	2002	2003	2002
<i>Industry Sector</i>	3.7	3.0	34.53	34.03
Mining and Quarrying	51.0	17.5	1.64	1.46
Manufacturing	4.2	3.5	24.08	24.14
Construction	-5.9	-3.3	5.09	5.66
Electricity, Gas and Water	2.9	4.3	3.22	3.27

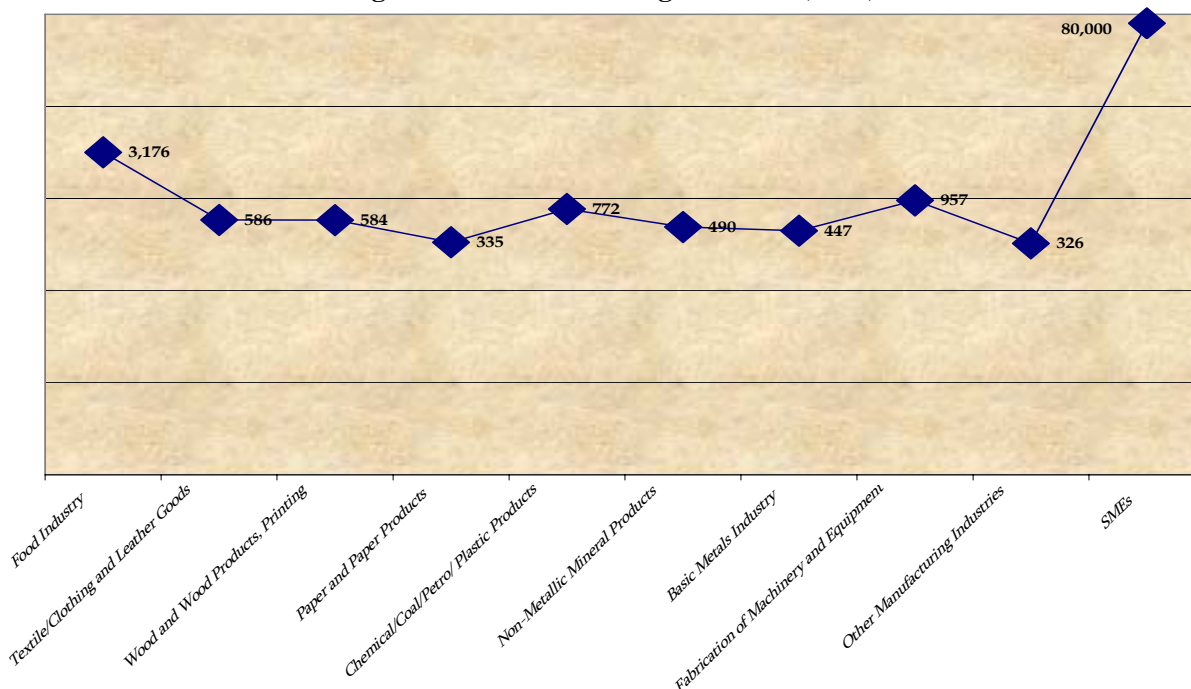
* GDP – Gross Domestic Product

Source: National Accounts of the Philippines, National Statistics Coordination Board; and Selected Philippine Economic Indicators, Central Bank of the Philippines

The sector was also dragged down by the contraction in public construction as a result of deficit-reduction efforts being implemented by the government. Manufacturing activity, which has the island of Luzon as host to close to 80 percent of the country's total number of manufacturing establishments, was boosted by

the food sector as it drew support from the recovery of agriculture from the adverse impact of El Niño. Textiles, beverage, furniture and fixtures, publishing/printing, chemicals/chemical products, and basic metals also turned in positive growth rates. The reverse happened in such sectors as tobacco, footwear/wearing apparel, leather, rubber, paper, metal industries, non-metallic minerals, machinery, and transport equipment. The number of manufacturing plants throughout the Philippines is shown in Figure 2-5.

Figure 2-5 Manufacturing Facilities (2003)



Aggregate Demand

On the demand side, private consumption spending again provided the brightest spot in the expenditure category, expanding at the rate of 5.3 percent in real terms (Table 2-5). This came amid declining foreign direct investment flows and the slow rebound in the global information technology industry, both of which impacted negatively on investments and exports. The category with the highest growth rate remained to be the transportation and communication sector, followed by fuel, light, and water.

Table 2-5 Real Growth Rates, 2002–2003: MTPDP* Targets vs. Actual Performance (Demand Side)

Particulars	2002		2003	
	MTPDP* Targets	Actual	MTPDP* Targets	Actual
Personal Consumption Expenditures	3.4	4.1	3.8	5.3
Government Consumption	2.3	-3.7	0.7	0.5
Investments	4.5	-5.0	9.1	0.1
Exports	1.2	3.6	8.9	4.4
Imports	2.3	4.7	9.0	10.2

* MTPDP – Medium Term Philippine Development Plan

Source: National Economic Development Authority

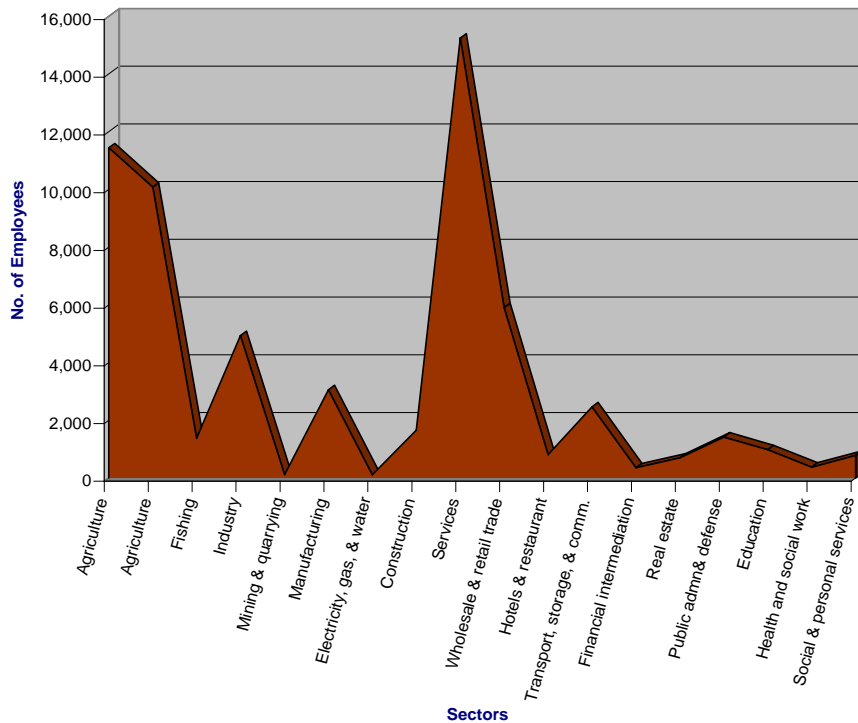
Meanwhile, fixed capital investments have been concentrated mostly in agriculture and telecommunications. The same trend has been observed in industries such as paper, sugar milling, and textiles, which are striving to improve their competitiveness.

Philippine exports also grew at only half of its targeted growth rate in 2003 due to the slump in the technology sector and the declining competitiveness in the merchandise sector such as garments and footwear. This was offset, however, by the strong export performance of non-factor services, which included earnings from contact/call centers. Imports, on the other hand, expanded at a hefty rate of 10 percent primarily on account of the large importation of capital goods and raw materials that supported capital investments in durable equipment.

Employment

Figure 2-6 presents the employment picture of the Philippine economy. The service sectors boasts of the highest number of employed persons accounting for 48 percent of the total employment. Next to the services sector, the agriculture, fishery, and forestry sector is considered the second largest employer contributing 36 percent to total employment. The industry sector ranks as having the lowest number of employed persons. This indicates how far behind industrial growth is in the Philippines compared to other countries.

Figure 2-6 Employment per Sector



Notes:

Data were taken from the results of the quarterly rounds of the Labor Force Survey using past week as reference period.
 Details may not add up to totals due to rounding.
 Data are as of September 15, 2004, preliminary.

Source: National Statistics Office

2.1.3 PROFILES OF ECONOMIC SECTORS

The sectors that are potentially considered as sources of POPs chemicals in the country and are therefore deemed as possible beneficiaries of any strategy that may be included in the National Implementation Plan are discussed below. In classifying these sectors as such, the results of the Initial Inventory on POPs were also taken into account.

Some of these sectors are major elements of the national economy while others are activities or even side effects of certain industrial and non-industrial processes. As such, the economic profiling was carried out at those levels where the pollution source was assumed and where the socio-economic impact could be described or estimated in certain way. Table 2-6 presents the economic profile of these sectors.

Table 2-6 Economic Profiles of Affected Sectors

Affected Sector	Relevant POPs Chemicals	Economic Profiles
Farms	POPs pesticides Dioxins and furans (open burning)	<ul style="list-style-type: none"> • Based on the 1991 data provided by the Bureau of Agricultural Statistics (BAS) there are 4,610,000 farm lands all over the country. Breaking it down according to land size, the numbers are as follows: <ul style="list-style-type: none"> ❖ Under 1.00 ha. – 1,680,000 ❖ 1.00 to 2.99 ha. – 1,960,000 ❖ 3.00 to 4.99 ha. – 520,000 ❖ 5.00 to 9.99 ha. – 320,000 ❖ 10.00 ha. and over – 100,000 • Gross agricultural crop production for 2003 was reported to be at 71,610,000 MT with an equivalent value around PhP 330 Billion • The 2003 data from the BAS reports that there are 11,220,000 persons employed in the agricultural sector • Farms are scattered through the Regions of Luzon, Visayas, and Mindanao
Reformulators	POPs pesticides	No. of facilities 10 – household pesticide formulators and repackers 15 – agricultural pesticide formulators and repackers Location: Region 4, 6, 10
Electric utilities (electric cooperatives, power transmission, and distribution)	PCBs Dioxins and furans	<ul style="list-style-type: none"> • There are 139 electric utilities in the country. The breakdown is as follows: <ul style="list-style-type: none"> ❖ 119 – Electric Cooperatives ❖ 19 – Private Electric Utilities

Affected Sector	Relevant POPs Chemicals	Economic Profiles
Transformer Servicing facilities	PCB	These are non formal sectors in the country. Most are not even registered in any of the corresponding appropriate government agencies
Hospitals	PCB Dioxins and furans	<ul style="list-style-type: none"> • As of 2002, there are a total of 661 government and 1,077 private hospitals registered with the Department of Health. • The 2004 Philippine Statistical Yearbook reports that in October 2003, there were 307,000 persons employed under the health and social work sector. • The reported health expenditure in 2002 was PhP 115.448 Million • Share to GNP is 2.7% (based on 2004 PSY)
Pulp and paper mills	Dioxins and furans	<ul style="list-style-type: none"> • The 2004 Philippine Statistical Yearbook reports that in 1999, there are a total of 203 paper and paper products manufacturing facilities. • The same source reports a total number of 24,043 employees in this sector. • The volume of sales reported is PhP 33.793 Billion
Fuel burning facilities	Dioxins and furans	<ul style="list-style-type: none"> • As reported in the Environmental Management Bureau 2001 Source Emission Inventory, there are 2,821 fuel burning facilities, 99% of which are industrial manufacturing facilities
Iron and steel industry	Dioxins and furans	<ul style="list-style-type: none"> • The 2004 Philippine Statistical Yearbook reports that there are 253 iron and steel industry facilities in the country. • This industry employs 28,040 personnel • The reported volume of sales, based on the 2004 PSY, is PhP 49.876 Billion
Cement manufacturing industry	Dioxins and furans	No. of facilities: 23 Volume of production: 24,893 Billion Pesos No. of employees: 6,722
Wastes Processing Facilities (wastes facilities)	Dioxins and furans	<ul style="list-style-type: none"> • As of January 2005, there are 68 registered hazardous wastes processing facilities nationwide. Most of these are medium size industries. • Based on January 2005 data from the National Solid Wastes Commission, there are 734 open dumps and 262 controlled dumps nationwide

2.1.4 ENVIRONMENTAL OVERVIEW

This section provides a snapshot of the environmental condition of the Philippines. It describes the status of natural resources, the air and water quality, and the issues on solid and hazardous wastes management in the country.

Land Resources

The Philippines has a total land area of about 30 million hectares, of which 47 percent is certified alienable and disposable land, and 50 percent is forestland. Land is categorized depending on the slope (lowlands or uplands).

Lowland agricultural areas are the most productive, although yields in these areas are relatively low and have been stagnating. For instance, average rice and corn yields have remained at about 2.9 and 1.5 metric tons per hectare per season throughout the 1990s. Salinization and water-logging pose problems in some irrigated areas, while saline water intrusions affect coastal areas. In addition, insufficient or unbalanced fertilizer use results to nutrient depletion in some places.

The upland agricultural areas are generally considered sub-marginal for most agricultural crops. Of the 16.3 million hectares of uplands, only 2 million are used for intensive agriculture. Population pressure has led to a substantial increase of cultivation. However, increasing cultivation using standard lowland farming techniques is leading to severe erosion problems. As documented in the 1993 study of the Bureau of Soils and Water Management, 45 percent of the country's land area suffers from moderate to severe erosion, while only 24 percent exhibits no apparent erosion.

The use of both chemical fertilizers and pesticides has also been increasing. Total fertilizer use grew from 2.1 million metric tons in 1993 to 3.1 million metric tons in 1997. However, total use provides little information on environmental impact. When used appropriately, fertilizers can increase yields and help maintain soil fertility. Otherwise, they can lead to nutrient imbalances and groundwater contamination.

Similarly, total pesticide use has been increasing. In 2004, around 14,000 metric tons (aggregate weight) of pesticides were imported. As in the case of fertilizers, pesticides can protect crops from pests but can also contaminate water, affect human health, and induce resistance in pests unless they are used properly.

Forests

In 1934, forest covered 57 percent or 17.1 million hectares of the total land area of the country. By 1990, this was substantially reduced to 20 percent or 6.1 million hectares. Recent estimates put the forest cover at around 5.4 million hectares. Between 1950 and 1990, about 3.8 million hectares of old growth dipterocarp forests are estimated to have been lost. Residual/secondary growth forests grew during the period by about 200,000 hectares, while grasslands decreased by about 3.3 million hectares.

Deforestation is particularly severe in the Luzon and Visayas islands and is currently acute in Mindanao. Palawan has the highest remaining proportion of forest cover among the major islands. The principal causes of deforestation in the Philippines are illegal logging, shifting cultivation, and forest fires, as well as conversion to agricultural lands and human settlements.

From 1989 to 1995, the average annual rate of deforestation was about 130,000 hectares. The remaining primary forest is estimated at 800,000 hectares. Since 1992, all primary forests have been declared part of the National Integrated Protected Areas System for biodiversity conservation and environmental protection.

There has been no consistency in the number of hectares reforested annually. Reforestation efforts were imposed on local communities without an adequate planning, monitoring, and implementation framework. As a result, reforestation has a very low success rate.

Protected Areas/Biodiversity

The Philippines is among the world's 17 "megadiversity" countries and is included in the list of biodiversity "hotspots", threatened areas with very high levels of biodiversity. The country is divided into 15 bio-geographic zones, with 18 sites identified as centers of plant diversity and six major island centers of animal diversity.

The country's biodiversity has a high species diversity and endemism. There are about 13,500 plant species (representing about 5 percent of the world's flora) and 170,000 animal species. Forty-four percent of flowering plants are endemic, found primarily in the few remaining primary forests. High species endemism has also been observed among mammals (64 percent), reptiles (68 percent), amphibians (78 percent), and birds (44 percent).

Widespread destruction and conversion of natural habitats, overexploitation, and pollution have led to rapid biodiversity loss. The Philippines has been identified by the International Union for Conservation of Nature and Natural Resources as one of the most endangered among the world's biodiversity hotspots.

From 1990 to 1998, the number of endangered species increased from 212 to 284. In addition, results of a recent biodiversity assessment show that existing infrastructures (roads, power and energy, ports and harbors, and growth areas) seriously threaten an estimated total area of 1.6 million hectares of biodiversity-rich ecosystems.

Water Resource and Water Quality

The country is endowed with rich water resources. These include inland freshwater (rivers, lakes, and groundwater), as well as marine (bay, coastal, and oceanic waters). The Philippines has sufficient water supply but not enough in highly populated areas, especially during the dry season.

Water pollution affects fresh, marine, and groundwater resources of the country. Surface water quality can be assessed by using dissolved oxygen and biochemical oxygen demand as parameters. The environmental and public health dimensions of the water quality situation are as follows:

- 36 percent of the river sampling points have been classified as public water supply sources
- 60 percent of the country's population live along coastal areas and contribute to discharge of untreated domestic and industrial wastewater from inlands
- 58 percent of groundwater supplies intended for drinking water are contaminated with total coliform and would need treatment
- 31 percent of illnesses for a five-year period were water-related diseases

Water classifications are arranged in the order of the degree of protection required, with Classes AA and SA having generally the most stringent requirements, while Class D and SD have the least stringent water quality requirements.

Rivers and Lakes occupy 1,830 square kilometers (0.61 percent of total area). The Philippines has 421 principal river basins in 119 proclaimed watersheds. Of these, 19 are considered major river basins and were included in the Water Quantity Scorecard. On the other hand, there is no updated inventory of lakes, but a recent study has placed the number of lakes at 72.

Between 1996 and 2001, the Environmental Management Bureau monitored 141 rivers. About 41 rivers (or 29 percent) had minimum dissolved oxygen values of less than 5 mg/l, which affects fish; 92 rivers (or 64 percent) had maximum values of biochemical oxygen demand that exceeded the criterion for Class A waters. These high values indicate organic pollution. Furthermore, dissolved oxygen and biochemical oxygen demand levels for Laguna de Bay, Taal Lake, and Lake Danao in Leyte meet the Class A criteria. Naujan Lake in Oriental Mindoro has dissolved oxygen and biochemical oxygen demand levels that do not meet its Class B criteria.

Bays and Coastal Waters cover an area of 266,000 km², while oceanic waters cover 1,934,000 km². Coastline length is 36,289 km. The Philippine coastline is irregular, with numerous bays, gulfs, and islets. About 60 percent of Philippine municipalities and cities are coastal, with 10 of the largest cities located along the coast. These coastal cities and municipalities are inhabited by about 60 percent of the total population.

Since 1996, the Environmental Management Bureau has monitored a total of 39 bays and coasts with Manila Bay having its own monitoring program. Except for Puerto Galera Bay, data indicated that 64 percent had dissolved oxygen levels below 5 mg/l, the minimum criterion set for waters suitable as a tourist zone, fishery spawning area, and contact recreation or swimming area. In the coasts of Mandaue to Minglanilla in Cebu (Central Visayas), dissolved oxygen levels varied from 0 to 14 mg/l, which indicates that the ecosystem is already undergoing “stress” during certain periods.

Except in Cawacawa (Zamboanga City), the maximum biochemical oxygen demand values were all within the criterion set for Class SB waters of 5 mg/l. Manila Bay has biochemical oxygen demand levels that are generally within fishery water quality criterion. However, seasonal high organic loadings from rivers draining into the bays result in harmful algal blooms that pose a continuing threat to marine resources and public health.

Groundwater is replenished or recharged by rain and seepage from rivers. The recharge or extraction potential is estimated at 20.2 billion cubic meters per year. Groundwater contributes 14 percent of the total water resource potential of the Philippines. It is used for drinking by about 50 percent of the people in the country. Based on the water rights granted by the National Water Resources Board since 2002, 49 percent of groundwater is consumed by the domestic sector, and the remaining shared by agriculture (32 percent), industry (15 percent), and other sectors (4 percent). About 60 percent of the groundwater extraction is without water-right permits, resulting in indiscriminate withdrawal. A high percentage (86 percent) of piped-water supply systems uses groundwater as a source.

In terms of sectoral demand, agriculture has a high demand of 85 percent, while industry and domestic have a combined demand of only 15 percent.

Pollution of groundwater may come from domestic wastewater, agricultural runoff, and industrial effluents. Domestic wastewater is the main contributor of bacterial contamination to the groundwater supplies. Limited data on the bacteriological content of groundwater from 129 wells indicated a high level of positive coliform bacteria in 75 wells (58 percent).

Another problem is saline water intrusion. This reduces water availability for domestic usage, including drinking and agricultural consumption. At present, the large cities and coastal areas that have serious problems of saltwater intrusion are: Metro Manila (from Malabon, Navotas, Manila, Parañaque), Cavite (from Noveleta, Rosario, Tanza, Naic), along Laguna de Bay (from Muntinlupa to Binangonan), and Cebu, Iloilo, Zamboanga, Laoag, and Dagupan.

Air Pollution

It is widely acknowledged that air pollution is a serious problem in Metro Manila. Particulate matter smaller than 10 microns (PM₁₀) is now considered the priority air pollutant. Sulfur dioxide, nitrogen oxides, ozone, and carbon monoxide levels all remain within the national standards. Ambient levels of lead have dropped significantly because of the phase-out of leaded petrol.

The largest contributors to total suspended particulates (TSP) and PM₁₀ are fossil fuel combustion in small and medium industrial and commercial installations, re-suspension, and construction activities. Vehicle exhaust contributes about 12 percent of total TSP emissions. Of this category, the largest contributors are diesel trucks, buses, and jeepneys.

Reports show that air pollution is becoming a problem in other highly urbanized areas. For instance, ambient monitoring from 1997 to 1999 at the main road in the central business district in Baguio City, showed TSP levels that ranged from fair to poor. In 1999, TSP levels were above the national guideline values having 24-hour TSP levels from 246 microgram per normal cubic meter ($\mu\text{g}/\text{m}^3$) to 341 $\mu\text{g}/\text{m}^3$.

In the Visayas, monitoring from 1995 to 1999 showed that in some stations, especially those along the main roads, 24-hour TSP levels are much higher than the national guideline values. Limited monitoring in Cebu City and Mandaue City in 1999 indicated excessive 24-hour TSP levels in several locations-238 $\mu\text{g}/\text{m}^3$ in Banilad, Mandaue City, 276 $\mu\text{g}/\text{m}^3$ in Talisay, Cebu, 262 $\mu\text{g}/\text{m}^3$ in Pardo, Cebu, municipalities and 239 $\mu\text{g}/\text{m}^3$ in Minglanilla, Cebu, and municipalities within 20 kms from Cebu City.

Solid and Hazardous Waste

Solid and hazardous waste generation has risen significantly and its widening dispersion to the environment is a growing threat to the quality of water, air, and land. This is compounded by the lack of environmentally sound waste treatment and disposal facilities.

The national average waste generation rates per capita are estimated to be 0.3 kg/capita/day, or about 22,500 tons/day (8.2 million tons/year) total. Metro Manila alone generates about 5,400 tons/day. In urban areas, the range is from 0.50 to 0.70 kg/capita/day.

In Metro Manila, only 6 percent of waste is recycled and another 6 percent is disposed by the residents themselves. Seventy three percent is collected while the rest is illegally dumped. Organic waste predominates in household wastes. There is no special collection system for domestic waste while industrial waste disposal is inadequately regulated.

About 142 local government units in the country are implementing integrated waste management programmes, which include waste reduction, composting, recycling, and re-use. According to estimates, the Metro Manila Federation of Environment Multi-purpose Cooperatives bought 69,400 tons of waste materials, which it sold to factories for P95.2M in 1998. In 1999, this volume went up by 38 percent to 95,600 tons worth P124.6M (P = Peso).

The manufacturing sector in Metro Manila and adjacent provinces (from Bataan in the north to Batangas in the south) generated nearly 168,000 metric tons of serious toxic and hazardous wastes. The four main producing sectors of toxic and hazardous wastes are chemicals, food and drink, textiles and engineering.

Materials imported for recycling purposes have also gone up in recent years. Toxic and hazardous wastes exported for recovery and treatment rose from 650 metric tons in 1997 to 2,062 metric tons in 1998. Similarly, hazardous waste locally transported, recycled, and/or treated increased from 3,499 metric tons in 1998 to 17,229 metric tons in 1999.

2.2 INSTITUTIONAL, POLICY AND REGULATORY FRAMEWORK

2.2.1 ENVIRONMENTAL POLICY, SUSTAINABLE DEVELOPMENT POLICY AND GENERAL LEGISLATIVE FRAMEWORK

In response to the Philippines' commitment to Agenda 21 that was adopted at the Earth Summit in Rio de Janeiro in 1992, the Philippines developed the Philippine Agenda 21 which serves as the nation's blueprint for sustainable development. The Philippine Agenda 21 is in line with the World Summit on Sustainable Development which was held in Johannesburg a decade after the Rio Summit, whereby the following five priority environmental issues were identified: (1) water supply and sanitation, (2) energy, (3) biodiversity, (4) poverty alleviation and health, and (5) desertification.

Philippine Agenda 21 strengthens the roles, relationships, and interactions between and among stakeholders in government, civil society, labor, and business in achieving equity and managing the ecosystems that sustain life. It envisions a better quality of life for all Filipinos through the development of a just, moral and creative, spiritual, economically vibrant, caring, diverse yet cohesive society characterized by appropriate productivity, participatory and democratic processes, and living in harmony and within the limits of the carrying capacity of nature and the integrity of creation.

One of the elements of the overall strategy for the protection of the environment and the pursuit of sustainable development is exemplified by the Philippines' ratification of the Stockholm Convention on POPs on February 17, 2004. Thereafter the Philippines became a party to the Convention on February 27, 2004. On May 27, 2004, the Convention entered into force in the Philippines.

The Philippines became one of the early signatories to the Convention due to its commitment to control toxic chemicals and hazardous wastes. As early as 1990, the Philippines enacted Republic Act 6969 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act. This Act mandates the regulation, restriction, or prohibition of the importation, manufacture, processing, sale, distribution, use, and disposal of chemical substances and mixtures that present unreasonable risk and/or injury to health and the environment.

The Philippines' commitment to control pollution brought about by hazardous substances was once again demonstrated with the passage of Republic Act 8749 or the Philippine Clean Air Act of 1999. Under Rule XLI of the Implementing Rules and Regulations of the Clean Air Act (Department of Environment and Natural Resources Administrative Order 2000-81), an inventory list of all sources of POPs in the country and a national government program on the reduction and elimination of POPs should be developed. All of these are in line with the commitments to the Convention. Furthermore, Rule XXVIII, Section 1 of the Clean Air Act bans incineration as a response to address the adverse effects of combustion fumes emitted by the burning of domestic, hospital, and hazardous wastes. Section 48 of Republic Act 9003 or the Ecological Solid Waste Management Act of the Philippines, prohibits the open burning of solid wastes, thus eliminating one major source of unintentional POPs.

2.2.2 DESCRIPTION OF EXISTING LEGISLATION AND REGULATIONS ADDRESSING POPs (MANUFACTURED CHEMICALS AND UNINTENTIONALLY PRODUCED POPs)

This section provides additional details on legal instruments, which are considered of particular importance for the management of POPs chemicals. To date, there are a number of legal and regulatory issuances that address POPs. These are:

Presidential Decree 1144 - Creating the Fertilizer and Pesticide Authority and Abolishing the Fertilizer Industry Authority

Presidential Decree 1144 created the Fertilizer and Pesticide Authority, an attached agency to the Department of Agriculture, “for the purpose of assuring the agricultural sector of adequate supplies of fertilizer and pesticides at reasonable prices, rationalizing the manufacture and marketing of fertilizer, protecting the public from the risks inherent in the use of pesticides, and educating the agricultural sector in the use of these inputs.” Included in the mandate of FPA is to regulate and monitor production, importation and use of pesticides and other agricultural chemicals in the country.

To implement the provisions of the Decree, the Fertilizer and Pesticides Authority issued its rules and regulations responsive to the requirements of the Decree. This implementing rules and regulations detail the conditions precedent to the importation, manufacture, formulation, repacking, distribution, delivery, sale, transport, storage, and use of any pesticide and other agriculture chemicals. These implementing rules and regulations are further elaborated in the “Fertilizer and Pesticide Authority – Pesticide Regulatory Policies and Implementing Guidelines” or the “Green Book” as it is more commonly referred to.

The Fertilizer and Pesticide Authority’s Green Book is a guidance document compiling all requirements and procedures for the manufacturers, formulators, repackers, distributors, traders, and users or applicators of fertilizer, pesticides, and other agricultural chemicals.

Republic Act 6969 or The Toxic Substances and Hazardous and Nuclear Wastes Control Act

Republic Act 6969 states that: “It is the policy of the State to regulate, restrict, or prohibit the importation, manufacture, processing, sale, distribution, use, and disposal of chemical substances and mixtures that present unreasonable risk and/or injury to health or the environment; to prohibit the entry, even in transit, of hazardous and nuclear wastes and their disposal into Philippine territorial limits for whatever purpose; and to provide advancement and facilitate research and studies on toxic chemicals and hazardous and nuclear wastes.” The Department of Environment and Natural Resources has the major responsibility to implement the objectives of Republic Act 6969.

The Department of Environment and Natural Resources issued Administrative Order 29, Series of 1992, which is the Implementing Rules and Regulations of Republic Act 6969. Title II of Department of Environment and Natural Resources Administrative Order 29 tasked the Environmental Management Bureau to establish the Priority Chemical List. In 1998, a list of 28 chemicals became the first Priority Chemicals List through the issuance of Department of Environment and Natural Resources Administrative Order 98-58. The Priority Chemical List registers chemicals that pose unreasonable risk to public health, workplace, and the environment. Of the 12 POPs chemicals, three are included in the Priority Chemicals List and these are PCB, Mirex, and Hexachloroene.

In addition to the Priority Chemicals List, a Chemical Control Order for PCB, which took effect in March 11, 2004, provides guidelines for the phase out of PCBs and PCB-containing materials, has been issued. The objectives of the Order are to reduce and eliminate the importation, manufacture, sale, transfer, distribution, and use of PCBs, PCB equipment, PCB-contaminated equipment, non-PCB equipment, PCB articles, and PCB packaging and to regulate the transport, treatment, and disposal of PCBs and PCB wastes, to protect human health and the environment. It also aims to reduce the hazards and unreasonable risks posed to human health and the environment from the improper use and management of PCBs, PCB equipment, PCB-contaminated equipment, non-PCB-equipment, PCB articles and PCB packaging, and the subsequent release of PCBs and PCB wastes.

The Chemical Control Order for PCB establishes requirements, procedures, and limitations for the importation, manufacture, use, and proper treatment, storage, and disposal of PCBs, PCB equipment, PCB-contaminated equipment, non-PCB equipment, PCB articles and PCB packaging, and subsequent release of PCBs and PCB wastes. It also requires the establishment of a compliance monitoring program to enforce the provisions of the Order.

Republic Act 8749 or The Philippine Clean Air Act of 1999

The enactment of Republic Act 8749 paved the way for the control and regulation of dioxins and furans releases to air. Republic Act 8749 is the only regulation, which has explicit provisions on the reduction and measurement of dioxins and furans releases into the environment from various sources. It sets the standard limit for the emission of dioxins and furans at 0.1 nanogram per normal cubic meter (ng/Nm^3) for treatment facilities using non-burn technologies. The provision on banning the use of incinerators under Section 20 of the Act will further reduce emissions of dioxins and furans into the environment. The application of state-of-the-art non-burn technologies in the treatment and destruction of bio-medical and hazardous wastes is also provided in Section 2 of Rule XXVIII of the Implementing Rules and Regulations of Republic Act 8749.

Under Section 32, a policy guideline was set for the Environmental Management Bureau of the Department of Environment and Natural Resources to establish an inventory list of all sources of POPs in the country. It also includes the development of short- and long-term national government programs on the reduction and elimination of POPs including dioxins and furans.

It provides that the emission of dioxins and furans into the air should be reduced by the most progressive techniques. That all average values of dioxins and furans measured over the sampling period of a minimum of 6 hours and a maximum of 8 hours must not exceed the limit value of $0.1 \text{ ng}/\text{Nm}^3$.

Republic Act 9003 or The Ecological Solid Waste Management Act of the Philippines

Republic Act 9003 does not contain any specific provisions for the management of dioxins and furans and other unintentional POPs. However, it provides requirements that would contribute towards their reduction through, for example, mandatory segregation of solid wastes generated by domestic and industrial sources. Through Section 48 of the Prohibited Acts of Republic Act 9003, open burning of solid wastes is strictly prohibited. Segregation and sorting of solid wastes will result in the recycling and re-use of materials that are precursors in the formation of unintentional POPs (like plastics and other chlorine-containing materials). The common practice of open burning of household wastes and agricultural residues contribute greatly to the releases of dioxins and furans in all environmental media. Industries under the Act are encouraged to adopt pollution prevention/cleaner production measures, which should also assist to reduce or eliminate releases of unintentional POPs.

2.2.3 ROLES AND RESPONSIBILITIES OF MINISTRIES, AGENCIES, AND OTHER GOVERNMENTAL INSTITUTIONS INVOLVED IN POPs LIFE CYCLES (FROM SOURCE TO DISPOSAL, ENVIRONMENTAL FATE, AND HEALTH MONITORING)

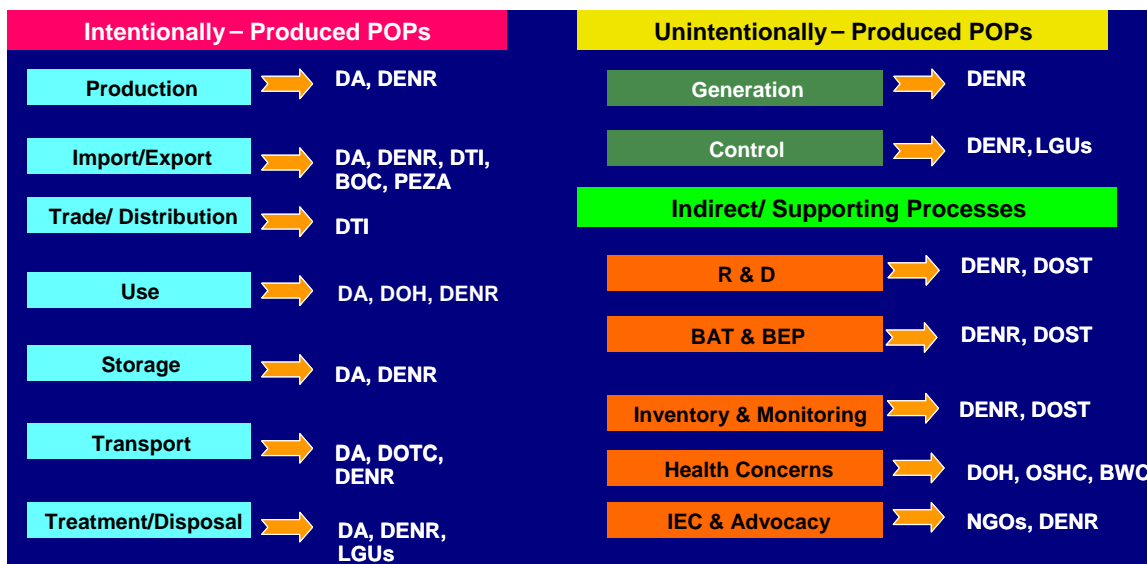
To date, the two agencies that are mandated to address intentional and unintentional POPs are the Environmental Management Bureau and the Fertilizer and Pesticide Authority. Brief summaries of their functions are presented below:

Environmental Management Bureau of the Department of Environment and Natural Resources. The Department of Environment and Natural Resource has the mandate for three environmental laws that are pertinent to the Convention. These are Republic Act 6969, the Toxic Substances, Hazardous and Nuclear Wastes Control Act; Republic Act 8749, the Clean Air Act; and Republic Act 2003 or the Ecological Solid Waste Management Act. Most of these laws are implemented by the Environmental Management Bureau and being a line bureau, enforcement and compliance monitoring are being executed by its Regional Offices in 16 Regions of the country. The Central Office reviews the Pre-manufacture, Pre-Importation Notifications for new industrial chemicals, prepares the Priority Chemical List and coordinates international agreements and conventions i.e. Stockholm Convention on Persistent Organic Pollutants, Rotterdam Convention on Prior Informed Consent, and the Basel Convention for the Transboundary Movement of Waste. The Research and Development Division provides support for research activities, water and air quality monitoring and laboratory accreditation. Under Republic Act 8749, the Environmental Management Bureau is tasked to establish inventory of all POPs sources in the country and develop short-term and long-term national government programs for its reduction and elimination, particularly the unintentional POPs

Fertilizer and Pesticide Authority of the Department of Agriculture. Through Presidential Decree 1144, the Fertilizer and Pesticide Authority is mandated to regulate and monitor production, importation and use of pesticides and other agricultural chemicals in the country. It is mandated to register and issue licenses to pesticide importers, formulators, and reformulators. The Fertilizer and Pesticide Authority issues licenses, which are pre-requisite to the importation, distribution, reformulation or any activity that involves fertilizer, pesticide, and other agricultural products. They also ensure, through monitoring and coordination with government product standards agencies, that the products comply with their standards, are handled safely – based on their occupational health and safety standards, and used appropriately. They impose penalties or sanctions for violation of the set rules and standards. Another primary function of the Authority is to educate fertilizer and pesticide handlers through continuous training and information dissemination.

Aside from the main regulators and policy formulators (Environmental Management Bureau and Fertilizer and Pesticide Authority) of POPs chemicals, there are other government agencies that have been performing regulatory functions pertinent to chemicals management. These include the Department of Health, Occupational Health and Safety Center, Department of Science and Technology, Department of Trade and Industry, Local Government Units, Academe, and Non-Government Organizations. To provide a mechanism for the interagency coordination, the Department of Environment and Natural Resources, through the POPs Project Management Office, has issued a Special Order creating an Interagency Consultative Committee. One of the main functions of the Interagency Consultative Committee is to assist in the drafting of the National Implementation Plan as well as lead the implementation of the strategies that will be outlined in the National Implementation Plan. The Interagency Consultative Committee's functions in the chemical life cycle are illustrated in Figure 2-7.

Figure 2-7 Interagency Consultative Committee’s Functions



Note:

DA	–	Department of Agriculture
DENR	–	Department of Environment and Natural Resources
DTI	–	Department of Trade and Industry
DOH	–	Department of Health
DOTC	–	Department of Transportation and Communications
LGUs	–	Local Government Units
DOST	–	Department of Science and Technology
OSHC	–	Occupational Safety and Health Center
BWC	–	Bureau of Working Conditions
NGOs	–	Non-government Organizations
BOC	–	Bureau of Customs

The details of the agencies’ mandates, the specific bureau/section per respective agencies, and their roles and responsibilities in POPs or chemicals management are discussed in the Enabling Activity Report: “Capacity and Needs Assessment for the Implementation of the Stockholm Convention on POPs” of the POPs Management Office under the Environmental Management Bureau.

2.2.4 RELEVANT INTERNATIONAL COMMITMENTS AND OBLIGATIONS

The Philippines has been actively involved in a number of international organizations pertaining to chemicals management. Table 2-7 presents some of the country’s international participation.

Table 2-7 Philippine Memberships in International Organizations, Programmes, and Bodies

International/ Organization	National Focal Point	Other Agencies Involved	Related National Activities
Intergovernmental Forum on Chemical Safety*	Department of Health	Department of Environment and Natural Resources, Department of Science and Technology, Department of Labor and Employment, Department of Interior and Local Government	National Chemical Profiling Capability Building on GHS – Globally Harmonized System Occupational Safety and Health; Children Environmental Health; Intergovernmental Forum on Chemical Safety Commitments
United Nations Environment Programme International Registry of Potentially Toxic Chemicals - National Correspondent	Environmental Management Bureau	Department of Health, Department of Science and Technology, Department of Labor and Employment, Department of Interior and Local Government	Public awareness Agencies involved: Department of Environment and Natural Resources, Fertilizer and Pesticide Authority, and Department of Labor and Employment – National Activity is representation of Philippines to Intergovernmental Forum on Chemical Safety and Strategic Alliance in International Chemical Management
Industry and Environment Programme Activity Centre – Cleaner Production Center	Industrial Technology and Development Institute	Integrated Program on Cleaner Production Technologies - Department of Science and Technology	Cleaner Production Trainings and Seminars; Cleaner Production Facility Assessment; Technology Database, Technology Evaluation, Technology Verification; Other activities conducted by Integrated Program on Cleaner Production Technologies - Department of Science and Technology
International Programme on Chemical Safety	Environmental Management Bureau	Department of Health, Department of Science and Technology, Department of Labor and Employment, University of the Philippines-National Poison Control And Information Service	Public awareness
World Health Organization	Department of Health	Department of Environment and Natural Resources	International Programme on Chemical Safety

**FINAL - NATIONAL IMPLEMENTATION PLAN FOR
STOCKHOLM CONVENTION ON POPs**

International/ Organization	National Focal Point	Other Agencies Involved	Related National Activities
Food and Agriculture Organization	Fertilizer and Pesticide Authority	Department of Agriculture, Department of Environment and Natural Resources	Public awareness
United Nations Industrial Development Organization	Department of Environment and Natural Resources	Industrial Technology Development Institute – Department of Science and Technology	PCB Inventory
International Labor Organization	Department of Labor and Employment – Occupational Safety and Health Center	Department of Environment and Natural Resources	International Labor Organization Convention on Chemical Safety – Basis for Chemical Safety Training given by Occupational Safety and Health Center
World Bank	Department of the Environment and Natural Resources	Various agencies	World Bank and Montreal Protocol Project – “Lawmakers and Legislators Awareness Program” in relation to occupational safety
ASEAN –Occupational Safety and Health Network	Department of Labor and Employment – Occupational Safety and Health Center	Various agencies	3rd Country Training Program on Occupational Safety and Health of Small and Medium Enterprises. Coordinator of Training area of Occupational Safety and Health Network and member of coordinating board

*Government of the Philippines was elected as Vice-President of the Intergovernmental Forum on Chemical Safety at its Fourth Session (Forum IV), held in Bangkok, Thailand, from 1-7 November 2003.

In addition, the Philippines has signified its accord to a number of international agreements on chemicals management, notwithstanding the Stockholm Convention on POPs. Table 2-8 presents these international agreements and the corresponding response of the Philippine government.

**Table 2-8
Participation in International Agreements/Procedures Related to Chemicals Management**

International Agreements	The Philippine Response	Primary Responsible Agency
Basel Convention	Ratified on October 21, 1993 Issued Department of Environment and Natural Resources Administrative Order 28, Series of 1994: The Interim Guidelines on the Importation of Recyclable Materials Containing Hazardous Substances	Environmental Management Bureau of the Department of Environment and Natural Resources

**FINAL - NATIONAL IMPLEMENTATION PLAN FOR
STOCKHOLM CONVENTION ON POPS**

International Agreements	The Philippine Response	Primary Responsible Agency
Montreal Protocol	<p>Ratified on July 17, 1991</p> <p>Through the Philippine Environment Code (Presidential Decree No. 1152) the Philippines expressed its commitment to improve air quality. It has set a goal to maintain levels of air quality in order to protect public health, to prevent to the greatest extent practicable, injury and/or damage to plant and animal life and property, and to promote social and economic development of the country. It provided guidelines for the phase out of certain Ozone Depleting Substances.</p>	Philippine Ozone Desk under the Environmental Management Bureau of the Department of Environment and Natural Resources
Rotterdam Convention on Prior Informed Consent Procedure	<p>The prior informed consent procedure aims to promote shared responsibility between exporting and importing countries in protecting human health and the environment from the harmful effects of trade of certain hazardous chemicals. It requires exporters trading in a list of hazardous substances to obtain the prior informed consent of importers before proceeding with the trade. It covers 22 pesticides and certain formulations of others, as well as 5 industrial chemicals.</p> <p>The Philippines is presently working for the ratification of the Convention which is now being undertaken by the Department of Foreign Affairs, Office of Legal Affairs.</p>	Fertilizer and Pesticide Authority Environmental Management Bureau
Kyoto Protocol	<p>Ratified on February 16, 2005</p> <p>The Philippines stands to benefit from the Clean Development Mechanism process under the Kyoto Protocol. Opportunities for investments in renewable energy and other carbon dioxide reducing activities should be harnessed and promoted with private sector participation. Clean Development Mechanism process enables investments at low cost through carbon trading, and enables the country to cut-back on both local and global air pollution.</p>	Environmental Management Bureau

*Most of these international agreements are not yet ratified. The Department of Health is usually part of the Committee but not as a lead because most of these has health component.

2.3 ASSESSMENT OF THE POPS ISSUE IN THE PHILIPPINES

This section provides the current state of knowledge about POPs in the Philippines. It addresses each POP listed in the annexes of the Stockholm Convention and the various aspects addressed (*inter alia*) in the Convention articles including inventory information, current technical management and monitoring capacity, potential impacts, and the level of public awareness and concern. Information presented in this section pertaining to policy, legal, and regulations; inventory data on POPs; and information regarding knowledge and information needs are all taken from the Philippine Enabling Activities on POPs report of the POPs Management Office under the Environmental Management Bureau.

2.3.1 ASSESSMENT WITH RESPECT TO ANNEX A, PART I CHEMICALS (POPS PESTICIDES)

Production, Importation, and Use

Major crops in the Philippines include rice, corn, coconut, sugar, banana, pineapple, mangoes, coffee, tomato, and vegetables like garlic and onion. Crop protection has been deemed to be a necessary element for increased agricultural production, not so much to increase yield but to minimize losses due to weeds, pests, and diseases. In 1998, the volume of sales for pesticides reached Php 4.8 billion or US\$120 million (Dioquino, 2002).

Although pesticides have been of gross benefit to agriculture, they may, if used improperly or if there is insufficient knowledge of their side effects, endanger man and animals. Moreover, residues from persistent pesticides may build-up in the food chain that may cause contamination of the environment and create potential hazards to human health and wildlife. Today, nine of the POPs chemicals under the Stockholm Convention are pesticides.

As documented in the study, "Inventory of Persistent Organic Pollutants", existing companies selling and/or trading pesticides claimed that POPs pesticides are no longer manufactured or used as active ingredients because of the banned status of these pesticides. The information was affirmed through a listing of trade names and active ingredients of products that the companies manufacture. Company respondents of the inventory admitted that they produced some of the POPs pesticides before they were banned. When Fertilizer and Pesticide Authority released the circulars, they immediately stopped production and disposed the produced goods within the phase-out period of 15 days. Except for Dichloro-diphenyl-trichloro ethane (DDT) and chlordane, all POPs pesticides have been banned before the 1990s, so it is very unlikely that old stocks still exist. Table 2-9 presents the history of use and the current status of these nine POPs pesticides.

Table 2-9 History of Use and Current Status of POPs Pesticides in the Philippines

Pesticide	Brief History of Use	Status	Levels and Trends
Aldrin	<p>Distributed in 1980 by Shell Chemicals Company (Philippines), Inc. with trade names such as Aldrex 2, Aldrex 4, Aldrex 40%, and aldrite (combined with pentachlorophenol)</p> <p>From 1980 to 1986, Fertilizer and Pesticide Authority records show that a total of 243.4 metric tons (MT) of <i>Aldrin Tech</i> was imported. There was also importation of <i>Aldrin 40 WP</i> from 1980 to 1982 that totaled 7.49 MT.</p>	Banned. Fertilizer and Pesticide Authority Pesticide Circular No. 4, Series of 1989	<p>No legitimate stocks except for the confiscated stocks stored at the FPA central office amounting to 2 liters.</p> <p>Obsolete stocks from Shell Company (Philippines), Inc. were reportedly sent to United Kingdom from 1997 to 1999</p>
Dieldrin	<p>Shell Chemical Company (Philippines) distributed dieldrin as Dioldrex 15 and Dieldrin 50 % WP in 1980. In 1983, 2.40 MT and 1.04 MT of Dieldrin Tech and Dieldrin 50 WP, respectively, were imported. By 1986, only 1.0 MT of Dieldrin Tech was imported.</p> <p>The last importation record of dieldrin was in 1986</p>	Banned. Fertilizer and Pesticide Authority Pesticide Circular No. 4, Series of 1989	No legitimate stocks of dieldrin left in the market.
Endrin	There were four (4) local distributors of Endrin in 1980; however there is no available record about the volume of its importation.	Banned. Fertilizer and Pesticide Authority Pesticide Circular No. 5, Series of 1983	No legitimate stocks of endrin left in the market.
Heptachlor	<p>Distributed by Marsman and Company, Inc. in 1980</p> <p>Marketed by Planters, Inc. as Heptachlor 25% WP, Planters Heptachlor 2E and Planters Hepatchlor 3E</p> <p>A total of 144.242 MT of <i>Heptachlor Tech</i> was imported in 1980 to 1986 as shown in Fertilizer and Pesticide Authority importation files.</p>	Banned. Fertilizer and Pesticide Authority Pesticide Circular No. 4, Series of 1989	No legitimate stocks of heptachlor left in the market.
Toxaphene	No local distribution and import information was obtained for toxaphene	Banned. Fertilizer and Pesticide Authority Pesticide Circular No. 4, Series of 1989	No legitimate stocks of toxaphene left in the market.

**FINAL - NATIONAL IMPLEMENTATION PLAN FOR
STOCKHOLM CONVENTION ON POPs**

Pesticide	Brief History of Use	Status	Levels and Trends
Mirex	Never registered as pesticides Catalan, Sibal, et.al. (2003) reported that mirex is still being used in the country	Never registered	No available information
Hexachloro benzene	Never registered as pesticides	Never registered	No available information
Chlordane	Fertilizer and Pesticide Authority records from 1980 to 1986 reveal a total of 297.928 MT of importation of <i>Chlordane Tech</i>	Banned Fertilizer and Pesticide Authority Pesticide Circular No. 1, Series of 1999	58 liters of confiscated Chlordane is stocked at the Fertilizer and Pesticide Authority Central Office and another 58 liters at Zuellig warehouse 12 hardware stores around Metro Manila were found to be selling pesticides labeled as “chlordane” in packages of 250 milliliter (mL), 500 mL, and 1 liter (L) bottles. Chlordane was also claimed to be available in 1-gallon packages.
DDT	A total of 69.965 MT of DDT 75% WP was imported in 1986. No information whether DDT was continuously imported after 1986. No local distribution information was obtained for DDT. Records showed that the use of DDT started even before the 1960s and lasted until 1992.	Restricted. Fertilizer and Pesticide Authority Pesticide Circular No. 11, Series of 1978 The Department of Health ordered the cancellation of the use of DDT in 1992 because of the emergence of permethrin, an alternative for DDT.	A Department of Health Regional Office reported 1,116 kg of DDT stockpile. The report also stated an unknown amount of DDT disposed of by burial.

Source: *Inventory of Persistent Organic Pollutants (POPs), Environmental Management Bureau – Department of Environment and Natural Resources, April 2004*

Regulatory Enforcement

Through a number of Fertilizer and Pesticide Authority circulars, six of the nine POPs pesticides were already banned, with the only exception being DDT, which is under restricted use, and mirex and hexachlorobenzene. However, there is a possibility that POPs pesticides enter the country illegally. The capacity of the Bureau of Customs and the Philippine Coast Guard to check and regulate the entry of prohibited goods is limited. To date, no POPs pesticides have been confiscated. Interviews indicate that illegal chemicals are also smuggled into the country through identified “backdoors” such as Zamboanga,

Tawi-Tawi, Ilocos Region, and Batanes. Pesticides entered through the backdoors, if any, are stored in small distributor warehouses in the provinces. It is not clear whether these distributors are FPA-registered.

Essentially, the uncertainty that all regulatory requirements set forth in the various circulars of the Fertilizer and Pesticide Authority are enforced, is attributed to weak enforcement. Insufficient enforcement is due to limited resources.

Roles and Responsibilities

The Fertilizer and Pesticide Authority is the main agency tasked to manage pesticides from importation, manufacture, use, reformulation, and distribution. The Environmental Management Bureau provides the necessary enforcement for the management of hazardous wastes generated in pesticides manufacturing facilities, including formulating plants, as well as large scale end-users of pesticides (large farms/plantations). Other agencies and organizations provide the necessary enforcement support, such as:

- Bureau of Customs – Enforce border controls in regulating the entry of banned pesticides or toxic chemicals in general
- Bureau of Plant Industry – Monitor residual pesticides and evaluate pesticide application practices to ensure acceptable level of residues in agricultural products
- Research and Development Division of the Environmental Management Bureau – Environmental monitoring of POPs pesticides in fish and shellfish in selected areas of the country
- Croplife Philippines – A plant and science industry association providing partnership with the Fertilizer and Pesticide Authority in pesticides management
- Non-government organizations – Provide support in monitoring, public awareness, and information dissemination

Summary of Available Environmental and Health Impact Monitoring Data

Most of the monitoring of pesticides, or POPs pesticides in particular, are being performed by the academe and other non-government organizations. Table 2-10 lists some of the studies conducted pertaining to environmental and health impacts of POPs pesticides.

Table 2-10 Selected Studies on Environmental and Health Monitoring on POPs Pesticides

Study	Significant/Relevant Findings
Weston International soil and water baseline study for the Clark Development Corporation, 1997	<ol style="list-style-type: none"> 1. Dieldrin was detected above Philippine National Standards/World Health Organization standards in four of the 15 operational wells sampled 2. Dieldrin was also found to be above standards in two of the three sampled back-up wells 3. Dieldrin concentrations detected ranged from 0.00015 to 0.0011 milligrams per liter (mg/L) while the drinking water quality standard is 0.00003 mg/L

Study	Significant/Relevant Findings
Presence of Hazardous Chemicals Known as Endocrine Disrupting Substances in the Philippines by Zenaida B. Catalan and Ben S. Malayang III, 2000	<ol style="list-style-type: none"> 1. Documented cases of human reproductive and developmental deformities or impairments linked by scientists to exposure of humans to Endocrine Disrupting Substances 2. Incidents of human impairments were found in some areas in the country 3. Water bodies in those areas were found to be contaminated with DDT, PCBs, lindane, heptachlor, chlordane, dieldrin, mercury, copper, and cadmium 4. Use of mirex by farmers even though the chemical is not registered by the Fertilizer and Pesticide Authority
Barril and Orillo study on organochlorine residues in 18 commercial milk and one human milk samples, 1979	<ol style="list-style-type: none"> 1. General presence of organochlorine insecticide residues such as aldrin, lindane, chlordane, DDT, heptachlor, and heptachlor epoxide 2. Total organochlorine insecticide residue levels ranged from 1.6 to 7.9 parts per million (ppm) on fat basis 3. All milk samples contained DDT and/or its metabolites, DDE and DDD, with total levels ranging from 0.6 to 5.9 ppm on fat basis (exceeded the permissible level of 1.25 ppm for total DDT in cow's milk as recommended by the World Health Organization) 4. Residues of lindane, aldrin, and chlordane were detected
Ostrea et.al. study on exposure analysis to environmental toxins by meconium analysis in 426 infants from the nurseries of five hospitals in Manila, 2002	<p>Exposure rate and medium concentration of pollutants in the infants contain:</p> <ul style="list-style-type: none"> - Chlordane (12.7%; 22.48 µg/ml) - DDT (26.5%; 12.56 µg/ml) - Lindane (73.5%; 2.0 µg/ml) - Malathion (53.0%, 6.80 µg/ml) - Parathion (32.0%; 2.30 µg/ml) - Pentachlorophenol (16.1%; 90 µg/ml)

2.3.2 ASSESSMENT WITH RESPECT TO ANNEX B CHEMICALS (DDT)

The Philippines has never manufactured DDT. Stocks of this chemical were all imported from other countries even before the 1960s. In 1986, a total of 69.965 MT of DDT was imported. However, it is unknown whether DDT was continuously imported after 1986 as no information was obtained for the succeeding years.

The report on “Inventory of Persistent Organic Pollutants” included a survey of a stockpile of DDT at a DOH regional office. The survey stated that such amount was equivalent to 1,116 kilograms (kg). The same survey also reported that an unknown amount of DDT was disposed of by burial.

By virtue of Fertilizer and Pesticide Authority Pesticide Circular No. 11, Series of 1978, the use of DDT was restricted for malaria control purposes and allowing only the Department of Health to import DDT. Interviews with Malaria Eradication Services of the Department of Health explained that during the early age of malaria infestation, the eradication was accomplished through the use of DDT. The process was called endoresidual spraying. The pesticides were sprayed by the "malaria spreemen" on the different breeding grounds of the malaria-carrying mosquitoes, such as streams, stagnant water, axels of plants, etc.

Dr. Juan Flavier, then Secretary of the Department of Health, ordered the cancellation of the use of DDT in 1992 because of the emergence of permethrin, an alternative for DDT. During the transition from DDT to permethrin, there was a reported increase of malaria cases in the country. However, the sudden increase of malaria cases could not be directly associated with the efficacy of permethrin since it may be attributed to several factors such as the improper handling of permethrins, as the “malaria spreemen” were not yet familiar with the chemical. Apart from permethrins, there are other alternatives to DDT as prescribed by the World Health Organizations.

In July 2003, the Department of Health requested Fertilizer and Pesticide Authority to issue an order for the total banning of DDT.

2.3.3 ASSESSMENT WITH RESPECT TO ANNEX A, PART II CHEMICALS (PCBS)

Production, Importation, and Use

The Philippines was never a producer of PCBs. The main source of entry of PCBs into the country is through importation. PCBs were imported mostly as part of electrical transformers. Relatively small volumes of PCBs were imported and used as capacitors and some were used in industrial applications.

The amount of PCB transformers imported over the years could not be estimated reliably due to the absence of proper records.

As documented in the Inventory of POPs Report under the Philippine Enabling Activity Project, PCB transformers from electrical utilities, manufacturing plants, buildings, etc. are being serviced for refilling and repair by servicing facilities. There are small to medium sized servicing facilities which retrieve the transformer casing and remanufacture it as reconditioned/second hand units, complete with a new label. Oil is filtered when dielectric strength reveals that it is still suitable for reuse. However, in cases of equipment explosion, the oil is generally discarded. Disposal is done either at the site of the electrical facility or transported to servicing or filtering facilities. Based on the telephone directory listing, there are 36 electrical companies engaged in the sale and manufacture of transformers in Metro Manila.

The same study revealed that rural electric cooperatives have disclosed that it is cheaper to buy refilled or reconditioned transformers because it costs 50 percent less than the brand new transformers. The cooperatives added that the existing inventory of transformers only includes information on the location, equipment rating, brand, and status of equipment but not the quality and quantity of the oil. They are sure that the recently acquired transformers are already PCB-free and added that the rest are suspected as PCB-contaminated equipment even if refilled with mineral oil due to the inadequacy of cleaning operations done on the equipment formerly containing PCB oil.

Levels and Trends

The Inventory of POPs was able to cover a total of 8,027 equipment of which 143 or 1.78 percent were positively identified as containing PCB oil while about 98.22 percent are assumed to contain PCB oil and should be subject to further validation and sampling. Out of the total equipment surveyed as part of the study, the electric utility sector has the highest numbers of equipment with PCB oil, followed by the industrial establishments and manufacturing sector. Table 2-11 presents a summary of PCB-contaminated equipment surveyed.

Table 2-11. Summary of Equipment Surveyed

Source Category	No. of Equipment Containing PCB Oil		No. of Equipment Assumed to Contain PCB Oil		Total	
	Units	%	Units	%	Units	%
Electric Utilities	61	42.7	6,650	84.3	6,711	83.6
Commercial Buildings	11	7.7	14	0.2	25	0.3
Industrial Establishments and Manufacturing Plants	49	34.3	200	2.5	249	3.1
Military Camps and Bases	8	5.6	3	0.1	11	0.1
Servicing Facilities	0	0.0	1,017	12.9	1,017	12.7
Hospitals	14	9.8	0	0.0	14	0.2
TOTAL	143	100.0	7,884	100.0	8,027	100.0

Source: Inventory of POPs, Environmental Management Bureau, April 2004

Out of the accounted transformer units, the majority are still in use while the rest are in retrofilling shops. For the capacitors, it was only in the manufacturing sector where PCB use was still reported. The respondents disclosed that because of the relatively shorter estimated lifespan of capacitors than transformers, most of the capacitors and oil circuit breakers in use today are already PCB-free. With the current standard of small-scale retrofilling facilities, it is most likely that the mineral oil used to replace PCB has also been contaminated already. Table 2-12 presents the status of the surveyed transformer equipment.

Table 2-12 Status of Transformer Equipment

Source Category	In Use		Out of Service		For Retrofilling		TOTAL	
	Units	%	Units	%	Units	%	Units	%
Electric Utilities	6,484	97.4	118	66.0	-	-	6,602	84.1
Commercial Buildings	13	0.2	12	6.7	-	-	25	0.3
Industrial Establishments and Manufacturing Plants	150	2.3	35	19.6	-	-	185	2.4
Military Camps and Bases	6	0.1	5	2.8	-	-	11	0.1
Servicing facilities	-	-	-	-	1,017	100.0	1,017	12.9
Hospitals	5	0.1	9	5.0	-	-	14	0.2
TOTAL	6,658	100.0	179	100.0	1,017	100.0	7,854	100.0

Regulatory Enforcement

Recognizing the need for a better management strategy for handling PCBs, the Department of Environment, through the Environmental Management Bureau issued another administrative order (DAO 2004-01), Chemical Control Order for PCB and PCB-Containing Substances in January 2004. This Chemical Control Order provides guidelines for the phase out of the use, sale, and importation of PCB electrical equipment. Under the same order, responsibilities and liabilities for the improper management and handling of PCBs and its wastes has been established. Furthermore, the Chemical Control Order

provides specific requirements for annual reporting, inventory, phase-out, storage, treatment, and disposal.

The scope of this CCO applies to the **importation, manufacture, sale, transfer, distribution** and the **use** of PCBs, PCB equipment, PCB contaminated equipment, non-PCB equipment, PCB articles and PCB packaging in commercial buildings and industrial facilities, including the use and possession by electric utilities and suppliers.

The Chemical Control Order covers those for enclosed applications, partially enclosed applications, and open-ended applications. This CCO also applies to the generation, storage, transport, treatment and disposal of PCB wastes, including those done by contractors, transporters and disposers.

Roles and Responsibilities

The Environmental Management Bureau of the Department of Environment and Natural Resources is responsible for the management of PCBs in the Philippines. However, there are other agencies that have indirect responsibilities in PCB management such as:

- Department of Trade and Industry
- Department of Interior and Local Government through the Local Government Units
- National Electrification Administration
- Philippine Export Zone Authority
- Bureau of Customs of the Department of Finance
- Philippine Coast Guard of the Department of Transportation and Communication
- Philippine Ports Authority
- Department of Health
- Bureau of Working Conditions of the Department of Labor and Employment

Summary of Available Environmental and Health Impact Monitoring Data

Overall, there is limited information on PCB inventories in the Philippines primarily because of the lack of regulatory framework and the lack of approved facility for management and disposal of PCBs. Concentrated PCB oil and contaminated mineral oils used as rinsate in decommissioning transformers in the past have been exported overseas for high temperature incineration. Some of the past studies conducted related to PCB assessment in the Philippines are listed Table 2-13.

Table 2-13 Previous Studies Pertaining to PCBs’ Environmental and Health Impacts

Study	Significant/Relevant Findings
PCB Monitoring Project of EMB at the two former United States military bases at Clark Air Base, Pampanga and Subic Naval Base, Zambales – Weston International, 1997	<ol style="list-style-type: none"> 1. Found 15,000 PCB transformers in Clark Air Base, which was reduced to 60 units in 1992, 24 units in 1993, and 8 units in 2001 2. Recorded 115 units of used electrical transformers that were imported to the country 3. Recorded 325 metric tons of PCB transformers, liquids, and contaminated equipment that were exported to Belgium and Netherlands in 2000

Study	Significant/Relevant Findings
National Power Corporation's Management of PCBs, 1986	<ol style="list-style-type: none"> 1. Significant amounts of indoor transformers used for station service for about 30 years (which are still in good operating condition) 2. PCB is present only in a small capacitor used in the power supply of a control panel in the Philippine Nuclear Power Plant – I 3. Presence of PCBs in indoor transformers used as station service
Sampling and Analysis of PCBs Based on an Inventory of PCB-Contaminated Sites in Clark Special Economic Zone - Asian Regional Research Programme on Environmental Technology-De La Salle University	<ol style="list-style-type: none"> 1. Wagner Aviation site showed high concentration of PCB from the soil 2. Oil obtained from the transformer site of the old chapel indicated alarming concentration of PCB (1,100 ppm Aroclor 1016 and 720,000 ppm Aroclor 1260)
Mussel Watch: Marine Pollution Monitoring of Butylins and Organochlorines in Coastal Waters in Thailand, Philippines, and India – Tanabe, Prudente, et.al., 2000	<ol style="list-style-type: none"> 1. Contamination of organochlorine compounds in green mussels collected along the coastal area of the Philippines during the period 1994-1997 2. Relatively high levels of PCBs (10 ng/g wet weight) were detected at some locations around populated and industrialized cities 3. Chlordane concentrations in the mussels were highest among the various organochlorines analyzed (7 ng/g wet weight), followed by DDT (2 ng/g wet weight) and hexachlorobenzene (<0.1 ng/g wet weight)
Asia-Pacific Mussel Watch: Monitoring Contamination of Persistent Organochlorine Compounds in Coastal Waters of Asian Countries – Monirith, Ueno, Prudente, et.al., 2003	Contamination of persistent organochlorines such as PCB, DDT, and its metabolites, chlordane and hexachlorobenzene were examined in mussels collected from coastal waters in 1994, 1997, 1998, 1999, and 2001

2.3.4 ASSESSMENT OF RELEASES FROM UNINTENTIONAL PRODUCTION OF ANNEX C CHEMICALS (PCDD/PCDF, HCB AND PCBS)

The consolidated dioxins and furans inventory conducted using the UNEP Toolkit for each main source category and sub-category yielded 534.06g toxic equivalent per annum (TEQ/a) as total annual releases to all environmental compartments. Uncontrolled combustion processes emitted the highest levels with 187.05g TEQ/a or 35 percent of the total annual releases. This is followed by power generation and cooking (157.23g TEQ/a), and production of chemicals and consumer goods at 91.56g TEQ/a. Uncontrolled combustion processes was found to be contributing to releases to three environmental media, namely, air, land, and residues. Table 2-14 summarizes the results of the study.

Table 2-14 Philippine National Source Inventory of Dioxins and Furans, 1999

Sector	Source Category	Annual Releases (g TEQ/a)					Total/Sector
		Air	Water	Land	Product	Residue	
1	Waste Incineration	37.8320	0.0000	0.0000	0.0000	3.7188	41.5508
2	Ferrous and Non-ferrous Metal Production	8.6640	0.0000	0.0000	0.0000	1.8884	10.5524
3	Power Generating and Cooking	142.8408	0.0000	0.0000	0.0000	14.3892	157.2300
4	Production of Mineral Products	2.5345	0.0000	0.0000	0.0000	0.0377	2.5722
5	Transportation	0.1158	0.0000	0.0000	0.0000	0.0000	0.1158
6	Uncontrolled Combustion Processes	135.4576	0.0000	46.8578	0.0000	4.7303	187.0457
7	Production of Chemicals and Consumer Goods	0.0000	0.5995	0.0000	77.6398	13.3225	91.5618
8	Miscellaneous (Drying of biomass, green fodder, wood chips, smoke houses, crematoria, smoke houses, dry cleaning residues, tobacco smoking)	0.2301	0.0000	0.0000	0.0000	0.0007	0.2308
9	Disposal/Landfilling	0.0000	43.2016	0.0000	0.0000	0.0000	43.2016
Total		327.6748	43.8011	46.8578	77.6398	38.0876	534.0611

Source: Inventory of Dioxins, Furans, and Dioxin-Like PCBs in the Philippines, January 2003

Releases to air has the highest contribution that totaled 327.67g TEQ/a with 35 percent attributed to uncontrolled combustion of agricultural residues, 30 percent from firewood cooking, and 18 percent from biomass fired boilers sub-categories. Dioxins and furans releases on products and land were estimated at 77.64 and 46.86g TEQ/a, respectively. Lastly, estimated releases in water and residues contributed 43.80 and 38.09g TEQ/a, respectively.

A significant finding is that the major source of dioxins and furans in the Philippines today is the uncontrolled combustion of agricultural wastes.

Regulatory Enforcement

There is no existing mechanism to enforce the provisions of the Clean Air Act and the Solid Waste Management Act, pertaining to the control of unintentional POPs releases. However, there are relevant on-going government initiatives on cleaner production, which includes encouraging the adoption of best environmental practice in industrial facilities and providing guidelines for best available technologies or techniques.

One salient example is the program of the Department of Energy. The Department of Energy is pursuing Renewable Energy as part of its strategy to lessen the country's dependency on imported and polluting fuels. Renewable energy is foreseen to provide up to 40 percent of the country's primary energy requirements over the ten-year period beginning in 2003. Although its share will decline in relation to the total figure, it is estimated to grow at an average annual rate of 2.4 percent in absolute terms. Biomass, micro-hydro, solar and wind will remain to be the largest contributors to the total share of renewable energy in the energy mix with an average share of 27.5 percent. Meanwhile, hydro and geothermal will contribute the balance and continue to be a significant source of electric power.

This thrust of the government to lessen dependency on fossil fuels through renewable energy is a significant strategy (though indirectly) in addressing unintentional POPs – considering that emissions from fossil-fueled facilities are one of the major sources of dioxins and furans. Although biomass in itself is a source of unintentional POPs, this is seen as a better alternative than the uncontrolled burning of agricultural wastes (biomass source) in the farms. The pending bill on Renewable Energy is expected to further boost the move of the government to increase the share of renewable energy in producing power.

In addition, energy supply for the non power sector is also being addressed by the Department of Energy, through its “Alternative Fuels Programs” for the transportation sector. These include: compressed natural gas and use of coco methyl ester and ethanol as fuel additives. In support of these programs, the President of the Philippines issued Memorandum Circular 55 – requiring all government vehicles including government owned corporations to incorporate the use of 1% coco methyl ester in their diesel requirements. On the other hand Senate Bill No. 1677 and House Bill 2583 call for the establishment of a National Fuel Ethanol Program. These programs would reduce unintentional POPs emission from the transport sector.

Roles and Responsibilities

Section 10 of Republic Act 9003 states the role of local government units as Solid Waste Management implementors. The Act states that: “Pursuant to the relevant provisions of RA 7160, otherwise known as the Local Government Code, the local government units shall be primarily responsible for the implementation and enforcement of the provisions of this Act within their respective jurisdictions”.

The Department of Science and Technology and the Department of Energy provide support in identifying and selecting best available techniques and best environment practices that could reduce generation of unintentional POPs.

2.3.5 INFORMATION ON THE STATE OF KNOWLEDGE ON STOCKPILES AND CONTAMINATED SITES

POPs Pesticides Stockpiles

Based on available information, around 21,457 liters of stockpiles of banned, obsolete, and/or unwanted pesticides are currently stored in FPA Regional Warehouses or at facility warehouses. Table 2-15 summarizes the FPA inventory of POPs and other pesticide stockpiles.

Table 2-15 Confiscated Pesticides by FPA In 2001

Pesticide Common Name	Storage Area	Quantity (liters)
Aldrin	FPA Central Office, NCR	2
Chlordane	FPA Central Office, NCR	58
Chlordane	Zuellig Warehouse	58
Other pesticide mixtures	Various FPA warehouses	21,457
DDT	Department of Health Regional Office	1,116 (kg)

Source: Fertilizer and Pesticides Authority, 2001

POPs Pesticides Potentially Contaminated Sites

Information on the existence and extent of contamination attributed to POPs pesticides is very limited. Most are indirectly derived from environmental and health monitoring performed by various sectors. One significant study was done in 1997 by Weston International for the Clark Development Corporation, a former US base facility. Results of the water quality assessment showed that dieldrin was detected above Philippine National Standards/World Health Organization (WHO) standards in four of the 15 operational wells sampled. Dieldrin was also found to be above standards in two of the three sampled back-up wells. The source of dieldrin is uncertain. The wells found contaminated with dieldrin are all found near the golf course. Its presence may be due to the breakdown product of a related pesticide, aldrin. Either aldrin or dieldrin may have been applied at the golf course to control insects. Results of the assessment of soil quality showed aldrin and alpha-BHC levels exceeding US EPA Region III-Risk Based Concentration criteria (RBC) in various sites of the former base. Lastly, chlordane and heptachlor were detected with concentrations exceeding the RBC residential criteria (Weston Study, 1997).

PCB Hot Spots and Contaminated Sites (PCBs)

As documented in the study, “Inventory of Persistent Organic Pollutants”, areas where early urbanization took place such as Metro Manila or the National Capital Region (NCR) and Metro Cebu, have the greatest number of suspected PCB transformers. NCR registered the highest quantity of accounted PCB. Region 4, where most of the electric cooperative respondents are located, ranks second. Third is Region 3, where the former United States military bases (Subic and Clark) were located.

Old buildings and manufacturing facilities in existence in the area still have some PCB transformers. Likewise, information gathered from respondents revealed that equipment for retrofilling and repair are brought to Metro Manila. The same probability may hold true for other old urban and industrial areas in Cebu and Davao City.

The findings of the PCB inventory indicate that potential hot spots are:

- Electric utilities
- Old industrial plants
- Transformer servicing facilities

Electric utilities are the significant sources of PCBs. Some of the facilities have open areas for transformer repair and storage where traces of oil contamination on soil were found. Sampling of the soil is necessary to confirm PCB contamination.

Some of the industrial plants which existed before the 1980s were found to be using transformers containing PCBs. Most of these facilities are located in the metro cities such as Metro Manila and Cebu where early urbanization and industrialization occurred. Some of those interviewed even disclosed that refilling of transformers are conducted on-site and that PCB oil was just thrown on the ground during repair and maintenance of the equipment.

Transformer servicing facilities are contracted by industrial plants and electric utilities for the filtering of oil to increase dielectric strength and for repair and maintenance of equipment. These facilities are also engaged in the decommissioning of equipment for processing into second hand transformer units. Servicing facilities visited were not properly decontaminating the equipment. Filtering machines that were previously used for PCB equipment are also used for filtering mineral oil, thus, potentially resulting in the spread of contamination of PCB. Moreover, residues are just thrown on-site and into drains and canals, thus, contaminating soil and nearby waterways.

Several investigative studies have been conducted in the past on the identified potential hotspots for PCBs. The US-based Weston International study has reported significant levels of PCBs in the main zone of the former US military base. Meanwhile, as part of the decommissioning of the former Rockwell Power Plant in Makati City, PCBs and PCB-contaminated materials were excavated and transported for encapsulation to the Meralco warehouse at Barangay San Joaquin, Pasig City. Furthermore, a study conducted by Tanabe, Prudente, et.al in 2000 on green mussels collected along the coastal area of the Philippines during the period 1994-1997 revealed relatively high levels of PCBs (10 ng/g wet weight) at some locations around populated and industrialized cities. Chlordane concentrations in the mussels were highest among the various organochlorines analyzed (7 ng/g wet weight), followed by DDT (2 ng/g wet weight) and hexachlorobenzene (<0.1 ng/g wet weight).

PCBs Stockpiles

Based on the study, "Inventory of POPs in the Philippines", a total of 2,401 tons PCB oil and 4,479 tons of PCB equipment (dry weight) were accounted. The bulk of PCB equipment is with the electric utilities, comprising of 1,309 tons PCB oil and 2,788 tons of equipment (dry weight). About 95.0 % of the PCB oil accounted for this industry is assumed PCB while 5.0% of the oil was positively identified as PCBs. Approximately 19% of the assumed PCB oil from the electric utilities is stored in drums (Table 2-16).

Table 2-16 Summary of PCB Stockpile

Industry Category	PCB Oil (Kg)	Equipment Dry Weight (Kg)	Total Weight
Electrical Utilities and Cooperatives	1,620,310	2,788,040	4,408,350
Commercial Buildings	34,723	83,454	118,177
Industrial Establishments and Manufacturing Plants	525,399	1,098,726	1,624,125
Military Camps and Bases	3,516	8,204	11,720
Servicing Facilities	191,397	445,121	636,518
Hospitals	25,215	55,191	80,406
Total	2,400,560	4,478,736	6,879,296

Relevant Regulations

The basic policy framework addressing contaminated sites is the Republic Act 6969 – Toxic Chemicals and Nuclear and Hazardous Wastes Act of the Philippines. However, the Act and its implementing rules and regulations (DAO96-29) do not include specific guidelines for the identification, classification and/or remediation of contaminated sites, and as such could not be enforced. Although, it mandates the generator to manage hazardous wastes from a cradle to grave approach, implementation procedures are not provided. There is however, a pending bill in the House of Congress, amending the Republic Act 6969 to provide more specific guidelines on hazardous wastes management, specifically disposal of hazardous wastes and management of contaminated sites.

2.3.6 SUMMARY OF FUTURE PRODUCTION, USE, AND RELEASES OF POPS (REQUIREMENTS FOR EXEMPTIONS)

The decision on DDT, whether to totally ban or request for exemption, is held in abeyance pending the final decision coming from the Fertilizer and Pesticide Authority. The Department of Health, the sole agency allowed to import DDT however banned its use in the eradication of malaria. The specific activities are outlined as part of the strategies and action plans discussed in Chapter 3 of the National Implementation Plan.

A number of chemicals that are currently tagged as future POPs are currently used in the country. These are presented in Table 2-17.

Table 2-17 Chemicals that Maybe Potentially Classified as POPs

Name of Chemicals	Uses	Users	Regulatory Status
Lindane	<ul style="list-style-type: none"> – Soil conditioner in pineapple plantations – Treatment of scabies 	<ul style="list-style-type: none"> – Pineapple and Sugarcane plantations – Scabies patients 	Restricted to pineapple plantations and to soil pre-plant applications
Endosulfan	<ul style="list-style-type: none"> – Molluscide for the control of golden snail, a pest prevalent in rice fields 	<ul style="list-style-type: none"> – Farmers 	Restricted – with concentration limited to 5% or lower
Pentachlorophenol	<ul style="list-style-type: none"> – Industrial wood preservative for utility poles, cross arms, fence posts, and similar structures 	<ul style="list-style-type: none"> – Sawmills – Creosoting facilities 	Severely restricted to wood treatment only by FPA accredited wood treating plants and institutions
Atrazine or phthalate esters	<ul style="list-style-type: none"> – Plasticizers, insect repellent 	<ul style="list-style-type: none"> – Plastics manufacturing facilities – Pain manufacturers 	No restriction of use
Organotin compounds	<ul style="list-style-type: none"> – Antifouling paints, plasticizers, fungicides, herbicides and etc. 	<ul style="list-style-type: none"> – Plastics industry – Manufacturers of polyurethane foams – Farmers 	Banned from all uses in agriculture
Organolead compounds	<ul style="list-style-type: none"> – Petrol additive 	<ul style="list-style-type: none"> – Petrochemicals 	Banned per Clean Air Act of the Philippines
Polybrominated diphenylethers	<ul style="list-style-type: none"> – Flame retardants on foam 		No restriction of use
Nonyl and octyl phenols	<ul style="list-style-type: none"> – Cleaners, surfactants 		No restriction of use
Short-chain chlorinated paraffins	<ul style="list-style-type: none"> – Plasticizers 	Plastic manufacturing facilities	No restriction of use

2.3.7 EXISTING PROGRAMS FOR MONITORING RELEASES AND ENVIRONMENTAL AND HUMAN HEALTH IMPACTS

Monitoring releases to the environment is a primary function of the Department of Environment and Natural Resources, through its Environmental Management Bureau. Monitoring impacts to human health is the function of the Department of Health. Due to the required resources needed in the conduct of regular monitoring for POPs, this activity is performed only on limited basis. Similarly, other national government agencies and the academe perform research and monitoring on POPs depending on existing foreign-funded monitoring activities.. Table 2-18 shows the current monitoring activities of various government and non government agencies.

Table 2-18 Monitoring Programs

Agency	Relevant Function to POPs Monitoring	Monitoring Programs/Activities
Research and Development Division – Environmental Management Bureau	<ul style="list-style-type: none"> Mandated to monitor environmental quality changes, the development of environmental standards, conduct of policy research and scientific experiments for research purposes, and the preparation of project proposals. Has been performing various environmental monitoring geared towards research. 	Metal and Pesticides Monitoring in selected water bodies, which they refocused to POPs pesticides and expanded to include PCBs.
Bureau of Plant Industry – Department of Agriculture	<ul style="list-style-type: none"> Protection of agricultural crops from pests and diseases Recommend plant quarantine policies and prescribe rules and regulations for the prevention, control, and eradication of pests, diseases, and injuries to plant and plant products Ensure safe supply of fresh agricultural crops and promote its export 	Pesticides residues in agricultural crops
Environmental and Occupational Health Office – Department of Health	<ul style="list-style-type: none"> Conduct research on the effect of environmental pollution to public health Has been actively involved in pursuing health risk/impact studies of toxic chemicals or POPs chemicals in particular. 	<ul style="list-style-type: none"> Health Impact of Toxic Chemicals In 1996, together with the World Bank and other Philippine agencies, collaborated for an assessment study on “Philippine Environmental Health Study” to provide the Government with an appraisal of the nature of the impact of environmental pollution on human health and its dimensions.
Industrial Technology Development Institute of the Department of Science and Technology	<ul style="list-style-type: none"> Its functions include: tests and analyses, technology development and assessment, calibration and metrology, setting of measurement standards, repair and design of apparatus, and providing technical services. Has initiated several activities pertaining to POPs. 	Inventory of POPs Monitoring level of POPs in breast milk (project-based)
Bureau of Food and Drugs	<ul style="list-style-type: none"> Mandated to be a policy formulating and sector-monitoring arm of the Department of Health on matters pertaining to foods, drugs, cosmetics and household hazardous substances. Its mission is to ensure the safety, efficacy, purity and quality of processed foods, drugs, diagnostic reagents, medical devices, cosmetics, and household hazardous substances through state-of-the-art technology, as well as the scientific soundness and truthfulness of product information for the protection of public health. 	Monitoring of chemical residues on food (case to case basis)

Agency	Relevant Function to POPs Monitoring	Monitoring Programs/Activities
Occupational Safety and Health Center – Department of Labor and Employment	<ul style="list-style-type: none"> • Mandated to protect Filipino workers against accidents and illnesses and to promote workers’ welfare through effective programs that enhance productivity, workers well being, and afford social protection to its client sector. • One of its function include the continuing studies and researches on occupational safety and health 	Monitoring workers’ health and safety
Poison Control Center, University of the Philippines	<ul style="list-style-type: none"> • A government agency under the Philippine General functioning as the monitoring arm of the country for poison cases 	Poison cases
Asian Regional Research Programme on Environmental Technology – De La Salle University	<ul style="list-style-type: none"> • Aims at conducting research on environmental issues relevant to Asia. The issues covered include wastewater, solid waste, air pollution, and hazardous waste. • Recognized as the National Research Institute on Industrial and Hazardous Wastes and is tasked to conduct studies on PCBs 	Monitoring traces of PCBs in selected areas (project –based)

2.3.8 KNOWLEDGE AND AWARENESS LEVEL

Generally, the level of knowledge and awareness among all the stakeholders on POPs is relatively low. Although, there are a number of initiatives done by both government and non-government organizations to increase the level of knowledge and awareness among the various stakeholders, a number of POPs management issues are rooted to either lack of knowledge or low level of awareness.

The Philippine Enabling Activity project produced a Communication Plan based on the perceived needs of the country. The said study has documented the existing endeavors pertaining to increasing the knowledge and awareness of various stakeholders in POPs management. These are shown in table 2-19.

Table 2-19 Information, Education, and Communication Activities of Various Agencies

Implementing Agency	Goals/Activities
Integrated Pest Management (IPM)/ Department of Agriculture	<ul style="list-style-type: none"> • Adopted as a national strategy for promoting sustainable agriculture and rural development • Aims to empower farmers to become effective managers and decision makers. Its objective is to be able to grow a healthy crop with the least disruption of the agro-ecosystem. Thus, it encourages natural pest control mechanisms and reduced pesticide usage and dependency. • The information education, and communication component of IPM includes training of farmers in season-long Farmer Field Schools. From May 1993 to May 1996, Kasakalikahan had trained close to 50,000 farmers in 36 provinces.
Technology Demo Project Food and Agriculture Organization	<ul style="list-style-type: none"> • Started in 1984 with the establishment of the first techno demo area on the proper use of pesticides in Candaba, Pampanga and Baliuag, Bulacan through the Agriculture Training Institute of the Fertilizer and Pesticide Authority and the Bureau of Food and Drugs. • As a result of these early efforts, the Food and Agriculture Organization considers the Philippines as one of the more advanced among Asia Pacific countries in terms of eliminating the nine POPs pesticides.
Farmers Field School Fertilizer and Pesticide Authority	<ul style="list-style-type: none"> • Conducted mostly on site with only 20 percent theory • Field activities include: every morning counting of insects and determination of the occurrence of diseases • Teaches farmers when to use and when not to use pesticides and recommends the use of pesticide only as a last resort. It runs every Saturday for almost one semester. • Supported by agri-technicians of the Local Government Units and from pesticide manufacturers and companies.
Pesticide Safety Awareness Symposium for Farm Women, sponsored by the Japan International Cooperation Agency Fertilizer and Pesticide Authority.	<ul style="list-style-type: none"> • Aimed to enhance the awareness of at least 500 farmwomen in three to five agricultural areas in the country of the importance of safe and judicious use of pesticides for safer farming practices and increased consumer vigilance concerning food safety. • Audience was primarily farm women, with ages ranging from 18 to 65, coming from provinces where the use of pesticides are relatively high and where participation of women in farming is found to be significant. Secondary audience consisted of agricultural technicians, barangay officials, non-government organizations, teachers, and other opinion leaders. • The provinces where the symposium was conducted were: Benguet (26 June 2002), Cebu (28 June 2002) and Davao del Norte (2-3 July 2002). Other provinces for future symposium are Leyte and Bukidnon.
Other Information, Education, and Communication Activities/ Fertilizer and Pesticide Authority	<ul style="list-style-type: none"> • Information campaign on the safe and judicious use of pesticides emphasizes that pesticides are toxic and poisonous. It stresses that if ever pesticides are to be applied, protective clothing should be used. Audiences of the campaign are not only farmers but also elementary students and their parents in selected areas of the country. • Conducts seminars and field campaigns as part of its product stewardship program, which it implements • Produced several brochures and some comics on the safe use of pesticides. • Other activities: 1) Information Campaign Caravan; (2) Pest Control Diary-Keeping Campaign; (3) Women Awareness Campaign; (4) Children Awareness Campaign; and (5) Distribution of information materials

Implementing Agency	Goals/Activities
Information, Education, and Communication Efforts Environmental Management Bureau	<ul style="list-style-type: none"> • Developed, produced, and distributed informative flyers and brochures on POPs. • Joined in the Partnership for Clean Air on topics related to or touching on POPs and solid waste

Source: Public Awareness and Information Campaign, Environmental Management Bureau, 2004

IEC and other related activities done by various non-government organizations are discussed in Section 2.3.9.

Table 2-20 presents the types of messages that various groups promoting alternatives to POPs use, such as sustainable agriculture, ecological solid waste management, and cleaner production, are using in their IEC programs.

Table 2-20. Types of Messages Used by Various Groups on POPs

“Alternative Group”	Message to Consumers	Message to Producers	Message to Government
Sustainable Agriculture	Pesticides contaminate food. Stay healthy, buy organic or pesticide-free food.	Farming is not just a means of livelihood, it is a way of life. Think of your family’s safety and think of the long-term gains of a healthy environment. Think Food security. Think happy family!	<ul style="list-style-type: none"> • Our soil is degrading; pesticides do not give our farms sustainable yields. • We need a national program on sustainable agriculture. • We need research and extension services. • AR Now! No to GMO!
Ecological Solid Waste Management	Dioxins and furans are carcinogenic. Do not burn plastics. Use clean fuels. Reduce, reuse, and recycle!	You are responsible for the waste packaging you produce. Buy back your product packaging. Minimize your packaging	<ul style="list-style-type: none"> • Let us work together in implementing the ESWM Act! • We will do our part, do yours! • No to Incineration! Use non-burn technologies!
Cleaner Production	Help protect the environment, patronize socially responsible companies!	Green Business is profitable business.	<ul style="list-style-type: none"> • We are willing to undertake CP measures but we need policy/measures and incentives to make it work. • Paging DOE, DOST, DTI, DENR!

Source: Public Awareness and Information Campaign, Environmental Management Bureau, 2004

Despite the on going IEC activities, a number of concerns and gaps on POPs are still rooted to low level of knowledge and awareness. These are¹:

- **Awareness of policy makers.** The POPs issue in the priority agenda of policy makers and planners. One issue is whether the national and local legislative, regulatory, and enforcement agencies are fully knowledgeable and aware of POPs management to enable them to craft effective policy and legislations
- **Disclosure of suppliers.** One gap pertains to the responsibility of suppliers of POPs and related products. The current laws and their implementing rules, regulations, and guidelines define the supplier's responsibility of promptly informing regulatory authorities of any new information on risks from its products. But the penalties for failure to disclose such information are not clearly defined
- **Lack of advertising responsibility of pesticide companies.** Some pesticide companies undertake intensive promotions and advertising of their products, which enhance dependence of farmers on pesticides for crop protection. Their claims for good harvest are seldom supported by technical information that the buyers can verify. The usual reason given not to disclose such necessary information is confidentiality of trade secrets.
- **Lack of neutral source of information on POPs.** Much of the information on POPs pesticides has come mainly from their suppliers. There is virtually no information available to the public on emitted dioxins and furans and used PCBs. A neutral source of information is necessary to ensure correct disclosure of information. Regulatory agencies need to strengthen their capabilities to provide such information. They must ensure that the public that needs their protection is fully informed of risks associated with POPs and other chemicals.
- **Gaps in knowledge, awareness, and practices by farmers.** Farmers often lack accurate knowledge about pests and their control. They usually obtain their knowledge from pesticide sales agents, government technicians, other farmers or neighbors, pesticide labels, and media. While aware that pesticides are hazardous, they often lack awareness of the risks of exposure. While Integrated Pest Management has been successfully implemented for rice, pesticide use in vegetable growing continues to increase. Often farmers do not use protective equipment when using pesticides, or use it improperly. It is a fact that protective equipment does not reduce pesticide contamination unless it is used and maintained properly. The farmers also have limited knowledge or appreciation of the problem of disposal of excess or old pesticides or used containers. Most handlers use backyards or open fields for disposal purposes or nearby water bodies. At present, there is no authorized major facility in the country for proper disposal of toxic and hazardous wastes.
- **Scarcity of information.** Little reliable information is available on the amount, types or location of use, particularly illegal use, of POPs. Information on the status of stockpiled POPs is similarly scarce and difficult to access. Where such information exists, it is usually piecemeal or only accessible to a few individuals within industry and government. This basic lack of knowledge of what, where, and how POPs are used and stored is a major obstacle to the elimination of POPs. This issue was addressed in part by the parallel project of the EMB on inventory taking of POPs.
- **Need for local epidemiological studies and lack of proper documentation.** Currently, health-risk assessment of human exposure to pesticides is mainly based on data from experiments on animals.

¹ Public Awareness and Information Campaign, Environmental Management, Bureau, 2004

Little information is available on human beings although there have been actual cases of human exposure. The need for epidemiological studies is also heightened by the fact that application methods and worker protection, poorly addressed in developing countries, may result in operators being dangerously exposed when using products not subject to any significant restrictions in industrialized countries.

2.3.9 OVERVIEW OF TECHNICAL INFRASTRUCTURE FOR PERSISTENT ORGANIC POLLUTANTS

This section provides an assessment of the technical infrastructure for POPs monitoring, research and development, and capacities for liquidating POPs in the Philippines.

Monitoring

The Environmental Management Bureau and Fertilizer and Pesticide Authority are tasked with monitoring POPs generation and emissions. Both agencies have trained technical personnel to conduct environmental monitoring. However, they lack the technical infrastructure in terms of performing the actual measurements and analysis of POPs.

The Environmental Management Bureau, in particular, does not have the equipment to monitor unintentional release of POPs. For PCB monitoring, the United Nations Development Programme through the Global Environmental Facility was able to provide EMB with training and PCB test kits that can determine the levels of PCB in oil. The test kits, however, only give an indication of whether the oil has more than 50 milligrams per liter of PCB.

The Fertilizer and Pesticides Authority utilizes the laboratory of the Bureau of Plant Industry for its analytical requirements.

The Philippine Clean Air Act provides for emission standards for dioxins and furans. As stated earlier, the Environmental Management Bureau does not have the capability to monitor these types of POPs. Likewise, industries, including both government and private laboratories, do not have the ability to monitor dioxins and furans. Both Environmental Management Bureau and industries rely on foreign laboratories to collect and analyze samples for dioxins and furans. These foreign laboratories are based in Singapore, Australia, Japan, and Belgium.

For the Philippines to develop its technical infrastructure on POPs assessment, measurement, and analysis, human resources must be trained on these equipment.

Research in the Area of POPs in the Philippines

Aside from academic institutions (including state colleges and universities), government organizations have research and development agencies that may be capable of conducting research in the area of POPs in the Philippines. Among the government agencies that have the capacity and mandate to conduct research and development work related to POPs are the following:

- Research and Development Division of the Environmental Management Bureau/Department of Environment and Natural Resources
- Ecosystems Research and Development Bureau of the Department of Environment and Natural Resources
- Industrial Technology Development Institute of the Department of Science and Technology

- Bureau of Food and Drug Administration of the Department of Health
- Bureau of Plant Industry of the Department of Agriculture
- Occupational Health and Safety Center of the Department of Labor and Employment

These organizations have technical staff that not only have the academic background but also the experience and training on conducting research and development work. Unfortunately, as described in the preceding section, their laboratories are not equipped to measure and analyze POPs.

Capacities for liquidating of POPS in the Philippines

The Philippine enabling activities to meet its obligations under the Stockholm Convention on POPs, particularly the initial inventory of POPs, revealed that the country currently has no sufficient means for liquidating POPs. The initial inventory showed that current stockpiles of obsolete POPs pesticides and PCB contaminated equipment are still potentially present in the Philippines. The report on the inventory stated that *there would be a need to dispose or destroy these stocks*.

Large companies such as a beer brewery and an electrical utility company disposed of their PCB stockpiles by exporting their wastes to Europe. However, due to the prohibitive cost of this method, majority of PCB contaminated equipment in most electric companies are still within their premises.

It should also be noted that the same electric utility company that exported some of its PCB contaminated equipment also buried and immobilized PCB contaminated soil in one of their compounds. The buried contaminated soil is subject to monitoring by the Environmental Management Bureau to ensure that PCB will not leach out of its containment.

The same initial inventory activity reported that retrofilling of transformers with PCB oil is still being practiced in the country.

A method for hazardous waste disposal gaining recognition in the Philippines is the co-processing of these wastes in cement kilns. The Environmental Management Bureau organized a technical working group specifically tasked to draft the legal and technical guidelines for co-disposal in cement kiln. In 1997, an agricultural company entered into a cooperation agreement with the Environmental Management Bureau, the Industrial Technology and Development Institute, and a cement manufacturer to dispose of their low efficacy herbicide in a cement kiln. The same cement manufacturer is currently conducting studies to determine their compliance to dioxin and furan emissions when introducing pesticide wastes into their kiln.

If the use of this method continue, consideration will need to be given to the requirements for complying with the best available techniques/best environmental practice (BAT/BEP) guidance of the Stockholm Convention: the Advance Draft (December 2004) on the Guidelines on BAT and Provisional Guidance on BEP Relevant to Article 5 and Annex C of the Stockholm Convention on POPs. The guidance document has a specific section (V.B) on cement kilns firing hazardous waste.

Given this present situation on the technical infrastructure, the Philippines may not have the sufficient technological capacity for the liquidation of POPs stockpiles, including POPs identification and assessment of contaminated wastes, soils and sediments.

Best Available Techniques and Guidance on Best Environmental Practices

Since 1990, various government agencies in the Philippines have published best available techniques BAT/BEP guidance for various industry sectors. However, most of these BAT and BEP guidance documents were not focused on reducing the usage and releases of POPs. These documents were intended to address more general issues on pollution prevention, cleaner production, energy efficiency, and waste treatment.

The Department of Environment and Natural Resources, through the Industrial Environmental Management Project, produced pollution management guides for ten (10) industry sectors. The guides included discussions on industry profiles, waste generation and characteristics, waste minimization options, and financial evaluation of these options.

The Department of Science and Technology also developed industrial pollution prevention and control guidelines for industries to help them reduce their pollution generation and treat any residuals. The said department is also currently addressing the management of plastics residual wastes from municipal solid wastes through research and development and compiling these in a manual. It should be noted that one of the prevailing (but illegal) practice of disposing plastics wastes in the country is by burning. In addition, the Department of Science and Technology has cleaner production and energy efficiency guidelines to reduce energy consumption. Although reduced energy consumption may lead to reduction in the release of unintentional POPs, these guidelines did not mention this beneficial impact.

The Development Bank of the Philippines also published environmental management guidebooks for manufacturing and service sectors. The purpose of these guidebooks is to orient bank account executives and potential clients on the benefits of properly managing environmental impacts. The guidebooks also provide a chapter on environmental management systems. Similar to the Department of Environment and Natural Resources and the Department of Science and Technology guidance documents, the Development Bank of the Philippines' outputs made no mention of POPs reduction in usage or release.

The Department of Energy is actively pursuing a renewable energy program. As opposed to conventional energy sources, renewable energy sources may not have the precursors of unintentional POPs releases. Some of these energy sources do not even require combustion. The said department promotes the usage of methyl esters and ethanol to fuel the transport industry. These renewable energy fuels do not contain chlorine, a key precursor for dioxin and furan formation.

The Department of Agriculture and Department of Health are currently promoting integrated pest management and integrated vector management, respectively. Both the integrated pest management and integrated vector management were promoted for health and environmental protection reasons but not necessarily related to POPs. However, with the issue of POPs, both agencies expanded the coverage of these management schemes to highlight the reduction in usage and release of POPs.

The publication of these guidance documents and activities show that the country has the technical capability to promote BAT/BEP given the resources.

2.3.10 ACTIVITIES OF NON GOVERNMENT ORGANIZATIONS

Various non government organizations are actively involved in POPs management in the areas of monitoring, information, education and communication, and special studies. Table 2-21 summarizes the activities of the relevant non government organizations:

Table 2-21 Summary POPs Activities Conducted by NGOs

Non Government Organizations	Goals/Activities
Pesticide Action Network (PAN) and International POPs Elimination Network (IPEN)	<ul style="list-style-type: none"> • A global public interest NGO network with more than 350 participating organizations in 65 countries and in all regions • Formed in 1998 during the first POPs Intergovernmental Negotiating Committee (INC) meeting • Its member groups collaborated to advance the common goal of creating a strong and effective POPs treaty • In May 2004 began a global NGO project called the International POPs Elimination Project (IPEP) in partnership with UNIDO and UNEP, with core funding from GEF.
Health Care Without Harm	<ul style="list-style-type: none"> • An international coalition of 440 organizations in 52 countries working to transform the health care industry so it is no longer a source of harm to people and the environment • Works to eliminate the dangerous practice of incineration, as well as to minimize the amount and toxicity of all waste generated by the health care sector • Has published several reports, including “Non-Incineration Medical Waste Treatment Technologies” • In 2004, teamed up with the Department of Health to demonstrate the possibility of safely disposing 19.5 million syringes used to immunize about 18 million children without burning them • Currently involved in a GEF/UNDP project with the Department of Health that will promote best practices in reducing medical waste to prevent environmental release of dioxin and mercury
Cavite Green Coalition	<ul style="list-style-type: none"> • A Cavite-wide NGO network dedicated to the protection and defense of the natural and living environment of the people • Officially launched on 7 February 2001 and is undertaking a project under the International POPs Elimination Project to raise awareness about the dangers of incinerator plants and the hazards of POPs, and provide information about alternative non-burn technologies for treating health care waste. • In January 2005, the group, together with other sectors, collected eggs from free-range chickens near a waste incinerator to have them screened for dioxins and other POPs.
Ecological Waste Coalition Of The Philippines	<ul style="list-style-type: none"> • Network of community, church, school, environmental and health groups and movements dedicated to the pursuit of ecologically sustainable and socially just solutions to managing discards. • Runs a campaign against POPs-producing waste facilities such as dumps and incinerators, and for Zero Waste alternatives. • Working with the Department of Tourism in promoting Zero Waste, and with the Philippine SEA Games Organizing Committee in making the 23rd SEA Games waste-free.
Global Alliance For Incinerator Alternatives / Global Anti-Incinerator Alliance	<ul style="list-style-type: none"> • Public interest NGO network of some 500 groups and individuals from the Philippines and 76 other countries • A participating group of IPEN, advocates the phase out of POPs-releasing incinerators and their replacement with Zero Waste resource management systems, clean production and other sustainable approaches to managing chemicals and discards • Since 2002, has been organizing the Global Day of Action on Waste and Incineration.

**FINAL - NATIONAL IMPLEMENTATION PLAN FOR
STOCKHOLM CONVENTION ON POPs**

Non Government Organizations	Goals/Activities
GREENPEACE	<ul style="list-style-type: none"> • An independent and non-political organization campaigning to ensure a just, peaceful and sustainable environment using non-violent direct action • Focuses on six campaign areas such as climate, oceans, toxics, nuclear power, forests and genetic engineering • Promotes the implementation of clean production strategies and ecological, non-incineration alternatives to waste management and disposal • Currently working on “greening” the electronics industry, and is part of the non-combustion demonstration project for the destruction of stockpiled PCBs.
Health And Environmental Alliance, Toxics	<ul style="list-style-type: none"> • Formed to support and help facilitate effective engagement by public interest nongovernmental organizations in global, regional and national efforts to promote chemical safety • Its website provides resources on POPs. Examples of community monitoring of health and environmental impacts of toxic chemicals are also furnished.
Mother Earth Foundation	<ul style="list-style-type: none"> • Seeks to realize man's oneness with Infinite Life in a healed and renewed earth primarily through environmental education and training • Conducts workshops on ecological waste management, and works with communities in establishing Material Recovery Facility to render waste incinerators and landfills unnecessary • A member of IPEN, this organization incorporates the problems with dioxins in the workshops they conduct with various audiences.
People’s Task Force For Bases Cleanup	<ul style="list-style-type: none"> • Deals with the toxic legacy of the former US military facilities in Pampanga and Zambales • Currently, doing a community health assessment under IPEP in a POPs-contaminated area in an Aeta community identified as PCB-contaminated site
International Rice Research Institute (IRRI)	<ul style="list-style-type: none"> • At IRRI, pesticide applications are confined to select experimental tests associated with weed control and integrated pest management. IRRI emphasizes IPM and recommends it as the preferred approach to pest management, not just in its experimental farms but also in all of Asia’s rice ecosystems. • Numerous international award-giving institutions have recognized IRRI’s efforts on IPM, especially its successful communication program on IPM in the Mekong Delta region of Vietnam.
Center for Alternative Development Initiatives (CADI)	CADI uses the biodynamic approach to sustainable agriculture. CADI managed to provide a limited but steady supply of organic products in Metro Manila. It has also successfully engaged farmer cooperators in at least three provinces (Iloilo, Cotabato and Zambales).
AGTALON	AGTALON embarked on Low External Input and Sustainable Agriculture or LEISA campaign to promote pesticide-free and low-cost but high quality bioorganic fertilizers in rice production. The campaign also included a financial and marketing assistance package as an economic incentive.
SIBAT	Some farmer groups are under the network called SIBAT or “Wellspring of Science and Technology, ” which is engaged in sustainable agriculture activities.
MASIPAG	Promotes sustainable agriculture to about 20 sites in 15 provinces in Luzon, Visayas and Mindanao. MASIPAG is a multisectoral coalition where farmers are also key decision makers. The network’s program includes collection, identification, multiplication, maintenance, evaluation, and hybridization of rice; alternative pest management, diversified farming, farmers training, and project benefit monitoring and evaluation.
CropLife Philippines	The leading trade association of agricultural chemical businesses in the country. CropLife spearheads the efforts of making available the different types of crop protection products. Its primary mandate includes the manufacture, importation and sales to distributors or end-users of these products. Composed of 19 members,

Non Government Organizations	Goals/Activities
	<p>CropLife's vision is to ensure better harvest, health and environment through the proper use of agricultural chemicals.</p> <p>CropLife works together with the Fertilizer and Pesticides Authority, a government regulatory and licensing body that oversees the distribution of crop protection products.</p>
Chemical Industry Association of the Philippines (SPIK).	<p>With 64 member industries from the chemical industry sector, SPIK is not only concerned with activities to promote the chemical industry within the country but with the ASEAN region as well. One of its first projects was the organization of the ASEAN Chemical Industries Club for the coordination of efforts by the chemical industry in the region. They spearhead the Responsible Care Program in the Philippines.</p>
Pollution Control Association of the Philippines	<p>An organization of companies and individuals with the mission of becoming an active partner with government and other agencies in institutionalizing environmental preservation and compliance. It is the only non-government organization represented in the Pollution Adjudication Board (PAB) of the DENR.</p>
Philippine Business for Environment (PBE)	<p>Incorporated in January 1992 to assist Philippine businesses address environmental issues and concerns. Specifically, PBE is involved in environmental enhancement projects; education and awareness; promotions of clean technology and sound environmental management; and intermediation between communities, business, and government in environmental issues. Among other things, PBE serves as intermediary between business, government, and the community in establishing reasonable standards and policies that reflect balance between the country's economic goals and environmental concerns and a databank of environmental resources that can be tapped by the business sector.</p>
Management Association of the Philippines (MAP)	<ul style="list-style-type: none"> • Leading association of more than 750 top executives in business and some government agencies and non-governmental organizations. • Published various IEC materials, such as the "Best Environmental Management Manual", with funding from the US-Asia Environmental Partnership Program and the photo book "Our Environment Today", published together with the AIJC with funding from the Canadian Government, Kodak Philippines and businessman Atty. Romeo Roxas. The MAP Environment Committee also publishes latest developments on the environment, including on POPs recently, in both the Philippine Daily Inquirer and the monthly MAP Newsletter.
Philippine Chamber of Commerce and Industry	<p>A non-government organization of SMEs, local chambers, and industries. It is a voluntary organization composed of business enterprises, chambers of commerce, and industry associations nationwide. Its objective is business growth and promotion. It serves as the single voice of Philippine businesses and as a critical catalyst in building globally competitive businesses and in strengthening local chambers and affiliated business associations. It achieves its vision and mission through focused advocacy for business growth, strategic business services, and national/international business networking resulting in sustainable economic growth for the long-term benefit of our businesses and people.</p>

2.3.11 SOCIO ECONOMIC ASSESSMENT

This section presents the impacted populations or environments, estimated scale, magnitude of threats to public health and environmental quality and social implications for workers and local communities.

The Philippines is one of many countries that import various industrial chemicals for its use and production. Most of its hazardous wastes generated are exported for disposal or treatment while others are either treated or temporarily stored on site.

Pollution caused by the chemicals industry is perceived as a serious threat in the country, as well as in other countries, where the quality of life of its citizens hitherto is measured in terms of growth in GDP. This economic indicator is now deemed an inappropriate measure of economic development. While GDP measures market activity reasonably well, it has been criticized for its neglect of non-market value added. More importantly, since GDP does not consider depreciation of man-made capital and also leaves out the degradation of “natural capital”, it is an inaccurate measure of true, sustainable income.²

The total ecological burdens caused by pollution need to be considered in national income accounting to arrive at a growth and development indicator that may now be construed a true measure of the quality of life. They also have to be assessed if sustainable development and policy options are to be formulated for the sound management of toxic chemicals.

The continued production and consumption of pesticides and related chemicals have brought unprecedented awareness on the pressures that these toxic chemicals may impact health and the environment. Said impact may show itself in two ways: (a) measurable change in production/productivity; and (b) measurable change in environmental quality.

The weight of scientific evidence on the hazards associated with POPs strongly suggests that overexposure to certain POPs can cause serious immune and metabolic effects, neurologic defects, reproductive anomalies, cancer, and other abnormalities in both humans and animals. Table 2-22 qualitatively summarizes the detrimental environment and health impacts of POPs. In the Philippines, no studies have been done to value these impacts. Their respective status in terms of usage in the country is also given in the same table.

Table 2-22 Health Impacts of POPs Chemicals and Current Status in the Philippines

POP Chemical	Environment/Health Impact Or Exposure Risk	Status
Aldrin	Occupational exposure was associated with a significant increase in liver and biliary cancer. Health effects due to acute exposure include headaches, dizziness, nausea, general malaise and vomiting, muscle twitching, myoclonic jerks and convulsions. Effects due to chronic exposure include accumulation in the human placental tissues and blood.	Banned since 1989.
Chlordane	It is a convulsant and potent central nervous system toxin. Prolonged exposure has been linked with neuroblastoma and acute leukemia.	Banned since 1999.
Dieldrin	The substance may cause effects on the central nervous system, resulting in convulsions, dizziness, headache, nausea, vomiting, and weakness. The substance may also be found in the human placenta.	Banned since 1989.
Endrin	A study of workers involved in the manufacture of endrin found a significant increase in liver and biliary tract cancers.	Banned since 1983.

² See, e.g. John Hicks, Value and Capital, 2nd ed. Oxford, Oxford University press; Yusuf Ahmad, Salah El Serafy, and Ernst Lutz (eds.), Environmental Accounting for Sustainable Development, World Bank, 1989; and E. Lutz, M. Munasighe and R. Chander, “A Developing Country Perspective on Environmental Accounting” ENVPR Divisional Working Paper No. 1990-12, World Bank, August 1990.

POP Chemical	Environment/Health Impact Or Exposure Risk	Status
Hepthachlor	As seen in animals, it is likely to cause tumors, convulsions and other central nervous system effects in humans on acute exposure.	Banned since 1989.
Toxaphene	Exposure has caused nausea, vomiting, diarrhea, stomach pains, headache, dizziness, ataxia, parathesia, and mental confusion. Symptoms occur within 1 hour and death within 4 to 24 hours.	Banned since 1989.
Hexachlorobenzene	Exposure has caused a range of symptoms including photosensitive skin lesions, hyperpigmentation, hirsutism, colic, severe weakness, porphyrinuria, and debilitation	Never registered for use in the Philippines by the FPA.
Mirex	There are no reports of injuries to human resulting from exposure to mirex.	Never registered for use in the Philippines by the FPA.
DDT	It is suppressive to the immune system and considered a probable carcinogen.	No local distribution information was obtained. Exclusively used by the DOH since 1978 for malaria control purposes. Banned by DOH since 1992.
Polychlorinated Biphenyls (PCB)	PCB might have adverse reproductive, developmental and endocrine effects. The most common signs of exposure to PCB are chloracne and elevation of liver enzymes.	New power providers are no longer using PCB equipment.
Dioxins and Furans	These compounds are known human carcinogens.	They have no known use. They are unintentional products of combustion or by-products resulting from production of other chemicals.

These modern hazards enumerated above have been known for years and the knowledge of the extent of harm these POPs cause has increased. It is well recognized, however, that the characterization of the potential adverse effects of exposure including but not limited to monitoring of the distribution, fate, interaction, effects and/or impact of pesticides on population dynamics within the ecosystem, is one of the complex fields in chemicals risk management activities. Its complexity is further aggravated by such limitations as lack of technical expertise, limited laboratory facilities, inadequate logistical support, and weak regulations and enforcement programs.³

Various studies have shown that the marginalized urban poor remains as the group most vulnerable to POPs exposure. The urban poor typically reside in areas adjacent to major sources of POPs. In the rural areas, meanwhile, the residents most prone to illnesses like malaria are also the ones most exposed to malaria control POP chemicals like DDT. The seemingly uncontrolled entry and circulation of “illegal” POPs pesticides in the agriculture sector further increases the exposure risks of farmers.

³ “Philippine Case Study: A Developing Country’s Perspective on POPs”. Paper presented during the International Forum on Chemical Safety Meeting on POPs, June 17-19, 1996, Manila, Philippines.

In the Philippines, there are no existing recorded cases of incidences directly associated with POPs. This could be attributed to the fact that the awareness level of the general public on POPs is quite low. Most of the environment-related health cases are attributed to pesticides use in general as pesticide poisoning is closely monitored by the DOH.

With regards to DDT, there are no local records available on its impact on health and environment. Its restrictive use in malaria control has been considered effective, although there were unconfirmed cases of DDT poisoning in certain areas where the chemical was supposedly used for malaria eradication.

Hexachlorobenzene and Mirex are registered in the country as industrial chemicals instead of pesticides. Like other POPs chemicals, there are no reported cases of health and environmental ill effects specifically attributable to the use of these substances.

Data on dioxins and furans reveal that exposure via inhalation is likely to be a significant contributor (although no data is available on exposure by other routes, such as food), and one of the dominant sources is uncontrolled combustion that includes biomass burning, waste incineration, and accidental fires. Ground data on the human health and environmental effects of exposure to these compounds, however, is likewise not available.

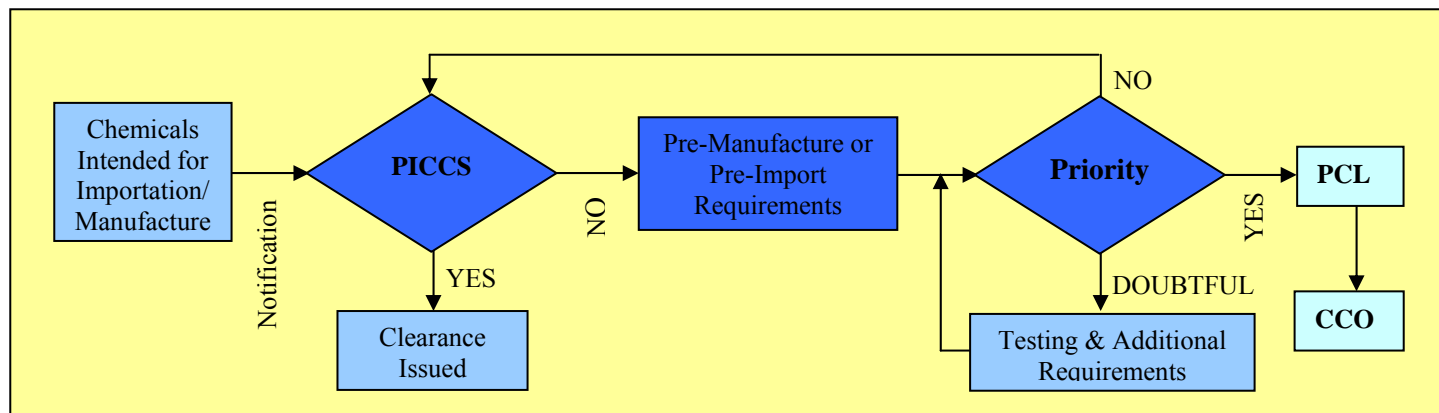
2.3.12 SYSTEM FOR MANAGING CHEMICALS

Registration of new chemicals in the Philippines is regulated by a number of agencies, depending on the intended use of the chemicals. The succeeding section present an overview on how new chemicals are managed in the country.

Industrial Chemicals

Through Republic Act 6969 and Department of Environment and Natural Resources Administrative Order 29, a number of requirements and mechanisms were established for identifying, screening, and evaluating new chemicals before they become commercially available in the Philippines. It also provided the evaluation of those chemicals already in use which, by virtue of their occurrence, use, or toxicity, may present human health and environmental concerns. Figure 2-8 presents the process for identifying, screening, and evaluating new chemicals in the Philippines as well as the relationship among the major activities under Title II of Department of Environment and Natural Resources Administrative Order 29.

Figure 2-8 Process for Identifying, Screening, and Evaluating New Chemicals



The following sections provide detailed information concerning the requirements and procedures applied to the Philippine Inventory of Chemicals and Chemical Substances (PICCS), Pre-Manufacturing and Pre-Importation Notification, Priority Chemicals List (PCL), and Chemical Control Order (CCO).

The Philippine Inventory of Chemicals and Chemical Substances

The Philippine Inventory of Chemicals and Chemical Substances is a list of all existing industrial chemicals and chemical substances used, sold, distributed, imported, processed, manufactured, stored, exported, treated, or transported in the Philippines. These chemicals and chemical substances in the inventory were nominated by Philippine industries themselves.

The Philippine Inventory of Chemicals and Chemical Substances was developed to provide government, industry, and the public with a core inventory of all existing chemicals and chemical substances in the country. This inventory serves as a guide for manufacturers and importers of chemicals. Manufacturers and importers of chemicals included in the Inventory need not notify and secure clearance from the Department of Environment and Natural Resources if the chemicals they are manufacturing or importing are not in the Priority Chemicals List, and are not subject to a Chemical Control Order. On the other hand, chemicals and chemical substances not included in the Inventory cannot be manufactured or imported unless the proponent follows the Pre-Manufacturing and Pre-Importation Notification testing and assessment process.

All manufacturers, importers, users, and distributors of chemical substances subject to Title II of Department of Environment and Natural Resources Administrative Order 29 are required to update the Philippine Inventory of Chemicals and Chemical Substances on a biannual basis. This is to update the information concerning the quantity of chemicals manufactured or imported, as well as, to document any change in the ownership of a chemical industry, and provide additional information regarding the chemicals already in the Inventory and the new chemicals added to the Inventory as a result of the Pre-Manufacturing and Pre-importation Notification process.

The following substances are exempted for inclusion in the Philippine Inventory of Chemicals and Chemical Substances:

- Non-chemical substances
- Naturally occurring substances
- Mixtures
- Radioactive substances, pesticides, drugs, foodstuffs, and cosmetics that are regulated by other laws in the Philippines
- By-products

Besides the exemptions listed, the following are exempted from filing for updating of Philippine Inventory of Chemicals and Chemical Substances:

- Small-quantity chemicals manufactured or distributed (not imported) for market test and research and development in quantities less than 1,000 kilograms per year
- Small-scale manufacturers and importers

Pre-Manufacturing and Pre-Importation notification

Republic Act 6969 requires all manufacturers and importers of a new chemical or any chemical that is not included in the Philippine Inventory of Chemicals and Chemical Substances to submit a Pre-Manufacturing and Pre-importation Notification to the Department of Environment and Natural Resources. This is to screen harmful substances before they enter the Philippine commerce. Its main objective is to ensure that new chemicals that could pose unreasonable risks to human health and the environment are either denied from being manufactured or imported into the country, or be placed under control and restrictions to limit potential releases.

Manufacturers and importers (proponents) of new chemicals are required to notify the Department of their intent to manufacture or import the new chemical not sooner than 180 days and not later than 90 days. Together with this notification, the proponent submits the appropriate Pre-Manufacturing and Pre-importation Notification forms.

Once a new chemical has been assessed and approved by the Department for import and manufacture, the proponent is granted a clearance to import and manufacture the new chemical. The proponent is also required to submit a Notice of Commencement to Import or Manufacture Form. Only after submission of this form will the new chemical be added to the Philippine Inventory of Chemicals and Chemical Substances. The new chemical may be added to the public version or the confidential version if Confidential Business Information is requested by the proponent in the Notice of Commencement.

The following cases are exempted from the Pre-Manufacturing and Pre-importation Notification rules:

- Small scale premises
- Small quantity chemicals
- Certain polymeric chemical derivatives
- Chemicals and chemical substances exempted from the Philippine Inventory of Chemicals and Chemical Substances requirements
- Chemicals and chemical substances included in the Philippine Inventory of Chemicals and Chemical Substances
- Non-isolated intermediates
- Articles
- New chemicals manufactured exclusively for export

Priority Chemicals List

The Philippine Priority Chemicals List is a list of existing and new chemicals that the Department of Environment and Natural Resources has determined to potentially pose unreasonable risk to public health, workplace, and the environment. Among the chemicals in the Priority Chemicals List, the Department determines which chemicals should be regulated. In addition, the Department imposes special reporting requirements that apply only to chemicals included in the Priority Chemicals List. This is an essential aspect of the Priority Chemicals List process since these reports will enable the Department to obtain the necessary information concerning the priority chemicals and their uses. Such information will assist the Department in making informed decisions on which chemicals should be regulated.

Assessment of the potential hazards and risks posed by each chemical in the Priority Chemicals List requires knowledge of the toxicity of a substance, and other characteristics that may influence the severity

and duration of adverse impacts. These include a chemical's persistence and tendency to bio-accumulate through the food chain.

The Department of Environment and Natural Resources has determined that the chemicals listed in the table below comprise the first Philippine Priority Chemicals List (Table 2-23). Table 2-24 presents the proposed second Philippine Priority Chemicals List.

Table 2-23 Philippine First Priority Chemicals List

1,1,1,-Trichloroethane	Ethylene Oxide
1,2 Diphenylhydrazine	Halons
Arsenic Compounds	Hexachlorobenzene
Asbestos	Hexachloroethane
Benzene	Lead Compounds
Beryllium Compounds	Mercury Compounds
Cadmium Compounds	Mirex
Carbon Tetrachloride	Polychlorinated Biphenyls (PCB)
Chlorofluor Carbons (CFCs)	Phosgene
Chloroform	Pentachlorophenol
Chlorinated Ethers	Polybrominated Biphenyls (PBB)
Chromium Compounds	Selenium
Cyanide Compounds	Tributyltin
Ethylene Dibromide	Vinyl Chloride

Table 2-24 – Proposed Second Priority Chemicals List

Aziridine	Phenol, 3-Hydroxy-
Nicotine Sulfate	Phenic Acid
Chlorosulfonic Acid	Ethylene, Trichloro-
Phosphorus Oxychloride	Benzene, 1,4-Dichloro-
Distannoxane, Hexabutyl	Propyleneimine
Formaldehyde	Phosphorus Pentachloride
MBT	Hydrazine
Mercaptan, Perchloromethyl-	Ethane, 1,2-Dichloro
Phosphorus Trichloride	O-Dichlorobenzene
Acrolein	Antimony Pentachloride
Acrylonitrile	Diethyl Sulfate
Oxirane, (Chloromethyl)-	Benzene, Chloro-
Chloropicrin	Phthalic Anhydride
Glutaraldehyde	Methyl Chloride
Hydrogen Peroxide	

The Department will regularly review and analyze the biennial reports required from industries importing, manufacturing, and wholesaling priority chemicals. The first reporting period began on 1996 and subsequent reporting is required every two years thereafter. The Priority Chemicals List will be updated every five years and the list of chemicals will be published.

Chemical Control Order

The Department of Environment and Natural Resources may issue Chemical Control Orders that prohibit, limit, or regulate the use, manufacture, import, export, transport, processing, storage, possession, and wholesale of those priority chemicals that the Department has determined to be regulated, phased-out, or banned because of the serious risks they pose to public health, workplace, and environment. At any time, the Department may impose a regulation, a phase-out plan, or a ban on a chemical or chemical substance when it determines that such action is necessary.

Chemicals and chemical substances that pose unreasonable risks to public health or the environment are potentially subject to Chemical Control Orders. Each year, the Department may determine what chemicals listed as priority should be regulated, controlled, or phased out. At present, the chemicals and chemical substances that have Chemical Control Orders are Cyanide, PCBs, Asbestos, and Mercury.

A chemical may be placed under control if the chemical is found to pose unreasonable risk or hazard to public health or the environment. Through the Chemical Control Order, the Department may:

- Prohibit the use, manufacture, import, export, transport, process, storage, possession, or sale of the chemical substance
- Limit the use, manufacture, import, export, transport, process, storage, possession, or sale of the chemical substance
- Place such controls or conditions on the use, manufacture, import, export, transport, process, storage, possession, or sale of the chemical substance to abate or minimize risks or hazards posed by the chemical substances on public health and environment.

Chemical substances and mixtures shall be exempted from the Chemical Control Order rules under the following conditions:

- Chemicals exempted under the Philippine Inventory of Chemicals and Chemical Substances rules
- Small-quantity chemicals
- Chemical substances that are reaction intermediates and do not leave the production process or undergo intermediate storage
- Chemical substances and mixtures regulated by laws other than Republic Act 6969
- Special circumstances as determined by the Department of Environment and Natural Resources

Pesticides

All pesticides intended for commercial use in the Philippines shall be registered with the Fertilizer and Pesticide Authority. Types of products to be registered include: new end use products or formulation, modification in the registration of a registered product, or registered pesticides with changes in formulation.

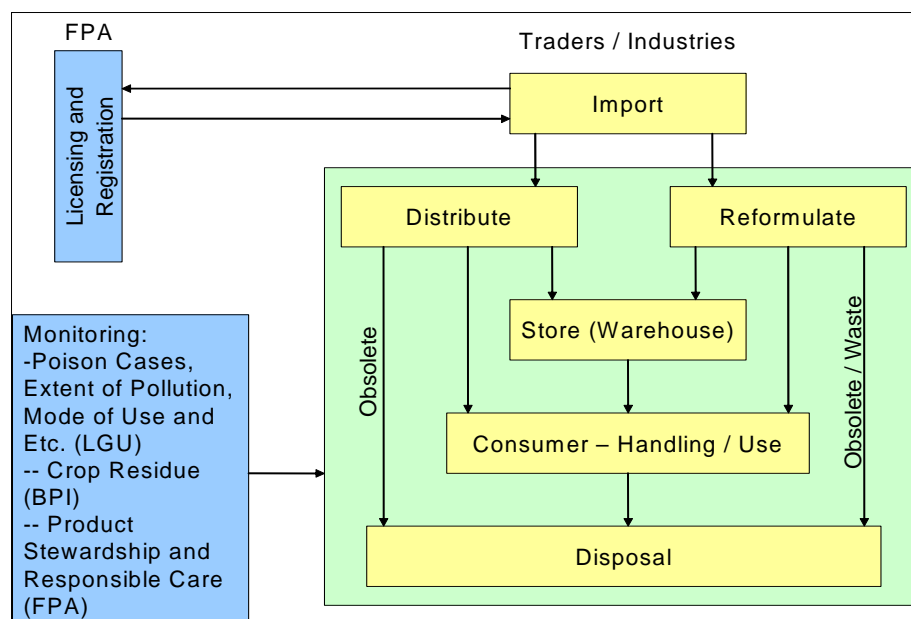
Applicants are to follow the procedures contained in the Pesticides Regulatory Policies and Implementing Guidelines issued by Fertilizer and Pesticide Authority that provide detailed information on the process applicable for pesticide registration. The second edition issued in year 2000 explains the procedure for registration of chemicals, including the data requirements and fees to be paid. The guidelines also contain the procedure for licensing, certification, and accreditation of pesticide handlers. Guidelines for bio-rational pesticides, product stewardship and responsible care, post registration activities, and penalties for violations are also discussed in detail in this Fertilizer and Pesticide Authority publication.

The detailed process of registering and monitoring of pesticides from importation to application/disposal is demonstrated in Figure 2-9 Detailed Life Cycle of Pesticides.

Prior to entry into the country, formulated pesticides and pesticide ingredients are registered with the FPA where standards are set to ensure that the products and/or active ingredients being registered are of good quality, bio-efficient, and safe both to human and the environment. The registration of pesticides itself is a thorough process. Separate applications are filed for each active ingredient, formulated product, and source of active ingredient. .

Monitoring activities at various levels follow registration. Data monitored at the barangay level are the popular types of pesticides used, incidence of pesticide poisoning in relation to specific pesticides and mode of use, extent of use of banned chemicals, extent of pollution in the environment measured by bird kill, fish kill, color of surface water, taste of ground/potable water, and other manifestations of pesticides effect on public health and environment. These reports are submitted to the Mayor’s office on a quarterly basis.

**Figure 2-9
Detailed Life Cycle of Pesticides**



Pesticide residues in fresh agricultural crops and the environment are also monitored by designated laboratories all over the country. Monitoring results are forwarded to Fertilizer and Pesticide Authority on a quarterly basis.

In monitoring and regulating pesticides, Fertilizer and Pesticide Authority applies the Product Stewardship and Responsible Care Principle whereby the traders (pesticides company) are obliged to ensure that their products are properly handled and safely used. This program requires the trader to submit an annual report covering the manufacturing or formulation process; the volume and quantity of products imported, processed and sold; the number of workers exposed to these substances; waste management and disposal methods. Apart from these requirements, the trader is also held responsible for assuring the safety of dealers and users by providing the necessary training on safe handling and use of their products; supplying protective clothing such as gloves, apron and etc. and making available antidotes to their products. Recalling and disposing of pesticides products that have been found to be unsafe for use are the responsibility of the trader. All costs incurred in the retrieval and disposal of all the products are to be shouldered by the trader.

Compliance of manufacturers, distributors, and importers to this principle and other provisions stipulated in PD 1144 are monitored by Regional Fertilizer and Pesticide Authority officers. Spot inspections are also conducted on handlers to ensure that provisions of PD 1144 are complied with. Results of monitoring activities may be used as grounds for renewal or revocation of licenses.

The policies, laws, rules and regulations now covering POPs chemicals may still have gaps. Hence they need to be reviewed well. And even if they are adequate now, such review has to be done periodically since conditions change. One policy gap, for example, refers to the responsibility of suppliers of POPs chemicals and related products. Since the enforcement capabilities of regulators are still weak, it is important that the law clarifies the responsibility of the supplier to ensure that the risks associated with its products during the product life cycle are acceptable. The current laws and their implementing rules, regulations, and guidelines define the supplier's responsibility of promptly informing regulatory authorities of any new information on risks from its products. But the penalties for failure to disclose such information are not clearly defined.

The Fertilizer and Pesticide Authority bans and restricts pesticides on the basis of other countries' studies. The Pesticide Policy and Technical Advisory (PPTAC) is a recommendatory body, which addresses the various issues and problems related to pesticides. The role of PPTAC in the process of banning a particular pesticide is basically the initiation / recommendation to ban it. Through reports and studies conducted by developed countries on a particular pesticide, the PPTAC and members of the Pesticide Regulatory Services Division may recommend the banning of a certain pesticide product.

Since the Fertilizer and Pesticide Authority does not have the facilities, even though they have the technical capability, they cannot do a "first-hand" laboratory or technical evaluation of a particular product. Once an initiative to ban a pesticide is made, the Fertilizer and Pesticide Authority calls for a consultation meeting with reformulators / manufacturers, during which they express their intention to ban a certain pesticide. The reformulators / manufacturers may ask for reconsideration or even appeal to stop the banning given that they can prove, with laboratory test results that the pesticide is not as harmful as other studies claim it to be.

Other Chemicals

Other chemicals are regulated by various agencies. These are discussed briefly in the succeeding sections.

Explosives

Explosive chemicals and even industrial chemicals that are considered precursors for explosives are regulated by the Firearms and Explosives Division of the Philippine National Police. This agency is responsible for the issuance of permits and licenses of firearms, ammunitions, explosives, and firecracker/pyrotechnic devices. The following are permits and licenses that this agency issues.

PERMIT

1. Permit to Unload
 - a. Explosives/Explosive Ingredients in solid form
 - b. Explosives/Explosive Ingredients in liquid form (Quantity/1.47)
 - c. Detonating Cords and Safety Fuse
 - d. Blasting Caps and Connectors
 - e. Theatrical Effects
2. Permit to Import Explosives/Explosive Ingredients
3. Permit to Purchase Explosives/Explosive Ingredients
4. Permit to Transport Pyrotechnics/Firecrackers

LICENSE

EXPLOSIVES AND EXPLOSIVE INGREDIENTS

1. Dealer's License
2. Manufacturer's License
3. Purchaser's License
4. Foreman's/Blaster's License

PYROTECHNIC AND FIRECRACKERS

1. Manufacturer's License
2. Dealer's License
3. Retailer's License Fee
4. License for Fireworks Display Operator

Radioactive Chemicals

Radioactive chemicals are regulated by the Philippine Nuclear Research Institute. This agency is mandated by law to enforce nuclear regulations to ensure that the use of radioactive materials is carried out safely and would not pose unnecessary risk to the general public and to workers occupationally exposed to radiation. The Nuclear Regulations, Licensing and Safeguards Division issues licenses for the following uses of nuclear energy:

- Medical use in nuclear medicine, teletherapy, brachytherapy, and radioimmunoassay
- Industrial use as gauges
- Industrial radiography in non-destructive testing
- Research and education
- Commercial sale and distribution of radioactive materials and equipment

Any person or firm with the intention to use radioactive material should file an application for a license with the Institute. The basic requirements that should be complied with prior to issuance of a license are the adequate facility and equipment, trained and qualified personnel, and adequate radiation safety procedures and programs.

Dangerous Drugs

Chemicals that are known to be precursor or essential chemicals in the production of dangerous drugs are regulated by the Philippine Drug Enforcement Agency. This agency serves as the implementing arm of the Dangerous Drug Board and is responsible for the efficient and effective law enforcement of all the provisions on any dangerous drug and/or controlled precursor and essential chemical as provided in the Act.

Food, Cosmetic, and Pharmaceutical Chemicals

Food, cosmetic, and pharmaceutical chemicals are regulated by the Bureau of Food and Drugs. This agency ensures the safety, efficacy, purity, and quality of processed foods, drugs, diagnostic reagents, medical devices, cosmetics, and household hazardous substances. Its Regulation Division is tasked to:

- Inspect and issue licenses to operate establishments dealing with the importation, exportation, distribution, and retailing of foods, drugs, medical devices, in vitro diagnostic reagents, cosmetics, and household hazardous substances
- Collect samples of products from outlets and ports of entry for quality monitoring
- Implement seizure, confiscation, and condemnation orders covering violative products
- Conduct training for Food and Drug Regulations Officers from the different Regional Health Offices
- Assist in monitoring adverse drug reactions

Its Product Services Division is tasked to:

- Establish standards for the registration of products such as processed foods, drugs, cosmetics, medical devices, in vitro diagnostic reagents, and household hazardous substances
- Evaluate and process application of product registration and listing
- Issue certificates or product registration and certificates of product listing
- Assist in the monitoring of violative products

CHAPTER 3.0 STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

3.1 POLICY STATEMENT

A policy statement sets the stage and performance of persons, individuals or groups and it precedes the development of specific procedures or practices that should be followed to realize the expectations of the policy. In the case of the National Implementation Plan, an environmental policy statement invokes the Philippines' commitment to addressing the POPs issue and should include a formal adoption or endorsement of the NIP. Likewise the policy statement, if appropriate, must define how the NIP would be integrated within the Philippines' overall environmental policies and sustainable development strategy.

To develop the environmental policy statement related to POPs, it is necessary to review existing laws and regulations that may be relevant to this undertaking. These include the Philippine Constitution and the Philippine Environment Policy as embodied in Presidential Decree 1151.

The Philippine Constitution provisions relevant to the protection of human health and the environment are as follows:

The State shall protect and promote the right to health of the people and instill health consciousness among them.

The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.

PD 1151, on the other hand, states the Philippine Environmental Policy as follows:

It is hereby declared a continuing policy of the State (a) to create, develop maintain and improve conditions under which man and nature can thrive in productive and enjoyable harmony with each other, (b) to fulfill the social, economic and other requirements of present and future generations of Filipinos, and (c) to ensure the attainment of an environmental quality that is conducive to a life of dignity and well-being.

With these statements and arising out of the consultations with stakeholders during the 2-day objective-setting workshop, the Philippine POPs Environmental Policy is stated as follows:

“Consistent with the policy of the State to protect the environment and promote the general welfare and health of the people and their right to a balanced and healthful ecology, the Philippines commits itself to implement policies, strategies and actions designed to eliminate the production and use of Persistent Organic Pollutants (POPs) and minimize the release of unintentional POPs by-products covered by the Stockholm Convention.

The Philippines shall execute this National Implementation Plan to meet its obligations under this Convention.”

3.2 IMPLEMENTATION STRATEGY

The implementation of the NIP requires inter-agency and multi-sectoral participation. It will involve many sectors, and will engage several government agencies, institutions and non-governmental organizations. This in turn calls for an effective inter-agency mechanism to facilitate collaboration and a strong and well-resourced coordinating agency to have oversight responsibility.

A POPs Project Management Office, under the Environmental Management Bureau of the Department of Environmental and Natural Resources, through its Chemicals Management Section has the overall coordination of the POPs NIP Implementation Project. An Interagency Consultative Committee, comprising various agencies, will continue to function as the mechanism for interagency collaboration. This mechanism was set up to assist the POPs Management Office in the formulation of the NIP. However, for the effort to be sustainable and to have strong enforcement support, an administrative order coming from the office of the President of the Philippines has to be invoked, allowing oversight function from the Office of the President. It is envisaged that this Administrative Order will strengthen the interagency mechanism and will allow inclusion of other key agencies currently not represented.

The interagency activities will still be guided by a Steering Committee which will regularly meet to review progress reports on implementation, advise the POPs Management Office as necessary and assist with coordinating inputs from different stakeholder organizations. Other specialized technical committees will be formed and convened as deemed necessary by the Steering Committee and the POPs Project Management Office to deal with specific issues.

Implementation of specific activities will involve:

- Different agencies with relevant mandates on chemicals management
- Local government units
- Non government institutions
- Private sectors
- Local communities, farmers, women's and youth groups, and schools

The importance of working closely with affected local communities like the farmers, end users, women's and youth groups, and local schools is vital to raising community awareness and appreciation of the potential impacts of POPs.

3.3 ACTIVITIES, STRATEGIES AND ACTION PLANS

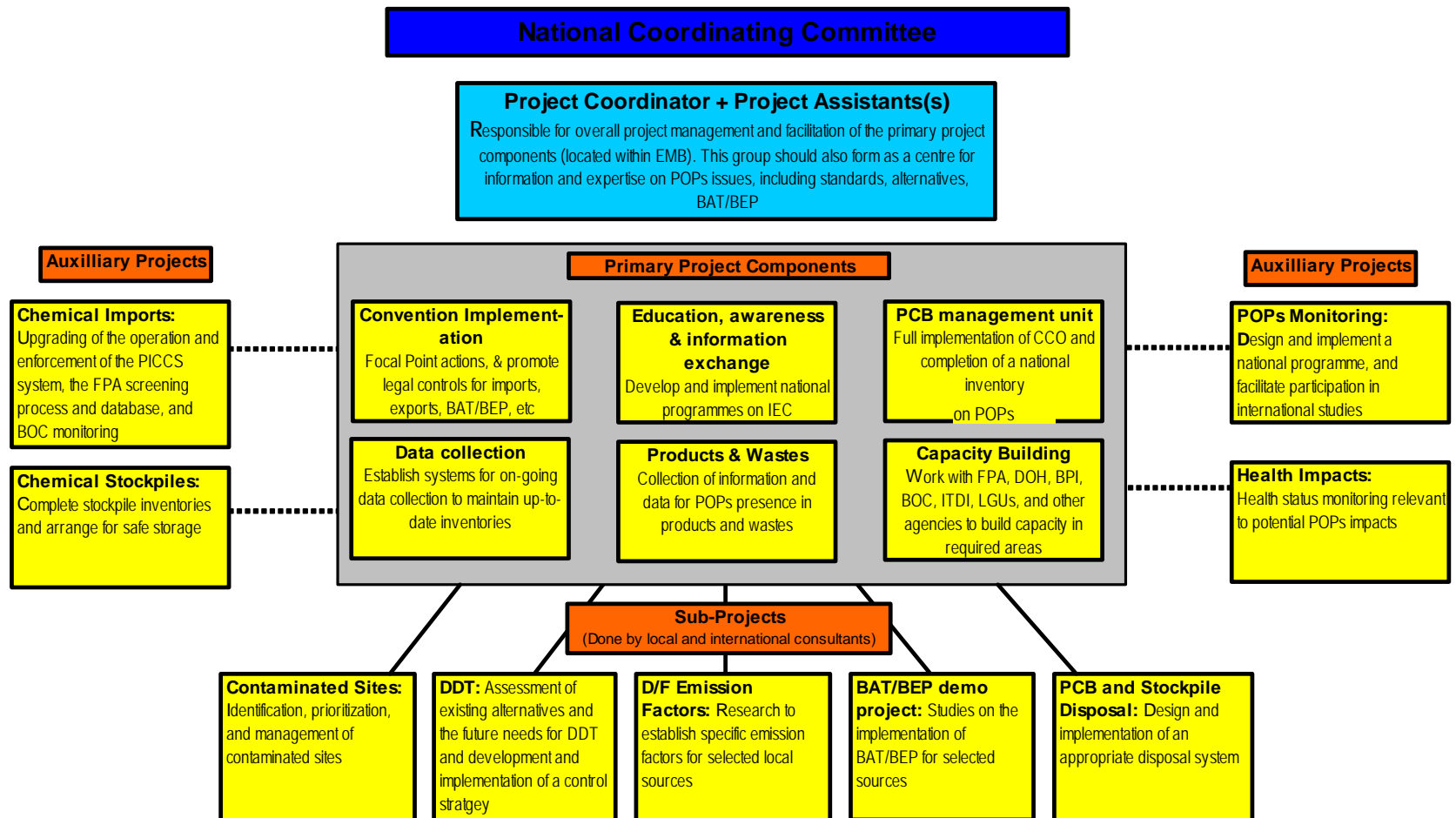
The National Implementation Plan consists of several specific strategies and action plans each targeting different goals and objectives. The goals and objectives of each Strategy and Action Plan reflect those of the Stockholm Convention on POPs and attempt to address the POPs issues in the Philippines. These actions plans are designed for a 5-year full implementation. It is expected that an annual review of the National Implementation Plan will be conducted by the Interagency Committee. A full review and evaluation shall be done after the 5th year of implementation.

The following Strategies and Action Plans define the goals, objectives, and key actions proposed for the Philippine National Implementation Plan:

- Action Plan addressing POPs Pesticides and DDT
- Action Plan addressing PCBs
- Action Plan addressing Unintentional POPs
- Action Plan addressing POPs Contaminated Sites
- Strategies on Public Awareness and Information Campaign

A general framework for NIP implementation plans is shown in Figure 3-1, while details of each of the action plan components are presented in the succeeding sections.

Figure 3-1 General Framework for NIP Implementation Plans



3.3.1 ACTION PLAN ADDRESSING ANNEX A, PART I CHEMICALS (POPs PESTICIDES)

Table 3-1 presents the summary of the action plan addressing the issues on POPs pesticides and outlining the mechanisms to comply with the Convention requirements considering a 5-year time frame of project implementation.

Table 3-1 Summary Action Plan Addressing POPs Pesticides

Sections	Contents
Context and Analysis of Issue	<p>Under Article 3 and Annexes A and B of the Convention, Parties must:</p> <ul style="list-style-type: none"> • Restrict and/or eliminate the production, use, and release of nine intentionally produced POPs pesticides (two of which may also occur as intermediates of some specific industrial processes), and • Regulate any trade in these POPs with both Parties and Non-parties <p>The Fertilizer and Pesticide Authority, by virtue of Presidential Decree 1144, is the government agency that has the mandate for control of all pesticides. It has issued a number of circulars since 1983 that banned the following POPs pesticides in the Philippines: Aldrin, Dieldrin, Endrin, Heptachlor, Toxaphene, and Chlordane. However, there is a limited amount of evidence that suggests that some continue to be available illegally on the open market. This fact points to a need for better monitoring and enforcement of the Pesticide regulations.</p> <p>The Fertilizer and Pesticide Authority has also restricted the use of DDT since 1978 for malaria vector mosquito control. In addition, the Department of Health issued an order in 1992 canceling the use of DDT because of its reported environmental and health effects and the availability of alternatives. Nonetheless, the Fertilizer and Pesticide Authority has indicated an unwillingness to completely discount the possible use of DDT in the future, in the event of a serious malaria outbreak. Further assessments therefore are required to determine whether the Philippines should register its need for an exemption under Annex B of the Convention, for continued use of DDT.</p> <p>Mirex and hexachlorobenzene are listed as Priority Chemicals by the Department of Environment and Natural Resources, under Republic Act 6969. This means that any intended imports and/or use of these chemicals must be registered and approved by the Department of Environment and Natural Resources. However, it is not known whether these chemicals are actually being used in the Philippines. This issue requires further investigation before a decision can be made to formally ban the import and use of mirex and hexachlorobenzene (or register for specific exemptions) as required under the Convention.</p> <p>As a result of the above controls on POPs pesticides, there are some 21,500 liters of banned, obsolete, and/or unwanted pesticides confiscated by the Fertilizer and Pesticide Authority and stored in their regional warehouses (as of 2001). Action is required to ensure that these stockpiles are properly managed, and ultimately disposed, in an environmentally sound manner.</p>

Sections	Contents
Goal and Objectives	<p>The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPs project. These are intended to address the highest priority issues.</p> <p>Goal:</p> <p>Ensure that all current and future uses of POPs pesticides are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the continuous monitoring of the impacts to health and environment</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Complete a review of the most appropriate and effective ways for improving monitoring and enforcement of the existing regulatory controls on POPs pesticides by the end of the 2nd year 2. Implement a programme that will inspect, retrieve, and properly dispose of POPs pesticides from year 1 up to the 2nd year 3. Develop and implement continuous environmental and health monitoring program from year 1 onwards 4. Complete an assessment of the effectiveness of current practices for the control of malaria in the Philippines, and options for improvements including the use of integrated vector management strategies, and the need for DDT effective alternative by the end of the 2nd year 5. Initiate all actions (as required under all relevant regulations) by the end of year 1, with a view to ban mirex and hexachlorobenzene
Assessment of Management Options	<p>Objective 1</p> <p>This objective aims to address the current deficiencies in monitoring and enforcement of the controls on POPs pesticides. However, because the extent of these deficiencies is not well documented, the chosen approach is to first carry out an in-depth review of the situation. This may lead to a number of possible management options for addressing the problems, but these cannot be determined until the review is complete. As such, the only real options to be considered at present are operational ones; ie, whether to carry out the review using internal (departmental) resources only, or by a process involving much wider participation, including the possible use of external consultants. The latter approach is potentially more expensive, but is the preferred one because it will allow consideration of a much wider range of views and is more likely to lead to solutions acceptable to all stakeholders, rather than just the Fertilizer and Pesticide Authority.</p> <p>Objective 2</p> <p>Once again, the options available here are limited. The Fertilizer and Pesticide Authority has legal responsibility for all stockpiles in its possession and must therefore undertake actions to manage and dispose stockpiles in a cost-effective and environmentally sound manner. The only options that will need to be resolved are operational ones, such as whether to relocate all stockpiles to a central storage facility and selection of the most suitable disposal method (including whether to dispose locally or off-shore). These latter aspects will be addressed in the planning for follow-on activities (ie. disposal) to this current action plan.</p>

Sections	Contents
	<p>The other aspect addressed in the planning for this objective, is how to identify other stockpiles that are currently not known to the Fertilizer and Pesticide Authority. It is proposed that this be tackled through a combination of awareness activities (for both the general public and industry) and the routine inspection activities carried out by staff of the Fertilizer and Pesticide Authority. These are considered the only two viable ways of addressing these issues, and the combination of the two is believed to be the most cost effective approach. The alternatives of a greatly increased inspection programme and sole reliance on an awareness campaign were rejected on the basis of greater costs for the former and a probably lower response rate for the latter.</p> <p>Objective 3</p> <p>There are a number of monitoring activities done by both government and non government sectors, especially the academe in monitoring the health and environmental impacts of POPs pesticides in the Philippines. There are a number of options that could be considered in attaining this objective. One is status quo – meaning continue encouraging various sectors to do their own monitoring. Second is have one sole agency that will develop and implement an integrated monitoring program to avoid duplication and sometimes misrepresentation of monitoring results. The third option, which is being considered is having a multi partite monitoring group coming from the inter agency consultative committee but the leadership is through the academe. Having an academe leading the group will remove the bias, which is highly possible if the lead is either from the government, non-government sectors, or the private entity.</p> <p>Objective 4</p> <p>The options here are as follows:</p> <ol style="list-style-type: none"> i. Assume DDT is no longer required and have the Fertilizer and Pesticide Authority issue a formal ban ii. Assume that DDT is still required and register an exemption under the Convention iii. Proactively investigate the efficacy of current malaria control measures and hence establish the need for DDT either now or in the future <p>Option (i) is by far the easiest and cheapest option, but runs the risk that DDT may not be available in the event of a sudden and serious outbreak of malaria. Option (ii) is also very easy to implement, but there are potential hidden costs as Annex 3 of the Convention would then require a report every three years on the continuing need for DDT and progress being made in the development of alternative malaria development strategies. This is in effect not much different from the work proposed in option (iii). The benefit of the latter is that this one-off in-depth investigation is likely to establish once and for all that DDT is no longer required, and no further actions need be taken (at least under the Convention).</p> <p>Objective 5</p> <p>This objective has a very straightforward outcome in the banning of mirex and hexachlorobenzene. This is a simple administrative/regulatory procedure and no other options need to be considered, with the exception of an initial operational measure to establish the current status of mirex or hexachlorobenzene use in the country. This will allow an assessment of any potential impacts on the users, prior to imposition of a ban.</p>

Sections	Contents
<p>Action Plan Implementation Strategy</p>	<p>The Fertilizer and Pesticides Authority shall be the lead agency in most of the actions that will address the key issues on POPs pesticides. In particular, it shall lead the technical working group that will monitor the activities to be undertaken with respect to the objectives for all POPs pesticides. The combined cost of all the objectives pertaining to POPs pesticides is estimated at US\$ 6,890,000.</p> <p>Objective 1 Complete a review of the most appropriate and effective ways for improving monitoring and enforcement of the existing regulatory controls on POPs pesticides by the end of the 2nd year. This will include activities such as:</p> <ul style="list-style-type: none"> • Identification of the most appropriate and effective ways for monitoring and enforcement • Producing a report detailing the review and the recommended policy interventions–consolidation <p>Resource needs for this activity are estimated to be US\$ 123,000 and a portion shall be sourced from the technical working group operation cost while the rest will be from external sources.</p> <p>Objective 2 Implement a programme that will inspect, retrieve, and properly dispose of POPs pesticides from year 1 up to the 2nd year. Activities will include:</p> <ul style="list-style-type: none"> • Formulation of methodologies and guidelines for use of the programme • Establishment of infrastructure (equipment and facilities) and manpower support to implement programmes • Conduct of public awareness campaign and implementation of policies so that potential holders will voluntarily identify POPs pesticides • Training of field inspectors on how to conduct inspection and identification of POPs pesticides (to include health and safety measures) – focused on strategy formulation • Carrying out of inspection programs • Designing and building of storage facilities, if necessary • Safe storage of confiscated POPs pesticides • Updating of database on POPs pesticides inventory • Development of cost-benefit analysis of environmentally-sound disposal methods for POPs pesticides and secure necessary resources for implementation • Implementation of (pilot or full scale) proper disposal of POPs pesticides <p>The total estimated funds needed for the implementation of the aforementioned activities is US\$ 5,302,000.</p> <p>Objective 3 Develop and implement continuous environmental and health monitoring program from year 1 onwards. This would include the following activities:</p> <ul style="list-style-type: none"> • Assessment of the existing health and environmental monitoring program implemented by various agencies pertaining to POPs pesticides including their capacity to diagnose POPs related cases • Development of a concerted and integrated health and environmental monitoring program to include capacity building for diagnosing POPs related cases • Implementation, updating, and periodic reporting on the results of the health and environmental monitoring

Sections	Contents
	<p>The total estimated expenses for the above activities are US\$ 100,000.</p> <p>Objective 4 Complete an assessment on the effectiveness of current practices for the control of malaria in the Philippines, and options for improvements including the use of Integrated Vector Management strategies, and the need for DDT by the end of the 2nd year. To implement this objective, the following activities will be conducted:</p> <ul style="list-style-type: none"> • Identification of all current practices and their efficacy (including preventive measures) on malaria control including updating the DDT inventory (stockpiles) • Assessment of the best strategies (including DDT substitutes) for malaria control • Trial of DDT alternatives • Policy recommendation on the need (or not) of DDT <p>The Department of Health (DOH) shall be the lead agency in assessing the need for DDT for malaria control in the country. The estimated budgetary requirement for implementing this objective is US\$ 1,265,000.</p> <p>Objective 5 Initiate all actions (as required under all relevant regulations) by the end of year 1, with a view to ban mirex and hexachlorobenzene. This will include:</p> <ul style="list-style-type: none"> • Review of all regulations and industrial practices that involve mirex and hexachlorobenzene • Identification and assessment of possible sources and generation of mirex and hexachlorobenzene as by-products and develop reduction strategies, if required. • Initiation of the regulatory process to officially ban the importation and use of mirex and hexachlorobenzene <p>The estimated budget for this undertaking is US\$ 100,000.</p>

3.3.2 ACTION PLAN ADDRESSING ANNEX A, PART II CHEMICALS (PCBS)

Table 3-2 presents the summary of the action plan addressing the issues on PCBs and outlining the mechanisms to comply with the Convention requirements considering a 5-year time frame of project implementation

Table 3-2 Summary Action Plan Addressing PCBs

Sections	Contents
Context and Analysis of Issue	<p>The Convention requires each Party to prohibit the production, import, export, and use of all PCBs. It also requires the elimination of the use of PCBs in equipment by 2025, and promotion of measures to reduce exposures and risk to control the use of PCBs. In addition, PCB-containing equipment and PCB liquids should not be exported except for the purpose of environmentally sound waste management, and all such liquids and equipment are to be disposed by 2028. Parties are also required to submit a report every five years on progress in eliminating PCBs.</p> <p>The Philippines has existing policies and a legal and regulatory framework to manage PCBs. In 1990, Republic Act No. 6969, otherwise known as the Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 was issued to regulate the importation, manufacture, processing, handling, storage, transportation, sale, distribution, use, and disposal of all unregulated chemical substances and mixtures in the Philippines. Its implementing rules and regulations identified and listed PCBs and other related materials as prescribed wastes. Furthermore, PCBs were classified under the Priority Chemicals List in 1998, thus, requiring users or generators of PCBs to submit a Hazardous Waste Registration Form and Biennial Report to the Environmental Management Bureau.</p> <p>In compliance with the country's commitment to the Convention, a Chemical Control Order on PCBs was issued. Under the Chemical Control Order, responsibilities and liabilities for the improper management and handling of PCB and its wastes will be established. It also provides specific requirements for annual reporting, inventory, phase-out, storage, treatment, and disposal. The Chemical Control Order covers closed applications (transformers, capacitors, voltage regulators, liquid-filled circuit breakers, and other electrical equipment containing dielectric fluids), partially enclosed applications (hydraulic fluids and heat transfer fluids), open-ended applications (lubricant, casting waxes, surface coatings, adhesives, etc.), PCB wastes (contaminated solvents/waters, used/waste oil, sludge and slurries) and PCB packaging or containers in storage for treatment or disposal. The Chemical Control Order also specifies the phase-out of PCBs in the country by year 2014 which is way ahead of the target date stated in the Convention.</p> <p>The Philippines was never a producer of PCBs. The main source of entry of PCBs into the country is through importation as part of electrical transformers. The amount of PCB transformers imported over the years could not be estimated reliably due to the absence of proper records. There is little or no information on PCBs in use other than transformers and capacitors.</p> <p>Based on the initial inventory of PCBs, there are PCB wastes and equipment present in the electric utility sector, manufacturing sector, old commercial buildings, and in transformer servicing facilities. The majority of the inventoried equipments are transformers (97.16%) while 113 units (2.57%) are capacitors. The rest are oil circuit breakers.</p> <p>As disclosed by electric utilities, transformer equipment in the country usually undergoes repair and refilling through equipment servicing facilities. The initial inventory activity identified the servicing facilities as a major depository of PCB contaminated equipment. With the current standard of small-scale refilling facilities, there is a strong probability that the mineral oil currently used in refilled transformers have been contaminated with PCB.</p>

Sections	Contents
Goal and Objectives	<p>The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPS project. These are intended to address the highest priority issues pertaining to PCBs.</p> <p>Goal</p> <p>Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes.</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Prepare a comprehensive and complete national inventory of PCBs, PCB containing materials, and PCB wastes from year 0 to year 2 of the National Implementation Plan 2. Establish and implement a program on safe handling, storage, and transport of PCBs, PCB-containing materials and PCB wastes from year 1 to year 3 3. Develop and implement continuous integrated environmental and health monitoring program from year 1 onwards. 4. Eliminate and destroy all PCBs, PCB-containing materials, and PCB wastes not later than 2025
Assessment of Management Options	<p>Objective 1</p> <p>This objective aims to characterize the scope of the PCB problem in the country and to establish an information base to track the movement of PCB wastes and materials, assist the Environmental Management Bureau in the implementation of the Chemical Control Order on PCBs, and help in the improvement of policies and management options for the total elimination of PCBs in the country. Guidelines from the United Nations Environment Programme, US Environmental Protection Agency, and other countries will be useful starting points to assist the country in the conduct of the complete and comprehensive inventory. The inventory policies and procedures and the inventory forms developed during the initial inventory will be further improved to encourage disclosure of information by stakeholders. The inventory will also help monitor continued progress at reducing the risk of PCB wastes.</p> <p>In support to the implementation of the Chemical Control Order, the PCB inventory will be conducted through the regulatory reporting procedure outlined in the Chemical Control Order wherein specific requirements for annual reporting and inventory of PCBs are included. This is aligned with the comprehensive inventory of PCB implied in the Convention provisions.</p> <p>There is a need to strengthen the registration of servicing facilities which were identified as potential sources of PCB wastes since these establishments are engaged in the refilling and repair of equipment. A code of practice and a mechanism for the accreditation of servicing facilities will be developed to achieve the following:</p> <ul style="list-style-type: none"> • Ensure that the handling of PCB-contaminated materials from the equipment is carried out in an appropriate manner • Increase the level of awareness of refilling operators on the proper handling of PCBs

Sections	Contents
	<ul style="list-style-type: none"> • Improve the standard of operation of facilities engaged in the repair and maintenance of PCB equipment so that appropriate controls and measures are taken to prevent contamination of non-PCB equipment • Initiate a plan for industry self-regulation towards improving compliance of retrofillers and generators with the Chemical Control Order on PCBs <p>With the conduct of inventory, the means for testing and monitoring should also be enhanced. There are laboratories capable of analyzing PCBs but they are mostly located in the industrial regions such as Metro Manila. Likewise, PCB concentration analysis in laboratories and the PCB test kits are quite costly. By strengthening the PCB inventory, resources for the inspection, testing, and analysis should also be strengthened. This would require upgrading of the laboratory of the Environmental Management Bureau as well as improving other private laboratories that would help in the analysis of PCBs. The cost of sampling and analysis for regulatory and validation purposes by the Environmental Management Bureau should be shouldered by the government agency itself while cost of analysis in a competent laboratory for compliance to the required submission of Certificate of Analysis, annual reports, and inventory reports to the Environmental Management Bureau; should be shouldered by the submitting entity.</p> <p>Objective 2</p> <p>Simultaneous with the inventory of PCBs, a program on the safe handling, storage, and transport of PCBs, PCB-containing materials, and PCB wastes should be undertaken within a period of three years. This objective aims to formulate guidance on the appropriate management of PCB-containing equipment to minimize hazards due to chemical exposure as well as reduce environmental risk from PCB leakage.</p> <p>The formulation of guidelines on the management of PCBs is envisioned to strengthen the existing regulatory requirements of the Chemical Control Order. This would be carried out as a means of improving the knowledge and awareness of users on the methodologies and processes that need to be undertaken for the safe handling, storage, and transport of PCBs. The guidelines would be distributed and disseminated to users of PCBs during the inventory process.</p> <p>Objective 3</p> <p>There are a number of monitoring activities done by both government and non government sectors, especially the academe in monitoring the health and environmental impacts of PCBs in the Philippines. There are a number of options that could be considered in attaining this objective. One is status quo, which is to continue encouraging various sectors to do their own monitoring. Second is to have one sole agency that will develop and implement an integrated monitoring program to avoid duplication and sometimes misrepresentation of monitoring results. The third option, which is being considered is having a multi partite monitoring group coming from the inter agency consultative committee but the leadership is through the academe. Having an academe leading the group will remove the bias, which is highly possible if the lead is either from the government, non-government sectors, or the private entity.</p>

Sections	Contents
	<p>Objective 4</p> <p>This objective aims to develop strategies for the total elimination of PCBs in the country. The availability of treatment and disposal technologies will be presented as a support to PCB waste generators in complying with the Chemical Control Order.</p>
Action Plan Implementation Strategy	<p>The Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead agency in most of the actions that will address the key issues on PCBs. It shall be supported by a PCB inventory inter-agency committee and a technical working group on PCB destruction. The combined cost of all the objectives pertaining to PCBs is estimated at US\$ 16,664,000 which includes US\$ 7,000,000 of investment from the private sector on the non-combustion PCB destruction facility.</p> <p>Around US\$ 100,000 is earmarked for the 5-year implementation of the plan and solely for the interagency oversight committee to ensure that the set goal to address the issues on PCBs is achieved.</p> <p>Objective 1 Prepare a comprehensive and complete national inventory of PCBs, PCB containing materials, and PCB wastes from year 0 to year 2. This will include activities such as:</p> <ul style="list-style-type: none"> • Preparation of a list of resources and expertise on PCB management and related research • Preparation of a comprehensive profile of potential sources of PCBs in the country consisting of PCB generators, treatment, storage, and disposal facilities, and servicing facilities • Development and publication of inventory guidelines • Development and implementation of monitoring and evaluation program/guidelines for inventory • Development of standard protocols for sampling and test methods • Upgrading of the Environmental Management Bureau laboratories that will analyze PCB • Accreditation of PCB samplers • Recognition of laboratories for PCB analysis • Conduct of training on identification and sampling for electric utilities, servicing facilities, generators, the Environmental Management Bureau, and other agencies • Strengthening the existing PCB information database • Strengthening and institutionalization of a system of reporting among generators • Development of policies on the shipment and consent procedures for the importation of transformer equipment • Conduct of inventory of PCB materials and wastes • Development of funding mechanism to assist in the conduct of the inventory • Analysis of data and coming up with a complete national inventory • Conduct of information, education campaign on health and technology for PCB management <p>Resource needs for this activity are estimated at US\$ 3,345,000.</p>

Sections	Contents
	<p>Objective 2 Establish and implement a program on safe handling, storage, and transport of PCBs, PCB-containing materials and PCB wastes from year 1 to year 4. Activities will include:</p> <ul style="list-style-type: none"> • Enhancement of guidelines for the storage and safe handling including transport and dismantling of PCBs • Enhancement of guidelines and standards for treatment, storage, and disposal facilities dealing with PCBs • Development and implementation of monitoring and evaluation program for handling and storage • Improving safe transportation rules and regulations for PCBs to include: transport vehicle standards, guidelines for preparation of waste shipments, emergency response capability along transportation routes, provisions for authorizing qualified carriers, and labeling/ placarding requirements for vehicles and containers • Development of code of practice for servicing/retrofilling and repair of equipment • Issuance of a memorandum circular prescribing the adoption of the code of practice for servicing/retrofilling and repair of equipment • Conduct of training of operators of treatment, storage, and disposal facilities, generators, and regulators • Enhancement of registration regulation for retrofilling facilities • Development and implementation of the accreditation system for servicing facilities and establishments • Development of guidelines/checklist for the evaluation of PCB Management Plan of generators and servicing facilities • Evaluation of PCB Management Plan of generators and servicing facilities • Conduct of routine inspection and monitoring on the implementation of the PCB management plan • Conduct of environmental monitoring for PCBs in water and soil <p>The total estimated funding requirement for the implementation of the aforementioned activities is US\$ 341,000.</p> <p>Objective 3 Develop and implement continuous environmental and health monitoring program from year 1 onwards. This would include the following activities:</p> <ul style="list-style-type: none"> • Assessment of the existing health and environmental monitoring program implemented by various agencies pertaining to PCBs • Development of a concerted and integrated health and environmental monitoring program to include capacity building for diagnosing POPs related cases • Implementation, updating, and periodic reporting of the results of the health and environmental monitoring activities <p>The total estimated expenses for the above activities are US\$ 100,000.</p>

Sections	Contents
	<p>Objective 4 Eliminate and destroy all PCBs, PCB-containing materials, and PCB wastes not later than 2025. To implement this objective, the following activities will be conducted:</p> <ul style="list-style-type: none"> • Issuance of policies in support of the Global Environment Facility/United Nations Industrial Development Organization/United Nations Development Programme POPs Destruction Facility Project • Development and implementation of the above project including Environmental Impact Assessment, and selection of technology • Facility construction • Provision of incentives for electric utilities to comply with the phase-out of PCB • Evaluation of existing environmental financing windows and market financing programs that would help electric utilities to phase-out, treat, and dispose PCB wastes and PCB-containing equipment • Transport of wastes from storage facilities to destruction facility • Facility operations/destruction of PCBs • Assessment, documentation, reporting • Facility decommissioning and abandonment <p>Estimated budgetary requirement for implementing this objective is US\$ 12,778,000.</p>

3.3.3 MEASURES TO REDUCE RELEASES FROM UNINTENTIONAL PRODUCTION (ARTICLE 5)

To prevent and control the releases of dioxins and furans and other unintentional POPs from various sources, several strategies and activities were identified as shown in Table 3-3. The crux of the strategy is the establishment and applications of BAT and BEP to minimize if not prevent the releases of unintentional POPs.

Table 3-3 Summary Action Plan Addressing Unintentional POPs

Sections	Contents
Context and Analysis of Issue	<p>Under the Convention, the Philippines is obliged to take measures to reduce total releases of dioxins and furans, and other unintentional POPs, with the goal of continuing minimization and, where feasible, ultimate elimination. The starting point will be for the Philippines to develop action plans that will evaluate current and projected dioxin and furan releases; review existing laws and policies; and develop strategies. More importantly, the Convention calls for actions to reduce or minimize the releases of unintentional production through the following initiatives:</p> <ul style="list-style-type: none"> • Promote or require substitute or modified materials, products, or processes to prevent the formation and release of unintentional POPs • Require the use of Best Available Techniques (BAT) for new sources in categories specified in the action plan and for all new sources in certain categories specified in Annex C of the Convention • Promote BAT and Best Environmental Practices (BEP) for new sources in other categories and for all existing sources

Sections	Contents
	<p>Draft guidance on the application of BAT/BEP has been prepared by an Expert Group established by the sixth session of the International Negotiating Committee and will be considered for adoption and/or further development during the first Conference of Parties (see www.pops.int).</p> <p>The Convention further provides general guidelines on preventing or reducing unintentional POPs formation and release particularly through the use of BAT and BEP. These are:</p> <ul style="list-style-type: none"> • Use of low-waste technology • Use of less hazardous substances • Promotion of the recovery and recycling of waste and of substances generated and used in a process • Replacement of feed materials which are POPs or where there is a direct link between the materials and releases of POPs from the source • Good housekeeping and preventive maintenance programs • Improvements in waste management with the aim of the cessation of open and other uncontrolled burning of wastes, including the burning of landfill sites • Minimization of these chemicals as contaminants in products • Avoiding elemental chlorine or chemicals generating elemental chlorine for bleaching <p>The issue of dioxins and furans, and other unintentional POPs, is far from being understood by potential generators, for the reason that public awareness is still limited and there is a need for continuing education regarding their sources and environmental and health impacts. The existing policies, laws, and regulations, on the other hand, do provide the necessary framework for the implementation of the Convention for unintentional releases, although the specific policies and regulations needed to address these pollutants are currently lacking. There are three major Philippine laws that relate to the management of dioxins and furans, namely, Republic Act 8749 otherwise known as the Philippine Clean Air Act of 1999; Republic Act 6969 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990; and Republic Act 9003 known as the Ecological Solid Wastes Management Act of 2000.</p> <p>The absence of specific policies also reduces the support required for research and development, which would serve as a basis for the formulation of legal standards and setting reduction or elimination targets. This is compounded by insufficient capability of the concerned agencies to utilize monitoring and assessment tools such as ecological and health risk assessment, food chain analysis, life cycle analysis, fate and transport modeling, and other analytical techniques that could provide the data and information used in setting up standards for animals, food, and other receptors or media.</p> <p>Another issue is the lack of proper coordination among the various government and private sectors on their activities related to dioxins and furans, and other unintentional POPs. This hampers the gathering of data and information. The roles of each support agency and other institutions that could be tapped to implement other provisions of the Convention are not well defined.</p> <p>Information, education, and communication campaigns involving training and education of individuals potentially exposed to unintentional POPs are a critical component of an effective national action plan. Lack of understanding of these substances with regards to</p>

Sections	Contents
	<p>environmental and health impacts is prevalent among the stakeholders. This is due to poor education about these compounds as well as limited availability of the means through which information about these products can be disseminated.</p> <p>Overall, the establishment and maintenance of effective legal, scientific, economic, and political institutions for unintentional POPs are significantly hampered because of insufficient human and financial resources. This deficiency is further compounded by the lack of appropriate administrative infrastructures needed to design, implement, monitor, and enforce relevant policies and programs that are vital in the implementation of the Convention.</p>
Goal and Objectives	<p>The following goals and objectives were developed as part of the priority setting exercise of the Philippines POPs project. These are intended to address the highest priority issues as identified.</p> <p>Goal</p> <p>Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Prepare an updated inventory of dioxin and furan releases for all significant sources by obtaining best-estimate nationwide activity data and most appropriate emission factors within three years from the approval of the National Implementation Plan 2. Develop and implement BAT/BEP promotion, adoption and monitoring programmes within three years across the most significant dioxin and furan source categories (based on updated inventory) 3. Formulate by the end of year 3 and continuously enforce thereafter appropriate policies and regulations to control dioxins and furans releases 4. Develop and implement a programme for information on the prevention of environmental and health effects of dioxin and furan by then end of year 2. 5.
Assessment of Management Options	<p>Objective 1</p> <p>This objective aims to establish a more appropriate and efficient inventory procedure as well as a comprehensive and institutionalized data collection and monitoring system. The emission factors used in the United Nations Environment Programme Toolkit are based on the inventory made by advanced and developed countries. In this regard, gap analysis will be performed to know which areas need reconciliation in the Toolkit's data requirement and actual available data reported in the country. Validating the emission factors under local conditions will further strengthen the results of the previous inventory.</p> <p>Objective 2</p> <p>This objective is directed at achieving the application of BAT/BEP across the major sources of unintentional POPs. The key management options for doing so are direct regulation and enforcement, or the application of education, awareness, and information programmes. The latter option is considered the most suitable and effective approach for the Philippines given the current low levels of knowledge and understanding and also the</p>

Sections	Contents
	<p>lack of significant capacity for enforcement. The regulatory approach will be more appropriately considered at some time in the future when our knowledge and capacity has increased to more viable levels.</p> <p>Government and private sectors have limited knowledge and understanding regarding BAT/BEP application. Capacitating them through the conduct of lectures, seminars, and training are vital measures that could be implemented. In this regard, BAT/BEP information, education, and communication materials have to be developed and implemented for public release. In addition, BAT/BEP will be integrated in the curricula and extracurricular activities of secondary and college educational levels.</p> <p>Some industries in the Philippines have been adopting BAT/BEP to lessen the production or release of dioxins and furans into the environment. Wastewater containing dioxins and furans could be prevalent among pulp and paper mill manufacturers because of the utilization of chlorinated bleaching agents (e.g., chlorine, hypochlorite, and chlorine dioxide) during process operation. Alternative non-chlorinated bleaching agents in the form of peroxide and per acetic acid could be used to make the effluent almost chlorine free. The cost of adopting these alternatives may be prohibitive on the part of the manufacturers. Wastewater leachate generated in the landfill and waste dumps are also contaminated with dioxins and furans as a result of their deposition in wastes, and often also from chlorinated materials. To lessen the impact of dioxin and furan contamination in groundwater and other bodies of water, appropriate BAT/BEP shall be implemented in the landfill sites.</p> <p>There is also a need to strengthen the institutional capability to support the promotion, adoption, and monitoring of BAT/BEP. Sampling and analysis capability for dioxins and furans have to be developed through the establishment of a sampling and analytical laboratory. Due to the high cost of setting up this type of facility, a needs assessment will first be conducted to determine the viability of the facility.</p> <p>Objective 3</p> <p>The existing policies, laws, and regulations in the Philippines do provide an overall framework for the implementation of this part of the Convention. However, there are no specific provisions on the reduction or management of unintentional POPs. This deficiency could be addressed through either regulatory or non-regulatory methods, or possibly a combination of the two. Either of these approaches may be effective. However, the first requirement is to carry out a full assessment of how the specific requirements can be best addressed within the policy and regulatory framework. Decisions on the most appropriate management options will be made on completion of the review. This will address the need for specific actions in the following areas:</p> <ul style="list-style-type: none"> • The requirement for new sources of unintentional POPs to adopt BAT/BEP, possibly under the Environmental Impact Statement System • Preventive measures for occupational health and safety • Recognition of BAT/BEP in the occupational health and safety standards • A requirement for industrial establishments to include in the self-monitoring report potential sources of unintentional POPs • Methods for encouraging inter-agency cooperation and sharing of data • Enhancement of the capacity of the National Statistics Coordination Board as repository of national information for the inventory of dioxins and furans

Sections	Contents
	<ul style="list-style-type: none"> • Methods for regulating the releases of unintentional POPs in all environmental media considering the socio-economic impacts of such activities • The possible adoption of ambient criteria and standards in all environmental media including animals and food. (The current dioxins and furans standard is only imposed on non-burn technology) <p>Objective 4</p> <p>Government and private sectors have limited knowledge and understanding regarding the environmental and health effects of dioxins and furans. Capacitating them through the conduct of lectures, seminars, and training are vital measures that could be implemented. In this regard, information, education, and communication materials on the environmental and health effects of dioxins and furans have to be developed and implemented for public release. In addition, the environmental and health effects of dioxins and furans will be integrated in the curricula and extracurricular activities of secondary and college educational levels.</p>
Action Plan Implementation Strategy	<p>The Industrial Technology Development Institute of the Department of Science and Technology and the Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead implementing agencies for this undertaking which will be supported by a Project Advisory Committee and other expert groups. The combined cost of all the objectives pertaining to dioxins and furans is estimated at US\$ 7,239,500.</p> <p>An estimated US\$ 100,000 will be used for the Creation of Project Advisory (expert) Committee that will implement the activities undertaken with respect to the objectives of progressive reductions in the releases of Dioxins and Furans. This amount will be part of the government agencies O&M budget and covers all project management activities from year 0 to year 5 of the National Implementation Plan.</p> <p>Objective 1 Prepare an updated inventory of dioxin and furan releases for all significant sources by obtaining best-estimate nationwide activity data and most appropriate emission factors within three years from the approval of the National Implementation Plan. To achieve this objective, the following activities will be conducted:</p> <ul style="list-style-type: none"> • Review of activity data collection methods • Review and strengthening of the monitoring system for industrial and household sources • Review and development of the monitoring system for agricultural, commercial, and other sources • Review and development of Philippine-specific emission factors • Data collection for the up-dated inventory • Inventory reporting, data analysis, and programme review <p>The total budget for the implementation of this objective is about US\$1,298,000.</p> <p>Objective 2 Develop and implement BAT/BEP promotion, adoption and monitoring programmes within three years across the most significant dioxin and furan source categories (based on updated inventory). This objective is expected to be attained by implementing the following project activities:</p>

Sections	Contents
	<ul style="list-style-type: none"> • Identification of BAT/BEP appropriate to the most significant dioxin and furan sources and set performance criteria for each identified BAT/BEP • Development and implementation of BAT/BEP information, education and communication programmes • Assistance to the local government units to issue resolutions and/or enact ordinances to promote BAT/BEP for unintentional POPs • Coordination with the Department of Education and the Commission on Higher Education to integrate BAT/BEP in the curricula and extra-curricular activities • Development of incentives/rewards system for dioxin and furan sources adopting BAT/BEP • Development of financing programs for sources adopting BAT/BEP • Development of performance evaluation of the application of BAT/BEP <p>The implementation period will be four years commencing in year 0 of the National Implementation Plan with a total budget of about US\$ 1,232,000.</p> <p>Objective 3 Formulate by the end of year 3 and continuously enforce thereafter appropriate policies and regulations to control dioxins and furans releases. This includes:</p> <ul style="list-style-type: none"> • Review of existing local and international regulations and policies pertaining to dioxins and furans • Requiring new sources to adopt BAT/BEP under the Environmental Impact Statement system • Integration of preventive policies on occupational safety and health • Inclusion of BAT/BEP in the occupational health and safety standards in reporting requirements • Establishment of sampling and analytical capability for dioxins and furans • Establishment of ambient baseline levels of dioxins and furans • Conduct of life cycle analysis and risk assessment based on the four major sources of dioxins and furans • Setting of ambient criteria and standards for emissions for BAT/BEP • Enforcement and monitoring of compliance <p>The policy formulation is expected to start by the end of the 3rd year implementation of the National Implementation Plan, just in time for the completion of the activities under Objective 2. Results of the activities under Objective 2 will provide information on how to best regulate the various sources of dioxins and furans. More importantly, by this time the needed infrastructure for monitoring releases would have been in placed. The start of enforcement is expected a year after and will be continuously implemented thereafter.</p> <p>The total implementation cost under this program is about US\$ 4,365,000.</p> <p>Objective 4 Develop and implement a programme for information on the prevention of environmental and health effects of dioxins and furans by the end of year 2. Implementation activities include:</p> <ul style="list-style-type: none"> • Identification, review, and development of environmental, health, and safety programs appropriate to the four significant dioxin and furan sources • Assisting local government units in issuing resolutions and/or enacting ordinances to promote environmental, health, and safety for dioxins and furans

Sections	Contents
	<ul style="list-style-type: none"> Coordination with the Department of Education and the Commission on Higher Education to integrate in the curricula and/or extra curricular activities the environmental and health impacts of dioxins and furans <p>The implementation of all the above activities is estimated to cost about US\$ 245,000. Part of the budget will be included in Objective 2.</p>

3.3.4 ACTION PLAN TO IDENTIFY CONTAMINATED SITES (ANNEX A, B, AND C CHEMICALS)

Table 3-4 presents the strategy and action plan to identify contaminated sites and for the formulation and implementation of appropriate site management methods.

Table 3-4 Summary Action Plan Addressing POPs Contaminated Sites

Sections	Contents
Context and Analysis of Issue	<p>One of the provisions of the Convention is for Parties to develop strategies for identifying POPs contaminated sites (Article 6 (1e)). The prevalent use of POPs pesticides and the improper handling of PCB transformer oils in the Philippines have led to speculations that there are sites which have been contaminated by these substances. A series of studies have been conducted to validate these speculations including the following:</p> <ul style="list-style-type: none"> Weston International Study for Clark Development Center [Aldrin, Dieldrin, Chlordane, Heptachlor, hexachlorobenzene, and PCBs] Sampling and Analysis of PCBs Based on an Inventory of PCB-Contaminated Sites in Clark Special Economic Zone - Asian Regional Research Programme on Environmental Technology – De La Salle University <p>Results of the studies asserted that there are indeed POPs contaminated sites present in the country.</p>
Goal and Objectives	<p>The following goal and objectives were developed as a result of the priority setting exercise of the Philippine POPs project. These are intended to address the highest priority issues as identified.</p> <p>Goal</p> <p>Complete identification of all contaminated sites and hotspots with corresponding appropriate management strategies to protect public health and the environment</p> <p>Objectives:</p> <ol style="list-style-type: none"> Establish criteria for the identification of contaminated sites by the end of year 1 Establish a group and a pool of trained personnel by the end of year 1, with the appropriate mandate for the identification, assessment, and management of contaminated sites Identify potentially contaminated sites throughout the Philippines based on

Sections	Contents
	<p>historical information, including an initial ranking of possible priorities for assessment from year 1 to year 3</p> <p>4. Complete expedited assessment (at least 100 priority sites) by the end of year 5, and come up with recommendations to manage these contaminated sites</p>
Assessment of Management Options	<p>The management options for identifying contaminated sites would include industry self-reporting (via regulatory or non-regulatory methods), or a nationally driven programme using government expertise augmented as necessary with local or international consultants. However, there is currently little or no expertise in this subject area, within the Philippines. Hence, the preferred approach is the one which will have the greatest impact on developing national capacity; i.e. development of a government-led programme supported by international expertise as necessary.</p> <p>Objective 1</p> <p>One of the initial requirements for contaminated site identification is a set of national criteria for (un)acceptable contamination levels. The simplest approach is to adopt criteria applied in other countries. However, this would have minimal benefit in developing local capacity. In addition, the criteria may not be relevant to local conditions. Hence, it is proposed that the work be done locally to establish a set of guidelines with criteria for the identification of contaminated sites. The Environmental Management Bureau of the Department of Environment and Natural Resources could oversee the process of preparing the guidelines. Consultations with experts and stakeholders should also be done to solicit broader views.</p> <p>Objective 2</p> <p>This objective aims to address the current insufficiency in the technical capabilities of field personnel in identifying and managing contaminated sites in the country. Since there is an apparent shortage of employees in the department level, local government units and non-government representatives would be trained as well. Several management options could be designed for this purpose; however, a single task force, mandated to function specifically for this purpose would put more bearing towards achieving this objective.</p> <p>Objective 3</p> <p>The same task force created to manage the contaminated sites could take the management responsibility for this activity. The trained personnel will be expected to conduct an extensive desk review to establish a baseline, followed by actual field sampling and testing to validate the preliminary data gathered through desk reviews. The identified sites will then be prioritized using environmental risk assessment methods.</p> <p>Objective 4</p> <p>The task force should be able to come up with a report by middle of the 3rd year detailing their assessment and recommendations on the first 100 priority contaminated sites. In addition, the task force would also be expected to recommend programs or activities geared towards managing these sites.</p>

Sections	Contents
<p>Action Plan Implementation Strategy</p>	<p>The Environmental Management Bureau of the Department of Environment and Natural Resources shall be the lead agency in most of the activities for contaminated sites. To ensure that planned activities and programs for contaminated sites are executed as scheduled, a technical working group shall be created and made to operate. The combined cost of all the objectives pertaining to contaminated sites is estimated at US\$ 2,627,000.</p> <p>Around US\$ 100,000 is earmarked for the 5-year implementation of the plan and solely for the interagency oversight committee to ensure that the set goal to address the issues on contaminated sites is achieved.</p> <p>Objective 1 Establish criteria for the identification of contaminated sites by the end of year 1. To achieve this, the following will be conducted:</p> <ul style="list-style-type: none"> • Develop draft criteria (based on reviews of criteria used in other countries and/or published by international agencies) • Review of draft criteria by technical working group • Issue Department of Environment and Natural Resources Administrative Order on identification of POPs contaminated sites <p>All of the aforementioned activities are expected to be completed within nine (9) months and the estimated budget requirement for this objective is US\$ 58,000.</p> <p>Objective 2 Establish a group and a pool of trained personnel by the end of year 1, with the appropriate mandate for the identification, assessment, and management of contaminated sites. This includes:</p> <ul style="list-style-type: none"> • Identification of training needs • Capacity building for identification and management of contaminated sites (through intensive field and desk-based training) • Provision of necessary equipment and other resources <p>Government and non-government representatives shall be capacitated for contaminated site identification through training and capability building activities. External consultants shall be hired for this purpose. The estimated cost of this activity is US\$ 35,000.</p> <p>Objective 3 Identify potentially contaminated sites throughout the Philippines based on historical information, including an initial ranking of possible priorities for assessment from year 1 to year 3. Implementation activities will include:</p> <ul style="list-style-type: none"> • Identification and mapping out of POPs contaminated sites including ecological burdens through secondary data assessment • Conduct of on-site assessment and testing of suspected sites for possible contamination of POPs <p>The total cost estimate for these activities is US\$ 1,685,000.</p> <p>Objective 4 Complete expedited assessment (at least 100 priority sites) by the end of year 5, and come up with recommendations to manage contaminated sites. The activities include:</p>

Sections	Contents
	<ul style="list-style-type: none"> • Establishment of procedures and policies for the clean-up and management of contaminated sites • Conduct of environmental risk assessment of identified hotspots to evaluate the need for decontamination, develop ranking criteria, and ranking of the hotspots according to degree of risk • Development of clean-up and management plans for hotspots, including Information Management Program (for the affected receptors including setting up of information center) • Development and implementation (as funds allow) of clean-up, destruction, and management plans for identified contaminated sites <p>These programs and activities are estimated to cost US\$ 750,000.</p>

3.3.5 ACTION PLAN FOR PUBLIC AWARENESS, INFORMATION, AND EDUCATION (ARTICLES 10)

To address the issue on the low level of knowledge and awareness of POPs, Table 3-5 outlines the strategy and action plan. This strategy and action plan is anchored on the Communication Plan framework developed as part of the Enabling Activity Project on Public Awareness and Information Campaign. The activities listed are either unique or will support the other information, education, and communication enhancement activities integrated in the Action Plans for POPs pesticides, PCBs, dioxins and furans, and contaminated sites.

Table 3-5 Summary Action Plan Addressing Public Awareness, Information and Education

Sections	Contents
Context and Analysis of Issue	<p>The Convention contains at least two Articles that highlight the importance of information, education, and communication in achieving the goals of the Convention. These are:</p> <ul style="list-style-type: none"> • Article 9 Information Exchange, which calls upon parties to facilitate, or undertake exchange of information relevant to reduction or elimination of POPs and alternatives to POPs, including their risks as well as economic and social costs. It establishes the kinds of information that need to be exchanged between Parties and the mechanisms of this exchange. • Article 10 Public Information, Awareness and Education, which calls upon parties to promote and facilitate awareness of POPs among policy and decision makers, industry and professional users, and the general public (especially women, children, and the least educated) and to encourage public participation in addressing POP effects on health and environment. The Article also emphasizes the need to store, maintain, and make accessible information generated from research, development, and monitoring. <p>In addition, the Convention contains some other references on the role of information, education, and communication in the implementation of the Convention. Article 5 has a provision on the need to include in the action plan “steps to promote education and</p>

Sections	Contents
	<p>training with regard to, and awareness of, strategies” adopted to meet the objective of reducing or eliminating releases from chemicals identified in Annex C of the Convention. The same article also includes provisions to promote the use of BAT/BEP. Article 11 requires that results of research, development, and monitoring activities be made accessible to the public on a timely and regular basis and that signatories undertake cooperation with regard to storage and maintenance of information generated from these activities. Article 13 discusses the promotion of multiple-source funding approaches, mechanisms and arrangements, including information on available sources of funds.</p> <p>The foregoing Articles and specific provisions show that information, education, and communication needs to go beyond creating awareness of what POPs are and how they can be managed, reduced, or eliminated. The articles provide that information, education, and communication must include information exchange, management information systems, appropriate technology promotion and transfer, advocacy (for appropriate structures and policies), and resource mobilization.</p> <p>On the other hand, the Philippines still requires tremendous effort to improve the level of knowledge and awareness across all sectors on POPs. Though a number of efforts pertaining to increasing the level of awareness have been conducted, especially by a number of non government organizations, several studies and reports showed that most of the issues on POPs are rooted to low levels of knowledge and awareness. The Enabling Activity Project on Public Awareness and Information Campaign has documented issues on the level of awareness and knowledge. Most significant issues include:</p> <ul style="list-style-type: none"> • Lack of advertising responsibility of pesticide companies • Lack of neutral source of information on POPs • Gaps in knowledge, awareness, and practices by farmers • Scarcity of information • Need for local epidemiological studies and lack of proper documentation <p>To address the above issues, a Communication Plan was developed as part of the Enabling Activity Project on Public Awareness and Information Campaign. A number of activities under the said Communication Plan have been initiated primarily by the Environmental Management Bureau, some of which are being co-implemented by other partner government agencies and non-government organizations.</p> <p>The set goals and objective presented herein are incremental activities to promote awareness, enhance knowledge level, and secure support from higher officials. These activities are under the framework of the set Communication Plan.</p>
Goal and Objectives	<p>Goal</p> <p>Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Develop and implement a program to sustain awareness and understanding of

Sections	Contents
	<p>the health, environmental risks, and economic impact of POPs from year 0 to year 5</p> <ol style="list-style-type: none"> 2. Create and implement educational programs on POPs from year 1 onwards 3. Develop and implement political lobbying programs to sustain POPs reduction and elimination as a public health priority, environmental issue, and priority action agenda 4. Build and sustain network of information exchange and communication on POPs and the National Implementation Plan from year 1 onwards
Assessment of Management Options	<p>Promoting initial and sustained environmental awareness requires purposeful communication. Purposeful communication is essential to the success of the National Implementation Plan programs, requirements, and activities. The environmental awareness aspects of those programs, requirements, and activities require pragmatic, value-laden and strategic use of Information, Education, and Communication approaches, tools, and techniques.</p> <p>The Information, Education, and Communication framework set forth in this action plan hinges on the need to inform, educate, motivate, and mobilize stakeholders—particularly government agencies and target corporations and private citizens. Key strategies in the action plan include:</p> <ul style="list-style-type: none"> • Social Mobilization — encouraging total, active and sustained involvement, and participation of all offices and program units of the government, as well as the private corporations and citizens mutually reinforcing communication activities to achieve program objectives. This concerns mobilizing human and technical resources; hence the use of interpersonal communication, opinion leaders (environmental consultants, cause champions, non-government organizations etc.), consultations, assemblies, and other means. • Social Marketing — making use of the Information, Education, and Communication outputs (for example, pamphlets, posters, guides, primers, magazines, articles, video cassettes, etc.) as support strategy for employing all types of available media. • Advocacy — using the focus group discussions/mini-seminars and related activities, lobbying/campaigning for environmental awareness and understanding of the program. • Alliance Building and Networking — solidifying intra-sectoral coordination through such activities as strengthening the hub of the community where the installations are located.
Action Plan Implementation Strategy	<p>The Environmental Management Bureau of the Department of Environment and Natural Resources and the Philippine Information Agency shall be the lead agencies. The combined cost of all the objectives pertaining to increasing the level of awareness and knowledge and ensuring full support from all partner stakeholders is US\$ 1,341,000.</p> <p>Objective 1 Develop and implement a program to sustain awareness and understanding of the health, environmental risks, and economic impact of POPs from year 0 to year 5</p> <ul style="list-style-type: none"> • Setting up of databank/library on POPs that would be the source of information for the continuous public dissemination. This would include: <ul style="list-style-type: none"> ○ Research studies ○ Testimonials from victims of POPs and those who shifted to

Sections	Contents
	<p style="text-align: center;">alternatives</p> <ul style="list-style-type: none"> ○ Technical reports ● Production and dissemination of Information, Education, and Communication materials based on documented testimonials and popularized technical reports and risk studies. <ul style="list-style-type: none"> ○ Focused distribution, leafleting, placement of posters and billboards at work places and offices, barangay halls, schools, health centers, local markets, shops, etc. ○ Posting of general information and updates on web page ● Conduct of series of seminars and lectures to various organizations both formal and non formal organizations <ul style="list-style-type: none"> ○ Creation and mobilization of Speakers Bureau ○ Development of pro forma presentation materials – power point presentation and videos ● Sustain media coverage through: <ul style="list-style-type: none"> ○ Preparation of local media directory ○ Writing and placement of regular news releases ○ Conduct of regular press conference ○ Radio-television guestings by government officials ○ Use of existing radio and television government programs ○ Tapping of public affairs programs for integration of POPs messages ○ Recognition of journalists & media organizations that regularly cover POPs and related issues ○ Organization/ coordination of special events pertaining to POPs <p>These programs and activities are estimated to cost US\$ 225,000.</p> <p>Objective 2 Create and implement educational programs on POPs in all levels from year 1 onwards. Activities include:</p> <ul style="list-style-type: none"> ● Coordination with the Department of Education and the Commission on Higher Education to integrate POPs in the curricula and/or extra curricular activities <ul style="list-style-type: none"> ○ Review of the existing curriculum on environmental education ○ Creation of a Committee on the Development of Integration Plan and Templates of Prototype lesson plan and modules on POPs ● Conduct of National Orientation seminar and training of potential trainors among teachers and student leaders from different schools nationwide. ● Involvement of research students (special science curriculum) in survey research as enumerators or tabulators and in the verification of existing data inventories on POPs. ● Requiring schools to have one of its Outreach Program the conduct of orientation seminars of the environmental and health effects of POPs in their respective communities ● Working with the national television networks to include POPs as one topic in their regular morning educational TV shows for kids (Batibot, ATBP, Hiraya Manawari, etc.) <ul style="list-style-type: none"> ○ Develop the concept for the TV shows ○ Run the TV shows

Sections	Contents
	<p>The above activities are estimated to cost US\$ 370,000.</p> <p>Objective 3 Develop and implement political lobbying programs to sustain POPs reduction and elimination as a public health priority, environmental issue, and priority action agenda. The following activities are proposed to help achieve the set objective:</p> <ul style="list-style-type: none"> • Identification of target political groups and development of specific/key messages and delivery methods per group • Conduct of series of lobbying activities for legislative and budgetary support for the reduction & elimination of POPs • Integration of POPs reduction and elimination in agency’s plans, programs, services, and resource allocation and be able to present effectively during regular Congress/Senate hearings on government program and budget allocations • Establishment and maintenance of an intra-agency and Local Government Unit reporting/ information exchange system • Enlistment of journalists, media agencies and associations and environment-friendly journalist associations (e.g., Philippine Center for Investigative Journalism, Philippine Center for Photo Journalism, Philippine Agricultural Journalists, Environmental Broadcasters Circle) in committees or task forces <p>The estimated budget requirement for this objective is US\$ 116,000.</p> <p>Objective 4 Build and sustain network for information exchange and communication on POPs and the National Implementation Plan from year 1 onwards</p> <ul style="list-style-type: none"> • Survey of partner stakeholders to establish common interest and preferred communication mechanisms • Set schedule for regular coordinative meetings, including reporting on POPs updates and the activities under the National Implementation Plan • Development and maintenance of information clearing house that would serve as the focal center for POPs information such as BAT/BEP practices, results of environment and health monitoring, international updates on POPs, and POPs issues, etc • Participation in local, national, and international forums on POPs • Presentations during regular meetings of business associations <p>These programs and activities are estimated to cost US\$ 630,000.</p>

3.4 DEVELOPMENT AND CAPACITY BUILDING PROPOSALS AND PRIORITIES

The action plans presented above were developed on the basis of agreed priorities for implementation of the Stockholm Convention in the Philippines. As indicated in those plans, much of the work will be carried out by local personnel, but with recourse to international expertise as and when required. This approach is intended to assist in developing local capacity for POPs management and implementation of the Convention. The specific priority areas where capacity building activities have been proposed are as follows:

Table 3-6 Capability Building Priorities

POPs Issues	Capability Building Proposals and Priorities
POPs pesticides	<ul style="list-style-type: none"> • Training of field inspectors on how to conduct inspection and identification of POPs pesticides (including health and safety measures) • Formulate methodologies and guidelines for inspection, retrieval, and proper disposal of POPs pesticides
PCBs	<ul style="list-style-type: none"> • Preparation of guidelines for PCB inventories, including standard protocols for sampling and test methods • Training on identification and sampling • Guidelines on storage and safe handling, transportation, servicing/retrofilling and repair • Training of TSD facility operators • Inventory of PCBs • Code of practice and mechanism for accreditation of servicing facilities • Enhancement of testing and monitoring, including analysis
D/Fs:	<ul style="list-style-type: none"> • On-going work on improved inventory procedures • Emission factor validation • Development of sampling and analytical capability • Assessment of command-and-control and market-based instrument policies
Contaminated sites	<ul style="list-style-type: none"> • Identification and management of contaminated sites • Development of guidelines with criteria for contaminated sites identification • Development of measures for management and clean-up of contaminated sites
Cross Cutting Capability Building Activities	<ul style="list-style-type: none"> • Development and demonstration of BAT/BEP • Environmental monitoring • Health impact monitoring to include diagnosing POPs related cases • Information, education, and communication

3.5 DETAILED ACTION PLANS, TIMELINES, RESOURCE REQUIREMENTS AND PERFORMANCE MEASURES

This section presents the details of each of the action plans, including the specific targets, milestone, and performance indicators, including the projected cost requirements. Tables 3-7 to 3-11 present the detailed strategies and action plans

Table 3-7 Strategies and Actions Plans Addressing POPs Pesticides

Goal: Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the conti																									
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule																				Performance Indicators		
			0 - mobilization period																						
			Year 1				Year 2				Year 3				Year 4				Year 5						
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Creation of TWG that will monitor activities undertaken with respect to objectives for all POPs pesticides	FPA – Lead Agency, DA-BPI – Co-Chairman, PPA, BOC, DOH-EOHO, OSHC, DILG, DTI, PNP, LGUs, Croplife, PMAP, CPAP, PBGA, Phil. Pesticides Applicators Foundation, Association of Banana Plantations, EMB, National Poison Mgt Center, UP-NSRI, Flower Growers Assoc	100																							Issuance of a Special Order forming the TWG for POPs Pesticides in the implementation of the NIP for the SC
Objective 1. Complete a review of the most appropriate and effective ways for improving monitoring and enforcement of the existing regulatory controls on POPs pesticides by the end of the 2nd year																									
Identify most appropriate and effective ways for monitoring and enforcement	FPA, EMB - support	18																							Recommendations
Come up with a report detailing the review and the recommended policy interventions – consolidation	FPA, EMB	5																							Final Report
Objective 2. Implement a programme that will inspect, retrieve, and properly dispose of POPs pesticides from year 1 up to the 2nd year																									
Formulate methodologies and guidelines for use of the program	FPA, EMB, For analytical procedures: BPI	10																							Finalized guidelines and methodologies
Establish infrastructure (equipment and facilities) and manpower support to implement program	FPA, EMB, For analytical procedures: BPI	1,150																							Facility infrastructure

Goal: Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the conti

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule 0 = mobilization period																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Conduct public awareness campaign and implement policies so that potential holders will voluntarily identify POPs pesticides	EMB, FPA, PIA, Croplife, CPAP	100																					Number of IEC materials produced and distributed

Goal: Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the conti

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule 0 - mobilization period																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Train field inspectors on how to conduct inspection and identification of POPs pesticides (to include health and safety measures) – focused on strategy formulation	FPA, EMB, OSHC-DOLE, LGUs	115																						Training materials developed; 5 Regional Trainings conducted; 100 trained inspectors; Train the trainer workshop conducted; Train BOC inspectors and OSHC representatives
Carry out inspection programs	FPA, EMB, LGUs	75																						No. of inspections conducted
Design and build storage facilities, if necessary	FPA, EMB, Croplife	1,265																						No. and size of storage facilities built
Safe storage of confiscated POPs pesticides	FPA, EMB	60																						Quantity of POPs Pesticides confiscated
Update database on POPs pesticides inventory	FPA	100																						Quantity of POPs Pesticides Inventoried
Develop cost-benefit analysis of environmentally-sound disposal methods for POPs pesticides and secure necessary resources for implementation	EMB	57.5																						Completed cost –benefit study
Implement (pilot or full scale) proper disposal of POPs pesticides	EMB, Private sector – will operate the disposal facility	2,369																						Pilot or full scale disposal facility

Goal: Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the conti																							
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule																Performance Indicators				
			Year 1				Year 2				Year 3				Year 4					Year 5			
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4	Q1	Q2	Q3
Objective 3. Develop and implement continuous environmental and health monitoring program from year 1 onwards																							
Assess the existing health and environmental monitoring program implemented by various agencies pertaining to POPs pesticides including diagnosing POPs pesticides related	NGO, DOH, OSHC, EMB, UP-NSRI	5																					Report
Develop a concerted and integrated health and environmental monitoring program to include capacity building for determining POPs pesticides related	EMB, NGO, DOH, UP-NSRI	10																					Health and environmental monitoring program
Implement, update, and periodically report the result of the health and environmental monitoring activities	EMB, DOH, OSHC	85																					Monitoring report
Objective 4. Complete an assessment of the effectiveness of current practices for the control of malaria in the Philippines, and options for improvements including the use of Integrated Vector Management strategies, and the need for DDT by the end of the																							
Identification of current practices and their efficacy (including preventive measures) on malaria control including updating the DDT inventory (stockpiles)	DOH, NCDP	65																					Report
Assessment of best strategies (including DDT substitute) for malaria control	DOH	115																					Report
Trial of DDT alternatives	DOH, Croplife, Academe, UP-NSRI, DOST-PCHRD, BPI	1,070																					Report/ Recommendations
Policy recommendation on the need (or not) of DDT	DOH, DENR-EMB	15																					Recommendation Apply for exemption on DDT use if found necessary Recommend banning if no longer needed

Goal: Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the conti																							
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule																				Performance Indicators
			0-5 mobilization period																				
			Year 1				Year 2				Year 3				Year 4				Year 5				
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Objective 5. Initiate all actions (as required under all relevant regulations) by the end of year 1, with a view to ban mirex and hexachlorobenzene																							
Review of all regulations and industrial practices that involve mirex and HCB	EMB, FPA, DTI, DOST, BWC-DOLE	20																					Report/ Recommendation
Identify and assess possible sources and generation of Mirex and HCB as by-products and develop reduction strategies, if required.	EMB, FPA, DTI, DOST, BWC-DOLE	60																					Report/ Recommendation
Initiate regulatory process to officially ban the importation and use of Mirex and HCB	EMB, FPA	20																					CCO for industrial chemicals, MC for pesticide uses

Table 3-8 Strategies and Actions Plans Addressing PCBs

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Set up PCB inventory inter-agency committee to review inventory procedures and reports	*EMB-DENR, DOST, NEA, DOE, Academe	100																						MOA among involved agencies; SO for the delegation of personnel
Objective 1. Prepare a comprehensive and complete national inventory of PCBs, PCB containing materials, and PCB wastes from year 0 to year 2 of the National Implementation Plan																								
Prepare a list of resources and expertise on PCB management and related researches	*EMB-DENR, DOST, Academe, NEA	5																						List of resources, expertise
Prepare a comprehensive profile of potential sources of PCBs in the country consisting of PCB generators, TSD facilities, and servicing facilities	*EMB-DENR, DTI, NEA, DOW, PEPOA, BOC, PPA	20																						Profile of generators, TSD facilities, and servicing facilities
Develop and publish inventory guidelines * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	*EMB-DENR, DOST, NEA, DOE, Academe	48																						Memorandum Circular, Published guidebook
Develop and implement monitoring and evaluation program/guidelines for inventory * Guideline preparation * Consultations with EMB regional offices * Review and approval * Editing/printing/publication	*EMB-DENR, DOST, NEA, DOE, Academe	25																						Published guidelines for inventory, raw data sheets, inventory program

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
		Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Develop standard protocols for sampling and test methods * Hiring of consultants * Drafting of protocols/standards * Consultative meetings with stakeholders * Approval of test methods	*EMB-DENR, DOST, NEA, DOE, Academe, NPCI, OSHC, DOH	230																					Memorandum Circular, Published guidebook
Upgrading of EMB laboratories that will analyze PCB * Train laboratories * Evaluate needs of EMB laboratories and demand for PCB sampling in each region * Select strategic regional laboratories to be upgraded *	EMB-DENR and selected regional offices (5)	2000																					Upgraded laboratories Trained laboratory staff
Accreditation of PCB samplers	EMB-DENR	55																					List of recognized PCB laboratories
Recognition of laboratories for PCB analysis * Setting of recognition criteria * Evaluation of laboratory capability * Announcement of list of recognized laboratories	EMB-DENR	345																					List of recognized PCB laboratories
Conduct training on identification and sampling for electric utilities, servicing facilities, generators, EMB, and other agencies	EMB-DENR, PCG, PPA, Marina, BOC, NGO, OSHC, DOH, Academe	70																					Trained Personnel

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Strengthen the existing PCB information database that will track the following information: * PCBs in use * PCBs in storage * PCBs in shipment * PCBs treated or disposed	EMB-DENR, PCG, PPA, Marina, BOC	210																					Operationalized national database
Strengthen and institutionalize the system of reporting among generators * Review reporting protocols and forms * Issue guidelines for EMB staff * Issue guidelines for industry reporting protocols * Submission of report	EMB-DENR	40																					50% reporting compliance by Year 1 based on profile; 75% reporting compliance by Year 2 based on baseline profile; 100% reporting compliance by Year 3 based on baseline profile
Develop policies on the shipment and consent procedures for the importation of transformer equipment	EMB-DENR, BOC, PPA, Marina	13																					MOA among agencies, memorandum of circulars
Conduct inventory of PCB materials and wastes * Validate suspected PCBs through inspection, sampling, and analysis * Labeling	EMB-DENR	184																					Labeled PCB equipment, laboratory test results
Develop funding mechanism to assist in the conduct of the inventory * Computerization of equipment inventory * Sampling and analysis	GFIs, NEA	20																					Available credit facility for electric cooperatives

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Analyze data and come up with a complete national inventory	EMB-DENR, PPDC	40																						Comprehensive national inventory
Conduct information, education campaign on health and technology for PCB management * Review existing IEC materials * Develop/design IEC materials and website on POPs	EMB-DENR, Academe, PEPOA, Philreca, PIA, CHED, DepEd, LGUs, NEA, NGOs, Media	40																						IEC materials: Ads, Website, Flyers/brochures
Objective 2. Establish and implement a program on safe handling, storage, and transport of PCBs, PCB-containing materials and PCB wastes from year 1 to year 4																								
Enhance guidelines for the storage and safe handling including transport and dismantling of PCBs * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	EMB-DENR	30																						Published guidebook
Enhance guidelines and standards for TSD facilities dealing with PCB * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	EMB-DENR	30																						Published guidelines and standards
Develop monitoring and evaluation program for handling and storage * Program/guideline development * Consultations * Review and approval * Editing/printing/publication	EMB-DENR, PPA, PCG, Marina, BOC	30																						Published guidebook

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
		Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Implement monitoring and evaluation program * Tracking and manifesting of PCBs from the site of origin to the site of storage and site of treatment/disposal including PCB waste transport and shipments * In	EMB-DENR, PPA, PCG, Marina, BOC	30																					Waste manifest, inspection reports
Improve safe transportation rules and regulations for PCBs to include: transport vehicle standards, guidelines for preparation of waste shipments, emergency response capability along transportation routes, provisions for authorizing qualified carriers, an	EMB-DENR, PPA, PCG, Marina, BOC, DOTC, OSHC	25																					Published guidebook
Develop code of practice for servicing/retrofilling and repair of equipment * Code of practice development * Consultation * Review and finalization	EMB-DENR, NEA, TESDA	24																					Code of Practice

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
		Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Issue memorandum circular prescribing the adoption of the code of practice for servicing/refilling and repair of equipment * MOA between EMB-DENR and TESDA * Drafting of MC * Consultations * Review and approval	EMB-DENR, TESDA	1																						MOA between EMB-DENR and TESDA; MC
Conduct training of operators of TSD facilities, generators, and regulators	EMB-DENR, PPA, PCG, Marina, BOC, OSHC, DOH	5																						Trained operators, generators and regulators
Enhance regulation of registration of refilling facilities * Review guidelines on registration * Issue guidelines for registration including LGU ordinances on junkshop/refilling facility regulation * Registrati	*EMB-DENR, DTI, LGUs, TESDA	3																						50% registered by Year 2; 75% registered by Year 3; 100% registered by Year 4
Develop an accreditation system of servicing facilities and establishments	EMB-DENR, *DTI, *TESDA, LGUs	4																						Memorandum circular
Implement accreditation of servicing facilities * Evaluate servicing facilities * Issue list of accredited servicing facilities	EMB-DENR, *DTI, *TESDA, LGUs, NEA, PEPOA, Philreca	4																						List of accredited servicing facilities

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
		Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Develop guidelines/checklist for the evaluation of PCB Management Plan of generators and servicing facilities * Guidelines development * Review and approval * Editing/printing/publication	EMB-DENR	4																						Published guidelines or checklist for evaluation of PCB management plan
Evaluation of PCB Management Plan of generators and servicing facilities	EMB-DENR	12																						Accepted PCB Management Plan
Conduct routine inspection and monitoring on the implementation of the PCB management plan	*EMB-DENR, NGO, LGUs	24																						Inspections conducted
Conduct environmental monitoring for PCBs in water and soil	EMB	115																						Monitoring report
Objective 3. Develop and implement continuous integrated environmental and health monitoring program from year 1 onwards																								
Assess the existing health and environmental monitoring program implemented by various agencies pertaining to PCBs including diagnosing	DOH, OSHC	5																						Assessment report
Develop a concerted and integrated health and environmental monitoring program to include capacity for diagnosing and treatment of PCB related cases	DOH, OSHC	10																						Integrated health and environmental monitoring program
Implement, update, and report the result of the health and environmental monitoring activities	DOH, OSHC	85																						Monitoring report

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																Performance Indicators				
			Year 1				Year 2				Year 3				Year 4					Year 5			
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4	Q1	Q2	Q3
Objective 4. Eliminate and destroy all PCBs, PCB-containing materials, and PCB wastes not later than 2025																							
Create Technical Working Group on PCB destruction	EMB-DENR, PPDC	4																					Technical Working Group
Issue policies in support of the GEF/UNIDO/UNDP POPs Destruction Facility Project	*EMB-DENR	4																					DAOs, MCs issued
Project development of GEF/UNIDO/UNDP POPs Destruction Facility Project including EIA, Selection of technology	EMB-DENR, PPDC, UNDP/ UNIDO	30																					Technology selected
Facility Construction (Includes private sector investment)	PPDC	12,315																					Facility commissioned; ECC issued
Transport of wastes from storage facilities to destruction facility	Accredited transporters	230																					Waste delivered to destruction facility/waste manifest
Facility Operations/destruction of PCBs - NO investment cost from the Government	PPDC	N/A																					PCB wastes destroyed; Certificate of Destruction issued to generator
Assessment, documentation, reporting	PPDC, *DENR-EMB	4																					Facilities inspected
Facility decommissioning and abandonment (cost not included in GEF sc request SC)	PPDC	185																					Area restored Certificate or clearance issued by DENR-EMB

Goal: Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
		Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Provide incentives for electric utilities to comply with the phase-out of PCB * Study incentives program to assist utilities * MOA among EMB-DENR, NEA, GFIs, BOI	BOI, GFIs, NEA, EMB=-DENR	4																					DAOs, MCs, MOA issued
Evaluate existing environmental financing windows and market financing programs that would help electric utilities to phase-out, treat, and dispose PCB wastes and PCB-containing equipment. * MOA with DBP and LBP on financing of PCB phase-out	BOI, GFIs, NEA, EMB=-DENR	2																					Available credit facility for electric cooperatives

Note: (*) - Lead agency

Table 3-9 Strategies and Actions Plans Addressing Dioxins and Furans

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge																							
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			0 = mobilization period																				
			Year 1				Year 2				Year 3				Year 4				Year 5				
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Creation of Project Advisory (expert) Committee that will implement the activities undertaken with respect to the objectives of progressive reductions in the releases of Dioxins and Furans		100																					
Objective 1. Prepare an updated inventory of dioxin and furan releases for all significant sources by obtaining best-estimate nationwide activity data and most appropriate emission factors within three years from the approval of the National Implementatio																							
Activity Data a. Critical review of methods for activity data collection * Review of UNEP Standard Toolkit and other inventory procedures (US-EPA, Japan Ministry of Environment, etc.)	ITDI-DOST, EMB, DOLE-OSHC, DOE-EUMB, DA-FPA, BOI-DTI, NSCB	12.5																					Report
Activity Data b. Recommend revised methods and submit to PAC for agreement * Prepare report and present results to PAC for agreement	ITDI-DOST, EMB, DOLE-OSHC, DOE-EUMB, DA-FPA, BOI-DTI, NSCB	12.5																					Report
Review and strengthen the monitoring system (for industrial and household sources) a. Review and revise SMR * Review SMR and harmonize the information with data requirements of the Inventory	EMB-EQD	7.5																					Revised SMR through MC
Review and strengthen the monitoring system (for industrial and household sources) b. Review and revise NSO data gathering form * Review NSCB data gathering form and harmonize with data requirements of the	NSCB, NSO, EMB	10																					Revised NSO data gathering form

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			0 = mobilization period																				
			Year 1				Year 2				Year 3				Year 4				Year 5				
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Review and strengthen the monitoring system (for industrial and household sources) c. Establish and maintain an online database * Collate information for data base * Develop on-line info database * Post te	EMB	100																					Established online database
Review and develop monitoring system (for agricultural, commercial, and other sources) a. Monitoring Report * Review monitoring system and harmonize with data requirements of the Inventory * Revise moni	DA-FPA, EMB, DA-BAI, DTI, MMDA, LGU	2.5																					Report
Review and develop monitoring system (for agricultural, commercial, and other sources) b. Database * Collate information for data base * Develop on-line info database * Post test on-line info data base	EMB	2.5																					Established online database
Review and set-up of Philippine emission factors a. Critical review of published emission factors, including gap analysis * Review literature on established and default emission factors in the UNEP Standard	ITDI-DOST, EMB	250																					Report
Review and set-up of Philippine emission factors b. Local source testing, where required * Identify the dioxins and furans labs that will do the sampling and analysis * Determine size and flux of releas	ITDI-DOST	700																					Test results

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge																							
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			0 = mobilization period																				
			Year 1				Year 2				Year 3				Year 4				Year 5				
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Review and set-up of Philippine emission factors c. Harmonize and submit list of proposed factors to PAC for discussion, agreement and adoption as a "national" reference document	ITDI-DOST	50																					Localized emission factors for Philippine application
Data Collection a. Recruit survey staff and carry out data collection, etc to prepare updated inventory * Prepare job descriptions and person specification for the positions * Training/Orient	EMB-PAC	100																					Updated inventory
Data Collection b. Capacitate existing agencies (EMB, LGUs, BOI, DTI, NSO, NSCB, DOE, OSHC, BFAD, and other agencies) * Conduct lectures/seminars on D/F inventory * Conduct a hands-on inventory on selected	EMB, ITDI-DOST, NSRI, OSHC, BFAD	30																					Trained personnel
Inventory reporting, data analysis, and programme review * Preparation of National D/F Inventory Report and include data gaps, if any	ITDI-DOST, NSO, DOE, EMB, DOH, OSHC, FPA, BOI-DTI, NEMC., MWSS, DILG-BFP, PCG, PPA, DOTC-LTO, MGB	20																					Inventory report
Objective 2. Develop and implement BAT/BEP promotion, adoption and monitoring programmes within three years across the most significant dioxin and furan source categories (based on updated inventory)																							
Identify the most significant D/F categories * Review the updated national inventory and identify four significant D/F sources	EMB, ITDI-DOST	2																					Identified 4 significant D/F categories
Identify BAT/BEP appropriate to the four significant D/F sources and set performance criteria for each BAT/BEP * Review available information * Prepare shortlist of BAT/BEP * Set performance criteria for BAT/BEP based on experts' re	EMB, ITDI-DOST, DOLE-OSHC, DOE, DA-FPA	670																					BAT/BEP database for the four significant D/F sources

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs 0 = mobilization period																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Identify BAT/BEP that will reduce D/F in wastewater and prevent D/F contamination of water resource * Identify all the possible pathways of D/F to water (e.g.. run-off from contaminated sites, e.g., leachate from dumpsites or	ITDI-DOST, EMB	15																						List of applicable BAT/BEP
Application of BAT/BEP	ITDI-DOST, prospective industry	15																						Monitoring report
Develop and implement BAT/BEP IEC programmes * Review database on D/F Develop IEC materials for public release * Develop IEC materials for industries with manufacturing processes releasing D/F * Present materials to FGD	EMB-EEID, PIA	5																						BAT/BEP IEC programmes
Assist LGUs to issue resolution and/or enact ordinances to promote BAT/BEP for Dioxins & Furans * Conduct meetings with LGU representatives on promotion of BAT/BEP * Conduct seminar-workshop on the importance of adopting BAT/BEP	EMB, ITDI-DOST, DILG-BLGD	427.5																						Number of enacted resolutions or ordinances by LGUs nationwide (it will justify the huge external funding)
Coordinate with DepEd and CHED to integrate BAT/BEP in the curricula and extra-curricular activities * Review existing curriculum * Develop integration plan and templates of lesson plan * Implement the integration program	EMB-EEID, PIA	25																						Integrated BAT/BEP in the curricula and extra-curricular activities

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge																										
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs 0 = mobilization period																				Performance Indicators			
			Year 1				Year 2				Year 3				Year 4				Year 5							
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4		
Develop incentives/rewards system for D/F sources adopting BAT/BEP * Review existing reward system * Create selection committee * Develop selection/merit criteria to facilitate and reward outstanding performance * Identify poss	DTI/BOI, EMB, OSHC, Office of the President, Legislative body	20																								Incentives or rewards system
Develop and adopt financing programs for sources adopting BAT/BEP * Review existing financial program for technology transfer/adoption by GFIs and PFIs * Conduct consultative meetings with implementing agencies for the developme	DOF, GFIs, Participating Development Banks (PDBs) or Banker's Association of the Philippines (BAP)	2																								Financing programs
Develop performance evaluation of the BAT/BEP * Develop evaluation criteria and plan * Execute the evaluation plan * Prepare performance evaluation report	ITDI-DOST, DOE, OSHC-DOLE	50																								Performance evaluation
Objective 3. Formulate by the end of year 3 and continuously enforce thereafter appropriate policies and regulations to control dioxins and furans releases																										
Review existing local and international regulations and policies pertaining to D/F * Review local and international regulations and policies which have specific provisions on the management of D/F * Prepare report on policy optio	EMB, ITDI-DOST, BFAD	100																								Report
Require new sources to adopt BAT/BEP under the EIS system * Include BAT/BEP as requirement for new sources under the EIS system * Prepare and issue MC or departmental order	EMB-EIA	5																								MC/DAO

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs 0 = mobilization period																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Integrate preventive policies on occupational safety and health * Review policies on OHS * Prepare integration plan * Integrate policies on OHS	OSHC	5																					Integrated policies
Include BAT/BEP in the occupational health and safety standards in reporting requirements * Review OHS standards and report forms * Revise forms and present in FGD * Adopt revised reporting requirements	DOLE, DOH	5																					OSH Standards
Establish sampling and analytical capability for D/F * Review sampling and analytical capability for D/F * Needs analysis for laboratory services * Determine viability of setting D/F laboratory * Assessment of alternatives to meet need	EMB-EQD & RDD, ITDI-DOST, UP-NSRI, BPI-DA	3,000																					Sampling and analytical capabilities
Establish ambient baseline levels of D/F for air, water, and soil * Identify distinct sites for baseline monitoring * Develop a study design for baseline monitoring * Conduct baseline monitoring	EMB-EQD & RDD, ITDI-DOST, UP-NSRI, BPI-DA	500																					Baseline levels for air, water, and soil

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs 0 = mobilization period																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Conduct life cycle analysis and risk assessment based on the 4 identified major sources of D/F * Review available information and identify information gaps * Review and select appropriate fate and transport models in the quantifi	ITDI-DOST, DOH, OSHC-DOLE, UP Poison Center, BFAD	500																					Life cycle assessment report; Ecological and health risk assessment report

Goal: Progressive reductions and continuous monitoring in the releases of dioxins and furans and other unintentional POPs in the Philippines, based on scientific knowledge																								
Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			0 = mobilization period																					
			Year 1				Year 2				Year 3				Year 4				Year 5					
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Set ambient criteria and standards for emissions for BAT/BEP * Review existing ambient standards and criteria * Set standards or criteria for dioxins and furans levels in environmental media	EMB	125																						Ambient criteria and emission standards
Enforce and monitor compliance * Issue amendments in DAO	EMB	125																						Enforcement/ monitoring data
Objective 4. Develop and implement a programme for information on the prevention of environmental and health effects of dioxin and furan by the end of year 2																								
Identify, review, and develop environmental, health, and safety programs for information, education, and communication	DOH, OSHC-DOLE, EMB	20																						Information programme either separately and/or integrated in the ongoing EHS activities
Assist LGUs to issue resolution and/or enact ordinances to promote environmental, health, and safety for D/F * Conduct meetings with LGU representatives on promotion of environmental, health, and safety programs for D/F * Prepar	DOH, OSHC-DOLE, EMB	200																						Enacted resolution or ordinance
Coordinate with DepEd and CHED to integrate in the curricula and/or extra curricular activities the environmental and health impacts of D/F * Review existing curriculum * Develop integration plan and templates of lesson plan * Implement th	DOH, OSHC-DOLE, EMB, DepEd, CHED	25																						Integrated in the curricular and extra curricular activities

Table 3-10 Strategies and Actions Plans Addressing Contaminated Sites

Goal: Complete identification of all contaminated sites and hotspots with corresponding appropriate management strategies to protect public health and the environment

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule																				Performance Indicators		
			Year 1				Year 2				Year 3				Year 4				Year 5						
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Create Technical Working Group	*EMB-DENR, FPA, Phil. Task Force for Hazardous Wastes, Academe, DOH-EHS	100																					Technical Working Group		
Objective 1. Establish criteria for the identification of contaminated sites by the end of year 1																									
Develop draft criteria (based on reviews of criteria used in other countries and/or published by international agencies)	*EMB-DENR, FPA, Phil. Task Force for Hazardous Wastes, Academe	57.5																					Criteria, DAO		
Review of draft criteria by technical working group																									
Issue Department of Environment and Natural Resources Administrative Order on id																									
Objective 2. Establish a group and a pool of trained personnel by the end of year 1, with the appropriate mandate for the identification, assessment, and management of contaminated sites																									
Identification of training needs	*EMB-DENR, FPA, BPI, Phil. Task Force for Hazardous Wastes, Academe, LGUs	34.5																					Trained personnel in EMB, FPA, DOH, BPI, BOC		
Capacity building for identification and management of contaminated sites (through intensive field and desk-based training)																									
Provision of necessary equipment and other resources																									

Goal: Complete identification of all contaminated sites and hotspots with corresponding appropriate management strategies to protect public health and the environment

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule																				Performance Indicators
			0 - mobilization period																				
			Year 1				Year 2				Year 3				Year 4				Year 5				
Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Objective 3. Identify potentially contaminated sites throughout the Philippines based on historical information, including an initial ranking of possible priorities for assessment from year 1 to year 3																							
Identify and map out contaminated sites of POPs including ecological burdens through secondary data assessment	*EMB-DENR, FPA, PPFHW, Electric cooperatives, Industry with transformers, MGB-abandoned mine sites	200																				Initial List of possible contaminated sites	
Conduct on-site assessment and testing of suspected sites for possible contamination of POPs	EMB-DENR, FPA, Academe, PPFHW	1,485																				Final List of contaminated sites	
Objective 4. Complete expedited assessment (at least 100 priority sites) by the end of year 5, and come up with recommendations to manage these contaminated sites																							
Establish procedures and policies for the clean-up and management of contaminated sites	EMB-DENR	50																				Guidebook on managing contaminated sites	
Conduct environmental risk assessment of identified hotspots to evaluate the need for decontamination, develop ranking criteria, and rank the hotspots according to degree of risk	EMB-DENR, FPA, Academe, NPCI	300																				Risk assessment studies, ranking	
Develop clean-up and management plans for hotspots, including Information Management Program (for the affected receptors + including setting up of information center)	EMB-DENR, FPA, Academe, NPCI	200																				Clean up and management plans	
Implement clean-up, destruction, and management plans for identified contaminated sites	EMB, FPA	200																				Clean up and management plans	

Note:
 (*) - Lead agency
 Enhancement of R&D focused on identifying technologies for remediation of contaminated sites

Table 3-11 Strategies and Actions Plans Addressing Information, Education, and Communication

Goal: Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators			
			Year 1				Year 2				Year 3				Year 4				Year 5							
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4		
Objective 1. Develop and implement program to sustain awareness and understanding of the health, environmental risks, and economic impact of POPs from year 0 to year 5																										
Set-up databank/library on POPs that would be the source of information for the continuous public dissemination. This would include: * Research studies and technical reports * Testimonials from victims of POPs and those who shifted to	PIA*, POPs Interagency Consultative Committee	25																								Database/library on POPs
Production and dissemination of Information, Education, and Communication materials based on documented testimonials and popularized technical reports and risk studies. * Focused distribution, leafleting, placement of posters and billboards a	PIA*, POPs Interagency Consultative Committee	50																								IEC Materials distributed and posted in strategic places
Conduct series of seminars and lectures to various organizations both formal and non formal organizations * Creation and mobilization of Speakers Bureau * Development of pro forma presentation materials – power point presentation and	POPs Interagency Consultative Committee	50																								Pool of Speakers on POPs Number of participants over the entire population of the country affected by POPs

Goal: Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Sustain media coverage through: * Preparation of local media directory * Writing and placement of regular news releases * Conduct of regular press conference * Radio-television guestings by government officials * U	POPs Interagency Consultative Committee, local media networks, PCIJ, PCPJ	100																						Number of media coverage/presence
Objective 2. Create and implement educational programs on POPs in all levels from year 1 onwards																								
Coordinate with the Department of Education and the Commission on Higher Education to integrate POPs in the curricula and/or extra curricular activities * Review existing curriculum on environmental education * Create a Committee on the	PIA*, DepEd*, CHED*, and POPs Interagency Consultative Committee,	50																						Prototype Lesson Plan pertaining to POPs
Conduct National Orientation seminar and training of potential trainors among teachers and student leaders from different schools nationwide.	POPs Interagency Consultative Committee	100																						Number of Teachers and students trained on POPs
Involve research students (special science curriculum) in survey research as enumerators or tabulators and in the verification of existing data inventories on POPs.	DepEd, CHED, POPs Interagency Consultative Committee	20																						Number of research students participating in POPs researches

Goal: Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators	
			Year 1				Year 2				Year 3				Year 4				Year 5					
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		Q4
Require schools to have as one of its Outreach Program, the conduct of orientation seminars of the environmental and health effects of POPs in their respective communities	DepEd, CHED, POPs Interagency Consultative Committee	20																						Number of schools conducting community seminars on POPs
Work with the national television networks to include POPs as one topic in their regular morning educational TV shows for kids (Batibot, ATBP, Hiraya Manawari, etc.) * Develop concept for the TV shows * Run the TV shows	POPs Interagency Consultative Committee, local media networks, PCIJ, PCPJ	180																						TV shows for kids presenting POPs and its environmental and health effects
Objective 3. Develop and implement political lobbying programs to sustain POPs reduction and elimination as a public health priority, environmental issue, and priority action agenda																								
Identify target political groups and develop specific/key messages and delivery methods per group	POPs Interagency Consultative Committee	10																						Targeted political groups, specific message and media type
Conduct series of lobbying activities for legislative and budgetary support for the reduction & elimination of POPs	POPs Interagency Consultative Committee	55																						Number of political supporters
Integrate POPs reduction and elimination in agency's plans, programs, services and resource allocation and present effectively during regular Congress/Senate hearings on government program and budget allocations	POPs Interagency Consultative Committee	14																						Agencies' Plans incorporating the National Implementation Plan on POPs
Establish and maintain an intra-agency and Local Government Unit reporting or information exchange system	POPs Interagency Consultative Committee, LGUs, LMPs, LoCs	14																						Attendance to LGU activities by the POPs Interconsultative Committee
Enlist journalists, media agencies and associations and environment-friendly journalist associations (e.g., Philippine Center for Investigative Journalism, Philippine Center for Photo Journalism, Philippine Agricultural Journalists, Environmental Broadcas	POPs Interagency Consultative Committee, local media networks, PCIJ, PCPJ	23																						Support from media

Goal: Full awareness and high level of knowledge across all sectors on POPs and whole support to the implementation of the National Implementation Plan

Tasks/Activities	Implementing Agency	Project Cost (US\$ 1,000)	Proposed Schedule of Costs																				Performance Indicators
			Year 1				Year 2				Year 3				Year 4				Year 5				
			Total	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Objective 4. Build and sustain network information exchange and communication on POPs and the National Implementation Plan from year 1 onwards																							
Survey partner stakeholders to establish common interest and preferred communication mechanisms	POPs Interagency Consultative Committee	10																					Identified other partners and communication means
Maintain regular coordinative meetings, including reporting on POPs updates and the activities under the National Implementation Plan	POPs Interagency Consultative Committee	10																					Number of meetings and participants per meeting Percent representation of agencies
Develop and maintain information clearing house that would serve as the focal center for POPs information such as BAT/BEP practices, results of environment and health monitoring, international updates on POPs and POPs issues, etc	ITDI-DOST*, POPs Interagency Consultative Committee	525																					Information clearing house
Participate in local, national, and international forums on POPs	POPs Interagency Consultative Committee	75																					Number of attendance to local and international forums
Present during regular meetings of business associations	POPs Interagency Consultative Committee	10																					Number of presentations made

Note: (*) - Lead agency

3.6 RESOURCE REQUIREMENTS AND 5-YEAR FINANCIAL PLAN

The proposed activities in the National Implementation Plan have extensive human, physical, and financial requirements. An estimated cost was developed based on the identified resource needs and appropriated over the 5-year timeframe of the National Implementation Plan.

The total estimated cost of the National Implementation Plan is US\$ 34, 406,000 spread over 5 years. Tables 3-12 to 3-16 present the detailed resource requirements and financial plan for each of the strategies and action plan.

SUMMARY OF COST

Category	Proposed	Proposed Annual Allocation US\$ ('000)				
	Total	Year 1	Year 2	Year 3	Year 4	Year 5
POPs Pesticides	6,890	607	1,674	3,875	367	367
PCBs	16,664	5,171	9,818	1,005	325	347
Dioxins and Furans	7,239	118	85	2,032	2,315	2,691
Contaminated Sites	2,627	352	780	843	333	320
Information, Education, and Communication	1,341	508	324	177	167	166
TOTAL	34,761	6,755	12,681	7,931	3,505	3,890

TABLE 3-12 ESTIMATED DEFENSIVE EXPENDITURE FOR PESTICIDES

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Creation of TWG that will monitor activities undertaken with respect to objectives for all POPs pesticides	Secretariat Operations (\$500,000)	100	20	20	20	20	20
Objective 1. Complete a review of the most appropriate and effective ways for improving monitoring and enforcement of the existing regulatory controls on POPs pesticides by the end of the 2nd year							
Identify most appropriate and effective ways for monitoring and enforcement	Meeting expenses, Manpower resources (Budget included in Secretariat)	18	18	0	0	0	0
Come up with a report detailing the review and the recommended policy interventions – consolidation	Manpower Operations Expense (Budget included in Secretariat)	5	5	0	0	0	0
Subtotal		123	23	0	0	0	0
Objective 2. Implement a programme that will inspect, retrieve, and properly dispose of POPs pesticides from year 1 up to the 2nd year							
Formulate methodologies and guidelines for use of the program	Manpower resources (Budget included in Secretariat)	10	10	0	0	0	0
Establish infrastructure (equipment and facilities) and manpower support to implement program	Infrastructure, Manpower Resources	1,150	150	1,000	0	0	0
Conduct public awareness campaign and implement policies so that potential holders will voluntarily identify POPs pesticides	Manpower resources; Printing of Materials; Other Logistical requirements (US\$100,000)	100	0	25	25	25	25
Train field inspectors on how to conduct inspection and identification of POPs pesticides (to include health and safety measures) – focused on strategy formulation	Manpower resources; Venue Expenses; Suppliers Trainors/Resource Persons (US\$100,000)	115	0	115	0	0	0
Carry out inspection programs	Manpower training	75	0	0	25	25	25
Design and build storage facilities, if necessary	Infrastructure (US\$ 1,000,000); Manpower Resources	1,265	0	115	1,150	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Safe storage of confiscated POPs pesticides	Manpower resources MOE (US\$ 20,000/year)	60	0	0	20	20	20
Update database on POPs pesticides inventory	Manpower resources (Budget included in Secretariat)	100	20	20	20	20	20
Develop cost-benefit analysis of environmentally-sound disposal methods for POPs pesticides and secure necessary resources for	Consultants Services (US\$ 50,000)	57.5	0	0	57.5	0	0
Implement (pilot or full scale) proper disposal of POPs pesticides	Equipment/Infrastructure (US\$ 2,000,000 capital + US\$ 20,000/year)	2,369	0	0	2,323	23	23
Subtotal		5,302	180	1,275	3,621	113	113
Objective 3. Develop and implement continuous environmental and health monitoring program from year 1 onwards							
Assess the existing health and environmental monitoring program implemented by various agencies pertaining to POPs pesticides	Consultants Services, Manpower Resources	5	5	0	0	0	0
Develop a concerted and integrated health and environmental monitoring program	Consultants Services, Manpower Resources	10	10	0	0	0	0
Implement, update, and periodically report the result of the health and environmental monitoring activities	Manpower Resources	85	0	25	20	20	20
Subtotal		100	15	25	20	20	20

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 4. Complete an assessment of the effectiveness of current practices for the control of malaria in the Philippines, and options for improvements including the use of Integrated Vector Management strategies, and the need for DDT by the end of the							
Identification of current practices and their efficacy (including preventive measures) on malaria control including updating the DDT inventory (stockpiles)	Manpower, Consultants, Meeting expenses	65	65	0	0	0	0
Assessment of best strategies (including DDT substitute) for malaria control	Manpower, Consultants, Meeting expenses	115	0	115	0	0	0
Trial of DDT alternatives	Laboratory, Researchers, Consultants, Operations expense	1,070	214	214	214	214	214
Policy recommendation on the need (or not) of DDT	Manpower	15	0	15	0	0	0
Subtotal		1,265	279	344	214	214	214
Objective 5. Initiate all actions (as required under all relevant regulations) by the end of year 1, with a view to ban mirex and hexachlorobenzene							
Review of all regulations and industrial practices that involve mirex and HCB	Manpower, consultants	20	20	0	0	0	0
Identify and assess possible sources and generation of Mirex and HCB as by-products and develop reduction strategies, if required.	Manpower, consultants	60	60	0	0	0	0
Initiate regulatory process to officially ban the importation and use of Mirex and HCB	Manpower operations expense (Budget included in Secretariat)	20	10	10	0	0	0
Subtotal		100	90	10	0	0	0
TOTAL FOR PESTICIDES		6,890	607	1,674	3,875	367	367

TABLE 3-13 ESTIMATED DEFENSIVE EXPENDITURE FOR PCBs

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Set up PCB inventory inter-agency committee to review inventory procedures and reports	Honoraria, staff, meeting expense	100	20	20	20	20	20
Objective 1. Prepare a comprehensive and complete national inventory of PCBs, PCB containing materials, and PCB wastes from year 0 to year 2 of the National Implementation Plan							
Prepare a list of resources and expertise on PCB management and related researches	Staff, honoraria	5	5	0	0	0	0
Prepare a comprehensive profile of potential sources of PCBs in the country consisting of PCB generators, TSD facilities, and servicing facilities	Staff, meeting expenses, travel	20	20	0	0	0	0
Develop and publish inventory guidelines * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	Printing expense, meeting expense	48	48	0	0	0	0
Develop and implement monitoring and evaluation program/guidelines for inventory * Guideline preparation * Consultations with EMB regional offices * Review and approval * Editing/printing/publication	Printing expense, meeting expense	25	25	0	0	0	0
Develop standard protocols for sampling and test methods * Hiring of consultants * Drafting of protocols/standards * Consultative meetings with stakeholders * Approval of test methods	Consultant, printing expense; staff; meeting expense; PPEs	230	230	0	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Upgrading of EMB laboratories that will analyze PCB * Train laboratories * Evaluate needs of EMB laboratories and demand for PCB sampling in each region * Select strategic regional laboratories to be upgraded *	Equipment and supplies, consultant, staff; training; construction of laboratory facilities; US\$ 1,700-capex; US\$ 12,000-consultant (6 man-months)	2,000	200	1,120	680	0	0
Accreditation of PCB samplers	Training kits, training tools, trainer, assessors, meeting expense	55	5	12.5	12.5	12.5	12.5
Recognition of laboratories for PCB analysis * Setting of recognition criteria * Evaluation of laboratory capability * Announcement of list of recognized laboratories	Travel, meeting expense, honoraria, proficiency testing expenses	345	45	75	75	75	75
Conduct training on identification and sampling for electric utilities, servicing facilities, generators, EMB, and other agencies	Trainers, food and venue, training kits, training tools, transportation	70	70	0	0	0	0
Strengthen the existing PCB information database that will track the following information: * PCBs in use * PCBs in storage * PCBs in shipment * PCBs treated or disposed	Computers, GIS and database programmers, consultant, GPS	210	21	168	21	0	0
Strengthen and institutionalize the system of reporting among generators * Review reporting protocols and forms * Issue guidelines for EMB staff * Issue guidelines for industry reporting protocols * Submission of reports	Staff	40	8	16	16	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Develop policies on the shipment and consent procedures for the importation of transformer equipment	Staff, meeting expenses, travel expenses, miscellaneous	13	13	0	0	0	0
Conduct inventory of PCB materials and wastes * Validate suspected PCBs through inspection, sampling, and analysis * Labeling	Staff, travel expenses, meeting expenses, miscellaneous	184	82.8	82.8	18.4	0	0
Develop funding mechanism to assist in the conduct of the inventory * Computerization of equipment inventory * Sampling and analysis	Meeting expense, miscellaneous, consultant	20	20	0	0	0	0
Analyze data and come up with a complete national inventory	Consultant, miscellaneous	40	15	20	5	0	0
Conduct information, education campaign on health and technology for PCB management * Review existing IEC materials * Develop/design IEC materials and website on POPs	Advertising Consultants, miscellaneous	40	8	8	8	8	8
Subtotal		3,345	816	1,502	836	96	96

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 2. Establish and implement a program on safe handling, storage, and transport of PCBs, PCB-containing materials and PCB wastes from year 1 to year 4							
Enhance guidelines for the storage and safe handling including transport and dismantling of PCBs * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	Consultant, printing expense, staff, meeting expense	30	30	0	0	0	0
Enhance guidelines and standards for TSD facilities dealing with PCB * Guideline preparation * Consultations * Review and approval * Editing/printing/publication	Consultant, meeting expense, printing expense, staff	30	30	0	0	0	0
Develop monitoring and evaluation program for handling and storage * Program/guideline development * Consultations * Review and approval * Editing/printing/publication	Consultant, printing expense, staff, meeting expense	30	30	0	0	0	0
Implement monitoring and evaluation program * Tracking and manifesting of PCBs from the site of origin to the site of storage and site of treatment/disposal including PCB waste transport and shipments * Inspection	Staff, transportation	30	2	7	7	7	7

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Improve safe transportation rules and regulations for PCBs to include: transport vehicle standards, guidelines for preparation of waste shipments, emergency response capability along transportation routes, provisions for authorizing qualified carriers, an	Consultant, printing expense, staff, meeting expense	25	25	0	0	0	0
Develop code of practice for servicing/retrofilling and repair of equipment * Code of practice development * Consultation * Review and finalization	Consultant, staff, meeting expense, printing, miscellaneous	24	24	0	0	0	0
Issue memorandum circular prescribing the adoption of the code of practice for servicing/retrofilling and repair of equipment * MOA between EMB-DENR and TESDA * Drafting of MC * Consultations * Review and approval	Staff, meeting expense	1	0.25	0.75	0	0	0
Conduct training of operators of TSD facilities, generators, and regulators	Trainors, food and venue, training kits, training tools, transportation	5	2.5	2.5	0	0	0
Enhance regulation of registration of retrofilling facilities * Review guidelines on registration * Issue guidelines for registration including LGU ordinances on junkshop/retrofilling facility regulation * Registration of se	Staff, travel, miscellaneous	3	0	1.2	2.4	0	0
Develop an accreditation system of servicing facilities and establishments	Staff, consultants, meeting expense	4	4	0	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Implement accreditation of servicing facilities * Evaluate servicing facilities * Issue list of accredited servicing facilities	Staff, travel expense, meeting expense	4	0	4	0	0	0
Develop guidelines/checklist for the evaluation of PCB Management Plan of generators and servicing facilities * Guidelines development * Review and approval * Editing/printing/publication	Consultant, staff, meeting expenses, travel expense	4	2	2	0	0	0
Evaluation of PCB Management Plan of generators and servicing facilities	Consultant, travel, staff, meeting expense, miscellaneous	12	0	3	3	3	3
Conduct routine inspection and monitoring on the implementation of the PCB management plan	Staff, travel expense, meeting expense, miscellaneous	24	0	6	6	6	6
Conduct environmental monitoring for PCBs in water and soil	Manpower, consultant services	115	23	23	23	23	23
Subtotal		341	172.75	49.45	41.4	39	39
Objective 3. Develop and implement continuous integrated environmental and health monitoring program from year 1 onwards*.							
Assess the existing health and environmental monitoring program implemented by various agencies pertaining to PCBs	Manpower, consultant services	5	5	0	0	0	0
Develop a concerted and integrated health and environmental monitoring program	Manpower, consultant services	10	10	0	0	0	0
Implement, update, and report the result of the health and environmental monitoring activities	Manpower, consultant services	85	0	25	20	20	20
Subtotal		100	15	25	20	20	20

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 4. Eliminate and destroy all PCBs, PCB-containing materials, and PCB wastes not later than 2025							
Create Technical Working Group on PCB destruction	Staff, honoraria, meeting expenses	4	4	0	0	0	0
Issue policies in support of the GEF/UNIDO/UNDP POPs Destruction Facility Project	Consultant, staff, meeting expenses	4	4	0	0	0	0
Project development of GEF/UNIDO/UNDP POPs Destruction Facility Project including EIA, Selection of technology	Consultant, staff, meetings, EIA preparation	30	30	0	0	0	0
Facility Construction (Includes private sector investment)	Construction expenses; capital cost of plan: GEF-US\$ 4.565M, UNIDO-US\$ 650T, UNDP US\$100T, DENR-US\$ 500T, NGO-US\$100T, PPDC-US\$6.4M	12,315	4,105	8,210	0	0	0
Transport of wastes from storage facilities to destruction facility	Transportation	230	0	5	88	88	49
Facility Operations/destruction of PCBs	Operating costs - private sector funds	0	0	0	0	0	0
Assessment, documentation, reporting	Staff, supplies	4	2	2	0	0	0
Facility decommissioning and abandonment (cost not included in GEF)	Decommissioning and abandonment costs	185	0	0	0	62	123
Provide incentives for electric utilities to comply with the phase-out of PCB * Study incentives program to assist utilities * MOA among EMB-DENR, NEA, GFIs, BOI	Consultant, staff, meeting expenses	4	2	2	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Evaluate existing environmental financing windows and market financing programs that would help electric utilities to phase-out, treat and dispose PCB wastes and PCB-containing equipment. * MOA with DBP and LBP on financing of PCB phase-out	Meeting expense, miscellaneous, consultant	2	0	2	0	0	0
Subtotal		12,778	4,147	8,221	88	150	172
TOTAL FOR PCB		16,664	5,171	9,818	1,005	325	347

TABLE 3-14 ESTIMATED DEFENSIVE EXPENDITURE FOR DIOXINS AND FURANS

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Creation of Project Advisory (expert) Committee that will implement the activities undertaken with respect to the objectives of progressive reductions in the releases of Dioxins and Furans	Human resources	100	20	20	20	20	20
Objective 1. Prepare an updated inventory of dioxin and furan releases for all significant sources by obtaining best-estimate nationwide activity data and most appropriate emission factors within three years from the approval of the National Implementatio							
Activity Data a. Critical review of methods for activity data collection * Review of UNEP Standard Toolkit and other inventory procedures (US-EPA, Japan Ministry of Environment, etc.)	Human resources, supplies, equipment	12.5	12.5	0	0	0	0
Activity Data b. Recommend revised methods and submit to PAC for agreement * Prepare report and present results to PAC for agreement	Human resources, supplies, equipment	12.5	12.5	0	0	0	0
Review and strengthen the monitoring system (for industrial and household sources) a. Review and revise SMR * Review SMR and harmonize the information with data requirements of the Inventory	Human resources, supplies, equipment	7.5	7.5	0	0	0	0
Review and strengthen the monitoring system (for industrial and household sources) b. Review and revise NSO data gathering form * Review NSCB data gathering form and harmonize with data requirements of the	Human resources, supplies, equipment	10	5	5	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Review and strengthen the monitoring system (for industrial and household sources) c. Establish and maintain an online database * Collate information for data base * Develop on-line info database * Post te	Human resources, supplies, equipment	100	50	50	0	0	0
Review and develop monitoring system (for agricultural, commercial, and other sources) a. Monitoring Report * Review monitoring system and harmonize with data requirements of the Inventory * Revise moni	Human resources, supplies, equipment	2.5	2.5	0	0	0	0
Review and develop monitoring system (for agricultural, commercial, and other sources) b. Database * Collate information for data base * Develop on-line info database * Post test on-line info data base	Human resources, supplies, equipment	2.5	2.5	0	0	0	0
Review and set-up of Philippine emission factors a. Critical review of published emission factors, including gap analysis * Review literature on established and default emission factors in the UNEP Standard	Human resources, supplies, equipment	250	0	0	125	125	0
Review and set-up of Philippine emission factors b. Local source testing, where required * Identify the dioxins and furans labs that will do the sampling and analysis * Determine size and flux of releas	Human resources, supplies, equipment	700	0	0	350	350	0

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Review and set-up of Philippine emission factors c. Harmonize and submit list of proposed factors to PAC for discussion, agreement and adoption as a "national" reference document	Human resources, supplies, equipment	50	0	0	25	25	0
Data Collection a. Recruit survey staff and carry out data collection, etc to prepare updated inventory * Prepare job descriptions and person specification for the positions * Training/Orienta	Human resources, supplies, equipment	100	0	0	50	25	25
Data Collection b. Capacitate existing agencies (EMB, LGUs, BOI, DTI, NSO, NSCB, DOE, OSHC, BFAD, and other agencies) * Conduct lectures/seminars on D/F inventory * Conduct a hands-on inventory on selected	Human resources, supplies, equipment	30	0	0	30	0	0
Inventory reporting, data analysis, and programme review * Preparation of National D/F Inventory Report and include data gaps, if any	Human resources, supplies, equipment	20	0	0	20	0	0
Subtotal		1,298	93	55	600	525	25
Objective 2. Develop and implement BAT/BEP promotion, adoption and monitoring programmes within three years across the most significant dioxin and furan source categories (based on updated inventory)							
Identify the most significant D/F categories * Review the updated national inventory and identify four significant D/F sources	Human resources	2	0	0	2	0	0
Identify BAT/BEP appropriate to the four significant D/F sources and set performance criteria for each BAT/BEP * Review available information * Prepare shortlist of BAT/BEP * Set performance criteria for BAT/BEP based on experts' re	Human resources, equipment, information materials	670	0	0	670	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Identify BAT/BEP that will reduce D/F in wastewater and prevent D/F contamination of water resource * Identify all the possible pathways of D/F to water (e.g. run-off from contaminated sites, e.g., leachate from dumpsites or a	Human resources, equipment, information materials	15	0	0	15	0	0
Application of BAT/BEP	Human resources, equipment, information materials	15	0	10	5	0	0
Develop and implement BAT/BEP IEC programmes * Review database on D/F Develop IEC materials for public release * Develop IEC materials for industries with manufacturing processes releasing D/F * Present materials to FGD	Human resources, equipment, information materials	5	0	0	5	0	0
Assist LGUs to issue resolution and/or enact ordinances to promote BAT/BEP for Dioxins & Furans * Conduct meetings with LGU representatives on promotion of BAT/BEP * Conduct seminar-workshop on the importance of adopting BAT/BEP	Human resources, equipment, information materials	427.5	0	0	427.5	0	0
Coordinate with DepEd and CHED to integrate BAT/BEP in the curricula and extra-curricular activities * Review existing curriculum * Develop integration plan and templates of lesson plan * Implement the integration program	Human resources, equipment, information materials	25	0	0	12	10	3

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Develop incentives/rewards system for D/F sources adopting BAT/BEP * Review existing reward system * Create selection committee * Develop selection/merit criteria to facilitate and reward outstanding performance * Identify poss	Human resources, information materials	20	0	0	10	10	0
Develop and adopt financing programs for sources adopting BAT/BEP * Review existing financial program for technology transfer/adoption by GFIs and PFIs * Conduct consultative meetings with implementing agencies for the developme	Human resources	2	0	0	1	1	0
Develop performance evaluation of the BAT/BEP * Develop evaluation criteria and plan * Execute the evaluation plan * Prepare performance evaluation report	Human resources	50	0	0	50	0	0
Subtotal		1,232	0	10	1,198	21	3
Objective 3. Formulate by the end of year 3 and continuously enforce thereafter appropriate policies and regulations to control dioxins and furans releases							
Review existing local and international regulations and policies pertaining to D/F * Review local and international regulations and policies which have specific provisions on the management of D/F * Prepare report on policy optio	Human resources	100	0	0	0	100	0
Require new sources to adopt BAT/BEP under the EIS system * Include BAT/BEP as requirement for new sources under the EIS system * Prepare and issue MC or departmental order	Human resources	5	5	0	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Integrate preventive policies on occupational safety and health * Review policies on OHS * Prepare integration plan * Integrate policies on OHS	Human resources	5	0	0	0	5	0
Include BAT/BEP in the occupational health and safety standards in reporting requirements * Review OHS standards and report forms * Revise forms and present in FGD * Adopt revised reporting requirements	Human resources	5	0	0	0	3	2
Establish sampling and analytical capability for D/F * Review sampling and analytical capability for D/F * Needs analysis for laboratory services * Determine viability of setting D/F laboratory * Assessment of alternatives to meet need	Human resources, analytical laboratory facilities and sampling equipment, external expertise	3,000	0	0	0	1,500	1,500
Establish ambient baseline levels of D/F for air, water, and soil * Identify distinct sites for baseline monitoring * Develop a study design for baseline monitoring * Conduct baseline monitoring	Human resources, analytical laboratory facilities and sampling equipment, external expertise	500	0	0	0	0	500

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Conduct life cycle analysis and risk assessment based on the 4 identified major sources of D/F * Review available information and identify information gaps * Review and select appropriate fate and transport models in the quantifi	Human resources, analytical laboratory facilities and sampling equipment, external expertise	500	0	0	0	0	500
Set ambient criteria and standards for emissions for BAT/BEP * Review existing ambient standards and criteria * Set standards or criteria for dioxins and furans levels in environmental media	Human resources, analytical laboratory facilities and sampling equipment, external expertise	125	0	0	0	125	0
Enforce and monitor compliance * Issue amendments in DAO	Human resources	125	0	0	0	0	125
Subtotal		4,365	5	-	-	1,733	2,627
Objective 4. Develop and implement a programme for information on the prevention of environmental and health effects of dioxin and furan by the end of year 2							
Identify, review, and develop environmental, health, and safety programs for information, education, and communication	Human resources	20	0	0	5	7.5	7.5
Assist LGUs to issue resolution and/or enact ordinances to promote environmental, health, and safety for D/F * Conduct meetings with LGU representatives on promotion of environmental, health, and safety programs for D/F * Prepar	Human resources	200	0	0	200	0	0
Coordinate with DepEd and CHED to integrate in the curricula and/or extra curricular activities the environmental and health impacts of D/F * Review existing curriculum * Develop integration plan and templates of lesson plan * Implement th	Human resources	25	0	0	9	8	8
Subtotal		245	0	0	214	15.5	15.5

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
TOTAL FOR DIOXIN AND FURANS		7,239	118	85	2,032	2,315	2,691

TABLE 3-15 ESTIMATED DEFENSIVE EXPENDITURE FOR CONTAMINATED SITES

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Create Technical Working Group	Consultant, staff, honoraria, meeting expenses	100	20	20	20	20	20
Objective 1. Establish criteria for the identification of contaminated sites by the end of year 1							
Develop draft criteria (based on reviews of criteria used in other countries and/or published by international agencies)	Consultant, staff, honoraria, meeting expenses						
Review of draft criteria by technical working group		58	58	0	0	0	0
Issue Department of Environment and Natural Resources Administrative Order on id							
Subtotal		58	57.5	0	0	0	0
Objective 2. Establish a group and a pool of trained personnel by the end of year 1, with the appropriate mandate for the identification, assessment, and management of contaminated sites							
Identification of training needs	Consultant, staff, honoraria, meeting expenses						
Capacity building for identification and management of contaminated sites (through intensive field and desk-based training)		35	35	0	0	0	0
Provision of necessary equipment and other resources							
Subtotal		35	34.5	0	0	0	0

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 3. Identify potentially contaminated sites throughout the Philippines based on historical information, including an initial ranking of possible priorities for assessment from year 1 to year 3							
Identify and map out contaminated sites of POPs including ecological burdens through secondary data assessment	Staff; consultant, meetings, travel expenses, miscellaneous	200	75	100	25	0	0
Conduct on-site assessment and testing of suspected sites for possible contamination of POPs	Staff, consultant, meetings, transportation, test kits, laboratory analysis	1485	165	660	660	0	0
Subtotal		1685	240	760	685	0	0
Objective 4. Complete expedited assessment (at least 100 priority sites) by the end of year 5, and come up with recommendations to manage these contaminated sites							
Establish procedures and policies for the clean-up and management of contaminated sites	Staff, consultant, meetings, publication of guidelines	50	0	0	37.5	12.5	0
Conduct environmental risk assessment of identified hotspots to evaluate the need for decontamination, develop ranking criteria, and rank the hotspots according to degree of risk	Staff, meetings, travel, consultants, miscellaneous	300	0	0	100	100	100
Develop clean-up and management plans for hotspots, including Information Management Program (for the affected receptors + including setting up of information center)	Staff, meetings, travel, consultants, miscellaneous	200	0	0	0	100	100
Implement clean-up, destruction, and management plans for identified contaminated sites	Staff, meetings, travel, consultants, miscellaneous	200	0	0	0	100	100
Subtotal		750	0	0	137.5	312.5	300

Tasks/Activities	Resource Requirements	Project Cost (US\$1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
TOTAL FOR CONTAMINATED SITES		2,627	352	780	843	333	320

TABLE 3-16. ESTIMATED DEFENSIVE EXPENDITURE FOR INTEGRATED INFORMATION, EDUCATION, AND COMMUNICATION PROGRAM							
Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1. Develop and implement program to sustain awareness and understanding of the health, environmental risks, and economic impact of POPs from year 0 to year 5							
Set-up databank/library on POPs that would be the source of information for the continuous public dissemination. This would include: * Research studies and technical reports * Testimonials from victims of POPs and those who shifted to a	Manpower, consultant services	25	14	6	3	1.6	0.4
Production and dissemination of Information, Education, and Communication materials based on documented testimonials and popularized technical reports and risk studies. * Focused distribution, leafleting, placement of posters and billboards a	Consultant services, travel expenses, communication, reproduction expenses	50	20	8	7.6	7.2	7.2
Conduct series of seminars and lectures to various organizations both formal and non formal organizations * Creation and mobilization of Speakers Bureau * Development of pro forma presentation materials – power point presentatio	Consultant services, manpower, travel expenses, reproduction expenses	50	20	8	7.6	7.2	7.2
Sustain media coverage through: * Preparation of local media directory * Writing and placement of regular news releases * Conduct of regular press conference * Radio-television guestings by government officials * U	Meeting expenses, reproduction, advertisement	100	48	28	8	8	8

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Subtotal		225	102	50	26.2	24	22.8
Objective 2. Create and implement educational programs on POPs in all levels from year 1 onwards							
Coordinate with the Department of Education and the Commission on Higher Education to integrate POPs in the curricula and/or extra curricular activities * Review existing curriculum on environmental education * Create a Committee on the	Manpower	50	50	0	0	0	0
Conduct National Orientation seminar and training of potential trainers among teachers and student leaders from different schools nationwide.	Manpower, travel, reproduction	100	15	65	12	4	4
Involve research students (special science curriculum) in survey research as enumerators or tabulators and in the verification of existing data inventories on POPs.	Manpower	20	2	6	4	4	4
Require schools to have as one of its Outreach Program, the conduct of orientation seminars of the environmental and health effects of POPs in their respective communities	Manpower	20	2	6	4	4	4
Work with the national television networks to include POPs as one topic in their regular morning educational TV shows for kids (Batibot, ATBP, Hiraya Manawari, etc.) * Develop concept for the TV shows * Run the TV shows	Manpower, advertisement	180	100	20	20	20	20
Subtotal		370	169	97	40	32	32
Objective 3. Develop and implement political lobbying programs to sustain POPs reduction and elimination as a public health priority, environmental issue, and priority action agenda							
Identify target political groups and develop specific/key messages and delivery methods per group	Manpower	10	10	0	0	0	0
Conduct series of lobbying activities for legislative and budgetary support for the reduction & elimination of POPs	Workshop expense, manpower	55	30	13	4	4	4

Tasks/Activities	Resource Requirements	Project Cost (US\$ 1,000)	Proposed Schedule of Costs (US\$ 1,000) 0 = mobilization period				
		Total	Year 1	Year 2	Year 3	Year 4	Year 5
Integrate POPs reduction and elimination in agency's plans, programs, services and resource allocation and present effectively during regular Congress/Senate hearings on government program and budget allocations	Workshop expense, manpower	14	6	2	2	2	2
Establish and maintain an intra-agency and Local Government Unit reporting or information exchange system	Manpower	14	6	2	2	2	2
Enlist journalists, media agencies and associations and environment-friendly journalist associations (e.g. Philippine Center for Investigative Journalism, Philippine Center for Photo Journalism, Philippine Agricultural Journalists, Environmental Broadcas	Meeting expenses, manpower	23	15	2	2	2	2
Subtotal		116	67	19	10	10	10
Objective 4. Build and sustain network information exchange and communication on POPs and the National Implementation Plan from year 1 onwards							
Survey partner stakeholders to establish common interest and preferred communication mechanisms	Manpower	10	10	0	0	0	0
Maintain regular coordinative meetings, including reporting on POPs updates and the activities under the National Implementation Plan	Meeting expenses, manpower	10	2	2	2	2	2
Develop and maintain information clearing house that would serve as the focal center for POPs information such as BAT/BEP practices, results of environment and health monitoring, international updates on POPs, and POPs issues, etc	Manpower, information technology infrastructure	525	140.5	139.03	81.8	81.8	81.8
Participate in local, national, and international forums on POPs	Meeting expenses, manpower	75	15	15	15	15	15
Present during regular meetings of business associations	Manpower	10	2	2	2	2	2
Subtotal		630	169.5	158.03	100.8	100.8	100.8
TOTAL FOR IEC		1341	507.5	324.03	177	166.8	166

3.7 SOCIO ECONOMIC EVALUATION

3.7.1 RATIONALE

As a signatory to the Stockholm Convention on POPs, the Philippines is committed to develop a National Implementation Plan (NIP) that will among others identify sustainable development options related to the elimination or reduction of POPs. This task requires:

- Good understanding of the physical, biological, and social impacts of environmental degradation;
- Sound estimates of the economic value of damage to the environment and the cost of investments that would mitigate such damage, to improve the design of policies and projects, and to arrive at environmentally sound investment decisions; and
- Development of policy tools and strengthening of human resources and institutions to implement viable strategies and manage natural resources on a sustainable basis.

This section primarily focuses on the second requirement mentioned above – the socio-economic assessment of environmental impacts of the chemicals industry, and of unintentional releases of POPs. The objective of such an assessment within the field of chemical risk management is to inform decision-makers of the social and economic costs and benefits of implementing the country's commitments to the Stockholm Convention on POPs.

3.7.2 CONCEPTUAL FRAMEWORK

The UNEP/World Bank Interim Guidance for Developing a National Implementation Plan for the Stockholm Convention enumerates several activities that should be undertaken in the socio-economic assessment of the environmental impacts of persistent organic pollutants, viz:

- Determine the nature and characteristics of the risks of concern;
- Determine the types of regulatory and non-regulatory measures or instruments that could be adopted to reduce or mitigate damage;
- Assess the costs of risk reduction and their distribution, where this includes costs to industry, consumers, regulators, and society more generally;
- Assess the benefits of risk reduction and their distribution, where these may relate to environmental and human health gains or to increased technical or product innovation;
- Assess the wider trade, competition, and economic development implications of adopting a change in policy where feasible.

Realistically, however, very little can be said about the availability and reliability of Philippine ground data on say, population exposure distribution, health outcomes and human exposure-response relationship, thus ruling out the implementation of the activities mentioned. For instance, it may not at all be possible to produce sensible figures for costs of past and current POPs usage/releases simply because the country does not have any good exposure data. Quantification of economic costs or effects can not therefore be pursued. Accordingly, less tedious albeit practical methods of valuing the detrimental impact

of POPs may be employed. After all, a major purpose of this endeavor is not to provide fine-tuned numbers but to indicate orders of magnitude.

Annex 3-1 present the valuation method used for this assessment

3.7.3 ECONOMIC COSTS OF POPs PHASE-OUT

Economic cost estimates for the different abatement programs, activities or management strategies envisioned under the five-year National Implementation Program were derived from estimates generated during various consultations and focused group discussions with concerned government agencies, affected industry representatives and the non-government (NGOs) and peoples' organizations (POs). These numbers were deemed to represent the internally-generated funds that will be allocated by the different government implementing agencies. To some extent, the venue also provided estimates on the likely external funding that will be required to implement the identified courses of action.

Where these were not available, "project-mode" estimates based on the Global Environmental Facility's (GEF) classification of programs and projects eligible for grant financing and the corresponding amount of assistance that may be extended under each category were adopted.

Proposed externally-funded projects/activities were further provided with local counterpart cost equivalent to 15 to 30 percent of the estimated project cost. This proportion more or less reflects the average amount of counterpart funding provided by the government to foreign-funded projects in the country.

Moreover, the economic cost estimates derived for the different abatement programs, activities or management strategies envisioned under the five-year National Implementation Program are deemed incremental. These estimates are considered over and above existing budgets of government agencies concerned with POPs. The various proposed interventions lined up in the National Implementation Plan and their corresponding cost estimates are not yet incorporated in the recently approved Medium-Term Public Investment Program (MTPIP) for Year 2005 – 2010 of the Philippine government. Considering further that the abatement activities lined up in the NIP are at this point mere conceptual propositions, the determination of specific program/project components and their corresponding resource requirements according to source (i.e., donor or counterpart funding) is a matter of convention not pursued in this report.

The details on the economic costs of POPs are shown in Tables 3-12 to 3-16.

3.7.4 ECONOMIC COST OF POP PESTICIDE PHASE-OUT

The Philippines is one of the countries in the Asia Pacific Region with significant advances in adapting pesticide regulations in conformity with Food and Agriculture Organization and other internationally recognized agencies. It complies with one of the main prerequisites for efficient risk management, i.e., an appropriate registration scheme.

Nevertheless, the strained and very limited human and financial resources and the weak institutional infrastructure jeopardize implementation, monitoring, enforcement, and improvement of pesticide laws

and policies. The FPA is still handicapped in dealing with the health and environmental problems posed by pesticides because of limitations in its enforcement capabilities.³

The defensive measures identified to hasten the phase-out of POPs pesticides are designed to address the supposed handicap of FPA. These include: the improvement in the monitoring and enforcement of existing regulatory controls on POPs pesticides; a program for the proper inspection, retrieval, and disposal of these chemicals; assessment of the efficacy of the current malaria control practices; and a prospective ban on Mirex and HCB. These preventive measures are estimated to cost \$ 5.74 million.

3.7.5 ECONOMIC COST OF PCBs PHASE-OUT

The budget for PCB phase-out has three major defensive expenditure items or tasks (Table 3-13). The enabling activities envisioned basically involve the completion of national inventory of PCBs and the development and implementation of a nationwide program for the safe handling, storage and disposal of PCBs, PCB-containing materials, and PCB wastes. These projects are important defensive expenditures to minimize or eliminate the environmental and health hazards of PCBs. Another important defensive expenditure item is the proposed destruction and elimination of PCBs, PCB-containing materials, and PCB wastes via the establishment of a decommissioning, disposal and treatment facility. This proposed task will be mainly spearheaded by the Philippine Petrochemical Development Corporation (PPDC) of the Department of Energy with a budgetary requirement of US\$ 7 million. The projected total defensive expenditure budget for PCB phase out is estimated at US\$ 16.67 million.

3.7.6 ECONOMIC COST OF REDUCING OR ELIMINATING RELEASES OF DIOXINS/FURANS

Preventive measures identified to reduce or eliminate the unintentional releases of dioxins and furans consist of D/F inventory preparation; development and implementation as well as the adoption of BAT and BEP; and policy formulation, regulation and enforcement. These measures are designed to complement the implementation of RA 8749 or the Clean Air Act which imposes a ban on the open burning and incineration of solid wastes. The complementary execution of the proposed activities and the provisions of RA 8749 will create substantial impact on the generation of dioxins and furans since open burning and incineration of wastes are the major sources of these unwanted products. As shown in Table 3-14, the total defensive expenditure budgeted for the reduction and elimination of D/F releases is estimated to be \$7.24 million.

3.7.7 ECONOMIC COST OF MANAGING POPs CONTAMINATED SITES

The defensive measures proposed for POPs contaminated sites are primarily focused on enabling activities leading to the identification and assessment of contaminated sites and eventually developing recommendations for their management. The total estimated defensive expenditure required amounts to US\$ 2.63 million.

⁴ Philippine Case Study: A Developing Country Perspective on POPs. IFCS Meeting on POPs, 17-19, June 1996, Manila, Philippines.

3.7.8 ECONOMIC COST OF INTEGRATED COMMUNICATION FRAMEWORK AND PLAN FOR MOBILIZING ACTION AND RESOURCES TOWARDS POPs REDUCTION AND ELIMINATION

In tandem with the above identified measures, there should be a systematic attempt to raise public awareness of the health and environmental impacts of POPs and encourage participation in decision-making. As a defensive expenditure item, the information and education campaign planned over the next five years should inculcate a systematic collaboration and consensus building across sectors, among affected stakeholders, to agree on priorities and adoptable measures. As shown in Table 3-15, the total defensive expenditure budget of US\$ 0.97 million is allocated for the Information, Education, and Communication component of the National Implementation Plan.

3.7.9 SUMMARY ESTIMATES OF 5-YEAR DEFENSIVE EXPENDITURES

Table 3-17 summarizes the projected defensive expenditures required over a 5-year period designed to reduce or eliminate POPs in the country. For all the identified POPs sources, the total amount of US\$ 32.25 million will be needed to implement all the identified defensive or abatement programs and activities.

By sector, the cost of PCB containment accounts for 50 percent of the total, while the total abatement cost for dioxins and furans consist of 22 percent of the total. The combined defensive expenditures estimated for POPs pesticides and PCB contaminated sites accounts for the least at 25 percent of the total preventive cost for all sectors.

While there were exhaustive attempts to fully identify the needed abatement programs and activities and accordingly impute costs on them, the derived defensive expenditure estimate is considered a lower-bound estimate of what is perceived to be the real economic cost. A very basic reason for this is that the cost estimated for each POPs source failed to include the costs of initiatives that may solely be undertaken by the private sector as well the non-government organizations and private organizations. For instance, the cost estimate does not include the cost for replacing PCB in the power sector. Likewise, possible local government unit initiatives and their corresponding values were not taken into account. Also unaccounted in the total estimate is the possible cost of public-private partnership initiative for the reduction or elimination of POPs in the Philippines.

Table 3-17 Summary of Estimated Defensive Expenditures for POPs Phase-Out in the Philippines

Items	Proposed Cost US\$ ('000)	Proposed Annual Allocation US\$ ('000)				
	Total	Year 1	Year 2	Year 3	Year 4	Year 5
POPs Pesticides	6,890	607	1,674	3,875	367	367
PCBs	16,664	5,171	9,818	1,005	325	347
Dioxins and Furans	7,239	118	85	2,032	2,315	2,691
Contaminated Sites	2,627	352	780	843	333	320
Information, Education, and Communication	1,341	563.22	335.25	158.29	142.80	141.44
Total	34,761	6,811.22	12,692.25	7,913.29	3,482.8	3,866.44

3.7.10 ECONOMIC BENEFITS OF POPs PHASE-OUT

There is a general agreement among the scientific community that empirical evidence exists on the adverse human health and environmental impacts of POPs to warrant immediate action, including bans and phase-outs. The weight of scientific evidence strongly suggests that overexposure to certain POPs can cause serious immune and metabolic effect, neurological defects, reproductive anomalies, cancer, and other abnormalities in both humans and animals.

Indeed, health impacts are no doubt the most compelling reason for such action. Improved health of the population is a critical factor in high productivity. Keeping the workforce and society healthy would eliminate income losses due to sickness and medical expenses. A healthy workforce would promote labor productivity and encourage investments in the various sectors of the economy like industry, manufacturing, services, infrastructure, and tourism.

Aside from the socio-economic benefits, non-health or environmental externalities associated with the POPs reduction or elimination are also significant. With POPs pesticide use reduction for instance, agricultural biodiversity is enriched due to the increase of beneficial insect population. Water bodies, which have long been considered as useless due to heavy spraying will be resuscitated. The resulting improved ecological balance therefore becomes conducive for sustainable agriculture.