

Federal Democratic Republic of Ethiopia

**National Implementation Plan for the Stockholm
Convention**

September 2006

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ACRONYMS AND ABBREVIATIONS

APCS.....	Automatic Pollution Control System
BAT.....	Best Available Technique
BEP.....	Best Environmental Practice
COP.....	Conference of Parties
DDT.....	Dichlorodiphenyltrichloroethane
EAF.....	Electric Arc Furnaces
EDC.....	Endocrine Disrupting Chemicals
EEPCO.....	Ethiopian Electric Power Corporation
EPA.....	Environmental Protection Authority
FAO.....	Food and Agricultural Organization
GEF.....	Global Environmental Facility
GNP.....	Gross National Product
HCB.....	Hexachlorobenzene
IPM.....	Integrated Pest Management
IVM.....	Integrated Vector Management
MoA.....	Ministry of Agriculture
MoARD.....	Ministry of Agriculture and Rural Development
MoH.....	Ministry of Health
MoI.....	Ministry of Information
MoTI.....	Ministry of Trade and Industry
NIP.....	National Implementation Plan
NGO.....	Non-Government Organization

PASDEP..... Plan for Accelerated and Sustainable Development to End Poverty
PCB..... Polychlorinated Biphenyls
PCDD..... Polychlorinated Dibenzo-p-dioxin
PCDF..... Polychlorinated Dibenzofuran
POPs..... Persistent Organic Pollutants
PPM..... Parts per million
PRTR..... Pollution Release and Transfer Register
SDPRP..... Sustainable Development and Poverty Reduction Strategy Program
TEQ..... Toxicity Equivalent
UNEP..... United Nations Environmental Program
UNIDO..... United Nations Industrial Development Organization
WHO..... World Health Organization

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EXECUTIVE SUMMARY

1. Objectives of the NIP Preparation, National Goal and Specific Objectives

This National Implementation Plan (NIP) is prepared to meet Ethiopia's obligations under the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention). Article 7 of the Stockholm Convention requires member countries to develop a national implementation plan to meet the requirements of the Convention and communicate such plan to the Conference of Parties (COP) within two years of the coming into force of the Convention. The NIP will, therefore, enable Ethiopia to fulfill its obligations under the Convention as well as help in mitigating the potential threats of POPs on human health and the environment at both the national and global level. Accordingly, the POPs/NIP project started in January 2004 with the overall objective of formulating a National Implementation Plan for Ethiopia in accordance with the requirements of the Stockholm Convention on POPs. The national executing agency for the project is the EPA whereas the GEF implementing agency is UNIDO.

The main objective of the NIP is to prepare a comprehensive and realistic action plan for the effective management of POPs chemicals in the Ethiopian context and to reduce, and ultimately eliminate, the use and release of POPs in accordance with the requirements of the Stockholm Convention and national sustainable development objectives and strategies such as the Environmental Policy and the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP).

The overall national goal of the NIP is:

Protection of human health and environment from the harmful effects of POPs chemicals in Ethiopia as well as at the global level by reducing and ultimately eliminating the use and release of POPs chemicals in accordance with the requirements of the Stockholm Convention and national sustainable development objectives and strategies.

The specific policy objectives of the NIP are the following:

- Develop national legislation to regulate, control, reduce and eventually eliminate the import, use and production of POPs chemicals in the country.
- Establish appropriate institutional mechanisms to regulate the impact of POPs on human health and the environment and strengthen enforcement capacity of such institutions.
- Strengthen national capacity and infrastructure to enable the country to adequately address the requirements of the Stockholm Convention and the implementation of the NIP.
- Identify and promote the application of best available techniques (BATs) and best environmental practices (BEPs) to enable the reduction and eventual elimination of POPs chemicals particularly from unintentional sources.
- Promote the establishment of research and development centers in order to search for alternatives to the use of POPs chemicals and to address their effects on human health and the environment.
- Create public awareness on the requirements of the Stockholm Convention and ensure the participation of the public in addressing the adverse impacts of POPs chemicals.
- Establish appropriate mechanism for adequate data collection, exchange and dissemination and information management system for POPs chemicals.

2. Ethiopia's Commitment to Implement the NIP

Ethiopia has to date addressed issues of chemicals management, including POPs chemicals, in a fragmented and partial manner. The environmental policy issued in 1997 contains several provisions relevant to chemicals management and hazardous wastes and there are several legal instruments in place that address some aspects of chemicals management including POPs chemicals. In conjunction with this, one activity that has commenced under the auspices of FAO and MoA in 2000 and is on-going is the disposal and export of obsolete pesticides, including POPs pesticides, from several regions in the country. The project plans to dispose all obsolete pesticides in the country including clean-up of respective contaminated sites and articles in use.

Aware of the adverse human health and environmental impacts of POPs chemicals both at the national and global level, and the need for concerted action to address such impacts, Ethiopia signed the Stockholm Convention on 17 May 2002 and ratified the instrument on 2 July 2002.

Ethiopia had, as a first step, prepared a National Chemical Profile in 1999 that provided an assessment of the country's chemical management infrastructure; an initial assessment of chemicals existing at the national level and the extent of their use as well as the legal, institutional, administrative and technical issues related to chemicals management of the country. The profile provides a comprehensive assessment of the national chemicals management infrastructure relating to the legal, institutional, administrative and technical aspects, along with an understanding of the nature and extent of chemicals availability and use.

Subsequent to the ratification of the Stockholm Convention and related international conventions such as the Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal (2000); the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (2002) and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (2002), Ethiopia has taken several prior steps towards meeting its commitments under the Convention and the preparation of the NIP. The steps taken are:

- Establishment of the POPs/NIP project office and a national steering committee.
- Launching of an inception workshop on POPs.
- Conducting training workshop on inventory taking of POPs chemicals.
- Carrying out a preliminary inventory and assessment of POPs chemicals and national infrastructure for POPs management.

3. Objectives of the Stockholm Convention

The objective of the Stockholm Convention is the protection of human health and the environment from the adverse impacts posed by the Persistent Organic Pollutants of the

twelve initially listed chemicals. It aims to do this based on the precautionary approach enshrined under the Rio Declaration (a set of non binding principles set forth under the 1992 Rio Declaration on Environment and Development). It therefore targets its actions on preventive mechanisms.

4. National Priorities and Key Issues

National POPs Priorities

The national POPs priorities for Ethiopia have been identified based on criteria agreed upon in the priority setting phase. The national POPs priorities are:

- Strengthening Human and Institutional Capacity for the Management of POPs.
- Developing Capacity and Capability for the Identification, Analysis, Research and Monitoring of POPs.
- Conducting Risk Assessment of POPs on Human Health and the Environment.
- Development of Information and Communication System for the Management of POPs.
- Undertaking safe and environmentally sound treatment and disposal of pops and pops-laden equipment and remediation of contaminated sites.

Key Issues Addressed under the Action Plan

This part provides a highlight of the main activities, action plans and strategies to be addressed in the NIP in the Ethiopian context for each category of POPs chemicals and the main activities identified in the action plan in a tabular form. The more detailed activities identified in the action plan is found in Tables 11-23 and goals and specific objectives for each action plan is also provided for each under section 3.3 (Activities, Strategies and Action Plans).

Table 1. Main Activities Identified in the NIP Action Plan for each Category of POPs Chemicals

No	Activities/Action Plans/Strategies	Main Activities Identified
1	Legal and Institutional Strengthening Measures	<ul style="list-style-type: none"> • Establishment of NIP secretariat under EPA for coordination of sectoral activities • Issuance of new legislation • Developing and issuing new standards and guidelines • Strengthening regulatory and enforcement capacity of relevant institutions
2	Production, Import/Export, Use, Stockpiles, Wastes and Release of Annex A POPs Pesticides	<ul style="list-style-type: none"> • Conduct comprehensive inventory and assessment. • Ensure proper management and handling of stockpiles and wastes. • Environmentally sound disposal of stockpiles and wastes. • Assess and monitor health and environmental impacts.

3	Production, Import/Export, Use, Identification, Labeling, Removal, Storage, Release and Disposal of PCBs and Equipment Containing PCBs	<ul style="list-style-type: none"> • Conduct comprehensive inventory and assessment. • Ensure proper management and handling of PCBs in use, stockpiles and wastes • Phase out PCBs in use • Dispose of current stockpiles and wastes. • Dispose of PCBs to be removed from equipment in use.
4	Production, Import/Export, Use, Stockpiles, Wastes and Release of DDT	<ul style="list-style-type: none"> • Conduct comprehensive inventory and assessment. • Ensure proper management and handling of DDT use, stockpiles and wastes. • Environmentally sound disposal of stockpiles and wastes. • Assess and monitor the health and environmental impacts of DDT • Identify and implement alternatives to DDT
5	Register for Specific Exemptions and Continuing Need for Exemptions	<ul style="list-style-type: none"> • Prepare a report justifying the continued use of DDT • Conduct periodic reviews on the continued use of DDT
6	Measures to Reduce Releases from Unintentional Production	<ul style="list-style-type: none"> • Conduct Inventory and Assessment of current and projected releases. • Develop and implement strategies to reduce releases. • Assess and monitor health and environmental impacts. • Review strategies every five years
7	Identification of Contaminated Sites and Remediation in an Environmentally Sound Manner	<ul style="list-style-type: none"> • Complete inventory and assessment of contaminated sites and initially determine the extent and severity of the environmental and socio-impacts of sites. • Undertake proper management of contaminated sites. • Undertake remediation measures of sites including risk assessment and clean-up.
8	Facilitating or Undertaking Information Exchange and Stakeholder Involvement	<ul style="list-style-type: none"> • Establish a focal point for information exchange. • Development of information gathering and exchange system. • Implement information exchange.
9	Public Awareness, Information and Education	<ul style="list-style-type: none"> • Assess level of awareness and information needs. • Conduct public awareness and sensitization. • Undertake training and education.
10	Effectiveness of Evaluation	<ul style="list-style-type: none"> • Develop criteria to evaluate the impacts of implementation of the Stockholm Convention. • Undertake periodic evaluation of impacts of implementation.
11	Reporting	<ul style="list-style-type: none"> • Identify and evaluate measures taken to implement the Convention. • Compile statistical data on use, production, import/export and release of POPs chemicals. • Prepare and submit report to the COP of the Convention.
12	Research, Development and Monitoring	<ul style="list-style-type: none"> • Conduct periodic studies on sources and releases of each category of POPs. • Develop a system to monitor the presence and levels of POPs in human and the environment • Conduct periodic studies on health, environment and socio-economic impact of POPs.
13	Technical and Financial Assistance	<ul style="list-style-type: none"> • Identify assistance needs and source of funding. • Prepare and submit proposals for funding. • Secure assistance.

Target for Implementation of NIP

The time schedule for the NIP implementation is provided in Table 21. Activities in the action plan are scheduled to be implemented during a twenty-year period from 2007-2026. The time frame for implementation is further divided into the short term (2007-2011); the mid-term (2012-2016) and the long-term (2017-2026). This division has, as far as possible, taken into account, the institutional, human resources and technical infrastructure requirements needed to effectively implement the discrete activities identified in the action plan. The implementation schedule is subject to review and updating during the implementation period.

Funding for NIP Implementation

The detailed estimated cost of implementing the NIP is provided in Table 25. This is presented by dividing the cost into the short-term (2007-2011), the mid-term (2012-2016) and the long-term (2017-2026). The total cost for implementing the whole NIP activities over the 20-year period would be USD 53,493,000. The cost of implementing the short-term activities of the NIP is USD 14,308,000, while the cost of implementing the mid-term and long-term action plans is USD 21,935,000 and USD 17,250,000, respectively. The cost of action plans on PCBs, in particular, the cost of substituting existing electrical equipment to phase out PCBs in use, constitutes the major cost of the NIP implementation amounting to about 50% of the total cost. The cost also indicates the amount to be generated from internal sources (mainly government) and to be sought from external sources. The costs to be covered from internal sources are mainly those costs related to activities that can be implemented using the resources of existing government structures.

I. Introduction

1.1 Purpose and Structure of the National Implementation Plan (NIP)

Purpose of the NIP

This National Implementation Plan is prepared to meet Ethiopia's obligations under the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention). Article 7 of the Stockholm Convention requires member countries to develop a national implementation plan to meet the requirements of the Convention and communicate such plan to the Conference of Parties (COP) within two years of the coming into force of the Convention. The NIP will, therefore, enable Ethiopia to fulfill its obligations under the Convention as well as help in mitigating the potential threats of POPs on human health and the environment at both the national and global level.

The main objective of the NIP is to prepare a comprehensive and realistic action plan for the effective management of POPs chemicals in the Ethiopian context and to reduce, and ultimately eliminate, the use and release of POPs in accordance with the requirements of the Stockholm Convention and national sustainable development objectives and strategies such as the Environmental Policy and the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP).

NIP Preparation and Stakeholders Consultation Process

Before reaching the NIP preparation phase, several activities have been undertaken on the basis of which the NIP was prepared. At the outset, the Environmental Protection Authority (EPA) approached UNIDO in 2002 to provide it with the necessary support to develop a project proposal for the preparation of the NIP for subsequent submission to the GEF. The project proposal was accepted in 2003 and funding secured from GEF under its enabling activities window. Accordingly, the POPs/NIP project started in January 2004 with the overall objective of formulating a National Implementation Plan for Ethiopia in accordance with the requirements of the Stockholm Convention on POPs.

The national executing agency for the project is the EPA whereas the GEF implementing agency is UNIDO.

Following the successful completion of the first phase of the project, which mainly focused at putting in place the necessary coordination mechanism by establishing a steering committee (list of steering committee members is provided in Annex 2), a two-day inception workshop on “ *The Enabling Activities to Facilitate Early Action on the Implementation of the Stockholm Convention on Persistent Organic Pollutants*” was organized in Adama on January 22-23 2004. The objective of the workshop was to officially launch the project as well as to present papers on various national and international aspects of POPs issues in order to create awareness of POPs issues among the main stakeholders including decision-makers. Various stakeholders attended the inception workshop, namely, relevant government sectors from the federal and regional level; environmental NGOs, the academia and representatives from the private sector (list of stakeholders represented is provided in Annex 2).

Subsequent to the inception workshop, a two-day POPs inventory training was given by an international consultant to six task teams who were contracted to undertake the assessment and inventory of POPs chemicals in the country.

Phase two of the POPs/NIP project, which commenced in February 2004, was directed towards undertaking a preliminary inventory and assessment of the national infrastructure for POPs management. To this effect, five task teams were established to carry out inventory and assessment of POPs chemicals, contaminated sites, health impacts of POPs, legal and institutional infrastructures including an assessment of gaps in chemicals management respectively. The work was completed in April/May 2005 and the following six documents were produced accordingly:

- Report on inventory and assessment of POPs pesticides;
- Report on inventory of PCBs;
- Report on inventory of PCCD and PCDF;

- Report on the assessment of the Health Impact of POPs pesticides;
- Report on inventory and assessment of Contaminated Sites;
- Report on chemicals management in Ethiopia with particular emphasis on POPs.

The draft POPs inventory and assessment reports were initially reviewed by the national steering committee, the project office and EPA. Thereafter, a two-day workshop was held in Addis Ababa during 16-17 June 2005 where a wider stakeholder consultation was carried out on the documents for further comments and refinements of the respective reports (workshop participants is provided in Annex 2).

The final and third phase of the POPs/NIP process was the preparation of the National Implementation Plan. This phase was commenced in late November 2005 and was divided into two parts. The first part focused on priority setting and determination of national objectives. Once the initial report was prepared, two consultation meetings were held with a view to ensuring the participation of stakeholders and enhancing the quality of the report. The first one was a Peer Review Group Meeting, which took place from January 14-15 2006 at the EPA meeting hall in which members of the peer review group forwarded several comments. Subsequently, a draft report was prepared after incorporating the relevant comments of the peer review group. The second consultation meeting was a validation workshop comprising of a wider group of relevant stakeholders. This workshop took place during February 23-24, 2006 in Addis Ababa (list of participants is provided in Annex 2). The validation workshop reviewed the draft report and provided their inputs and a final report was submitted to the project office and EPA in March 2004.

The second part of the NIP preparation phase, which commenced in mid-March 2004, comprised the formulation of a National Implementation Plan and Development of specific Action Plans on POPs. A draft National Implementation Plan was prepared in May 2006. The draft NIP was initially reviewed by a peer review group formed by the Federal EPA in June 2006. Once the comments of the peer review group were incorporated a validation workshop was held from July 20-21. The participants of this

validation workshop were drawn from governmental, non-governmental and private organizations involved in the management of POPs chemicals (list of participants is provided in Annex 2). The participants at the validation workshop provided valuable comments on the draft NIP report and this final report has been prepared after incorporating the comments forwarded at the validation workshop.

Structure of the NIP

The introduction part discusses the purpose of the NIP as well as the NIP preparation process and stakeholder consultations during the different phases of the preparation of the NIP. It also includes a brief description of the nature of POPs chemicals and their adverse impacts on human health and the environment as well as a discussion of the basic provisions and requirements of the Stockholm Convention on POPs. The second part provides a country baseline information, which provides a general overview of the geography and population of the country, the political and economic profile including profiles of the main economic sectors relevant to the context of the management of POPs chemicals as well as the overall environmental conditions of the country. It also gives an overview of the policy, legal and institutional framework of the country and an assessment of POPs issues in the country for each category of POPs chemicals based on information available from various sectors and the results obtained from the POPs inventory and assessment phase. This part also incorporates available information on current technical infrastructure and monitoring capacity related to POPs chemicals in the country; potential impacts of POPs at the national level and the level of public awareness in the country on POPs.

More importantly, the third part and main body of the report incorporates the Strategy and Action Plan Elements of the NIP. The first sub-section elaborates the various steps taken by Ethiopia to date towards meeting the commitments of the Stockholm Convention and in preparing the national implementation plan. It provides a policy statement including the overall national policy goals and specific objectives of the NIP. It also describes the formal procedure to be taken for the formal endorsement of the NIP by stakeholders and by the government. The second sub-section discusses the strategy

towards implementing the NIP which includes what coordinating mechanism is to be established; the implementation approach and the procedures for review, updating and reporting of the NIP. The third sub-section provides specific action plans for each category of POPs chemicals and for the various subject areas that need to be addressed in order to meet the requirements of the Stockholm Convention. Sub-section four, describes priority areas required for capacity building in Ethiopia in order to adequately discharge the requirements of the Convention. Subsection 5, provides the timetable for implementing the NIP during the short, medium and long-term in tabular form. The final section, provides the cost requirements for implementing the action plan identified in the NIP.

1.2 Persistent Organic Pollutants

Persistent Organic Pollutants (POPs) are a group of chemicals that contain carbon in their chemical structure. These substances either occur naturally or are results of anthropogenic activities. Those POPs intentionally produced for human use have wider applications in agriculture and industrial processes. Still some of these chemicals are byproducts of certain industrial activities. Within this category fall Dioxins, Furans, HCBs and PCBs which are unintentionally produced as a result of incomplete combustion of organic substances containing chlorine.

POPs possess a combination of certain properties rendering them to be very dangerous. They are stable and stay in the environment long after their release without undergoing any significant chemical or biological degradation. DDT, which is one amongst the 12 notorious chemicals regulated under the Stockholm Convention, is said to persist in the environment for not less than 12 years after spray. Other POPs chemicals may even remain in the environment for decades without changing into less harmful forms.

POPs have a character of low water and high fat solubility. This makes them to dissolve in plant and animal fatty tissues. The substances can easily access their ways through the food chain. To complicate matters these chemicals have a high tendency to bioaccumulate as one goes up the ladder of the food chain. Plants take up the chemicals

from the environment in the event of preparing their food. Animals depending on these plants indirectly receive the same chemicals while feeding themselves. Some evidences establish that the concentration of POPs escalate as one moves up the ladder of the food chain. Hence, higher animals like fish, predatory birds, mammals and human beings which are at the apex of the food chain will have more of these toxic substances.

The chemicals are also known for their potential of long-range transport. They are not contained within the geographic area of their release or application. The substances generally attach themselves with such media as air, water, soil, sediments etc. to circulate around. POPs chemicals even take the agency of migratory species such as birds and mammals to travel long distances as the animals move into their seasonal abode. This makes the problems they cause transboundary in nature. Evidences suggest that the chemicals have moved into areas that even had no history of utilizing the chemicals. (It is reported that they surface in such fairly uninhabited regions as the Arctic.)

These toxic chemicals are noted for their harmful effects including the thinning of eggshells in birds and decreased lactation period in nursing mothers. Specific adverse effects on human beings include neurobehavioral disorders, liver damage, cancer, allergies, hyper-sensitivity, and birth defects. Some of the chemicals are generally termed as endocrine disruptors because of their interference in the normal functioning of the endocrine system in the human body. “In a 2003 study of endocrine disrupting chemicals (EDC) found in the air and dust in 120 US homes, over 60 of the EDCs were found. Prevalent among them were three POPs—heptachlor, chlordane, and DDT—pesticides that have all been banned for years in the US.”

The danger posed by these chemicals became a widely observed problem and the United Nations Environment Program (UNEP) launched an investigation on an initial list of 12 chemicals that possess the characteristics noted above. These are Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Mirex, Toxaphene, Hexachlorobenzene, PCBs, Chlorinated dioxins and Chlorinated furans. Most of these are pesticides while some are chemicals that have industrial applications. Still others are byproducts of certain

industrial processes. These chemicals are designated for global action through the Stockholm Convention. Though the action is to begin only on these 12 POPs chemicals, similar action is yet to be undertaken on a consecutive batch of chemicals through the machinery of the Convention. That is to say, POPs of similar nature, are expected to be added to the initial list as scientific evidences justify it. The Conference of the Parties to the Stockholm Convention will, during its periodic meetings, decide on this issue of adding a new set of POPs to the current list of controlled chemicals.

1.3 The Stockholm Convention on Persistent Organic Pollutants

Overview

The Stockholm Convention on POPs chemicals is a global, legally binding instrument, aimed at protecting human health and the environment across the world from the harmful impacts of persistent organic pollutants. The Convention was adopted at a Conference of Plenipotentiaries held from 22 to 23 May 2001 in Stockholm, Sweden. After meeting the necessary requirements and formalities, the Stockholm Convention has entered into force on May 17, 2004. Ethiopia has ratified the Convention on June 9, 2002. A multipurpose national implementation plan is hence underway.

Objective of the Convention

The Objective of the Stockholm Convention is the protection of human health and the environment from the adverse impacts posed by the Persistent Organic Pollutants of the twelve initially listed chemicals. It purports to do this based on the precautionary approach enshrined under the Rio Declaration (a set of non binding principles set forth under the 1992 Rio Declaration on Environment and Development). It therefore targets its actions on preventive mechanisms.

Main Provisions of the Convention

The Convention starts by immediately targeting only the 12 particularly toxic POPs for reduction and eventual elimination. It, however, sets up a system for tackling additional

chemicals identified as unacceptably hazardous. Major obligations of parties to the Convention relate to control of releases, drawing up implementation plans, complying with mandatory provisions of elimination, reduction or restricted usage, duty of information exchange, public awareness and education, and cooperation through research and development.

Table 2: POPs Regulated under the Stockholm Convention

No.	Name of the chemical	Application of the chemical			List under Annex (A, B or C)
		pesticide	industrial	unintentional byproducts	
1	Aldrin	➤			A
2	Chlordane	➤			A
3	DDT	➤			B
4	Dieldrin	➤			A
5	Endrin	➤			A
6	Heptachlor	➤			A
7	Mirex	➤			A
8	Toxaphene	➤			A
9	Hexachlorobenzene	➤	➤	➤	C
10	PCBs		➤	➤	C
11	Chlorinated dioxins			➤	C
12	Chlorinated furans			➤	C

The control provisions of the Convention require parties to prohibit and/or take legal and administrative measures of reduction or elimination from releases of the intentionally produced POPs, unintentionally produced POPs, and stockpiles and wastes containing the chemicals.

Obligations relating to intentionally Produced POPs

Under Article 3 of the Convention each Party is required to prohibit and/or take legal and administrative measures to eliminate the production and use of all the intentionally produced POPs listed in Annex A. The chemicals slated for elimination are Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene (HCB), Mirex, Toxaphene, Polychlorinated Biphenyls (PCBs). Among these POPs, PCBs are industrial chemicals, whereas HCB is used both an industrial chemical and pesticide. The remaining POPs listed in Annex A are pesticides.

The Convention also restricts the production and use of intentionally produced POPs listed in Annex B and only DDT is listed in this Annex currently. As far as DDT is concerned, the Convention requires parties to eliminate the production and use of DDT except for disease vector control programs. A party that intends to produce and/or use DDT has to notify the Secretariat of the Convention. In addition it is required to meet certain conditions, one of which is the development and implementation of an action plan, which include:

- Development of regulatory and other mechanisms to ensure that DDT use is restricted to disease vector control;
- Implementation of suitable alternative products, methods and strategies;
- Measures to strengthen health care and to reduce the incidence of the disease.

Obligations relating to unintentionally Produced POPs

Article 5 of the Convention deals with unintentionally produced POPs. It requires each party to take measures to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C. The POPs listed in Annex C are HCB, PCBs, Dioxins and Furans. Developing an action plan to identify, characterize and address the unintentional release of these chemicals is the major obligation of each party. The action plan should evaluate current and projected releases, develop source inventories and release estimates. It should also evaluate the efficacy of laws and policies relating to the management of such releases. In addition to the action plan each party is required to (i) promote feasible, practical measures that can expeditiously achieve a significant

reduction of these releases; (ii) promote and/or require use of substitute materials or processes to prevent the formation of these chemicals; (iii) promote and implement, in accordance with the action plan, the use of best available techniques and best environmental practices for existing and any newly identified sources of the chemicals.

The chemicals listed in Annex C are unintentionally formed and released from thermal processes involving organic matter and chlorine as a result of incomplete combustion or chemical reactions. The activities that are the main sources in the generation of unintentionally produced POPs are listed in Annex C. These activities cover a wide range of economic activities including industrial processes such as ferrous and non-ferrous metals production, cement and other minerals production, production and use of chemicals and consumer goods, such as manufacture of pulp and paper, chemicals, petroleum, textiles and leather products. The other categories include waste incineration, power generation and other fuel burning, transport, uncontrolled combustion processes such as agricultural and forest fires. Drying of biomass, crematoria, dry cleaning and tobacco smoking are also considered as having potential for formation and release of these chemicals to the environment.

Releases from Stockpiles and Wastes

Article 6 of the Convention deals with the management of stockpiles containing chemicals listed in Annexes A or B and of wastes containing or contaminated with any of the POPs listed in Annexes A, B or C. Such stockpiles and wastes are to be managed in a manner protective of human health and the environment. The article further requires each party to:

- Develop strategies for identifying stockpiles and products or wastes containing or contaminated with the listed POPs;
- Manage stockpiles and wastes so identified in a safe, efficient and environmentally sound manner;
- Dispose of such wastes so that the persistent organic pollutants are destroyed or irreversibly transformed;

- Ensure that disposal shall not lead to recovery or reclamation for direct reuse or alternative uses;
- Take appropriate measures so that wastes containing or contaminated with POPs shall not be transported across international boundaries without taking into account relevant international rules, standards and guidelines; and
- Make efforts to identify sites that are contaminated with chemicals covered in the Convention.

However, the Convention does not explain as to what an Environmentally Sound Management (ESM) of wastes entails. But inferences can be made from the relevant provisions of the most widely accepted Multilateral Environmental Agreement currently in force regarding the handling of wastes: the Basel Convention. It refers to an ESM as the mechanism of "...taking all practicable steps to ensure that hazardous wastes and other wastes are managed in a manner which will protect human health and the environment against adverse effects which may result from such wastes..."

Development of a National Implementation Plan

Article 7 of the Convention urges each Party to develop and endeavor to implement a plan for meeting its obligations under the Convention. Each party is under obligation to communicate its implementation plan to the Conference of the Parties within two years of the coming into force of the Convention. The plan shall be reviewed and updated where appropriate on a periodic basis. The Convention requires Parties, where appropriate to cooperate directly or through global, regional or sub-regional organizations and consult their national stakeholders including women's groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans. Parties are also required to endeavour to utilize and, where necessary, establish the means to integrate national implementation plans for POPs in their sustainable development strategies where appropriate.

Information Exchange

Each Party to the Convention is obliged under Article 9 to facilitate or undertake the exchange of information relevant to POPs, either directly among Parties or through the Secretariat. The Convention also requires each Party to appoint a national focal point for information exchange. In addition, the Convention states that information on health and safety to human beings and the environment shall not be regarded as confidential.

Public Information, Awareness and Education

Article 10 of the Convention requires each Party to promote and facilitate:

- POPs awareness among policy and decision makers;
- Provision to the public of all available information on POPs
- Development and implementation of educational and public awareness programs on POPs;
- Public participation in addressing POPs issues.

The Convention also requires each Party, within its capabilities, to ensure that the public has access to information.

Research, Development and Monitoring

According to Article 11, Parties are required, within their capabilities, at the national and international levels, to encourage and/or undertake appropriate research, development, monitoring and cooperation pertaining to persistent organic pollutants and, where relevant, to their alternatives and to candidate additional persistent organic pollutants.

Addition of New POPs

The Convention has put in place the procedure whereby new candidates of POPs are to be included into the initial list of chemicals. The information requirement and screening criteria for listing a chemical in any of the annexes is put under Annex D, and includes:

- Chemical identity
- Persistence
- Bioaccumulation
- Potential for long- range environmental transport
- Adverse effects to human health or to the environment

Box 1. Summary of the Requirements of the Stockholm Convention relating to Annex A POPs pesticides (provisions relating to stockpiles and wastes apply both to DDT, PCBs, Dioxins and Furans)

- Prohibit and/or take all legal and administrative measures necessary to eliminate the production, use, import and export of Annex A POPs pesticides.
- Restrict import and export of POPs pesticides, except under conditions in Article 4 of the Convention (specific exemptions registered with the Secretariat) or for the purpose of environmentally sound disposal of POPs pesticides taking into account any relevant provisions existing in international PIC instruments.
- Develop and apply strategies for identification of stockpiles, products and articles in use and waste containing POPs pesticides.
- Prohibit the use, recycling, recovery and direct or alternative uses of persistent organic pollutants.
- Manage stockpiles in a safe, efficient and environmentally sound manner upon their becoming waste.
- Take appropriate measures so that POP pesticides are handled, transported and stored in an environmentally sound manner, as well as disposed of, so that the POPs content is destroyed or transformed in a way that they do not exhibit the characteristics of persistent organic pollutants. Their disposal should be made in an environmentally sound manner taking into account international regulations, standards and guidelines.

Box 2. Summary of the Requirements of the Stockholm Convention relating to PCBs

- Immediately stop the production of PCBs (by the date of entry into force of the Convention).
- Eliminate the use of PCBs in equipment by 2025.
- Identify, label and remove from use the equipment containing greater than 10% PCBs and volumes greater than 5 litres.
- Identify, label and remove from use the equipment containing greater than 0.005% PCBs and volumes greater than 0.05 litres.
- Prohibit the export and import of PCBs and equipment containing PCBs (except for purposes of environmentally sound management).
- Achieve the environmentally sound management of PCB wastes as soon as possible, but not later than 2028.
- Develop and implement strategies for identification of stockpiles, products and articles in use and waste containing PCBs.
- Manage stockpiles in a safe, efficient and environmentally sound manner upon their becoming waste.
- Take appropriate measures so that PCBs are handled, transported, stored and disposed of in an environmentally sound manner.

Box 3. Summary of Requirements of the Stockholm Convention relating to DDT

- Eliminate the production and use of DDT except for the exceptions in Annex B part I for: disease vector control in accordance with WHO recommendations and guidelines; production and use of DDT as intermediate in production of dicophol.
- Promote research and development of alternative chemicals to DDT.
- The production and use of DDT shall be eliminated except for Parties that have notified the Secretariat of their intention to produce and/or use it (DDT Register established with the Secretariat).
- Import is allowed for the use or purpose which is permitted for the party under Annex B (use and production in disease vector control or specific exemption for production of dicofol)
- Export only for the purpose of environmentally sound disposal or to a Party which is permitted to use that chemical under Annex B.
- Each party that uses DDT shall, every three years, provide the Secretariat and the WHO information on the amount used, conditions of such use and its relevance to the Party's disease management strategy.
- Each party is encouraged to develop and implement an action plan as part of NIP with the goal of reducing and ultimately eliminating the use of DDT. The action plan shall include: I) development of regulatory and other mechanism to ensure that DDT use is restricted to disease vector control; ii) implement suitable alternatives products, methods and strategies, including resistance management strategies to ensure the continuing effectiveness of these alternatives; iii) measures to strengthen health care and to reduce the incidence of the disease.
- Within their capabilities, to promote research and development of safe alternative chemical and non-chemical products, methods and strategies, relevant to the conditions of those countries and with the goal of decreasing the human and economic burden of the disease. Factors to be considered in this respect shall included human health risks and environmental implications of such alternatives.
- The Conference of Parties, in consultation with the WHO, shall every three years, evaluate the continued need for DDT for disease vector control on the basis of available scientific, technical, environmental and economic information, including: a) the production and use of DDT and the conditions set out in para 2; b) the availability, suitability and implementation of the alternatives to DDT; and c) progress in strengthening the capacity of countries to transfer safely to reliance to such alternatives.
- A party may, at any time, withdraw its name from the DDT Registry upon written notification to the Secretariat. The withdrawal shall take effect on the date specified in the notification.

Box 4. Summary of the Requirements of the Stockholm Convention relating to PCCD/PCDF, HCB and PCB (Annex C)

- Develop an action plan to identify, characterize and address the release of chemicals listed in Annex C.
- Promote the development, and where appropriate, require the use of substitute materials, products and processes to prevent the formation and release of chemicals listed in Annex C.
- Promote and introduce the best available techniques (BAT) as soon as possible, but not later than four years after the entry into force of the Convention, for new sources within particular industrial categories (Annex C-Part I) which have the potential for formation and release of POPs compounds in Annex C to the environment.
- Promote the use of best available techniques and best environmental practices for the existing sources within the categories listed in Annex C-Part II and III, and for new sources within the categories listed in Annex C-Part III.

II Country Baseline

2.1 COUNTRY PROFILE

2.1.1 Geography and Population

Ethiopia is a landlocked country lying in the north-eastern part of the Horn of Africa. It stretches between 3⁰N and 15⁰N latitudes and 33⁰ E and 48⁰E longitudes. The country borders with Djibouti in the east, Somalia in the southeast, Kenya in the south, Sudan in the west, and Eritrea in the north and northeast.

The total geographic area of the country is 440,284 square miles (1.104 million square kilometres) making it the 9th largest country in Africa.

Regional Map of Ethiopia

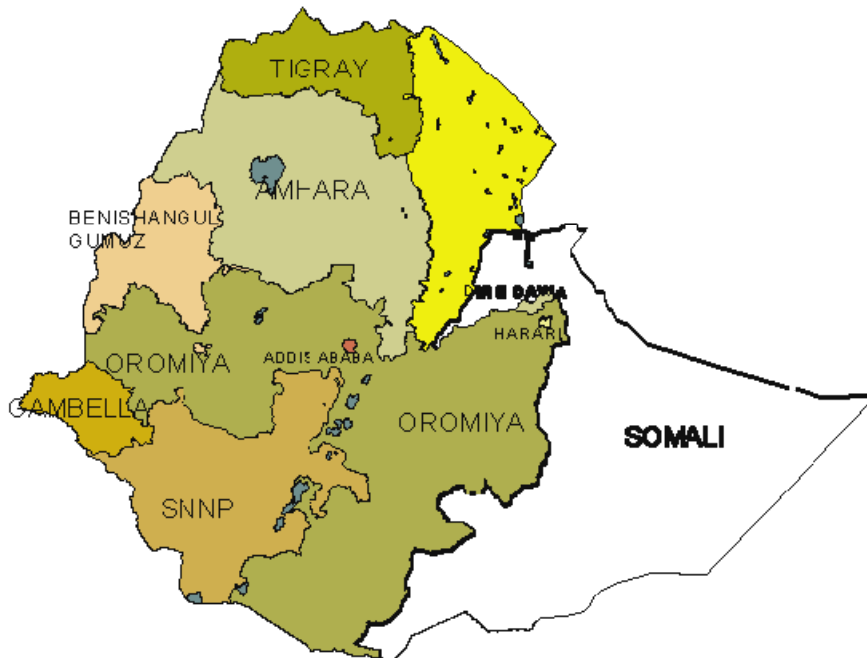


Fig.1. Map of Ethiopia.

Ethiopia is endowed with a diversity of topographic features ranging from a shallow point of 110 m below sea level to a peak rising 4,500 m above sea level. The country enjoys three types of climatic zones namely: "kolla" which is the hot low land zone of

approximately 1,500 m above sea level, "Woina Dega" which is within the range of height between 1,500 and 2,400 m, and "Dega" so termed because of its cool temperature and covers the highlands of the country above 2,400 m. The regions in the Dega zone generally receive more rain than the lowlands.

Ethiopia is the third populous country in Africa with a population of approximately 71 million. 85% of the total population live in the rural countryside making the country one of the least urbanized in the world. The working-age population, defined as the portion of the entire population between the ages 15–65, was 52.5 per cent (27 million) in 1994. The crude birth rate is estimated at 40.5 per 1000. The average age of the population is 21.8 years and the literacy rate 35.5 per cent. The rate of unemployment is 2.91 per cent and the percentage of women employed outside is nearly 41.96%.

Only nine urban centers in Ethiopia have a population size over 100,000 inhabitants. (Ministry of Health, 2006). Addis Ababa is the largest in terms of population, and the only one with the number of inhabitants more than one million (see table 3). According to a household survey conducted in 1998 urban unemployment rate was estimated at 29.9 percent. (MOFED, 2004)

Table 3: Total Projected Population within the Eleven regions of Ethiopia

Region	Total Population (projected)
Addis Ababa	2,805,000
Afar	1,340,000
Amhara	18,143,000
Benishangul	594,000
Dire Dawa	370,000
Gambella	234,000
Harari	185,000
Oromiya	25,098,000
SNNPR	14,085,000

Somali	4,109,000
Tigray	4,113,000
Ethiopia	71,076,000

Source: CSA, 2005

2.1.2 Political and Economic Profile

Ethiopia is established as a federal republic under the 1995 Constitution. The executive branch includes the President, the Council of States, and the Council of Ministers. Executive power resides with the Prime Minister. The Parliamentary system in Ethiopia is bicameral whereby representation is assumed through national legislative elections conducted every five years. The judicial branch comprises of federal and regional courts.

The country is divided into nine regional states and two City administrations. The regional states are Afar, Amhara, Benishangul/ Gumuz, Gambela, Hareri, Oromiya, Somali, Tigray, and Southern Nations, Nationalities, and Peoples. Addis Ababa and Dire Dawa are the two autonomous city administrations that enjoy full measure of self-administration, and are accountable to the Federal Government. Delimitation of the 9 regional states is made solely on the basis of settlement patterns, language, identity and consent of the people concerned. These States assume exclusive powers that is not given to the Federal Government, or powers concurrently given to both the federal government and the regions. Powers of the Federal Government include: the duty to protect and defend the Constitution, formulate and implement the country's policies, strategies and plans with respect to overall economic, social and development matters, formulate and implement foreign policy and negotiate and ratify international agreements; formulate and execute the country's financial, monetary and foreign investment policies and strategies; regulate inter-state and foreign commerce etc.

The powers of regional governments, on the other hand, include establishment of a State administration that advances self-government and democratic order, protection of the Federal Constitution, enactment of the State constitutions and subordinate laws; formulation and execution of economic, social and development policies, strategies and

plans of the State; administration of land and other natural resources in accordance with Federal laws and establishment and administration of the state police force; maintaining public order and peace within the State. The Federal Government and the States have concurrent power on matters of taxation. Accordingly, they jointly levy and collect profit, sales, excise and personal income taxes on enterprises they jointly establish. They also jointly levy and collect taxes on the profits of companies, on dividends due to shareholders, on incomes derived from large-scale mining and all petroleum and gas operations, and royalties on such operations.

Local government entities consist of Regional States, Zonal and Woreda governments. The Federal Government is responsible for drawing up general policies pertaining to common interests and benefits while Regional Governments are usually implementers of these policies. Each of the nine states has its own parliamentary assembly, which elects representatives to the upper chamber of the federal parliament, the House of the Federation. Each has taxing powers and administers its own budget, but in practice the assemblies have had to rely on the central government for funding.

2.1.3 Profiles of Economic Sectors

The government has embarked on a market economy, including privatization of state enterprises and rationalization of government regulation. While the process is still ongoing, so far the reforms are reported to have attracted a number of foreign investors. The following sectors are of utmost importance for the country's economy.

Agriculture

By and large the Ethiopian economy is based on agriculture, which contributes for 50% to the GDP and more than 80% of the country's exports. The sector employs 85% of the population. The major agricultural export crop is coffee, providing for 35% of Ethiopia's foreign exchange earnings, (down from 65% a decade ago because of the slump in coffee prices since the mid-1990s). Other traditional major agricultural exports are semi-processed hides and skins, pulses, and oilseeds. Sugar and floriculture development have also become important in the economy in recent years.

Several seasonal crops are grown in different parts of the country. The main ones are cereals (teff, barley, maize, wheat, sorghum, oats and millet), pulses (horse beans, fenugreek, field peas, haricot beans, chickpeas, vetch and lentils), and oil crops (niger seed, linseed, rapeseed, groundnuts, sunflower and sesame). The main cash and industrial crops are coffee, oil seeds, pulses, cotton, sisal, tobacco, fruits and sugar cane.

Ethiopia's agriculture is, however, plagued by periodic drought, land degradation caused by inappropriate agricultural practices and overgrazing, deforestation, population pressure, undeveloped water resources, and poor transport infrastructure.

Industry

The industrial sector, despite its small contribution to GDP, supplies important consumer goods both to the domestic and international markets. The main manufacturing products are textiles, foodstuffs, beverages, leather and non-metallic products.

The sector comprises of mining and quarrying activities, large and medium scale manufacturing industries (that engage on the average 10 persons and use power driven machines), small-scale industries and handicrafts (that engage less than 10 persons), electric, water and construction industries accounted on the average for 11 percent of the GDP for the period between 1994/95 and 2002/03. Reports establish that during this period, the sector has been growing at the rate of 7 percent per annum.

The role of industry as it stands now is very limited in terms of supply of consumer goods, generating employment opportunities, absorbing agricultural raw materials and earning foreign exchange through exports. This sector is currently dominated by light manufacturing products such as construction materials, metal and chemical products as well as basic consumer goods such as food, beverages, leather, clothing and textiles. The manufacturing belt in the country is concentrated in and around the capital, Addis Ababa and mostly caters for the domestic market, although the number of exported goods is growing. The Government is making all efforts in dismantling barriers for investment and creating conducive atmosphere for private sector participation in the country.

Ethiopia offers opportunities for mineral exploration and development. The gold deposits in the southern, western, and northern parts of the country are sources of the country's gold production. Besides, there are opportunities in Ethiopia for large-scale production of salt, potash, tantalum, platinum, sulphur and iron. However, currently the mineral sector is a minor contributor to the national economy. Mining operations are expected to be an important economic factor for the Government in the export oriented development strategy. In this regard, platinum deposits of Yubdo in western Ethiopia, the Dallol potash deposits in the Danakil depression area, the condensate and natural gas deposits in Ogaden, the columbo-tantalite deposits in Adola (Kenticha), and the Bikailal iron-ore and phosphate deposits are potential areas in the sector. The country has potential for marble resources available for export as well as local consumption. Marbles are found largely in the northern part of Ethiopia and at present a lot of activities are taking place in exploration and production.

Tourism sector

The tourism sector has a great potential for generating revenue and to contribute to economic development in Ethiopia. There are a number of natural, human-made and cultural sites in the various regions of Ethiopia among which some have been designated as world heritage sites by UNESCO. To cite a few examples these are: the Semien Mountains National Park, the Historical and Archaeological sites of Axum, the Rock-Hewn Churches of Lalibela, the Medieval Castles of Gondar, the Tiya Monolithic Stone Stelae, the Lower Awash Valley Paleontology, and The Omo Valley Paleontology and Prehistoric Sites. Other tourist destinations mainly include the wildlife centers along the Great Rift Valley and the South-West including the eastern historic area of the walled city of Harar. The present constraints to the growth of this sector can be largely identified as shortage of tourist facilities and limited tourism promotion.

Service sector

The service sector constitutes trade, hotels and restaurants, transport and communications, banking, insurance and real estate development, public administration

and defense, construction, education, health, and other services. The sector on average accounted for 42 percent of GDP for the period 1994/95 –2002/03. Within the service sector, the largest sub-sector is the distribution service, which comprises trade, hotels and restaurants, transport and communications.

In general, the overall sectoral decomposition of Real GDP: agriculture, industry and services, their changes over the pervious years and share of GDP are shown in Table 4 below.

Table 4: GDP by Industrial Origin, 1994/95-2002/03

Indicators	1994/95 Actual	1995/96 Actual	1996/97 Actual	1997/98 Actual	1998/99 Actual	1999/00 Estimate	2000/01 Estimate	2001/02 Estimate	2002/03 Estimate
Change over the previous year									
Real GDP	5.4	10.2	5.1	-1.4	6.0	5.3	7.7	1.6	-4.1
Agriculture	3.4	14.7	3.4	-11.2	3.8	2.2	11.5	-2.3	-12.9
Industry	8.1	1.6	6.7	2.4	8.6	1.8	5.0	5.8	4.9
Services	7.2	6.9	6.9	10.4	7.7	9.3	4.7	4.6	2.0
% GDP									
Agriculture	49.7	51.7	50.9	45.9	44.9	43.6	45.1	43.4	39.4
Industry	11.2	10.3	10.5	10.9	11.1	10.7	10.5	10.9	11.9
Services	39.1	38.0	38.6	43.3	43.9	45.7	44.4	45.7	48.6

Source:- Ministry of Finance and Economic Development

2.1.4 Environmental Overview

Natural Resource Depletion

Ethiopia is endowed with a variety of environmental and natural resources. The country has a total area of 111.5 ha out of which 74 million ha or 66% is potentially cultivable land. However, the actual size of land cultivated at present is estimated to be only 16.5 million or 14.8% of the total. Moreover, due to its topography and varied climatic conditions, Ethiopia is the home of various plant and animal species. There are about 7,000 different higher plant species out of which 12 percent are endemic. Ethiopia is a centre of origin for various crop species, e.g. Arabica coffee, teff, enset etc., and has unique and useful genetic diversity of other crop species, e.g. sorghum, barely, wheat,

horse beans, field peas, lentils and linseed. Out of the total known wildlife resources, 30 mammals (12%), 16 bird (2.5%), 3 reptile (3.9%), and 17 amphibian (31.5%) species are endemic to Ethiopia. There are 862 bird species recorded in Ethiopia among which 30.2% have been accorded international importance. Ethiopia has a livestock population which is the largest in Africa and the tenth largest in the world. Livestock in Ethiopia are the principal capital of the farmer (4.0 TLU per household). The resources are however affected by continuous malpractices and natural catastrophes. Natural causes of resource degradation have mainly stemmed from the recurrent drought and famine throughout much of the history of Ethiopia. This has led to enormous loss of assets on the part of small holder farmers and pastoralists which in turn has resulted in natural resources degradation and aggravation of poverty.

Unattended human activities prompted by the rapid growth of population and the consequent increase in the exploitation of natural resources is a major cause of natural resource depletion.

Land degradation is the biggest challenge of the country. The problem ranges from desertification or soil degradation, due to deforestation and soil erosion, to environmental pollution, ensuing from the unwise use of a wide variety of chemicals for agriculture, domestic purposes or for the manufacturing of industrial products with steadily growing devastating effects on the environment and public health.

In Ethiopia, up to 400 tons of fertile soil / hectare is lost annually from lands devoid of vegetative cover as well as from lands where no soil conservation has been carried out (EPA, State of Environment Report, 2003). The soil thus lost annually is from the farmlands, which makes up 13 % of the total area. Such kind of erosion is common at places where extensive farming activities are carried out. The amount of soil carrying nutrients and that is lost every year through the agency of erosion is estimated at 1.5 to 1.9 billion tons. The impact of soil erosion is considerable particularly in the highlands of the country. It has led to the loss of nutrient in agricultural farmlands which in turn become the reason for decreased agricultural outputs and hence to food insecurity. It is also the major reason to the damage of water bodies like lakes through siltation.

Industrial Environmental Problems

Ethiopia is not an industrialized country. The limited number of factories the country has is situated in and around the capital city by the Akaki river designed deliberately to let their emissions into it. Despite the fact that their number is few, their impact in terms of pollution is enormous, for these industries use old and outdated technology. Moreover, a great majority of these industries discharge their waste in the form of liquid, dust iparticles and smoke, without any treatment. Studies indicate that only a few of the industries located in Addis Ababa treat their wastes before final disposal. However the majority discharge their waste without any treatment into nearby water bodies and open spaces. This has exposed streams flowing across Addis Ababa into the Awash River to serious pollution and reportedly being the cause for ailments to the people and animals using the water.

Occupational health hazards in industries is also serious because of lack of adequate safety equipment and inadequate guidelines for appropriate use of safety equipment, weak inspection services and lack of occupational safety standards.

Table 5. Sampled Industries and Establishments with Treatment Plants

Factory/ Plant	Type of Pollutant			With Treatment Facilities
	Air	Soil	Water	
Leather and Leather Products	-	5	5	5
Chemical	1	5	7	-
Textile	2	4	7	3
Metal	2	4	7	1
Non Metal	2	-	-	-
Beverages	1	1	4	1
Food	1	2	3	-
Abattoirs	1	1	1	-
Hospital	-	1	1	1

Source: Factory Questionnaire Response, EPA, 2003

Environmental Problems Related to Biodiversity

Ethiopia's rich biodiversity is being affected by a number of factors. Among the causes contributing to biodiversity loss are included: the introduction of invasive alien species, settlement and investment activities that do not take into account environmental concerns; inappropriate use of natural resources resulting from the lack of land use policy and land use planning; the continuous increase in the amount of toxic waste and other pollutants; low awareness level of the public regarding the value of biodiversity; high degradation of forests, vegetative cover and water & soil resources; the impact of widespread poverty in the country and the recurring drought and desertification.

Water Resources

Ethiopia is often known for its vast water resources that could be applicable for various economic and social purposes. However, due to various reasons, including limited national capacity, the resource is not presently being used to the desired extent. Furthermore, the water resource and the related aquatic eco-systems are facing a great deal of pressure. Siltation as a result of poor farming practices, devegetation and erosion as well as chemical pollution from farms, industries, mining operations and urban sewers are the major problems affecting the resource.

Aquatic Resources

The major causes for the depletion of aquatic resources are [State of the Environment Report, 2003]:

- Failure to practice sustainable production methods;
- Using sub-standard fishing gear;
- Failure to select appropriate fishing spots;
- Lack of control and protection system;
- Siltation of water bodies due to inadequacy of soil and water conservation activities; and

- The difficulty of ensuring sustainable fishing practices in a situation where unlicensed fishermen far outnumber those licensed.

2.2 INSTITUTIONAL, POLICY AND REGULATORY FRAMEWORK IN ETHIOPIA

2.2.1 Environmental Policy, Sustainable Development Policy and General Legislative Framework

The Environmental Policy of Ethiopia

The Constitution of the Federal Democratic Republic of Ethiopia (1995) is the foundation of all policies and laws in the issue of environmental management and protection in Ethiopia. It has incorporated environmental rights as the fundamental privilege of all citizens. The right to sustainable development is also recognized as the development trend which the country is supposed to follow.

The Environmental Policy of Ethiopia is basically a document drawn out of the Conservation Strategy of Ethiopia. It was approved on April 1997 by the Council of Ministers as the overarching policy document of environmental management in the country. The policy sets an overall goal of improving and enhancing the health and quality of the life of the citizenry and the promotion of sustainable social and economic development "... through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs..." The Polluter pays principle is recognized as a key guiding principle under the policy. This is later to be a fundamental principle when the Environmental Pollution Control Proclamation was enacted in 2002.

The policy constitutes ten sectoral and ten cross-sectoral policy elements amongst which the Control of hazardous materials and pollution from industrial waste is included. The need to adhere to the precautionary principle is emphasized under this policy section. It is stipulated that the precautionary approach shall be employed with a view to minimizing

and preventing discharges of substances from industrial plants and personal or communal appliances, and to disallow the discharge when they are likely to be hazardous.

The other policies under this section include establishment of clear linkages between the control of pollution and other policy areas including water resources, agriculture, human settlements, health and disaster prevention and preparedness; provision of adequate regulation of agricultural (crop and livestock) chemicals; keeping registers of toxic, hazardous and radioactive substances, and to make the information available on request; maintaining regular environmental audits to ensure the adoption of environmentally sound practices in all public and private development activities including industrial and mining operations.

Sustainable Development Policy

The Sustainable Development and Poverty Reduction Strategy Program [SDPRP], issued on July 2002 recognizes the importance of environmental protection as a prerequisite for any development activity in the country. Environmental protection is however treated under the document as one of the cross cutting issues with little emphasis on its core concepts.

There is currently a move on the part of the government to amend this programme with what is known as the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) in an effort to link the prevalent poverty with environmental concerns.

Plan for Accelerated and Sustainable Development to End Poverty

The major aim of the PASDEP is the realization of the Millennium Development Goals within the Ethiopian context, which in effect calls for integrating environmental goals with in the development agenda.

The PASDEP within its elaborate environmental component has encompassed the Environmentally Sound Development vision of the country. The vision is to bring about a self-reliant Ethiopian population with a high quality of life in a productive environment,

which assures equity between genders and among generations. The strategic goals sought to achieve this vision are, among other things:

- Ensure community-led environmental protection and the sustainable use of environmental resources,
- Remove the adverse impacts of municipal waste;
- Prevent environmental pollution;
- Ensure proactively the integration of environmental and ethical dictates especially mainstreaming gender equity in development.

General Legislative Framework on Environment

Environmental Protection Organs Establishment Proclamation

This was a proclamation that entered into force on 31st of October 2002 in an initiative to revise the existing structure of environmental protection and to redefine the responsibilities of environmental actors. The main objective of this Proclamation is ascribing responsibilities to separate organizations for environmental development and protection, regulation and monitoring, avoiding possible conflicts of interests and duplication of efforts. The proclamation fosters the idea of differentiated but yet coordinated responsibilities between and among environmental agencies both at federal and regional levels. The Environmental Protection Authority reestablished by this law is accountable to the Prime Minister. In addition it provides for the establishment of the Environmental Council which is endowed with the task of, among other things, reviewing proposed environmental policies, strategies, and laws, and issuing of recommendations to the government.

The proclamation envisages the establishment of environmental units within each sectoral institution with the responsibility to ensure that the activity of the particular organization is being carried out in a manner which is compatible with the environmental law and standards. The Ministry of Water Resources, Ethiopian Road Authority and Ethiopian Electric and Power Corporation have, following this obligation, established their respective Environmental Units. The proclamation also calls for the establishment of environmental organs, within the regions, vested with extensive mandates that enables

the coordination of environmental activities, avoids duplication and improves the dissemination of environmental information. In compliance to this, all regional states have already established environmental agencies or have assigned environmental responsibilities to existing agencies.

Environmental Pollution Control Proclamation

This Proclamation came into force on the 3rd of December 2002 with an objective of realizing the effective implementation of environmental objectives and goals enshrined within the Environmental Policy. The Proclamation recognized that some of the social and economic development endeavours in the country may be capable of causing environmental impacts that might be detrimental to the ensuing developmental activities of the nation. It has thus emphasized the need to prevent when possible or minimize pollution resulting from economic development through appropriate measures.

A specific obligation of safety in handling, importation and use of chemicals is amongst the key concerns of the proclamation. It, however, does not address the issue of POPs separately, and in a manner recognizing their distinct features.

The Proclamation also focuses on issues such as household pollution control, management of hazardous wastes, and radioactive substances etc. The government is duty bound to formulate practicable environmental standards based on scientific and environmental principles. In line with this a number of standards including ambient air and water quality standards have been drafted through the Environmental Protection Authority, currently awaiting the approval of the Environmental Council. The institutionalization of environmental inspectors vested with wider mandates is also another important feature of this law. These people are expected to check and monitor compliance of establishments with the set standards.

Environmental Impact Assessment Proclamation

Environmental Impact Assessment is recognized under Proclamation 299/2002 as a proactive tool meant to bring about thoughtful development by predicting and mitigating

the adverse environmental impacts that a proposed development activity is likely to cause as a result of its design, location, construction, operation, modification and cessation. This law came into force as of the 3rd day of 2002 with a view to ensuring that assessment and consideration of the environmental impacts of projects and public documents are made prior to their approval, providing effective means of harmonizing and integrating environmental, economic, social and cultural considerations and aspirations into the decision-making process in a manner that promotes sustainable development. The law has put in place the procedures to be followed in order to go through the impact assessment requirements.

Pesticides Registration and Control Council of State Special Decree No. 20/1990

The decree was promulgated on the 1st of September 1990 as Council of State Special Decree No.20/1990. It establishes that:

- The manufacture, import, sale or use of an unregistered pesticide is prohibited;
- A pesticide, which is not duly packed or labeled, cannot be imported, stored, transported or offered for sale;
- A package shall be designed and made in such a way that it contains the pesticide safely during transportation, storage, marketing, distribution and use including reuse where applicable;
- Accidents in connection with the transportation, storage, marketing, use or treatment otherwise of pesticides shall forthwith be reported;
- Directives shall determine the storage and manner of disposal of pesticides and their packages; and
- Contravention of the decree as enumerated shall be met with the cancellation of registration while other violations shall be punished according to the Penal Code.

2.2.2 Roles and Responsibilities of Relevant Governmental Institutions

Certain line ministries and agencies have responsibilities, in one way or another, to manage chemicals or address their impacts on health and the environment in Ethiopia. The main agencies with respect to the POPs issues are outlined hereunder.

The Ministry of Health

This Ministry is vested with the power of registering and controlling the administration of pharmaceuticals, medical appliances, and pesticides for public health in the country. It also rules over the issue of disease vector control like malaria and other vector borne diseases.

The Ministry of Justice

The Ministry represents the Federal Government in criminal cases falling under the jurisdiction of the Federal Courts including offences committed against legal instruments on chemical management

The Federal Police

This entity directs and supervises actions designed to control illicit traffic in drugs.

The Ministry of Foreign Affairs

In consultation with the concerned organs, the Ministry is responsible to negotiate and sign treaties and agreements Ethiopia enters into with other states and international organizations which are approved by the Government. It undertakes all formalities of ratification of treaties and agreements including agreements on various classes of chemicals. It also co-ordinates all relations of other government organs with foreign states and international organizations; and ensures that good relations with neighboring countries are strengthened including environmental protection and chemicals management.

The Ministry of Transport and Communications

The Ministry, among other tasks,

- Prepares draft laws concerning the regulation of transport such as the transportation of hazardous chemicals;

- Prepares and submits and, upon approval, implements standards relating to the smoke, gas, vapour and the like emitted from the exhaust pipes of vehicles with a view to preventing pollution; and
- Supervises the use of waterways.

The Ministry of Labour and Social Affairs

This Ministry is mandated to:

- determine standards and measures for the safety and health of workers;
- supervise and ensure that where undertakings are constructed, expanded, renovated or their appliances installed, they are not dangerous to the safety and health of workers;
- prepare a list of occupational diseases and schedules or degrees of disablement; and
- classify dangerous trades or undertakings.

The Ministry of Agriculture and Rural Development

This Ministry:

- Registers and Controls pesticides in use in the country;
- Controls migratory pests;
- Gives a competence assurance certificate to any person who wants to engage in fertilizer business after making sure that enabling conditions are satisfied;
- Makes sure that any fertilizer locally manufactured or imported and stocked and ready for distribution and sale conforms to the requirements of Ethiopian Standard and is registered for use in the country as fertilizer; and ensures that the disposal of any adulterated fertilizer is done according to the agency's directives.

The Ministry of Trade and Industry

- Conducts studies that help to control unfair trade practices on chemicals and follows up their implementation; and
- Implements the Chemicals Weapons Convention.

The Ministry of Water Resources

The Ministry is, among other things, expected to prepare draft laws concerning the protection and utilization of water resources; and prescribe the quality standard for waters to be used for various purposes.

The Environmental Protection Authority

The Authority is obliged, among other things, to:

- Prepare environmental protection policies, strategies and laws and, upon approval, follows up their implementation;
- establish a system for environmental impact assessment of public and private projects, as well as social and economic development policies, strategies, laws, and programmes;
- prepare standards that help in the protection of soil, water and air as well as the biological systems they support and follow up their implementation; and
- follow up the implementation of international treaties on environmental protection to which the country is a party.

The Security, Immigration and Refugee Affairs Authority

- Issues license for the possession or use of arms, firearms and explosives;
- Prescribes conditions under which explosives may be sold; and,
- Issues permits to persons who deal with explosives and to persons who repair arms and firearms.

The Ethiopian Science and Technology Agency

- Develops the capability and establish the system for searching, selecting, negotiating, procuring and importing technologies that are appropriate to the Ethiopian socio-economic conditions;
- Encourages and ensures the application of studies, research and development activities that are carried out to improve and develop indigenous technologies; and ;

- Initiates a patent law that encourages and supports technology transfer, enhances the practical application of inventions and encourages the development of inventions and innovations.

Ethiopian Health and Nutrition Research Institute

- Conducts research on traditional medicine, modern drugs and improvement of health;
- Carries out research in matters relating to food and nutrition; and
- Offers chemical, microbiological and medico-legal analysis of samples governing public health, criminal and, at times, environmental investigations.

Quality and Standards Authority of Ethiopia

- Provides standards of quality of products including chemicals (e.g. fertilizers, soaps and detergents); and
- Enforces these standards and works to strengthen the voluntary adherence to ISO 14000.

Drug Administration and Control Authority

The Authority, which is accountable to the Ministry of Health, is mandated to register and control drugs that are put into use in the country.

Ethiopian Customs Authority

This is an institution duty bound by law to check out and control all merchandise, including chemicals, imported into the country.

2.2.3 Relevant International Commitments

Ethiopia is party to most of the chemical related multilateral environmental agreements. However most of the obligations embedded under the conventions need national implementation. The apparent problem faced with domestication of these conventions is

mainly related to the limited capacity in the field of chemicals management, meagre resources for national implementation and lack of a clear national goal to list out priorities. The relevant chemical conventions related to POPs are outlined under table 6 together with the dates of adoption in Ethiopia.

Table 6: POPs related Conventions and Instruments of Adoption in Ethiopia

No	POPs Related Conventions	Ethiopia's ratification/accession/acceptante etc.
1	Stockholm Convention on Persistent Organic Pollutants	Signed - (17 May 2002) Ratified - (2 July 2002) Proc.No.279/2002
2	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Ratified - 2 July 2002 (Proc.No.278/2002)
3	Basel Convention on the Trans-boundary Movement of Hazardous Wastes and their Disposal	12/04/2000 (Proc.# 192/2000)
4	Basel Ban Amendment	08/10/2003
5	Protocol on Liability and Compensation for Damage Resulting from the Trans-boundary Movements of Hazardous Wastes and their Disposal	08/10/2003
6	Bamako Convention on the Ban of the Import into Africa and the Control of Trans-boundary Movement and Management of Hazardous Wastes with in Africa	Acceded - 2002 (Proc.No.355/2002)

2.2.4 Existing Legislation and Regulations Addressing POPs

There is no legislation, which is directly and wholly devoted to the management of POPs chemicals. However, there are several legislations, which are applicable to POPs in one-

way or another. Environmental Pollution Control Proclamation No. 300/2002 and Pesticide Registration and Control Council of State Special Decree No. 20/1990 are among the most important legislations for regulating POPs chemicals in Ethiopia. However, analysis of the relevant legislations and their enforcement indicates that the legal system that relates to the management and use of chemicals in general and POPs in particular in Ethiopia is far from well developed. Lack of comprehensive approach and coverage is one of the major shortcomings of the legal framework. The other major gap and limitation in the area is lack of legislations and standards in the following areas:

- Lack of rules that expressly ban the production, import and use of POPs pesticides
- Lack of legislation that directly and comprehensively regulate industrial chemicals, including PCBs;
- Lack of proper regulatory mechanism for the use of DDT;
- Lack of enabling legislations and standards to regulate releases of unintentionally produced POPs from different source categories;
- Lack of proper regulatory mechanism on the management of POPs stockpiles and wastes;
- Lack of proper regulatory framework on information gathering and exchange;
- Lack of regulatory framework on public awareness and participation.

2.2.5 Key Approaches and Procedures for POPs Chemicals and Pesticides Management

Perhaps the most strictly enforced legislation we have is the Explosive Proclamation of 1942. This Proclamation, however, did not provide for a public body to be responsible for its implementation and such essentials as the system of inspection to be put in place for the service of adequate enforcement. This apparent flaw, however, is overcome by another legislation, Proclamation 6/1995, which bestows upon the Security, Immigration and Refugee Affairs Authority the responsibility of implementation. The Authority, by means of directives, has instituted an elaborate system of controls complete with the necessary manpower (including inspectors) and procedures. The latter requires, among others:

- Permits from the relevant government body establishing the need for the explosive in question;
- The contract document of the work requiring the use of the explosive;
- Certificate of competence of the expert that is to handle the explosive;
- The availability of an adequately guarded and constructed explosive magazine; and
- Others, concerning the type, quantity and make of the explosive(s), route of transport and port of arrival in Ethiopia, and schedule of consumption.

The Pharmacy Regulation of 1964, the Pesticide Registration and Control Council of State Special Decree No. 20/1990, the Radiation Protection Proclamation No. 79/1993 and the Fertilizer Manufacturing and Trade Proclamation No. 137/1998 each, in its own peculiar fashion, provides for the requirements of its respective implementing body to be met by users, the various procedures to be resorted to, a system of inspection, and punitive measures (fines and/or imprisonment). The legislative adequacy that is more or less discerned here is, however, compromised when it comes to enforcement. This is attributed to the lack of sufficient resources manifested in the shortage of manpower and facilities, and financial constraints. A good example, in this regard, is the accumulation of some 1500 tons of obsolete pesticide over a period of 40 years. The same goes for the other legal instruments partially or indirectly dealing with chemicals. Proclamation No. 42/1995, the Labor Law, is a case in point. In spite of being a fairly good law, the state of occupational safety and health in the country is very weak, ensuing from lack of enforcement due to weak or inadequate commitment expressed, *inter alia*, by an inadequate budget. This law has been amended twice, the latest of which is awaiting publication on the Federal Negarit Gazeta for application.

2.3 ASSESSMENT OF POPS ISSUE IN ETHIOPIA

As was mentioned in the previous section, one of the objectives of the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) is the integration of environmental goals with the development agenda that Ethiopia is undertaking. The PASDEP within its elaborate environmental component has encompassed the

Environmentally Sound Development vision of the country. The vision is to bring about a self-reliant Ethiopian population with a high quality of life in a productive environment, which assures equity between genders and among generations. Some of the major POPs issues to be addressed under the NIP and the elaborated action plans are also aimed at meeting the basic objective that are contained in the PASDEP as well as to meet the sustainable development objectives of the country.

With respect to Annex A POPs pesticides, the main issue relates to the existence of huge amounts of stockpiles, wastes and contaminated sites. Such stockpiles, wastes and contaminated sites, if left unmanaged, entail adverse socio-economic and environmental impacts. According to the study on human health and environmental effects of POPs chemicals conducted during the POPs inventory phase, cases of death, abortion, infertility, nervous system disorders, kidney, respiratory and chronic skin problems, which are most likely related to exposure to POPs, have been observed among most of the pesticides sprayers and storekeepers visited. Communities living around some of pesticide stores have also reported health problems like headache, asthma, nausea sinusitis, etc. The health effects of POPs pesticides are not limited to the areas where the chemicals are used or stored, since exposure to the chemicals may result from contaminated water, air or food. These in turn lead to expenses for medical treatment and loss of productivity due to poor health. The social effects resulting from the health impacts of POPs pesticides also include putting an additional burden on the already weak health services of the country and affecting the living conditions of children and other family members of persons whose health is affected by exposure to POPs pesticides. It is therefore imperative to dispose of Annex A POPs pesticides in an environmentally sound manner to mitigate the adverse socio-economic impacts of Annex A POPs pesticides and improve the living standards of the Ethiopian population.

There is a significant environmental pollution from DDT, since even in strictly indoor spraying the chemical eventually reaches out to the environment. Some studies have shown that up to 80% of indoor-sprayed DDT leaks out into the environment within a

few months. When releases from illegal use for agriculture and from stockpiles and wastes are considered, DDT release to the environment is expected to be very significant. There are some indicative evidences that the significant release of DDT to the environment is adversely affecting human health and the environment with significant social and economic adverse consequences. The study on human health and environmental effects of POPs chemicals conducted during the POPs inventory phase has identified probable cases of health problems among DDT storekeepers and sprayers as well as communities residing in nearby stores. According to a study, mothers in Addis Ababa have significant residue level of DDT in their breast milk. These adverse health and environmental impacts of DDT have produced social and economic consequences like increased expenses for medical treatment, decreased income due to loss of productive work force and increased burden on the health service. The environmental impacts have also the potential to affect the tourism industry and the export market. Thus, replacing DDT for controlling malaria by considering other chemical and non-chemical option, disposing obsolete DDT in environmentally sound manner and ensuring the restricted use of DDT for vector disease control pending its replacement are the major issues requiring action. Accordingly, the environmental and sustainable development goals of PASDEP will thus be met through these actions.

The preliminary inventory on POPs identified 2505 PCB containing electrical transformers, out of which about 2415 are currently in use. No assessment has been carried out on the health and environmental impacts of the use of PCBs in the studies conducted during the inventory phase or by any other study. Therefore, it is difficult to analyze the social and economic effects of the use of PCBs in Ethiopia. The inventory on PCB found out that EEPCO technicians do not take any precaution during repair work on power transformers due to absence of awareness on the impacts of PCBs on human health. The inventory suggested the existence of a high possibility of dermal contact to PCBs and of inhaling PCB vapors. Due to poor management and handling of decommissioned transformers and capacitors, and long years of open storage, the land in the vicinity of the store and the nearby stream are believed to be contaminated by PCBs that have spilled over or from discarded dielectric fluids. In general, considering the high

toxicity of the chemical and the existence of significant releases in the country from PCBs in use as well as in stockpiles and wastes, it can be assumed that the chemical is resulting in health and environmental problems with various social and economic consequences. Accordingly, the main measure that Ethiopia should take with regard to PCBs is their replacement and disposal of stockpiles and wastes through a phase-by-phase approach taking into account the huge cost that this requires as well as the various social and economic effects that may result due to power interruptions during the substitution phase.

The assessment on the health and environmental impacts of POPs chemicals conducted during the inventory phase has scant information regarding impacts of dioxin and furans releases. No other studies in the area could also be found. It is observed that respiratory and cardiovascular disorders are prevalent among the residents of Metehara and Wonji, which could be related to exposure to dioxin. This case could be indicative of the health and environmental impacts of dioxins and furans with the resulting social and economic consequences related to medical expenses, loss of productivity, etc.

The major sources of PCCD/F emission in Ethiopia is uncontrolled domestic waste burning, forest and accidental fires in houses, factories, vehicles and commercial enterprises. Management options for reducing and ultimately eliminating the release of PCCD/F are the promotion of Best Available Technology (BAT) and Best Environmental Practices (BEP) in activities and processes that release PCCD/F. The best environmental practices for waste incineration include well-maintained facilities, well-trained operators, a well-informed public and constant attention to the process to minimize PCDD/F release. With regard to medical waste, retrofitting old plants is one key option to consider in medical waste management. Choice of such option, however, requires consideration of the cost of doing so. The other option is to shut down existing inappropriate plants. This can only be considered if alternative techniques are introduced simultaneously. Ideally open burning should be banned. Efforts should be intensified to reduce open burning such as reuse, recycling, composting, modern sanitary land filling and incineration using best available techniques.

2.3.1 Assessment with Respect to Annex A, Part I Chemicals (POPs Pesticides)

Ethiopia has not produced or exported Annex A POPs pesticides to date. However, Annex A POPs pesticides have been imported and used in the country in the past as evidenced by a significant amount of such pesticides found as stockpiles and wastes (obsolete pesticides) together with other pesticides in some parts of Ethiopia during the inventory phase of the NIP preparation. Since the inventory did not cover all stockpiles of pesticides in the country, the findings in the inventory should be considered preliminary and further inventory is required to come up with exhaustive and accurate information on the amount of stockpiles and wastes of Annex A POPs pesticides found in the country. It is to be noted here that there has been no available information of Annex A POPs pesticides from Addis Ababa during the preliminary inventory because the current inventory in Addis Ababa focuses on pesticides in general and not distinctly on Annex A POPs pesticides.

According to the inventory results, four types of obsolete Annex A POPs pesticides were found, namely, Aldrin, Dieldrin, Heptachlor and Chlordane. Types and quantity of Annex A POPs pesticides found in the inventory phase in different regions of Ethiopia is shown in Table 7 below.

Table 7: Types of Annex A POPs Pesticides and Quantity by Region (Kg/Lt)

Region	Aldrin	Dieldrin	Heptachlor	Chlordane	Total Obsolete Annex A pesticides
Oromia	1057.33	2217	485	172	3,931.33
SNNP	462.75	NA	8	50	520.75
Gambella	NA	NA	NA	NA	NA
Somali	NA	NA	NA	NA	NA
Benishangul Gumuz	NA	NA	NA	NA	NA
Harari	NA	NA	NA	NA	NA
Dire Dawa Administration	NA	NA	NA	NA	NA
Afar	NA	NA	6410	NA	6410
Amhara	589	540	140	2369	3638
Tigray	50	65	NA	NA	115
Total	2159	2822	7043	2591	14615.08

Source: A Report on POPs and Other Pesticides Inventory in Ethiopia, March 2005 (NB: NA is for data not available)

No reliable data or record of past imports and use of Annex A POPs pesticides exists in the country and it is difficult, therefore, to determine the extent of their use in the past. Moreover, there has been no monitoring or risk assessment made of such POPs chemicals to determine their human health and environmental impacts in the country. The Ethiopian Customs Authority has taken the task of recording imports since the year 2000. However, the records show register of chemicals by groups as insecticides, fungicides or herbicides and do not show the type of chemicals imported. Thus, these do not help to understand what particular POPs have been imported, if any or what particular hazardous chemical has been introduced in the country.

It is worth mentioning here that no Annex A POPs pesticides are at present legally imported, produced and used in the country. The Pesticide Registration and Control Council of State Special Decree issued in 1990, requires registration by the Ministry of Agriculture for pesticides used in the country. The Ministry of Agriculture has registered none of the Annex A POPs pesticides since then. Thus, the import or use of Annex A POPs pesticides may be considered to have been prohibited by administrative action since the issuance of the decree although no legislation has been put in place to specifically ban them yet.

The main concern with regard to Annex A POPs pesticides in Ethiopia is, therefore, that of managing and disposing of existing stockpiles and wastes in a safe and environmentally sound manner and monitoring their impacts on human health and the environment.

2.3.2 Assessment with Respect to Annex A, Part II Chemicals (PCBs)

The National Inventory on PCB releases carried out for the year 2003, covered PCB containing electrical equipment operational within the Ethiopian Electric Power Corporation (EEPCCO). The electrical equipment assessed in the inventory is power capacitors and transformers. Accordingly, the number of PCB- containing transformers

and capacitors within the operational premise of EEPCO are 2505 and 40, respectively. Corresponding quantities of PCB containing dielectric fluids are in the order of 1,181,667 kgs and 1255kgs for transformers and capacitors respectively. The highest number of PCB containing transformers is found in the central Region of EEPCO (i.e. 674 units), followed by 309 transformers in the Western Region. These transformers are those imported until 1989 G.C where some are currently in use, few are stand-by; still few are kept in workshops for maintenance, and the remaining are said to have transcended their useful lives and hence discarded.

Gofa main store of EEPCO located in Addis Ababa is the largest store of decommissioned transformers and capacitors. A total of 90 transformers manufactured from 1957-1987 G.C are open stored and are exposed to rain and sunlight. The dielectric fluid, contained in these transformers, is estimated at 14054 kgs. The inventory indicates that there are few capacitors stored together with transformers. Moreover, dielectric fluids in stores to be used for top-up and replacement purposes are estimated to be 4776 kgs.

Gofa main store has a dimension of about 50 meters by 60 meters, and is identified as one of the hotspots in the national inventory. Due to poor management and handling of decommissioned transformers and capacitors, and long years of open storage, the land in the vicinity of the main store and the nearby stream are believed to be contaminated by PCBs that have spilled over or discarded dielectric fluids. Due to poor fencing of the store, the area is easily accessible to dogs, cattle and even human beings.

Power transformers are maintained at Mexico square and Kotebe maintenance centers. Due to absence of awareness on impacts of PCBs on human health, EEPCO technicians do not take any precaution during repair work. There is, therefore, a high possibility of dermal contact to PCBs and of inhaling PCB vapors. PCB containing dielectric fluids are stored in concrete pits located at the two repair and maintenance workshops of the corporation.

The national inventory on PCB releases was, however, not able to determine the exact quantity of PCB containing electrical equipment within the EEPCO system. This is due to the absence of any data (either on the name plate or on equipment manual) on the amount of dielectric fluids in each PCB- concentration range. It is therefore recommended that, in order to determine PCB concentrations, tests such as density test and chlorine presence test have to be conducted by taking oil samples from PCB- containing electrical equipment. This calls for establishing local oil testing capacity by installing a laboratory equipped with testing devices, chemicals and required expertise. Moreover, in order to strengthen the national coverage of the inventory on PCB releases, further data collection within the EEPCo system, and assessment of the industrial enterprise and commercial facilities need to be worked out.

Table 8: Inventory of PCB Containing Electrical Equipment and Quantities of Dielectric Fluids (imported until 1989 G.C)

No.	Power Plant/Region/District	No. of Transformers	No. of Capacitors	Dielectric fluid (kgs)	
				In Transformers	In Capacitors
1	Awassa District	148	-	7992	-
2	Southern District (Addis Ababa)	237	-	62789	-
3	EEPCO Auxiliary service at kotebe (A.A)	96	-	20572	-
4	Melka wakena Hydro power plant	27	-	114055	-
5	Awash II & III hydro power plant	9	-	63630	-
6	Koka (Awash) hydro power plant	96	20	86900	1000
7	Finchaa hydro power plant	42	13	100,298	255
8	Eastern Region – (Dire Dawa)	109			
9	North western Region (Bahir Dar)	31	-	248,280	-
10	Jimma Region	188	-	30130	-
11	Western Region operation	309	-	128096	-
12	Addis Ababa Region – Eastern District	128	-	28139	-
13	Addis Ababa Region – Western District	150	-	31002	-
14	Akaki District	108	-	27053	-
15	Addis Ababa – Northern District	154	-	30742	-
16	Central Region	674	-	152050	-
17	Addis Ababa – Gofa Main store	90	7	18830	Not given
18	Northern Region (Mekelle)	57	--	31109	
	TOTAL	2505	40	1,181,667	1255

2.3.3 Assessment with respect to Annex B chemicals - DDT

DDT is currently used, produced and imported in Ethiopia for the purpose of disease vector control (malaria). There is no information on export of DDT. The production and use of DDT for disease vector control is accepted under the Stockholm Convention with the proviso that parties to the convention are encouraged to reduce and ultimately eliminate the use of DDT through the development of an action plan as part of the NIP.

According to the inventory conducted on POPs pesticides and other pesticides, both active and obsolete DDT were found in stores/sites in different parts of Ethiopia to the tune of 160, 573 Kg/Lt and 55, 720 Kg/Lt respectively. It should be mentioned, that the inventory is preliminary and does not cover all pesticide stockpiles and wastes found in Ethiopia including DDT.

As mentioned earlier on with respect to Annex A POPs pesticides, there are no reliable records of past imports of DDT. According to the data obtained from the Nazareth Customs Office in the inventory phase, the Adami Tulu Pesticides Processing Share Company has been importing technical grade DDT since 2001 for formulation and production. The sole buyer of DDT is the Ministry of Health for malaria control purposes.

The main concern with DDT in Ethiopia is related to ensuring and monitoring that the production and use of DDT is restricted to disease vector control in Ethiopia in accordance with the WHO guidelines and recommendations and to devise action plans and strategies for safe, effective and affordable alternatives to use DDT for disease vector control.

The inventory indicates that the storage, use and handling of DDT is far from desirable and that there may be a high risk of impact on human health and the environment. Moreover, there may also be cases of illegal use of DDT for agricultural pest control. It is therefore recommended that adequate storage and awareness raising and capacity

building in the safe management, use and handling of DDT for indoor residual spraying is required. The inventory also recommends that adequate support and focus should be made on research and development for alternatives to DDT and other POPs in the future. Obsolete POPs including DDT should also be cleaned up and disposed of as an immediate measure in accordance with the provisions of the Stockholm Convention.

2.3.4 Assessment of releases from unintentional production of Annex C Chemicals (PCDD/PCDF, HCB and PCBs)

The national inventory on PCDD/PCDF release for the year 2003 has been carried out. The inventory covered ten main categories taking into account the five release vectors, namely air, water, land, residue and products. The result of the inventory indicates that “uncontrolled combustion process” is the major contributor to PCDD/PCDF emissions amounting to 92 gm TEQ/annum followed by “Waste Incineration” releasing an annual emission of about 56 gm TEQ/annum. The annual release figure corresponding to “waste incineration” is mainly accounted for by uncontrolled batch combustion without employing automatic pollution control system (APCS), of medical/hospital waste, which is comprised of open burning of solid waste generated from hospitals, health centers, clinics, drug stores, and burning of expired medicines.

The national assessment on ferrous and non – ferrous metal production (main category 2) has identified iron and steel plants that utilize as inputs materials like billets, scraps, lime additives and auxiliaries. Accordingly, the iron and steel production sector of the country produces spare parts for industries, hand tools, farm implements and construction materials. Electric Arc Furnaces (EAF) for direct melting of scraps are employed in some of the iron and steel plants, while others utilize heavy fuel oil to operate furnaces. The iron and steel plants assessed in the study do not employ pollution control equipment such as fabric filters. They are found to be causes of PCDD/PCDF emissions. Gases emitted from such furnaces are difficult to capture. Emissions seem to increase greatly by poor quality mixed scrap feeds, particularly when dirty scraps containing cutting oils, plastic and other external materials are found attached to metal scraps. Some foundries

assessed during the study are operated with induction furnaces attached with fabric filters.

The national assessment on power generation and heating (main category 3) has examined the major subcategories that are believed to be potential contributors to furan/dioxin emissions. Heavy and light fuel oil boilers operational in industries and commercial establishments are thoroughly studied. The case of virgin wood/ biomass fired stoves at rural and urban areas of the country is also considered. Moreover, household heating and cooking with fossil fuels (charcoal, kerosene and LPG) has been part of the study. PCDD/PCDF emissions generated by all relevant subcategories in main category 3 have been determined. The total PCDD/PCDF emission to air due to power generation and heating is 11.202 gm TEQ/a, of which 10.84 gm TEQ/a is accounted for household heating and cooking with biomass.

Mineral products (main category 4) like cement, lime, bricks, glass and ceramics are produced in the country at varying rates. Automatic pollution control systems like Electro-Static Precipitators (ESP) are properly utilized in cement production. Glass production is also equipped with dust bag filters. The ceramics plant uses mixing plant with fabric filters. However, brick production does not at all employ dust control equipment.

According to the National Inventory on PCDD/PCDF for the year 2003, dioxin/furan emissions from uncontrolled combustion processes (category 6) is mainly contributed by uncontrolled domestic waste burning which is composed of solid waste generated and burnt in twelve towns of the country and solid waste generated and burnt in industrial enterprises of Ethiopia.

Open biomass burning (i.e. forest and grassland fire) releases PCDD/PCDF into air and land amounting to 7.44 gm TEQ/a and 5.92 gm TEQ/a, respectively. Uncontrolled domestic waste burning is a major contributor to PCDD/PCDF emissions into air, amounting to 77.32 gm TEQ/a. Statistics on accidental fires in domestic, commercial and

industrial buildings, and in vehicles are thoroughly examined in the study, and corresponding PCDD/PCDF emissions have been determined.

Other sources of PCDD/PCDF emissions into the environment considered in the National Inventory, and incorporated in category 6, are open burning of biomass during Ethiopian holidays, fires in houses, factories, vehicles and commercial enterprises. Contribution of each of the nine categories to national PCDD/PCDF emissions is indicated in the Table below.

Table 9: PCDD/PCDF Release Inventory for Ethiopia (2003)

No	Source categories	Annual Release (gm TEQ/a)					Total
		Air	Water	Land	Product	Residue	
1	Waste Incineration	56.172					56.172
2	Ferrous and Non-ferrous Metal Production	0.05					0.05
3	Power Generation & Heating	11.202					11.202
4	Production of Mineral products	0.1346					0.1386
5	Transport	0.0782					0.0782
6	Uncontrolled combustion processes	86.01		5.954			91.964
7	Production of chemicals and consumer Goods	0.024			28.0		28.024
8	Miscellaneous	0.0447	-	-	-	-	0.0447
9	Disposal/ Land fill		3.843		1.553	21.5	27.00
	TOTAL	153.70	3.843	5.954	29.553	21.5	214.70

2.3.5 Information on the state of knowledge on stockpiles, contaminated sites and wastes, identification, likely numbers, relevant regulations, guidance, remediation measures and data on releases from sites

According to a preliminary inventory and assessment undertaken with regard to POPs contaminated sites, stockpiles and wastes, a total of 220 contaminated stores/sites were identified in all the 11 regional states including the autonomous administrations of Addis Ababa and Dire Dawa.(Contaminated Sites Survey Team Final Report, April 2005) These contaminated sites consist of 23 burial sites, 137 contaminated stores where contaminants are contained within stores, 41 stores already contaminated with spilled out chemicals, 19 open fields contaminated due to poor storage and/ or handling of chemicals. The types of contaminants have been identified during the preliminary

inventory and accordingly 44 contaminants are POPs and non-POPs chemicals (mixed), 79 are POPs only, 80 are non-POPs chemicals and 21 are of unknown chemical identity.

Table10: Identified Contamination Sites in each region

Regional Administrations	No. of Identified Contaminated Sites
Addis Ababa	7
Afar	7
Amhara	36
Benishangul Gumuz	4
Dire Dawa	6
Gambella	3
Harari	2
Oromia	102
SNNPR	41
Tigray	12
Total	220

Source: Contaminated Sites Survey, 2004

During the national inventory, it has been found necessary to classify the contaminants. The main factor employed for the classification were such parameters as the distance of water resources and streams from contaminated sites, degree and extent of contamination and observed effects on the health and environment. The contaminants were classified as “highly severe”, “severe”, “moderate” and “low”. But it should be noted that such rankings made to the contaminated sites did not follow any international standard and hence calls for its revision according to acceptable standards of tolerable contamination hazard, pollution etc. Following this mode of classification, however, 64 sites/ stores were observed to be “highly severe”, 61 to be “severe”, 35 to be “moderate”, and 60 to be “low” in the level of contamination. Fifty three of the highly severely contaminated sites have been recommended for priority action and clean up in the first five years. These sites are mainly burial sites and open dumping fields. Eighty four sites drawn from the severe, moderate, and low categories have been recommended for clean up in the second

five years. Another group of 77 sites have been considered for clean up in the third five years quarter of action.

With regard to stockpiles of obsolete pesticides and contaminated sites, an FAO project task force was established with Swedish support upon the request of the Ethiopian Government in 1997 in order to evaluate the scale of the problem of obsolete pesticides in the country. In 1998, a mission composed of a multi-disciplinary group of experts was fielded to verify the inventory of obsolete pesticides conducted by the Ministry of Agriculture and to assess the suitability and acceptability of options for their complete and environmentally sound disposal.

The use of cement kilns was considered as a first option for the destruction of obsolete pesticides but was found to be technically not feasible. It was therefore considered that the sole disposal option would be through High Temperature Incineration (HTI) at a licensed hazardous waste incineration facility which is found only in developed countries. To this effect, the FAO mission prepared a project document which made an initial estimate of 1500 tonnes of obsolete pesticides, areas of heavily contaminated soil and unspecified numbers of pesticide contaminated containers and equipment such as sprayers in over 450 sites. The cost of disposal was estimated at USD 4.5 million.

After some delays due to lack of funds, project operations started in April 2000 under the supervision of a full-time project coordinator. During the first 18 months of project operations the following main activities were undertaken:

- Meeting held with representatives of donors, concerned ministries, NGOs and IGOs to discuss project goals and to secure the necessary pledges for financial and political support.
- Setting project objectives in consultation with counterparts from the Ministry of Agriculture (MoA) and senior Ministry personnel.
- Designing a realistic project plan in consultation with the MoA and other parties.
- 5 day training of 40 selected federal and regional MoA personnel on inventory taking.

- Establishing a National Project Coordination Committee representing all project stakeholders.
- Completion of a nation-wide re-inventory exercise. The inventory identified over 940 sites and more than 2,800 tonnes of obsolete pesticide stocks. In addition, it specified the amount of heavily contaminated soils at 100 tonnes and empty drums and contaminated spray equipment at 350 tonnes.
- Review of the local formulation plant to assess the capacity to reformulate products found in Ethiopia.
- Commissioning of existing laboratory equipment and training of MoA personnel in the use of the equipment.
- Sampling of obsolete stocks to determine the amount of material which could be reformulated or given an extension to the manufacturers two-year shelf life.
- Review of current IPM initiatives in Ethiopia and the sponsorship of a first national IPM workshop.
- Review of existing Pesticide Registration initiatives which revealed that Ethiopia a robust registration procedures.
- Review of existing Donor programs for agricultural inputs including pesticides.

Subsequent to the above activities, the FAO opened an international tender for bids for the disposal of obsolete pesticides and the clean-up of contaminated sites. Accordingly, the first batch of 1500 tonnes of obsolete pesticides was shipped to Finland for environmental disposal.

The second phase of the actual operation of the project commenced in 2004 with a plan to dispose of 1000 tons of obsolete pesticides existing in different parts of the country. A British Company has won the bid for this second phase, and currently, 500 tonnes of obsolete pesticides have been collected in various interim storage sites ready to be shipped for disposal to the U.K.

The plan of the FAO/MoA project is to dispose of all obsolete pesticides including clean-up of contaminated sites in the country.

2.3.6 Summary of future production, use and releases of POPs - requirements for Exemptions

Except for DDT which is currently being produced (see Section 2.3.3.), no other POPs chemical is manufactured in Ethiopia. There is no future plan to request for exemption or to engage in manufacturing any of these chemicals in the country.

2.3.7 Existing programmes for monitoring releases and environmental and human health impacts, including findings

There is a serious dearth of sufficient and reliable data or records on the effects of POPs on human health and the environment in Ethiopia. According to the preliminary assessment on this issue, pesticide sprayers and storekeepers are on top of the list of groups of people affected by POPs chemicals. People living near the areas of pesticide stores are also affected by releases from stockpiles. Pesticide storekeepers, especially women are the most vulnerable group in relation to POPs releases from stockpiles. Headache, nausea, asthma, vomiting, bronchitis, skin allergies and abdominal cramps are common among those occupationally exposed groups. Besides abortion, infertility, nervous system disorders and kidney problems, deaths of storekeepers were observed on some sites that are probably related to exposure to POPs.

Utilization of POPs pesticides near lakes and rivers has also adversely affected the environment. Aquatic organisms inhabiting these contaminated lakes and rivers are

inevitably exposed to POPs. Some birds preying on fish from these water bodies showed a reduction both in number and species.

The indoor spraying of DDT for malaria control constitutes one of the highest releases of POPs in the country. The high concentration of DDT compounds residues detected in milk from mothers indicate that apart from DDT sprayers and storekeepers, the general public, in particular women are significantly affected by POPs releases from DDT. Information on the health and environmental effects of releases from PCBs as well as from dioxins and furans is not available.

2.3.8 Current level of information, awareness and education among target groups; existing systems to communicate such information to the various groups; mechanism for information exchange with other parties to the Convention

The majority of the populations of Ethiopia are not well informed about POPs chemicals and their harmful effects on human health and environment. It is only very recently that a very few sector of the population came to know their harmful effects. What have so far been known about POPs chemicals was their application in the industry and agriculture and particularly their benefits in controlling insects, animal pests, infectious diseases and weeds.

Since the inception of the project on developing a National Implementation Plan on POPs a series of awareness workshops were held to a variety of professionals and the larger public. Workshops on national inventory and assessment on POPs chemicals and validation have been carried out. Participants from NGOS, representatives of government organizations, stakeholders and individuals have attended the above workshops which enabled them to get information on the types and effects of POPs chemicals. The national study tours conducted by experts during the POPs inventory have provided opportunity to transfer awareness to municipalities of city administrations, health bureaus, hospitals and industries of 12 major towns of the country.

Existing system to communicate information to the various groups

The availability of information exchange system with regard to POPs chemicals is one of the shortfalls generally exhibited in the country. Establishment of such a system is one of the activities envisioned in the National Implementation Plan (NIP). The FDRE Environmental Protection Authority also has a plan to establish information exchange system at a national level.

Public information tools and mechanisms

EPA is the responsible organ for disseminating information related to the management of chemicals. The target groups for information dissemination are Environmental Protection Bureaus of Regional States, NGOs engaged in Environment Management, industries, education institutions and academic societies, economic institutions, and the media (Press, Radio, TV). But since these efforts are not sufficient a national data base on POPs chemicals needs to be established at the FDRE EPA. By so doing, linkages among the beneficiaries and stakeholders can be created in order to effect exchange of information. Other sectoral institutions also undertake Environmental Awareness programs. Some are indicated below.

- The Department of Plant Protection and Technology control under the Ministry of Agriculture and Rural Development (MoARD) carries out various awareness and training programs on safe use of chemical pesticides.
- Concerning occupational safety and health the Labor Inspection Services under the Ministry of Labor and Social Affairs or Bureaus are offering training programs on the prevention of employment injuries and diseases including those posed by chemicals.
- The Confederation of Ethiopian Trade Unions, through the Department of Occupational Safety and Health, conducts various awareness programs aimed at raising the safety and health consciousness of industrial workers.

Mechanism for dissemination of information among the Convention Parties

To date no base has been developed for information exchange between the Convention parties.

2.3.9 Relevant activities of non-governmental stakeholders

The body of information charting out environmental organizations that have activities in Ethiopia is very inadequate. The only database to be found in the country, so far, is the one developed by Forum for Environment in December 2004. Classification is made between the many environmental actors based on whether the organization in question is a Governmental, Bilateral or multilateral entity, an NGO, a religious institution, or a cooperative. From the information incorporated in the database the following Non governmental stakeholders are found to engage in chemicals management, advocacy services related to chemicals and research and development.

Chemical Society of Ethiopia:

This is a professional association engaged mainly to popularise and to engage in researches related to chemistry, and to provide a forum for the exchange of information on chemicals management.

Crop Life Ethiopia:

This is an organization established with the objective of promoting environment friendly methods of producing, distributing and storing agrochemicals. It also assists the government in the arduous task of controlling the distribution of banned agrochemicals in Ethiopia. The organization has so far collaborated with the different actors in the implementation of the national obsolete pesticides programme and in delivering trainings related to the safe handling and treatment of pesticides.

Safe Environment Association

This is an NGO established in 2004 with a mission to combat pollution from dangerous chemicals used in agriculture and industrial processes through, among other things, delivering trainings, advocacy, researches etc. It also engages in the promotion of environmentally sound alternatives for crop protection and productivity. It also trains people in the hazards posed by hazardous wastes and POPs.

There are other organizations indicated in the database that are engaged in environmental matters and remotely touching upon the issue of POPs in their programmatic activities.

2.3.10 Overview of technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, management, research and development - linkage to international programmes and projects

In Ethiopia there are no laboratories equipped for ably analyzing organochlorine pesticides and PCBs. The country also lacks proper equipment for monitoring PCDD/PCDF emission levels. Moreover, except for fewer attempts quite in recent time, none of the higher learning institutions, non governmental organizations and public health institutes was engaged in any study and research of the effects of POPs chemicals.

However, as can be seen from the discussions above, PCBs are used in power transformers and capacitors by EEPCO and industrial enterprises in Ethiopia. Reports suggest that technicians engaged in handling and repairing this electrical equipment have been exposed to dermal contacts. Despite this, however, hospitals and public health institutes have not taken any study to prove the presence of PCBs in the blood of workers. There is even no record that any change in the health of technicians was traced back to any form of exposure to POPs chemicals.

There is no accredited laboratory in the country to detect the presence of POPs chemicals in food, air and water. According to the report made by the Health Task Team of the NIP, the agency duty bound to analyse the residue levels of POPs chemicals on samples, i.e. the Ethiopian Quality and Standards Authority, have no record of monitoring residue levels of POPs and other agricultural chemicals (Report of the Health Task Team, March 2005). Pesticide residues in water have not so far been analysed in the laboratory of the agency vested with the mandates (Ethiopian Health and Nutrition Research Institute).

The outstanding cause for lack of appropriate mechanism in the assessment of POPs chemicals in Ethiopia is the poor human resource capacity in the sector. According to the

same report, there are currently no occupational physicians, nurses or clinical toxicologists among the specialized doctors and nurses that are capable of solving the health problems caused by POPs chemicals in Ethiopia.

2.3.11 Identification of impacted populations or environments, estimated scale and magnitude of threats to public health and environmental quality and social implications for workers and local communities

The preliminary assessment carried out in the past on the impact of POPs chemicals on human health did not indicate any tangible evidence or any marked risk of professionals or workers occupationally exposed to organochlorine pollutants. Ethiopia has not yet eliminated obsolete pesticides (generally organochlorine pesticides), PCBs and other POPs chemicals. Neither has Ethiopia yet controlled PCDD/PCDF emission levels. In all cases of POPs chemicals, the Ethiopian population and the environment are at potential risk.

Given the absence of awareness on the harmful effects of DDT, obsolete pesticides, contaminated sites, stockpiles and wastes scattered all over the rural areas of the country, the farmers, cattle and wild animals residing in the vicinity of POPs pollutants are exposed to the chemicals. Considering the limited skill of the technicians working on EEPCOs transformer station and repair workshops, it is apparent that they are exposed to PCBS. One cannot entirely eliminate potential risk of accidents with transformers and capacitors with PCBs and the resulting local contamination, the scope of which is hard to predict.

Fire brigade workers of municipalities, who are intensively engaged in remediation of accidental fires, are the population at risk because of their exposure to PCDD/PCDF. It is known that any fire generates PCDD and PCDF and firemen are the most exposed to past fire smoke. These firemen have never been examined to record the PCDD/PCDF levels in their blood.

In rural areas and some urban areas of Ethiopia biomass is the mainstay of household energy supply. It is burnt at home for cooking and as a source of light. The rural population in general and mothers and infants in particular are openly exposed to PCDD/PCDF emissions.

Another part of the population at a potential risk of POPs chemicals are those living in the vicinity of rivers that are potential discharge points of industrial and residential wastes. Rivers like Akaki, kebona, Gullele in Addis Ababa and Borkena River in Kombolcha are few to mention. One can easily notice the irritating smell of the air if one stood in the vicinity of one of the polluted rivers mentioned above, caused by chemicals wastes put into the water. The rivers in Addis Ababa are reported to be used as potential sources of urban agriculture from which vegetables like lettuce, carrot and cabbage are constantly supplied to several 'Gulits' and groceries located at different areas of the city and consumed by a large portion of the population in Addis Ababa.

2.3.12 Details of any relevant system for the assessment and listing of new chemicals

There is no comprehensive system that provides for the assessment and listing of POPs chemicals in Ethiopia. Nonetheless there is a law regarding pesticides registration and control in Ethiopia. This law (Council of State Special Decree No.20/1990) prohibits to manufacture, import, sale or use unregistered pesticides. This would call for the establishment of a national registry and the setting in place of procedures for assessing and listing the chemicals. The body designated for the purpose (Ministry of Agriculture and Rural Development) has not so far established the Registry. Nor has it laid down the rules and procedures necessary in dealing with pesticides. The same is true for the assessment and listing of non-pesticide chemicals in Ethiopia where the set of available rules are unsatisfactory. These laws include a proclamation on explosives, drugs and Psychotropic substances, pesticides, radioactive substances and fertilizers.

2.3.13 Details of any relevant system for the assessment and regulation of chemicals already in the market

It has been stated under Section 2.2.4 above that there is no legislation in Ethiopia that currently enforces the POPs issue. The scrap of legislations that directly or indirectly touches upon chemicals administration and management are far from sufficient to embrace upcoming issues of concern particularly related to the POPs chemicals.

Different ministries, agencies and other governmental institutions are responsible for, and concerned with, various aspects of the management of POPs in Ethiopia. Environmental Protection Authority, Ministry of Agriculture and Rural Development, Ministry of Health, Ministry of Labour and Social Affairs, Customs Authority, Road Transport Authority and Drug Administration and Control Authority are some of the major players in regulating the use and management of chemicals including POPs. The existing institutional arrangement and capability related to the management and control of hazardous chemicals, including POPs, is compounded with a number of problems. Outstanding among these are the lack of effective coordination among institutions, mandate overlaps, lack of clarity as to the role of regional states, insufficient linkage with federal institutions, lack of awareness among decision makers, merger and creation of new institutions from time to time and weak implementing capacity of institutions.

Most government ministries and institutions are constrained by the lack or shortage of facilities; human and financial resources that are needed to properly manage and regulate POPs chemicals. The number of available professionals in many institutions is inadequate and requires further capacity building in this direction. The infrastructure and resource available to properly manage chemicals, including POPs, in Ethiopia is very low and totally below the actual needs.

Information on chemicals, including POPs, is very limited and is found scattered in many institutions. Establishing an effective data collection, treatment and exchange mechanism is highly required. The limited efforts being exerted by various bodies to raise chemical awareness includes the risks attached with the management of chemicals, research into

environmentally sound alternatives and occupational safety. But given the amount and extent of chemical usage in the country, the efforts are far from adequate.

III. STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

3.1 POLICY STATEMENT

Ethiopia's Commitment to Address POPs Issues to Date

Ethiopia has to date addressed issues of chemicals management, including POPs chemicals, in a fragmented and partial manner. The environmental policy issued in 1997 contains several provisions relevant to chemicals management and hazardous wastes and there are several legal instruments in place as discussed in section 2.2.1 of the NIP that address some aspects of chemicals management including POPs chemicals. In conjunction with this, one activity that has commenced under the auspices of FAO and MoA in 2000 and is on-going is the disposal and export of obsolete pesticides, including POPs pesticides, from several regions in the country. The project plans to dispose all obsolete pesticides in the country including clean-up of respective contaminated sites and articles in use.

Aware of the adverse human health and environmental impacts of POPs chemicals both at the national and global level, and the need for concerted action to address such impacts, Ethiopia has signed the Stockholm Convention on 17 May 2002 and ratified the instrument on 2 July 2002.

Ethiopia had at the outset prepared a National Chemical Profile in 1999 that provided an assessment of the country's chemical management infrastructure; an initial assessment of chemicals existing at the national level and the extent of their use as well as the legal, institutional, administrative and technical issues related to chemicals management of the country.

Subsequent to the ratification of the Stockholm Convention and related international conventions such as the Basel/Bamako Conventions and the Rotterdam Convention (see

section 2), Ethiopia has taken several prior steps towards meeting its commitments under the Convention and the preparation of the NIP. The steps taken are:

- Establishment of the POPs/NIP project office and a National Steering Committee.
- Launching of an Inception Workshop on POPs.
- Conducting training workshop on inventory taking of POPs chemicals.
- Carrying out a preliminary inventory and assessment of POPs chemicals and national infrastructure for POPs management.

NIP Goal and National Policy Objectives

The overall national goal of the NIP is:

The protection of human health and environment from the harmful effects of POPs chemicals in Ethiopia as well as at the global level by reducing and ultimately eliminating the use and release of POPs chemicals in accordance with the requirements of the Stockholm Convention and national sustainable development objectives and strategies.

The specific policy objectives of the NIP are the following:

- Develop national legislation to regulate, control, reduce and eventually eliminate the import, use and production of POPs chemicals in the country.
- Establish appropriate institutional mechanisms to regulate the impact of POPs on human health and the environment and strengthen enforcement capacity of such institutions.
- Strengthen national capacity and infrastructure to enable the country to adequately address the requirements of the Stockholm Convention and the implementation of the NIP.
- Identify and promote the application of best available techniques (BATs) and best environmental practices to enable the reduction and eventual elimination of POPs chemicals particularly from unintentional sources.

- Promote the establishment of research and development centers in order to search for alternatives to the use of POPs chemicals and to address their effects on human health and the environment.
- Create public awareness on the requirements of the Stockholm Convention and ensure the participation of the public in addressing the adverse impacts of POPs chemicals.
- Establish appropriate mechanism for adequate data collection, exchange and dissemination and information management system for POPs chemicals.

Procedure for Formal Endorsement of the NIP

Since the implementation of the NIP requires the participation and commitment of all national stakeholders, this draft NIP shall initially be presented for prior endorsement at a stakeholder workshop in which all relevant federal and regional government agencies, the private sector, NGOs, the academia and research institutions will be represented. Once, stakeholders endorse the NIP, the NIP document will be submitted to the government for formal endorsement.

3.2 IMPLEMENTATION STRATEGY

3.2.1 Coordinating Mechanism for the Implementation of NIP

The multi-sectoral nature of POPs issues calls for a concerted action of all stakeholders. Therefore, a Steering Committee (SC) composed of relevant government and non-government institutions shall be established to oversee and coordinate the implementation of the NIP. The steering committee shall be composed of representatives from the Ministry of Agriculture and Rural Development; the Ministry of Health; the Ministry of Trade and Industry, the Ministry of Labor and Social Affairs; the Drug Administration and Control Authority; the Ethiopian Health and Nutrition Research Institute; the Ethiopian Cleaner Production Center; the Ethiopian Private Industries Association; the Ethiopian Labor Union, representative of NGOs and the academia. Similarly, steering committees with corresponding representation of governmental and non-governmental

institutions will be established in each regional state. The latter will report their activities to the Secretariat established at the Federal level. The steering committee shall meet bi-annually and will:

- Review the progress made, sufficiency and effectiveness of the implementation of the NIP based on the report submitted by each implementing agency.
- Determine further actions that may be needed for the appropriate implementation of the NIP.
- Review and update the NIP where further actions are necessary.

The management and practical implementation of the NIP shall be coordinated and run by a secretariat to be hosted by the EPA. The secretariat shall be responsible for coordinating and follow up of the implementation of the NIP by Implementing Agencies.

Technical Committee composed of representatives from relevant institutions shall also be established. The technical committee shall have an advisory role and will be responsible to make suggestions and recommendations on the implementation and revision of the NIP to the steering committee and the secretariat.

The action plan prepared below has assigned different activities for different agencies. These implementing agencies shall be responsible to carry out the activities specifically given to them in the action plan.

Coordination and implementation mechanisms and structures described above can be modified by the steering committee as deemed necessary. With a view to clarifying responsibilities and mandates, Memorandums of Understanding that govern the relationships among different stakeholders are encouraged to be drawn up.

3.2.2 Implementation Approach and Priorities for NIP

Each institution designated to implement the various POPs activities identified in the action plan shall develop their own detailed action plans including specific tasks required

to meet the activities they are expected to implement in line with the timeframe provided in the NIP (Table 21). These plans shall be submitted to the Secretariat and will be reviewed and approved by the NIP Steering Committee. Where certain revisions of the submitted plans are required, the secretariat shall recommend to the implementing agency such revisions and the plans will be revised accordingly after consultations.

Priorities identified for NIP based on criteria set during the priority setting phase are:

- Strengthening Human and Institutional Capacity for the Management of POPs.
- Developing Capacity and Capability for the Identification, Analysis, Research and Monitoring of POPs.
- Conducting Risk Assessment of POPs on Human Health and the Environment.
- Development of Information and Communication System for the Management of POPs.
- Carrying out Public Awareness, Sensitization, Training and Education.

3.2.3 Monitoring and Evaluation, Reporting and Updating of NIP Activities

Each implementing institution shall monitor and evaluate the implementation of the activities designated to them and submit an annual progress and financial report to the NIP secretariat. The reports submitted to the NIP secretariat shall be evaluated by using performance indicators to be prepared by the respective responsible institutions. The reports will be compiled by the secretariat and submitted to the steering committee for review to ensure sufficiency and effectiveness of the implementation of NIP. Where the performance indicators demonstrate that certain objectives/goals have not been achieved and further actions are necessary for the appropriate implementation of the NIP, such further actions may be recommended by the Secretariat and be submitted to the steering committee for consideration and approval. Once further actions are approved, the NIP will be revised and updated accordingly. The updated NIP will be presented to a stakeholder workshop in which all implementing agencies are represented and endorsed for subsequent implementation. The NIP secretariat shall submit the annual NIP implementation report to the secretariat of the Stockholm Convention in accordance with the requirements of the Stockholm Convention.

3.3 Activities, Strategies and Action Plans

3.3.1 Activity: Institutional and Regulatory Strengthening Measures

The existence of appropriate institutional and regulatory mechanism to manage and control POPs is fundamental in addressing POPs issues. However, the preliminary inventory on legal and institutional frameworks to manage POPs chemicals has identified several gaps and limitations in the area. Although some aspects of POPs issues are addressed in various legislations, there is no comprehensive legislation for the management of all aspects of POPs chemicals. Standards and guidelines that are required to appropriately implement relevant legislation are also lacking in most areas. The other major problem identified relates to lack of clear mandates and coordination mechanism among concerned institutions and their capacity limitation to effectively implement laws and regulations. Addressing these problems is imperative to properly manage and control POPs chemicals in Ethiopia.

Goal and Objectives

The goal of the action plan on institutional and regulatory strengthening measures is to provide an enabling institutional and legal framework for the proper management of POPs chemicals. It aims also to achieve the following specific objectives:

- Update and issue comprehensive legislation on POPs chemicals.
- Issue appropriate standards and guidelines to effectively implement the legislation.
- Provide appropriate institutional framework with clear mandates and coordination mechanisms at all levels.
- Strengthen the implementation capacity of relevant institutions.

Table 11: Action Plan for Institutional and Regulatory Strengthening Measures

Activities	Indicators	Timeframe	Implementers	Resources Required and Cost
<p>Coordination of NIP Implementation</p> <p>Establish NIP secretariat office</p> <p>Train professional staff</p> <p>Coordinate all relevant sectors for implementation of NIP</p> <p>Review, monitor, report NIP activities</p>	<p>Focal point for NIP implementation established and effective coordination ensured</p>	<p>20 years</p>	<p>EPA</p>	<p>Staff Logistics Office accessories USD 1, 150,000</p>
<p>Issuance of legislations</p> <p>Review existing laws to identify legal gaps and issues to be addressed</p> <p>Revise existing legislation and issue new ones</p>	<p>A comprehensive legal system addressing all aspects of POPs issues enacted</p>	<p>2 Years</p>	<p>EPA, Parliament/Council of Ministers</p>	<p>Experts USD 60,000</p>
<p>Development and issuance of guidelines and standards</p> <p>Identify areas that require standards and guidelines for effective implementation of POPs legislation</p> <p>Revise existing standards and guidelines and issue new ones</p>	<p>Standards and guidelines for POPs chemicals issued</p>	<p>3 years</p>	<p>EPA, MoH, MoARD, EEPCO</p>	<p>Experts USD 75,000</p>
<p>Strengthening the regulatory capacity of institutions</p> <p>Conduct trainings for relevant staff of implementing agencies on contents of POPs legislations, standards and guidelines</p> <p>Organize periodic forums for experience sharing and coordination among relevant staff of implementing agencies</p>	<p>Number of training sessions conducted and experience sharing forums organized</p>	<p>8 years</p>	<p>EPA, Relevant agencies</p>	<p>Resource persons, Logistics USD 150,000</p>

3.3.2 Activity: Measures to Reduce or Eliminate Releases from Intentional Production and Use

The majority of POPs chemicals targeted by the Stockholm Convention are intentionally produced for pest control and industrial purposes. Article 3 of the Convention requires Parties to take legal and administrative as well as other measures to reduce or eliminate releases from intentionally produced POPs. The inventory on POPs chemicals established that, from the POPs chemicals targeted by the Stockholm Convention, only DDT is produced in the country. It also established the existence of releases from the use as well as stockpiles and wastes of different classes of intentionally produced POPs.

Therefore it is necessary to include in the NIP measures to address the problem of releases from intentionally produced POPs. However, it would be more appropriate to provide separate measures for each of the different issues and classes of intentionally produced POPs. Thus, various measures to reduce or eliminate releases from the intentional production and use of POPs chemicals are included under other sections of the NIP including under 3.3.1, 3.3.3, 3.3.4, 3.3.5 and 3.3.6.

3.3.3 Activity: Production, Import and Export, Use, Stockpiles, Wastes and Release of Annex A POPs Pesticides (Annex A, Part I Chemicals)

Preliminary inventory of Annex A POPs pesticides disclosed no production and export of these chemicals. Even though the inventory did not present complete and reliable data on import, use, stockpiles and wastes, it revealed that Annex A POPs pesticides have been imported and used in the country. In particular, it established the existence of substantial volume of stockpiles and wastes of Annex A POPs pesticides. Moreover, reliable data and regular monitoring mechanism on the health and environmental effects of Annex A POPs pesticides are lacking. Thus, an action plan that addresses these problems is required.

Goal and Objectives

The over all aim of this action plan is the elimination of the use, import, stockpiles and wastes of Annex A POPs pesticides. The specific objectives of the action plan are:

- Make available comprehensive and accurate data and information on past and existing, use, import, stockpiles and wastes of Annex A POPs pesticides;
- Ensure the proper management and handling of current stockpiles and wastes of Annex A POPs Pesticides;
- Establish interim storage to properly manage stockpiles and wastes of Annex A POPs pesticides until disposal;
- Dispose all Annex A POPs pesticides stockpiles and wastes in an environmentally sound manner;
- Identify the health and environmental effects of Annex A POPs pesticides; and
- Establish mechanism to regularly monitor the health and environmental effects of Annex A POPs pesticides.

Table 12: Action Plan for Production, Import and Export, Use, Stockpiles, Wastes and Release of Annex A POPs Pesticides (Annex A, Part I Chemicals)

Activities	Indicators	Timeframe	Implementers	Resources Required and Cost
<p>Making available comprehensive and accurate data</p> <p>Review current inventory on Annex A POPs pesticides and identify data and information gaps</p> <p>Conduct a complete inventory to update the data and information on past and exiting import, use, stockpiles and wastes of Annex A POPs pesticides</p>	<p>Inventory and assessment of Annex A POPs pesticides conducted and disseminated to relevant stakeholders</p>	<p>2 years</p>	<p>EPA</p>	<p>Experts Logistics</p> <p>USD 55,000</p>

<p>Proper management and handling of stockpiles and wastes of POPs pesticides</p> <p>Prepare guidelines and training materials for the proper management and handling of existing stockpiles and wastes</p> <p>Provide training to relevant staff based on the guidelines and training materials</p> <p>Upgrading storage facilities of stockpiles and wastes</p> <p>Provide protective devices for staff handling stockpiles and wastes</p> <p>Identify sites of stockpiles and wastes that require interim storage</p> <p>Identify and construct appropriate sites suitable for interim storage</p> <p>Transfer identified stockpiles and wastes to interim storage</p>	<p>Guidelines issued</p> <p>Training materials prepared</p> <p>No. of trainings conducted</p> <p>Storage facilities upgraded</p> <p>Sufficient protective devices available</p> <p>No. of interim storage constructed</p> <p>Amount of stockpiles and wastes transferred to interim storage</p>	5 years	EPA, MOARD	<p>Experts Finance Equipment Logistics</p> <p>USD 500,000</p>
<p>Disposal of stockpiles and wastes</p> <p>Assess the alternatives on environmentally safe disposal of stockpiles and wastes</p> <p>Dispose all stockpiles and wastes of Annex A POPs pesticides in an environmentally sound manner</p>	<p>The amount of stockpiles and wastes disposed</p>	5 years		<p>Finance Experts Logistics</p> <p>USD 5,000,000</p>
<p>Assessment and monitoring of the health and environmental impacts</p> <p>Develop a mechanism to regularly monitor the health and environmental effects of Annex A POPs pesticides</p> <p>Regularly monitor the health and environmental effects of Annex A POPs pesticides</p>	<p>Availability of regular reports on the health and environmental effects</p>	10 Years	EPA, MOARD, MoH	<p>Experts, Equipment Logistics</p> <p>USD 75,000</p>

3.3.4 Activity: Production, Import and Export, Use, Identification, Labeling, Removal, Storage, Release and Disposal of PCBs and Equipment containing PCBs (Annex A, Part II chemicals)

The National Inventory on PCB releases carried out in 2003 covered PCB containing electrical equipment operational within the Ethiopian Electric Power Corporation (EEPCO). The electrical equipment assessed in the inventory are power transformers and capacitors. The result of the inventory indicates that PCB – containing transformers and capacitor within EEPCO are 2505 and 40, respectively. Corresponding quantities of PCB- containing dielectric fluids are 1,181,667 kgs and 1255 kgs for transformer and capacitors, respectively. These electrical equipment are those imported until 1989 G.C, where some are currently in use, some are stand by under maintenance in workshops and the remaining are discarded as non – serviceable. The result of the inventory indicates that further assessment will have to be carried out on PCB- containing electrical equipment in EEPCO system. Due to absence of data either on the nameplate or equipment manual, the amount of dielectric fluids in each PCB – concentration range has not been determined. Thus, lack of adequate data on PCB and the existence of significant PCB releases from the use, stockpiles and wastes are major problems that need to be addressed by the action plan.

Goal and Objectives

The overall objective of the action plan is the reduction and ultimate elimination of PCBs releases into the environment from PCB use, stockpiles and wastes. The specific objectives of the action plan are:

- Make available comprehensive and accurate information on past and existing, use, import, stockpiles and wastes of PCBs in the country;
- Prohibit the import and use of PCBs and PCB containing equipment and materials;
- Promote measures to reduce exposure to human health and the environment from PCBs releases;
- Identify and remove from use damaged equipment containing PCBs;

- Ensure safe management of PCBs containing equipment;
- Monitor and assess impact of PCBs in human and environmental media;
- Build facilities for safe disposal of all PCB and PCB containing equipment;
- Build the capacity of institution to handle PCBs and PCB containing equipment.

Table 13: Production, Import and Export, Use, Identification, Labeling, Removal, Storage, Release and Disposal of PCBs and Equipment Containing PCBs (Annex A, part II Chemicals)

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
<p>Making comprehensive and accurate data available</p> <p>Review the preliminary inventory on PCBs and identify data and information gaps</p> <p>Conduct a complete inventory to update the data and information on past and exiting import, use, stockpiles and wastes of PCBs</p> <p>Conduct analyses on PCBs in equipment identified by inventory</p> <p>Establish database of inventory and analyses results</p>	<p>A comprehensive and complete inventory on PCBs conducted</p> <p>PCBs concentration in equipment analyzed and results established</p> <p>Database on PCBs established</p>	<p>4 years</p>	<p>EPA, EEPCO, Industry, Research institutes</p>	<p>Experts, Computer hardware and software, equipment Logistics</p> <p>USD 200,000</p>

<p>Proper management of PCBs in use, stockpiles and wastes</p> <p>Develop guidelines on safe handling and management of PCBs</p> <p>Provide training to personnel involved in handling and managing PCBs</p> <p>Upgrading storage facilities of stockpiles and wastes</p> <p>Identify sites and construct appropriate interim storage</p> <p>Place warning notices near PCB containing equipment and storages</p> <p>Establish mechanism for reporting accidents</p>	<p>Personnel trained in safe handling and management of PCBs</p> <p>PCBs managed and handled safely</p> <p>Interim storage facilities for PCB equipment constructed</p> <p>Risks of release from PCBs minimized or prevented</p>	19 years	EPA, EEPCO, Industry	<p>Experts Finance Equipment Logistics</p> <p>USD 250,000</p>
<p>Phasing out of PCBs in Use</p> <p>Develop detailed plan to phase out PCBs in use</p> <p>Develop procedures for removal of PCBs from equipment in use</p> <p>Remove PCBs from equipment in use and transfer to interim storages</p>	<p>Phase out plans and procedures developed</p> <p>All PCBs in use removed and collected in interim storage sites</p>	12 years	EPA, EEPCO, Industry	<p>Experts Finance Equipment Logistics</p> <p>USD 20,000,000</p>
<p>Disposal of current PCBs stockpiles and wastes</p> <p>Assess the alternatives on environmentally safe disposal of stockpiles and wastes</p> <p>Dispose all current stockpiles and wastes of PCBs in an environmentally sound manner</p>	<p>The amount of current PCB stockpiles and wastes disposed</p>	5Years	EPA, EEPCO, Industry	<p>Experts, Equipment Logistics</p> <p>USD 1,000,000</p>
<p>Disposal of PCBs to be removed from equipment in use</p> <p>Dispose all stockpiles and wastes of PCBs to be removed from equipment in an environmentally sound manner</p>	<p>The amount of disposed PCBs that are removed from equipment in use</p>	15 years	EPA, EEPCO, Industry	<p>Experts, Equipment Logistics</p> <p>USD 5,000,000</p>
<p>Assessment and monitoring of the health and environmental impacts</p> <p>Develop a mechanism to regularly</p>	<p>Availability of</p>	19 Years	EPA, EEPCO, Industry	<p>Experts, Equipment Logistics</p> <p>USD 300,000</p>

monitor the health and environmental effects of PCBs Regularly monitor the health and environmental effects of PCBs	regular reports on the health and environmental effects			
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3.3.5 Activity: Production, Import and Export, Use, Stockpiles, Wastes and Release of DDT (Annex B chemicals)

DDT has been used, produced and imported in Ethiopia for the purpose of disease vector control (malaria). The inventory on POPs, though not comprehensive, also found both active and obsolete DDT stockpiles in the order of 160, 573 Kg/Lt and 55, 720 Kg/Lt respectively. The major concerns in Ethiopia related to DDT include lack of comprehensive and accurate data, lack of proper and effective regulatory and monitoring mechanism to ensure DDT use is restricted to disease vector control, improper management and storage of stockpiles and wastes, lack of risk assessment and monitoring of releases from DDT use as well as from stockpiles and wastes, and lack of well-developed strategy and research on alternative disease vector control. The action plan on DDT intends to address these concerns.

Goal and Objectives

The goal of this action plan is the reduction, proper regulation and ultimate elimination of the use, production, import, stockpiles and wastes of DDT. The specific objectives are:

- Make available comprehensive and accurate data and information on past and existing, use, import, stockpiles and wastes of DDT.
- Ensure the proper management and handling of the use of DDT as well as current stockpiles and wastes.
- Establish interim storage to properly manage stockpiles and wastes of DDT until disposal.

- Dispose obsolete stockpiles and wastes of DDT in an environmentally sound manner.
- Establish mechanism to regularly monitor the health and environmental effects of DDT use, stockpiles and wastes.
- Identify and implement appropriate alternatives to DDT use.

Table 14: Action Plan for Production, Import and Export, Use, Stockpiles, Wastes and Release of DDT

Activities	Indicators	Timeframe	Implementers	Resources Required and Cost
<p>Making comprehensive and accurate data available</p> <p>Review current inventory on DDT and identify data and information gaps</p> <p>Conduct a complete inventory to update the data and information on past and exiting import, use, stockpiles and wastes of DDT</p>	<p>A comprehensive and complete inventory and assessment of DDT use, import, stockpiles and wastes conducted</p>	2 years	EPA, MOH Adamitulu	<p>Experts Logistics</p> <p>USD 40,000</p>
<p>Proper management and handling of DDT use and DDT stockpiles and wastes</p> <p>Prepare guidelines and training materials for the proper management and handling of DDT use, stockpiles and wastes</p> <p>Provide training to personnel involved in DDT handling and management</p> <p>Upgrading DDT storage facilities</p> <p>Provide protective devices for staff handling stockpiles and wastes</p>	<p>Guidelines and training materials prepared</p> <p>Training of personnel for handling and management of DDT conducted.</p> <p>Storage facilities for DDT constructed.</p> <p>Risk from DDT release minimized or prevented</p>	9 years	EPA, MOH Adamitulu	<p>Experts Finance, Equipment Logistics</p> <p>USD 250,000</p>

<p>Disposal of DDT stockpiles and wastes</p> <p>Identify sites and construct appropriate interim storage for DDT stockpiles and wastes</p> <p>Assess the alternatives on environmentally safe disposal of stockpiles and wastes</p> <p>Dispose all stockpiles and wastes of DDT in an environmentally sound manner</p>	<p>No of interim storage constructed</p> <p>The amount of DDT stockpiles and wastes disposed</p>	<p>5 Years</p>	<p>EPA, MOH Adamitulu</p>	<p>Finance Logistics</p> <p>USD 1,200,000</p>
<p>Assessment and monitoring of the health and environmental impacts of DDT</p> <p>Develop a mechanism to regularly monitor the health and environmental effects of DDT</p> <p>Regularly monitor the use, health and environmental effects of DDT</p>	<p>Mechanism for periodic monitoring of health and environmental impacts of DDT established</p> <p>Periodic monitoring of the health and environmental effects of POPs conducted</p>	<p>15 Years</p>	<p>EPA, MOH Adamitulu</p>	<p>Experts, Equipment Logistics</p> <p>USD 300,000</p>
<p>Identification and implementation of alternatives to DDT</p> <p>Conduct a research and cost-benefit analysis on alternative vector disease control options to the use of DDT</p> <p>Design and implement alternative vector disease control strategies such as IVM to the use of DDT</p>	<p>Research on alternative use to DDT and cost-benefit analysis conducted</p> <p>DDT use reduced</p>	<p>15 Years</p>	<p>EPA, MOH Adamitulu</p>	<p>Experts Finance</p> <p>USD 5,000,000</p>

3.3.6 Activity: Register for Specific Exemptions and the Continuing Need for Exemptions (Article 4)

Article 4 of the Stockholm Convention allows a Party to register for specific exemptions with respect to chemicals listed in Annex A or B. The article also requires a Party using this right to submit a report to the Secretariat justifying its continuing need for registration of the exemption. Although Ethiopia did not formally register for a specific exemption on DDT upon ratifying the Convention, it has continued producing and using DDT. As most parts of Ethiopia are prone to malaria and as malaria is a one of the leading health problem in the country, there is actual need for the use of DDT for malaria

control in the country for some time to come until DDT is replaced by an effective alternative.

Goal and Objectives

The overall objective of this action plan is to meet Ethiopia’s obligation under article 4 of the Stockholm Convention. It has the following specific objectives:

- Prepare and submit to the Secretariat a report justifying Ethiopia’s continuing need for specific exemption with respect to DDT.
- Conduct periodic reviews on the continuing need to use DDT in the country.

Table 15: Action Plan on Register for Specific Exemptions and the Continuing Need for Exemptions (Article 4)

Activities	Indicators	Timeframe	Implementers	Resources Required and Cost
Prepare and submit to the Secretariat a report justifying Ethiopia’s continuing need for a specific exemption with respect to DDT	Report submitted to the Secretariat	1 Year	EPA, MOH	Experts USD 15,000
Conduct periodic reviews on the continuing need to use DDT in the country	Status report prepared periodically	10 Year	EPA, MOH	Experts USD 35,000

3.3.7 Action plan: Measures to Reduce Releases from Unintentional Production (Article 5)

The national inventory on PCDD and PCDF has revealed the existence of PCDD and PCDF releases from all source categories. According to the inventory, the total PCDD and PCDF annual release in 2003 from 10 major source categories was about 214 gm TEQ/annum, with uncontrolled combustion process being the major source contributing about 92 gm TEQ/annum followed by waste incineration which released about 56 gm TEQ/annum. Lack of adequate data and information on releases of unintentionally produced POPs from different source categories, absence of mechanism for maintaining

release inventories for different source categories, lack of adequate regulatory mechanism, absence of emission standards and limited capacity and research for the application of BAT and BEP are among the pressing issues in Ethiopia related to unintentionally produced POPs. Thus, an action plan that addresses these problems is required.

Goal and Objectives

The overall objective of the action plan is to reduce and ultimately eliminate releases from unintentionally produced POPs. The action plan has the following specific objectives:

- Develop and apply a mechanism to monitor the releases of PCDD/PCDF, HCB and PCBs;
- Update the types of sources of unintentional production of PCDD/PCDF, HCB and PCBs and their releases and develop data management system on same;
- Strengthening of public awareness and education and their integration in the decision- making process and implementation of measures.
- To promote the use of alternative methods to reduce/eliminate emissions form uncontrolled combustion.
- To promote the adoption of best available techniques (BAT) and best environmental practices (BEP)

Table 16: Action Plan to Reduce Releases from Unintentional Production (Article 5)

Activities	Indicators	Timeframe	Implementers	Resources Required and Cost
<p>Assessment of current and projected releases of unintentionally produced POPs</p> <p>Review current inventory on unintentionally produced POPs and identify data and information gaps</p> <p>Conduct a complete inventory to update the data and information on sources and releases of unintentionally produced POPs</p> <p>Develop a system of release register (PRTR) and regularly monitor releases</p>	<p>A comprehensive inventory on PCCD/PCDF conducted</p> <p>Establish PRTR for regular monitoring of releases</p>	4 years	EPA, Industry, Municipalities, MoT, Other relevant stakeholders	<p>Experts, Computer hardware and software, equipment Logistics</p> <p>USD 150,000</p>
<p>Implementation of strategies to reduce releases</p> <p>Develop and implement environmentally sound management of municipal wastes</p> <p>Develop and implement strategies to reduce and prevent forest fires</p> <p>Phase out old and existing medical waste incinerators and construct modern incinerators</p> <p>Promote alternative energy sources and methods to the use of wood fuels in households</p> <p>Identify and phase out industrial and (<i>reword</i>) chemical process that release unintentionally produced POPs by promoting BAT and BEP</p> <p>Develop and enforce vehicle emission standards</p> <p>Assess cost implications for industrial sectors due to introduction of BAT</p>	<p>Municipal wastes properly managed</p> <p>Forest fires controlled</p> <p>Construction of modern incinerators</p> <p>Decrease in the use of wood fuels in households</p> <p>Processes identified and phased out</p> <p>Standard in place and enforced</p>	19 years	EPA, Industry, Municipalities, MoARD MoH Moot, Other relevant stakeholders, The public at large	<p>Experts Finance, Equipment Logistics</p> <p>USD 4,000,000</p>
<p>Assessment and monitoring of the health and environmental impacts</p> <p>Develop a mechanism to regularly</p>		19 Years	EPA, Industry, Municipalities, MoA	<p>Experts, Finance Equipment Logistics</p>

monitor the health and environmental effects of releases from unintentionally produced POPs through establishing a PRTR Regularly monitor the health and environmental effects of releases	Mechanism developed Regular reports on the health and environmental effects		MoH MoT,	USD 360,000
Review of strategies every 5 years	Revision and updating of strategies	15	EPA, Industry, Municipalities, MoA MoH MoT,	Experts Finance USD 80,000

3.3.8 Activity: Measures to Reduce Releases from Stockpiles and Wastes (Article 6)

Release from stockpiles and wastes of Annex A and B POPs chemicals is a serious POPs issue in Ethiopia. The nature, sites and facilities in which stockpiles and wastes of POPs pesticides, PCBs and DDT are stored varies. Thus, action plans to deal with releases from stockpiles and wastes for each of these groups of POPs chemicals are already provided under 3.3.3, 3.3.4 and 3.3.5.

3.3.9 Strategy: Identification of Stockpiles, Articles in Use and Wastes

Measures required for identifying stockpiles, articles in use and wastes of POPs pesticides, PCBs and DDT are already presented in sections 3.3.3, 3.3.4 and 3.3.5, respectively.

3.3.10 Activity: Manage Stockpiles and Appropriate Measures for Handling and Disposal of Articles in Use

Activities needed to manage identified stockpiles of POPs pesticides, PCBs and DDT and to appropriately handle and dispose articles in use are also presented under 3.3.3, 3.3.4 and 3.3.5.

3.3.11 Strategy: Identification of Contaminated Sites (Annex A, B and C Chemicals) and Remediation in an Environmentally Sound Manner

Article 6 of the Stockholm Convention requires a party to develop appropriate strategies for identifying sites contaminated by POPs chemicals and to undertake remediation of contaminated sites in an environmentally sound manner. Though not conclusive, the inventory on contaminated sites identified 77 sites wholly contaminated by POPs chemicals and 44 sites contaminated by POPs and other chemicals. This finding shows that the issue of contaminated sites by POPs chemicals is a serious problem in the country. Thus, an action plan that addresses this problem is required.

Goal and Objectives

The overall objective of the action plan is to properly manage and ultimately clean up all sites contaminated by Annex A, B and C POPs chemicals. The specific objectives are:

- Identify all sites contaminated by POPs chemicals;
- Properly manage all contaminated sites by POPs chemicals; and
- Reclaim contaminated sites by POPs chemicals phase by phase.

Table 17: Action Plan for Identification of Contaminated Sites (Annex A, B and C Chemicals) and Remediation in an Environmentally Sound Manner

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Undertake a complete inventory to identify contaminated sites and assess the extent and severity of the socio-economic and environmental impact of such sites	All contaminated sites identified	1 year	EPA, MOA, MOH	Experts, Logistics USD 30,000

Secure and label identified sites	Contaminated sites secured and labeled	1 Year	EPA, MOH	MOA,	Experts Equipment USD 100,000
Remediation of contaminated sites Conduct risk assessment of contaminated sites and prioritize sites for clean up. Develop a plan to carry out clean up measures Provide training and skill upgrading to staff of relevant agencies to implement clean up measures Carry out a phase-by-phase clean up of contaminated sites	Sites prioritized A plan in place Trainings given Sites cleaned up	5 years	EPA, MOH, EEPCO	MOA,	Experts Finance Equipments Logistics USD 5,100,000

3.3.12 Activity: Facilitating or Undertaking Information Exchange and Stakeholder Involvement

Information exchange on various issues related to POPs chemicals both at the international level with other parties and at national level with different stakeholders is central to the proper management of POPs chemicals. The Stockholm Convention also puts an obligation on a party to facilitate or undertake the exchange of information relating to the reduction or elimination of the production, use and release of POPs, to their alternatives and risks as well as to their economic and social costs.

Goal and Objectives

The overall goal of the action plan is to establish and maintain a viable information exchange system both at a national and international level. The action plan has also the following specific objectives:

- Establish a focal point for the exchange of information on POPs chemicals;
- Build the capacity of the focal point to properly discharge its functions;
- Develop information exchange and stakeholder’s involvement rules and guidelines;
- Collect, analyze and exchange information.

Table 18: Action Plan for Facilitating or Undertaking Information Exchange and Stakeholder Involvement

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
<p>Establishing a focal point</p> <p>Designate a national focal point for the exchange of information</p> <p>Equip the focal point with the required experts and equipment</p>	<p>National focal point established</p> <p>The existence of a focal point capable to discharge its functions</p>	1 Year	EPA	<p>Experts Finance Equipment</p> <p>USD 100,000</p>
<p>Prepare and adopt rules and guidelines for information exchange and for facilitating stakeholders involvement</p>	<p>Rules and guidelines in place</p>	6 months	EPA	<p>Experts</p> <p>USD 30,000</p>
<p>Undertake a continuous collection, analysis and exchange of information</p>	<p>Smooth flow of information</p>	19 Years	EPA	<p>Experts Equipment</p> <p>USD 80,000/year</p>

3.3.13 Activity: Public Awareness, Information and Education (Article 10)

Promoting and facilitating public information, awareness and education about POPs chemicals is one of the obligations imposed on Parties under the Stockholm Convention. The level of awareness and information about POPs among decision makers and other actors as well as among the general public in Ethiopia is indicated as significantly low in the preliminary inventory on POPs. There is a need, therefore, to provide for measures to promote and facilitate public awareness, information and education.

Goal and Objectives

The overall goal of this action plan is to make policy/decision makers and the general public informed and active participants in the control and proper management of POPs chemicals. The specific objectives are:

- Create awareness about POPs among policy/decision makers, other actors and the general public;
- Provide information about POPs to stakeholders and the general public;
- Promote education programs on POPs.

Table 19: Action Plan for Public Awareness, Information and Education (Article 10)

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Conduct an assessment on the level awareness and information need of different target groups	Assessment report	1 Year	EPA	Experts Finance logistics USD 20,000
<p>Public awareness and sensitization</p> <p>Prepare and produce IEC materials (e.g. brochures, posters, newsletters, articles, training manuals, videos, etc.) on POPs</p> <p>Undertaking distribution of IEC materials and public sensitization activities (Radio and TV programs, workshops, seminars, etc.)</p>	<p>IEC materials produced</p> <p>Number of IEC materials distributed and sensitization events conducted</p>	9 Years	EPA, MoI	Experts Equipment Finance USD 220,000
<p>Conducting training and education</p> <p>Provide trainings to policy makers, personnel of relevant institutions, scientists and educators</p> <p>Include POPs issues in formal and non-formal education programs</p>	<p>Trainings conducted</p> <p>Inclusion of POPs issues in the syllabus of relevant courses</p>	9 Years	EPA NGOs,	Resource persons Finance logistics USD 250,000

3.3.14 Activity: Effectiveness of Evaluation (Article 16)

Article 16 of the Stockholm Convention provides that the Conference of Parties shall evaluate the effectiveness of the Convention starting four years after the coming into force of the Convention. It also provides that the evaluation shall be conducted on the basis of available scientific, environmental, technical and economic information, including national reports. The CoP expects each party to generate comparable monitoring data on the presence of the chemicals listed in Annex A, B and C as well as their regional and global environmental transport. An action plan is needed to meet this requirement of the Convention.

Goal and Objectives

The overall goal of this action plan is to facilitate the evaluation of the effectiveness of the Stockholm Convention at global level. The specific objectives are:

- Evaluate periodically the effects of the implementation of the Stockholm Convention in Ethiopia on the presence of Annex A, B and C POPs chemicals.
- Submit periodic reports to the Conference of Parties on the effectiveness of the Convention

Table 20: Action Plan for Effectiveness of Evaluation (Article 16)

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Develop system to monitor and evaluate the impacts of the implementation of the Convention in Ethiopia	System developed	1 Year	EPA	Experts USD 10,000
Conduct periodic evaluation on the impacts of the implementation of the Convention	Availability of periodic evaluation reports	20 Years	EPA	Experts Logistics USD 40,000/evaluation

3.3.15 Activity: Reporting

Article 15 of the Stockholm Convention requires a Party to report on the measures it has taken to implement the Convention and on the effectiveness of the measures taken. It also requires a party to provide the Secretariat statistical data on POPs chemicals in the country. Thus, an action plan is required to meet this obligation.

Goal and Objectives

The goal of this action plan is to meet the reporting obligation of the country under the Stockholm Convention. It has the following specific objectives:

- Identify measures taken to implement the Convention;
- Assess the effectiveness of the measures taken
- Collect/compile statistical data on production, import and export of intentionally produced POPs;
- Prepare periodic reports in the format to be decided by the COP

Table 21: Action Plan for Reporting

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Identification and evaluation of measures taken to implement the Convention	Report	6 months	Report	Experts Logistics USD 40,000
Compilation of statistical data on production, import and export of intentionally produced POPs	Statistical data available	3 months	Statistical data available	Experts Logistics USD 3,000
Preparation and submission of a national report to COP	Report submitted	3 months	Report submitted	Experts USD 5,000

3.3.16 Activity: Research, development and monitoring (Article 11)

Article 11 of the Stockholm Convention requires Parties to encourage and/or undertake research, development and monitoring activities pertaining to POPs and, where relevant, to their alternatives and candidate POPs. One of the findings of the preliminary inventory on POPs in Ethiopia is the lack of data on and the absence of systematic monitoring mechanisms of the sources and releases of POPs, levels in human and the environment as well as their health, environmental and socio-economic impacts. Moreover, as the use of DDT for malaria control is continued, there is a pressing need to find alternative to it. Therefore an action plan that addresses these problems is required.

Goal and Objectives

The overall aim of this action plan is to minimize and ultimately eradicate the negative impacts of POPs chemicals by systematically monitoring their sources, levels in human and the environment and impacts and by finding alternatives to them. The specific objectives of the action plan are:

- Establish the sources and releases of POPs into the environment;
- Establish presence and levels of POPs in human and the environment;
- Establish the health, environment and socio-economic impacts of POPs;

Table 22: Action Plan for Research, development and monitoring (Article 11)

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Conduct periodic studies on sources and releases for each category of POPs chemicals-Annex A, B, C	Study reports	15 year	EPA, MOA, MOH, EEPCO, Research and academic Institutions	Experts Logistics USD 300,000
Develop a system and monitor the presence and levels of POPs in human and the environment	System developed	15 Year	EPA, MOA, MOH, EEPCO, Research and academic Institutions	Experts Logistics USD 300,000
Conduct periodic studies on the health, environmental and socio-economic impacts of POPs	Study reports	15 year	EPA, MOA, MOH, EEPCO, Research and academic Institutions	Experts Logistics Equipment USD 500,000

3.3.17 Activity: Technical and Financial Assistance

Since Ethiopia is one of the least developed countries, it lacks the financial and technical capacity to successfully implement this national implementation plan and thereby met its obligation under the Stockholm Convention. Thus, Ethiopia needs to obtain financial and technical assistance from the international community as envisaged in the Convention. Action plan is, thus, required to facilitate and secure financial and technical assistance.

Goal and Objectives

The overall objective of this action plan is secure technical and financial assistance that are required to successfully met the countries obligation under the Stockholm Convention. The specific objectives are:

- Identify financial and technical need
- Identify potential sources for financial and technical assistance
- Prepare proposals and submit requests for assistance

Table 23: Action Plan for Technical and Financial Assistance

Activities	Indicators/outputs	Timeframe	Implementers	Resources Required and Cost
Conduct assessments on the technical and financial assistance needs for each term - short, mid and long term	Technical and financial assistance needs determined	12 Years	EPA	Experts Logistics USD 60,000
Identify available outside funds based on the arrangements established by the Convention and the COP	Potential sources of assistance identified	12 Years	EPA	Experts Logistics USD 30,000
Prepare and submit proposals for funding to identified sources	Submission of proposals	12 Years	EPA	Experts USD 90,000

3.4 DEVELOPMENT AND CAPACITY BUILDING PROPOSALS AND PRIORITIES

The task of development and capacity building proposals to achieve the objectives of the NIP in the Ethiopian context has five major priority components, namely:

- Strengthening the human and institutional capacity for managing POPs chemicals in Ethiopia.
- Developing capacity and capability for the identification, analysis and monitoring of POPs chemicals.
- Developing information and communication system for the management of POPs chemicals.
- Conducting risk assessment of POPs chemicals on human health and the environment.
-

The major goal for implementing the above capacity building proposals is to improve the management of risks to human health and the environment from POPs.

1. STRENGTHENING HUMAN AND INSTITUTIONAL CAPACITY FOR MANAGING POPs CHEMICALS.

I. GOAL

The main goal of this project is to build the appropriate human and institutional capacity for POPs management.

II. OBJECTIVE

The objective of this project component is to strengthen the human and institutional capacity for the management of POPs in Ethiopia so as to improve the management of risks to human health and the environment from POPs.

III. ACTIVITIES

The major activities to be accomplished include:

- Development and issuance of legislation for the management and control of POPs.
- Establishment of an appropriate system for coordination of activities of relevant institution for the management and control of POPs.
- Conducting education and creation of awareness among decision-makers and the general public on the risks posed by POPs and the need to address such issues through the implementation of the NIP.
- Training of staff of relevant institutions in the management and control of POPs chemicals.
- Training of staff in the judiciary system and other law enforcement agencies with the view to appropriate enforcement of POPs legislation.

IV. OUTPUTS

The expected outputs are:

- Policy and legislation for the management and control of POPs will be developed.
- A system for coordination of activities of relevant institutions on POPs will be laid down.
- Awareness among decision-makers and the public at large on POPs issues and the NIP will be created.
- Capacity of relevant institutions for the management and control of POPs will be built.
- Enforcement capacity of the judiciary and law enforcement agencies regarding POPs chemicals will be strengthened.

V. TIMEFRAME

The timeframe for the implementation of this project is proposed to be two years.

VI. BUDGET

The estimated budget for this project is USD 257,000

2. DEVELOPING CAPACITY AND CAPABILITY FOR THE IDENTIFICATION, ANALYSIS, RESEARCH AND MONITORING OF POPS CHEMICALS.

I. GOAL

The main goal of this component is to improve the management of risks to human health and the environment from POPs.

II. OBJECTIVE

The objective of the project is to develop capacity and capability for the identification, analysis and monitoring of POPs in the environment.

III. ACTIVITIES

The major activities envisaged under this proposal are as follows.

- Identify at least two laboratories to be upgraded.
- Procure equipment and other inputs.
- Upgrade physical infrastructure.
- Recruit and train staff.
- Analyze POPs releases into the environment and POPs containing equipment.
- Monitor and assess the health effects of POPs.

IV. OUTPUTS

The expected outputs for the implementation of the above activities are :

- Analytical equipment for analyzing POPs will be acquired.
- Staff required to run laboratories will be trained.
- Levels of POPs in the environment are properly assessed.
- Consumables
- Transportation.

V. TIMEFRAME

The time-frame for implementing this project is proposed to be five years.

VI. Budget

The estimated budget for this project is USD 3,800,000

3. DEVELOPING INFORMATION AND COMMUNICATION SYSTEM FOR THE MANAGEMENT OF POPS

I. GOAL

The main goal of the project is to improve the management of risks to human health and the environment from POPS.

II. OBJECTIVE

The objective of this project is to develop and implement information and communication system for the management of POPS.

III. ACTIVITIES

The main activities to be undertaken include the following:-

- Sensitize relevant stakeholders and conduct information needs assessment.
- Assess public participation and perception on public health and environmental risks of POPS.
- Identify sources of data and information on POPS.
- Establish centers for data management and dissemination on POPS.
- Establish poison information and management centers.
- Develop website for exchange of information.
- Train stakeholders on the operation and management of the information system.
- Hold forums to exchange information and experiences on POPS management.
- Issue periodic publications.

IV. OUTPUTS

The expected outputs for the above-mentioned activities are:-

- National data and information centre on POPs established.
- Communication strategy formulated and implemented.
- Networking among stakeholders at the national and international levels promoted.
- Poison information and management centers established.

V. TIMEFRAME

The timeframe to implement this project is proposed to be two years.

VI. BUDGET

The estimated budget for this project is USD 260,000

4. CONDUCTING RISK ASSESSMENT OF POPs CHEMICALS ON HUMAN HEALTH AND THE ENVIRONMENT.

I. GOAL

The main goal of the project is to protect human health and the environment from the harmful effects of POPs.

II. OBJECTIVE

The objective of the project is to investigate and assess the extent and severity of the health and environmental effects of POPs in Ethiopia.

III. ACTIVITIES

The main activities to be undertaken include the following:

- Compile data on the types, sources and routes of releases of POPs into the environment.
- Identify high-risk groups by carrying out studies through administration of questionnaires.
- Determine the routes of human exposure to POPs.

- Identify cases of POPs poisoning at hospitals in identified risk locations.
- Determine sample size for study.
- Collect and analyze blood and breast milk samples from identified risk groups.
- Conduct health/medical surveillance on the sample population.
- Develop modeling approaches for the assessment of exposure and risk posed by POPs to identified high risk groups.
- Estimate the nature and severity of health effects of POPs on the exposed population.
- Identify opportunities for management interventions required to reduce identified adverse effects and risks to acceptable levels.

IV. OUTPUTS

The expected outputs of the project will include

- Data on the types sources and releases of POPs into the environment collated.
- Data and other gaps in the information available on the health effects of POPs established.
- High risk groups identified and sample population (subjects) determined.
- Levels and trends of POPs in subjects determined.
- Medical surveillance on the sample population to establish a dose-response relationship carried out.
- Nature and severity of the health effects experienced by sample population to POPs exposure assessed.
- Management and preventive interventions required to reduce identified adverse effects and risks to acceptable levels recommended.

V. TIMEFRAME

The timeframe for implementing this project is two years.

VI. BUDGET

The estimated budget for this project is USD 468,600

5. UNDERTAKING SAFE AND ENVIRONMENTALLY SOUND TREATMENT AND DISPOSAL OF POPS AND POPS-LADEN EQUIPMENT AND REMEDIATION OF CONTAMINATED SITES.

I. GOAL

The main goal of the project is to improve the management of risks to human health and the environment from POPs.

II. OBJECTIVE

The objective of the project is to undertake safe and environmentally sound (SES) treatment and disposal of POPs, POPs- laden equipment and remediation of contaminated sites.

III. ACTIVITIES

- Conduct survey of institutional capabilities of EEPCO, industrial enterprises, commercial establishment, municipalities and hospitals for the safe and environmentally sound collection, transportation and storage of POPs wastes and POPs – containing equipment.
- Retool relevant institutions to effectively handle POPs absolute POPs-containing equipment.
- Conduct two workshops at Federal level and four workshops at regional level to sensitize and promote public and private sectors participation in safe and environmentally sound management of POPs.
- Prepare BID documents for treatment and disposal of POPs.

IV. OUTPUTS

The project outputs include the following:-

- Capability of line institutions and for the safe and environmentally sound collection, transportation and storage of POPs enhanced.
- Public and private sector participation in the safe and environmentally sound collection, transportation, storage, treatment and disposal of POPS promoted.

- Facilitate for the safe and environmentally sound storage and disposal of existing POPS pesticide and POPs- containing equipment identified and rehabilitated and /or redesigned.
- Procedures for the safe and environmentally sound treatment and disposal of POPs. Pesticide, PCBs – containing equipment developed.
- Treatment and disposal of existing stockpiles of PCB- containing, POPs Pesticides contacted.

V. TIMEFRAME

The timeframe for implementing this project is five years.

VI. BUDGET

The estimated budget for this project is USD 4,605,000.

3.5. Timetable for NIP Implementation

Table 24: Timetable for NIP Implementation

No	Activities	Implementation Years (2007-2026)																			
		Short-Term					Mid-Term					Long-Term									
		07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	Institutional and regulatory strengthening measures																				
1.1	Establishment of NIP Secretariat																				
1.2	Coordination of the implementation, evaluation and updating of NIP activities																				
1.3	Issuance of legislation																				
1.4	Development and issuance of standards and guidelines																				
1.5	Strengthening the regulatory and enforcement capacity of relevant institutions																				
2	Management of Annex A POPs pesticide																				
2.1	Comprehensive inventory on POPs pesticide																				
2.2	Proper management and handling of stockpiles and wastes of POPs pesticide																				
2.3	Environmentally sound disposal of POPs pesticides, stockpiles and wastes																				
2.4	Assessment and monitoring of the health and environmental impacts of POPs pesticides																				
3	Management of PCBs																				
3.1	Comprehensive inventory on PCBs																				
3.2	Proper management and handling of PCBs in use, stockpiles and wastes																				
3.3	Phasing out of PCBs																				
3.4	Disposal of current PCB stockpiles and wastes																				
3.5	Disposal of PCBs to be removed from equipment in use																				
3.6	Assessment and monitoring of the health and environmental impacts of PCBs																				

4	Management of DDT																			
4.1	Comprehensive inventory on DDT																			
4.2	Proper management and handling of DDT use and DDT stockpiles and wastes																			
4.3	Environmentally sound disposal of DDT stockpiles and wastes																			
4.4	Assessment and monitoring of the health and environmental impacts of DDT																			
4.5	Identification and implementation of alternatives to DDT																			
5	Register for specific exemptions and the continuing need for exemptions																			
5.1	Preparation of a report justifying the continuing use of DDT																			
5.2	Conducting periodic reviews on the continuing need to use DDT																			
6	Measures to reduce releases from unintentional production																			
6.1	Assessment/inventory of current and projected releases of unintentionally produced POPs																			
6.2	Development and implementation of strategies to reduce releases																			
6.3	Assessment and monitoring of the health and environmental impacts																			
6.4	Review of strategies every 5 years																			
7	Identification and remediation of contaminated sites																			
7.1	Identification of contaminated sites																			
7.2	Proper management of contaminated sites																			
7.3	Remediation of contaminated sites																			
8	Information exchange and stakeholder involvement																			
8.1	Establishment of a focal point																			
8.2	Development of information gathering and exchange system																			
8.3	Implementation of information exchange																			

9	Public Awareness, Information and Education																				
9.1	Assessment of level of awareness and information need																				
9.2	Public awareness and sensitization																				
9.3	Training and education																				
10	Effectiveness of Evaluation																				
10.1	Development of criteria to evaluate the impacts of implementation of the Convention																				
10.2	Periodic evaluation of the impacts of the implementation of the Convention																				
11	Reporting																				
11.1	Preparation and submission of a report																				
12	Research, development and monitoring																				
12.1	Conduct periodic studies on sources and releases for each category of POPs chemicals																				
12.2	Develop a system and monitor the presence and levels of POPs in human and the environment																				
12.3	Conduct periodic studies on the health, environmental and socio-economic impacts of POPs																				
13	Technical and financial assistance																				
13.1	Identification of assistance needs and sources																				
13.2	Securing assistance																				

3.6 Cost of NIP Implementation

The cost of implementing the NIP is presented by dividing the cost into short-term (2007-2011), mid-term (2012-2016) and long-term (2017-2026). The total cost for implementing the whole NIP activities over the 20-year period would be USD 53,493,000. The cost of implementing the short-term activities of the NIP is USD 14,308,000, while the cost of implementing the mid-term and long-term action plans is USD 21,935,000 and USD 17,250,000, respectively. The cost of action plans on PCBs, in particular, the cost of substituting existing electrical equipment to phase out PCBs in use, constitutes the major cost of the NIP implementation amounting to about 50% of the total cost. The cost also indicates the amount to be generated from internal sources (mainly government) and to be sought from external sources. The costs to be covered from internal sources are mainly those costs related to activities that can be implemented using the resources of existing government structures like enacting laws and enforcing them.

Table 25: Cost of NIP Implementation

No	Activities	Cost in USD								
		Short term (2007-2011)			Medium Term (2012-2016)			Long Term (2017-2026)		
		Cost in USD	From Internal source	From external source	Cost	Internal source	From external source	Cost	Internal source	From external source
1	Institutional and regulatory strengthening measures	585,000	285,000	300,000	450,000	150,000	300,000	400,000	100,000	300,000
2	Management of POPs pesticides	4,505,000	200,000	4,305,000	1,125,000	125,000	1,000,000	0	0	0
3	Management of PCBs	1,200,000	50,000	1,150,000	12,300,000	100,000	12,200,000	13,150,000	150,000	13,000,000
4	Management of DDT	3,290,000	40,000	2,250,000	2,400,000	0	2,400,000	1,100,000	0	1,100,000
5	Register for specific exemptions and the continuing need for exemptions	30,000	30,000	0	20,000	20,000	0	0	0	0
6	Measures to reduce releases from unintentional production	1,250,000	250,000	1,000,000	1,640,000	200,000	1,440,000	1,700,000	200,000	1,500,000
7	Identification and remediation of	2,130,000	100,000	2,030,000	3,000,000	0	3,000,000	0	0	0

	contaminated sites									
8	Information exchange and stakeholder involvement	370,000	150,000	220,000	400,000	200,000	200,000	400,000	200,000	200,000
19	Public Awareness, Information and Education	390,000	20,000	370,000	100,000	0	100,000	0	0	0
10	Effectiveness of Evaluation	50,000	10,000	40,000	40,000	0	40,000	40,000	0	40,000
11	Reporting	48,000	48,000	0						
12	Research, development and monitoring	400,000	0	400,000	350,000	0	400,000	350,000	0	400,000
13	Technical and financial assistance	60,000	60,000	0	60,000	60,000	0	60,000	60,000	0
Total		14,308,000	1,243,000	13,065,000	21,935,000	855,000	21,080,000	17,250,000	710,000	16,540,000

Annex 1 Records of Stakeholders and Public Participation

A. List of Participants at the Inception Workshop on POPs (22-23 January 2004)

No	Name	Institution
1	Shimelis Fekadu	Federal EPA
2	Ababu Anage	Federal EPA
3	Yigzaw Ayalew	Federal EPA
4	Wondwosen Sintaheyu	Federal EPA
5	Mohammed Ali	Federal EPA
6	Birhanu Solomon	Federal EPA
7	Geremew G/Selassie	Federal EPA
8	Tamene Bekele	Federal EPA
9	Tewodros Mulugeta	Federal EPA
10	Achayelesh Kibru	Federal EPA
11	Ammanuel Malifu	Federal EPA
12	Dagnachew Debru	Federal EPA
13	Solomon Abate	Federal EPA
14	Etsegenet Dagne	Federal EPA
15	Tewodros Bekele	Federal EPA
16	Mohamed Daud	Plant Protection
17	Aklilu Bekele	Ethiopian Customs Authority
18	Hailu Mecha	EWCO
19	Assefa Desta	Ethiopian Health and Nutrition Research Institute
20	Belete Tekiwe	Ministry of Information
21	Dr. Abera Ijigu	Commercial Bank of Ethiopia
22	Ayele Kebede	FFE
23	Bekele Jembere	BSE- Addis Ababa University
24	Aseged Taue	Ethiopian Health and Nutrition Research Institute
25	Ginjo Giya	Christian Relief and Development Association
26	Yohannes G/Eyesus	National Meteorology Service Agency
27	Getaneh Gebre	Addis Abeba EPA
28	Yalem Birhan Abraha	Chemical Society of Ethiopia
29	Girma Demissie	Ethiopian Electric Power Corporation
30	Tezera Taye	Oromia Reporter
31	Fisseha Tesfu	Ministry of Foreign Affairs
32	Andualem Ayalew	Chemical Society of Ethiopia
33	Kifle Lemma	Consultant
34	Gufla Fitiwe	ENNMS
35	Kinfe Yemerou	Akaki Metal
36	Sue Edwards	Institute for Sustainable Development
37	Yemane Gedamu	Federal EPA
38	Molalign Wakjira	Federal EPA
39	Tadesse G/Medhin	Ethiopian Agricultural Research Organization
40	Sintayehu Alemu	Drug Administration and Control Authority

41	Sileshi Taye	Ministry of Health
42	Melaku Mengistu	Ethiopian Cleaner Production Center
43	Zerihun Gezahegn	Ministry of Labor
44	Teketsel Tsige	Ministry of Mines
45	Wario Gelgalo	PES
46	Dr. Nigussie Megersa	Addis Ababa University
47	Endale Gorfu	Ethiopian Energy Development
48	Abiy Alemu	Safe Environment Group
49	Dr. Alemayehu Wodajeneh	FAO
50	Biratu Oljira	Ministry of Agriculture
51	Hadera G/Medhin	Safe Environment Group
52	Abiy Girma	Ministry of Water Resources
53	Worku Ayele	Ministry of Finance and Economic Development
54	Muhie Endrie	Quality and Standards Authority
55	Berhanu Kibret	Consultant
56	Eyasu Tekie	Ethiopian Science and Technology Commission
57	Semret Mezgebi	UNIDO
58	Filseta Birhane	UNIDO
59	Abdinasir Mohamed	BoFED, Jigiga
60	Wondwosen Gizaw	EPPS.C
61	Muhedin Ahmend	BoFED, Harari
62	Belachew Bunarie	Adamitulu Pesticide S.Co
63	Abdu Mohammed	BoFED, Dire Dawa
64	Mesfin Kebede	Benishangul, EPA
65	Admassu Molla	Amahara Environmental P.L.A
66	Alemayehu Geleta	Oromia Environmental Protection
67	Brook Lemma	Alemaya University
68	Alay Hagos	Debu University
69	Gashaw Abate	Federal EPA
70	Gosaye Mengiste	Ministry of Information
71	Shewangizaw Kifle	EEA
72	Berhanu Genet	ENDA Ethiopia
73	Tensaye W/Mariam	Ethiopian Customs Authority
74	Alemayhu Woldeamanuel	Ministry of Agriculture
75	Hailu Bekele	GETU
76	Habekristos Beyene	Central Statistics Authority
77	Beletu Abate	Ethiopian News Agency
78	Imeru Tamrat	Consultant
79	Ahmed Kedir	Walta Information Center
80	Dr. Nebiyeleul Gessese	UNIDO
81	Siyoum Semu	UNIDO
82	Birhanu Gobena	UNIDO
83	Mohammed Ali	Federal EPA

B. List of Participants at the Workshop on Preliminary Inventory and Assessment of POPs (16-17 June 2005)

No	Name	Institution
1	Muhuye Endrie	Quality and Standards Authority
2	Mehari Wondimagegn	Federal EPA
3	Tayech Ourgicho	Federal EPA
4	Mamush Teka	Commercial Bank of Ethiopia
5	Amha Abay	ECUA??
6	Sintayehu Alemu	Drug Administration and Control Authority
7	Wondwosen Sintayehu	Federal EPA
8	Siraj Bekelie	Oromia Environmental Protection Bureau
9	Gebresilassie G/Amlak	Federal EPA
10	Alemayehu Takele	Ethiopian News Agency
11	W/Birhan Kuma	Oromia Health Bureau
12	Tewodros Nega	Federal EPA
13	Abdi Hakim Mohamed	Somali Region Environment Protection Bureau
14	Dress Bizualem	Tigray Region EPA
15	Alemayehu Getachew	Federal Ministry of Health
16	Zerihun Gezahegn	Ministry of Labour and Social Affairs
17	Dr. Abera Kumie	Addis Ababa University
18	Sileshi Taye	Ministry of Health
19	Belachew Bunarie	Adamitulu Pesticide Production Sh. Co.
20	Woudeneh Assefa	Oromia Health Bureau
21	Yeyesuswork Bekele	Federal EPA
22	Tesfaye Ayele	Federal EPA
23	Abdu Mohamed	Diredawa EPA
24	Getnet Hunegnaw	Amhara Region Environmental Protection, Land Use and Administration Authority
25	Biniyam Solomon	Federal EPA
26	Aster Tefera	EWNHS
27	Feleke Gezahegn	Ethiopian Seed Enterprise
28	Delelegn Woyessa	BSE
29	Melaku Mengistu	Ethiopian Cleaner Production Center
30	Kinfemichael Yemerou	Akaki Metal Products
31	Nuwala Muktar	Harar EPA
32	Zerfie Mersha	Addis Abeba Region EPA
33	Dr. Aynalem Abebe	Federal EPA
34	Yalemberhan Abraha	Chemical Society of Ethiopia
35	Gizaw Woldeyohannes	Burayu Brick Factory
36	Shewangizaw Kifle	Ethiopian Electricity Agency
37	Yohannes Yoseph	Ethiopian Electric Power Corporation
38	Abdulwahib Idris	Clean and Green Addis Ababa Society
39	Kaleab Aismaw	ATF

41	Berhanu Wondimu	AABGSc
42	Tekle Woldegerima	Addis Ababa EPA
43	Birhanu Solomon	Federal EPA
44	Abera Assefa	SBPD Agency
45	Teketel Tsige	Ministry of Mines
46	Abiy Girma	Ministry of Water Resources
47	Fikreyohannes Yadessa	Addis Ababa City Roads Authority
48	Libawit H/Michael	Federal EPA
49	Samson John	Ministry of Foreign Affairs
50	Wario Gulgalo	PPESA
51	Kaleyesus Bekele	MCC
52	Tassisa Kaba	Addis Ababa University
53	Tassene Negash	TNT Chemie En.
54	Mohammed Ali	Federal EPA
55	Zereu Ghirmay	Federal EPA

C. List of Participants at the Validation Workshop on POPs Priority Issues (23-24 February 2006)

No	Name	Institution
1	Zekarias Fante	Addis Ababa Water and Sewerage Authority
2	Aynalem Abebe	Federal EPA
3	Addisu Meshesha	Ethiopia Radio
4	Belachew Bunarie	Adamitulu Pesticide Production Sh. Co.
5	Feleke Gezahegn	Ethiopian Seed Enterprise
6	Yazew Teferi	Federal EPA
7	Muhiye Endris	Quality and Standard Authority of Ethiopia
8	Abdu Mohmmmed	Dire Dawa Environmental Protection Agency
9	Ayele Kebede	Forum for Environment
10	Jemal Seid	Afar Agriculture, Natural Resources and Environmental Protection Office
11	Lishan Kenea	FESA
12	Woldeberhan Kuma	Southern NNP Regional EPA
13	Mekonen Workneh	Ethiopian Customs Authority
14	Dr. Abdikadir Risku	Ministry of Foreign Affairs
15	Dintayehu Alemu	DACA
16	Tadesse Amera	Institute of Sustainable Development
17	Mehari Wondmaghegn	Federal EPA
18	Assefa Allaho	Adamitulu Pesticide Production Sh. Co.
19	Yesuswork Bekele	Federal EPA
20	Amanu Legesse	Agricultural Institute
21	Wagnew Tassew	Ethiopia Health and Nutrition Research Institute
22	Zeru Girmay	Federal EPA
23	Kidane Gizaw	Ethiopian Electric Power Corporation
24	Tesfaye Ayele	Federal EPA
25	Zelalem Tezera	Federal EPA
26	Zerfie Mersha	Addis Ababa EPA
27	Kemal Mohammed	Amhara Environmental Protection Agency
28	Zenebe Fikere	Central Statistics Authority
29	Mesfin Kebede	Benshangul Environmental Protection Agency
30	Ashenafi Dereje	Ministry of Information
31	Solomon Kebede	Ministry of Mines and Energy
32	Kassahun Shiferraw	Dire Dawa EPA
33	Eshetu Ahmed	Ethiopian Institute of Agricultural Research
34	Tesfye Woldeyes	Federal EPA
35	Alemayehu Geleta	Oromia Environmental Protection Office
36	Demis Wondaferaw	Confederation of Ethiopian Trade Unions
37	Meskir Tesfye	Federal EPA

38	Tedros Nega	Federal EPA
39	Dereje G/Michael	Institute of Sustainable Development
40	Melaku Mengistu	Ethiopian Cleaner Production Center
41	Solomon Demissie	Ministry of Labour and Social Affairs
42	Abera Assefa	Sanitation, Beautification and Parks Development Agency
43	Belayneh Kebede	Federal EPA
44	Ababayew Wassie	Oromia Health Bureau
45	Fikreyohannes Yadessa	Addis Ababa City Roads Authority
46	Alemayehu Getachew	Federal Ministry of Health
47	Samson John	Ministry of Foreign Affairs
48	Mohammed Salah	Walta Information Center
49	Oman Agwa	Gambella EPA
50	Abebe Dirriba	Oromia Agriculture and Rural Development Bureau
51	Lalisa Wereti	Transport Authority
52	Hadera Medhin	Safe Environment Association
53	Abiye Aleme	Safe Environment Association
54	Yonas Tekelemaraim	Federal EPA
55	Haddish Berhe	Tigray Environmental Protection Agency
56	Selamawit Tesaye	Commercial Bank of Ethiopia
57	Musa Hassen	Sanitation, Beautification and Parks Development Agency
58	G/Selassie G/Amlak	Federal EPA
59	Berhanu Kebret	Consultant
60	Melese Tafese	Federal EPA
61	Rahel Abebe	Ethiopian News Agency
62	Tayech Ourgicho	Federal EPA
63	Samuel Assefa	Oromyia Agricultural Bureau
64	Mohammed Ali	Federal EPA

D. List of Participants at the Validation Workshop of the Draft POPs National Implementation Plan (20-21 July 2006).

	Name of participant	Institution
1	Diress Bizualem	Tigray - EPLUA
2.	Rahima Hassen	Somali Region Environment Protection Bureau
3.	Askal Ayalew	Ministry of Transport and Communication
4.	Fikreyohannes Yadessa	AACRA
5.	Emanuel Malifu	FEPA
6.	Hadera Gebremedhin	SEA
7.	Melese Tafese	FEPA
8.	Oman Agwa	Gambela Region EPA
9.	Mohammed Dawd	Ambo Plant Protection Research Center
8.	Yeyesuswork Bekele	FEPA
9.	Feleke Gezahegn	Ethiopian Customs Authority
10.	Sintayehu Alemu	DACA
11.	Tesfaye Emiru	MOWR
12.	Demissie Gizaw	Clean and Green Addis Ababa Society
13.	Mussa Hassan	Addis Ababa Sanitation and Beautification Agency
14.	Habtamu Wodajo	FEPA
15.	Zegaye Haile	FMOA
16.	Begna Bekele	Oromia Health Bureau
17.	Aster Tefera	EWNHS
18.	Meskir Tesfaye	FEPA
19.	Tsehay Azage	MOARD
20.	Samuel Assefa	
21.	Shewaye Deribe	FEPA
22.	Melaku Mengistu	ECPC
23.	Dereje G/michael	ISD
24.	Yalembirhan Abraha	CSE
25.	Yonas T/Michael	FEPA
26.	Dr. Aynalem Abebe	FEPA
27.	Feleke Gezahegne	ESE
28.	Tekle W.Gerima	AAEPA
29.	Shimelis Tizazu	EHHRI
30.	Moges Gebreamlak	QSAE
31.	Admassu Molla	Amhara EPLAUA
32.	Woldebirhan Kuma	SNNPRS EPA
33.	Tesfaye Woldeyes	FEPA
34.	Yimer Ali	

	Name of participant	Institution
35.	Yohannes Yosef	EEPCO
36.	Selhadin Tewfik	Harari EPA
37.	Abdu Mohammed	Diredawa EPA
38.	Mesfin Kebede	BGRS - EPLAUA
39.	Zerihun Gezahegne	MOLSA
40.	Gebreslassie G/amlak	FEPA
41.	Lishan Kenea	PESA
42.	Gefiye Ashebir	OEPO
43.	Demis Wondaferu	CETU
44.	Belachew Bunarie	Adamitulu Pesticides P. Sh. Co.
45.	Teshale Belihu	
46.	Mohammed Ali	FEPA
47.	Zereu Girmay	FEPA