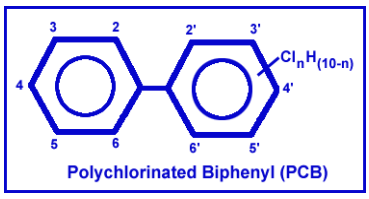
KINGDOM OF LESOTHO

Enabling Activities to Facilitate Early Action on the Implementation of the Stockholm

Convention on Persistent Organic Pollutants (POPs)

NATIONAL IMPLEMENTATION PLAN



MAY 2005

LESOTHO

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MTEC/NES/CONV/12 **3rd September 2007**

Executive Secretary
Secretariat for the Stockholm Convention
United Nations Environment Programme
11 - 13 chemin des Aŕemones
CH-1219 Châtelaine
Switzerland

Dear Sir/Madam,

Re: Submission of Lesotho's National Implementation Plan (NIP) on Persistent Organic Pollutants

We wish to submit a document on the captioned subject matter. The document was developed under the general support from Global Environment Facility as the implementing agency and United Nations Industrial Development Organisation as the executing agency.

Lesotho as a signatory to Stockholm Convention on Persistent Organic Pollutants (POPs) is committed in ensuring compliance with the requirements of the Convention. However, often technical and financial limitations are encountered in executing POPs related activities. We therefore, submit our NIP for record purposes and funding consideration.

Thanking you in advance for your continued support.

Yours faithfully,

M. Malie (Mrs.)
Principal Secretary

Report Summary Sheet

Client:	**Client Contact Person(s):**
Ministry of Tourism, Environment and Culture P. O. Box 10993 Maseru, 100 Lesotho	Mr. Michael Lehlohonolo Lesemane - National Project Coordinator [POPs] Mr. S. M. Damane - Director Department of Environment.

Title of Report:

NATIONAL IMPLEMENTATION PLAN FOR THE STOCKHOLM CONVENTION

Summary:
This is a compilation of national objectives and action plans aimed at capacitating Lesotho towards implementation and meeting the obligations of the Stockholm Convention.

Keywords:
Persistent Organic Pollutants, Stockholm Convention, National Implementation Plan

Work Carried out By: Synergy Holdings (Pty) Ltd

Rev No	Issue Date	Reason for Issue	Compiled By	Reviewed By
3	September, 2005	Client Request, per contract	Mr. L. Molapo Dr. K. Khalema Mr. M. Thekiso Mr. T. Tšasanyane Mr. L. Ramatekoa	UNIDO & National Workshop

Foreword

The National Implementation Plan (NIP) on Persistent Organic Pollutants (POPs) for the Kingdom of Lesotho has been developed and produced to become a nationally owned working document. It was developed within the project entitled, "*Enabling Activities to Facilitate Early Action on the Implementation of the Stockholm Convention"* on Persistent Organic Pollutants.

The document has been developed through an interactive process by all relevant stakeholders in the country to encourage dialogue and multi-sectoral collaboration among the technocrats and decision-makers on issues related to Persistent Organic Pollutants in Lesotho.

Persistent Organic Pollutants are synthetic chemical substances that pose toxic properties to humans, animals and environment. Their descriptions are given in the subsequent sections, but briefly and concisely in the executive summary.

The purpose of the document is to set the groundwork for policy and implementation of initiatives towards sound management of Toxic and Hazardous substances. It should not be viewed as a definitive document or definitive statement by the authors or its producers on matters related to Persistent Organic Pollutants that are specific to Lesotho, but rather as a living document that will be reviewed from time to time as more information becomes available.

A broad spectrum of officers, mostly having a sound background in the field of health and environmental sciences have played a key role in writing, commencing, and shaping the contents of this document. The largest proportion of these people are in fact members of established committees whose responsibilities are to advise on, in a nutshell the regulation and use of all chemical substances (Chemical Management Committee, CheMaC), and the other that is responsible for all issues related to pollution control and waste management (Committee on Waste Management, COWMAN. The Department of Environment, formerly the National Environment Secretariat of the ministry of Tourism, Environment and Culture is the coordinating department/body for Persistent Organic Pollutant activities.

It should be borne in mind that all the activities that have been undertaken over months of extensive exercise through good planning procedures to comply with the obligations of the Convention are meant to help Lesotho to resolve the problems of detrimental effects that are caused by Persistent Organic Pollutants. The Government has, as a signal to embracing the support given by international partners/organisations committed itself to becoming a party to the Stockholm Convention and will therefore work hard to comply with its provisions.

A safe and healthy environment is central and directly linked to the efficiency of any nation. In striving to improve our country's competitiveness in the global village, we must therefore ensure effective institutionalisation of sound environmental protection and management systems.

The goal will be efficiently and effectively reached only if every citizen has the right attitude and take full responsibility to practise proper behaviour towards maintaining an environment free of Persistent Organic Pollutants. It follows that rigorous efforts are needed to create awareness and impart with efficacy, the necessary knowledge to the community at large.

Honourable Ms Lebohang Ntsinyi
Minister of Tourism, Environment and Culture

Abbreviations and Acronyms

AIDS	:	Acquired Immune Deficiency Syndrome
BATs	:	Best Available Techniques
BEPs	:	Best Environmental Practices
CEDAMA	:	Committee on Environmental Data Management
CFCs	:	Chlorofluorocarbons
CheMaC	:	Chemical Management Committee
COWMAN	:	Committee on Waste Management
CSIR	:	Center for Scientific and Industrial Research
DANCED	:	Danish Cooperation for Environment and Development
DDT	:	Dichloro Diphenyl Trichloroethane
DRWS	:	Department of Rural Water Supply
DWA	:	Department of Water Affairs
EIA	:	Environmental Impact Assessment
FAO	:	Food and Agriculture Organisation
GDP	:	Gross Domestic Product
GEF	:	Global Environment Facility
GHGs	:	Green House Gases
GMPs	:	Good Manufacturing Practices
GNP	:	Gross National Product
GOL	:	Government of Lesotho
HCB	:	Hexa Chloro Benzene
HCW	:	Health Care Waste
HIV	:	Human Immuno Virus
ICCS	:	International Conference on Chemical Safety
IFCS	:	Intergovernmental Forum on Chemicals Safety
IMF	:	International Monetary Fund
JPOI	:	Johannesburg Plan of Implementation
LCCI	:	Lesotho Chamber of Commerce and Industries
LCN	:	Lesotho Council of Non-Governmental Organisations
LCO	:	Lesotho Consumer Organisation
LDC	:	Least Developed Country
LEC	:	Lesotho Electricity Corporation
LHDA	:	Lesotho Highlands Development Authority
LNDC	:	Lesotho National Development Corporation
LPG	:	Liquid Petroleum Gas
MCC	:	Maseru City Council
MDG	:	Millennium Development Goals
MSDS	:	Material Safety Data Sheet
MTEC	:	Ministry of Tourism, Environment and Culture
MTICM	:	Ministry of Trade and Industry, Cooperatives and Marketing
NDSC	:	National Desertification Steering Committee
NDSO	:	National Drugs Service Organization
NEP	:	National Environment Policy
NES-		National Environment Secretariat
NIP-		National Implementation Plan
NMR	:	Nuclear Magnetic Resonance

NUL	:	National University of Lesotho
ODS	:	Ozone Depleting Substances
ONAN	:	Oil Natural Air Natural
PCBs	:	Poly Chlorinated Biphenyls
PCDD	:	Poly Chlorinated Dibenzo Dioxin
PCDF	:	Poly Chlorinated Dibenzo Furan
PELUM	:	Participatory Ecological Land Use Management
PIC	:	Prior Informed Consent
POPs	:	Persistent Organic Pollutants
PRS	:	Poverty Reduction Strategy
PTS	:	Persistent Toxic Substances
RSA	:	Republic of South Africa
SACU	:	Southern African Customs Union
SADC	:	Southern African Development Community
SAICM	:	Strategic Approach to International Chemicals Management
SuDTeC	:	Sustainable Development Technical Committee
TEQ	:	Toxic Equivalent
UNDP	:	United Nations Development Programme
UNEP	:	United Nations Environment Programme
UNIDO	:	United Nations Industrial Organisation
USEPA	:	United States Environment Protection Agency
WASA	:	Water and Sewerage Authority
WHO	:	World Health Organisations

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Executive summary

Persistent Organic Pollutants (POPs) are synthetic chemical substances that pose toxic properties to humans and animals, are bio-accumulative in organisms through the food chains, and get transported over long-range distances from the points of their release through various environmental media such as air, water and migratory species. Their occurrence in the environment lasts for a considerable length of time. They last because they resist photolytic, chemical and biological degradation.
Persistent Organic Pollutants concentrate in fatty tissue of living organisms, and thus their contents increase in a process of bioaccumulation and bio-magnification. These classes of compounds are highly toxic and cause an array of adverse effects such as cancer and birth defects to both humans and animals.
Many of the POPs have found wide use as pesticides to protect plants against plants diseases and vector-borne diseases. Some are used as heat resistant dielectrics in electrical equipment such as transformers and capacitors. Dioxins and Furans are a category of POPs that are produced as by-products of incomplete combustion and chemical processes.
Because of the toxicity, persistence and distributive capacity of POPs, their strict management towards total elimination is desirable. To this end, an international cooperation and intervention is a prerogative of all nations.
Countries of the world have realized the importance and need of sound management of chemicals in general, with the aim of protecting human health and environment. The management has taken the form of various international and regional instruments, principles, guidelines and codes of ethics. Some of the pertinent international fora, initiatives and conventions include:
Lesotho became a party to the Stockholm Convention in January, 2002, In addition to her membership to Stockholm Convention, she is also party to Basel Convention and Montreal Protocol and is in the process to acceding to Rotterdam convention.
Article 7 of the Stockholm Convention states:
"1. Each Party shall:
(a) Develop and endeavour to implement a plan for the implementation of its obligations under this Convention;
(b) Transmit its implementation plan to the Conference of the Parties within two years of the date on which this Convention enters into force for it; and
(c) Review and update, as appropriate, its implementation plan on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.

In response to this article, the country started by collecting baseline data which shows the status of POPs in the country. The findings of the inventories are discussed below:
ANNEX A Part I and Annex B Chemicals
The survey of POPs pesticides during the inventory, phase of the project, was carried out throughout the whole country to cover all ten administrative districts. Some of the POPs pesticides have been used in the country before the 90s although there is no clear record of their discontinued use.
The main stakeholders in the use of POPs pesticides were identified as two main groups; farmers and suppliers. Each group consisted of a number of different stakeholders for example farmers included commercial and subsistence farmers, group of farmers (e.g. cooperatives and associations), missions, schools and institutions. Suppliers included individuals such as street vendors, retail stores,

agrochemical shops, Non-Governmental Organizations, the Ministry of Agriculture and other line ministries (e.g. Health and Finance).

According to the study, frequently used pesticides fall under the Pyrethroid and Organophosphate groups. Organochlorines constituted a very small percentage of pesticides employed in the country although thiodan (endosulfan) alone was employed by majority of respondents. According to their responses it is possible that farmers are not using POPs pesticides although many farmers did not know names of the pesticides they were using thus complicating the assessment. However, majority were not even familiar with POPs pesticides except DDT, which they were generally clear that they stopped using in the 70's. Other than DDT the other persistent toxic pesticide recorded was obsolete 2,4,5 T which is believed to be contaminated with Dioxins.

In addition to lack of knowledge about POPs pesticides and their potential negative effects farmers and suppliers were not fully aware of the dangers associated with pesticides. Thus a lot of training is needed country-wide to raise awareness of stakeholders about pesticides as a whole and on POPs pesticides in particular. Although the extension service is present, the study shows that there is insufficient effort about Plant Protection services (including pesticide use and handling) especially in the rural areas. National capacity building is also needed at other levels (such as institutions of higher learning, research, etc.) for the POPs identification and analysis.

Lack of regulatory framework in the country is the main problem that needs immediate attention, as there is no control at all on pesticides. Not only will enactment of the law pertaining to chemicals be useful for controlling importation of POPs pesticide but it will also help monitoring of pesticides such that issues of accumulation of obsolete pesticides are avoided as well as addressing the main problem of pesticide disposal, which is still a major challenge in the country.

DDT was used as a broad spectrum pesticide in the country. It was used for agricultural purposes as well as a pesticide in public health. In agriculture it was used on almost all crops for control of any pest in the country (FAO 1974). It was also used on livestock for control of ectoparasites especially on cattle. Although its use or records of its existence were not available from the livestock staff it was admittedly used for that purpose in as far back as the '70's. For crop protection its use has been documented in some old agricultural pamphlets and guidelines (Anonymous -). Records indicating its use in the past were available at the Plant Protection store of Agricultural Research and it was last recorded in 1984 with amounts not exceeding 50kg.

ANNEX A Part II Chemicals

The PCB Task Team covered all the districts of the country in their investigations. In all of the districts the work covered both pole mounted and ground transformers.

The year of manufacture was used as the main criterion when identifying transformers that are likely to contain PCBs. In this regard, the Task Team assumed that any transformer that was manufactured in 1960s to 1989 was a suspect. In addition to this, all transformers which, did not have name plates or had insufficient information were also treated as suspects. Another group of transformers that was treated as suspects were those which have been donated to LEC by the development partners.

A total of about 1175 transformers were inventoried. Those which manufactured during the period 1960s-1989 were about 379, four hundred and sixty four (464) transformers were produced in 1990-1999, and 272 transformers were manufactured

between 2000 and 2003. The region which had the highest number of old transformers (1960s-1969) is Maseru with 12 transformers that were manufactured within that period. Sixty (60) transformers did not have either dates of manufacture nor name plates, with some of them being very old. As for ownership of transformers, the highest number of transformers in the country belongs to the Lesotho Electricity Corporation (LEC). Other role players are the Lesotho National Development Corporation (LNDC), the Lesotho Highlands Development Authority (LHDA) and a limited number of individuals. The Team also noted that the type of cooling for almost all transformers in the country is "Oil Natural Air Natural" (ONAN).

On the basis of the collected data, the weights of suspects from Mohales Hoek, Mountain, Maseru, Leribe regions are 35,348kg, 34,049kg, 319,884kg and 245,169kg respectively, thus making a total weight of about 634,450kg(634 tons). However, when estimates for Mohales Hoek region and Thaba-Tseka Town and neighbouring villages are included, it becomes **723,450kg**.

Risk assessment of contaminated sites was also carried out. In this regard, the issues that were considered to be of utmost importance were human activities in the immediate environment of the transformer, distance of a transformer from a sensitive medium e.g. water course, wetland, etc. Since the location or activities in the vicinity of a transformer also have a bearing on the risk, the Task Team also looked into other aspects which are potential threats to some of the transformers. These include fire hazards, stability of the area, dumping of waste, etc. the high risk transformers will be targeted for removal during implementation phase of the NIP.

According to the results, leakage from transformers is the most serious threat to human health and environment. The situation can further be aggravated by unstable platforms which may in turn collapse and release oil.

ANNEX C Chemicals

On the basis of the "Standardized Toolkit for Identification and Quantification of Dioxins and Furan Releases", the main categories were identified, which are relevant to Lesotho. Out of the 10 categories, 9 categories were deemed existent in the country; these excluded Ferrous and Non-Ferrous Metal Production. It was further realized that the burning of waste in many areas is regarded as incineration, which in real technical terms it is not. However, due to lack of another category, the process of burning, particularly medical waste has been treated as incineration. All hospitals in the country were found to have medium technology incinerators, all of which are either out of order or not functioning in a normal way. This has lead to the burning of medical waste in an incomplete combustion process which is even a worse producer of Dioxins and Furans.

The category of Power Generation and Heating was considered only as far as household heating and cooking is concerned, and here statistical data from demographic analyses were used to quantify amounts of fuel consumed, hence the emission rates of dioxins and furans.

Transport category was dealt with in two ways, namely, motor vehicle counts, as per the registers of the traffic departments, and through compiled statistical data on total imports of hydrocarbon fuels. Activities in the Production of Mineral Products are quiet low, considering that it only applies to Brick production and Asphalt mixing.

Regarding uncontrolled combustion processes, there is a serious problem of quantification as it was not possible to determine the frequency of burning. This deals with biomass burning as well as burning of waste, both of which are evidently common in Lesotho. The best option seemed to be a statistical estimation based on probabilistic aspects.

Production of chemicals is non-existent in the country. However, the use of chemicals is applicable. This category is therefore considered only in so far as the use of chemicals and consumer goods is concerned. The subcategory deals with textile production since Petroleum industry is covered in transport. In this regard, customs records for a full year export of textile were used as the basis.
There are of course other diverse activities, which are considered under miscellaneous. Regarding this category, the crematorium is not yet in operation, but there are dry cleaners and a lot of tobacco smoking. Emission from biomass has also been considered, and the drying of biomass was extrapolated from the household-heating category.
Under the category of Disposal, landfills and waste dumps, capacities were estimated on daily basis over a period of a month in order to establish mean activity. As part of the study, it was noted that there exists a number of illegal dumpsites, some of which may have been missed, and this encompasses open water dumping as well as composting. Sewage treatment activity calculations were based on the estimates of generated sewage as adopted by Water and Sewage Authority (WASA). The estimated amount of sewage generated is based on the total water consumption.
In all areas visited where activities existed, the extent of contamination, as well as the capacity to manage the activity was used as the basis of proclaiming such areas as hotspots. In as far as by-products are concerned; this was restricted to dumps of wastes/residue from all categories mentioned above.
The total by-products emissions for Lesotho are estimated at 292.3 g-TEQ/a in air, 149.1 g-TEQ in waters, 2.1 g-TEQ/a on products and 1264.6 g-TEQ as residues, while emissions on land are negligible. Release from products is far negligible, and represents about 0.12% of the total inventories sources. On the other hand, the bigger portion is contributed by residues that are left after burning waste at illegal and uncontrolled dumping sites.
The dioxins and furans formed through various processes escape into the environment through different pathways/media namely: air, land and water. The escape into the air is brought about by combustion and high temperature thermal process, whereas on land it occurs by adsorption, absorption and leaching on or into the soil. The introduction of dioxins and furans to water could happen in a number of ways. This includes discharge of effluent or contamination with leachate and chemicals containing dioxins and furans. Of the three media, air is the most affected by these releases followed by water and then land. This can be explained by indicating that a lot of waste is burnt due to poor waste management system resulting in gaseous emissions. With water in the second spot, the contaminants are introduced through effluent from sewage treatment works, leachate from waste disposal sites all of which are operated in an inefficient manner. The land receives little pollution partly because Lesotho does not practice massive organic farming whereby sludge is used to condition the soil.
From the inventories, it was evident that unintentional release of dioxins and furans, by main category, is dominated by waste disposal or landfilling, which is followed by uncontrolled combustion. The rest produce insignificant releases. From this analysis, it is a requisite that this document, the National Implementation Plan for Management of POPs, should address dumpsites and landfills at the highest priority. It is therefore conclusive that dumpsites, landfills and
Although the inventories have not covered HCB, it is a well known fact that there are no industrial activities/ processes in the country which use HCB.

The standard toolkit does not include estimates for PCBs and as such the inventories have not included unintentional production of PCBs. However, the actions that will be taken to address dioxins and furans will at the same time reduce PCB emissions.

Legislation

According to the report by chemical legislation, Lesotho does not have a legislation dealing specifically with the management of chemicals and pesticides POPs included, There are however, a few pieces of legislation, which generally touch on dangerous substances and hazardous chemicals. The laws that exist are fragmented and not specific to chemicals. These laws which are administered by different Government Ministries and Departments are as follows:

Public Awareness

The survey results show that most people are aware of the dangers of pesticides even though they do not use protective clothing, maybe because it is unavailable or expensive. the disposal of containers on the other hand was seen to be a problem as most farmers dumped in rivers thus polluting water downstream or buried thus polluting underground water resources. The public also acknowledged Incinerators and transformers as problematic though the level of understanding of problems was low.

In her endeavours to undertake early actions, this document is developed as a living document that will guide all sectors towards elimination of POPs in the country. The overall goal of NIP is to provide the road map in order to protect the health of Basotho and environment from harmful effects of POPs and PTSs. Therefore the Government of Lesotho through its competent authority commits itself to providing active leadership and support in the development and maintenance of appropriate procedures and measures to prevent or eliminate use, stockpiles, and wastes of POPs and to reduce unintentional releases of POPs in the environment.

Lesotho does not have a specific legislation dealing with the management of chemicals and pesticides, specifically persistent organic pollutants substances. There are however, a few pieces of legislation, which generally touch on dangerous substances and hazardous substances. The laws that exist are fragmented and not specific to chemicals.

The country is further incapacitated in terms of financial requirements to meet the infrastructural developments and human resource base to undertake some of the requirements of the convention.

The following Priority areas were identified and validated through a consultative workshop of all stakeholders as part of the NIP development.

1. Integrate management of POPs and chemicals in national socio-economic development programmes.
2. Increase awareness and education of Basotho communities on the effects of POPs on health and environment.
3. Develop policy framework and legal instruments for effective management of POPs and PTS.
4. Develop and implement effective waste disposal and management systems at local and national level.
5. Improve scientific knowledge base and skills in POPs management, particularly from lower educational levels.
6. Develop and implement sustainable resources mobilization strategies for effective programme implementation and infrastructure development.
7. Develop and implement monitoring and evaluation tools and indicators for

assessing POPs impacts on health environment and socio-economic activities.
8. Establish information systems and database of POPs generation, use and contaminated sites.

These are the encompassing objectives set in order to enable the country to address POPs issues in a very sustainable way. All action plans are directed towards achievement of these goals.

In this document there is a section on action plans and strategies. The subsection on Activities and action plans covers seventeen intervention areas as outlined in the guidance document. There are three major categories of Persistent Organic Pollutants identified for purposes of this document, namely, Annex A Part I and Annex B Chemicals (pesticides and DDT), Annex A Part II Chemicals (Polychlorinated Biphenyls) and Annex C Chemicals/ unintentional POPs (Hexaclorobenzene, PCBs, Dioxins and Furans). This section therefore outlines all relevant intervention areas under each of these categories. It should be noted that there are several cross cutting issues among all these categories, implementation of which becomes blanket, in terms of addressing POPs issues. However, each category has been dealt with independently so as to cover all pertinent issues thereof. Such cross cutting issues include Policies and Legislation, Public awareness and education, Information exchange as well as reporting. In terms of overall implementation, the time frame (implementation schedule) indicates all those overlaps.

The total cost of implementing the NIP is as stipulated below:

Category	**Resource Requirement in Maluti (M)**		**Potential Source of Funding**	**Alternate Source of Funding**
	Baseline	**Incremental**		
Annex A Chemicals	1,492,167.00	1,938,490.00	GOL, GEF	UNEP, UNITAR, UNDP
Annex A Part B Chemicals	3,567,150.00	106,771,300.00	GOL, LEC, GEF	UNEP, UNITAR, UNDP
Annex C Chemicals	14,400,900.00	325,292,950.00	GOL, GEF, WB,	UNEP, UNITAR, UNDP
Totals	19,460,217.00	434,022,720.00		Other dev. partners

The required funds will go towards among others: development of relevant legislative frameworks, establishment of appropriate infrastructure, capacity building, replacement of contaminated equipment and cleaning up of contaminated sites.

The time required to implement the NIP ranges from a few months to about 18 years with the phase out of PCB containing equipment being one of the activities that will take longest period.

1. Introduction

Persistent Organic Pollutants (POPs) are synthetic chemical substances that pose toxic properties to humans and animals, are bio-accumulative in organisms through the food chains, and get transported over long-range distances from the points of their release through various environmental media such as air, water and migratory species. Their occurrence in the environment lasts for a considerable length of time. They last because they resist photolytic, chemical and biological degradation.

Persistent Organic Pollutants concentrate in fatty tissue of living organisms, and thus their contents increase in a process of bioaccumulation and bio-magnification. These classes of compounds are highly toxic and cause an array of adverse effects such as cancer and birth defects to both humans and animals.

Many of the POPs have found wide use as pesticides to protect plants against plants diseases and vector-borne diseases. Some are used as heat resistant dielectrics in electrical equipment such as transformers and capacitors. Dioxins and Furans are a category of POPs that are produced as by-products of incomplete combustion and chemical processes.

Because of the toxicity, persistence and distributive capacity of POPs, their strict management towards total elimination is desirable. To this end, an international cooperation and intervention is a prerogative of all nations.

Countries of the world have realized the importance and need of sound management of chemicals in general, with the aim of protecting human health and environment. The management has taken the form of various international and regional instruments, principles, guidelines and codes of ethics. Some of the pertinent international fora, initiatives and conventions include:

The Rio conference on environment and development, which culminated in Agenda 21 and Rio principles which have become instrumental in promoting development and strengthening of institutions for environmental protection and entrenched principles of sustainable development at national and international level. Chapters 19 and 20 deal with management of hazardous chemicals and wastes respectively.

The International Conference on Chemical Safety (ICCS) held in Stockholm in 1994 established the Intergovernmental Forum on Chemicals Safety (IFCS), through which countries can regularly discuss their activities and priorities for the sound management of chemicals.

The Benzene Convention concerning protection against hazards of poisoning from benzene, this convention aimed at protecting workers from hazards arising from the production, handling and use of benzene. It applies to all activities involving exposure of workers to this toxic chemical.

The C170 Chemicals Convention concerning safety in the use of chemicals at work, whose objective is the regulation of the management of chemicals in the work place, protection of the environment, the public and workers from harmful effects of chemicals. This convention requires that state parties make appropriate provisions for classification of chemicals including their labeling and markings.

The Basel Convention on the Control of Transboudary Movements of Hazardous Wastes and their Disposal is aimed at; reducing transboudary movement of hazardous wastes to a minimum consistent with environmentally sound and efficient management; minimizing the amount and toxicity of hazardous wastes generated and ensuring their environmentally sound management as close as possible to the source; assisting developing countries in environmentally sound management of hazardous wastes they generate. Chemicals form a greater part of such wastes under this convention.

The Bamako Convention on the ban of the importation into Africa and the control of transboundary movement and management of hazardous wastes in Africa, aimed at creating a framework of obligations to strictly regulate the incoming hazardous wastes into Africa, through monitoring, reporting and action on transboudary movement of such wastes.
The Rotterdam Convention on Prior Informed Consent (PIC) Procedure relates to certain hazardous chemicals and pesticides in international trade. The objective is to reduce the environmental and health hazards posed by chemicals and pesticides, by facilitating information exchange about their characteristics and thus informing national decision-making process in import and export.
Strategic Approach to International Management of Chemicals (SAICM) is aimed at clustering among others three chemical related conventions (Rotterdam, Stockholm and Basel)
Stockholm Convention on Persistent Organic Pollutants (POPs) has as its main objective, the protection of human health and environment against the toxic, long lasting chemicals. It applies to twelve chemicals referred to as POPs. These can be classified in three categories namely;
Pesticides – aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene and hexachlorobenzene (which is also an industrial and unintended by-product)
Industrial chemicals – PCBs (also unintended by-product) and
Unintentionally produced POPs – dioxins and furans, PCBs and HCB.

State parties to the Convention are obliged among others, to prohibit the production, use import and export of chemicals in annex A, to restrict production and use of annex B chemicals, develop strategies for identifying stockpiles of these chemicals and manage them in an environmentally sound manner and to develop an action plan of implementing the Convention which take into consideration the Best Available Techniques (BAT) and Best Environment Practices (BEP).
The parties to the Stockholm Convention should also ensure that PCBs are managed in an environmentally sound manner and to remove from use those found above certain threshold values by 2025.
Lesotho is a party to The Stockholm Convention, Basel Convention, Montreal Protocol and is in the process to acceding to Rotterdam convention, among other international initiatives in environmental management.
Article 7 of the Convention states:
“1. Each Party shall:
(a) Develop and endeavour to implement a plan for the implementation of its obligations under this Convention;
(b) Transmit its implementation plan to the Conference of the Parties within two years of the date on which this Convention enters into force for it; and
(c) Review and update, as appropriate, its implementation plan on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.

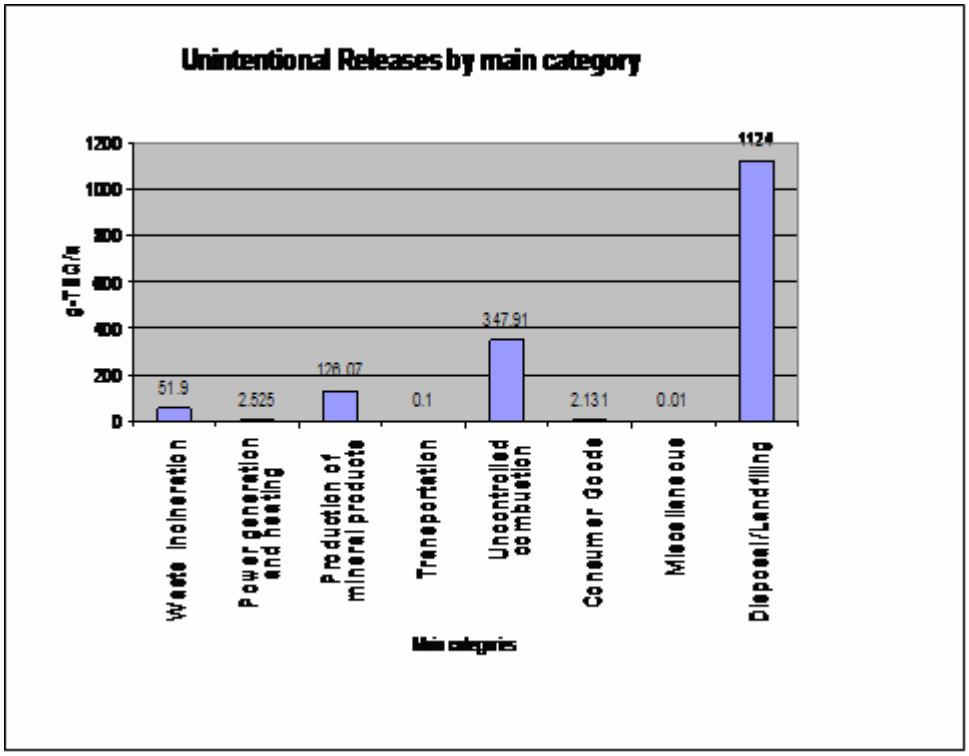
2. The Parties shall, where appropriate, cooperate directly or through global, regional and subregional organizations, and consult their national stakeholders, including women’s groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans.

3. The Parties shall endeavour to utilize and, where necessary, establish the means to integrate national implementation plans for persistent organic pollutants in their sustainable development strategies where appropriate."

Towards the development of this National Implementation Plan (NIP), the lead agency, the Department of Environment formerly called National Environment Secretariat, of Lesotho engaged several task groups to undertake consultations and collect data in the second and third phases of the project. Following the inception workshop, individuals who constituted the task groups were trained by the implementing agency, UNIDO, first in inventory taking of the Persistent Organic Pollutants. The inventory process was carried out throughout the whole country, engaging officials of all relevant government Ministries and parastatals as well as Non-governmental organizations. It culminated in eight assessment reports, which indicated the status and extent of POPs issues in the country.
The third phase came up with priority areas in a holistic fashion. The approach was to take the cross-cutting issues in capacity status towards proper management and regulation of POPs and Persistent Toxic Substances (PTSs). Priority areas were identified as follows and validated through a consultative workshop of all stakeholders:

1. Integrate management of POPs and chemicals in national socio-economic development programmes.
2. Increase awareness and education of Basotho communities on the effects of POPs on health and environment.
3. Develop policy framework and legal instruments for effective management of POPs and PTS.
4. Develop and implement effective waste disposal and management systems at local and national level.
5. Improve scientific knowledge base and skills in POPs management, particularly from lower educational levels.
6. Develop and implement sustainable resources mobilization strategies for effective programme implementation and infrastructure development.
7. Develop and implement monitoring and evaluation tools and indicators for assessing POPs impacts on health environment and socio-economic activities.
8. Establish information systems and database of POPs generation, use and contaminated sites.

All subsections of this document were developed with these priority areas as encompassing objectives.
The National Implementation Plan for early implementation of Stockholm Convention follows closely the NIP Development Guidance document developed by UNEP. Chapter three of this document starts by highlighting the general issues divided in three categories namely, Pesticides and DDT, Polychlorinated Biphenyls and Dioxins and Furans. The subchapter of 3.3 is dealt with as intervention areas and all relevant sections of the sub-chapter discussed under the three categories.


Unintentional Releases by main category
1200
1000
800
600
400
200
0
51.9
2.525
126.07
0.1
347.91
2.131
0.01
1124
Waste Incineration
Power generation and heating
Production of mineral products
Transportation
Uncontrolled combustion
Consumer Goods
Miscellaneous
Disposal/Landfilling

2. Country baseline

The Kingdom of Lesotho lies between 28°35' and 30°40' south and 27°00 and 29°20' east. It is a small land-locked, mountainous country, which has a land surface of 30,350 km^2. The country has distinct variation in elevations, with the lowest point being at 1,300m and the highest point being Mount Thabana Ntlenyana at 3,482m above sea level. The country has four ecological zones namely: the Lowlands; the Foothills; the Mountains and the Orange River valley. The first zone ranges between 1300 to 1800m above sea level (masl) and cover area of about 12%. The foothills are at between 1800 and 2100 masl and cover 15% of land area. The mountains occupy central and eastern parts of the country and constitute 65% of the country's area.

The country's climate is largely dependant on altitude and is characterized by cool to cold dry winters and hot wet summers. Mean annual rainfall ranges from 600mm in the southern and western lowlands to 1,600mm in the northeastern highlands where frost, heavy snowfall and hailstorms are common during the winter months. The mean annual temperature ranges from 5,7° C at the higher elevations, to 16° C in the southern lowlands.

The country is divided into ten (10) administration regions named, districts, these within the local government structures are headed by District Secretaries. The districts are subdivided into wards, with district coordinating and development councils having a very close relationship with traditional system of administration; hereditary chieftainship is still embraced by most Basotho and is cherished as the grassroots local government.

Maseru the capital city is the only municipality, despite the fact that most District centers are gazetted as urban areas.

2.1 Country profile

2.1.1 Geography and population

Lesotho is a small country with a population of just above 2 million. About 80% of the country is mountainous or foothills and 80% of the population is rural. The country is demarcated into ten administrative districts, each thus having a center, which is becoming urbanized at a high rate.

Lesotho is further divided into four ecological zones, namely, Lowlands, Foothills, Mountains and the Senqu valley. These zones differ in terms of topography, altitude, climate and number of people and population concentration. When three quarters of the country is mountains, the other three zones share the remaining one-quarter. The lowlands have gained a good share of population while the mountains; foothills and Senqu valley effectively lost a share of theirs. The population density as per 2001 demography survey has been indicated as 71 persons per square meter. Notably though is the fact that, this includes the mountain areas which of course are not populated, meaning that this is in effect much higher than this. The density on arable land is estimated at 531, which is a better indicator of the population distribution.

2.1.2 Political and economic profile

Lesotho falls within the category of 'least developed countries (LDC), this is because she is currently faced with deeper development problems than was the case at the time of independence. The basic challenge facing the country centres on the fundamental need to provide a substantial basis for a better quality of life for all Basotho.

Despite the intensified focus on poverty reduction, the proportion of Basotho households living below the poverty line is estimated at 58 percent of the population. The majority of this population thus does not possess adequate access to basic human needs, with about 40 percent of the labour force currently in search of gainful employment. Preliminary estimates have indicated that, in order to make a significant impact on unemployment figures, approximately 40 000 new jobs will need to be created annually for a sustained period.

Development strategies implemented by the government and involving either five or three-year rolling plans have previously articulated policy direction for socioeconomic development. Such multipronged policies pursued in the past have not been able to achieve the primary objective of improving the livelihoods of the people of Lesotho. With a pronounced slump recorded in the past decade, economic growth has been

erratic and performance has been marked by highly unsustainable short-term successes:
In first plan period of 1970/1 – 1974/5, GDP average growth of 8 %, attributable to sound performance in agricultural sector
In second plan period of 1975/6 – 1979/80, GDP average growth of 7% resulted from increased diamond mining, large volumes of external assistance, migrant worker remittances, and increase in Southern African Customs Union (SACU) revenues.
In period of 1980 – 1990, low GDP growth rate of 3.9%
In period of 1990 – 1999, slight rise in GDP growth to 4.2%, with early favourable performance attributable to construction of Lesotho Highlands Water Project as well as rapid expansion of manufacturing sector; political disturbances in 1998 saw negative GDP growth
Negative impacts of the economy during these periods resulted from various factors. These included erratic agricultural performance with low levels of job creation, declining migrant labour remittances due to progressive retrenchments, winding down of activities concerning the Lesotho Highlands Water project, attainment of full production capacity in manufacturing, and a steady increase in population with ever-growing numbers of job seekers. Operational difficulties were also experienced in the country's utility sectors, further discouraging foreign investors and the resulting in huge backlogs of unserviced customers.
Since 1998, when civil and political unrest contributed to an economic recession, Lesotho's economy has contracted by 11.5 percent, as measured by real gross national product. The recovery to the level prior to this event is expected to be slow; the projected growth rate for 2001/02 was 1.7 percent.
The direction to implementing the government's poverty reduction and growth strategy, which is supported by most development partners, started in the 2001/2002 budget proposal. Structural adjustment is focusing investment in those sectors that would have a positive impact on poverty reduction. With priorities carefully identified, resources have been allocated to programmes directed at such reduction, as well as the provision of general public services, building up to reserves for the future, and short to medium-term investments.
Lesotho's national income is derived from both domestic economic activity and migrant labour remittances. In order to offset adverse development in the South African mining industry, more investments need to be made in the domestic economy. The country's economy has traditionally been based on subsistence agriculture and animal husbandry, as well as small-scale industries that include clothing, footwear, textiles, food processing and construction. The small but expanding manufacturing base depends largely on farm products to support the milling, canning, footwear and jute industries.
Economic sectors such as manufacturing and telecommunications are beginning to show good signs of growth, but much needs to be done to build on this progress. Lesotho's major natural resource is water, often referred to as 'white gold' by the Basotho people. Completion of construction phases in the Lesotho Highlands Water Project and establishment of major hydropower facilities are seeing the sale of water to South Africa, generating royalties that are an important source of income for Lesotho.
Along with other developing countries, Lesotho faces a number of risks and threats to its political and socioeconomic development. Through a new national vision, such weakness and issues are being isolated and an effort made to turn them into national capacity. This is done through the development objectives of an

environment of macroeconomic and political stability, characterized by a sound and coherent policy framework.
Based on free market principles and private ownership of property, the Lesotho economy presents a relatively open business climate. The government's response to the negative economic developments lies in the formulation of a series of initiatives to correct the growing macroeconomic imbalances and lay the foundation for renewed economic growth:
Accelerated divestiture of state-owned enterprises
Improvement in the domestic financial intervention
Increased diversification of the revenue base
Containing of government expenditure through public sector reforms

The scourge of HIV and AIDS has taken its toll in the country. Currently at least one in three Basotho adults are infected with HIV and AIDS, which is approximately 350,000 people now living with it. It is estimated that about 70 people die each day of AIDS related illnesses. The Government of Lesotho has responded to this challenge through a number of initiatives including the "Strategies for Scaling up the National Response to the HIV/AIDS Pandemic in Lesotho".

2.1.3 Profiles of economic sectors

The mission for the performance measurement of the manufacturing sector in Lesotho is to provide accurate, relevant and timely information for decision-making, policy and programme formulation planning and research by both public and private sectors.
Lesotho makes a good choice as a location for export oriented manufacturing industries and numerous foreign companies have successfully established bases in this country.
The Lesotho National Development Corporation (LNDC) is the major driver behind attracting new manufacturing investments in the country. It administers fully serviced industrial plots, providing both general purpose and customized factory building as well as developing commercial property for leasing. LNDC administers full-secured sites in Maseru, the capital (Thetsane and maseru West industrial sites) and at Maputsoe (inclusive of Ha Nyenye). Industrial sites at Mohales' Hoek and Mafeteng are steadily being occupied. All these estates currently cover an area of about 160 hectares.
There is a new industrial area in Maseru, Ha-Tikoe that will cover an area of about 80 hectares, which is being opened to meet a growing demand of expansion and further potential projects.
Types of industries already established at these sites include Clothing, Textiles, Footwear, Agro-business and health care. Some Engineering, construction and building materials as well as commercial services and distribution carry a considerable portion of overall industrial strength.
Exploration of the mineral wealth of Lesotho has not yet been sufficiently undertaken. Known deposits of diamond are exploited by fledging mining industry, with concentration on diamonds. The Lets'eng-La-Terae diamond mine is now fully operational. Further diamond digging areas exist nearby Liqhobong where work is done on a co-operative basis. Mineral reserves are estimated at 1,913, 600 tones at a grade of 69 carats per hundred tones.
Other exploration (geochemical survey) work on minerals has revealed the existence of some base metals however; viability of mining them is still being investigated.

Coal and bituminous shale deposits have been indicated in several areas, though they are of poor quality and quantity for commercial viability. Clay is vastly mined and used mainly in brick production.

Lesotho imports all of its oil and gas, yet this industry is one of the key elements in the economy of Lesotho. There are no known oil or gas reserves.

Popularly known as the "Mountain Kingdom" and "The Kingdom in the sky", this rugged country has tremendous potential for development in the tourism industry. The recognition of the significant role that the sector could play in the economy of the country has led to promotional programmes to be put in places, through several strategies directed at developing and harnessing this opportunity.

The vast majority of rural households in Lesotho gain significant part of their livelihood from subsistence farming, i.e. more than 85% of the population is engaged in subsistence agriculture and informal activities. Livestock farming is characterized by medium holdings of cattle, sheep and goats, while maize, sorghum, wheat and Beans/Peas dominate the crop family, in that order of significance.

Agricultural goods, exported primarily to South Africa include mohair, wool and hides. While efforts are being made to improve on this sector, Lesotho imports most of the products that are used in the country since it is not self sufficient in food production.

Table 1, below, indicates the imported value of chemicals into the country. No production/manufacturing of chemicals, hence no Exportation. Petroleum products constituted by far the largest value of imports followed by fertilizers and pharmaceutical products. These values were compiled in 1999 and are expected to be higher for 2005 due to the growing economy, which is estimated at about 2.6 % in 2002 and 3.4 in 2003 with an actual growth of 4.5 by 2004.

Table 1: Chemical Imports in 1999

Description	**Value of Imports by Commodity in Maloti (1999) – USD1 ≈ M 6.00**				
	1st Quarter	**2nd Quarter**	**3rd Quarter**	**4th Quarter**	**Total**
Petroleum Products	57030613	79434311	83849363	66750262	287054549
Inorganic compounds and radioactive elements	1580046	1469833	1591160	1675536	6316575
Organic Chemicals and Pesticides	13417481	24043584	21573956	47192108	106227129
Pharmaceutical Products	5281764	3450977	2577378	2258058	15768177
Fertilizers	4795488	5060345	3386452	11291261	24533546
Cosmetic Products	2960225	913847	1763852	3025130	8663054
Miscellaneous Chemical Products	657561	1132883	1354783	1258997	4404224
Explosives	499716	659145	691670	1103863	2954440

Source: Foreign Trade Statistics, 1999 by Bureau of Statistics Maseru

According to foreign trade statistics, of 1999, Lesotho imported mostly commodities belonging to SITC categories, 0, 6, 7 and 8, corresponding to food and live animals, manufactured goods, machinery and equipment and miscellaneous manufactured

articles; mineral fuels, lubricants and related material (SITC3) and chemicals and related products (SITC 5) contributed 16.3% of the total value of imports collectively. Almost all imports are consigned from RSA. Throughout the period 1989-1999 imports from RSA amounted to about 90% on the average. However, all SACU countries are trade partners of Lesotho.

2.1.4 Environmental overview

Water resources

Water is the most valuable Lesotho's natural resource. It is a key determinant of economic growth and a resource that must be carefully managed as part of an environmentally sustainable development. Overall, total water resources in Lesotho are abundant in relation to the demand. Nevertheless, there are severe water shortage problems. For surface water sources, which are mostly direct river abstractions, variability of flows and lack of regulation facilities leads to seasonal shortages. Groundwater sources are generally smaller if explored in perched water tables, and a lack of sufficient capacity to drill deeper means that some of these boreholes are often overused leading to local depletion and a shortfall in supply

Biodiversity

The current data shows that aquatic and terrestrial ecosystems are being degraded at an alarming rate, mostly by human-induced factors. Loss of habitats, extinction of species and reduction in genetic variability can directly be linked to human behaviour. The increases in population density coupled with livestock population pressure have serious implications on the country's natural resources and consequently environmental degradation. Population growth has necessitated a need for increased productivity, which has further contributed, to the loss of biological diversity. Poverty exerts a huge pressure on natural resources since poor people tend to rely heavily on the environment for sustenance of their livelihoods, for example, dependency on biomass as the main source of energy has placed a tremendous pressure on indigenous trees and shrubs. Pollution, occurrence of invasive alien species and overexploitation have contributed to a significant decline in biodiversity in the country.

Climate and the Atmosphere

Studies carried out in the country show that residential sector is responsible for more than 90% of energy consumption (including fossil fuel that emits Green House Gases (GHG's)) for household activities. Transport, industry, government and other institutions are some of the major sectors that consume fossil fuel in the country. Though the country's contribution of GHG's is minor, its insufficient vegetation cover to absorb these gases makes it a net emitter of GHG's. As for Ozone Depleting Substances (ODS's), most of them emanate from refrigeration services sector. But emission of these has decreased with time in the country and the intention is to eliminate them by the year 2008.

Due to its geographical location, Lesotho is vulnerable to climate change, with rainfall and temperature varying in all time scales. This climatic variability places critical constraints on crop production. In recent years, the country has experienced droughts associated will El Nino conditions, and studies show that the frequency of these droughts is increasing with time.

Land use and planning

Eighty percent (80 %) of the population in Lesotho derives its livelihood from agricultural activities but the total arable land is estimated at 9 % of the country's

land base creating conditions for extreme poverty and tremendous pressure on the natural resource base. The Government of Lesotho together with interested and affected stakeholders have embarked on adopting an integrated approach in land use and resource management strategies in order to minimize pressures imposed on land by natural and man made activities. The initial steps in implementing the land management strategy were to undertake a land resources studies in 1989 and 1994.

Waste Management and Pollution Control

In Lesotho, waste generation is not only a function of population alone but also of economic growth or income. Affluent societies produce more waste than the less so, but the overall total waste generated by the country annually amounts to about 802 400 tonnes (Mvuma, 2002).

Insufficient solid waste handling and disposal at casual dump sites take place in all towns of Lesotho. Industrial solid waste is disposed of together with domestic solid waste or burned at the industries in open fire places. Solid waste is generally not incinerated, but due to the insufficient collection system, random and intensive burning of waste takes place. This burning of wastes (including industrial wastes) causes considerable air pollution. Furthermore, no system or guidelines currently exist for handling of hazardous wastes, therefore, these are often disposed of together with domestic wastes at dump sites.

Some activities concerning hospital waste have been identified. Clinical waste generated at the main hospitals is to some extend sorted out and incinerated in poorly managed incinerators. The remaining solid waste is disposed of at dump sites.

Recycling of solid waste is performed by one or two private contractors, and only if this is financially attractive. There is currently no legislation enforcing or promoting recycling. As such, recycling efforts are market driven. Recyclable materials are mainly collected by the public and a few organisations. These materials are then collected by or delivered to private contractors. Informal recycling takes place at dump sites through scavenging.

2.2 Institutional, policy and regulatory framework

Lesotho does not have a specific legislation dealing with the management of chemicals and pesticides, specifically persistent organic pollutants substances. There are however, a few pieces of legislation, which generally touch on dangerous substances and hazardous substances. The laws that exist are fragmented and not specific to chemicals. These laws which are administered by different Government Ministries and Departments are as follows:

The Environment Act No 15 of 2001, which is administered the by Ministry of Tourism, Environment and Culture;

The Labour Code Order No. 24 of 1992 which is administered by the Ministry of Employment, and Labour;

The Labour Code (Chemical Safety) Regulations 2003 which are administered by the Ministry of Employment and Labour;

Public Health Order 1970 which is administered by the Ministry of Health and Social Welfare;

Customs and Excise Act 1982 which is administered by the Lesotho Revenue Authority a statutory body under the Ministry of Finance;

Draft Pesticides Control Bill 1986 which will be administered by the Ministry of Agriculture and Food Security; and

Import and Export Act 1984, which is administered by the Ministry of Trade and Industry, Cooperatives and Marketing.

Lack of coordination between the Ministries makes it difficult to enforce a lot of national laws. Several of these laws overlap while others are inconsistent and contradict each other. There are also gaps and inadequate provisions to address current environmental issues such as hazardous waste management, agricultural and industrial chemicals. There is therefore a need to develop a specific law on chemical management.

Lesotho is a party to a number of multilateral environmental agreements, such as the Stockholm Convention on Persistent Organic Pollutants, Basel Convention on Transboundary Movement of Hazardous Waste and Their Disposal. Lesotho is in the process of acceding to the Rotterdam Convention on Prior Informed Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. She has however not fully translated her political will into concrete actions due to diverse implementation constraints. The main constraints have been indicated as: lack of financial resources, limited institutional capacity and inadequate environmental awareness. There is also lack of effective comprehensive chemical related laws as most of the laws are outdated, lack of enforcement of existing laws inadequate as they may be, on management of chemicals and lack of coordination among institutions dealing with environmental issues. Despite the foregoing, Lesotho is obliged to enact effective national legislation to implement the Stockholm Convention.

Lesotho ratified the Stockholm Convention on 23rd January 2002, which came into force on the 15th May 2004. The objective of the Stockholm Convention is the protection of human health and the environment. The Stockholm Convention applies to twelve chemicals referred to as persistent organic pollutants. Some of these persistent organic pollutants are agricultural pesticides while others are industrial chemicals and unwanted by-products of industrial processes or combustion.

The following capacity gaps in the management of chemicals and pesticides have been identified in Lesotho.

Lack of /inadequate capacity (Enforcement infrastructure);

Shortage of Human Resources; and

Lack of financial resources.

2.2.1 Environmental policy, sustainable development policy and general legislative framework

Environmental issues in Lesotho became visible in Government's agenda in late 80s when the country prepared a National Environment Action Plan, 1989, This documents highlights environmental problems facing the country and proposes measures to be carried out in addressing them. It also proposes a coordination mechanism for effective implementation of the suggested solutions.

The early 90s saw the incorporation of sustainability issues into the Country's constitution, 1993. Article 36 states that

"Lesotho shall adopt policies designed to protect & enhance the natural and cultural environment of Lesotho for the benefit of both present and future generations and shall endeavour to assure all citizens a sound and safe environment adequate for their health and well-being"

The aforementioned statement acted as a driving force for the development of pro-sustainable development policies, action plans and programmes and facilitated Lesotho's membership to multilateral environmental agreements.

Lesotho is a party to a number of Multi-lateral Environmental Agreements(MEAs) and declarations and to implement them she has effected appropriate policy and legal framework as well as effective institutional arrangements. As a response to implement Agenda 21, it formulated National Action Plan, 1994 under the guidance of NES.

The National Environment Policy (NEP) was finalized and approved by the Cabinet in 1996 and was further reviewed in 1998. The NEP reinforces powers of sectoral ministries and focuses on areas of high environmental priority in Lesotho. Apart from that the country has established Environmental Units within the planning division of each line ministry. This is to ensure that the role and efforts of NES are effective and to ensure that environmental considerations are incorporated at every level of decision-making in all line ministries.

For NES and line ministries to execute their responsibilities efficiently, it is necessary that their capacity in environmental management be enhanced, and trends over the past years show an increase in capacity of the Government to manage the environment and increase in financial resources allocated to environmental management although human resources and financial resources are still inadequate. So far, the country has achieved the following:

Development and adoption of Vision 2020, which is a long term perspective plan that will guide the development process in Lesotho;

Adoption of National Goals and Objectives for the next three years linked to Millennium Development Goals (MDGs);

Formulation of the Poverty Reduction Strategy (PRS), which is a comprehensive plan for realising equity-based growth and operationalising Vision 2020, and localising Johannesburg Plan of Implementation;

In preparation for the implementation of Environmental Act 2001, the government with assistance of Danish Cooperation for Environment and Development (DANCED) offered 16 short courses to enhance capacity of NES, Environment Units, within all sectors, the Ministry of Planning as well as some parastatals;

Despite inadequacy of staffing within NES and absence of legal mandate, its EIA and Pollution Control Division has successfully reviewed numerous EIA reports and project briefs before implementation of projects. Regrettably, some developers did not follow recommendations made by NES;

In order to improve the environmental quality, the country has prepared environmental standards and guidelines. These include Water and Sewerage Authority's (WASA) Effluent Standards, NES Draft Water Quality Standards, NES EIA Sectoral Environmental Checklists, EIA Draft Manual and Department of Rural Water Supply's (DRWS) EIA Manual.

A number of committees whose membership has been drawn from diverse backgrounds i.e., Government, private sector and non governmental agencies, have also been established to work with NES in implementing its mandate of coordination and environmental Management. These are as follows:

CheMaC - Chemical Management Committee
COWMAN - Committee on Waste Management
NDSC - National Desertification Steering Committee
CEDAMA - Committee on Environmental Data Management
SuDTeC -Sustainable Development Technical Committee

As a way forward in addressing the problem, the current legislation and enforcement measures could be strengthened by:
Developing a specific law on chemical management;
Amending the Environment Act 2001 or the Customs and Excise Act 1982 to include a list of hazardous substances the importation of which should be banned; This process is already underway.
Identifying the authority or authorities responsible for implementing the law, identify the relationship with other existing laws, and define jurisdiction among the authorities;
Training of law enforcement officers (police, customs officers, lawyers) and technical personnel such as agricultural field officers, occupational safety and health officers, health inspectors, environment officers;
Sourcing for equipment and financial resources.

2.2.2 Roles and responsibilities of ministries, agencies, other governmental institutions and Technical Committees

This section of the NIP discusses the mandates of various ministries and non-Governmental Organizations in relation chemical management. It has also identified areas where chemical and waste management issues could be incorporated into existing regulatory or administrative systems. Table 2 at the end of this section has summarized the extent of involvement of each of the departments or agencies in chemical and waste management.
Ministry of Tourism, Environment and Culture (MTEC)
Formerly called the Ministry of Environment, Gender and Youth Affairs, the ministry is charged with an overall mandate to oversee all policy matters related to environmental protection. MTEC is not a direct implementer of environmental programmes, they are responsibilities of sectoral ministries.
With the enactment of the Environment Bill 2001, which calls for the establishment of a semi-autonomous Lesotho Environment Authority (LEA), stronger monitoring and enforcement measures could be possible. Through its environment wing, NES, the Ministry has set up a number of technical and advisory committees as stated earlier.
Ministry of Agriculture and Food Security
The Ministry of Agriculture and Food Security is more concerned with food security and agricultural diversification. It is important to note that chemicals (fertilizers, herbicides and pesticides) play a central role in agriculture and also that the Ministry is a major importer of agro-chemicals which are used for pest control, veterinary, as well as fertilizers and herbicides for improvement of crop yields.
It is worth mentioning that the Ministry is currently faced with a problem of storage and disposal of obsolete chemicals which are posing a threat to human health and environment particularly in the catchment areas within which storage facilities are located.
Ministry of Health and Social Welfare
The Ministry is concerned with the health impacts of chemicals on the general public. Hence their Environmental Health Section was established to deal with risk factors and respond to incidences. Another response was the establishment of Occupational Health & Safety Programme within the section and its role is to monitor and ensure proper management of industrial chemicals/industrial solvents in the workplaces. In addition, the Section is also responsible for pest control. In pursuant to the latter mandate, the Section acquires stores and uses pesticides. They have

currently, reported a stockpile of obsolete Icon (fipronil) pesticide which needs to be disposed of.

At present there is no Drug Regulatory Authority and as such there is not much control on pharmaceutical products which are coming in and out of the country however NDSO and TriPharm and other distributing agencies that are partially controlled by the ministry.

Ministry of Employment and Labour

The ministry is concerned with occupational safety and health issues with regard to the use, storage and handling of chemicals at workplaces, among others. The Ministry also administers Labour Code and associated regulations.

Ministry of Trade and Industry, Cooperatives and Marketing

This Ministry is responsible for among others establishment of a conducive environment for various industrial activities inclusive of production of chemicals and their products. The same Ministry is charged with the responsibility of regulating imports and exports of chemical substances. It also issues trade licenses and permits.

Ministry of Transport and Public Works

The Department of Traffic and Transport carry out inspections on the road. Thus in the regulation of transportation and transfer of hazardous substances and chemicals, a good management can be effected from this standpoint.

Ministry of Natural Resources

Charged among others with protection and overall management of natural resources; the department of Energy is responsible for controlling trade of petroleum fuels. The Department Water Affairs mandated to protect all water bodies/resources – wetlands, springs, to large dams against any kind of pollution, and misuse.

Ministry of Education

The Ministry, through Schools Supply Unit procures and stores large quantities of 'learning, teaching' chemicals to be distributed to most high schools. None of the high schools have any specific disposal or treatment for any chemical of toxicological importance. The University, on the other hand, attempts to scrub and bury some heavy metallic compound wastes.

Non-Governmental Organisations

Outside government, there are a number of NGO's coordinated through Lesotho Council of Non-Governmental Organisations (LCN), and there is an Environmental coordinating office/desk.

The Lesotho Consumer Organization (LCO) is still in its infant stages, which currently does not have strong programs on the ground. Their major mandate is to protect consumer rights as stipulated in the constitution of the country, through awareness and stewardship. LCO is strongly supported by MTICM.

Both LCN and LCO are represented in some of the technical/advisory committees mentioned earlier. In addition, they are also members of Environmental Units.

Table 2: Responsibilities of Government Ministries, Agencies and other institutions

Ministry Concerned	**Importation**	**Production**	**Storage**	**Transportation**	**Distribution and/or Marketing**	**Use/ handling**	**Disposal**
Environment	X					X	X
Health	X		X			X	X
Agriculture	X		X		X	X	X
Labour and employment							
Transport	x	X	X	X	X		

Local government				X		X	
Customs	X						
Finance							
Maseru City Council			X			X	X
NGO's	X		X	X	X	X	X
LCO					X	X	

X = involvement Source Chemical Management Profile, 1999

Technical Committees

Of all the technical committees mentioned earlier, Chemical Management Committee (CheMaC) and Committee on Waste Management (COWMAN) will play vital roles in the implementation of NIP. CheMaC advises government of all matters relating to chemical management, and in the context of NIP, the Committee will advise government on measures to be taken to ensure compliance with Stockholm Convention and strategy for identifying chemicals which display POPs characteristics. COWMAN deals with issues relating to waste including waste containing POPs or having a potential of releasing POPs.

2.2.3 Relevant international commitments and obligations

Lesotho is a party to a number of multilateral environmental agreements. The agreements in which Lesotho participates which are relevant to chemicals used are:

Stockholm Convention on Persistent Organic Pollutants

Recognizing that persistent organic pollutants possess toxic properties, resist degradation, bioaccumulate and are transported, through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems, Lesotho is also determined to protect human health and the environment from the harmful impacts of persistent organic pollutants, The parties have agreed to institute measures to reduce or eliminate releases from both intentional and unintentional production and use, as well as reducing releases from stockpiles and wastes of the twelve persistent organic chemicals, listed in the annexes A, B and C of the convention. Among the major sources of one group of these pollutants, Dioxins and Furans (includes PCBs) are thermal processes, of which medical waste incineration is one of the contributors.

Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal

The Basel Convention makes specific reference to control of special health care waste: sharps, pathological infectious waste, hazardous chemical waste, and pharmaceutical waste. Annex I of the Basel Convention includes the following waste categories that specifically refer to health care waste:

Clinical wastes from medical care in hospitals, medical centers, and clinics.

Wastes from the production and preparation of pharmaceutical products.

Waste pharmaceuticals, drugs, and medicines, and

Waste from the production, formulation and use of biocides and phytopharmaceuticals.

Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

The purpose of this convention is to reduce hazards posed by chemicals and pesticides by facilitating information exchange about their characteristics by providing for a national decision-making process on their import and export and by disseminating these decisions to parties.
The convention covers pesticides and chemicals that have been banned or severely restricted for health or environmental reasons by parties and which have been notified by parties for inclusion in the Prior Informed Procedures.
There are other international conventions which are not directly linked with chemicals management, however are impingent on natural resource management, which is one of the major measures in minimizing releases from unintentional production of POPs: These include:

Montreal Protocol on the substances that deplete the ozone layer.
The objective of the protocol is to protect the ozone layer by taking precautionary measures to control global emissions of substances that deplete the layer, mainly Chloro- Fluoro-Carbons (CFCs). This agreement has been well implemented in Lesotho in as far as substitution of CFCs in refrigerants is concerned.
Convention on Biological Diversity
Its objective is to promote the sustainable use of Biological diversity components and encourage equitable sharing of the benefits arising out of the utilization of genetic resources. One of the threats to biological diversity is wild or intentional burning of fires. These fires do produce considerable amounts of Dioxins and Furans as such, the two conventions are supplementary.

2.2.4 Description of existing legislation and regulations addressing POPs

Lesotho has no legislation or policy on pesticides, fertilizers, industrial chemicals, consumer chemicals, waste chemicals, or radioactive materials other than the Labour Code Order of 1992 Part VII Section 105 which deals with prohibited and toxic substances in the work environment. The sixth schedule of the same law covers dangerous substances, including pesticides. However, the country is aware of these limitations and is in the process of addressing them. To this effect, the Environment Act 2001 is being amended to include a list of banned substances (including POPs).

Title	Part/ Section/ clause, etc.	**Description**	**Relevance to Stockholm Convention**	**Identified gaps**
Labour Code Order 1992	PartVII section 105 Schedule six	Prohibited and toxic substances Dangerous	Prohibition of toxic substances. Handling of dangerous substances including pesticides	Legislation is not POPs specific

		substances (including Pesticides)		
Environment Act 2001	Amendments	List of banned substances	Prohibition of import and use of POPs	

Lesotho currently uses very few regulatory and control approach to control chemicals, let alone non-regulatory mechanisms such as voluntary and incentive schemes. However, strict control applies to Liquefied Petroleum Gas and CFCs. There is no legislation or policy whatsoever on pesticides, fertilizers, industrial chemicals, consumer chemical, waste chemicals and radioactive material.
As mentioned earlier the Ministries of Trade and Natural Resources (Department of Energy) are responsible for the control and regulation of Liquid Petroleum Gas (LPG) while CFCs are the responsibility of Lesotho Meteorological Services (LMS). All dealers in LPG and refrigerants are registered and in the case of dealers in refrigerants, a very tight monitoring mechanism is in place.
However the enforcement of all the legislations is not effective due to;
Insufficient human and financial resources
Inadequate skilled personnel
Lack of infrastructure and equipment
Inadequate multi-sectoral collaboration and co-ordination

Table 3: Banned or Severely Restricted Chemicals: Lesotho Situation

Name of Chemical	**Details of Restriction i.e. Reason for control action**
Methyl Parathion	Highly toxic
Ethyl parathion	Highly toxic
Aldicarb	Very highly toxic
Captafol	Carcinogenic
Mercury compounds	Persistent toxic substances
*Aldrin	Persistent toxic substances
*Dieldrin	Persistent toxic substances
*DDT	Persistent toxic substances
HCH Mixer Isomers	Persistent toxic substances
Chlordane	Persistent toxic substances
*Heptachlor	Persistent toxic substances
*PCBs, PBBs	Persistent toxic substances
Tris (2,3) dibromopropyl phosphate	Persistent toxic substances

Table 3 above shows a list of internationally banned/severely restricted chemicals. Lesotho is not yet a signatory to these conventions but it is acting voluntarily to restrict some of these chemicals e.g. mercury and mercuric compounds. In some instance Lesotho is forced to act upon the use of these chemicals by its trade partners like South Africa.

most of these chemicals are controlled or restricted internationally, through some conventions of which Lesotho may not have signed yet, however very effective voluntary restriction efforts do exist. These are planned to be included in the restrictions provided for in the Environment Act amendment which is in process

key approaches and procedures for POPs chemical and pesticide management including enforcement and monitoring requirements

There is no specific legislation for management of POPs in Lesotho, hence, the mandate of various institutions discussed under 2.2.2 is vague. However, the Ministry of Employment and Labour (MOEL), through the Labour Code Order of 1992 is mandated to regulate the use, storage, and handling of chemicals (including pesticides) at workplaces. Furthermore, the Ministry of Trade and Industry, Cooperatives and Marketing (MTICM) is charged with the responsibility of regulating imports and exports of chemical substances, as well as establishing a conducive environment for various industrial activities inclusive of the production of chemicals and their products. Lastly, the amended Environment Act 2001 will enable the Ministry of Finance and Development Planning (MFDP) through its Customs Officers, and the Ministry of Health and Social Welfare (MOHSW) through its Port Health Officers, to prohibit any entry of banned substances (including POPs) into the country.

Table:

Title	Part/section clause, etc.	Issuing Ministry	Amendment (if any)	Description	Relevance to Stockholm Convention
Labour Code Order 1992	Part VII section 105 Schedule six	MOEL		Prohibited and toxic substances Dangerous substances (including Pesticides)	Prohibition of toxic substances. Handling of dangerous substances including pesticides
Environment Act 2001		MTEC	Schedule to the amendment bill, 2005	Bans importation and use of all Annex A Part I and II and Annex B chemicals	Banning of POPs

At present there is no legislation on fertilizers, pharmaceuticals, industrial chemicals, consumer chemicals, waste chemicals, etc. the only comprehensive legislations are that which control and regulate LPGs and CFCs.
There is no legislation on chemical wastes in Lesotho; normally there is no import/export of chemical waste. A chemical waste treatment plant is however being

planned for the SADC member states of which Lesotho is a party. Even though this is likely to be based in South Africa, due to its proximity, Lesotho will benefit the most. However small amounts of chemical waste are produced in Lesotho mainly because of it weak industrial and manufacturing base.

Pesticides are regulated by international protocols, declarations and guidelines set by organizations like WHO and FAO. Lesotho does not have regulations and/or guidelines of its own. In many instances any pesticide that is allowed in the South Africa is also given a green light in Lesotho by default.

The lack of robust guidelines for pharmaceutical products is a concern. The Dental and Pharmacy order of 1970 is indeed not only weak but also non-specific. It can however be improved and supported with more specific regulations. Issues dealing with sale of drugs in stores and by street vendors need attention.

One of the few really tight and robust guidelines in chemical management is the Ozone Depleting Substances (ODS) Regulations 2000 which is about to be published. An authority that deals with ozone depleting substances has been set up and its role includes the screening and processing of applications. Not anyone can import or export such substances. The authority is charged also with registering air conditioning and refrigeration servicing businesses. A person operating such a business would have to undergo training in an institution which is recognized by the authority before registering. The law is very specific because it lists all the chemicals which it regulates e.g. CFC-12(R-12) and CFC-11(R-11). The manufacturing of such chemicals are also forbidden. Labeling requirements as well as duties of customs officials are also clearly set. On the overall, this should serve as model legislation for the other sectors.

Perhaps one of the legislation that deal with chemicals quite extensively is the Labour Code Order of 1992 under health, safety and welfare at work section as well as the sixth schedule of the same law. It covers areas such as application, duties of the employer, employees, designers, manufacturers, and importers, exporters, keeping of documents, safety and health officers and committees at work. The provisions of the code give clear guidelines on notification of industrial accidents and dangerous occurrences, fire prevention and fire fighting as well as prohibition of toxic substances. Removal of dust and fumes is also dealt with in the code. Protective equipment and clothing is to be supplied where any substance used is likely to cause a person bodily injury, or impairment of health. The six schedule further deals with labeling and marking of toxic, corrosive or flammable substances as well as their storage. Guidelines stipulating precautionary measures to be taken with regard to explosive or flammable dust, gas, vapour, ionizing and non-ionising radiation are also contained here.

International laws and conventions, which bind Lesotho, are many but certainly need to be incorporated in the national legislation. As an example POPs Convention and Basel conventions have been ratified and are as such binding to Lesotho. However, it is almost impossible to prosecute in cases where a breach of these laws has occurred since there are no local laws that deal specifically with items being regulated under those conventions. In the case of the Ministry of Agriculture the only guidelines are the South African laws from which most fertilizers and pesticides come. The chemical environment is tightly controlled by wide ranging laws, which also have punitive capabilities. Another good example is National Drug Supply Organization and Lesotho Pharmaceutical Corporation, the only drug manufacturing organization in the country, which follows guidelines set by Food and Drug Authority

(United States of America), and Good Manufacturing Practices (GMP). These deal with all aspects of chemicals including disposal and analysis.
Many areas related to the environment are not addressed at all e.g. air pollution and hazardous waste management. Pesticide control in all its totality is also not covered – in fact all agricultural chemicals including fertilizers are not controlled. Pharmaceutical products on the other hand are not regulated in all their different forms. However, even though chemical waste is not yet a big problem it is not addressed in any way by the present laws.

2.3 Assessment of the POPs issues in the country

2.3.1 Assessment with respect to Annex A, part I chemicals (POPs pesticides) : Historical, current and projected future production, use, import and export; existing policy and regulatory framework; summary of available monitoring data (environment, food , humans) and health impacts.

The survey of POPs pesticides during the inventory, phase of the project, was carried out throughout the whole country to cover all ten administrative districts. As such all the four distinct agro-ecological zones namely lowlands, foothills, highlands and Senqu River valley were surveyed. Some of the POPs pesticides have been used in the country before the 90s although there is no clear record of their discontinued use.
The main stakeholders in the use of POPs pesticides were identified as two main groups; farmers and suppliers. Each group consisted of a number of different stakeholders for example farmers included commercial and subsistence farmers, group of farmers (e.g. cooperatives and associations), missions, schools and institutions. Suppliers included individuals such as street vendors, retail stores, agrochemical shops, Non-Governmental Organizations, the Ministry of Agriculture and other line ministries (e.g. Health and Finance).
According to the study, frequently used pesticides fall under the Pyrethroid and Organophosphate groups. Organochlorines constituted a very small percentage of pesticides employed in the country although thiodan (endosulfan) alone was employed by majority of respondents. According to their responses it is possible that farmers are not using POPs pesticides although many farmers did not know names of the pesticides they were using thus complicating the assessment. However, majority were not even familiar with POPs pesticides except DDT, which they were generally clear that they stopped using in the 70's. Other than DDT the other persistent toxic pesticide recorded was obsolete 2,4,5 T which is believed to be contaminated with Dioxins.
In addition to lack of knowledge about POPs pesticides and their potential negative effects farmers and suppliers were not fully aware of the dangers associated with pesticides. Thus a lot of training is needed country-wide to raise awareness of stakeholders about pesticides as a whole and on POPs pesticides in particular. Although the extension service is present, the study shows that there is insufficient effort about Plant Protection services (including pesticide use and handling) especially in the rural areas. National capacity building is also needed at other levels (such as institutions of higher learning, research, etc.) for the POPs identification and analysis.
Lack of regulatory framework in the country is the main problem that needs immediate attention, as there is no control at all on pesticides. Not only will

enactment of the law pertaining to chemicals be useful for controlling importation of POPs pesticide but it will also help monitoring of pesticides such that issues of accumulation of obsolete pesticides are avoided as well as addressing the main problem of pesticide disposal, which is still a major challenge in the country.
There is general lack of data relating to the impacts of POPs pesticides on human health and environment as mentioned in the inventory. Although there is no no institution which is legally mandated to oversee pesticides issues in the country, the Ministry of Agriculture through Crop protection Division and Agric Research are currently coordinating pesticide management.

2.3.2 Assessment with respect to Annex A, part II chemicals (PCBs)

In carrying out this work, the PCBs Task Team focused exclusively on transformers. The Task Team covered all the district of the country viz Butha-Buthe, Leribe, Mokhotlong, Thaba-Tseka, Berea, Maseru, Qacha's Nek, Mohale's Hoek and Quthing. In all of the districts the work covered both pole mounted and ground transformers.
For the purposes of determining which of the transformers are likely to contain PCBs, the Task Team assumed that any transformer that was manufactured in 1960s to 1989 was a suspect. In addition to this, all transformers which, did not have name plates or had insufficient information were also treated as suspects. Another group of transformers that was treated as suspects were those which have been donated to LEC by the development partners.
The task team inventoried about 1175 transformers in total. Those which fall within the period 1960s-1989 were about 379, four hundred and sixty four (464) transformers were produced in 1990-1999, and 272 transformers were manufactured between 2000 and 2003. The region which has the highest number of old transformers (1960s-1969) is Maseru with 12 transformers that were manufactured within that period. Sixty (60) transformers did not have either dates of manufacture nor name plates, with some of them being very old. As for ownership of transformers, the Lesotho Electricity Corporation (LEC) owns the highest number of transformers in the country. Other role players are the Lesotho National Development Corporation (LNDC), the Lesotho Highlands Development Authority (LHDA) and a limited number of individuals. The Team also noted that the type of cooling for almost all transformers in the country is "Oil Natural Air Natural" (ONAN).
On the basis of the collected data, the weights of suspects from Mohales Hoek, Mountain, Maseru, Leribe regions are 35,348kg, 34,049kg, 319,884kg and 245,169kg respectively, thus making a total weight of about 634,450kg(634 tons). However, when estimates for Mohales Hoek region and Thaba-Tseka Town and neighbouring villages are included, it becomes **723,450kg**.
Risk assessment of contaminated sites was also carried out. In this regard, the issues that were considered to be of utmost importance were human activities in the immediate environment of the transformer, distance of a transformer from a sensitive medium e.g. water course, wetland, etc. Since the location or activities in the vicinity of a transformer also have a bearing on the risk, the Task Team also looked into other aspects which are potential threats to some of the transformers. These include fire hazards, stability of the area, dumping of waste, etc.
According to the results, leakage from transformers is the most serious threat to human health and environment. The situation can further be aggravated by unstable platforms which may in turn collapse and release oil.

The report recommends the following issues to be considered when developing National Implementation Plan:

a) Environmentally sound management of PCB containing equipment including among others: development of a tracking system, establishment of a database for all transformers, labeling of all PCB containing equipment, etc;

b) A clear phase out programme that targets oldest and less effective transformers

c) Construction of a temporary storage facility of reasonable size in Maseru and small satellite storage facilities in the districts. They should all have concrete slabs and retaining walls around them;

d) Risk management or mitigation measures should be put in place;

e) Establishment of closer cooperation with South Africa in the area of chemical and waste management;

f) Capacity building on various aspects of PCB management for relevant stakeholders;

g) Awareness raising campaign at all levels;

h) Training of relevant LEC staff on occupational health aspects of PCBs;

i) Development of a regulatory system for PCB containing equipment e.g. banning importation of PCB containing equipment.

2.3.3 Assessment with respect to Annex B chemicals (DDT)

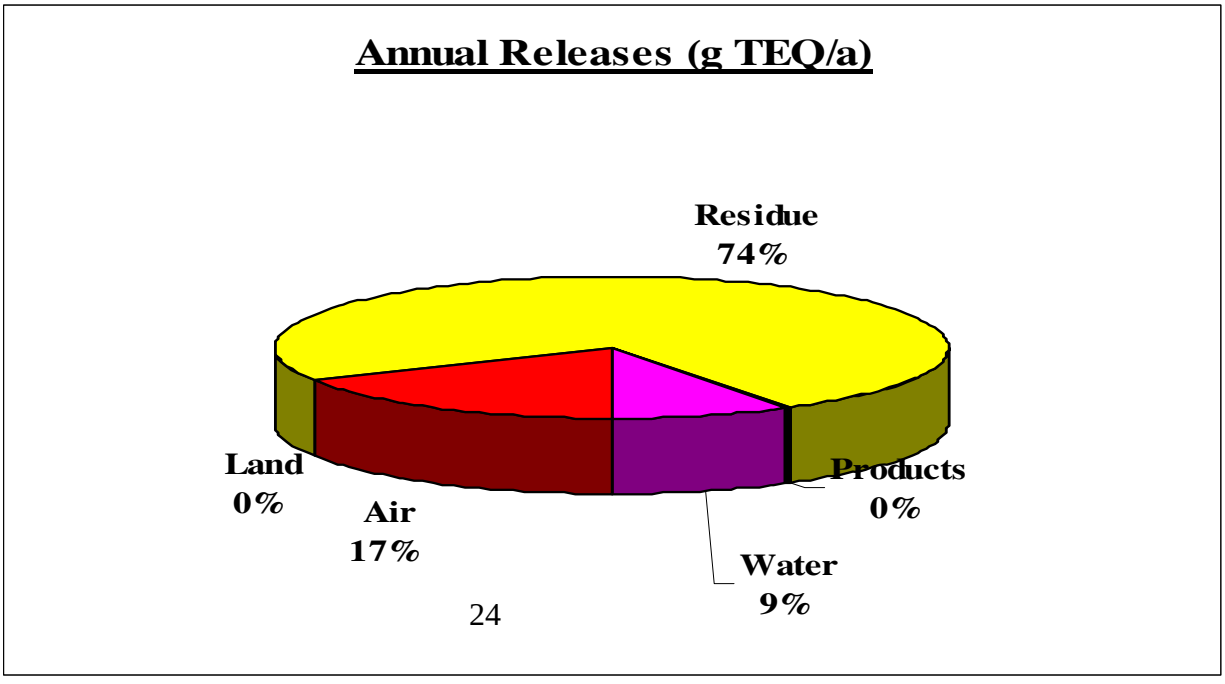
By virtue of her cool and dry climate, Lesotho is malaria free as such currently DDT iis not used n vector control or any other sector. However, DDT was used as a broad spectrum pesticide in the country during early 70s. It was used for agricultural purposes as well as a pesticide in public health. In agriculture it was used on almost all crops for control of any pest in the country (FAO 1974). It was also used on livestock for control of ectoparasites especially on cattle. Although its use or records of its existence were not available from the livestock staff it was admittedly used for that purpose in as far back as the ‘70’s. For crop protection its use has been documented in some old agricultural pamphlets and guidelines (Anonymous -). Records indicating its use in the past were available at the Plant Protection store of Agricultural Research and it was last recorded in 1984 with amounts not exceeding 50kg.

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

On the basis of the “Standardized Toolkit for Identification and Quantification of Dioxins and Furan Releases”, the main categories were identified, which are relevant to Lesotho. Out of the 10 categories, 9 categories were deemed existent in the country; these excluded Ferrous and Non-Ferrous Metal Production. It was further realized that the burning of waste in many areas is regarded as incineration, which in real technical terms it is not. However, due to lack of another category, the process of burning, particularly medical waste has been treated as incineration. All hospitals in the country were found to have medium technology incinerators, all of which are either out of order or not functioning in a normal way. This has lead to the burning of medical waste in an incomplete combustion process which is even a worse producer of Dioxins and Furans.

The category of Power Generation and Heating was considered only as far as household heating and cooking is concerned, and here statistical data from

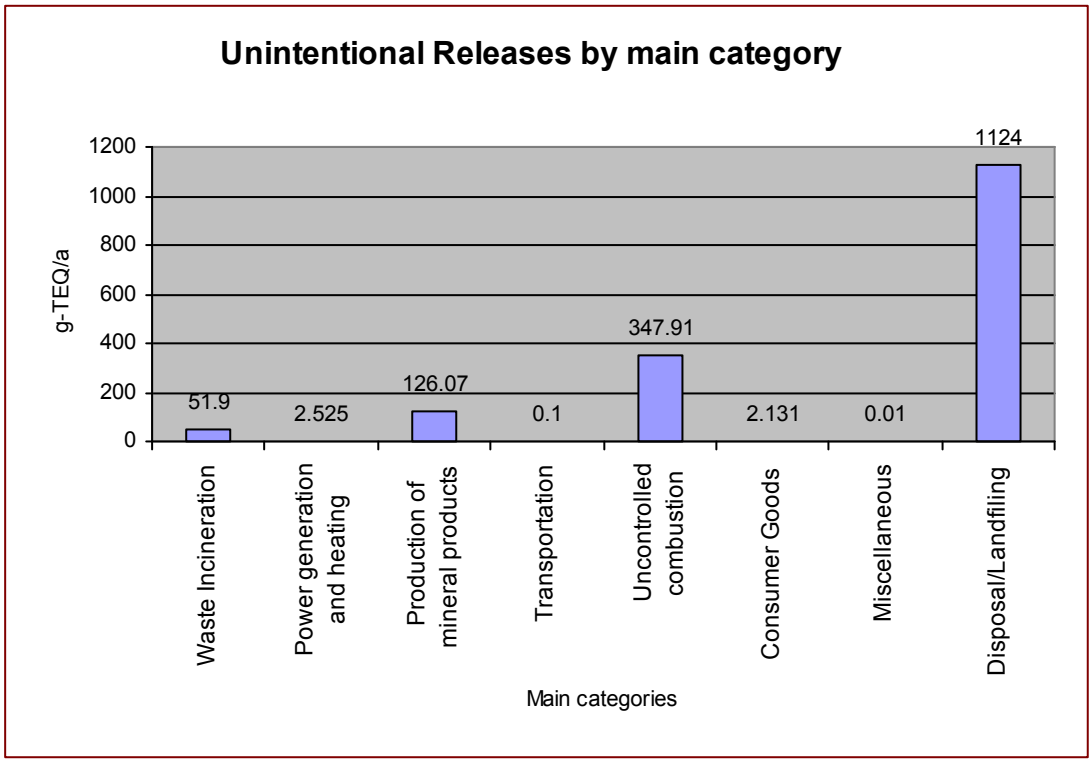
demographic analyses were used to quantify amounts of fuel consumed, hence the emission rates of dioxins and furans.
Transport category was dealt with in two ways, namely, motor vehicle counts, as per the registers of the traffic departments, and through compiled statistical data on total imports of hydrocarbon fuels. Activities in the Production of Mineral Products are quiet low, considering that it only applies to Brick production and Asphalt mixing.
Regarding uncontrolled combustion processes, there is a serious problem of quantification as it was not possible to determine the frequency of burning. This deals with biomass burning as well as burning of waste, both of which are evidently common in Lesotho. The best option seemed to be a statistical estimation based on probabilistic aspects.
Production of chemicals is non-existent in the country. However, the use of chemicals is applicable. This category is therefore considered only in so far as the use of chemicals and consumer goods is concerned. The subcategory deals with textile production since Petroleum industry is covered in transport. In this regard, customs records for a full year export of textile were used as the basis.
There are of course other diverse activities, which are considered under miscellaneous. Regarding this category, the crematorium is not yet in operation, but there are dry cleaners and a lot of tobacco smoking. Emission from biomass has also been considered, and the drying of biomass was extrapolated from the household-heating category.
Under the category of Disposal, landfills and waste dumps, capacities were estimated on daily basis over a period of a month in order to establish mean activity. As part of the study, it was noted that there exists a number of illegal dumpsites, some of which may have been missed, and this encompasses open water dumping as well as composting. Sewage treatment activity calculations were based on the estimates of generated sewage as adopted by Water and Sewage Authority (WASA). The estimated amount of sewage generated is based on the total water consumption.
In all areas visited where activities existed, the extent of contamination, as well as the capacity to manage the activity was used as the basis of proclaiming such areas as hotspots. In as far as by-products are concerned; this was restricted to dumps of wastes/residue from all categories mentioned above.
The total by-products emissions for Lesotho are estimated at 292.3 g-TEQ/a in air, 149.1 g-TEQ in waters, 2.1 g-TEQ/a on products and 1264.6 g-TEQ as residues,



while emissions on land are negligible. Release from products is far negligible, and represents about 0.12% of the total inventories sources. On the other hand, the bigger portion is contributed by residues that are left after burning waste at illegal and uncontrolled dumping sites.

The dioxins and furans formed through various processes escape into the environment through different pathways/media namely: air, land and water. The escape into the air is brought about by combustion and high temperature thermal process, whereas on land it occurs by adsorption, absorption and leaching on or into the soil. The introduction of dioxins and furans to water could happen in a number of ways. This includes discharge of effluent or contamination with leachate and chemicals containing dioxins and furans. Of the three media, air is the most affected by these releases followed by water and then land. This can be explained by indicating that a lot of waste is burnt due to poor waste management system resulting in gaseous emissions. With water in the second spot, the contaminants are introduced through effluent from sewage treatment works, leachate from waste disposal sites all of which are operated in an inefficient manner. The land receives little pollution partly because Lesotho does not practice massive organic farming whereby sludge is used to condition the soil.

From the inventories, it was evident that unintentional release of dioxins and furans, by main category, is dominated by waste disposal or landfilling, which is followed by uncontrolled combustion. The rest produce insignificant releases. From this analysis, it is a requisite that this document, the National Implementation Plan for Management of POPs, should address dumpsites and landfills at the highest priority. It is therefore conclusive that dumpsites, landfills and uncontrolled combustion are considered as hotspots. In terms of dumpsites, special attention needs to be given to Ha-Tšosane and Maputsoe dumpsites, which cater for all sorts of waste, including industrial waste.



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

A *contaminated site* is defined as a site at which substances occur at concentrations: (1) above background levels and pose or are likely to pose an immediate or long-term hazard to human health or the environment, or (2) exceeding levels specified in policies and regulations. During the inventory phase of the project, a number of sites that were contaminated with pesticides, transformer oil and dioxins and furans were identified. However, no samples were taken to confirm whether the sites were contaminated with POPs.

In the case of pesticides, dipping areas, pesticides stores and their immediate environments were identified as suspects. Fig 1 shows one of the dipping areas.

Fig1: A dipping area which is likely to be contaminated with pesticides

According to the PCB inventory, a transformer storage facility at the Head Office of the Lesotho Electricity Corporation (LEC) should be treated as priority for sampling and testing. Other sites include patches of contamination in the vicinity of leaking transformers. The latter sites have been subjected to risk assessment which determined those which need to be addressed in the short, medium and long term. Fig 2 shows transformer storage facility at LEC head Office in Maseru.

Fig 2 : Transformer storage facility contaminated with oil

Dioxins and Furans, as indicated by the inventories, are mainly released from burning of wastes and sewage treatment. Fig 3 below shows open burning of waste from industries at Maputsoe. Such waste comprises papers, styrofoam, plastics, sponges, etc.

Fig 3: Open burning of waste at Maputsoe

As mentioned earlier, there are no laws dealing specifically with POPs. However, polluter pays principle has been enshrined in the Environment Act, 2001 and in addition to the principle, The Act has provisions relating to prohibition of pollution and restoration order which will be used against institutions whose activities release POPs to the environment once the said Act becomes operational.

In the case of dip tanks which have that are contaminated environment with pesticides, the Ministry of Agriculture would take a lead in ensuring the cleaning up of such areas. PCBs contaminated sites will be cleaned up by LEC and any other owner of transformer which is polluting the environment.

Dioxin and furan contaminated sites will decontaminated by industries that are dumping and burning waste and the local authorities within whose jurisdiction those dumpsites fall.
The overall responsibility of ensuring that polluters clean up the environment and where possible required resources from financial mechanism are made available will be the Ministry of Tourism, Environment and Culture

2.3.6 Summary of future production, use and releases of POPs – requirements for exemptions

In the light of the current situation, where there is absolutely no intentional production of POPs chemicals in the country, coupled with the implementation of the Stockholm convention, Lesotho shall include within her legal framework, restrictions with regard to POPs production and import. It therefore follows that no POPs will be produced in the country while their use especially in transformers will decline overtime. Since Lesotho is a malaria free country, no exemption for DDT is required. As for the use of other pesticides for the control of termites, the Country has been using fipronil (phenyl pyrazole) with excellent results. Therefore no exemption for POPs pesticides has been or is planned to be requested.

CHEMICALS	IMPORT	EXPORT	PRODUCTION	RELEASES	USE
ANNEX A PARTI	0	0	0	0	INSUFFICIENT DATA
ANNEX A PART II	0	0	0	INSUFFICIENT DATA	INSUFFICIENT DATA
ANNEX B	0	0	0	0	0
ANNEX C	N/A	N/A	UNITENTIONAL		

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

The assessment of the health effects of persistent organic pollutants in Lesotho was carried out in February to May 2004. Six districts representing **60%** of the districts of Lesotho were sampled for the study. The study covered: the assessment of environmental monitoring activities in various government and parastatal institutions; review of health records in hospitals; interview of: farmers, women who have had miscarriages, mothers of babies born with below normal birth weights and risk groups such as: incinerator operators, workers in waste disposal sites, and residents close to potential release points for persistent organic pollutants like dioxins and furans. The key findings of the study include the following:
There is no monitoring of persistent organic pollutants in the monitoring activities of all institutions involved in some form of environmental monitoring in Lesotho. The inclusion of these substances in the existing monitoring activities will require some training for staff and equipping laboratories for some of the institutions to be able to analyse POPs.
Environmental monitoring policies, standards and guidelines do not exist. These tools need to be developed to direct envisaged POPs monitoring in Lesotho.

Surveillance of environmentally related diseases is not adequately performed by the Ministry of Health and Social Welfare. Orientation of clinicians on diseases that may require follow up to establish exposure to certain environmental factors will facilitate detection of root causes of the diseases which will, in turn, direct or inform focus for future monitoring areas.
Persistent organic pollutant pesticides are not used in the production of food and animal feed in Lesotho. This may, therefore, rule out the presence of POPs in food. If present, it may be as a result of the POPs produced unintentionally and settling on food following transportation by environmental medium such as air and illegal importation and transportation.

Miscarriages in women investigated and the low birth weights of newborn babies may not be due to exposure to persistent organic pollutants. Investigated women, mothers and children showed that some of the women went through successful pregnancies following a previous miscarriage. Children born in the subsequent pregnancies were growing well and interact

very well with other children. Other factors may account for women's miscarriages and low birth weights in newborn babies. These factors may include: disease conditions, unexpected psychological factors, intrauterine malnutrition, multiple pregnancies, pre-eclampsia and other conditions with inadequate placental nutritional supply.
POPs associated conditions were not identified among risk groups like farmers. The five categories under investigation were: skin conditions, eye conditions, respiratory, neurological/psychological conditions and conditions of the reproductive system. Albeit this observation, there is need to educate farmers in the safe handling of pesticides, orientation on persistent organic pollutants pesticides and their environmental and health effects. To reduce reliance on chemical control methods in pest control, integrated pest management needs to be promoted.
Waste disposal sites commonly used in Lesotho include dumpsites like the one located at Tŝosane village (Fig 4). This dumpsite serves the city of Maseru. One of the major characteristics of the dumpsite is the regular release of smoke due to spontaneous fires. Populations residing around this site are affected in a number of ways that include high prevalence of health conditions that may be associated with vitiated air. Eye and respiratory conditions appear to be more do

- Residents close to waste disposal or dumpsites.
- Personnel working in power utilities especially those close to storage sites for decommissioned transformers that may be containing oil with PCBs.
- Sectors of the community that may be abusing transformer oil.
- Urban population where population density is high.

Fig 4: Tšosane dumpsite serving the capital, Maseru.

Since DDT is still in use in the Republic of South Africa, community education needs to be embarked on to prevent its being purchased for use in agriculture by individual farmers.

This survey did not have control groups; hence, the findings are only indicative and suggest areas where further comprehensive assessments should be done. In carrying out such assessments, it would be crucial to carry out the medical history and physical examination of some of the risk groups. Some of the areas that may be targeted in such examinations could include skin, liver and kidney functions

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

The public awareness survey was undertaken to assess the adequacy of public awareness strategies and techniques in the country in addressing persistent organic pollutants. Data were collected in all regions of the country from both users and people who should know about these pesticides. The findings show that there is presently no public information policy in Lesotho, there is however a draft media policy though it has not passed through parliament. There is also no Environmental Education Policy.

Various awareness raising techniques are employed by different government ministries and institutions, ranging from individual methods to group methods. Some of these methods have proved to be very effective, while others are most popular though they have proved to be less effective.

The survey results indicated that most people are aware of the dangers of pesticides even though they do not use protective clothing, perhaps because of unavailability or expensiveness of such equipment. The disposal of containers on the other hand was seen to be a problem as most farmers dumped them in rivers thus polluting water streams or are buried thus polluting underground water resources. The public also acknowledged Incinerators and transformers as problematic though the level of understanding of problems was very low.

The recommendations therefore are that there is need to use multiple awareness raising methods to be effective and to reach as many sectors of the public as

possible. Certain methods should be improved upon so that they are attractive to the public as they can be very effective.
Section 95 of the Environment Act, 2001 has provisions relating to freedom of access to environmental information. It stipulates that any person who wishes to gain access to information that is kept by an Authority would granted permission subject to payment of a fee. Such information would not include proprietary information which shall be treated by the Authority as confidential. However, as expected there are no procedures for implementation of pollutant release and transfer registers.

2.3.9 Relevant activities of non-governmental stakeholders

There are several Non governmental Organizations in Lesotho. Their traditional role has been to watch over government programmes and seek to increase the government commitment and rate of implementation of development initiatives. There is no NGO that is specifically, actively involved in the monitoring of the use of hazardous chemicals inclusive of POPs in the country. None of the NGOs mentioned below is affiliated to PAN which has been advocating for the banning of hazardous pesticides in Africa. What come close to PAN is PELUM since they advocate for organic farming which by definition does not use pesticides. Unfortunately the membership of this NGO is limited.
Lesotho Chamber of Commerce and Industry is a business community umbrella NGO, which is set out to promote private enterprise activities in Lesotho and liaise with GOL matters relating to business promotion and refutation. It further facilitates cooperation among local business persons. This could facilitate trade in friendlier non-POPs substances and facilitate the regulation of PTS.
The Lesotho Council of NGOs is an umbrella development institution representing NGOs operating in Lesotho. It aims to stimulate, promote and support NGOs in their development efforts. It serves as a focal point for coordination and collaboration on the activities of all NGOs in line with national development objectives.
Lesotho Teachers Trade Union stands for advocacy in education and training including information dissemination.
Transformation Resource Center is a development, education and training NGO. It is working for more just and humane society through community transformation and self analysis. Facilitating problem identification, problem solving and training for transformation are the major objectives of TRC.
There are several other NGOs which are rural development oriented, dealing in wider issues of self reliance, water and sanitation as well as education. Some may target selected groups of the society such as women and disabled people.

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

Current monitoring standards for POPs in the environment
Environmental monitoring entails regular or routine collection or measurement of a set of selected parameters for purposes of determining change. Thus, in a monitoring programme, three outcomes are likely to be recognized, viz., *improvement, deterioration or no change* in a given situation.
Agencies that are expected to be involved in environmental monitoring, which could include to some extent, the monitoring of persistent organic pollutants include, *inter*

alia, the following: Ministry of Health and Social Welfare, Ministry of Agriculture and Food Security, Ministry of Tourism, Environment and Culture, Ministry of Natural Resources and the Ministry of Local Government. Environmental monitoring activities performed by these agencies are summarized in table 4.
It is noted that, some of these agencies do not have well spelt out and documented parameters that are monitored and the frequency of monitoring such parameters. A better situation is observed in the monitoring activities of the Ministry of Natural Resources -Water and Sewerage Authority and the Department of Water Affairs where such documentation exists. None of the identified institutions perform the monitoring of persistent organic pollutants. This situation is brought about by:

The fact that there is no legislation controlling the use of chemicals including pesticides in the country. Guidelines on the use of pesticides covering issues such as: the types of pesticides to be used, methods of application, dosages and time in terms of maturity of crops to be treated are not easily accessible for staff working with farmers, farmers and other parties who may have an interest in this matter.
Lack of skills in undertaking monitoring and analysis of POPs.
Limitations in relevant laboratory equipment and supplies.

Monitoring of residues of pesticides in the harvested products is not done for a plethora of reasons that include: Unavailability of national policies, standards and guidelines; unavailability or inadequately equipped infrastructure (laboratories), inadequately trained personnel within the expected monitoring agencies; the fact that most of the products go directly to the consumers without going via the formal controlled markets like shops and supermarkets where inspections are conducted though not as regularly as ideally required. These shortfalls would need to be considered with care during the development of chemical/persistent organic pollutants monitoring in the future. The capacity of existing laboratory facilities in the country is summarized in table 5.

Available equipment performs organic and inorganic analysis, elemental analysis, molecular structure analysis or quantification. Most of the equipment is found in the National University of Lesotho (NUL) laboratory followed by the Agric Research laboratories. It will be noted that most of the laboratories do not have equipment such as Gas-liquid chromatography with electron-capture detection, Gas chromatography, packed column gas chromatography, thin layer liquid chromatography and high performance liquid chromatography that are recommended for the detection of a number of POPs (Heptachlor, Aldrin, Dieldrin, Endrin, Chlordane, Hexachlorobenzene, PCBs) (WHO 1988; WHO 1989, WHO, 1991; WHO, 1998; UNEP, 2002).

Waste management facilities
Poor waste management is one of biggest problems in the country. As mentioned earlier waste is being dumped at various localities in the country with some of the sites being within residential areas. As for POPs specific facilities, there are no POPs waste disposal facilities in the country. It is hoped that the POPs waste will be exported to neighbouring countries for environmentally safe disposal.

Contaminated Site Remediation

The country does not have capacity for contaminated site remediation. Once again assistance in this area will be sought from neighbouring countries and friends.

Health Monitoring Capability

The country does not have a monitoring programme aimed at assessing the health impacts of POPs.

Technical Support Services

Research and Development

Information Management capacity

The capacity to manage information is adequate in terms of human resources and hardwares. However, there are certain aspects relating to the Convention and indeed strategic approach to chemicals which require special attention. Legislative framework being foundation for other tools should be given priority.

Table 4: Summary of monitoring activities by different agencies

AGENCY	SUMMARY OF MONITORING FUNCTIONS & FREQUENCY	CHEMICAL MONITORING		ADEQUACY OF FUNDS		STAFF TRAINING NEEDS	OTHER REMARKS
		OTHERS	POPs	OTHERS	POPs		
Ministry of Agriculture and Food Security (Research – Plant Protection Section)	**Putting** pesticides on trial for future use & evaluating their effectiveness, application and safety. **Training** of staff in other sections. **Storage** of pesticides for distribution and/or disposal. Monitoring of chemicals and POPs in the environment not done.	No	No	No	No	Procedures for carrying out sampling & analysis of POPs & environmentally sound disposal of samples.	There are no facilities for analyzing POPs. NUL thought to be a probable institution to do analysis failing which CSIR would be used. Absence of laws controlling pesticides, a major problem. Costs for using CSIR may be a limiting factor.
Ministry of Tourism, Environment and Culture (National Environment Secretariat)	**Coordinate**, advice and regulate environmental management and advance application of environmentally sound technology concept. **Set** standards, guidelines & monitor adherence to EIA. **Disseminate** information on environmental issues & ensure Lesotho's adherence to treaties and environmental conventions.	No	Yes	No	No	Investigating contaminated sites – dioxins, furans and pesticides including sampling. Risk assessment & management Estimating populations at risk Determining mitigation measures	Though there is no regular monitoring programme, there is an observed concern on storage of chemicals. Locally, WASA, Water Affaires and NUL could be used for analyzing chemicals. For POPs, NUL could be approached for dioxins & furans (Problem – disposal of samples). CSIR would be the next option. Concern on the recognized weak research base of the country. Poor disease surveillance that does not facilitate linking health conditions with environmental exposure. The Environment Act #15 of 2001 forms the framework for further specific legislation in chemical management and other related issues.

AGENCY	SUMMARY OF MONITORING FUNCTIONS & FREQUENCY	CHEMICAL MONITORING		ADEQUACY OF FUNDS		STAFF TRAINING NEEDS	OTHER REMARKS
		OTHERS	POPs	OTHERS	POPs		
Ministry of Health and Social Welfare (Environmental Health)	**Inspecting** reported and/or suspected nuisances. **Inspecting** pollution points, disposal sites for liquid and solid wastes. Water quality surveillance (sanitary surveys and bacteriological analysis. Investigation and control of environmental related diseases and epidemics. Investigation of chemical related food poisoning incidents.	No	No	Yes	No	Background on POPs Effects of POPs on health and the environment Sampling & analysis of POPs Environmentally sound treatment and disposal of POPs	Chemical monitoring confined to those suspected to be contaminating food and water and done per public complaints. Legislation in place makes POPs monitoring a difficult task. Community education on chemical/POPs management essential in view of non-existing monitoring programmes. Clinicians need to be given orientation on POPs related health conditions to enhance information exchange and facilitate appropriate environmental investigations.
Ministry of Local Government (Maseru City Council – Department of Health and Environment)	Identify pollution sources. **Create** awareness on environmental issues. **Initiate** legal action on authors of nuisances.	No	No	No	No	Sampling and analysis of chemical parameters including persistent organic pollutants.	Facilitating mechanisms include three pieces of legislation: Urban Government Act of 1983; Public Health Order # 12 of 1970; Environment Act #15 of 2001

AGENCY	SUMMARY OF MONITORING FUNCTIONS & FREQUENCY	CHEMICAL MONITORING		ADEQUACY OF FUNDS		STAFF TRAINING NEEDS	OTHER REMARKS
		OTHERS	POPs	OTHERS	POPs		
Ministry of Natural Resources (Water Affaires)	**Monitoring** the quality of surface & ground water and industrial wastewater. Monitoring activities are sometimes guided by observed or suspected pollution points. Monitoring is done on a monthly basis	YES	NO	NO	NO	Detailed training in POPs, background and effects; sampling and analysis for POPs plus a lot of practical work.	While monitoring is ongoing in the department there are occasions where analysis for some parameters especially those not done at the DWA lab are not done due to shortage of funds. WASA and NUL labs offer some assistance at a cost. Outside Lesotho, University of the Orange Free State and CSIR give assistance at a relatively higher cost. Other than being guided by the Water Resources Act of 1978, the department's operations are also supported by: the Water Resources Management Policy and Strategy 1999 and the Industrial Wastewater Policy of 2002. Dissemination of regular monitoring reports can facilitate informed decision making and promote better stakeholder participation in environmental monitoring and management. Declaration of chemicals coming into Lesotho outlining the chemical composition of each chemical can ease chemical analysis done or to be done by the department. Better equipment for the laboratory would broaden the monitoring functions of the department.
Ministry of Natural Resources (Water and Sewerage Authority)	Monitoring chemical/minerals in the natural environment excluding toxic chemicals (heavy metals, insecticides and pesticides	Yes	No	No	No	Monitoring of persistent organic pollutants	Supporting pieces of legislation Environment Act number 15 of 2001 and the Water and Sewerage Authority Act of 1992. The agency has documentation on parameters monitored for drinking water plus relevant procedures for analysis.

Table 5: Capacity of available laboratories

LABORATORY	CAPACITY			
	HUMAN RESOURCES		EQUIPMENT	COMMENTS
	Number	Qualifications	Available	
National University of Lesotho	8	7 x PhD 1 x MSc	HPRC, Gas Chromatography, GEMS 3800, FTIR, NMR 400 MHz Bruiker, B.A.S-100, RE 1501 Spectro fluoro photometer, LC 10 AT Liquid Chromatograph (Shimatsu), Gas Chromatograph 3800, Conductivity meter 4310, ICP – AES, AAS SpectrA 220 & 100, MAGNA-IR 560 Spectrometer ESP, SP3 – 300 Infra-red Spectrophotometer, , DR2000 Direct Reading Spectrophotometer,	Need: Extraction equipment, standard and reference materials (dioxins and furans), trapping fumes hood
Department of Water Affairs	6	-2 x BSc Biology & Chemistry -2 x Postgraduate -2 x on the job training	Spectrophotometer UV and visible, Hach DR 200 spectrophotometer, Autoclave, Centrifuge, BOD_5 cabinet	Structure needs to be expanded to accommodate extra equipment and staff
Water & Sewerage Authority	6	2 x BSc 1 x Diploma 3 x COSC	Spectrophotometer UV and visible range, HACH DR 2400, Analytical balance, Incubator, Autoclave, pH meter, Turbidity meter, Conductivity meter, Drying ovens	Structure too small to accommodate extra equipment and staff
Ministry of Agriculture and Food Security (Agric Research)	***PLANT PROTECTION LABORATORY***			
	3 Researchers	2 x MSc 1 x BSc	Microscope, Laminar flow, Steriliser, Autoclave, Fume Hood, Incubators	
	SOILS LABORATORY			
	2 Lab Technicians 1 Research Officer 4 Laboratory Analysts	MSc & BSc 1 x Diploma 3 x Certificate	Digital spectrophotometer, AA spectrophotometer, Flame photometer, Ion selective electrodes, Digital balances, pH meters, Moisture machines, Dionized machines, Distillers, Shakers, Kjeltromachines	
Ministry of Health & Social Welfare (Central Laboratories)	***HAEMATOLOGY***			
	7	1 x BSc 6 x Diploma	Automated cell counter Coagulometer	Very limited space to accommodate additional equipment and staff
	CLINICAL BIOCHEMISTRY			

LABORATORY	CAPACITY			
	HUMAN RESOURCES		EQUIPMENT	COMMENTS
	Number	Qualifications	Available	
	8	1 x MSc 2 x BSc 4 x Diploma 1 x Certificate	-Autoanalyser (routine diagnostic) -Ion selective electrode -Autoanalyser – (immuno assays) -High Performance Liquid Chromatography	Very limited space to accommodate additional equipment and staff

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

Communities at risk of exposure to Persistent Organic Pollutants include:
People living in the vicinity of dumpsites, such as Tšosane in Maseru and Maputsoe dumpsites and Ha-Nyenye;
Personnel working in power utilities especially those close to storage sites for decommissioned transformers that may be containing oil with PCBs;
Sector of the community that may be abusing transformer oil i.e., drinking it, applying it on livestock, etc.
These groups of society have not been quantified yet and it is the plan to establish the extent and magnitude of the impacts of POPs around these areas.

2.3.12 Details of any relevant system for the assessment and listing of new chemicals
Lack of legislation on pesticides management has made it impossible to establish any registration system for all pesticides that are imported into the country. Section 82 of the Environment Act, 2001 has provisions relating to registration of hazardous chemicals and substances. However, it is worth mentioning that the Act is not operational and that it is not comprehensive enough to cover requirements of Stockholm Convention hence a need for a separate law dealing with hazardous chemicals and pesticides.
Currently there is no system for the assessment and listing of new chemicals. Lesotho's economic situation and geographical position has led to high dependence of South African systems. This may be derived from the fact that, almost all economic resources come from Lesotho's only neighbour. Users of chemicals depend largely on Material Safety Data Sheets (MSDS) provided with the chemical. This is why there are situations whereby some MSDS and chemical names are still in other languages and there is no national requirement as yet to maintain such information in the official languages, English or Sesotho.

2.3.13 Details of any relevant system for the assessment and regulation of chemicals already in the market
There is neither a system of assessment nor regulation for chemicals and pesticides already in the markets, except those that are restricted in work places through the Labour Code (chemicals) regulations.
Labour Code (Chemical Safety) Regulations 2003 are subsidiary legislation made under the Labour Code Order 1992. The regulations are administered by Ministry of Employment and Labour. The regulations apply to the work environment. The regulations define a "chemical" as "chemical elements, compounds, and any mixtures thereof, whether natural, synthetic, or biological and in whatever state" and defines "hazardous chemical" as "any chemical which has been classified as hazardous in accordance with international instruments or for which relevant information exists to indicate the chemical is hazardous". Employers are to take adequate measures for safety of workers, their health and welfare.
The regulations require the manufacturer to prepare material safety data sheets which should contain information on chemical name, trade name, hazard, description, uses, explosive effects, chemical and physical properties, safe storage

and handling, accidental release measures, clean-up and disposal considerations, transport information.
The regulations provide for a total ban on the manufacture, production, processing, handling, use, storage and transportation of chemicals specified in Schedule IV. The existing legal framework is not adequate to ensure compliance with the Convention hence the changes discussed in section 2.3.12.

3.0 Strategy and action plan elements of the national implementation plan

3.1 Policy statement

The overall goal of NIP is to provide the road map in order to protect the health of Basotho and environment from harmful effects of POPs and PTSs. Therefore the Government of Lesotho through its competent authority commits itself to providing active leadership and support in the development and maintenance of appropriate procedures and measures to prevent or eliminate use, stockpiles, and wastes of POPs and to reduce unintentional releases of POPs in the environment.

3.2 Implementation strategy

Vision

By 2020, Lesotho will be free from all intentionally produced POPs and all unintentional emissions of POPs will be significantly reduced.

Mission

The Government of Lesotho, in collaboration with stakeholders in the management of chemicals strives to rid Lesotho of persistent organic pollutants and all hazardous chemicals for which affordable alternatives are available.

Guiding principles

The formulation and implementation of the Lesotho's National Implementation Plan (NIP) for Stockholm Convention is a response to a need for environmentally sound management of POPs as articulated in the Convention as well as Agenda 21 and Johannesburg Plan of Implementation (JPoI). At national level, the NIP is guided by the following principles:-

a. The Government of Lesotho believes that poor people are highly vulnerable to toxic effects of hazardous chemicals including POPs and that environmentally sound management of chemicals will protect human health particularly the poor and environment;

b. Government recognizes that none of the POPs are manufactured in the country and that most of those that are still in use are imported from elsewhere. The cooperation with SADC member states especially South Africa is crucial to the successful implementation of the country's obligations under the Convention;

c. The synergies between conventions relating to chemicals (Stockholm, Rotterdam and Basel) have been recognized at global level. Lesotho being part of the international community is already pursuing measures to cluster implementation of these conventions. This strategic approach would result in reduction of monitoring and reporting costs;

d. When replacing POPs that are currently in use, decision-makers will be guided by the availability of cheaper effective alternatives;

e. Government recognizes that partnership with private sector will greatly facilitate implementation of the country's obligations under the Convention;

f. Public awareness and participation in environmentally sound management of chemicals can be achieved through well packaged and group specific information on chemical management and their impacts on human health and environment;

g. Transboundary movement of POPs will be solely for environmentally sound disposal and such transportation will be consistent with the provisions of relevant national laws and Basel Convention;

h. This Plan is a living document which will be monitored and reviewed regularly so as to maintain continuity and modify strategies as more information becomes available.

i. Continued improvement in the knowledge base, skills and expertise relating to management POPs is crucial.

Implementation Strategies

The implementation strategies shall encompass:

i) Multi-stakeholder participation, a phase-out plan in such a way that it targets old and ineffective articles in use, and reduces emissions using BAT and environmentally sound disposal of waste.

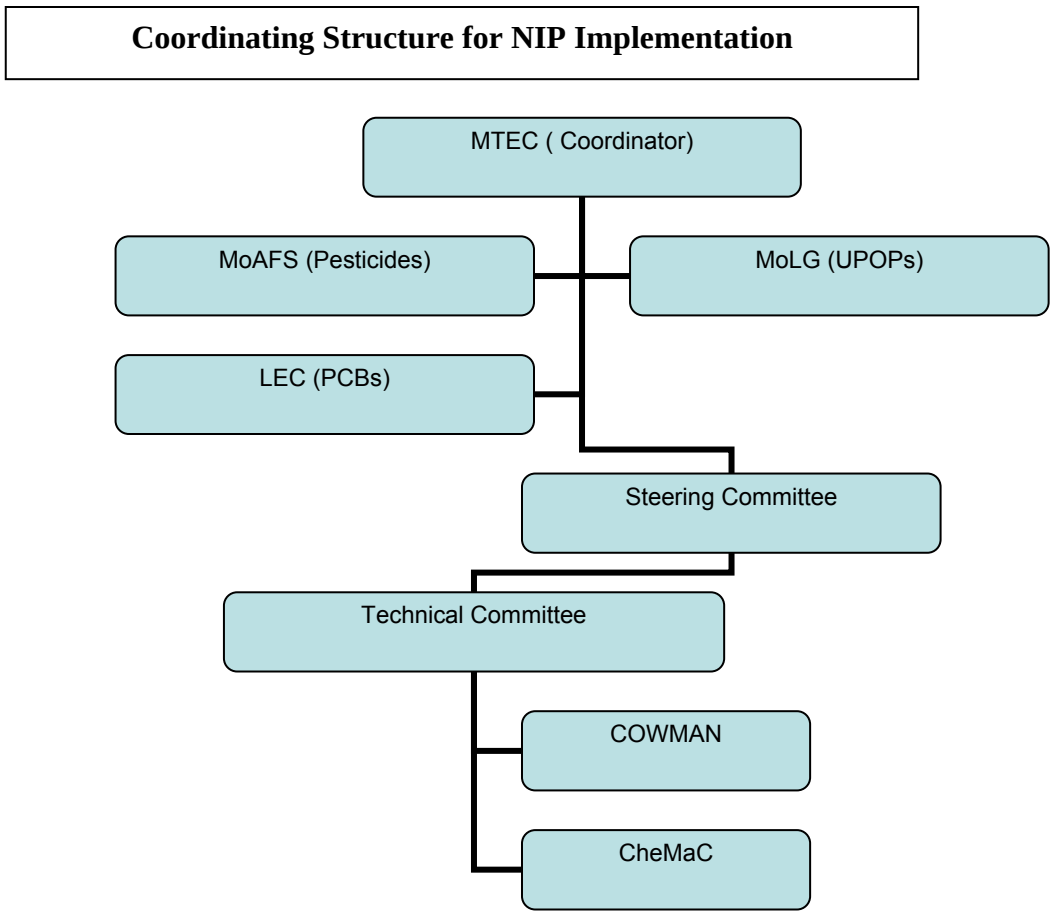
ii) Development and enforcement of all applicable Environmental legislative requirements and standards, which have been established nationally, regionally and internationally with the purpose of protecting human health and the environment.

iii) Documentation and maintenance of information in relation to human and environmental impacts emanating from the use of POPs and unintentionally released POPs

iv) Provision of adequate information, communication and education material to all sectors of the society, with the aim of creating awareness on the causes and effects of unintentional releases of POPs on humans and the environment.

Institutional Arrangements

By virtue of being the Focal Point for Stockholm Convention, the Ministry of Tourism, Environment and Culture will be charged with the overall coordination of NIP implementation. Since the issues being addressed in the NIP are relevant to the mandates of three institutions, namely, Ministry of Agriculture and Food Security, Ministry of Local Government and the Lesotho Electricity Corporation, they will form part of a Steering Committee for the implementation programme. The Steering Committee will give the project/ programme policy direction. The Chemical Management Committee (CheMaC) as the custodian of chemical management issues will also be represented in the Steering committee. he Committee on Waste Management will also have a representation in the Steering Committee. The two committees will be merged to form a new entity, Technical Committee which will be charged with responsibility of advising the Steering Committee on technical aspects of the project.



3.3 Activities, strategies and action plans

The subsection on Activities and action plans covers seventeen intervention areas as outlined in the guidance document. There are three major categories of Persistent Organic Pollutants identified for purposes of this document, namely, **Annex A Part 1 and Annex B POPs , Annex B Part II POPs (PCBs) and Annex C Unintentional POPs (UPOPs).** The focuses on measures to minimize health impacts are inbuilt within these categories. This section therefore outlines all relevant intervention areas under each of these categories. It should be noted that there are several cross cutting issues among all these categories, implementation of which becomes blanket, in terms of addressing POPs issues. However, each category has been dealt with independently so as to cover all pertinent issues thereof. Such cross cutting issues include Public awareness and education, Information exchange as well as reporting. In terms of overall implementation, the time frame (implementation schedule) shall indicate all those overlaps.
The costs of implementing or undertaking these activities have been reflected in totals as both baseline costs, to be provided by the Government of Lesotho as part of the normal operations of the public service. The incremental costs constitutes additional funds required for “new” ventures which the country may not readily be able to absorb, hence these shall be requested from Lesotho’s development partners and international organizations.

This chapter starts with the overall description of the main focus of each subchapter. This is followed by a table outlining objectives, strategies and activities, with the cost estimations.

Annex A Part 1 and Annex B POPs

3.3.1 Institutional and regulatory strengthening measures

The main objective in this regard is to Develop and amend Relevant Legislation towards proper management of Pesticides, including setting up an adequate institutional capacity
The activities in this sub-chapter are aimed at developing and amending Relevant Legislation towards proper management of Pesticides, including setting up adequate institutional capacity. The main strategy focuses on Strengthening the Environment Act 2001 and assigns responsibilities appropriately
The major role player in implementation of measures related to Annex A Part 1 chemicals shall lie with the Ministry of Agriculture and Food Security (MAFS), with the Department of Environment monitoring and accepting quarterly reports for evaluation of progress. Budgetary allocations shall be done directly to MAFS.

3.3.2 Measures to reduce or eliminate releases from intentional production and use

The objective to ban or prohibit the production and use of POPs pesticides in Lesotho is the focus measure. This is done for possible future production, as there is currently no chemicals production in the country. Activities shall involve Drafting of regulations governing access and use of pesticides and Publicize pesticides management manual

3.3.3 Production, import and export, use, stockpiles and wastes of Annex A POPs pesticides (Annex A, part 1 chemicals)

The objective of NIP under his subchapter is to regulate the import, use and disposal of pesticides wastes and Prohibit and/or eliminate production, use, import and export of Annex A POPs pesticides. The strategy to be adopted include Monitoring the use of Annex A POPs pesticides in the country and Development and implementation of finer strategies to identify stockpiles, products and articles in use and wastes containing Annex A POPs pesticides. A further Management of stockpiles in a safe, efficient and environmentally safe manner until they are deemed to be wastes is deemed a requisite.
The Strategy to be adopted include:
Monitoring the use of Annex A POPs pesticides
Developing and implementing strategies to identify stockpiles, products and articles in use and wastes containing Annex A POPs pesticides
Managing stockpiles in a safe, efficient and environmentally safe manner until they are deemed to be wastes

3.3.4 Production, import and export, use, identification, labelling, removal, storage and disposal of PCBs and equipment containing PCBs (Annex A, part II chemicals)
The subchapter is dealt with under *Annex A, part II chemicals*

3.3.5 Production, import and export, use, stockpiles and wastes of DDT (Annex B chemicals) if used in the country

Lesotho does not experience Malaria which is the major use of DDT as a result DDT is not used in the country.

3.3.6 Register for specific exemptions and the continuing need for exemptions (article 4)

T**he country is not planning to register any exemption now and in the future**

3.3.7 Measures to reduce releases from unintentional production (article 5)

The sub-chapter is dealt with under Annex C Unintentional POPs (UPOPs), as there are no unintentional production of POPs pesticides and DDT.

3.3.8 Measures to reduce releases from stockpiles and wastes (article 6)

Strengthening Hazardous Waste Regulations to Reduce or Eliminate POPs Releases from Stockpiles and Wastes as well as to dispose of all obsolete pesticides, including POPs in an environmentally sound manner is the major focus of th measure and the Strategies to be adopted range from Carrying out audits and improving existing pesticides storage facilities, through Development of Hazardous Waste Regulations to Reduce or Eliminate POPs Releases from Stockpiles and Wastes to Handling, collection, transportation and storage of Annex A POPs pesticide wastes in an environmentally safe manner and dispose them irreversibly.

3.3.9 Identification of stockpiles, articles in use and wastes

The objective of this measure is **t**o develop and implement technical guidelines for identification and classification of pesticides stockpiles and wastes using the strategy of Adapting international and regional guidelines and classification systems

3.3.10 Management of stockpiles and Institution of appropriate measures for handling and disposal of articles in use.

To develop and implement technical guidelines for handling and disposal of hazardous pesticides and their containers through Adoption of International and manufacturers Material Safety Data (MSD) codes and guidelines for handling and disposal.

3.3.11 Identification of contaminated sites (Annex A, B and C Chemicals) and remediation in an environmentally sound manner

To identify and clean up contaminated sites in an environmentally sound manner through regularly updating of inventories of contaminated sites and stockpiles and Development and implementation of clean-up programmes based on updated inventories

3.3.12 Facilitating or undertaking information exchange and stakeholder involvement

To capacitate the National Focal Point in terms of Information and Communication Technology by Establish a clearing House for POPs and PTSs within the NES website

3.3.13 Public awareness, information and education (article 10)

To assure that Lesotho has appropriate institutional capacity to allow the public, adequate awareness of the POPs pesticides issues and POPs-related activities and that it has sufficient opportunity to provide input regarding implementation of the convention and thus protection of their own lives by Engaging all methods and means of mass communication in the dissemination of POPs issues

3.3.14 Effectiveness evaluation (article 16)

The sub-chapter will be developed once the Convention provides information on the requirements.

3.3.15 Reporting

To report to the Secretariat and Government on measures taken to prevent importation, use and disposal of listed pesticides through Continuous Inventory reviews and monitoring, with annual reports compiled

3.3.16 Research, development and monitoring (article 11)

To carry out research on alternatives to POPs pesticides including Integrated Pest Management (IPM) and biopesticides Focussing on pesticides recommended by FAO for use in developing countries and Pursueing research on biopesticides within the framework of biosafety policy and biosafety protocol

To further design and implement a monitoring plan to assess country's compliance with relevant articles of the convention through Monitoring activities of all sectors and Evaluating the effectiveness of all actions taken to make the country free from POPs pesticides.

3.3.17 Technical and financial assistance (articles 12 and 13)

The country shall endevour to access all available technical and Financial assistance globally – multi and bilateral by Developing proposals aimed at addressing weaknesses in the existing pesticides management infrastructure

Annex B Part II POPs (PCBs)

3.3.1 Institutional and regulatory strengthening measures

Regarding PCBs, the main objective of regulatory strengthening is **t**o provide relevant institutions with resources and skills required for effective implementation of the Plan. This goes towards building the capacity of institutions on PCBs management at different levels (law enforcers, technicians, managers and teachers). The strategy to be adopted involves Enhance the analytical capacity of the National University of Lesotho, as well as training trainers with respect to PCB issues in general.

To further put in place regulatory measures that will ensure environmentally sound management of PCBs is a prerequisite to strengthening and ensuring effective institutional participation. This shall be achieved through:

Banning of Production, importation and use of PCBs in all applications except in small volumes to be used as standards
Developing agreements on transboundary movement of PCBs between South Africa and Lesotho within broad frameworks of Rotterdam and Basel Conventions

3.3.2 Measures to reduce or eliminate releases from intentional production and use

The objectives are the same as those of institutional strengthening and can be addressed through inclusion of PCBs in the list of banned chemicals.
It is further desirable to reduce number of leakages from 20% of in-service transformers to 0% by 2007 as an objective. To achieve this the country shall:
Develop and implement a comprehensive monitoring and maintenance programme
Replace leaking equipment that is no longer cost effective to maintain

3.3.3 Production, import and export, use, stockpiles and wastes of Annex A POPs pesticides (Annex A, part 1 chemicals)

The sub-chapter is dealt with under Annex A, part 1 chemicals.
3.3.4 Production, import and export, use, identification, labelling, removal, storage and disposal of PCBs and equipment containing PCBs (Annex A, part II chemicals)

The objectives can be outlined as follows"

To identify, label and remove from use equipment with PCB concentration higher than 10% percent and PCB volumes greater than 5litres no later than 2020
To identify, label and remove from use equipment with PCB concentration higher than 0.05% percent and PCB volumes greater than 5litres no later than 2020
To identify, label and remove from use equipment with PCB concentration higher than 0.005% percent and PCB volumes greater than 0.05litres no later than 2020

There should further be prohibition of importation of PCBs waste and reuse of liquids containing more than 0.005% PCBs in the country by 2008

All these are expected to be done through:

Identification/screening and labeling of equipment containing different PCBs concentrations
Developing a phase out plan that start with inefficient equipment which has the highest concentration of PCBs and
Capitalising on existing projects to develop relevant waste management law e.g. Partnership for the Development of Environmental Law and Institutions in Africa (PADELIA)
Including PCBs in the list of banned chemicals in the amendments to the Environment Act, 2001 and hazardous chemicals law
Dispose of PCB waste within SADC region

3.3.5 Production, import and export, use, stockpiles and wastes of DDT (Annex B chemicals) if used in the country

The sub-chapter is dealt with under Annex A, part 1 and Annex B chemicals

3.3.6 Register for specific exemptions and the continuing need for exemptions (article 4)

The country is not planning to register any exemption now and in the future

3.3.7 Measures to reduce releases from unintentional production (article 5)

The objective is really to significantly reduce PCB releases from unintentional production by 2020 by curbing production of unintentional PCBs through the use of appropriate technologies and adoption of appropriate standards and guidelines.

It is further required to discourage open burning of waste at domestic dwellings and landfills through legislative control.

3.3.8 Measures to reduce releases from stockpiles and wastes (article 6)

The major objective to this end is to significantly reduce releases from decommissioned transformers by 2010. This is to be achieved though:
Centralizing the storage of decommissioned transformers.
Developing a monitoring plan for storage facilities
Exporting PCB containing wastes for environmentally safe disposal in neighbouring countries that have capacity to do so

3.3.9 Identification of stockpiles, articles in use and wastes

The objective is to identify and label all PCB containing equipment by 2006, through determining the concentration of PCBs in electrical equipment especially transformers and updating PCB inventories.

3.3.10 Management of stockpiles and appropriate measures for handling and disposal of articles in use.

The phasing out all PCB containing equipment by 2020
Strategy:
Replace old transformers 1960-early 70s by new PCB free ones
Legislative reviews

3.3.11 Identification of contaminated sites (Annex A, B and C Chemicals) and remediation in an environmentally sound manner

Objective: To manage contaminated sites in an environmentally sound manner
Strategy:
Prioritise sites in terms of site and inherent risks
Polluter pays principle be applied to sites contaminated after the environment Act, 2001 has come into operation

3.3.12 Facilitating or undertaking information exchange and stakeholder involvement

Objective: To disseminate information on status of PCBs in Lesotho nationally, regionally and globally
Strategy:
Network with national, regional and multi-lateral institutions dealing with PCB issues
Publish information on PCB on internet/ Department's website with links to Government's website

3.3.13 Public awareness, information and education (article 10)

Objectives:
To increase the level of awareness among Basotho from low(<1%) to medium (50%) by 2007
To include PCBs issues in schools curricula by 2008

Strategy:
Cooperate with relevant sectors in the development and implementation of education and training programme
Strengthen the current LEC's public awareness programmes

3.3.14 Effectiveness evaluation (article 16)
3.3.15 Reporting

Objective: To report the progress made in the implementation of the Convention to Government and Secretariat of the Convention
Strategy:
Include sections in the hazardous chemicals and waste laws, which oblige companies that are in possession of PCB containing equipment to report on their progress towards phasing them out.
Produce regular reports on progress made towards phasing out PCBs

3.3.16 Research, development and monitoring (article 11)

Objective 1: To pilot the alternatives to PCBs under different conditions/ecozones and monitor their performance
Strategy: Introduce transformers (as replacement for old ones) which use alternatives to PCBs in the country or observe existing ones
Objective 2: To monitor the impacts of PCBs particularly on the health of high risk groups
Strategy: Target maintenance work force and any personnel responsible for cleaning transformer storage facilities
3.3.17 Technical and financial assistance (articles 12 and 13)

Objective: To develop proposals for the elimination of PCBs in the country by 2006
Strategy: Cooperate with all relevant stakeholders in the preparation of proposals for environmentally sound management of PCBs
Annex C Unintentional POPs (UPOPs)
3.3.1 Institutional and regulatory strengthening measures

Objectives:
To develop Integrated Waste Management and Pollution Control policy framework and amend relevant legislation to ensure significant reduction in the releases of dioxins and furans
To train law enforcement officers (environmental inspectors, police, lawyers, judges etc) in implementing legal instruments aimed at reducing dioxins and furans

Strategy:
To develop Integrated Waste Management and Pollution Control policy framework and amend relevant legislation to ensure significant reduction in the releases of dioxins and furans
Strengthen Environment Act 2001 and other relevant legislations and assign responsibilities appropriately
Collaborate with other stakeholders in developing training programmes

3.3.2 Measures to reduce or eliminate releases from intentional production and use
3.3.3 Production, import and export, use, stockpiles and wastes of Annex A POPs pesticides (Annex A, part 1 chemicals)
3.3.4 Production, import and export, use, identification, labelling, removal, storage and disposal of PCBs and equipment containing PCBs (Annex A, part II chemicals)
3.3.5 Production, import and export, use, stockpiles and wastes of DDT (Annex B chemicals) if used in the country
3.3.6 Register for specific exemptions and the continuing need for exemptions (article 4)
3.3.7 Measures to reduce releases from unintentional production (article 5)

Objective: To implement measures and procedures for the identified source categories that will significantly reduce releases of dioxins and furans
Strategy: Develop/formulate a legal framework for major activities (vehicle, factories) that emit dioxins and furans
3.3.8 Measures to reduce releases from stockpiles and wastes (article 6)

Objective: To implement cleanup systems and proper waste management for stockpiles and waste of potential releasers of Dioxins and Furans
Strategy:
Develop guidelines and standards for reducing dioxins and furans from stockpiles and waste
Carry out regular inspections/audits of the stockpiles and waste to ensure compliance with set standards

3.3.9 Identification of stockpiles, articles in use and wastes

Objective: To develop a system with guidelines for identification and classification of all source categories from which dioxins and furans are emitted.
Strategy:
Adopt international and regional guidelines on the harmonisation and classification systems
Update the Lesotho dioxins and furans inventory in order to develop a system with guidelines to adequately identify all source categories of dioxins and furans

3.3.10 Management of stockpiles, and appropriate measures for handling and disposal of articles in use.

Objective: To implement cost-effective and sanitary waste disposal systems
Strategy: Adopt internationally set standard operating procedures (SOPs) and manufacturer's codes and guidelines for reduction of dioxins and furans
3.3.11 Identification of contaminated sites (Annex A, B and C Chemicals) and remediation in an environmentally sound manner

Objective: To identify and clean up sites contaminated with Dioxins and Furans in an environmentally sound manner
Strategy:
Regular updating of inventories
Use of Geographical Information Systems (GIS) to map and locate contaminated sites

3.3.12 Facilitating or undertaking information exchange and stakeholder involvement

Objective: To coordinate and strengthen information exchange to reach every person
Strategy: Develop information exchange systems and guidelines and involve stakeholders or IAP to address dioxins and furans
3.3.13 Public awareness, information and education (article 10)

Objective: To disseminate information, education and communication to the public in order to increase awareness
Strategy: Engage all methods and means of mass communication in the dissemination of POPs issue focusing on dioxins and furans
3.3.14 Effectiveness evaluation (article 16)
3.3.15 Reporting

Objective: To report to the Secretariat of the Convention and Government on the achievements in addressing reduction of dioxins and furans
Strategy: Periodic update of monitoring data
3.3.16 Research, development and monitoring (article 11)

Objective: To monitor the levels of dioxins and furans contamination at identified sites
Strategy:
Focus on dioxins and furans as recommended by any of internationally recognized organisation or institutions, e.g. WHO, UNEP UNITAR etc
Strengthen the normal surveillance of specialised community groups such as workers

3.3.17 Technical and financial assistance (articles 12 and 13)

Objective: Access all available technical and financial assistance globally-multilaterally and bilaterally
Strategy: Develop proposals and send out

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Intervention Area: 3.3.1 Institutional and regulatory strengthening measures			
Objectives			
Develop and amend Relevant Legislation towards proper management of Pesticides, including setting up adequate institutional capacity			
Strategy			
Strengthen Environment Act 2001 and assign responsibilities appropriately			
Activities			
Develop Pesticides Control Policy	Policy document adopted by Government	1 year	GOL: M 44,500 Incremental : M 75,000
Amend and enact the Pesticides Control Bill	Pesticides Control Act passed by Parliament	2 years	Incremental : M 75,000 (PADELIA – hazardous chemicals & Pesticides bill)
Develop Pesticides registry and permit system	Registry and permit system in use by Crops and Public Health division	6 months	GOL : M 3,000 Incremental : M 25,000
Capacitate the Agricultural Extension division and Environmental Health divisions in terms of personnel	Establishments increased by 6	4 years	GOL : M 360,000
Train all Agriculture extension officers and Health inspectors	Training programmes conducted	4 years	GOL : M 30,000 Incremental : M 120,000
Intervention Area: 3.3.2 Measures to reduce or eliminate releases from intentional production and use			

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Objectives			
To ban/prohibit the production and use of POPs pesticides in Lesotho			
Activities			
Draft regulations governing access and use of pesticides	Regulation in place	2 months	GOL : M 4,500) Incremental : M 25,000
Publicise pesticides management manual	Manuals distributed to stakeholders in ten districts	2 months	GOL : M 20,000 Incremental : M 25,000.00
Intervention Area: 3.3.3 Production, import and export, use, stockpiles and wastes of Annex A POPs pesticides (Annex A Part 1 Chemicals)			
Objectives			
To regulate the import, use and disposal of pesticides wastes			
Prohibit and/or eliminate production, use, import and export of Annex A POPs pesticides			
Strategy			
Monitor the use of Annex A POPs pesticides			
Develop and implement strategies to identify stockpiles, products and articles in use and wastes containing Annex A POPs pesticides			
Manage stockpiles in a safe, efficient and environmentally safe manner until they are deemed to be wastes;			
Activities			
Develop pesticides stockpile management guidelines	Management guidelines in place	3 months	GOL : M 3,000 Incremental : M 25,000
Develop monitoring programmes for Pesticides	Monitoring programme in place	3 months	GOL : M 25,000
Train customs staff on identifying procedures pesticides	Training programmes conducted	1 year	To be combined with PCB training

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
			M 130,000.00
Develop means of communication between the customs department and the regulating authority.	Communication procedures in place	2 months	GOL : M 25,000
Register/ establish a database of all institutions that import and sell pesticides	A registry of outlets maintained by Health and Agriculture	1 month	GOL : M 3,000 Incremental :M 25,000
Intervention Area: 3.3.8 Measures to reduce releases from stockpiles and wastes			
Objectives			
Strengthening Hazardous Waste Regulations to Reduce or Eliminate POPs Releases from Stockpiles and Wastes			
To dispose of all obsolete pesticides, including POPs in an environmentally sound manner			
Strategies			
Carry out audits and improve existing pesticides storage facilities			
Develop Hazardous Waste Regulations to Reduce or Eliminate POPs Releases from Stockpiles and Wastes			
Handle, collect, transport and store Annex A POPs pesticide wastes in an environmentally safe manner and dispose them irreversibly			
Activities			
Review and update or develop legislation to include Registration of POPs stockpiles and wastes, prohibition of recovery or reuse	Legislation to include registration of POPs stockpiles and wastes in place by 2007	2 years	GOL: M 300,000 Incremental : M 108,240
Design, licensing, operation, tracking and monitoring of storage facilities for, handling of, and transportation of hazardous pesticides wastes	Guidelines for licensing, operation, tracking etc in place by 2006	6 Months	GOL : M 95,502
Design, technology selection, licensing, operation and monitoring of waste disposal operations for hazardous wastes	Guidelines for technology selection, licensing, operation and monitoring in place by 2006	6 Months	GO L: M 95,502

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Identification, registration, assessment and remediation of sites contaminated with hazardous pesticides	Upgraded register of contaminated sites developed by 2006	1 year	GOL: M 32,436
Develop clean up standards and guidelines for hazardous pesticides	Standards and guidelines developed by 2007	6 Months	GOL: M 15,000 Incremental : M 72,000
Intervention Area: 3.3.9 Identification of stockpiles, articles in use and wastes			
Objectives			
To develop and implement technical guidelines for identification and classification of pesticides stockpiles and wastes			
Strategies			
Adapt international and regional guidelines and classification systems			
Activities			
Draft national guidelines for identification and classification of pesticides	Guidelines for identification and classification available by 2007	6 Months	GOL : M 95,502
Adopt and Implement Globally Harmonized System (GHS) of labeling for active pesticides	Adopted GHS of labeling for active pesticides by 2007	2 Months	GOL : M 31,834
Intervention Area: 3.3.10 Manage stockpiles and appropriate measures for handling and disposal of articles in use			
Objectives			
To develop and implement technical guidelines for handling and disposal of hazardous pesticides and their containers			
Strategies			
Adopt International and manufacturers (MSDS) codes and guidelines for handling and disposal			
Activities			
Draft national guidelines for handling and disposal of pesticides	Guidelines for identification and classification available by 2007	6 Months	GOL : M 95,502

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Intervention area: 3.3.11 Identification of contaminated sites with POPs pesticides and remediation in an environmentally sound manner			
Objectives			
To identify and clean up contaminated site in an environmentally sound manner			
Strategies			
Regularly update inventories of contaminated sites and stockpiles			
Develop and implement clean-up programmes based on updated inventories			
Activities (remediation/waste disposal)			
Clear the store rooms of Agric Department of the obsolete stockpiles of pesticides and other materials that are not for immediate use(within one year)	All stores upgraded and cleared	1 year	GOL : M 9,072 Incremental : M 1,000 000
Treat and dispose of the obsolete pesticides and POPs pesticides	All inventories obsolete stock disposed	6 months	
Contract an expert to carry out the initial clean up	All contaminated sites cleaned	6 months	Incremental : M30,000
Intervention Area : 3.3.12 Facilitating or undertaking information exchange and stakeholder involvement			
Objectives			
To capacitate the National Focal Point in terms of Information and Communication Technology			
Strategies			
Establish a clearing House for POPs and PTSs within the NES website			
Activities			
Procure and install ICT equipment and programmes	All major equipment in place	1 year	GOL: M 7,500 Incremental : M 55,000
Procure membership and full participation in CIEN and INFOCAB and others	Membership confirmed	10 years	GOL: M 75,000
Intervention Area : 3.3.13 Public awareness, information and education			

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Objectives			
To assure that Lesotho has appropriate institutional capacity to allow the public adequately awareness of the POPs pesticides issues and POPs-related activities and has sufficient opportunity to provide input regarding implementation of the convention and thus protection of their own lives			
Strategies			
Engage all methods and means of mass communication in the dissemination of POPs issues			
Activities			
Send periodic letters or arrange meetings with NGO, Agric and Health sectors to inform them of progress made and encourage their continued involvement and support.	Letters and meetings held regularly	5 years	GOL : M 2,000 Incremental : M 2,000
Providing brief updates through relevant publications (e.g. newsletters of professional associations, industry or workers' organisations)	Updates included in all issues of professional publications	5 years	Cost of an article @ M1168 quarter page and half a page @M2335
Making use of the news media (e.g. newspapers, radio, television) in order to reach out to the general public.	Continuous media campaigns conducted	5 years	Cost of an article @ M1168 quarter page and half a page @M2335
Intervention Area: 3.3.15 Reporting			
Objectives			
To report to the Secretariat and Government on measures taken to prevent importation, use and disposal of listed pesticides			
Strategies			
Continuous Inventory reviews and monitoring, with annual reports compiled			
Activities			
Appoint a Steering committee to coordinate the Implementation phase of the project and to produce the annual reports	Annual reports compiled	5 years	GOL : M 955,020

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Adopt the guidelines that have been agreed by the COP	All reporting guidelines available and used	1 Month	GOL : M 15,917 Incremental : M 1,250
Produce the report and submit it to the Secretariat	Annual reports compiled and submitted	1 month	
Intervention area: 3.3.16 Research, Development and monitoring			
Objectives			
To carry out research on alternatives to POPs pesticides including Integrated Pest Management(IPM) and biopesticides			
Strategies			
Focus on pesticides recommended by FAO for use in developing countries			
Pursue research on biopesticides within the framework of biosafety policy and biosafety protocol			
Activities			
Develop proposals of projects to be undertaken in indigenous biopesticidal materials	Proposals to solicit funds developed by 2008	6 Months	GOL : M 95,502
Conduct research on suitable IPM strategies for Lesotho	IPM programmes for various pests (insects, vectors, weeds, rodents etc) in Lesotho	3 years	Incremental : M 200, 000
Promote the use IPM amongst the farmers in Lesotho	Training Programmes conducted throughout the country	1 year	Incremental : M 25, 000
Promote the use of Machobane Farming System (Local Organic Farming System) amongst the smallholder farmers in Lesotho	Number of farmers engaged in the system increased from 3,000 to 30,000	2 years	Incremental : M 50, 000
Solicit funds from potential donors for the research projects	Proposals submitted by 2008	1 day	GOL : M 408

Annex A Part I Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Objectives			
To design and implement a monitoring plan to assess country's compliance with relevant articles of the convention			
Strategies			
Monitor activities of all sectors and Evaluate the effectiveness of all actions taken to make the country free of POPs pesticides			
Activities			
Develop and implement a monitoring plan with clear indicators	Monitoring plan developed by 2006	3 months	GOL: M 3,002
Establish a network of institutions that will report on cases of violation of the regulatory framework and actions taken	Annual reports produced	1 month	GOL: M 2,250
Form a task team made up of all stakeholders to review the implementation plan	Task team formed by 2007	1 week	GOL : M 370
Develop a check list of milestones/indicators	A list of indicators developed by 2007	1 day	GOL : M 370
Intervention Area: 3.3.17 Technical and financial assistance			
Objectives			
Access all available technical and Financial assistance globally – multi and bilateral			
Strategies			
Develop proposals aimed at addressing weaknesses in the existing pesticides management infrastructure			
Activities			
Consult the stakeholders to identify potential donors and type of expertise required	Deficiency areas agreed on and sources of funding identified	3 years	GOL : M 1,500

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Intervention Area: 3.3.1 Institutional and regulatory strengthening measures			
Objectives			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Objective 1 To provide relevant institutions with resources/skills required for effective implementation of the Plan			
Strategies			
Strategy1: Build the capacity of institutions on PCBs management at different levels(law enforcers, technicians, managers and teachers)			
Activities			
Design a training programme for different categories	Training programme in place by 2006	2 months	LEC & GOL : M 9,000 Incremental : M 48,000
Train relevant institutions on various aspects of PCBs management particularly identification and safe handling	A total of 100 participants (technicians, law enforcers and teachers) trained on PCB management About 20 managers trained on PCB management	15 days 3 days	LEC & GOL : M 6,750 Incremental : M 1,266,000
Strategy 2: Enhance the analytical capacity of the National University of Lesotho			
Acquire PCB standards for the National University's laboratory to be used in the PCB analyses	All relevant PCBs standards purchased by 2006	60 days	LEC & GOL : M 4,800 Incremental : M 40,000
Objective 2 To put in place regulatory measures that will ensure environmentally sound management of PCBs			
Strategies			
Strategy 1: Ban Production, importation and use of PCBs in all applications except in small volumes to be used as standards			
Activities			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Include PCBs in the schedule of chemicals to be banned	Amendments to the Environment Act, 2001 published by 2006	1 year	GOL: M 12,000
Publish and distribute list of banned chemicals to all potential importers, law enforcement agencies and customs officials	All boarder posts, police stations and potential importers have list of banned chemicals by 2006 List published on internet by 2006 Communicating the same information to PIC Secretariat through appropriate forms by 2006	30days 1 day 2 days	GOL : M 10,000 GOL : M 150 GOL : M 400
Strategy 2: Develop agreement on transboundary movement of PCBs between South Africa and Lesotho within broad frameworks of Rotterdam and Basel Conventions			
Prepare agreement on transboundary movement of PCBs between South Africa and Lesotho within the context of joint bilateral cooperation and Basel Conventions	Agreement developed by 2006	3 months	GOL : M 50,000
Intervention Area: 3.3.2 Measures to reduce or eliminate releases from intentional production and use			
Objectives			
Objective 1: To ban production of PCBs (above)			
Strategies			
Strategy 1 : Include PCBs in the list of banned chemicals (above)			
Activities			
Include PCBs in the list of chemicals whose production has been banned (above)			
Objective 2: To reduce number of leakages from 20% of in-service transformers to 0% by 2007			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Strategies			
Develop and implement a comprehensive monitoring and maintenance programme			
Replace leaking equipment that is no longer cost effective to maintain			
Activities			
Review and upgrade monitoring and maintenance plan	An upgraded monitoring and maintenance plan by 2006	5 days	LEC : M 1,500
Develop technical guidelines for safe handling of PCBs	Technical guidelines developed by 2006	1 month	LEC : M 6,000 Incremental : M48,00
Identify irreparable equipment	Irreparable equipment labeled by 2006	2 months	LEC & GOL : M 6,750 Incremental : M 21,600
Remove irreparable equipment from the network	All damaged equipment removed from the network by 2010	4 years	LEC & GOL : M 18,000 Incremental : M 309,600
Construct containment structures	100 containment structures for high risk transformers constructed by 2008	3 years	LEC & GOL : M 22,500 Incremental : M 400,000
Intervention Area: 3.3.4 Production, import and export, use, identification, labeling, removal, storage and disposal of PCBs			
Objectives (articles in use)			
To identify, label and remove from use equipment with PCB concentration higher than 10% percent and PCB volumes greater than 5litres no later than 2020			
To identify, label and remove from use equipment with PCB concentration higher than 0.05% percent and PCB volumes greater than 5litres no later than 2020			
To identify, label and remove from use equipment with PCB concentration higher than 0.005% percent and PCB volumes greater than 0.05litres no later than 2020			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Strategies			
Identify and label equipment containing different PCBs concentrations			
Develop a phase out plan that start with inefficient equipment which has the highest concentration of PCBs			
Activities			
Sample oil from transformers and analyse it for PCBs using test kits	At least 200 samples tested by 2006	3 months	LEC & GOL : M 13,500 Incremental : M 32,400
Send some samples for further analysis using Mass-spectroscopy	At least 20 samples tested by 2006	3 months	LEC & GOL : M 4,800 Incremental : M 6,000
Label tested transformers and those found to be containing PCBs appropriately	PCB containing equipment labeled by 2006	1 month	LEC and GOL : M 2,000 Incremental : M 10,000
Use Global positioning systems(GPS) locate PCB containing equipment and GIS to map them	PCB containing equipment located by 2006	3 month	Be done concurrently with sampling
Develop a comprehensive phase out plan	PCB Phase out plan developed by 2007	3 months	LEC & GOL : M 13,500 Incremental = M 48,000
Remove from use the most inefficient PCB containing transformers	Remove PCB containing transformers from the network at the rate of 10 transformers/annum	10 years	LEC & GOL : M 54, 000 Incremental : M 21,420,000
Construct/upgrade at least one central storage facility for decommissioned	Storage facility constructed by 2010		LEC & GOL : M 9,000

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
transformers in Maseru and satellite ones in the districts			Incremental : M 5,900,000
Prepare and implement an agreement between South Africa and Lesotho for the export of PCB containing waste for environmentally safe disposal	Agreement between South Africa and Lesotho on transboundary movement of waste in place by 2006	3 months	GOL : M 50,000
Objective			
To prohibit importation of PCBs waste and reuse of liquids containing more than 0.005% PCBs in the country by 2008			
Strategies			
Capitalise on existing projects to develop relevant waste management law e.g. Partnership for the Development of Environmental Law and Institutions in Africa (PADELIA)			
Include PCBs in the list of banned chemicals in the amendments to the Environment Act, 2001 and hazardous chemicals law			
Dispose of PCB waste within SADC region			
Activities			
Produce Hazardous waste law by 2008	Hazardous law published by 2008	3 years	GOL : M 60,000 (PADELIA)
Include PCBs containing waste in list of banned wastes in the hazardous waste law by 2008	Schedule of banned wastes published as part of the law by 2008	1 day	GOL (part of amendment of Environment Act, 2001) and PADELIA
Distribute the list of banned wastes to customs officers and law enforcement agencies 2008	List of banned wastes available at all police stations and boarder posts by 2008	10 days	GOL : M 5,000
Adapt PIESA waste guidelines to Lesotho's conditions	PCB waste management guidelines developed by 2007	2 months	LEC & GOL : M 13, 500 Incremental : M

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
			48,000
Intervention Area: 3.3.7 Measures to reduce releases from unintentional production			
Objective			
To significantly reduce PCB releases from unintentional production by 2020			
Strategies			
Curb production of unintentional PCBs through the use of appropriate technologies (adoption of appropriate standards and guidelines)			
Discourage open burning of waste at domestic dwellings and landfills through legislative control			
Activities			
Make an inventory of unintentional sources of PCBs	An inventory completed by 2006	3 months	GOL : M 30,000 Incremental : M 84, 000
Construct appropriate landfills for waste disposal with incinerators which meet international standards starting in Maseru		-	Dioxins and furans **3.3.10**
Phase out the use of leaded petrol by 2006	Leaded petrol no longer used in country by 2006 Leaded petrol included among banned chemicals (especially additives) by 2006	1 year	GOL & petroleum companies : M 30,000
Develop an integrated waste management and pollution control policy	An integrated waste management and pollution control policy		Dioxins and Furans **(3.3.1)**
Develop air quality standards which include a standard for PCBs	Air quality standards in place		Dioxins and Furans **(3.3.7)**
Intervention Area: 3.3.8 Measures to reduce releases from stockpiles and wastes			
Objective			
To significantly reduce releases from decommissioned transformers by 2010			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Strategies			
Centralise the storage of decommissioned transformers with satellites in the districts/urban centres			
Develop monitoring plan for storage facilities			
Export PCB containing wastes for environmentally safe disposal in neighbouring countries with capacity to do so			
Activities			
Identify possible sites and subject them to preliminary screening process by 2006	Candidate sites screened by 2006	2 weeks	LEC & GOL : M 2, 250
Carry out an EIA for Maseru site to determine its appropriateness by 2007	EIA study conducted by 2007	2 months	LEC & GOL : M 1, 350 Incremental : M 250,000
Construct the facilities in Maseru and in the districts by 2015	One central facility and two satellite ones constructed by 2010	1 year	Covered under 3.3.4
Carry out tests to determine the PCB content of decommissioned equipment suspected of containing PCBs by 2006	200 samples under 3.3.4 to include wastes	3 months	Covered under 3.3.4
Identify and label wastes containing PCBs by 2006	Wastes containing PCBs identified and labeled by 2006	3 months	Covered under 3.3.4
Design a licensing/clearance system for companies to be responsible for transporting PCB containing wastes by 2007	Include licensing forms in hazardous waste management law by 2007	3 months	Part of waste management regulations PADELIA
Intervention Area: 3.3.9 Identification of stockpiles, articles in use and wastes			
Objective			
To identify and label all PCB containing equipment by 2006			
Strategies			
Determine the concentration of PCBs in electrical equipment especially transformers			
Update PCB inventories			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
Activities			
Take samples for analysis	200 samples collected for preliminary testing of which At least 20 samples are taken for laboratory analysis	30 days	Covered under 3.3.4
Label PCB containing equipment by 2006	Label all PCB containing equipment by 2006	30 days	GOL & LEC M 40,000 Incremental : M 79, 800
Establish and maintain a database of equipment containing PCBs by 2006	Database of PCB containing equipment established by 2006	10 days	Incremental : M 13,000 (UNEP PCB Project)
Develop a tracking system for PCB containing equipment by 2006	A tracking system for transformers developed by 2006	4 days	LEC & GOL : M 1, 500
Intervention Area: 3.3.10 Manage stockpiles and appropriate measures for handling and disposal of articles in use			
Objective			
To phase out all PCB containing equipment by 2020			
Strategies			
Replace old transformers 1960-early 70s by new PCB free ones			
Legislative reviews			
Activities			
Prepare or update list of old transformers and identify inefficiencies by 2006	List of old transformers updated by 2006	4 months	GOL & LEC : M 22, 500 Incremental : M 64, 800
Implement phase out plan starting with the most inefficient equipment by 2008	At least 30 transformers replaced per year for	10 years	GOL & LEC : M 2,500,000

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
	10years		Incremental : M 75,000,000
Include regulations on handling, transport, storage and disposal of PCB-containing equipment in hazardous waste management law by 2008	Issues relating to handling, transportation and disposal of PCBs included in the hazardous waste management law by 2008	3 months	GOL & LEC : M 13,500 Incremental : M 64,000
Prepare a voluntary agreement between owners of transformers (LEC and individuals) and Government committing the parties to PCBs phase out by 2008	At least three voluntary agreements between owners of transformers and government	2 years	LEC & GOL : M 20,000 Incremental : M 12,000
Develop guidelines on transportation of PCB containing equipment by 2007	Guidelines on transportation of PCB containing equipment prepared by 2007	1 month	GOL: M 40,000 Incremental : M 70,000
Intervention area: 3.3.11 Identification of contaminated sites (Annex A and C Chemicals) and remediation in an environmentally sound manner			
Objective			
To manage contaminated sites in an environmentally sound manner			
Strategies			
Prioritise sites in terms of site and inherent risks			
Polluter pays principle be applied to sites contaminated after the environment Act, 2001 has come into operation			
Activities			
Take soil samples from the sites for laboratory analysis	At least 10 samples taken for laboratory analysis	4 months	LEC & GOL : M 4,500 Incremental : M 30,000
Prepare a prioritized list of contaminated sites	Prioritised list of contaminated sites	1 day	LEC : M 300
Erect signage discouraging people from	Erect at least 10 signage in	10 days	GOL & LEC : M

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
entering /walking through the contaminated sites/premises	affected areas		4,500 Incremental : M 20,000
Embark on cleaning programme for the area using existing international guidelines by 2007	Clean at least two sites per annum	1 year	GOL & LEC : M 12,000 Incremental : M 120,000
Intervention Area : 3.3.12 Facilitating or undertaking information exchange and stakeholder involvement			
Objective			
To disseminate information on status of PCBs in Lesotho nationally, regionally and globally			
Strategies			
Network with national, regional and multi-lateral institutions dealing with PCB issues			
Publish information on PCB on internet/ Department's website with links to Government's website			
Activities			
Hold regular meetings of CheMaC	Monthly minutes		GOL : M 72, 000
Connect strategic institutions to internet by 2007	At least 10 institutions connected to internet	3 days	Incremental : M 12,000
Establish a web based clearing house mechanism on POPs by 2006	Clearing house mechanism in place by 2006	10 days	GOL: M 600 Incremental : M 12,000
Intervention Area : 3.3.13 Public awareness, information and education			
Objectives			
To increase the level of awareness among Basotho from low(<1%) to medium (50%) by 2007			
To include PCBs issues in schools curricula by 2008			
Strategies			
Cooperate with relevant sectors in the development and implementation of education and training programme			
Strengthen the current LEC's public awareness programmes			
Activities			
Train LEC workers in the management of	Train twenty participants on	3 days	Incremental : M

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
PCBs especially occupational health issues by 2006	safe handling of PCB		12,000
Hold at least ten workshops for teachers on chemical management inclusive of PCBs issues by 2008	Ten workshops held by 2008	2 years	Incremental : M 427,000
Produce awareness raising material for different target groups covering PCBs and their alternatives by 2006	Awareness material for different groups ready by 2006	Three months	Incremental : M 200,000
Include PCB issues in environmental chemistry from high schools to tertiary institutions by 2008	PCB included in high school and tertiary syllabi by 2010	Four years	Incremental : M 120,000
Produce posters, factsheets and write articles on the effects of PCBs by 2006	Produce at least 1,000 of each of the products by 2006	3 months	GOL : M 10,000
Involve teachers in the evaluation of the material before its publication by 2006	Teachers comments received by 2006	10 days	LEC & GOL : M 4, 500
Distribute material to all districts by 2007	Material distributed to all districts by 2007	10 days	GOL : M 5,000
Network with existing committees under various institutions by 2007	Contacts with at least four committees established	5 days	LEC & GOL : M 2,250
Access information from the internet and disseminate it to all stakeholders by 2006	Relevant information on PCBs downloaded from internet	Continuous from 2005	LEC : M 72,000
Intervention Area: 3.3.15 Reporting			
Objectives			
To report the progress made in the implementation of the Convention to Government and Secretariat of the Convention			
Strategies			
Include sections in the hazardous chemicals and waste laws, which oblige companies that are in possession of PCB			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
containing equipment to report on their progress towards phasing them out.			
Produce regular reports on progress made towards phasing out PCBs			
Activities			
Collate statistical data from companies by 2007	Data from companies received on annual basis	1 week	LEC : M 30,000
Produce annual reports on progress made in the phase out of PCB containing equipment	Annual reports produced every year starting from 2005	2 week	LEC & GOL : M 90,000
Prepare and submit regular progress reports to the Secretariat of the Convention	Reports submitted at regular interval to the Secretariat- once every five years	1 month	LEC & GOL : M 27,000 Incremental : M 144,000
Intervention area: 3.3.16 Research, Development and monitoring			
Objectives			
Objective 1			
To pilot the alternatives to PCBs under different conditions/ecozones and monitor their performance			
Strategies			
Introduce transformers (as replacement for old ones) which use alternatives to PCBs in the country or observe existing ones			
Activities			
Collect data on performance of transformers that use alternatives PCB under different ecozones (highlands and lowlands)	Pilot transformers identified by end of 2005 Data on performance of various PCB alternatives documented by 2008	3 years	LEC : M 108,000 Incremental : M 120,000
Use the information to prepare area region specifications for transformers	Region specific transformer specifications produced by 2009	1 month	LEC: M 4,500
Objective 2			

Annex A Part II Chemicals			
Objective/Strategy/Activity	**Measures of Success**	**Duration**	**Cost**
To monitor the impacts of PCBs particularly on the health of high risk groups			
Strategies			
Target maintenance work force and any personnel responsible for cleaning transformer storage facilities			
Activities			
Identify high risk groups and decide on the number to be screened	Groups and individuals identified	2 weeks	LEC & GOL : M 9,000
Engage a doctor to take blood samples and examine the identified groups on regular interval	Medical reports	I month	GOL & LEC : M 15,000 Incremental : M 300,000
Produce reports of the extent of contamination and associated impacts if any	Reports produced on regular basis annually	2 months	Part of PCB report
Intervention Area: 3.3.17 Technical and financial assistance			
Objectives			
To develop proposals for the elimination of PCBs in the country by 2006			
Strategies			
Cooperate with all relevant stakeholders in the preparation of proposals for environmentally sound management of PCBs			
Activities			
Identify bilateral, regional and multilateral sources of financial and technical assistance	List of potential sponsors ready by 2006	2 days	LEC & GOL : M 900
Develop and submit proposals aimed at addressing short and long term needs	At four small to medium project proposals submitted by 2006	4 months	GOL : M 30,000 Incremental : M 40,000

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Intervention Area 3.3.1 Institutional and regulatory strengthening measure			
Objectives			

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
To develop Integrated Waste Management and Pollution Control policy framework and amend relevant legislation to ensure significant reduction in the releases of dioxins and furans			
To train law enforcement officers (environmental inspectors, police, lawyers, judges etc) in implementing legal instruments aimed at reducing dioxins and furans			
Strategies			
To develop Integrated Waste Management and Pollution Control policy framework and amend relevant legislation to ensure significant reduction in the releases of dioxins and furans			
Strengthen Environment Act 2001 and other relevant legislations and assign responsibilities appropriately			
Collaborate with other stakeholders in developing training programmes			
Activities			
Draft policy document on Integrated Waste Management and Pollution Control which covers reduction of dioxins and furans releases from major source categories.	Policy document in place	1 year	GOL: M 6,000 Incremental : M 144,000
Organize nine regional workshops involving interested and affected parties, stakeholders, NGOs, government sectors, community leaders to make input on formulation of policy on dioxins and furans.	Workshop proceedings available	1 year	GOL: M 3,000 Incremental : M 374,000
Develop regulations under the Environment Act 2001 to address reduction of the release of dioxins and furans.	Regulations in place	2 years	GOL : M 4,500 Incremental : M100,000
Conduct crusher courses for law enforcement officers.	Reports on training proceedings	3 years	GOL : M 6,000 Incremental : M 280, 000
Institute statutes prohibiting smoking in public places	Statutes in place 30 Anti-smoking billboards in place	2 years 6 months	GOL: M 4,500 Incremental : M 100, 000
Intervention Area 3.3.7 Measures to reduce releases from unintentional production			
Objective			

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
To implement measures and procedures for the identified source categories that will significantly reduce releases of dioxins and furans			
Strategy			
Develop/formulate a legal framework for major activities (vehicle, factories) that emit dioxins and furans			
Activities			
Update the inventories register by 2010	Updated register available	4 months	GOL : M 13,500 Incremental : M 38,000
Review/amend existing legislation to incorporate dioxins and furans	Reviewed legislation in place	2 years	Covered under 3.3.1 incremental
Develop guidelines and standards (air pollution) for major activities (factories, vehicles) which emit dioxins and furans	Guidelines and standards available	2 years	Covered under 3.3.1 Incremental
Review of the set bench marks	Targets achieved	Yearly	
Intervention 3.3.8 Measures to reduce releases from stockpiles and wastes			
Objective			
To implement cleanup systems and proper waste management for stockpiles and waste of potential releasers of Dioxins and Furans			
Strategies			
I. Develop guidelines and standards for reducing dioxins and furans from stockpiles and waste			
II. Carry out regular inspections/audits of the stockpiles and waste to ensure compliance with set standards			
Activities			
Develop guidelines for proper management of waste disposal sites	Management guidelines developed and available	6 months	GOL : M 13,500 Incremental : M 100,000
Set guidelines for remediation/rehabilitation of sites contaminated with dioxins and furans	Rehabilitation guidelines set and available	1 month	GOL : M 25, 000
Conduct periodic audits of the source categories of dioxins and furans significant to Lesotho once every 2 years	Audit reports available	1 year	GOL: M 90,000 Incremental : M 130,000

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Draw a maintenance programme for sewage ponds.	Sewage ponds maintenance programme in place	3 months	GOL & WASA: M 20,000
Intervention Area 3.3.9 identification of stockpiles, articles in use and wastes.			
Objective			
To develop a system with guidelines for identification and classification of all source categories from which dioxins and furans are emitted.			
Strategies			
Adopt international and regional guidelines on the harmonisation and classification systems			
Update the Lesotho dioxins and furans inventory in order to develop a system with guidelines to adequately identify all source categories of dioxins and furans			
Activities			
Check documents and statistical records on the amounts of stockpiles, articles in use and wastes that may lead to release of dioxins and furans	Documents and statistical records retrieved and amounts verified	1 month	GOL : M 3,000
Solicit stakeholders involvement and participation in mapping and quantifying stockpiles and wastes	List of stakeholders involved and participated Maps produced Records of quantities compiled	- 1 year 1 year	 GOL : M 10,000 Incremental : M 100,000
Draft guidelines for identification and classification of source categories of dioxins and furans significant to Lesotho	Draft guidelines in place	6 months	GOL: M 9,000 Incremental :M 50,000
Intervention Area 3.3.10 Management of stockpiles and appropriate measures for handling and disposal of articles in use			
Objective			
To implement cost-effective and sanitary waste disposal systems			
Strategy			
Adopt internationally set standard operating procedures (SOPs) and manufacturer's codes and guidelines for reduction of dioxins and furans releases			

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Activities			
Introduce alternatives to chlorine containing plastic bags at chain stores/supermarkets	Use of alternatives (paper bags, bring your own bag etc) mostly practiced	1 year	GOL & Private Sector : M 50, 000
Set structures and encourage segregation of all different types of waste at points of generation (industries, households and institutions).	Waste separation system in place and effective	5 years	GOL: M 10,000,000 (Local Authorities Incremental : M 90, 000,000
Set up and promote recycling of plastic and Poly Vinyl Chloride products	Records on amounts of plastic and PVC collected for recycling increasing	5 years	Incremental : M 12,000,000
Construct technologically cost-effective waste incineration plants or equipment in design and operation that will reduce emission of dioxins and furans when treating medical waste.	Analytical reports showing reduced quantities of dioxins and furans in emissions and residues.	3 years	GOL : M 1,000,000 Incremental : M 2,054,950
Adopt Polluter-Pays-Principle from Cradle to Grave	Principles enforced Register of polluters available	2 years 1 year	GOL : M 50,000
Institute penalty charges for those who litter and practice illegal dumping.	Documented records of those prosecuted	10 years	GOL : M 500, 000
Construction of 2 regional sanitary landfills.	2 regional sanitary landfills under construction or in operation	2 years	GOL : M 2,000,000 Incremental : M 198,000,000
Maintenance of sewage/oxidation ponds by employing competent personnel, conduct refresher courses for existing staff and keep records of any deviations from standard operating procedures	3 refresher courses conducted Competent staff recruited Records available	2 weeks - -	GOL & WASA : M 32, 200

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Produce manuals/handbooks that should be used as guidelines for equipment or activities which burn/incinerate waste with the intend to reduce dioxins and furans releases.	200 manual/handbooks available for boilers and incinerators	1 year	GOL : M 30,000
Intervention Area 3.3.11 Identification of contaminated sites (annex c) and remediation in an environmentally sound manner.			
Objective			
To identify and clean up sites contaminated with Dioxins and Furans in an environmentally sound manner			
Strategies			
Regular updating of inventories			
Use of Geographical Information Systems (GIS) to map and locate contaminated sites			
Activities			
Plan and schedule field trips to assess the extent of contamination	Number of trips taken Assessment records of findings documented	6 months -	GOL : M 43, 200
Take samples for analysis for levels of dioxins and furans from contaminated sites	Results of analysis documented	6 months – 1 year	GOL : M 5,000 Incremental : M 100,000
Compile reports for appropriate cause of action to be taken	Reports with maps compiled	1 month	GOL : M 5,000
Mobilize organizations/companies with technical capacity to rehabilitate the contaminated sites (-Engage remediation expert to assess the cost of cleaning up the contaminated sites -Engage an expert to carry out the clean up)	Measures and procedures for the decontamination and rehabilitation in place Contracts signed Documented records of decontamination and rehabilitation available	4 months 2 weeks 1 year	GOL : M 3, 000 Incremental : M 1, 000,000
Intervention Area 3.3.12 Facilitating or undertaking information exchange and stakeholders involvement			
Objective			

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
To coordinate and strengthen information exchange to reach every person			
Strategy			
Develop information exchange systems and guidelines and involve stakeholders or IAP to address dioxins and furans			
Activities			
Establish section, which deals exclusively with dioxins and furans in all major resources centres	Dioxins and furans section set up	1 year	GOL: M 50, 000
Intervention 3.3.13 Public awareness, information and education			
Objective			
To disseminate information, education and communication to the public in order to increase awareness			
Strategy			
Engage all methods and means of mass communication in the dissemination of POPs issue focusing on dioxins and furans			
Activities			
Develop and introduce brochures, pamphlets, journals, fact-sheets on dioxins and furans for different population groups.	Brochures, pamphlets journals, fact-sheets developed and available quarterly	5 years	Incremental : M 2, 000, 000
Organize and hold public gatherings (Pitso's) to disseminate information, communication and education material on dioxins and furans.	Number of Pitso's organised and held in 80 constituencies Number and list of participants available Reports of proceeding available	2 years - -	GOL : M 64, 000
Organize slots on national radio and TV for addressing the nation on dioxins and furans.	Documented records of the number of slots kept Active public participation in phone-in programmes	6 months - 1 year -	GOL : M 25,000

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Prepare articles on dioxins and furans for publishing on local newspapers.	Records of articles published in local newspapers available	1 year	GOL : M 30,000 Incremental : M 312, 000
Produce posters and billboards at public places warning the public about the consequences of burning plastics, paper, rubber, grass, trees, veld fires and any material likely to generate dioxins and furans.	Posters and billboards produced and displayed at strategic public places	4 months – 1 year	GOL : M 40,000 Incremental : M 60, 000
Consult with Department of Education and other stakeholders in developing curriculum for lower educational levels focusing on dioxins and furans and include waste management as a subject at lower educational level.	Number of consultative meetings/seminars etc conducted and recorded List of participants available Proceedings from consultative sessions documented and available	2 years - -	GOL : M 100,000
Train pupils at lower educational levels on various aspects of dioxins and furans.	Number of pupils trained and knowledgeable	5 years	Incremental : M 5, 000, 000
Encourage schools to organise field trips/study tours for pupils to waste disposal facilities.	Number of trips/tours taken Reports of such trips/tours available	1 year -	GOL : M 30,000.
Encourage schools to engage pupils in extra-curriculum activities such as cleaning campaigns.	Number of extra-curriculum activities organised and carried out recorded and available List of pupils engaged in extra-curriculum activities kept Documentation of proceedings available	1 year - -	GOL : M 30, 000

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Identify and maintain procedures for identifying gaps in information and knowledge amongst various groups concerning health effects due to releases of dioxins and furans.	Procedures documented and available Stakeholders comments documented for future improvements	1 year -	GOL: M 7,500 Incremental : M 50,000
Intervention Area 3.3.15 Reporting			
Objective			
To report to the Secretariat of the Convention and Government on the achievements in addressing reduction of dioxins and furans			
Strategy			
Periodic update of monitoring data			
Activities			
Prepare a standardized reporting format at local level	Reporting format in place	4 months	GOL : M 18, 000
Compile a national report and submit to the Secretariat of the Convention	Forwarding letter	Every 2 years	GOL : M 25,000
Intervention Area 3.3.16 Research, development and monitoring			
Objective			
To monitor the levels of dioxins and furans contamination at identified sites			
Strategies			
Focus on dioxins and furans as recommended by any of internationally recognized organisation or institutions, e.g. WHO, UNEP UNITAR etc			
Strengthen the normal surveillance of specialised community groups such as workers			
Activities			
Institute legislation to oblige organizations whose activities may release dioxins and furans to develop Environmental Management Systems.	Legislation enacted and enforced	2 years	PADELIA

Annex C Chemicals			
Objectives/Strategies/Activities	**Measures of success**	**Duration**	**Cost**
Set standards of exposure levels, exposure limits or Threshold Limit Values of dioxins and furans specific to activities taking place in Lesotho.	Documents on standards and Threshold Limit Values available.	3 years	GOL: M 15,000 Incremental : M 200,000
Harmonize toxicological and epidemiological methods in order to have internationally comparable results.	Documentation/reports harmonisation methods available	3 years	Incremental : M 1,000, 000
Conduct epidemiological studies on the effects of dioxins and furans to communities of Basotho where they are known to be released or potentially available**. (**	Number of studies conducted Reports of epidemiological studies available	5 years	Incremental : M 10, 000, 000
Establish baseline data on the effects or intake of dioxins and furans from various pathways such as air, flora and fauna, water bodies, land and residues.	Format and procedures for surveillance developed, agreed upon and documented Baseline data established	1 year	Incremental : M 2, 000,000
Manage data, keep records and document such information relating to releases of dioxins and furans accordingly.	Well established section in the libraries for dioxins and furans	Covered under 3.3.12	Covered under 3.3.12
Intervention Area 3.3.17 Technical and financial assistance			
Objective			
Access all available technical and financial assistance globally- multilaterally and bilaterally			
Strategy			
Develop proposals and send out			
Activities			
Make proposals to seek funding/grants from international organizations for capital and operational budgets for reduction of dioxins and furans.	Proposals made and approved Number of projects funded and running	9 months	GOL : M 50,000 Incremental : M 100, 000

3.4 Development and capacity-building proposals and priorities

This section outlines all priority areas within which proposal shall be developed in order to access assistance in the enhancement of these areas.
They are grouped under four major groups as below:
Legal and Institutional frameworks
Review of pollution control related policies and legislation for effective implementation of the Stockholm Convention
Strengthening of institutional capacity of the government departments and other institutions
Strengthening enforcement of relevant legislation
Developing regulations responsible for coordination and monitoring of POPs releases.
Strengthening legislation enforcement mechanisms
Developing mechanisms to promote proper management of stockpiles of POPs Pesticides and DDT, wastes and contaminated sites; and
Establishing coordination mechanism pertaining to PCDD/PCDF

Public Information, awareness and education
Development of technical information on POPs for use as reference materials in government departments and agencies, academic and research institutions and NGOs;
Improving information dissemination infrastructure in key institutions
Establishing database on POPs
Developing programmes for raising awareness on POPs releases and their effects on human health and the environment
Updating chemical management profile

Infrastructure capacity for control
Establishing facilities for disposal of POPs wastes and contaminated equipment
Establishing clean up and remediation schemes of POPs contaminated sites and areas which pose threat of further contamination
Promoting and encouraging adoption of best available techniques and best environmental practices, BATs and BEPs respectively and
Instituting mechanism for PCDD/PCDF release control.
In the overall, setting appropriate pollution control structures and mechanisms
Development of a detailed PCB phase out plan

Monitoring and research
Develop monitoring systems on POPs Pesticides and DDT (PCBs), (Dioxins and Furans) and their impacts on human health and the environment
Establish monitoring standards and procedures/guidelines for POPs releases and procedure for assessment of impacts to human health and the environment, and
Establish schemes for monitoring, control and management of releases of POPs and contaminated sites
Promotion of alternatives to POPs

3.5 Timetable for plan implementation

This subchapter summarizes the implementation schedule and thus the connectivity of all activities, whose completion would directly allow the country to meet the obligations of the Convention as they are outlined in section 3.3.
To ensure early action and time for follow ups, all activities have been designed to be fulfilled within the initial five year period. Subsequent activities shall be dominated by monitoring and reporting and, perhaps updating and further refinement of strategies. Indicators to allow progress to be reviewed and monitored are identified in section 3.3.

Enter gant chart

3.6 Resource requirements

This Subchapter would summarize the projected costs of measures included in the NIP. Incremental costs for measures are identified in subchapter 3.3 and potential sources of funding for both incremental costs and baseline costs are herein noted. In accordance with article 13 of the Convention, alternate sources of funding are considered, as Lesotho would be seeking development assistance.

Category	**Resource Requirement in Maluti (M)**		**Potential Source of Funding**	**Alternate Source of Funding**
	Baseline	**Incremental**		
Pesticides and DDT	1,492,167.00	1,938,490.00	GOL, GEF	UNEP, UNITAR, UNDP
Polychlorinated Biphenyls	3,567,150.00	106,771,300.00	GOL, LEC, GEF	UNEP, UNITAR, UNDP
Dioxins and Furans	14,400,900.00	325,292,950.00	GOL, GEF, WB,	UNEP, UNITAR, UNDP
Totals	19,460,217.00	434,022,720.00		Other dev. partners

It is worth noting that the programmes within this Plan are cross-cutting and encompassing to all activities designed to address both National Development and Poverty Reduction. It is estimated that with full implementation of this plan, more than a hundred new jobs would be created and the overall environment would improve a hundred fold from the current status.

References and Bibliography

ATSDR (Agency for Toxic Substances and Disease Registry), 2001. Polychlorinated biphenyls

Bergstöm, S., 1994: Maternal Health: a priority in reproductive health – In *Health and Disease in Developing Countries* Eds: Lankinen, K.S., Bergstöm, S., Mäkelä, P.H., Peltomaa, M.

Bergstöm, S., 1994: Perinatal Health – In *Health and Disease in Developing Countries* Eds: Lankinen, K.S., Bergstöm, S., Mäkelä, P.H., Peltomaa, M.

Bureau of Statistics, Lesotho (2004): Statistical Report No.21: 2003. Manufacturing in Lesotho 1997 – 2003, 3rd quarter.

Bureau of Statistics - Ministry of Finance and Development Planning (2001): Lesotho Demographic Survey Analytical Report. Volume 1

Carl Bro International, a/s 2000. Siting and EIA on Landfills Training Session regarding Solid Waste Management in Lesotho.

Department of Energy (2002**):** *Consumption per Fuel Group*.

Fuggle, R.F., Rabie, M.A., 1999: Environmental Management in South Africa

Envio, 2004. Chemical management in Germany: PCB recycling/disposal facility (workshop presentation)

European Science Foundation, 2002. PCB pollution of Karstic Region (Krupa River, Slovenia)

Government of Lesotho, 2001. Environment Act No 15 of 2001

Government of Lesotho, 1978. Water Resources Act 1978

Government of Lesotho, 1970. Public Health Order 12 of 1970

Heimlich, J.E., Ohioline.osu.edu/cd-fact The invisible environment series: PCBs

Kumar U., 1995, In Analysis of National Legislations of Lesotho, Mozambique, Tanzania and Zimbabwe with Respect to Natural Resources Management, SADC-ELMS Coordination Unit, Maseru, Lesotho

Lankinen, K.S., Bergstöm, S., Mäkelä, P.H., Peltomaa, M., 1994: *Health and Disease in Developing Countries* Eds

Lesotho Revenue Authority (2003/2004): Individual Exporter's Records. AGOA Statement Grouping.

Lesotho Government, Environment Act NO. 15 of 2001

Lesotho Government, Import and Export Act 1984

Lesotho Government, National Environment Policy 1996

Lesotho Government, 1989, National Environment Action Plan, GOL, Maseru

Letsie M., Nkonyana J. (2001): Survey Report on Prevalence of Diabetes and Hypertension in Lesotho.

Masa Nagai, Chemicals Legislation, 2001, A paper presented at the Fifth Global Environmental Policy and Law Training, Nairobi, Kenya).

Ministry of Industry, Trade, Trade and Marketing (2005**):** Lesotho Revenue of Commerce, Industry and Tourism.

Ministry of Natural Resources, 2002: Industrial Wastewater Management Policy

Ministry of Natural Resources, 1999: Water Resources Management Policy and Strategies

Molapo L. and Tjela 'M., 2001 Chemicals Legislation in Lesotho: A Paper presented at the POPS Chemicals in Accra, Ghana (unpublished

Mörner, J., 1996: Alternatives to POP pesticides for the protection of plants and building constructions. In: Alternatives to persistent organic pollutants.

Mvuma, G. G. K., (2001): Urban Poverty Reduction Through Municipal Solid Waste Management (MSWM): A case study of Maseru and Maputsoe in Lesotho

Nassiep, S., 2004. Proposal to Lesotho Electricity Corporation : The management and disposal of polychlorinated biphenyl containing oils and equipment (draft).
National Environment Management Authority, Report of the Magistrates' Training Symposium on Environmental Law and Practice, Imperial Botanical Beach Hotel, Entebbe, Uganda, 30 November – 3rd December 2003
National Environment Secretariat, 2001, National Profile of Chemical Management Infrastructure
National Environment Secretariat, 1999. State of Environment Report in Lesotho, 1997. NES, Maseru
POPs Project, 2004. PCB Inventory Final Report (phase II inventory report)
POPs Project, 2004. POPs Pesticides Final Report (phase II inventory report)
POPs Project, 2004. DDT Final Report (phase II inventory report)
POPs Project, 2004. Identification and Quantification of Dioxins and Furans (phase II inventory report)
POPs Project, 2004. Contaminated sites report (phase II inventory report)
POPs Project, 2004.Public information and awareness survey (phase II inventory report)
Power Institute for East and Southern Africa, 2004. PCB Guidelines
Secretariat of the Basel Convention, 1992. Basel Convention on the control of transboundary movement of hazardous wastes and their disposal and protocol on liability and compensation. UNEP Switzerland.
UNEP, Basel, 2003. Preparation of a national environmentally sound management plan for PCBs and PCB-contaminated equipment. Basel Secretariat, Geneva
UNEP-Chemicals, 2000. Proceedings of a sub-regional workshop on management of PCBs and dioxins/furans, Arusha, Tanzania, 13-16 November, 2000.UNEP-chemicals, Geneva.
UNEP-Chemicals, 1999. Guidelines for the identification of PCBs and materials containing PCBs 1st issue. UNEP Chemicals, Geneva.
UNEP-Chemicals, 2002. PCB transformers and capacitors from management to reclassification and disposal. UNEP-Chemicals, Geneva.
UNEP-Chemicals, GEF, 2003. Regionally based assessment of persistent toxic substances. UNEP-Chemicals, Geneva.
UNEP, 1995, Legislating Chemicals: An Overview, Environmental Law and Institutions Program Activity Centre.
UNEP, Management of Toxic and Hazardous Chemicals in Kenya
UNEP, Management of Toxic and Hazardous Chemicals in Tanzania
UNEP 2001. The Making of a Framework Law in Kenya, African Centre for Technology Studies, Nairobi, Kenya
UNEP, May 200. PCB Transformers and Capacitors – From Management to Reclassification and Disposal

UNEP, 2001: Stockholm Convention on Persistent Organic Pollutants – Text and annexes
WHO, 1989: International Programme on Chemical Safety – Health and Safety Guide No. 21 Aldrin and Dieldrin
WHO, 1991: International Programme on Chemical Safety – Health and Safety Guide No. 13 Endrin
WHO, 1992: International Programme on Chemical Safety – Health and Safety Guide No. 68 Polychlorinated Biphenyl (PCBs) and Polychlorinated Terphenyls (PCTs) Health and Safety

WHO, 1997: Vector Control – Methods used by communities and individuals
WHO, 1998: International Programme on Chemical Safety – Health and Safety Guide No. 13 Hexachlorobenzene
WHO, 1988: International Programme on Chemical Safety – Health and Safety Guide No. 13 Chlordane
WHO, Geneva, 1988: International Programme on Chemical Safety – Health and Safety Guide No. 14 Heptachlor
Witzsch G. and D. Ambrose, 1992, Lesotho Environment and Environmental Law, Environmental Law Project, Faculty of Law, National University of Lesotho, Roma
wlapwww.gov.bc.ca/wat/wq water quality criteria for polychlorinated biphenyls(PCBs)
www.abb.com 2004. Health Effects of PCBs

Annexes

Detailed Inventories

PCB Inventory

Suspect Transformers

As mentioned in elsewhere in the NIP, criteria for identifying suspect transformers was established by the Task Team i.e., year of manufacture, missing information, donated equipment. On the basis of the criteria suspect transformers were identified. The inventory report gives information relating to suspect transformers in each region i.e. manufacturer, year of manufacture, their total weight.

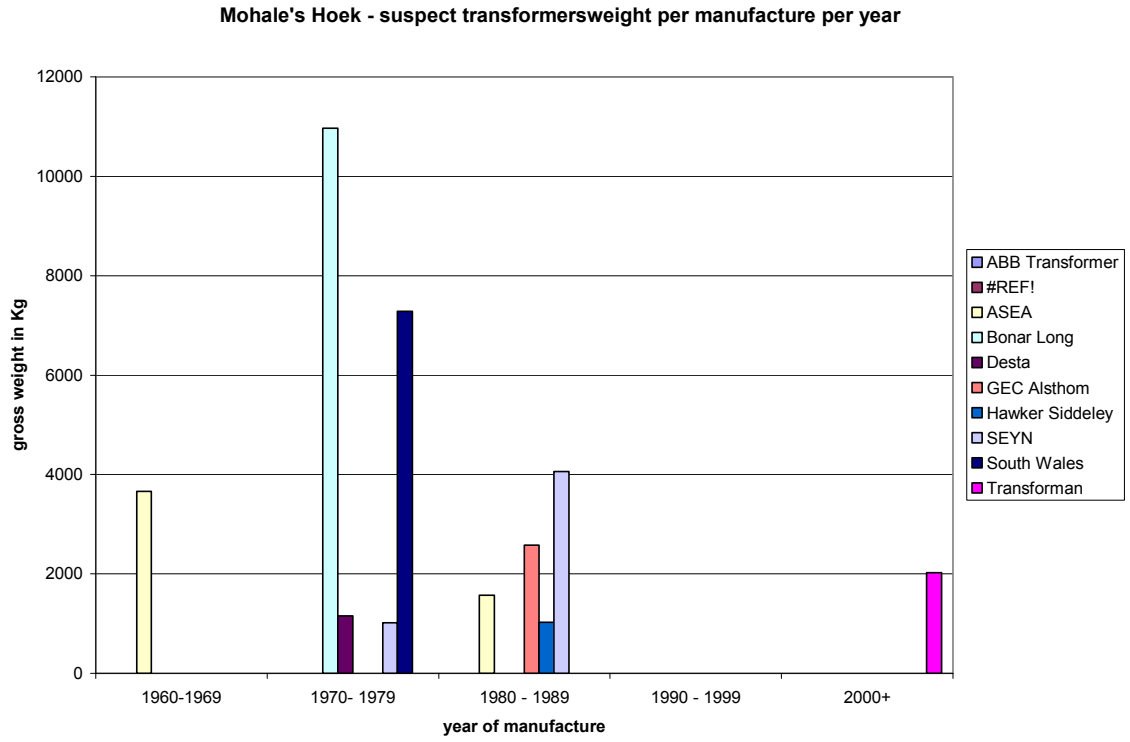
In Mohale's Hoek(**Table 6 and Fig 4)** ASEA is the only manufacturer whose product falls within 1960-69 period. Bonar Long transformers which were manufactured between 1970-79 have the highest total weight at 10,970 kg. 1970-79 has the highest total mass for all transformers at 20,427 kg. It is followed by 1980-89 period at 9,233kg. 1960-69 is the last at 3,665kg.

When one takes into account the estimated number of suspects (81), and the estimated average weight of 1000kg, the weight of remaining suspect transformers becomes 81,000kg. The total weight for Mohales Hoek region is therefore approximately 116,348kg (± 116,000kg). However, the estimates have not been captured on both graphs and tables.

Table 6 Mohale's Hoek - Weight per Manufacture for Suspect Transformers

Manufacture		**Total Weight (Kg)**				**TOTAL**
	1960-1969	**1970- 1979**	**1980 - 1989**	**1990 - 1999**	**2000+**	
ABB Transformer						0
ASEA	3665		1569			5234
Bonar Long		10970				10970
Desta		1157				1157
GEC Alsthom			2580			2580
Hawker Siddeley			1024			1024
SEYN		1020	4060			5080
South Wales		7280				7280
Transforman					2023	2023
TOTAL	**3665**	**20427**	**9233**	**0**	**2023**	**35348**

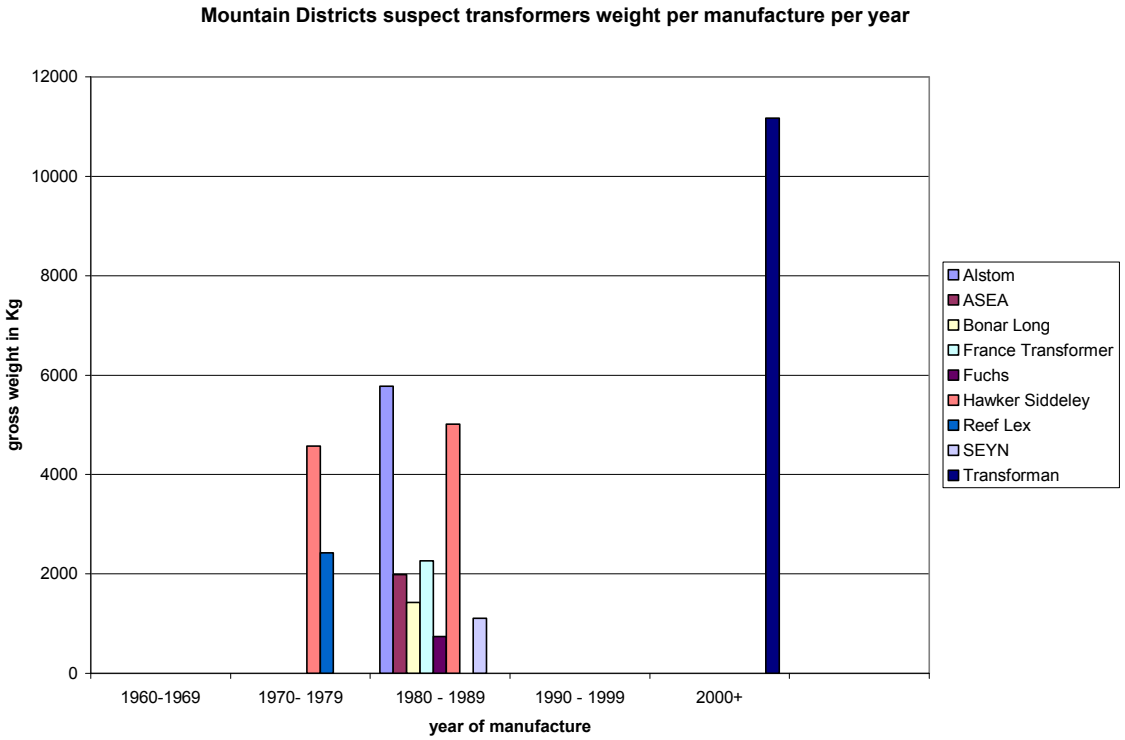
Fig4



The M**ountain region** (**Table 7 & Fig 5**) does not have transformers whose year of manufacture fall within the period 1960-69. It does however, have very few which were manufactured within the period 1970-79. The total weight of the latter group is 7,002 kg. The 1980-89 period has the highest total weight at 18,301kg. The refurbished transformers(2000+) are second at 11,173kg.

Table 7 Mountain Districts - Weight per manufacture for Suspect Transformers								
Manufacture		**Total Weight (Kg)**				**In use**	**Out of service**	**TOTAL**
	1960-69	**1970- 79**	**1980 - 89**	**1990 - 99**	**2000+**			
Alstom			5774				5	**5774**
ASEA			1983					**1983**
Bonar Long			1426					**1426**
France Transformer			2260					**2260**
Fuchs			740					**740**
Hawker Siddeley		4575	5008					**9583**
Reef Lex		2427						**2427**
SEYN			1110					**1110**
Transforman					11173			**11173**
TOTAL	**0**	**7002**	**18301**	**0**	**11173**	**0**	**5**	**36476**

Fig5



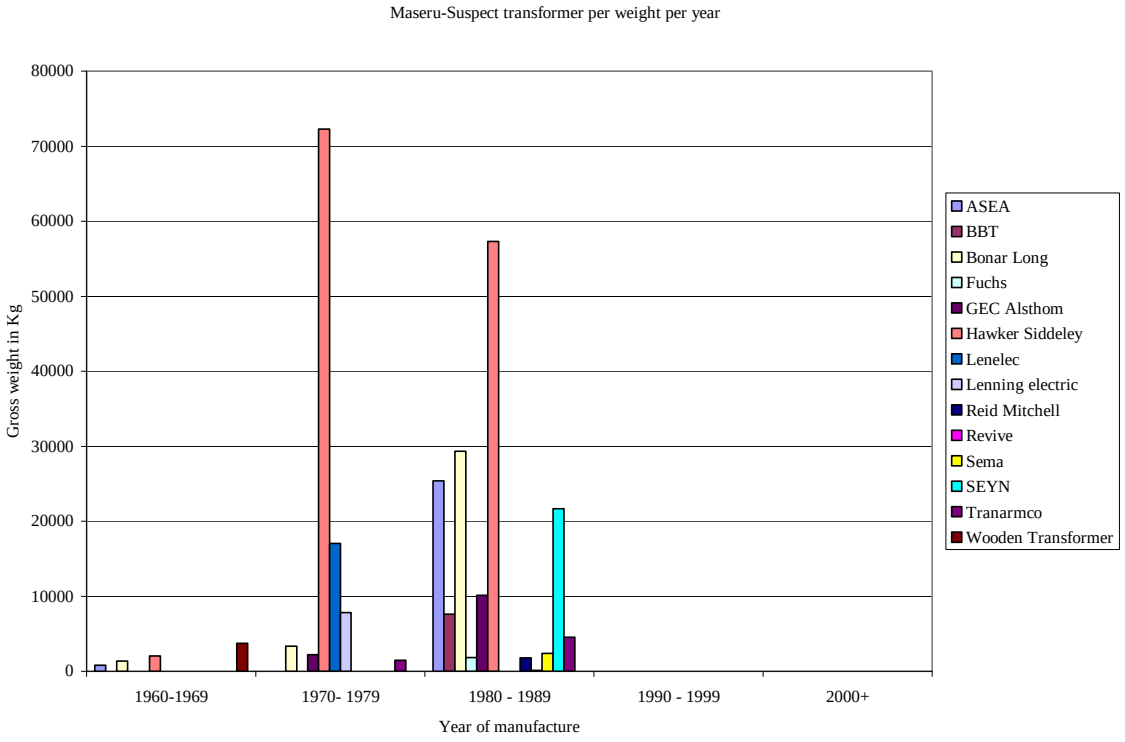
In **Maseru**, ASEA, Bonar Long, Desta, ECC S.A. and Wooden transformer have products which fall within the period 1960-69 with total weights of 828 kg, 1372 kg, 2577, 975kg and 3694 kg respectively. Their total weight is 11511kg. The period 1980-89 has the highest total weight for all transformers at 18968, followed by 1970-79 period at 113,637kg (Table 8 and Fig 6). Those which did not have dates of manufacture add up to 5068 kg. While those which are suspects by virtue of missing information (2000+) had a total weight of 1700kg.

Table 8 : Maseru Districts - Weight per manufacture for Suspect Transformers

Manufacturer		**Total Weight (Kg)**					**TOTAL**
	1960-69	**1970- 79**	**1980 - 89**	**1990 - 99**	**2000+**	**no date**	
ASEA	828	0	25365		0	3276	**29469**
Aberdare	0	0	0		0	1792	**1792**
BBT	0	0	7610		0	0	**7610**
Bonar Long	1372	3320	29340		0	0	**34032**
Desta	2597	0	2928		0	0	**5525**
ECC- South Afrca	975	1837	0		0	0	**2812**
Fuchs	0	0	1808		0	0	**1808**
GEC Alsthom	0	2200	10118		0	0	**12318**
Hawker Siddeley	2045	72293	57297		0	0	**131635**
Lenelec	0	17030	0		0	0	**17030**
Lenning electric	0	7830	0		0	0	**7830**
Power Engineers	0	0	480		0	0	**480**
Reef Sema	0	6150	2361		0	0	**8511**
Reid Mitchell	0	0	1773		0	0	**1773**

Revive	0	0	108		0	0	**108**
SEYN	0	0	21665		0	0	**21665**
South Wales	0	225	0		0	0	**225**
Tranarmco	0	1432	4536		0	0	**5968**
Transforman	0	1320	5114		1700	0	**8134**
Tranformer Manufacture	0	0	2045		0	0	**2045**
Tranformer Physics	0	0	10800		0	0	**10800**
Wooden Transformer	3694	0	0		0	0	**3694**
No name	0	0	4620		0	0	**4620**
Total per year	**11511**	**113637**	**187968**		**1700**	**5068**	**319884**

Fig 6



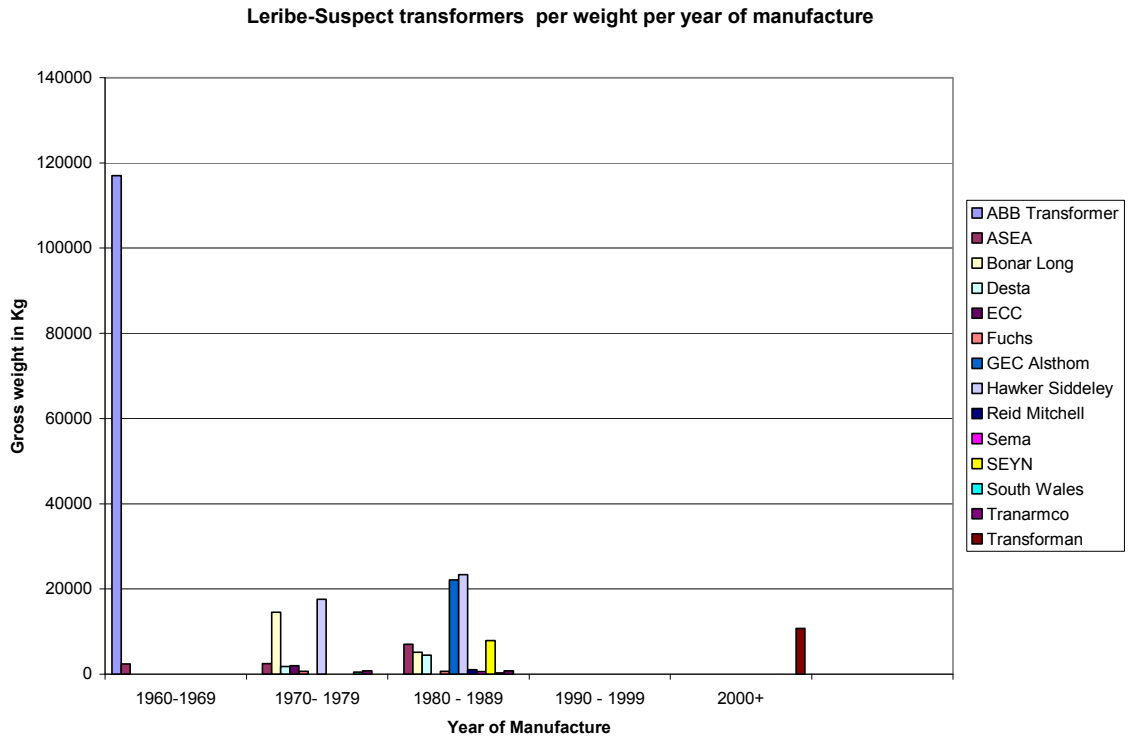
Data relating to total weights of transformers in Leribe has been summarized in Table 9 and Fig 7. It is only in Leribe where the total weight for 1960-69 transformers is the highest at 119,375 kg. This is due to the fact that some large substation transformers were manufactured within that period. This is followed by 1980-89 at 73,336 kg, 1970-79 at 40,314 kg and lastly 2000+ at 10,714 kg.

Table 9: Leribe Suspect Transformers- Weight per manufacture per year

Manufacture		**Total Weight (Kg)**				**No date**	**TOTAL**
	1960-1969	**1970- 1979**	**1980 - 1989**	**1990 - 1999**	**2000+**		
ABB Transformer	117000						**117000**
ASEA	2375	2515	7040				**11930**
Bonar Long		14563	5106				**19669**
Desta		1837	4428				**6265**
ECC		1964					**1964**

Fuchs		704	663				**1367**
GEC Alsthom			22157				**22157**
Hawker Siddeley		17565	23373			1430	**42368**
Reid Mitchell			1068				**1068**
Sema			610				**610**
SEYN			7890				**7890**
South Wales		450	285				**735**
Tranarmco		716	716				**1432**
Transforman					10714		**10714**
TOTAL	**119375**	**40314**	**73336**	**0**	**10714**	**1430**	**245169**

Fig7



The four regions have been compared in tables 10, 11 and figs 8 and 9. It is clear from the tables that Maseru has the highest total weight of suspect transformers at 319884 kg. It is followed by Leribe at 245169 kg.

Table 10: TOTAL WEIGHT OF SUSPECT TRANSFORMERS PER REGION								
	Mohale's Hoek	**Mountain Region**	**Maseru**	**Leribe**			
TOTALWEIGHT PER REGION	**35348**	**34049**	**319884**	**245169**			
	TOTAL WEIGHT OF SUSPECT TRANSFORMERS PER YEAR OF MANUFACTURE PER REGION						
	1960-1969	1970-1979	1980-1989	1990-1999	2000+	No date	
Mohale's Hoek	3665	20427	9233	0	2023	0	
Mountain Region	0	7002	18301	0	11173	0	

Maseru	11511	113637	187968	0	1700	5068	
Leribe	119375	40314	73336	0	10714	0	
TOTAL	**134551**	**181380**	**288838**	**0**	**25610**	**5068**	

Fig8

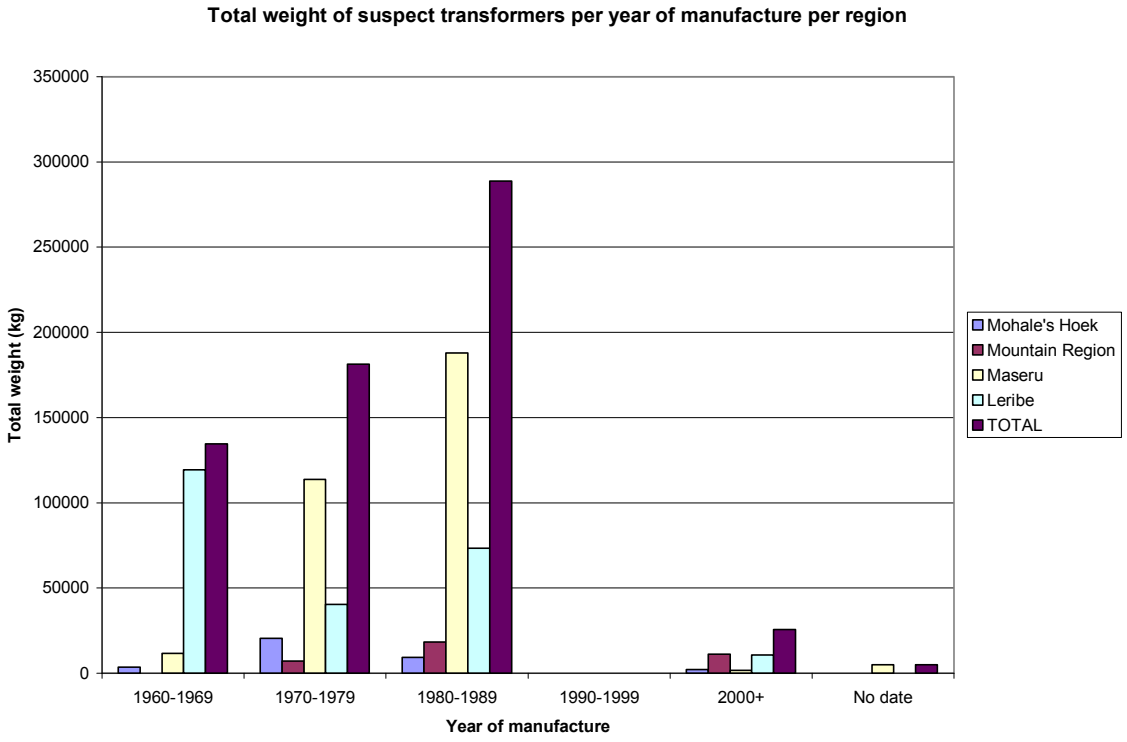


Fig9

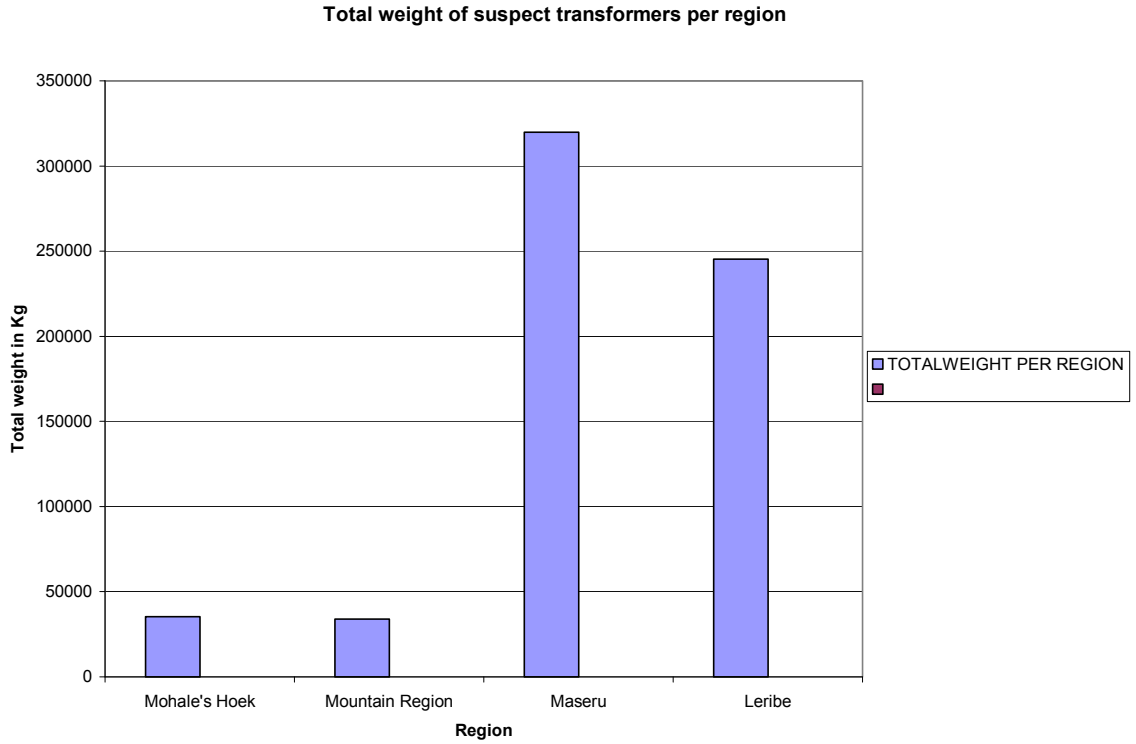


	Table11:Suspect transformers per weight per manufacture per region					
		Weight in Kg per Region				
	Mohale's Hoek	**Mountain Region**	**Maseru**	**Leribe**		
Manufacture						
ABB	0	0	0	117000		
Alstom	0	5774	0	0		
ASEA	5234	1983	29469	11930		
Aberdare	0	0	1792	0		
BBT	0	0	7610	0		
Bonar Long	10970	1426	34032	19669		
Desta	1157	0	5525	6265		
ECC	0	0	2812	1964		
France transformer	0	2260	0	0		
Fuchs	0	740	1808	1367		
GEC Alsthom	2580	0	12318	22157		
Hawker Siddeley	1024	9583	131635	42368		
Lenelec	0	0	17030	0		
Lenning Electric	0	0	7830	0		
Power Engineers	0	0	480	0		

Reef Sema	0	0	8511	610		
Reid Mitchell	0	0	1773	1068		
Revive	0	0	108	0		
SEYN	5080	1110	21665	7890		
South Wales	7280	0	225	735		
Tranarmco	0	0	5968	1432		
Transforman	2023	11173	8134	10714		
Transformer Manu.	0	0	2045	0		
Transformer Physics	0	0	10800	0		
Wooden Transformer	0	0	3694	0		
No Name	0	0	4620	0		
TOTAL	35348	34049	319884	245169	**634450**	

Present regulations pertaining to PCBs

There are no regulations pertaining to PCBs, PCB-containing equipment and PCB-containing wastes. However, the Environment Act, 2001 does have provisions for management of hazardous chemicals and wastes. Section 76, management of hazardous waste (a) (v) is on persistent waste which by definition includes PCBs and other persistent pollutants. Sections 82-83 contains clauses dealing with toxic and hazardous chemicals and substances. Apart from these implicit clauses there are no laws regulating the use of PCBs and their disposal in the country.

Cases of Abuse of Transformer Oil

According to the results of inventories transformer oil is being misused on a number of occasions including the following:-

Applied on cattle as a control for external parasites such as ticks and lice;

Used to control kikuyu grass and other undesirable plants around people's houses and LEC's substations

Applied on humans as a treatment for rash;

Taken as an aphrodisiac

Mixed with some traditional herbs and applied on people or some appliances as a "protection" against lightening strikes

While cases (a) and (b) are not direct application on humans, PCBs will still affect the health of humans. In the event where they are applied on cattle, PCBs will be absorbed through skin/hides ending up in their tissues or when animals link themselves, as they often do, they will ingest PCBs. The meat of such animals will definitely have high levels of PCBs. People who eat the meat will be exposed to PCBs.

In the case of application in the control of kikuyu grass around people's properties (houses), and LEC substation, people who walk on the treated area will pick up the pollutants and carry them into their houses or homes. Children who play in the area are likely to ingest the dirt directly or indirectly by putting contaminated hands in their mouths.

Contaminated sites

A number of contaminated sites have been identified. The sizes vary from few square centimeters to square meters with the biggest on being at LEC head office in Maseru District.

The contaminated site at LEC Headquarters should be given top priority since it is a serious threat to the health of employees and customers. Actions to be undertaken in the long and short terms include sampling of the site and testing of samples, if the results are positive, a sign which shows the likely hazards associated with the facility should be erected, access through the facility be closed, an alternative site for storage of damaged transformers should be identified. An appropriate facility be constructed (long term).

People who are likely to be exposed to PCBs at work (Planning Division of LEC) should consider having spare clothes to wear at work which they can change before leaving work. They should also shower so as to wash away PCBs. This can be taken as a precautionary measure until tests have been carried out.

In the case of small patches of contaminated sites that are close to residential areas, children should be discouraged from playing in the dirt on or near the sites. Notices on the hazards associated with the sites should be put on the poles supporting transformer platforms.

Regulatory framework for all hazardous chemicals should be formulated. Water quality standards should be amended to include a limit for PCBs. USEPA has set the limit of 0.0005 mg/l for PCBs(ATSDR, 2001). Lesotho may wish to set a much stringent standard since her waters may not be contaminated to the same level as those of US.

Annex A

Dioxins and furans

On the basis of the "Standardized Toolkit for Identification and Quantification of Dioxins and Furan Releases", the main categories were identified, which are relevant to Lesotho. Out of the 10 categories, 9 categories were deemed existent in the country; these are herein presented in table 1, below.

Table 1: Main categories, identifying categories relevant to Lesotho.

Category	**Source Category**	**Relevance to Lesotho**
1	Waste Incineration	*Yes*
2	Ferrous and Non-Ferrous Metal Production	**No**
3	Power Generation and Heating	Yes
4	Production of Mineral Products	Yes
5	Transportation	Yes
6	Uncontrolled Combustion Processes	Yes
7	Production of Chemicals and Consumer Goods	Yes
8	Miscellaneous	Yes
9	Disposal/Land filling	Yes
10	Identification of Potential Hot-Spots	Yes

It was further realized that the burning of waste in many areas is regarded as incineration, which in real technical terms it is not. However, due to lack of another category, the process of burning, particularly medical waste, has been treated as incineration. All hospitals in the country were found to have medium technology incinerators, all of which are either out of order or not functioning in a normal way.

The category of Power Generation and Heating was considered only as far as household heating and cooking is concerned, and here statistical data from demographic analyses were used to quantify amounts of fuel consumed, hence the emission rates of dioxins and furans.

Transport category was dealt with in two ways, namely, motor vehicle counts, as per the registers of the traffic departments, and through compiled statistical data on total imports of hydrocarbon fuels.

Activities in the Production of Mineral Products are quiet low, considering that it only applies to Brick production and Asphalt mixing. There are various data gaps in this area and this are discussed in detail in the report.

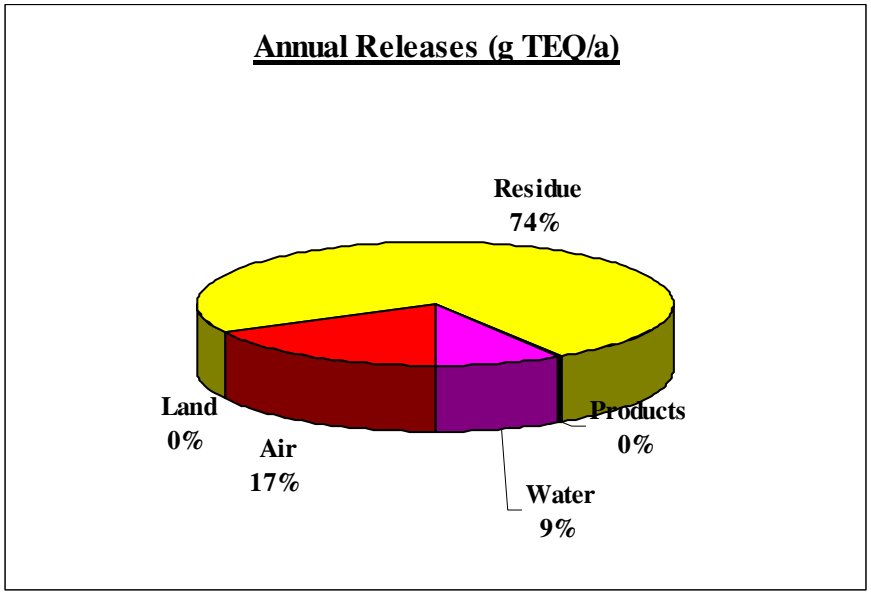
Regarding uncontrolled combustion processes, there is a serious problem of quantification as there is no ways of assessing the frequency of burning. This deals with biomass burning as well as burning of waste, both of which are evidently common in Lesotho. The best option seemed to be a statistical estimation based on probabilistic aspects.

Production of chemicals is non-existent in the country. However the use of chemicals is applicable. This category is therefore considered only in so far as the use of chemicals and consumer goods is concerned. The subcategory deals with textile production since Petroleum industry is covered in transport. In this regard, customs records for a full year export of textile were used as the basis.

There are of course other diverse activities, which considered under miscellaneous. In this category, the crematorium is not yet in operation, but there are dry cleaners

and a lot of tobacco smoking. Emission from biomass has also been considered, and the drying of biomass was extrapolated from the household-heating category.
Under the category of Disposal, landfills and waste dumps capacities were estimated on daily basis over a period of a month in order to establish mean activity. As part of the study, it was noted that there exists a number of illegal dumpsites, some of which may have been missed, and this encompasses open water dumping as well as composting. Sewage treatment activity calculations were based on the estimates of generated sewage as adopted by Water and Sewage Authority (WASA). The estimated amount of sewage generated is based on the total water consumption.
In all areas visited where activities existed, the extent of contamination, as well as the capacity to manage the activity was used as the basis of proclaiming such areas as hotspots. In as far as by-products are concerned, this was restricted to dumps of wastes/residue from all categories mentioned above.
The total by-products emissions for Lesotho are estimated at 292.3 g-TEQ/a in air, 149.1 g-TEQ in waters, 2.1 g-TEQ/a on products and 1264.6 g-TEQ as residues, while emissions on land are negligible, as shown in **figure 1** below.

Figure 1: Graphical presentation of the overall annual releases of dioxins and furans for Lesotho.

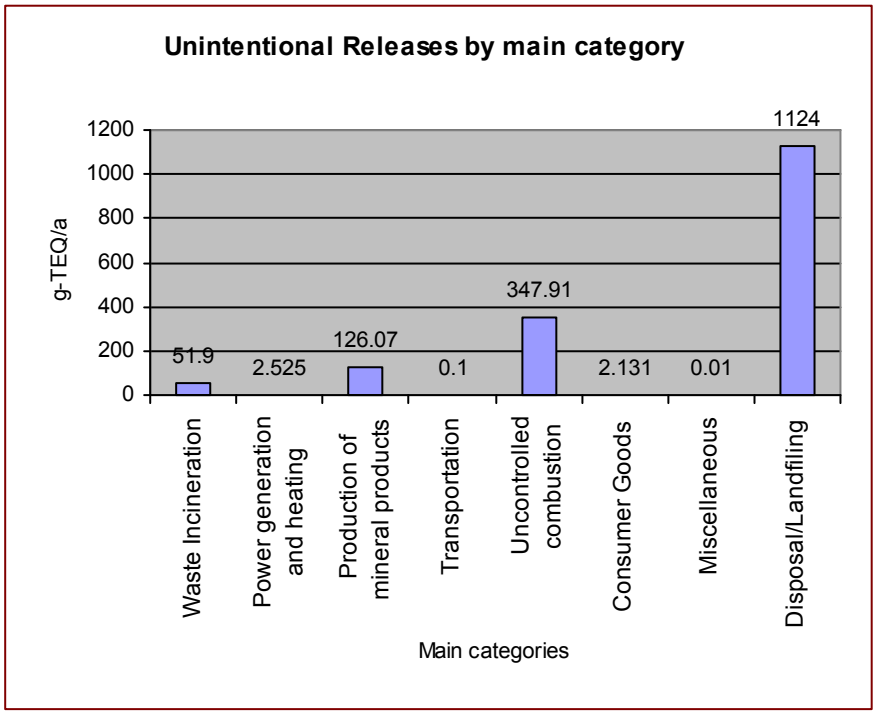


From figure 1 above, release from products is far negligible, and represents about 0.12%, hence why it appears as zero on the pie chart. On the other hand, the bigger portion is contributed by residues that are left after burning waste at illegal and controlled dumping sites.

The dioxins and furans formed through various processes escape into the environment through different pathways/media namely: air, land and water. The escape into the air is brought about by combustion and high temperature thermal process, whereas on land it occurs by adsorption, absorption and leaching on or into the soil. The introduction of dioxins and furans to water could happen in a number of ways. This includes discharge of effluent or contamination with leachate and chemicals containing dioxins and furans. Of the three media, air is the most affected by these releases followed by water and then land. This can be explained by indicating that a lot of waste is burnt due to poor waste management system resulting in gaseous emissions. With water in the second spot, the contaminants are introduced through effluent from sewage treatment works, leachate from waste disposal sites all of which are operated in an inefficient manner. The land receives little pollution partly because Lesotho does not practice massive organic farming whereby sludge is used to condition the soil.

Figure 2: *Graphical presentation of unintentional release of dioxins and furans emissions by main category.*

From **figure 2**, unintentional release of dioxins and furans, by main category, is dominated by waste disposal or landfilling, which is followed by uncontrolled combustion. The rest produce insignificant releases. From this analysis, it is obvious that when preparing the National Implementation Plan for Management of



POPs, with respect to dioxins and furans, dumpsites and landfills should be afforded the highest priority. It is therefore conclusive that dumpsites, landfills and uncontrolled combustion are considered as hotspots. In terms of dumpsites, special attention needs to be given to Ha-Tšosane and Maputsoe dumpsites, which cater for all sorts of waste, including industrial waste.

In comparison with other countries (from the toolkit), Lesotho exceeds Uruguay and Jordan in all categories, but is far less than Philippines and Brunei Darussalam, in terms of dioxin and furan releases. A comparison that is understandable, considering the economic levels of these countries. This therefore indicates a direct correlation of emissions with economic level/activity of the country.

Annex A

Pesticides and DDT

Lesotho has ratified the Stockholm Convention whose objective is to eliminate the use of persistent organic pollutants (POPs). Because of this it has to take steps to fulfill its obligation under this convention. Taking an inventory of POPs pesticides was necessary to provide baseline information to be used in the national implementation plan for controlled use/elimination of POPs. The survey of POPs pesticides was carried out throughout the whole country to cover all ten administrative districts. As such all the four distinct agro-ecological zones namely lowlands, foothills, highlands and Senqu river valley were surveyed. Persistent Organic Pollutants are 12 chemicals identified to be highly dangerous to humans and the environment in general due to their persistency in the environment. Nine of these chemicals are pesticides. Some of these pesticides have been used in the country before the 90s although there is no clear record of their discontinued use.

The main stakeholders in the use of POPs pesticides were identified as two main groups; farmers and suppliers. Each group consisted of a number of different stakeholders for example farmers included commercial and subsistence farmers, group of farmers (e.g. cooperatives and associations), missions, schools and institutions. Suppliers included individuals such as street vendors, retail stores, agrochemical shops, Non-governmental organizations, the ministry of Agriculture and other line ministries (e.g. Health and Finance).

Questionnaires were administered to get farmers' responses on the availability or knowledge of existence of POPs pesticides. Various stores and shops were visited to record pesticide stocks in these places. The visit included inspection of the site for general storage conditions. Only one pesticide disposal site was visited because other stores/suppliers did not mention having disposal sites

According to the study, frequently used pesticides fall under the Pyrethroid and Organophosphate groups. Organochlorines constituted a very small percentage of pesticides employed in the country although thiodan (endosulfan) alone was employed by majority of respondents. According to their responses it is possible that farmers are not using POPs pesticides although many farmers did not know names of the pesticides they were using thus complicating the assessment. However, majority were not even familiar with POPs pesticides except DDT, which they were generally clear that they stopped using in the 70's. Other than DDT the other persistent organic pollutant pesticide recorded was obsolete 2,4,5 T which is believed to be contaminated with Dioxins.

In addition to lack of knowledge about POPs pesticides and their potential negative effects farmers and suppliers were not fully aware of the dangers associated with pesticides. Thus a lot of training is needed country-wide to raise awareness to different levels of stakeholders about pesticides as a whole and on POPs pesticides in particular. Although the extension service is present the study shows that there is insufficient effort about Plant Protection services (including pesticide use and handling) especially in the rural areas. National capacity building is also needed at other levels (such as institutions of higher learning, research etc.) for the POPs identification and analysis.

Lack of regulatory framework in the country is the main problem that needs immediate attention, as there is no control at all on pesticides. Not only will enactment of the law pertaining to chemicals be useful for controlling importation of POPs pesticide but it will also help monitoring of pesticides such that issues of

accumulation of obsolete pesticides are avoided as well as addressing the main problem of pesticide disposal, which is still a major challenge in the country.

DDT was only found in one district, Quthing. The amount that was still at the farmers disposal was approximately 0.4 kg. According to the farmer this pesticides was purchased in Natal, South Africa in 2001 and has been used for control of lice and ticks on his cattle. It was only this incidence where DDT was encountered. Although it was not discovered anywhere else its continued use especially as an acaricide can not be ruled out. The way in which it has entered Lesotho indicates how easy POPs especially DDT which is allowed in South Africa for control of Malaria can gain access into Lesotho. With the present situation whereby there are no regulations governing pesticides in the country it is possible to have any pesticide into the country. Furthermore the geographical positon of Lesotho makes it easier for illegal trade because entry into South Africa is very easy even without using the official border posts. These border posts are also very many and most of them are not even well manned.

Store inspections however revealed no stocks of DDT, not even obsolete ones thus one can be hopeful that the voluntary efforts by the ministry of Agriculture to discourage its use have paid off (ARD 1986). Interviews with some of the suppliers also revealed that they actually sell pesticides that are recommended by the Ministry of Agriculture.

Annex B

Stakeholder and Public consultation and

Workshop participants

POPs National Implementation Plan Review Workshop

Convention Centre

19th – 20th April 2005

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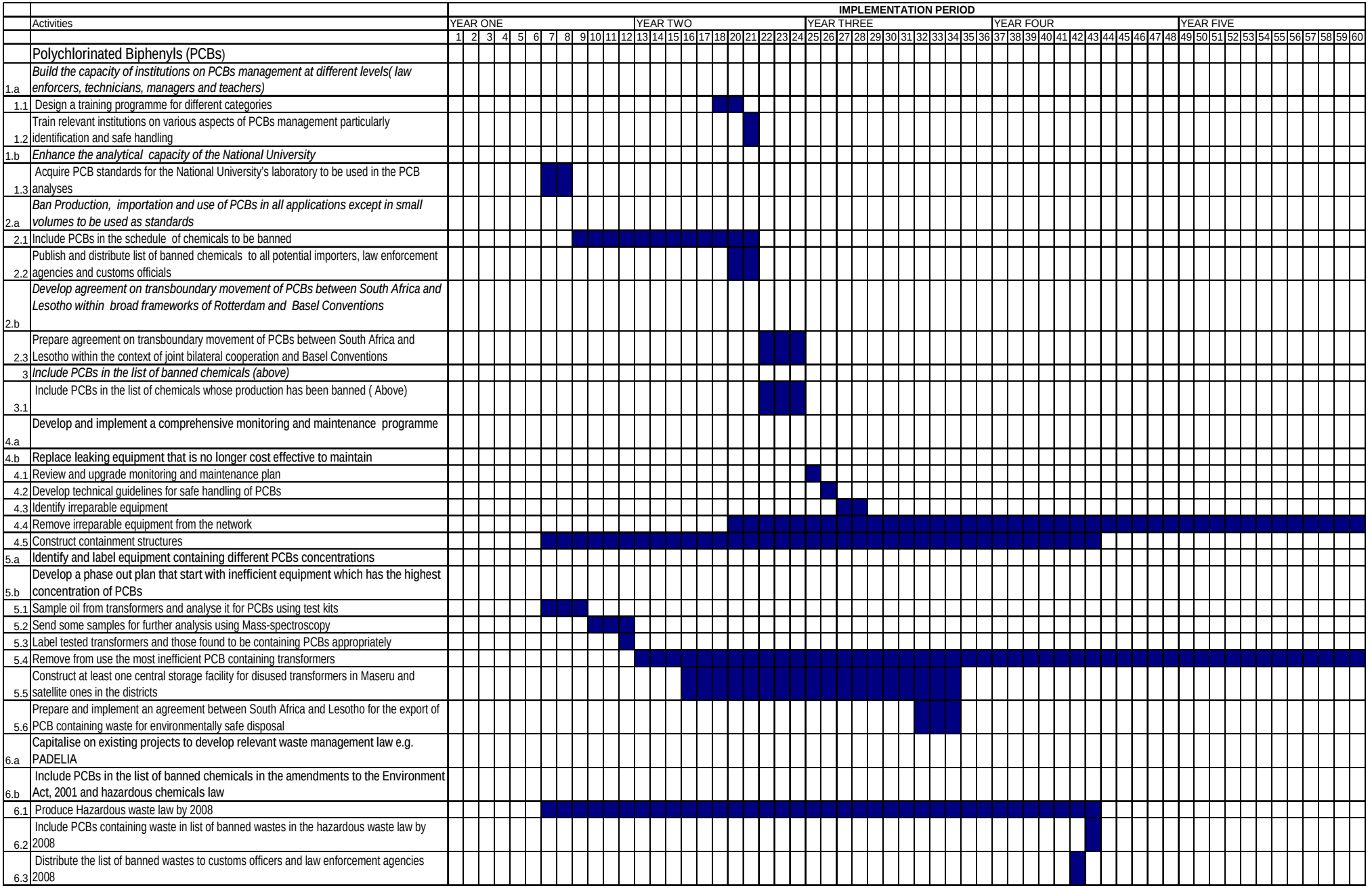
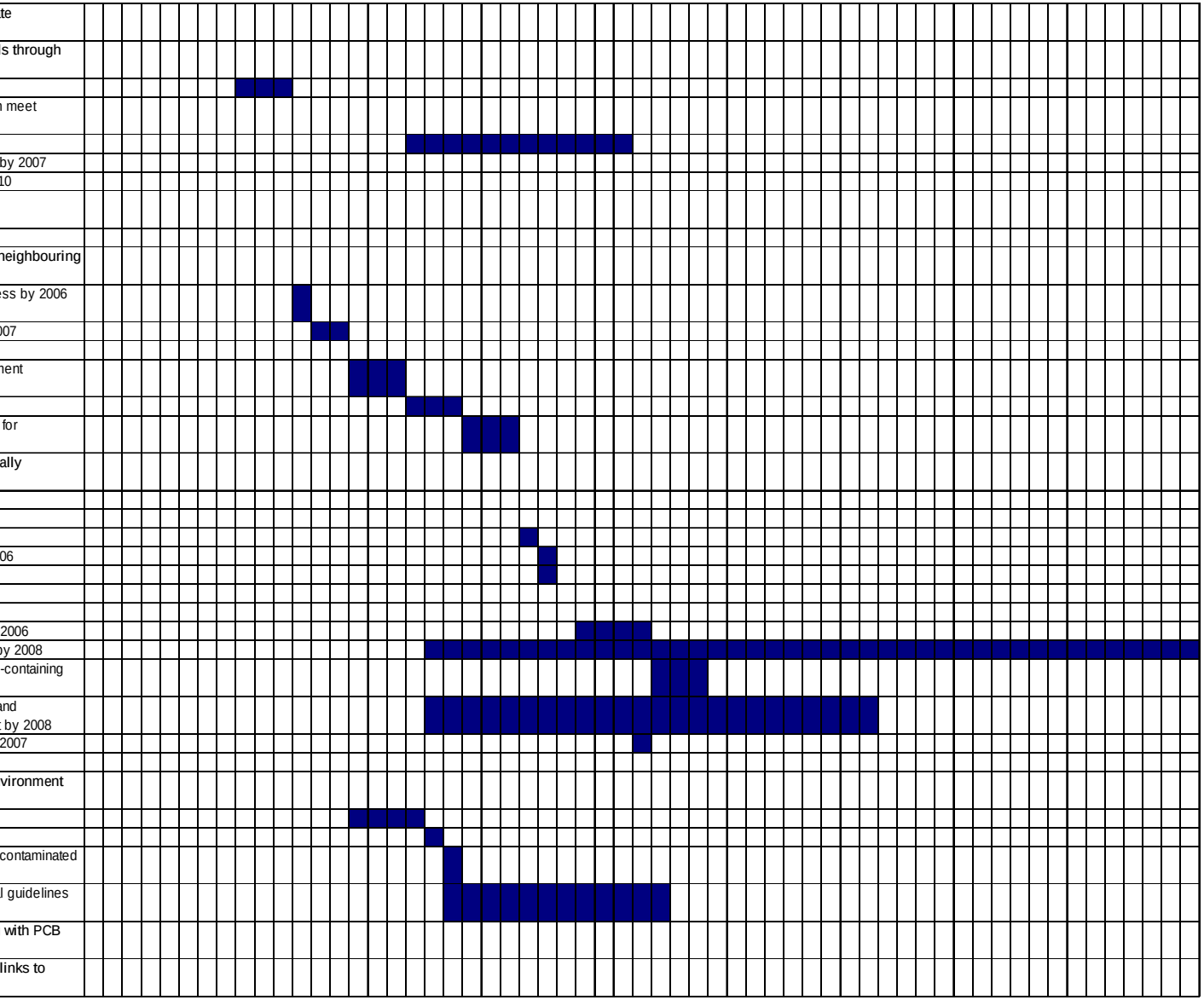
	ACTIVITY	IMPLEMENTATION PERIOD																																																											
		YEAR ONE												YEAR TWO												YEAR THREE												YEAR FOUR												YEAR FIVE											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	PESTICIDES and DDT																																																										
1.0	Strengthen Environment Act 2001 and assign responsibilities appropriately																																																										
1.1	Develop Pesticides Control Policy	■	■	■	■	■	■	■	■	■	■	■	■																																														
1.2	Amend and enact the Pesticides Control Bill										■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																										
1.3	Develop Pesticides registry and permit system																																	■	■	■	■	■	■																						
1.4	Capacitate the Agricultural Extension division and Environmental Health divisions in terms of personnel	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■												
1.5	Train all Agriculture extension officers and Health inspectors							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
2.0	To ban/prohibit the production and use of POPs pesticides in Lesotho																																																										
2.1	Draft regulations governing access and use of pesticides												■	■																																													
1.2	Develop guidelines for handling and use of pesticides													■	■																																											
3a	Monitor the use of Annex A POPs pesticides																																																										
3b	Develop and implement strategies to identify stockpiles, products and articles in use and wastes containing Annex A POPs pesticides																																																										
3c	Manage stockpiles in a safe, efficient and environmentally safe manner until they are deemed to be wastes;																																																										
3.1	Develop pesticides stockpile management guidelines						■	■	■																																																		
3.2	Develop monitoring programmes for Pesticides									■	■	■																																															
3.3	Train customs staff on identification procedures for pesticides									■	■	■	■	■	■	■	■	■	■	■	■																																								
3.4	Develop means of communication between the customs department and the regulating authority.										■	■																																																	
3.5	Register all institutions that import and sell pesticides						■																																																						
4a	Carry out audits and improve existing pesticides storage facilities																																																										
4b	Develop Hazardous Waste Regulations to Reduce or Eliminate POPs Releases from Stockpiles and Wastes																																																										
4c	Handle, collect, transport and store Annex A POPs pesticide wastes in an environmentally safe manner and dispose them irreversibly																																																										
4.1	Review and update or develop legislation to include Registration of POPs stockpiles and wastes, prohibition of recovery or reuse	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																				
4.2	Design, licensing, operation, tracking and monitoring of storage facilities for, handling of, and transportation of Pesticides wastes													■	■	■	■	■	■																																										
4.3	Design, technology selection, licensing, operation and monitoring of waste disposal operations for POPs wastes													■	■	■	■	■	■																																										
4.4	Identification, registration, assessment and remediation of sites contaminated with POPs pesticides							■	■	■	■	■	■							■	■	■	■	■	■																																				
4.5	Develop clean up standards and guidelines for POPs pesticides											■	■	■	■	■	■																																												
5.0	Adapt international and regional guidelines and classification systems																																																										
5.1	Draft national guidelines for identification and classification of pesticides							■	■	■	■	■	■																																																
5.2	Adopt and Implement Globally Harmonized System (GHS) of labeling for active pesticides												■	■																																														
6.0	Adopt International and manufacturers (MSDS) codes and guidelines for handling and disposal																																																										
6.1	Draft national guidelines for handling and disposal of pesticides							■	■	■	■	■	■																																															

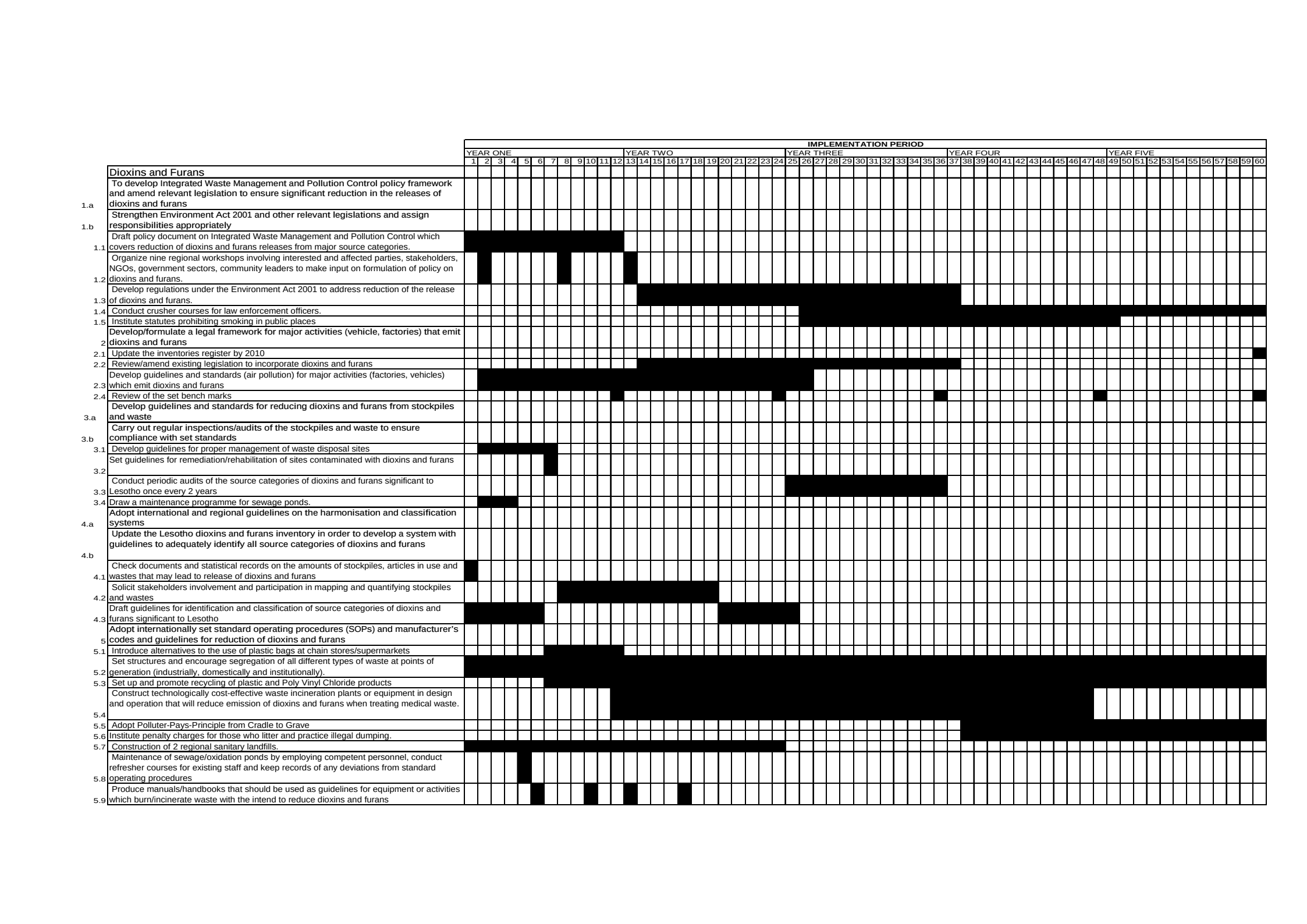
7a	Regularly update inventories of contaminated sites and stockpiles	
7b	Develop and implement clean-up programmes based on updated inventories	
7.1	Clear the store rooms of Agric Department of the stockpiles of pesticides and other materials that are not for immediate use(within one year)	
7.2	Treat and dispose of the obsolete pesticides and POPs pesticides	
7.3	Contract an expert to carry out the initial clean up	
8.0	Establish a clearing House for POPs and PTSs within the NES website	
8.1	Procure and install ICT equipment and programmes	
8.2	Procure membership and full participation in CIEN and INFOCAB and others	
9.0	Engage all methods and means of mass communication in the dissemination of POPs issues	
9.1	Send periodic letters or arrange meetings with NGO, Agric and Health sectors to inform them of progress made and encourage their continued involvement and support.	
9.2	Providing brief updates through relevant publications (e.g. newsletters of professional associations, industry or workers' organisations)	
9.3	Making use of the news media (e.g. newspapers, radio, television) in order to reach out to the general public.	
10.0	Continuous Inventory reviews and monitoring, with annual reports compiled	
10.1	Engage a Steering committee to coordinate the Implementation phase of the project and to produce the annual reports	
10.2	Adopt the guidelines that have been agreed by the COP	
10.3	Produce the report and submit it to the Secretariat	
11a	Focus on pesticides recommended by FAO for use in developing countries (green pesticides)	
11b	Pursue research on biopesticides within the framework of bisafety policy and Biosafety Protocol	
11.1	Develop project proposals for research and promotion of indigenous biopesticidal materials	
11.2	Conduct research on suitable Integrated Pest Management (IPM) strategies	
11.3	Promote IPM amongst the farmers in the Country	
11.4	Promote Machobane Farming system (organic Farming system)	
12.0	Monitor activities of all sectors and evaluate the effectiveness of all actions taken to make the country free from POPs pesticides	
12.1	Develop and implement a monitoring plan with clear indicators	
12.2	Establish a network of institutions that will report on cases of violation of the regulatory framework and actions taken	
12.3	Form a task team made of all stakeholders to review implantation plan	
12.4	Develop a check list of milestones/indicators	
13.0	Develop proposals aimed at addressing weaknesses in the existing pesticides management infrastructure	
13.1	Consult the stakeholders to identify potential donors and type of expertise required	


IMPLEMENTATION PERIOD
Activities
YEAR ONE
YEAR TWO
YEAR THREE
YEAR FOUR
YEAR FIVE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Polychlorinated Biphenyls (PCBs)
1.a Build the capacity of institutions on PCBs management at different levels(law enforcers, technicians, managers and teachers)
1.1 Design a training programme for different categories
1.2 Train relevant institutions on various aspects of PCBs management particularly identification and safe handling
1.b Enhance the analytical capacity of the National University
1.3 Acquire PCB standards for the National University's laboratory to be used in the PCB analyses
2.a Ban Production, importation and use of PCBs in all applications except in small volumes to be used as standards
2.1 Include PCBs in the schedule of chemicals to be banned
2.2 Publish and distribute list of banned chemicals to all potential importers, law enforcement agencies and customs officials
2.b Develop agreement on transboundary movement of PCBs between South Africa and Lesotho within broad frameworks of Rotterdam and Basel Conventions
2.3 Prepare agreement on transboundary movement of PCBs between South Africa and Lesotho within the context of joint bilateral cooperation and Basel Conventions
3 Include PCBs in the list of banned chemicals (above)
3.1 Include PCBs in the list of chemicals whose production has been banned (Above)
4.a Develop and implement a comprehensive monitoring and maintenance programme
4.b Replace leaking equipment that is no longer cost effective to maintain
4.1 Review and upgrade monitoring and maintenance plan
4.2 Develop technical guidelines for safe handling of PCBs
4.3 Identify irreparable equipment
4.4 Remove irreparable equipment from the network
4.5 Construct containment structures
5.a Identify and label equipment containing different PCBs concentrations
5.b Develop a phase out plan that start with inefficient equipment which has the highest concentration of PCBs
5.1 Sample oil from transformers and analyse it for PCBs using test kits
5.2 Send some samples for further analysis using Mass-spectroscopy
5.3 Label tested transformers and those found to be containing PCBs appropriately
5.4 Remove from use the most inefficient PCB containing transformers
5.5 Construct at least one central storage facility for disused transformers in Maseru and satellite ones in the districts
5.6 Prepare and implement an agreement between South Africa and Lesotho for the export of PCB containing waste for environmentally safe disposal
6.a Capitalise on existing projects to develop relevant waste management law e.g. PADELIA
6.b Include PCBs in the list of banned chemicals in the amendments to the Environment Act, 2001 and hazardous chemicals law
6.1 Produce Hazardous waste law by 2008
6.2 Include PCBs containing waste in list of banned wastes in the hazardous waste law by 2008
6.3 Distribute the list of banned wastes to customs officers and law enforcement agencies 2008

7.a	Curb production of unintentional PCBs through the use of appropriate technologies (adoption of appropriate standards and guidelines)
7.b	Discourage open burning of waste at domestic dwellings and landfills through legislative control
7.1	Make an inventory of unintentional sources of PCBs
7.2	Construct appropriate landfills for waste disposal with incinerators which meet international standards starting in Maseru by 2007
7.3	Phase out the use of leaded petrol by 2006
7.4	Develop an integrated waste management and pollution control policy by 2007
7.5	Develop air quality standards which include a standard for PCBs by 2010
8.a	Centralise the storage of disused transformers with satellites in the districts/urban centres
8.b	Develop monitoring plan for storage facilities
8.c	Export PCB containing wastes for environmentally safe disposal in neighbouring countries with capacity to do so
8.1	Identify possible sites and subject them to preliminary screening process by 2006
8.2	Carry out an EIA for Maseru site to determine its appropriateness by 2007
8.3	Construct the facilities in Maseru and in the districts by 2015
8.4	Carry out tests to determine the PCB content of out –of- service equipment suspected of containing PCBs by 2006
8.5	Identify and label wastes containing PCBs by 2006
8.6	Design a licensing/clearance system for companies to be responsible for transporting PCB containing wastes by 2007
9.a	Determine the concentration of PCBs in electrical equipment especially transformers
9.b	Update PCB inventories
9.1	Take samples for analysis
9.2	Label PCB containing equipment by 2006
9.3	Establish and maintain a database of equipment containing PCBs by 2006
9.4	Develop a tracking system for PCB containing equipment by 2006
10.a	Replace old transformers 1960-early 70s by new PCB free ones?
10.b	Legislative reviews
10.1	Prepare or update list of old transformers and identify inefficiencies by 2006
10.2	Implement phase out plan starting with the most inefficient equipment by 2008
10.3	Include regulations on handling, transport, storage and disposal of PCB-containing equipment in hazardous waste management law by 2008
10.4	Prepare a voluntary agreement between owners of transformers (LEC and individuals) and Government committing the parties to PCBs phase out by 2008
10.5	Develop guidelines on transportation of PCB containing equipment by 2007
11.a	Prioritise sites in terms of site and inherent risks
11.b	Polluter pays principle be applied to sites contaminated after the environment Act, 2001 has come into operation
11.1	Take soil samples from the sites for laboratory analysis
11.2	Prepare a prioritized list of contaminated sites
11.3	Erect signage discouraging people from entering /walking through the contaminated sites/premises
11.4	Embark on cleaning programme for the area using existing international guidelines by 2007
12.a	Network with national, regional and multi-lateral institutions dealing with PCB issues
12.b	Publish information on PCB on internet/ Department's website with links to Government's website



12.1	Hold regular meetings of CheMaC
12.2	Connect strategic institutions to internet by 2007
12.3	Establish a web based on clearing house mechanisms on POPs by 2006
13	Cooperate with relevant sectors in the development and implementation of education and training programme
13.1	Train LEC workers in the management of PCBs especially occupational health issues by 2006
13.2	Hold at least ten workshops for teachers on chemical management inclusive of PCBs issues by 2008
13.3	Produce awareness raising material for different target groups covering PCBs and their alternatives by 2006
13.4	Include PCB issues in environmental chemistry from high schools to tertiary institutions by 2008
13.5	Produce posters, factsheets and write articles on effects of PCBs by 2006
13.6	Involve teachers in the evaluation of the material before its publication by 2006
13.7	Distribute material to all districts by 2007
13.8	Network with existing committees under various institutions by 2007
13.9	Access information from the internet and disseminate it to all stakeholders
14.a	Include sections in the hazardous chemicals and waste laws, which oblige companies that are in possession of PCB containing equipment to report on their progress towards phasing them out.
14.b	Produce regular reports on progress made towards phasing out PCBs
14.1	Collate statistical data from companies by 2007
14.2	Produce annual reports on progress made in the phase out of PCB containing equipment
14.3	Prepare and submit regular progress reports to the Secretariat of the Convention
15	Introduce transformers (as replacement for old ones) which use alternatives to PCBs in the country or observe existing ones
15.1	Collect data on performance of transformers that use alternatives PCB under different ecozones (highlands and lowlands)
15.2	Use the information to prepare area region specifications for transformers
16	Target maintenance work force and any personnel responsible for cleaning transformer storage facilities
16.1	Identify high risk groups and decide on the number to be screened
16.2	Engage a doctor to take blood samples and examine the identified groups on regular interval
16.3	Produce reports of the extent of contamination and associated impacts if any
17	Cooperate with all relevant stakeholders in the preparation of proposals for environmentally sound management of PCBs
17.1	Identify bilateral, regional and multilateral sources of financial and technical assistance
17.2	Submit proposals aimed at addressing short and long term needs


IMPLEMENTATION PERIOD
YEAR ONE
YEAR TWO
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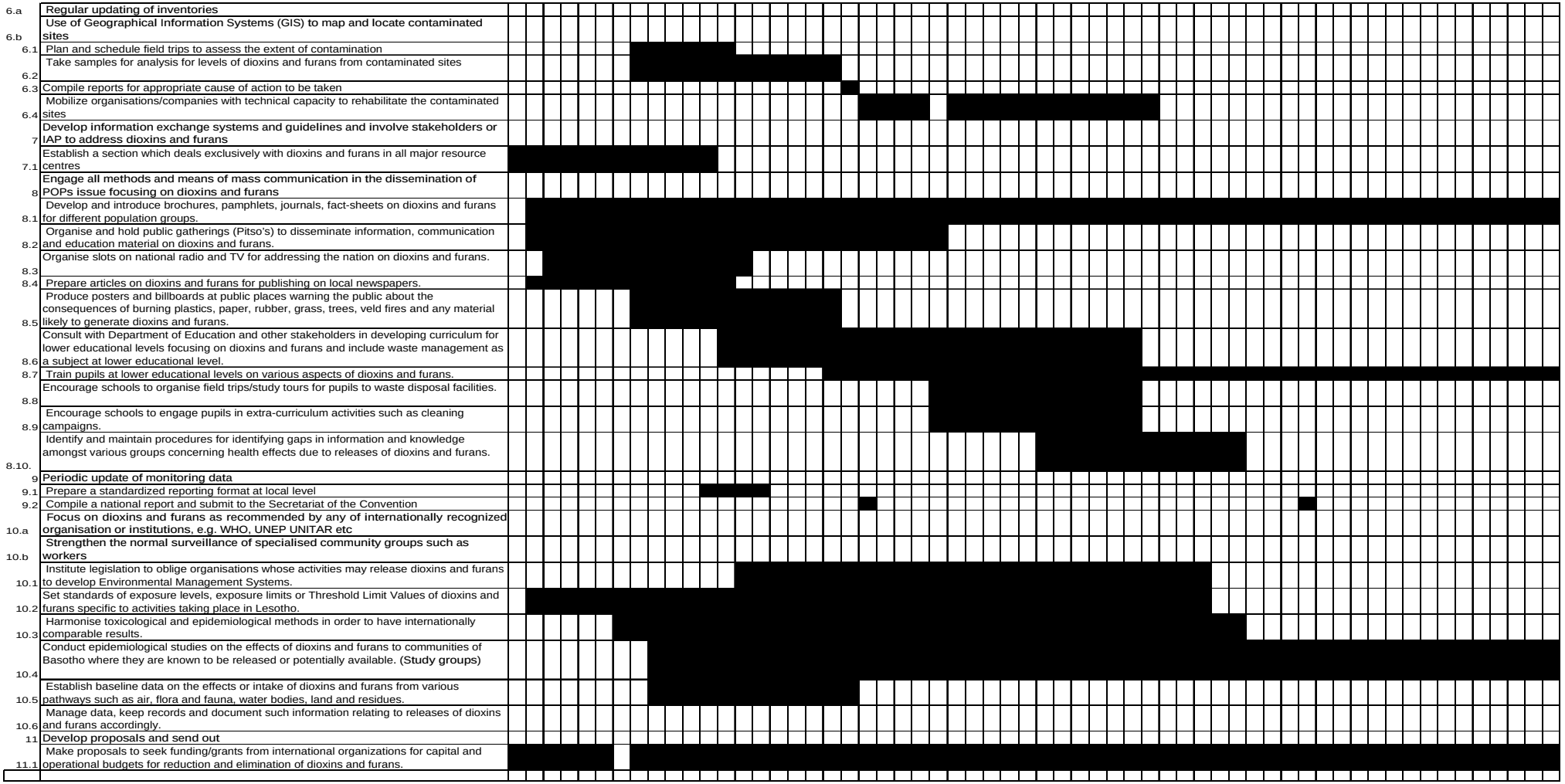
YEAR FOUR
YEAR FIVE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
Dioxins and Furans
1.a To develop Integrated Waste Management and Pollution Control policy framework and amend relevant legislation to ensure significant reduction in the releases of dioxins and furans
1.b Strengthen Environment Act 2001 and other relevant legislations and assign responsibilities appropriately
1.1 Draft policy document on Integrated Waste Management and Pollution Control which covers reduction of dioxins and furans releases from major source categories.
1.2 Organize nine regional workshops involving interested and affected parties, stakeholders, NGOs, government sectors, community leaders to make input on formulation of policy on dioxins and furans.
1.3 Develop regulations under the Environment Act 2001 to address reduction of the release of dioxins and furans.
1.4 Conduct crusher courses for law enforcement officers.
1.5 Institute statutes prohibiting smoking in public places
2 Develop/formulate a legal framework for major activities (vehicle, factories) that emit dioxins and furans
2.1 Update the inventories register by 2010
2.2 Review/amend existing legislation to incorporate dioxins and furans
2.3 Develop guidelines and standards (air pollution) for major activities (factories, vehicles) which emit dioxins and furans
2.4 Review of the set bench marks
3.a Develop guidelines and standards for reducing dioxins and furans from stockpiles and waste
3.b Carry out regular inspections/audits of the stockpiles and waste to ensure compliance with set standards
3.1 Develop guidelines for proper management of waste disposal sites
3.2 Set guidelines for remediation/rehabilitation of sites contaminated with dioxins and furans
3.3 Conduct periodic audits of the source categories of dioxins and furans significant to Lesotho once every 2 years
3.4 Draw a maintenance programme for sewage ponds.
4.a Adopt international and regional guidelines on the harmonisation and classification systems
4.b Update the Lesotho dioxins and furans inventory in order to develop a system with guidelines to adequately identify all source categories of dioxins and furans
4.1 Check documents and statistical records on the amounts of stockpiles, articles in use and wastes that may lead to release of dioxins and furans
4.2 Solicit stakeholders involvement and participation in mapping and quantifying stockpiles and wastes
4.3 Draft guidelines for identification and classification of source categories of dioxins and furans significant to Lesotho
5 Adopt internationally set standard operating procedures (SOPs) and manufacturer's codes and guidelines for reduction of dioxins and furans
5.1 Introduce alternatives to the use of plastic bags at chain stores/supermarkets
5.2 Set structures and encourage segregation of all different types of waste at points of generation (industrially, domestically and institutionally).
5.3 Set up and promote recycling of plastic and Poly Vinyl Chloride products
5.4 Construct technologically cost-effective waste incineration plants or equipment in design and operation that will reduce emission of dioxins and furans when treating medical waste.
5.5 Adopt Polluter-Pays-Principle from Cradle to Grave
5.6 Institute penalty charges for those who litter and practice illegal dumping.
5.7 Construction of 2 regional sanitary landfills.
5.8 Maintenance of sewage/oxidation ponds by employing competent personnel, conduct refresher courses for existing staff and keep records of any deviations from standard operating procedures
5.9 Produce manuals/handbooks that should be used as guidelines for equipment or activities which burn/incinerate waste with the intend to reduce dioxins and furans


6.a Regular updating of inventories
6.b Use of Geographical Information Systems (GIS) to map and locate contaminated sites
6.1 Plan and schedule field trips to assess the extent of contamination
6.2 Take samples for analysis for levels of dioxins and furans from contaminated sites
6.3 Compile reports for appropriate cause of action to be taken
6.4 Mobilize organisations/companies with technical capacity to rehabilitate the contaminated sites
7 Develop information exchange systems and guidelines and involve stakeholders or IAP to address dioxins and furans
7.1 Establish a section which deals exclusively with dioxins and furans in all major resource centres
8 Engage all methods and means of mass communication in the dissemination of POPs issue focusing on dioxins and furans
8.1 Develop and introduce brochures, pamphlets, journals, fact-sheets on dioxins and furans for different population groups.
8.2 Organise and hold public gatherings (Pitso's) to disseminate information, communication and education material on dioxins and furans.
8.3 Organise slots on national radio and TV for addressing the nation on dioxins and furans.
8.4 Prepare articles on dioxins and furans for publishing on local newspapers.
8.5 Produce posters and billboards at public places warning the public about the consequences of burning plastics, paper, rubber, grass, trees, veld fires and any material likely to generate dioxins and furans.
8.6 Consult with Department of Education and other stakeholders in developing curriculum for lower educational levels focusing on dioxins and furans and include waste management as a subject at lower educational level.
8.7 Train pupils at lower educational levels on various aspects of dioxins and furans.
8.8 Encourage schools to organise field trips/study tours for pupils to waste disposal facilities.
8.9 Encourage schools to engage pupils in extra-curriculum activities such as cleaning campaigns.
8.10. Identify and maintain procedures for identifying gaps in information and knowledge amongst various groups concerning health effects due to releases of dioxins and furans.
9 Periodic update of monitoring data
9.1 Prepare a standardized reporting format at local level
9.2 Compile a national report and submit to the Secretariat of the Convention
10.a Focus on dioxins and furans as recommended by any of internationally recognized organisation or institutions, e.g. WHO, UNEP UNITAR etc
10.b Strengthen the normal surveillance of specialised community groups such as workers
10.1 Institute legislation to oblige organisations whose activities may release dioxins and furans to develop Environmental Management Systems.
10.2 Set standards of exposure levels, exposure limits or Threshold Limit Values of dioxins and furans specific to activities taking place in Lesotho.
10.3 Harmonise toxicological and epidemiological methods in order to have internationally comparable results.
10.4 Conduct epidemiological studies on the effects of dioxins and furans to communities of Basotho where they are known to be released or potentially available. (Study groups)
10.5 Establish baseline data on the effects or intake of dioxins and furans from various pathways such as air, flora and fauna, water bodies, land and residues.
10.6 Manage data, keep records and document such information relating to releases of dioxins and furans accordingly.
11 Develop proposals and send out
11.1 Make proposals to seek funding/grants from international organizations for capital and operational budgets for reduction and elimination of dioxins and furans.