THE NATIONAL IMPLEMENTATION PLANS (NIPs) FOR THE MANAGEMENT OF PERSISTENT ORGANIC POLLUTANTS (POPs) IN ZAMBIA

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EXECUTIVE SUMMARY

This document constitutes Zambia's National Implementation Plan (NIP) for the management of Persistent Organic Pollutants (POPs), and the implementation of the said plan under the Stockholm Convention (SC) obligations. These pollutants include DDT, PCBs, Dioxins and Furans, and POPs Pesticides.

The objective of the SC as set in Article 1 of the SC states as follows: "Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Convention is to protect human health and the environment from POPs".

Therefore, the key obligation of Parties to the SC, as outlined in sub-paragraph (a), paragraph 1 of Article 7, is to draw up a National Implementation Plan (NIP) which is to be implemented by each party in order to fulfill its obligations under the Convention. Zambia became a signatory to the SC in May 2001. The current status is that Zambia is a Party to the Convention and it came into force on 5th October 2006.

In August 2002, Zambia launched the "Development of NIPs" Project, which culminated into a series of activities to the development of this document.

This document presents a country profile which outlines the geographical, demographic, political, economic, and environmental overview of Zambia. In addition, an outline of the current status of the institutional, policy and regulatory framework relevant to issues of POPs and an assessment of these issues is also given. The document also provides an action plan for the implementation of the NIP.

Zambia is located in Southern Africa between 8^0 – 18^0 South longitude and 22^0 – 34^0 East latitude, and covers an area of 752 614 km^2, sharing borders with Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south, Namibia in the southwest and Angola in the west.

According to the 2000 national census, the population of Zambia was 10 757 192. Males constituted 49.1% of the population and 50.9% were females, 67% of the total population were estimated to be less than 15 years old. Life expectancy was 48 years and 52 years respectively for males and females. The population growth rate was 2.9 per cent per annum with fertility levels of 6 children per woman.

Zambia's economy is free-market oriented with the majority of investments vested in the private sector. The national currency is the Zambian Kwacha. Mining is the largest economic activity which accounts for 90% of the national foreign exchange revenue through international trade. Non-traditional export commodities such as vegetables and flowers have added value to the national foreign exchange earnings. The manufacturing sector contributes 14% to Zambia's export earnings and accounted for 10.7% of GDP in 2002. Agriculture accounted for over 14.9% of GDP in 2002. The main agricultural crops grown are maize, sweet potatoes, groundnuts, sorghum, millet, cotton, soya beans, mixed beans, sunflower and paddy rice.

In the environmental sector, Zambia has been experiencing land degradation due to application of chemical fertilizers and lime coupled with improper agricultural practices. A total of 20,717,147 kg of top-dressing fertilizer, 19,852,424 kg of Basal fertilizer and 106,675 kg of lime were applied to crops countrywide during the 2000/2001 agricultural season. Over-fishing and the use of unsuitable fishing methods has been on an increase. Forest reserves which account for 7.4 million hectares of land have continued to experience widespread depletion resulting in biodiversity loss due to high demand for fuel wood. The depletion of forest reserves has led to desertification, soil erosion, siltation and a reduction in the flow of streams. Water and air pollution from industrial sites and inadequate control in the transportation of hazardous chemicals and wastes has also been rising.

Zambia is a democratic Republic whose government exercises its powers through three independent organs comprising the Executive, Judiciary and Legislature. The executive power of the Republic is vested in the President who is the head of State and Government. The Judiciary consists of the Supreme Court, High Court, Industrial Relations Court, Subordinate Courts, Local Courts and such lower courts as may be prescribed by an Act of Parliament. The Legislature comprises the President and the National Assembly.

The National Assembly consists of 150 elected members and not more than 10 members are nominated by the President. The National Assembly is vested with powers to, among other things, make laws.

The institutional framework through which the NIP will be implemented includes several government line ministries and agencies. The line ministries include Ministry of Tourism, Environment and Natural Resources (MTENR), Ministry of Health (MoH), Ministry of Labour and Social Security (MLSS), Ministry of Agriculture and Co-operatives (MACO), Ministry of Mines and Minerals Development (MMMD), Ministry of Science, Technology and Vocational Training (MSTVT), Ministry of Education (MoE), Ministry of Commerce, Trade and Industry; and Ministry of Energy and Water Development. Agencies that have relevance to the implementation of the NIP include Environmental Council of Zambia (ECZ), Food and Drugs Control Laboratory, National Institute for Scientific and Industrial Research, National Malaria Control Centre, Zambia Agriculture Research Institute, Zambia Bureau of Standards, Zambia Revenue Authority and some institutions of higher learning.

To ensure effective implementation, deliberate efforts were made to formulate a NIP that conforms to the Zambian Fifth National Development Plan (FNDP), Vision 2030 and the Millennium Development Goals (MDGs).

The national lead agency in the implementation of the NIP will be ECZ, a quasi-government statutory body under MTENR. ECZ is the National Focal Point in matters related to the sound management of chemicals. ECZ provides vital technical competence base for information exchange with international, regional, sub-regional, national and local stakeholder institutions.

Some of the key regulatory mechanisms that will aid the implementation of these are the; Environmental Protection and Pollution Control Act (which is the principal Act on Environment), Public Health Act, Local Government Act, National Council for Construction, Food and Drugs Act, Natural Resources Conservation Act, Petroleum Act, and Mines and Minerals Act. Others are the Pharmaceutical Regulatory Act, Occupational Health and Safety Act, Water Act, Weeds Control Act and Standards Act.

Persistent Organic Pollutants (POPs)

POPs constitute a class of organic compounds that possess toxic properties, resist natural degradation, bio-accumulate and are transported through air, water and migratory species. POPs accumulate in the fatty tissues of living organisms and their concentration increases higher in the food chain. Exposure to POPs has been associated with adverse health effects such as cancer, reproductive defects, immune system suppression, hormonal disruptions etc.

Currently the SC only identifies twelve chemicals as POPs. These include those that are intentionally produced for use as pesticides i.e. Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, and Toxaphene. Polychlorinated Biphenyls (PCBs) though also intentionally produced are used as dielectric fluids in electricity transformers, capacitors and other such equipment. The last category are chemicals that are unintentionally produced from thermal processes involving organic matter and chlorine as a result of incomplete combustion. Chemicals falling under this group include polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs).

Current Status of POPs issues in Zambia

The POPs of major concern in Zambia are Chlordane, DDT, PCBs, and PCDDs/PCDFs. Chlordane is used for termite control in the construction industry and in plantations. The lack of cost-effective alternatives for termite control implies that the use of Chlordane will continue for some time to come. DDT is exclusively used for malaria vector control and there has been a steady increase in the quantities used, particularly for Indoor Residue Spray. The PCBs found in Zambia are contained in equipment such as transformers and capacitors. Though the importation of such PCB containing equipment was banned in the 1980s, there are still a number of them, both obsolete and in use countrywide. PCDDs/PCDFs are also of major concern in Zambia due to among other things, poor management of solid waste and practices such as open air burning.

POPs Pesticides

None of the POPs pesticides are locally produced. The countrywide inventory survey carried out in 2004 revealed that the country had been using about 145 metric tones of POPs pesticides annually before the mid 1980s. It was also noted that Chlordane is still in use for termite control mainly in the construction industry.

Poly Chlorinated Biphenyls (PCBs)

The 2004 national inventory revealed that there were 15 262 transformers countrywide, mostly owned by electrical utilities and mining companies. Out of this number, 76 were PCBs containing and these were stored at Kariba North Bank and Konkola Copper Mines, 57 tonnes of PCBs contaminated soil and 2 700 litres of PCB-oil was stored in drums at Kariba North Bank and ZCCM – IH. In addition, there were 1 642 capacitors countrywide.

Dichloro diphenyl trichloroethane (DDT)

DDT is not locally produced in the country. The national inventory of 2004 revealed that DDT in Zambia was exclusively used for Indoor Residual Spraying (IRS). From 2000 to 2004, the country used a total of 29,615Kg of DDT for IRS. At the time the inventory was done the projected amount of DDT to be procured by the Ministry of Health for IRS in the 2004/2005 transmission period was 11,055kg and in the 2005/2006 transmission period was 7,500. The amount projected for procurement in the 2006/2007 transmission period was expected to increase by 65% to reach the quantity of 56,280kg.

Polychlorinated DibenzoDioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)

According to the 2004 national inventory, the major release routes for PCDDs/PCDFs were air, land and residue. The total amount of PCDDs/PCDFs released to these vectors was estimated at 483.1g TEQ/a and this was broken down as follows: air 289.7g TEQ/a; residue 144.9g TEQ/a; land 48.4g TEQ/a. The single, largest source of these releases was uncontrolled combustion processes i.e. forest fires and open air burning, which emitted significant amounts to all the release vectors. This was followed by ferrous and non-ferrous metal production which made significant contributions to the amount of PCDDs/PCDFs released to air and residue. The next major source of releases was from waste incineration which contributed mainly to the emissions to air and residue.

The implementation of the proposed NIP especially PCDDs and PCDFs Action Plans will not only result in elimination of POPs but will also result in reduced Green House Gas emission and contribute to mitigating Climate Change.

National Priorities in Relation to POPs Management

The 2004 inventory findings formed the basis for prioritising issues with regards to the management of POPs. The priority areas related to POPs production, use/disposal in the country include pollution of inland/ground waters, air, soils and foods. Treatment of hazardous waste, control of chemical imports, emergency preparedness, occupational health and safety of workers in the agricultural, industrial and transport sectors are other areas of concern. Zambia is a developing country and open air burning is very rampant. This was estimated to be the major source of PCDDs/PCDFs in the country. As a result, this NIP takes into consideration several strategies aimed at mitigating this problem.

Priorities issues

The following are some of the priority issues identified in the management of POPs in Zambia:

1. Develop a system for management and control of Chlordane.
2. Develop an effective management of PCBs.
3. Evaluate the persistence of DDT in different matrices including soil, water, food and breast milk.
4. Strengthen the existing legal framework in order to address PCDD and PCDF releases.

Strategy and Action Plan Elements.

Implementation Strategy

The NIP for Zambia will be implemented through a multi stakeholder approach where ECZ on behalf of MTENR will continue to serve as the National Focal Point for the SC. An inter-ministerial Coordinating Committee will be set up to coordinate the implementation of the NIP. This committee will comprise of relevant ministries involved in POPs management such as agriculture, environment, health, industry and labour. In addition, civil society and public interest groups will be integrated into this framework. The outlined institutional and legal framework will facilitate smooth implementation strategies through responsible ministries and agencies as earmarked in the Action Plans.

Action Plans and Cost of Implementation

1. Institutional and Regulatory Strengthening measures: US$ 181,000.
2. Production, Import and Export, Use, Stockpiles and Wastes of Pesticides POPs (Annex A, Part 1 Chemicals): US$ 277,000.
3. Production, Import and Export, Use, Identification, Labeling, Removal, Storage and Disposal of PCBs and Equipment Containing PCBs (Annex A, Part II Chemicals): USD 1,478,000.
4. Production, Import and Export, Use, Stockpiles and Wastes of DDT (Annex B Chemicals): US$ 244,143.
5. Releases from Unintentional Production of PCDDs/PCDFs, HCB and PCBs**:** US$ 19,741,800.
6. Identification of Relevant Stockpiles, Articles-in-Use and Wastes – Plan for Assessment and Mitigation of Releases from Stockpiles and Wastes: Pesticides, DDT, PCBs and HCB (Annexes A, B and C Chemicals): Yet to be costed.
7. Identification and Appropriate Management of Contaminated Sites (Annex A, B and C Chemicals): US$ 2,038, 571.
8. Public Awareness, Information and Training: US$ 44,286.
9. Monitoring and Reporting: US$ 184,314.
10. Periodic Review and Updating Mechanism: US$ 9,957.
11. Development and Capacity Building Proposals and Priorities: yet to be costed

The total cost for NIP implementation covering both short term and long term action plans is twenty four million fifty nine thousand and forty three United States Dollars (US$ 24,059,043). The financing will be shared by the Private Sector, Donors and the Government of the Republic of Zambia.

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AAS	Atomic Absorption Spectrometry
AMCEN	African Ministerial Conference on Environment
ASP	African Stockpile Project
AU	African Union
BAT	Best Available Techniques
BEP	Best Environmental Practices
BSI	British Standards Institute
CEC	Copperbelt Energy Corporation
CIDA	Canadian Development Agency
CHC	Chemical Hazard Communication
COMESA	Common Market for Eastern and Southern Africa
DDT	Dichloro diphenyl trichloroethane
DRC	Democratic Republic of the Congo
ECZ	Environmental Council of Zambia
EIA	Environmental Impact Assessment
EPPCA	Environmental Protection and Pollution Control Act
ERB	Energy Regulation Board
ESM	Environmentally Sound Manner
EU	European Union
FAO	Food and Agriculture Organization
FPD	Flame Photometric Detector
GDP	Gross Domestic Product
GEF	Global Environment Fund
GHS	Globally Harmonized System
GIS	Geographical Information System
GLC	Gas Liquid Chromatography
GLP	Good Laboratory Practice
GRZ	Government of the Republic of Zambia
GTZ	Gesellschaft für Technische Zusammenarbeit
HCB	Hexachlorobenzene
ICT	Information and Communication Technology
IFCS	Inter-Governmental Forum on Chemical Safety
ILO	International Labor Organization
IFCS	Intergovernmental Forum on Chemical Safety
IRPTC	International Register of Potentially Toxic Chemicals
IRS	Indoor Residual Spraying
ISO	International Standards Organization
ITNs	Insecticide Treated Nets
IVCM	Integrated Vector Control Management
JICA	Japan International Cooperation Agency
MACO	Ministry of Agriculture and Co-operatives
MCTI	Ministry of Commerce Trade and Industry
MDGs	Millennium Development Goals
MEWD	Ministry of Energy and Water Development
MLGH	Ministry of Local Government and Housing
MLSS	Ministry of Labor and Social Security
MMMD	Ministry of Mines and Minerals Development
MoH	Ministry of Health
MSTVT	Ministry of Science, Technology, and Vocational Training
MTENR	Ministry of Tourism, Environment and Natural Resources
NEAP	National Environmental Action Plan

NEPAD	New Economic Partnership for African Development
NIP	National Implementation Plan
NISIR	National Institute for Scientific and Industrial Research
NMCC	National Malaria Control Center
NORAD	Norwegian Development Agency
NP	National Profile
NPE	National Policy on Environment
OECD	Organisation for Economic Co-operation and Development
OSHS	Occupational Safety and Health Services
PCBs	Polychlorinated biphenyls
PCDDs	Polychlorodibenzo-p-dioxins
PCDFs	Polychlorodibenzofurans
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PRSP	Poverty Reduction Strategy Paper
SADC	Southern African Development Community
SAICM	Strategic Approach to International Chemical Management
SC	Stockholm Convention
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNITAR	United Nations Institute for Training and Research
USAID	United States International Development Agency
WCSZ	Wildlife Conservation Society of Zambia
ZABS	Zambia Bureau of Standards
ZCCM	Zambia Consolidated Copper Mines
ZCCM-IH	Zambia Consolidated Copper Mines – Investments Holdings
ZCTU	Zambia Congress of Trade Unions
ZESCO	Zambia Electricity Supply Corporation
ZNFU	Zambia National Farmers Union
ZNTB	Zambia National Tourist Board
ZRA	Zambia Revenue Authority

1.0 INTRODUCTION

Having identified the effects of Persistent Organic Pollutants (POPs) on human health and the environment, the Governing Council of the United Nations Environment Program (UNEP) requested in its decision 18/32 in May 1995 that an international assessment be undertaken of an initial list of 12 POPs. The list included Aldrin, Chlordane, Dichloro diphenyl trichloroethane (DDT), Dieldrin, Dioxins, Endrin, Furans, Hexachlorobenzene, Heptachlor, Mirex, Polychlorinated biphenyls (PCBs) and Toxaphene. During this period, the Inter-governmental Forum for Chemical Safety (IFCS) was mandated to develop recommendations on international action for consideration by the UNEP Governing Council and the World Health Assembly not later than 1997.

In June 1996, the IFCS confirmed the need for international action including a legally binding instrument, to reduce the risks to human health and the environment arising from the release of the 12 POPs. After a series of negotiations, the Stockholm Convention (SC) was signed at a ceremony on 23 May 2001 in Stockholm, Sweden. The objective of the Convention is to protect human health and the environment from POPs. Zambia became a signatory in May 2001 and ratified the SC on 5th October 2006.

The Convention specifies provisions each Party has to undertake, such as to reduce or eliminate intentional production and use of POPs are outlined in Article 3. This category includes Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, Toxaphene and PCBs which fall under Annex A, Part I of the Convention. Additionally, Parties to the SC have an obligation to eliminate the use of PCBs in equipment such as transformers, capacitors and other receptacles containing liquid stocks by 2025. This class of POPs is defined under Annex A, Part II of the Convention. Another obligation of Parties is the restricted production and/or use, including environmentally sound disposal of DDT described under Annex B, Part I and II of the Convention respectively. Further, Article 5 specifies obligations to reduce or eliminate releases from unintentionally produced POPs such as polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs), hexachlorobenzene and PCBs under Annex C of the Convention. Finally, Article 6 specifies obligations to reduce or eliminate releases of POPs from stockpiles or wastes.

Parties to the SC recognize that POPs possess toxic properties, resist degradation, bioaccumulate and are transported, through air, water and migratory species, across international boundaries and deposit far from their place of release where they accumulate in terrestrial and aquatic systems. They are also aware of the health concerns, especially in developing countries, resulting from local exposure to POPs, in particular impacts on women and, through them on future generations. Therefore Article 7, 1 (a) of the SC stipulates that each Party shall develop an implementation plan in order to fulfill its obligations under the Convention. In addition, sub-article 1 (b) of Article 7, states that each Party shall transmit its implementation plan to the Conference of Parties (COP) within two years of the date on which the Convention enters into force for that Party.

Strategies to facilitate information exchange, awareness and education programs about POPs are outlined in Articles 9 and 10 of the Convention. While research, development and monitoring strategies are outlined in Article 11. Technical assistance, financial resources and mechanisms accessible are also included in articles 12, 13, and 14 respectively. Implementation, effective evaluation and non-compliance by Parties are set out in Articles 15, 16 and 17. Lastly, articles 18 to 30 deal with general administrative issues.

Zambia launched the NIPs project through, a stakeholder consultative workshop in 2002. The project was to be executed in five phases as follows:

- Phase 1: Determination of coordinating mechanisms and organisation of process
- Phase 2: Establishment of a POPs inventory and assessment of national infrastructure and capacity
- Phase 3: Priority setting and determination of objectives
- Phase 4: Formulation of a prioritised and costed National Implementation Plan, and specific Action Plans on POPs
- Phase 5: Endorsement of NIP by stakeholders

The first activity under Phase one was a Consultative Workshop with participants drawn from Government, Non-Governmental Organizations, Community Based Organizations, Academia, Private Sector, Parastatal

Organizations and International Cooperating Partners. This workshop, established coordinating mechanisms and four thematic working groups were constituted. These are Dioxins and Furans, DDT, POPs Pesticides and PCBs working groups. Each working group was tasked with the formulation of prioritized and costed specific Action Plans on POPs that would constitute the NIP. To aid in the development of the NIP, a POPs inventory and assessment of national infrastructure and capacity followed by priority setting and determination of objectives was undertaken.

The NIPs Project has resulted in a number of key national outputs contributing to sound chemical management. These include:

(i) Enhanced public awareness on POPs;
(ii) Involvement of Civil Society in POPs issues;
(iii) Updating of a *National Profile* to assess the chemicals management infrastructure in Zambia and inclusion of POPs issues;
(iv) Establishing of POPs Inventory and publication of National POPs Inventory Reports;
(v) Analysis and publication of the existing Data of POPs impacts on human health, socio-economics and environment and their reduction, and
(vi) The NIP document is a means to meet the initial reporting obligations of Zambia towards the Convention as well as the strengthening of Zambia' capacity for managing POPs and the broader group of Persistent Toxic Substances.

POPs constitute a class of organic compounds that possess toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species. POPs tend to accumulate in fatty tissues of living organisms and their concentrations increase as one moves higher in the food chain. Exposure to POPs has been associated with adverse health effects such as cancer, reproductive defects, immune system suppression and hormonal disruptions.

The National Inventory of 2004 revealed that POPs of major concern in Zambia are Chlordane, DDT, PCBs, and PCDDs/PCDFs. Chlordane is used for termite control in the construction industry and in plantations. The lack of cost effective alternatives for termite control implies that the use of Chlordane will continue for some time to come. DDT is permitted for use only in IRS for malaria vector control. The said inventory revealed that there has been a steady increase in the quantities used since 2000. PCBs found in Zambia are contained in equipment such as transformers and capacitors used mainly in the electricity sector. Though the importation of such PCB containing equipment was banned in the 1980s, there are still a number in use and obsolete stockpiles in the country. In the case of unintentionally produced POPs, the major source of PCDDs/PCDFs in Zambia is open air burning of waste resulting from poor waste management systems.

This report therefore outlines the priorities identified by the Thematic Working Groups and their action plans for the management of POPs issues in Zambia.

2.0 COUNTRY BASELINE

This chapter provides background information relevant to the NIP. It gives a description of the current situation and the state of knowledge about POPs in Zambia including capacity to address the problem.

2.1 Country Profile

An overview of the geography, population, political and economic profile including the economic sectors and the environment are presented in this sub-chapter.

2.1.1 Geography

Zambia is a landlocked country situated in the southern part of Africa between 8^o – 18^o South and 22^o – 34^o East, with a land area of 752 614 km^2**,** sharing borders with Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south, Namibia in the southwest and Angola in the west. Figure 2.1 shows the location of Zambia in the Southern Africa Region.

Zambia has a sub-tropical climate with three distinct seasons: the cool dry season from May to August, a hot dry season from August to October and the warm wet season from November to April. The average annual temperature ranges between 18^0 and 20^0C. The maximum annual average temperature is 32^0C and minimum temperature averages 4^0C.

The main rivers in Zambia are the Zambezi, Kafue, Luangwa and Luapula and the major lakes are Tanganyika, Mweru, Bangweulu and Kariba. The northern part of the country receives the highest rainfall with an annual range of 1,100mm to over 1,400mm. The southern and eastern parts of the country have less rainfall, ranging from 600mm to 1,100mm annually.

Figure 2.1: Location of Zambia in the Southern Africa Region

Geological Survey of Zambia, 2007

2.1.2 Population

Zambia's population as at 2000 was 9, 885, 591, compared to 7, 759, 117 in 1990 representing a 2.5% growth rate with fertility levels of 6 children per woman. Males and females constitute 49.1% and 50.9% of the population respectively. In 2000, 67% of the total population was below 15 years of age and life expectancy was 48 and 52 years for males and females respectively (CSO, 2000).

The majority constituting 65% of the population are rural dwellers, while 35% are urban dwellers. The average national population density is 13 people per square km. Lusaka Province has the highest average of 64 people per square km with the lowest being North Western province at 5 people per square km.

2.1.3 Political Profile

Zambia is a democratic Republic presided over by an Executive President. The Government is composed of three independent organs, namely the Executive, Legislature and Judiciary. The role of the Executive is to formulate policies and implement laws. The legislature headed by the Speaker of the National Assembly is responsible for formulating and enacting laws and is composed of 150 elected members. In addition, 10 members are nominated by the President bringing the total number to 160. The Judiciary headed by the Chief Justice is responsible for interpreting laws and administration of justice in the country.

There are seven major local languages namely, Cibemba, KiKaonde, Silozi, Lunda, Luvale, Cinyanja and Citonga, with an additional 66 dialects bringing the total to 73. However, English is the official language used as a medium of communication. Zambia has a three-tier education system which is primary, secondary and tertiary.

Zambia is a member of the following regional and sub-regional organizations: the African Union (AU), Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC).

2.1.4 Economic Profile

Zambia's major export commodity is copper. Between 2002 and 2005 copper accounted for an average of 67 percent of annual total export receipts. Non-Traditional Exports (NTEs) largely comprise primary products such as cotton lint, cotton yarn, flowers, vegetables, gemstones and tobacco. Secondary products include sugar, copper wire and electric cables. Copper prices recorded an upward trend from US$0.61 per pound in 2002 to US$1.61 per pound by the end of 2005, world commodity prices have been extremely unstable generally exhibiting a downward trend. This has resulted in the share of NTEs increasingly becoming an important source of Zambia's foreign exchange, employment and income for many rural households who grow export crops (MFNP, 2006).

2.1.4.1. Manufacturing

Since 1996, the manufacturing sector has grown, though recovery has been uneven. Industries that have recorded significantly recovery include those that are meeting the growing domestic demand for food, beverages and tobacco due to population growth and those that have had new entrants with a focus on exports (mainly textiles and leather products). Other industries, such as basic metals, non-metallic minerals and fabricated minerals, remained stagnant or declined (MFNP, 2006). Value added at constant 1994 prices was estimated at K338 billion in 2005 compared to about K326 billion in 2004, a growth of 3.7 percent. Most of the growth came from the Food, Beverages and Tobacco, 4.8 percent; Wood and Wood Products: 7.5 percent; Paper and Paper Products: 9.6 percent; Chemicals, Rubbers and Plastics: 5.1 percent; Non-metallic Mineral Products: 6.9 percent; and fabricated metal products: 4.2 percent. The textile industry and basic metal products recorded declines in value added of –4.7 percent and –3.9 percent, respectively as shown in Table 2.1.

Table 2.1: GDP by Economic Activity at Constant 1994 Prices (K' Billion) 2000-2005

Sub-Sector	2000	2001	2002	2003	2004	2005
Food beverage and Tobacco	155.7	164.0	172.3	187.7	198.6	208.1
Textiles and Leather products	45.8	46.8	50.0	51.3	50.3	48.0
Wood and wood Products	19.2	20.3	22.2	24.4	25.4	27.3
Paper and Paper Products	7.5	7.8	8.0	8.6	8.9	9.7
Chemical/Rubber/Plastics	21.9	22.8	25.1	26.4	28.6	30.1
Non- Metallic Mineral Products	4.6	4.8	4.9	5.6	6.4	6.8
Basic Metal Products	1.4	1.2	1.2	1.4	1.4	1.4
Fabricated Metal Products	6.5	6.0	5.8	6.1	6.4	6.6
Total Manufacturing	**262.7**	**273.7**	**289.4**	**311.4**	**325.9**	**338.0**
Share of Manufacturing in Total GDP (%)	10.5	10.5	10.7	10.9	10.9	10.7

Source: Central Statistical Office, 2005 Revised.

Manufacturing contributed 10.7% of GDP in 2005 and provided 15% of employment in the formal sector as shown in Table 2.2.

Table 2.2. Formal Sector Employment by Industry: 2001-2005.

Sub-sector of Industry	2001	2002	2003	2004	2005
Agriculture	59 248	43 819	64 096	65 136	65 496
Mining	34 966	37 245	48 957	46 078	32 103
Manufacturing	47 697	67 752	39 385	45 340	40 151
Electricity	5038	7 316	10 832	12 346	6 309
Construction	13 798	2 406	3 467	5 787	7 953
Trade	52 223	508 123	53 450	44 460	67 251
Transport	46 618	21 566	26 725	26 510	20 697
Finance	31 415	52 727	28 555	31 880	22 313
Community Services	184 331	145 763	141 697	138 691	173 990
TOTALS	**291 003**	**740 04**	**275 467**	**277 537**	**262 273**

Source: CSO, 2000, "Quarterly Employment and Earnings Survey Report"

2.1.4.2 Mining

Zambia is endowed with precious metals, gemstones, and industrial minerals and the economy has continued to be dominated by copper. An estimated 460 firms hold mining licenses, but most of these lack financial and technical capacity to realize the mines' potential. Consequently, more than 60 percent of these licenses are considered dormant (MFNP, 2006). The major export minerals are copper and cobalt. Other minerals include limestone and semi-precious stones. The sector produces about 7.9% of GDP and accounts for 10% of employees in the formal sector as shown in Table 2.3.

Table 2.3: Percentage Distribution of Employed Persons by Industry, Zambia. 2002 - 2003.

Type of Industry	Total	Rural	Urban	Total No of Employed Persons.
Agriculture/Forestry/Fisheries	72	93	15	2 525 510
Mining & Quarrying	10	0	5	49 528
Manufacturing	3	1	10	121 898
Electricity/Gas & Water	0	0	1	10 488
Construction	1	0	4	45 281
Trade	9	0	26	309 223
Hotels and Restaurants	1	3	2	33 014
Transport & Communications	2	0	5	55 076
Finance &Insurance etc	1	0	5	50 124
Community/Social Services	9	2	27	313 978
Not Stated	0.1	0.0	0.2	3 251
All Zambia	**100**	**100**	**100**	**3 517 371**

Source: CSO, 2004 "Living Conditions Monitoring Survey Report, 2002-2003"

2.1.4.3 Agriculture

Zambia has a landmass of approximately 752,614 square kilometres, of which 56 percent is arable land (42 million hectares). In addition about 35 percent of the fresh water resources in the SADC region are in Zambia, which if well nurtured, could make agriculture the main stay of the economy (MFNP, 2006).

Agriculture has become an increasingly important contributor to Zambia's economy and agriculture based exports accounted for 22 percent of GDP in 2001 as compared to 20 percent in 1990. The main agricultural crops grown are maize, sweet potatoes, groundnuts, sorghum, millet, soya beans, mixed beans, sunflower, cotton, and paddy rice. Since 2001, the sector has shown signs of improvement particularly for cash crop production such as cotton, tobacco and wheat. This was driven by the increased role of the private sector through out-grower schemes (MFNP, 2006).

2.1.5 Environmental Overview

2.1.5.1 Historical Background of the Environment in Zambia

Zambia's population has been growing resulting in increased pressures being placed on the environment. At the time of the NIP development, the country had no policy on environment. However, its development has been necessitated by the need to make our cities environmentally sustainable.

In the early stages the framework within which the environment had been governed was through the National Conservation Strategy (NCS) formulated in 1985. This document provided an overview of the status of environmental resources in Zambia, identified key environmental issues and made recommendations for policies, programmes and actions to these issues. One of the proposed actions was the enactment of the Environmental Protection and Pollution Control Act (EPPCA) CAP 204 of the Laws of Zambia in 1990 and the subsequent establishment of Environmental Council of Zambia (ECZ) in 1992.

In 1994, Government developed a National Environment Action Plan (NEAP) whose overall objective was to integrate environmental concerns into the social and economic development planning process. The NEAP identified five priority areas of concern, namely; water pollution and inadequate sanitation; soil erosion; air pollution; wildlife depletion; and deforestation.

In 2004, Government initiated the formulation of the National Policy on Environment (NPE) which was in its final draft form. The main purpose of the NPE is to create an umbrella policy for the welfare of the nation's environment so that socio-economic development will be achieved effectively without damaging the integrity of the environment or its resources. This policy is expected to encompass all areas of environmental management including management of issues related to POPs.

2.1.5.2 Priority Concerns Related to Chemicals (including POPs) Production, Import, Export and Use

The majority of mining, manufacturing and agricultural activities are located along the line of rail. The priority areas related to POPs production, use and disposal include pollution of inland and ground waters, air, soils and foods. Others include treatment of hazardous waste, control of chemical imports, emergency preparedness, occupational health and safety of workers in the agricultural, industrial and transport sectors. This poses a great challenge in safeguarding human health and protection of the environment.

Many of the enumerated concerns are being addressed by ECZ through the EPPCA. Other relevant Acts and their respective subsidiary legislation within the Ministries of Health, Labour and Social Security; Mines and Minerals Development, and Energy are also used. Of particular concern is the inadvertent importation and subsequent local use of electric power transmission and distribution equipment that use oils which contains PCBs.

2.2. Institutional, Policy and Regulatory Framework.

An analysis of the policy, regulatory and institutional frameworks is presented.

2.2.1 Environmental Policy and Regulatory Framework

2.2.1.1 Environmental Policy

Matters relating to environment and natural resource management are enshrined in the Constitution of Zambia (1996), thus laying a firm foundation for the formulation of the NPE. The Policy underlines the commitment of government, in partnership with the people, to effectively manage the environment for the benefit of present and future generations.

2.2.1.2 Legislative Framework

A number of legal instruments have been promulgated that regulate various aspects of the environmental management including the use of chemicals such as POPs. Inter alia:

- Agricultural Lands Act, CAP 187
- Water Act, CAP 198
- EPPCA, CAP 204
- Mines and Minerals Act, CAP 213
- Pneumoconiosis Act, CAP 217
- Plant Pests and Diseases Act, CAP 233
- Local Government Act, CAP 281
- Town and Country Planning Act, CAP 283
- Public Health Act, CAP 295
- Pharmaceutical Regulatory Act, CAP 299
- Food and Drugs Act, CAP 303
- Extermination of Mosquitoes Act, CAP 312
- Natural Resources Conservation Act, CAP 315
- Noxious Weeds Act, CAP 231
- Standards Act, CAP 416
- Petroleum Act, CAP 435
- Factories Act, CAP 441
- National Council for Construction Act

These pieces of legislation provide the necessary institutional mechanisms needed to implement the NIP to ensure effective cross sector coordination.

2.2.2.Roles and Responsibilities of Ministries, Agencies and other Government Institutions involved in POPs Life Cycle.

Several government ministries are entrusted with the responsibility of ensuring that laws, regulations and operational guidelines are in place to protect human health and the environment from the adverse effects of POPs. The key ministries are; MTENR, MoH, MLSS, MLGH, MACO, MEWD, and MMMD.

Details of the roles played by government line ministries and other institutions involved in the management of chemicals including POPs are listed Table 2.4.

Table 2.4. Responsibilities of Government Ministries, Agencies and other Institutions

Stage of Life-Cycle Concerned	Importation	Production	Storage	Transportation	Distribution / Marketing	Use / Handling	Disposal	Disaster Preparedness
MTENR	✓	✓	✓	✓	✓	✓	✓	✓
MoH	✓	✓	✓	✓	✓	✓		✓
MACO	✓	✓	✓	✓	✓	✓		✓
MLSS		✓	✓		✓	✓	✓	✓
MCTI	✓	✓	✓	✓	✓			
MMMD		✓	✓			✓	✓	✓
MST						✓	✓	
MFND	✓							✓
MCT				✓				
MHA	✓							✓
MFA	✓							
MLGH	✓		✓	✓		✓	✓	✓
MEWD	✓		✓	✓		✓	✓	✓
MoD	✓		✓	✓		✓	✓	✓

Source: National Chemicals Profile 2004

2.2.2.2. Government Agencies Relevant to POPs Management

Environmental Council of Zambia

ECZ is an autonomous body whose role is to regulate and coordinate environmental management in support of sustainable development in Zambia. The ECZ operates via its Inspectorate through the Pesticides and Toxic Substances (PTS), Water Pollution Control (WPC), Waste Management (WM), and the Air Pollution and Noise Abatement (APNA) (incorporating the National Ozone unit) and Environmental Impact Assessment Units. ECZ is the National Focal Point in matters related to the sound management of chemicals. As the Lead Agency at the national level, ECZ provides the vital technical competence base for information exchange with international, regional, sub-regional, national and local stakeholder institutions.

Ministry of Tourism, Environment and Natural Resources

MTENR is charged with the responsibility of domesticating environmental conventions such as the SC, Basel Convention, Rotterdam Convention and other tourism related global treaties. These include wildlife, forestry, heritage and environmental protection and pollution control. All legislation relating to the management of POPs is enacted through this key ministry.

Ministry of Health

MoH is charged with the responsibility of ensuring policies related to health services are implemented effectively. The Food and Drugs Control Laboratory based in MoH monitors chemicals and drugs including POPs in food. In addition, the Occupational Health Safety and Research Bureau (OHSRB) also under MoH monitor's occupational diseases in workers and carries hazard assessment measurements at the work place. Lastly the National Malaria Control Centre (NMCC) is responsible for promotion of malaria prevention and control.

Ministry of Finance and National Planning

MoFNP formulates government's development financial and fiscal policies relating to sustainable development. MoFNP participates in chemical management through border controls and surveillance undertaken by the Zambia Revenue Authority (ZRA) who monitor and control the importation and exportation of chemicals in conjunction with ECZ to ensure that chemical products are registered prior to importation or exportation.

Ministry of Labour and Social Security

MLSS is responsible for protecting workers against occupational accidents and diseases through the Occupational Safety and Health Services (OSHS) Department to ensure the protection of workers from physical, health and environmental hazards resulting from exposure to chemicals.

Ministry of Agriculture and Co-operatives
MACO, through the Zambia Agricultural Research Institute (ZARI) monitors the presence of POPs in the environment.

Ministry of Mines and Minerals Development
MMMD is concerned with the health and safety of mine workers and persons living in mining areas as well as protection of the environment during the lifespan of the mine and after cessation of active mining. The ministry's responsibilities with respect to chemicals management are similar to those of the OSHS Department (under MLSS), but are applicable only to the mining sector.

Ministry of Science, Technology and Vocational Training
MSTVT deals with post secondary skills and vocational training aspects which include development of specialized curricular related to environmental management which may include POPs. The National Institute for Scientific and Industrial Research (NISIR) under MSTVT undertakes research and development activities in several areas including agriculture, industry, environment and natural resource management.

Ministry of Education
MoE deals with policy relating to education at all levels including pre-school, primary, secondary and tertiary levels. MoE plays a major role in the management of chemicals in the country through the inclusion of environmental aspects in the formal education curricula.

Ministry of Commerce, Trade and Industry
The Ministry through the Zambia Bureau of Standards develops and maintains standards of quality for numerous analytical processes and finished products and maintains statistics on companies operating in the industrial production sector of the Zambian economy.

Ministry of Defense
This Ministry is responsible for all matters relating to security in the nation. This ministry regulates the use of chemicals related to defense and security in Zambia.

Ministry of Foreign Affairs
This Ministry is charged with the responsibility of all international relations for Zambia. In relation to chemicals management, it acts as a conduit for all international multilateral agreements which include those on environment and chemicals management.

Ministry of Local Government and Housing
Through Local Authorities, the Ministry is responsible for waste management and public health service delivery.

ZCCM-IH
In addition to government agencies involved in POPs, ZCCM–Investment Holdings a holding company has on behalf of government taken over some of the environmental liabilities relating to mining industries left over by the now defunct Zambia Consolidated Copper Mines (ZCCM). This includes the disposal of obsolete stocks of PCB containing equipment. These roles are further illustrated in Table 2.5.

Table 2.5: POPs-related Responsibilities of Government Ministries, Agencies and other Institutions

Stage of Life-Cycle Concerned	Importation	Production	Storage	Transportation	Distribution/ Marketing	Use/ Handling	Disposal	Disaster Preparedness
Pesticide POPs/DDT	ECZ	MLGH/MLSS/ECZ/ MACO	ECZ/MoH	ECZ	MoH/ZAA	ECZ/MoH	ECZ	ECZ/MoH
Industrial Chemicals	ECZ	MMMD/ECZ/NCC/ ZBS	ECZ	ECZ	ECZ	ECZ/OHSSD/ OHSRB	ECZ	ECZ/MoH
Dioxins and Furans	-	ECZ/MMMD/MLGH	-	-	-	-	ECZ	ECZ/MLGH/MoH
Stockpiles and Wastes	-	ECZ/MoH/MLGH	ECZ	ECZ	ECZ	ECZ	ECZ	ECZ/MoH

Source: ECZ, 2004 National POPs Inventory

2.2.3. Relevant International Commitments and Obligations

In Zambia, the following national, regional/sub-regional organizations as well as international linkages through which POPs management issues could be addressed exist:

Bamako Convention on the Ban of Import into Africa and the control of the Transboundary Movement and Management of Hazardous Waste within Africa. This is achieved through the promotion and provision of training in sound environmental management of hazardous wastes, technology transfer, information dissemination, research and consulting on the sound management of all hazardous waste among African States.

New Partnership for Africa's Development (NEPAD) is a program of action for the development of the African continent adopted by the assembly of heads of states and governments in Africa. The environmentally sound management of chemicals including POPs is identified as a key issue under the environmental initiative in Chapter 38 of the NEPAD Plan of Action.

Abuja Declaration
Zambia committed herself to the Roll Back Malaria (RBM) principles and strategy in 1999 and in the year 2000 she reaffirmed her commitment to the RBM by becoming a signatory to the Abuja Heads of State Declaration on RBM. Zambia has committed herself to using DDT only for purposes of malaria vector control in order to enable her meet the commitments under the Abuja Declaration.

Stockholm Convention on POPs was adopted in 2001 in response to the urgent need for global action to protect human health and the environment from the adverse effects of POPs. The convention seeks to eliminate or restrict production and use of all intentionally produced POPs. In addition, it also seeks the continued minimization and where possible elimination of all releases of un-intentionally produced POPs. The convention entered into force in 2004 and Zambia became a party in 2006.

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their disposal was adopted in 1989 in response to concerns about toxic waste produced in industrialized countries being dumped in the developing world and in countries with economies in transition. In its initial phases, the convention focused on drawing up controls for transboundary movements of hazardous wastes across international frontiers and the development of criteria for environmentally sound management of the wastes. Recently however, it has emphasized the full implementation of treaty agreements, promotion of environmentally sound management of wastes and minimization of the generation of all such wastes. It entered into force in May, 1992 and Zambia became a party in 1994.

Rotterdam Convention on Prior Informed Consent Procedure for certain Hazardous Chemicals and Pesticides in International Trade. The convention was adopted in 1998 following numerous concerns related to potential risks posed by hazardous chemicals and pesticides. In the 1980's, UNEP and FAO developed voluntary codes of conduct and information exchange systems resulting in the Prior Informed Consent (PIC) procedure introduced in 1989. It entered into force in February, 2004.

Strategic Approach to International Chemicals Management (SAICM)
Zambia has since 2002 been part of the process to bring about a strategic approach to international chemicals management following the Johannesburg World Summit on Sustainable Development where countries committed to ensuring that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health. It is anticipated that the process will be completed by February 2006 at the International Conference on Chemicals Management (ICCM).

Globally Harmonized System for the Classification and Labeling of Chemicals
The Globally Harmonised System (GHS) refers to the development of common methods of classifying and labelling of chemicals. The objective is to promote a common and consistent criterion worldwide for categorising chemicals according to their hazards and communicate this information to users using tools such as labels and safety data sheets. Work on the GHS has been on going since the 1992 World Summit on

Sustainable Development in Rio de Janeiro. The GHS provides a framework for the classification of chemicals according to the hazards they pose to humans and the environment.

CODEX Alimentarius
The Codex Alimentarius Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The following are the purposes of the programme:

- protect health of the consumers
- ensure fair trade practices in the food trade,
- promote coordination of all food standards work undertaken by international governmental and non-governmental organizations

Southern Africa Customs Union (SACU)
This is a body of Customs administrations from some Southern African countries organized to eliminate customs restrictions on goods exchanged between member nations and to establish a uniform tariff policy toward non-member nations. The SACU Agreement, provides for a democratic institutional structure; a dispute settlement mechanism; the requirement to have common policies on industrial development, agriculture, competition, and unfair trade practices. Zambia is not a member of SACU but is directly affected by its operations by virtue of Zambia trading with SACU.

2.2.4 Principles of Existing Legislation and Regulations Relevant to Addressing POPs

The Environmental Protection and Pollution Control Act, Cap 204
This Act provides for the protection of the environment and the control of pollution; to establish the Environmental Council and prescribe the functions and powers of the Council; and to provide for matters connected with or incidental to the foregoing. It is the principle Act that governs sound management of chemicals and hazardous waste.

The Agricultural Lands Act, Cap 187
This Act provides for the establishment of the Agricultural Lands Board; to prescribe the composition and membership thereof; to prescribe its powers and functions; to provide for tenant farming schemes; and to provide for matters incidental to or connected with the foregoing.

The Water Act, Cap 198
This Act provides for the consolidation and amendment of the law in respect of the ownership, control and use of water and for matters incidental thereto or connected therewith

The Mines and Minerals Act, Cap 213
This Act makes provision with respect to prospecting for and mining minerals and matters connected with or incidental to the foregoing.

The Pneumoconiosis Act, Cap 217
This Act makes new provision for the assessment and payment of compensation in connection with pneumoconiosis. It provides for the medical examination and standards of physical fitness to be required of persons exposed or likely to be exposed to the risk of pneumoconiosis and for matters incidental to or connected with the foregoing.

The Plant Pests and Diseases Act, Cap 233
This Act provides for the introduction, eradication and prevention of the spread of plant pests and diseases in Zambia and for matters incidental thereto.

Local Government Act, Cap 281
This Act provides for an integrated three tier local administration system which defines the functions of local authorities, for the repeal of the Local Administration Act and certain related laws; and matters connected with or incidental to the foregoing.

The Town and Country Planning Act, Cap 283
This Act makes provision for the appointment of planning authorities, for the establishment of a Town and Country Planning Tribunal, for the preparation, approval and revocation of development plans, for the control of development and subdivision of land, for the assessment and payment of compensation in respect of planning decisions, for the preparation, approval and revocation or modification of regional plans; and for matters connected with and incidental to the foregoing.

The Public Health Act, Cap 295
This Act provides for the prevention and suppression of diseases and generally to regulate all matters connected with public health in Zambia. This includes aspects pertaining to the use of chemicals for the disease vector control.

The Pharmaceutical Regulatory Act, Cap 299
This Act provides for the control of the profession of pharmacy and the trade in drugs and poisons.

Food and Drugs Act, Cap 303
This Act provides for the protection of the public against health hazards and fraud in the sale and use of food, drugs, cosmetics and medical devices; and for matters incidental thereto or connected therewith.

The Extermination of Mosquitoes Act, Cap 312
This Act prescribes measures for the extermination of mosquitoes and for matters incidental thereto.

Noxious Weeds Act, Cap 231
This Act to provides for the eradication of noxious weeds and matters incidental thereto.

The Standards Act, Cap 416
This Act provides for standards of quality control for certain commodities, for the repeal of the Zambia Bureau of Standards Act and for matters connected with or incidental to the foregoing.

Petroleum Act, Cap 435
This Act makes provision for regulating the importation, conveyance and storage of petroleum and other inflammable oils and liquids and for incidental matters.

The Factories Act, Cap 441
This Act provides for the regulation of the conditions of employment in factories and other places as regards the safety, health and welfare of persons employed therein. It also provides for the safety, examination and inspection of certain plant and machinery and for purposes incidental to or connected with the matters aforesaid.

Tsetse Control Act
This Act makes provision for the control and prevention of the spread of tsetse flies and provides for matters incidental thereto.

The Petroleum (Exploration and Production) Act, Cap 440
This Act provides for the regulation of petroleum exploration, development and production, title to and control of petroleum, establishment of a Petroleum Committee, to definition of the functions and powers of the Committee, regulation of contracts relating to petroleum operations and for matters connected with or incidental to the foregoing in Zambia.

The Agricultural (Fertilizer and Feed) Act
This Act to provides for the regulation and control of the manufacture, processing, importation and sale of agricultural fertilisers and farm feed. It also provides minimum standards of effectiveness and purity of such fertilisers and feed for matters incidental to or connected with the foregoing.

The Electricity Act
This Act provides for the regulation of generation, transmission, distribution and supply of electricity and for matters connected with or incidental to the foregoing.

National Council for Construction Act
This Act provides for the promotion and development of the construction industry in Zambia and regulates the same

2.2.5. Key Approaches and Procedures for POPs Chemical and Pesticide Management including Enforcement and Monitoring Requirements.

Pesticides including POPs in Zambia are regulated under the EPPCA and its subsidiary legislation Statutory Instrument No. 28 of 1997 which provides for the control of production, importation, exportation, transportation, distribution, storage, use and disposal of all pesticides including POPs. Being a party to the Stockholm Convention, the Zambian Government has banned the importation and use of Aldrin, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex and Toxaphene, in addition to restricting DDT and Chlordane use for malaria vector control and termite control in construction respectively.

In September 1997, ECZ initiated a PCB sub-project with financial and technical support from CIDA. Objectives of the sub-project included training ECZ and ZESCO staff in Environmentally Sound Management (ESM) of PCB containing equipment, carrying out an inventory of all PCB containing equipment and to initiating the phasing out of such equipment. ECZ has since included in its management strategy a program to eliminate PCBs from use within the time frames set by SADC and the Stockholm Convention. In 2002, ZCCM Investments Holdings Plc and Copperbelt Energy Company disposed of approximately 152,000 tonnes of capacitors, solids, oil and soil contaminated with PCBs in excess of 50ppm at Ekokem OY incinerator in Finland. The disposal was the first to be undertaken in the country and done in accordance with the requirements of the Basel Convention and the Hazardous Waste Management Regulations, SI No. 125 of 2001.

In 2004, a Committee comprising members from ECZ, NCC and the chemical and construction Industry was set up to coordinate the use of Chlordane in the construction Industry. This Committee resolved to promote the implementation of a *one –supplier – one importer* system similar to the one employed under the DDT management plan.

In view of the foregoing, MSTVT has set up a Bureau to review all technologies currently in use in the country with the view to recommend on Best Available Techniques (BAT) and Best Environmental Practices (BEP) in the context of POPs management among other sectors. It is envisaged that there will be collaboration between this Bureau and ECZ, especially in the EIA process.

There are no specific measures for reducing or eliminating the unintentional production of PCDDs and PCDFs, however guidelines are being developed to minimize the impacts of these emissions arising from rampant open burning of waste under the Waste Management SI No. 71 of 1993 and Air pollution Control Regulations SI No. 141 of 1996.

2.3 Assessment of POPs Issues in Zambia.

The current state of knowledge on POPs in the country is dealt with in this section. The 12 POPs listed in the Annexes of the Convention and the various subject areas addressed in the SC articles, along with inventory information, current technical, management and monitoring capacity, potential impacts and the level of public awareness and concern are also analyzed.

2.3.1. Assessment for Pesticides POPs.

In Zambia, Pesticides POPs were in use until the mid 1980's primarily for the control of pests in agriculture and construction. The chemicals used included Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor and Toxaphene. There are no records of past use of Mirex in Zambia. DDT, Dieldrin and Aldrin were formulated locally for termite control by private companies such as Coopers (Z) Limited and Shell Chemicals which are no longer in operation. The rest of the Pesticide POPs were imported primarily from the Middle East and Europe.

Prior to the mid-1980s, it was estimated that Zambia was using about 160 metric tones of Pesticides POPs annually as shown in **Figure 2.2**

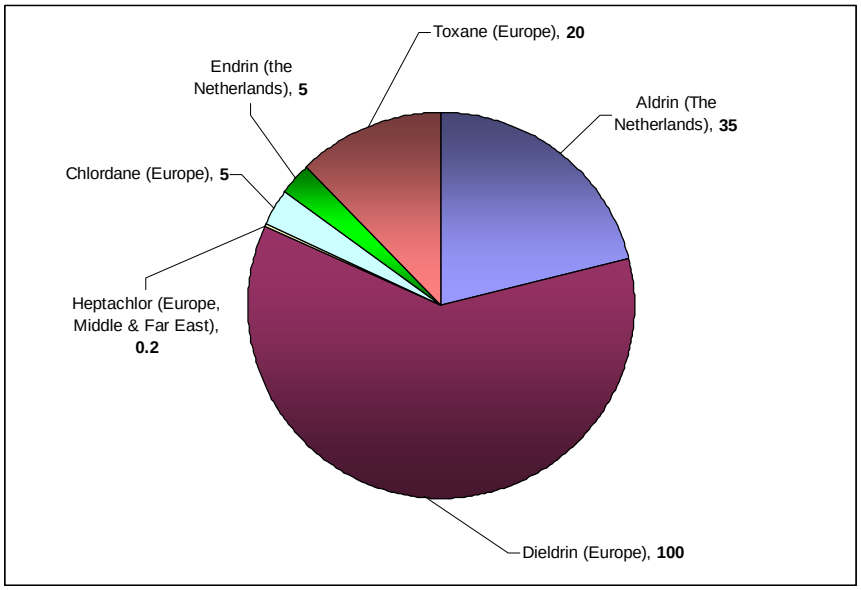

Figure 2.2. Estimated use of Pesticides POPs (metric tones) in the mid 1980s and their origins
Source: Zambia Agrochemical Association

The inventory revealed that Dieldrin was consumed the most followed by aldrin, chlordane and endrin in that order. Most of the products were used in crop protection against soil inhabiting insects such as termites, grubs and stalk borers and in the construction industry, against termites. Dieldrin was also used for the control of Tsetse flies and locusts. The major crops on which some of these POPs Pesticides were applied included maize, sugar cane, wheat, coffee, cotton, soya beans, citrus and plantations. Toxaphene was used for tick control while DDT was considered as one of the most effective pesticides in both the agriculture and construction sectors.

Prior to 1997, there were 338.2 metric tons of obsolete stocks of pesticide POPs located at the Zambia Institute of Animal Health (ZIAH) in Mazabuka and Zambia Cooperative Federation (ZCF) in Lusaka. These stocks were exported to the United Kingdom for incineration in 1997

POPs USE IN THE CONSTRUCTION SECTOR

The construction industry has various levels of '*use*' of construction POPs through pesticides commonly referred to as anti-termite treatment. The first level of use is by architectural or engineering consultants who only specify the use of anti-termite but do not necessarily specify the brand or particular chemical. At this level, knowledge of the chemical is not necessary as long as the activity has been specified. Further, little or no attention is given to the type of chemical use, therefore, the likelihood of perpetuating the use of POPs is very high.

The second level is that of Quantity Surveyors who measure the amount or quantity of construction materials required and their cost from the architect's or engineer's specification. At this stage, some quantity surveyors are aware of the brand name of the chemical, the cost, and the quantities required especially when they are a contractor's quantity surveyor. Contractors purchase, store and handle the chemicals used during construction, hence have more knowledge of specific chemicals than the other construction fields. Consequently, suppliers fall under this category. Most suppliers of construction material stock chlordane based anti-termite treatment chemicals.

with funding from FAO/GTZ. At the time of the inventory, no obsolete stocks of Pesticides POPs were found in the country.

The inventory further revealed that out of the Pesticide POPs of concern, only Chlordane was still being used in the construction industry for treatment of foundations, the protection of wooden fencing poles and construction materials. Additionally, Chlordane was being used for clearing of anthills in pasture lands and golf courses. Several trade names are used for Chlordane such as Antkil, Termidan, Termicide, Chlordasol and Kontakil. These formulations usually contain about 30% to 60% Chlordane. In Zambia, chlordane has been imported by agrochemical companies, through crop protection tenders for specific projects such as control of locusts and tsetse flies.

In relation to storage, it was found that small scale farmers do not have proper storage facilities, in some instances, chemicals were kept away from children by storing them on rooftops while others store them in separate lockable rooms. Most commercial farmers and agrochemical distributors have modern structures with concrete floors, lockable doors, sufficient ventilation, lighting, and are located away from water catchments areas. Lastly, the construction industry generally has storage facilities which have concrete floors, are well ventilated, secure, and have sufficient lighting.

The inventory also found that alternatives to chlordane such as other chemicals, traditional and natural alternatives were in use in the country. The chemicals that farmers use as alternatives to chlordane for control of termites are presented in the table 2.6:

Table 2.6. Chemical alternative to chlordane

Trade Name	Active Ingredient	Cost Rating by Users	Effectiveness
Chlorpyrifos	Chlorprifos	Affordable/expensive	Limited residual
Termik	Aldicab	Expensive	Ineffective against termites
Carbofuran	Carbofuran	Expensive	Ineffective against termites
Superguard	Pirimiphos methyl & Permethrin	Affordable	Not effective on soil pests
Confidor	Imidacloprid	Expensive	Effective
Aldicarb	Aldicarb	Expensive	Effective limited residue
Gaucho	Imidacloprid	Expensive	Effective limited residue
Cruiser	Thiamexothan	Expensive	Effective limited residue
Actara	Thiamexothan	Expensive	Effective limited residue
Regent	Fripanol	Expensive	Effective
Parathion	Parathion	Inexpensive	Ineffective and hazardous

Source: ECZ, 2004 National Pesticide POPs Inventory.

As can be seen from table 2.6 above, most of these chemicals were said to be expensive and have short residual effect lasting from four to six weeks except for confidor which is relatively more effective than the others against termites and is more expensive. In the construction sector however, the identified alternatives were Chlorphyrifos and Regent (*Fripanol*) with the latter being considered more effective though exceedingly expensive.

Traditional methods are classified as farm practices aimed at reducing the incidence of pest damage through the following practices:

- Stalking of maize in field: Farmers cut the maize stalks with cobs just before harvesting and heap them in the upright position in the field to dry. This reduces the amount of maize exposed to termites.
- Cutting of leaves and laying them in the field: The leaves are cut and laid on the ground in the field thereby providing alternative food to termites.
- Winter ploughing: The principle behind winter ploughing method is that since termite nests are made during

winter, ploughing at this time disturbs the nests thereby reducing the termite populations.

These practices also include the use of an ant-guard, a metal strip laid along the edges of the concrete slab underneath the external walls. Another form of ant-guard is where the concrete slab is extended a few centimetres beyond the foundation walls and a groove is created on the underside to prevent access of ants or termites to the walls of a building.

Lastly, natural methods used for termite control are extracts from *Tephrosia vogellii* leaves and wood ash. This is done by *Tephrosia vogellii* leaves crushed and soaked in water and the extract applied to the affected area. There are no standard methods such as quantities of leaves, amount of water and duration of soaking in water. Wood ash is sprinkled on termite moulds thereby disturbing communication among termites. Most of these alternatives have not been evaluated to determine their efficiency against termites. However, the cost-benefit ratio has not been determined. It is therefore difficult to recommend them as alternatives to termite control as there were merely mentioned by the farmers.

Disposal of pesticide containers was being done using the following methods:

- Crushing and burying of used containers
- Burning of plastics and paper packaging
- Throwing containers in pit latrines
- Leaving containers unattended or thrown away in shallow pits

In the construction sector, empty containers were usually transported to dumping sites with the debris that accumulates during the construction process.

There is currently no production of Pesticide POPs in Zambia. All the Chlordane used in the country comes through importation. There are currently no other suitable, cost effective alternatives for the control of termites other than the use of chlordane, therefore, it will continue to be used in future until suitable alternatives are developed.

Priority concerns for POPs Pesticide in Zambia

The following issues ranked in order of priority were identified in the management of POPs Pesticides in Zambia:

1. Include the ban of POPs Pesticides except chlordane in legislation.
2. Develop monitoring mechanisms for the use and distribution of chlordane.
3. Evaluate the impact of chlordane on the environment through pesticide residue analysis.
4. Create a database on the use and distribution of chlordane from source to end-user.
5. Educate the public on the dangers, effects and handling of POPs pesticides.
6. Build capacity of stakeholders such as enforcement agents, distributors, users, customs officers and the general public through training.
7. Develop an appropriate system for licensing and distribution of chlordane.
8. Identification of alternatives to POPs pesticides and determination of their efficacy /cost benefits.

2.3.2. Assessment of PCBs

PCBs have been produced on an industrial scale for more than fifty years and were commonly used as dielectric fluids in transformers and capacitors, in heat transfer and hydraulic systems, and as ink solvents in carbonless copy paper. Other uses of PCBs included the formulation of lubricating and cutting oils as plasticizers in paints, in adhesives, in sealants, as flame retardants and in plastics. Countries that have manufactured PCBs include Austria, China, Czechoslovakia, France, Germany, Italy, Japan, Russia, Spain, the United States of America and the United Kingdom. Zambia like most developing countries has not produced PCBs, but has since the 1930's imported PCB containing equipment.

Currently, there are 15, 262 transformers and 1, 642 capacitors country wide, mostly owned by the electrical utilities and mining companies. 57 tonnes of PCB contaminated soils and 2, 700 litres of PCB oil is stored in drums at Kariba North Bank and ZCCM-IH. There are 76 transformers known to contain PCBs also stored at Kariba North Bank and Konkola Copper Mines. Table 2.7 shows the usage of PCB containing equipment in Zambia by sector.

Table 2.7: Usage of PCB containing equipment in Zambia by sector

SECTOR	USAGE
Mining Industries	Transformers, Capacitors, Circuit Breakers, Hydraulic Equipment
Electrical Utilities (like ZESCO, CEC, Lunsemfwa, Kariba North Bank)	Transformers, Large Capacitors, Small Capacitors, Circuit Breakers, Voltage Regulators, Lighting Ballasts.
Manufacturing Industries (Textiles Industries)	Transformers, Small Capacitors, Circuit Breakers, Voltage Regulators, Lighting Ballasts.
Residential and Commercial Buildings (including Hospitals, Schools, Households	Small Capacitors in washing machines, Circuit Breakers, Lighting Ballasts, Power Supply Units.
Water Utilities	Transformers, Small Capacitors, Circuit Breakers, Voltage Regulators
Agricultural industry (Mpongwe D Company, Nakambala Sugar Estate etc)	Transformers, capacitors

The storage of PCB containing equipment is in accordance with the HW Management and PTS regulations which include requirements for their proper storage. Currently there are two storage facilities which are owned and operated by Zesco. Other secure storage sites exist in various companies such as the Hazardous Waste Interim Storage Shed at Kalulushi where 184 UN approved drums containing 57 tonnes of PCBs contaminated soils are kept. Figure 2.3 shows areas suspected to be contaminated by PCBs.

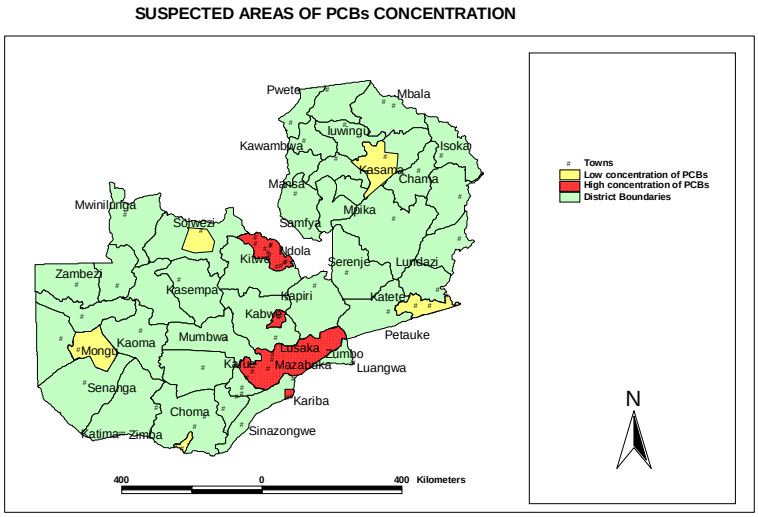

Figure 2.3: Areas suspected to be contaminated by PCBs

In 2002, ZCCM IH and Copperbelt Energy Company (CEC) disposed approximately 152,000 tonnes of capacitors, solids, oil and soil contaminated with PCBs (in excess of 50ppm) at Ekokem OY incinerator in Finland. Phase 2 of the PCBs Removal Project on the Copperbelt by ZCCM IH Plc will involve the excavation of PCBs contaminated soils and concrete above the threshold of 50ppm at the former PCB capacitor room and from the grounds of Orion Substation at Kabwe. The PCB contaminated soils and waste materials will be transported by road to Durban, South Africa and from there by sea to Riihimaki, Finland. This process has already been initiated and approved by ECZ.

To ensure sound management of PCBs in Zambia, issues identified in order of priority were to;

1. Develop facilities for interim storage of PCB and PCB containing equipment;
2. Identify sites contaminated with PCBs and establish a scheme for control, monitoring and management of PCBs;
3. Develop awareness raising programme on PCBs;
4. Establish clean up and remediation schemes for contaminated sites;
5. Promote research and development in PCB dangers and alternative technologies to PCB use;
6. Provide incentives on use of alternative technologies to PCBs use;
7. Complete the PCB inventory to cover all the companies;
8. Strengthen regional and international co-operation;
9. Enhance generation, collection and dissemination of information;
10. Strengthen institutional capacity to handle PCBs; and lastly
11. Strengthen existing legislation and enforcement capacities.

2.3.3. Assessment of DDT

The use of DDT in Zambia dates back to the 1940s, where it was used in controlling pests in crops such as cotton and vegetables, eradicating termites and for malaria vector control. The usage of DDT like other POPs was discontinued due to international pressure advocating its ban for agricultural purposes in the 1980's. It was however, re-introduced in Zambia in 2000 specifically for the malaria vector control programme coordinated by the Ministry of Health (MoH) and other cooperating partners as a result of the increase in malaria cases.

Available data shows that during the period 2000-2006, more than 29,600kg of DDT was used for Indoor Residual Spraying (IRS) for malaria control in selected areas of Lusaka, Livingstone, Kabwe, Ndola, Chingola, Kalulushi and Kitwe districts. DDT is not locally available in Zambia, but is imported from South Africa.

Currently, the only users of DDT are Konkola Copper Mines (KCM), Chambeshi Plc, Bwanamkubwa Mining Ltd and selected District Health Boards.The importation of DDT and its use is regulated under the EPPCA by ECZ who monitor DDT from the point of entry into the country to its final disposal. The National Malaria Control Centre (NMCC) submits returns on quantities used to ECZ. In addition, ECZ also conducts random checks on all agrochemical dealers for the presence of DDT. MoH is the only institution authorized to import and distribute DDT through the NMCC. It also has the responsibility to train and supervise all users to ensure that all required environmental safeguards are in place thereby avoiding its release into the environment. Figure 2.4 shows distribution of DDT in Zambia in 2004.

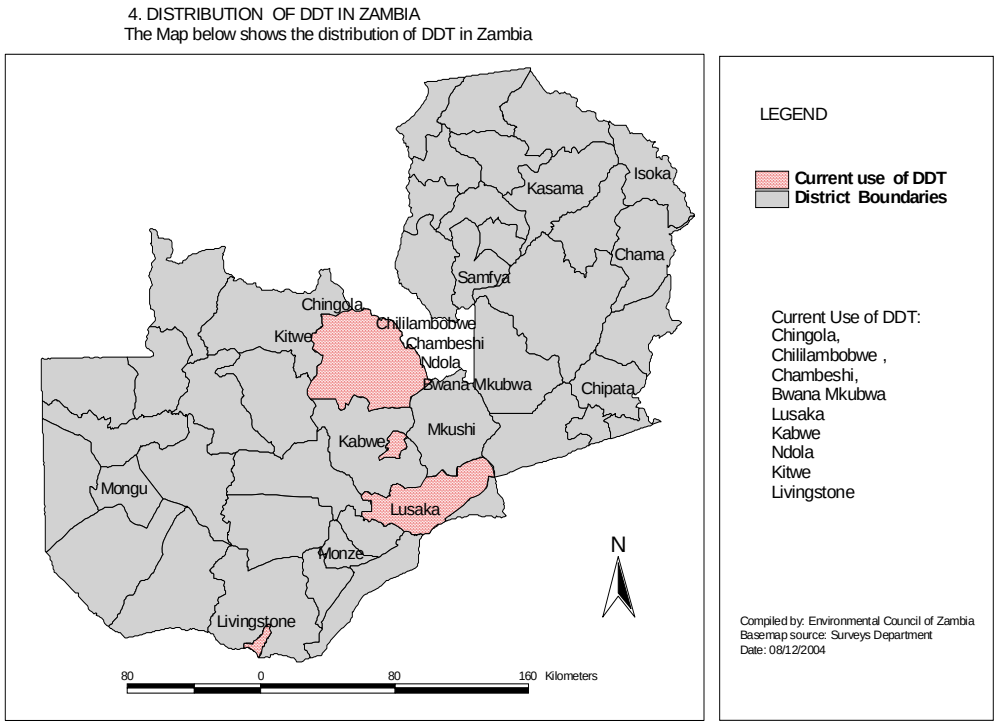

Figure 2.4: Distribution of DDT in Zambia as at 2004

DDT USAGE IN "ROLL BACK MALARIA PROGRAMME"

The reintroduction of DDT for IRS in malaria vector control coordinated by MoH is as a result of the increase in malaria cases. Zambia committed herself to the Roll Back Malaria (RBM) principles and strategy in 1999 and in 2000, reaffirmed her commitment to the RBM by becoming a signatory to the Abuja Declaration on RBM.

For DDT to be imported into the country, the potential user requires approval from MoH. A license to import DDT into the country is issued by ECZ. The procurement and use of DDT is regulated under the EPPCA Cap 204 of the laws of Zambia. The company required to comply with the EPPCA and its subsidiary legislation as regards transportation and distribution of DDT.

The available data on DDT usage in Zambia from 2000 to 2004 shows that a total of 25,726 kg of DDT was used for IRS in malaria vector control in selected areas of Ndola, Kitwe, Chililabombwe, Chingola, Chambeshi, Livingstone, Kabwe and Lusaka districts. The spraying of DDT was used together with other intervention measures under the Integrated Vector Control Management Strategy. Within these districts, over 45,000 (approximately 20% of the total number of households) un-plastered households were sprayed. However, this figure does not include structures covered under the KCM and Chambishi Metals Plc IRS programmes.

A total of **29,615kg** of DDT was used by both MoH and the mining companies for IRS. About 11,055kg of DDT was to be procured by MoH for the 2004/05 malaria transmission period. 7,500 kg DDT is planned to be procured for next transmission season (2005/6) and 56,280 kg of DDT planned for 2006/7 transmission season.

Disposal
DDT is packed in plastic sachets, once the content is used the resulting packaging material becomes an environmental challenge as regards disposal. This is exacerbated by the lack of sound disposal facilities in the country. Currently all empty sachets are stored pending appropriate disposal in accordance with the Hazardous Waste (HW) Management Regulations SI No 125 of 2001. In 2004 only 8 districts were using DDT. Projection indicates that by the end of 2006, this number will rise to fifteen (15) districts. It is therefore envisaged that there will be a corresponding increase in waste generated, thus resulting in stockpiles.

Alternatives
Currently both chemical and non chemical alternatives are being employed as alternatives to the use of DDT. The chemical options being used are Organo-phosphates, Carbamates and Pyrethroids. Additionally, environmental management and biological control methods are being used as non-chemical options.

Priority Issues
To ensure sound management of DDT in Zambia, issues identified in order of priority were to;:

1. Identify alternatives and determine their efficacy and cost effectiveness.
2. Manage stockpiles and waste disposal for purposes of strengthening supervision of DDT usage and development of a database on DDT procurement and use.
3. Domesticate the SC and development of guidelines for handling, monitoring and evaluation of DDT.
4. Evaluate the persistence of DDT in different matrices including soil, water, food, breast milk.
5. Conduct cohort studies in areas where DDT is being used.
6. Strengthen the monitoring and auditing capacity of ECZ.
7. Review the minimum residue level requirements of DDT in food.
8. Investigate the capacity to handle DDT contaminated areas.

2.3.4. Assessment for PCDDs and PCDFs

Polychlorodibenzo-p-dioxins (PCDDs) commonly called Dioxins and Polychlorodibenzofurans (PCDFs), which are commonly referred to as Furans are formed as unintentional by-products in a wide range of processes. They are widely dispersed in the environment and may be present in raw materials or products. A summary of releases of Dioxins and Furans by environmental media (e.g. air, land, water and amounts released in residues and products) is shown in Table 2.8.

The 2004 inventory identifies several data gaps and gives estimates based on data obtained from Zambia's core economic and domestic activities. Releases from the ten main categories were identified, namely; waste incineration, ferrous and non-ferrous metal production, power generation and heating, production of mineral products, transportation, uncontrolled combustion processes, production of chemicals and consumer goods, miscellaneous, disposals/landfills and hot spots.

Table 2.8: Dioxins and Furans annual release

Source Categories	Annual Releases (g TEQ/a)				
	Air	Water	Land	Product	Residue
Waste Incineration	29.6	0.0	0.0	0.0	0.2
Ferrous and Non-Ferrous Metal Production	9.1	0.0	0.0	0.0	26.1
Power Generation and Heating	8.6	0.0	0.0	0.0	0.0
Production of Mineral Products	0.9	0.0	0.0	0.0	0.2
Transportation	0.2	0.0	0.0	0.0	0.0
Uncontrolled Combustion Processes	241.3	0.0	48.4	0.0	83.6
Production of Chemicals and Consumer Goods	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0
Disposal/Landfills	0.0	0.0	0.0	0.0	34.9
Identification of Potential Hot-Spots					
Total	**289.7**	**0.0**	**48.4**	**0.0**	**144.9**

The **major** source of Dioxins and Furans is uncontrolled combustion processes whose principle release vector is air (243.1 g TEQ/a), followed by the amount left in residue (83.6 g TEQ/a) and the amount released to land (48.4 g TEQ/a). Waste incineration whose principle sink is air at 29.6 g TEQ/a is another source. Other major emitters to residue are disposal/ land filling emitting 34.9 g TEQ/a as shown in Table 2.8. These results are based on estimates from the UNEP Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases.

There are currently no guidelines specific to Dioxins and Furans emission reduction in Zambia, though the EPPCA provides for monitoring of air pollutants on a general basis. The process of developing the same, has however, been initiated. It is envisaged that these guidelines will be transposed into legislation in future.

Projected Trends of PCDDs and PCDFs Releases

The population of Zambia according to the Central Statistical Office (CSO) Census of Population and Housing for the year 2000[1] was estimated at 10.76 million inhabitants. The total PCDD/PCDF release estimates from the 2004 base inventory for Zambia was 290 g TEQ/a to air and a grand total of 483 g TEQ/a to all vectors i.e. air, water, land and residue. This implies that the per capita contribution in terms of PCDD/PCDF releases was 29 μg TEQ/a to air and 49 μg TEQ/a to the total emissions. In 2000, population growth rate was projected at 2.9 % (CSO, 2000). Assuming a linear relationship between activities emitting PCDDs/PCDFs and the annual population growth rate, the annual PCDD/PCDF release will be expected to increase by approximately 8.3 g TEQ to air and 14 g TEQ to the total releases to all vectors. It is anticipated that new sources will also emerge.

Priorities include:

To ensure sound management of Dioxins and Furans PCBs in Zambia, issues identified in order of priority were to;

1. Set up educational, monitoring and enforcement guidelines;
2. Implement a measurement monitoring programme to enforce set minimum emission levels.
3. Measure data generation and put in place appropriate infrastructure and equipment.
4. Implement policy changes so that guidelines are transposed into legislation.

2.3.5 Existing Policy and Regulatory Framework, Summary of Available Monitoring Data (environment, food, humans) and Heath Impacts

Existing Policy to Address POPs in Zambia

Zambia has a general National Policy on Environment (NPE) which addresses environmental issues generally. The NPE addresses broad environmental issues and does not specifically discuss issues relating to POPs. Taking into consideration that POPs issues are cross cutting, it is envisaged that they will be covered under broad areas of air pollution, water pollution and land degradation.

Existing Regulatory Framework to Address POPs in Zambia

The EPPCA regulates chemical management, protection of human health and the environment. It contains regulations on importation, distribution, use, and disposal of pesticides including other types of wastes.

In Zambia POPs issues are dealt with under general regulations.

- The PTS regulations of 1994 of the EPPCA provide for the registration, labeling, packaging, handling, use, storage and disposal of chemicals.

[1] Source: Zambian Central Statistical Office {© Census of Population and Housing 2000}

- The HW Management Regulations of 2001 provide for the appropriate storage and disposal of wastes which include POPs stockpiles (DDT and PCBs), Health Care waste (incineration specifications) and rehabilitation of contaminated sites.
- The Air pollution regulations provide specifications for incinerators which touch upon dioxins and furans.

Issues related to POPs are regulated within these broad regulations however there is need to amend these regulations to deal with POPs issues specifically.

Summary of Available Monitoring Data (Environment, Food and Humans) and Health Impacts

In Zambia, there is no data pertaining to monitoring of POPs in the environment, food and humans. In addition, although several health defects with symptoms similar to POPs exposure have been recorded in the country, none have been confirmed scientifically or otherwise. Additionally, no studies to ascertain the level of bio-concentration and bioaccumulation of POPs in humans and the environment have been done.

Current Level of Information, Awareness and Education Amongst Target Groups

From observations made during site visits, it is apparent that levels of awareness on POPs issues in the target groups are low. The lack of awareness and training in pesticide use and management among Farmers has been noted. There are ongoing efforts to raise awareness of POPs issues by the ECZ, who have done the following:

- training for media practitioners on POPs related issues
- A high level sensitization workshops for policy makers
- Production and dissemination of sensitization brochures on PCBs
- Production and dissemination of posters on the four broad thematic categories of POPs
- Community sensitization plays on pesticide management.
- Produced and aired on national television a Video on POPs management.
- Produced and aired on national radio a series of programs dealing with different aspects of POPs management.

Other stakeholders dealing with POPs related issues also have their own programs aimed at sensitizing specific target groups on the dangers that POPs pose to human health and the environment.

Mechanism for Information Exchange with other Parties to the SC

ECZ is the official focal point to the SC, it therefore acts as a conduit through which information is exchanged with the Convention Secretariat and other parties to the Convention. As a party to the SC Zambia, through ECZ is obliged to report back to the Secretariat on various aspects of implementation of the convention by completing and submitting information requirements from the Secretariat. This is done through a wide stakeholder consultative process.

2.3.6 Information on State of knowledge on Stockpiles, Contaminated Sites and Wastes, identification, likely numbers, relevant regulations, guidance, remediation measures, data on releases from sites

At the time of preparation of this NIP, available documented POPs contaminated sites in Zambia relate to only two POPs; PCBs and DDT.

PCBs Contaminated Sites

Evidence adduced from inventory findings indicate that the following sites are PCB contaminated:

1. Kitwe ZESCO storage site at the main substation
2. Lusaka ZESCO transformer workshop and storage shed.
3. Konkola Copper Mining Company (KCM) - Nkana mine
4. KCM -Mufulira storage shed.
5. Orion Mining Company's site in Kabwe
6. Contaminated soil waste packed in UN approved drums at Kalulushi storage site.

The number of identified PCB contaminated sites currently stands at six (6) as listed above.

Stockpiles arising from DDT usage

Although exact quantities of DDT waste are not currently available, it is evident that there are substantial stockpiles of used sachets and other waste located in the various districts where it is being used. It is envisaged that they will be transported to a central storage facility in accordance with the HW Management Regulations on the transportation and storage of hazardous waste. These quantities are expected to increase with the projected scale up of IRS activities as indicated by the MoH.

Zambia does not have the capacity to handle the disposal of both the PCBs and DDT wastes in country, therefore, they will be transported to another country for final appropriate disposal in accordance with the requirements of the Basel Convention on the transboundary movement of hazardous waste.

2.3.7 Relevant Activities of Non-governmental Stakeholders

Relevant non-governmental stakeholders are drawn from employers' organizations, workers representative organizations and environmental watchdog organizations. Some of the key ones and their activities are as follows:

Zambia National Farmers Union (ZNFU)

Its members use quite a variety of agro-chemicals in their operations and therefore are an important stakeholder in the implementation of the NIP. It is very clear that the implementation process does involve them right from the beginning and will go a long way in imparting the necessary knowledge to most users of the agro-chemicals thereby reducing the risk of poisoning and exposure to these dangerous chemicals.

Wildlife Conservation Society of Zambia (WCSZ)

WCSZ was founded in 1953 and is the oldest and most established wildlife and environmental NGO in Zambia. The Society runs amongst others the famous Chongololo and Conservation Clubs, providing environmental awareness to school going children all over Zambia. The Society's overall objectives are to create a strong lobbying and consultative presence that will make meaningful progress with achieving sensible and sustainable environmental policies.

Citizens for Better Environment (CBE)

Citizens for Better Environment are an environmental pressure group based on the Copperbelt; they are involved in advocacy work advocate for environmental rights of communities. CBE has addressed issues of PCBs especially on the Copperbelt.

Zambia Congress of Trade Unions (ZCTU)

The ZCTU was established in 1965 and it is the most dominant and most representative trade union federation in Zambia. The ZCTU represents 29 national unions. The main goal of the ZCTU is to protect and safe guard workers rights and interests and to foster the principles that work should take place in a safe and healthy working environment and that conditions of work should be consistent with workers wellbeing and human dignity. Therefore Occupational Health and safety programmes are a major component of the ZCTU agenda their participation in the NIPs implementation will help in the realization of its goals in as far as occupational health and safety is concerned with special emphasis on chemicals and POPs in particular.

Women for Change

The existence of Women for Change as a Zambian NGO is based on the principle of non-partisan collaboration with civic, political and other organizations on matters concerning the development of rural communities. One of its main objectives is to advocate for policies and practices that are gender sensitive, just and effectively respond to the plight of the vulnerable in society.

Christian Children for Zambia (CCFZ)

CCFZ is a non-governmental organization dedicated to improving the lives of children. This organization supports vocational training, literacy training, food distribution, educational programs, early childhood development, health and immunization programs, nutritional programs, water and sanitation development, and emergency relief, safeguarding children in both manmade and natural disasters. CCFZ works for the well-being of children by supporting locally led initiatives that strengthen families and communities, helping them overcome poverty and protect the rights of their children.

2.3.5.3. Overview of Technical Infrastructure for POPs Assessment, Analysis, Management, Research and Development

The major laboratories with capacity to undertake chemical analyses for various substances are found in government institutions, such as the Food and Drugs Control Laboratory, the Geological Survey Department Laboratory and the Medical Stores Laboratory, universities, research institutes and industry.

The Food and Drugs Control Laboratory was established to help in the enforcement of the Food and Drugs Act. The laboratories in learning institutions are for research and teaching purposes. The laboratories set up by the copper mining conglomerates on the Copperbelt were established for metallurgical process quality monitoring. When environmental law was enacted they incorporated pollution monitoring and control. CEC and ZESCO have equipment and kits for detecting PCBs in soil, and oil samples.

Available laboratories utilise international standards, especially the ISO 9002 for quality assurance purposes. SADC-ELMS, through the Swedish University of Agriculture, has developed a Draft manual, entitled "Environmental Monitoring of Pesticides in the SADC Region" which is in use in some laboratories. A listing of some laboratories and their capacity is given in Annex 10.

2.3.5.4. Overview of Government Information Systems/ Computer Capabilities

The principal government department responsible for management of information is the Central Statistical Office (CSO). The range of data includes census, production in the various sectors of the economy and exports/imports. Other government departments have their own systems for processing and storage of data. These are situated in the planning units of respective ministries. ECZ also collects specific information on environmental trends.

2.3.5.5. Overview of Technical Training and Education Programmes

Learning institutions provide certificates and diplomas for undergraduate courses in natural sciences. The courses provide the necessary basic understanding of environmental issues, and are helpful in preparing individuals for challenging positions in the field of chemicals management. Specific courses such as environmental studies and engineering have been introduced recently.

The CHC/GHS project undertaken during the period 2001-2003, in Zambia, opened the opportunity for the sector working groups to identify training needs, available and existing institutions in key areas where capacity building activities in chemical hazard communication and management could be established.

The National Situation Analysis on the state and levels of CHC understanding by consumers; workers in the agriculture, industrial production and transport sectors as well as the general public revealed the presence of very wide gaps in the levels of knowledge and understanding of CHC in all sectors. Overall, the general results of the Comprehensibility Testing (CT) carried out over all four sectors showed that the levels of CHC understanding were very low.

The success of the project can be gauged from the number of positive outcomes of the CHC project, which include, among others:

- worker training programmes have been initiated at three industrial facilities using comprehensibility testing tools from the project

- as a result of the awareness raising efforts associated with the project, two products were removed from the market because of improper labelling, and
- as part of the project, Customs Clearance Department officers and ECZ officers have been trained to enhance capacity in the enforcement of labelling requirements in effect in Zambia at border points.

One of many significant and poignant expectations from the project is the development of an Emergency Response System for the Transport sector, approved for funding by the Environmental Support Programme of the World Bank.

Identification of impacted populations or environments, estimated scale and magnitude of threats to public health and environmental quality

Data on residues of pesticides in food is not readily available for the Zambian situation. There has been no baseline data collection undertaken for the presence of POPs in the environment and human populations. However, information from the 2004 inventory reports for all four POPs thematic areas shows that some areas are vulnerable to exposure owing to the presence of POPs related activities. The Copperbelt Province has a higher risk due to the IRS campaign by the Ministry of Health which predominantly uses DDT as the insecticide of choice. Within this province, women and children are further exposed since they are the ones who spend more time in the homes which are sprayed. The presence of PCB containing equipment in the mines and electricity utility companies pose a threat to the environment and human populations in the province.

Chlordane is currently being used in the construction industry thereby posing a threat to the handlers and possibility of it being mis-used for agricultural purposes is high therefore a wider population is threatened. Dioxins and furans have been observed to result mainly from uncontrolled burning of waste exposing a wider population to their effects. Women and children are more vulnerable as they are usually engaged in activities that have an aspect of open air burning, e.g. cooking on firewood, scavenging at dumpsites etc.

In general human populations along the line of rail are more vulnerable to the effects of POPs owing to the increased level of economic activity. The environment however, can not be compartmentalized because POPs by nature are ubiquitous and are transported over long distances implying that a wider geographical area would be affected by their bio-accumulation and bio-accumulation.

Details of Relevant Systems on Assessment and Listing of New Chemicals

The ECZ through the PTS Regulations is responsible for the registration and listing of new chemicals in Zambia. This is achieved by thoroughly reviewing all applications for importation and registration of new chemicals and where need arises, wide stakeholder consultation. In addition, the lists of chemicals from the Secretariat of the Rotterdam Convention that require “Prior Informed Consent” are used as a guide in the registration of new chemicals.

To ensure that no banned or restricted chemicals come into the country, ECZ has put in place stringent monitoring mechanisms such as border controls, random inspections on chemical distribution outlets and farms. In the event of non-compliance, measures such as levying of penalties, prosecution and revocation of licences are imposed on the offender to deter future non-compliances.

3. STRATEGY AND ACTION PLAN ELEMENTS.

3.1. Policy Statement.

Zambia is committed to the protection of human health and the environment from harmful impacts of dangerous chemicals such as POPs. This is evidenced from provisions made in the 'Vision 2030', in which the country has articulated her commitment to long-term goals in the area of economic development vis-à-vis environmental sustainability. To operationalise the vision, the Fifth National Development Plan (FNDP) has been formulated for the period 2006-2010 under the theme *Broad Based Wealth and Job Creation through Citizenry Participation and Technological Advancement.*

Recognising the importance of preserving the environment and the welfare of the Zambian people, Government signed the Stockholm Convention in 2001 and became a Party in 2006. Consequently, Government through ECZ and its stakeholders has spearheaded the sound management of POPs. POPs of concern in the country are; DDT, Chlordane, PCBs, Dioxins and Furans. Mechanisms and strategies have been proposed through the NIP to abate and minimize effects of POPs on human health and the environment. This is in line with the National Policy on Environment (NPE) whose objective is to support Government's development priority to eradicate poverty and improve the quality of life of the people of Zambia. Further, this will provide for the welfare of the nation's environment so that socio-economic development can be achieved effectively without damaging the integrity of the environment.

Therefore, the NIP for the management of POPs is in compliance with national policies, development plans as well as the overall vision of the country in reducing poverty and improving the quality of life for the people. The following are policy pronouncements on the NIP to facilitate review, amendment and eventual adoption and approval by stakeholders and the Government of the Republic of Zambia:

Recognising the risks posed by POPs to human health and the environment, the Zambian Government commits itself to progressive reduction in usage and eventual elimination of all stocks of PCBs, DDT, Chlordane and minimising exposure of the Zambian people to unintentionally produced dioxins and furans.

The underlying principles will include strategies and activities for the management of POPs based on a risk assessment approach justified by internationally accepted risk factors.

Raising awareness will be achieved through public education and communication of POPs related issues to all stakeholders and the public.

Integrating POPs management strategies with other existing strategies on hazardous waste and national solid waste strategies will be done to achieve a harmonised approach to environmental management.

Continuous participation in all international efforts to meet obligations of the SC will be adhered to with its respective commitments.

3.2. Implementation Strategy.

In order to ensure a coherent approach to chemical management at all levels, State Parties in cooperation with other stakeholders, developed the Strategic Approach to International Chemicals Management (SAICM), which was adopted at the International Conference on Chemicals Management (ICCM) in February 2006 in Dubai. Paragraph 23 of the SAICM Overarching Policy Strategy provides for an integrated approach to managing chemicals, where each government should establish arrangements for implementing the strategic approach on an inter-ministerial basis. To facilitate communication both at national and international levels, each government is required to appoint a National Focal Point to act as an effective conduit for communication on strategic approach matters. SAICM will therefore combine the synergies of the Basel, Rotterdam, Stockholm and Vienna Conventions.

It is therefore envisaged that the NIP for Zambia will be implemented through a multi stakeholder approach where ECZ will continue to act as the National Focal Point for the SC. An inter-ministerial Coordinating Committee will be set up to coordinate the implementation of the NIP. This committee will comprise of relevant ministries involved in POPs management such as agriculture, environment, health, industry and labour. In addition, civil society and public interest groups will be integrated into this framework. The outlined institutional and legal framework will facilitate implementation of the NIP through responsible ministries and agencies as provided for in the Action Plans.

The Inter-ministerial Coordinating Committee will be responsible for the NIP review, reporting to the SC secretariat on the uses of DDT and Chlordane and evaluation of the NIP implementation activities.

3.3. Strategies and Action Plans.

This section discusses the Action Plans developed for the implementation of the NIP in Zambia with specific resource allocation for each aspect. The detailed costing and time frame for each plan are tabulated in Annex 1.

3.3.1. Action Plan: Institutional and Regulatory Strengthening Measures

According to paragraph 1(a) of Article 3 of the SC, each State Party shall prohibit and/or take legal and administrative measures necessary to eliminate the:

(i) production and use of chemicals listed in Annex A subject to the provisions of that Annex;
(ii) import and export of chemicals listed in Annex A in accordance with the provisions of paragraph 2. Paragraph 1 (b) requires that each Party shall restrict the production and use of the chemicals listed in Annex B in accordance with the provisions of that Annex.

Article 5 (a)(ii) of the SC provides for an evaluation of the efficacy of the laws and policies of the Party relating to the management of chemicals listed in Annex C. Article 6 paragraph 1 (c) of the SC requires that each Party manages the stockpiles, as appropriate, in a safe, efficient and environmentally sound manner.

In order to meet the above Convention obligations, the country plans to strengthen, harmonize and enforce existing legislation which will be preceded by a gap analysis of the current laws and policies since current legislation is not POPs specific. The National Profile, NPE and the Socio-economic and Human Health Assessment Report will also be updated to incorporate new developments related to POPs. To accomplish this, the country will need support from local and external sources to cover costs for consultancy, meetings, surveys, legal services and publicity. It is estimated that the overall plan for institutional and legal frameworks review will cost six hundred and thirty-two million four hundred thousand kwacha (ZMK 632,400,000) equivalent to one hundred and eighty one thousand United States Dollars (US$ 181,000)

3.3.2. Action Plan: Production, Import and Export, Use, Stockpiles and Wastes of Pesticides POPs *(Annex A, Part 1 Chemicals).*

Article 3 paragraph 1 (a) of the SC, provides that each Party shall prohibit and/or take legal and administrative measures necessary to eliminate the production, use, import and export of chemicals listed in Annex A.

In addition, Article 6 provides that each Party shall ensure that stockpiles consisting of or containing chemicals listed either in Annex A or Annex B and wastes, including products and articles upon becoming wastes, consisting of, containing or contaminated with a chemical listed in Annex A, B or C, are managed in a manner protective of human health and the environment as provided for in sub-paragraphs (a), (b), (c), (d) and (e).

Specific Action Plans to help Zambia meet this obligation of the SC mainly concern alternatives to Chlordane being the only POPs Pesticide currently imported and used in the construction industry for termite control. Key activities will include literature review on existing alternatives, field surveys, development and implementation of pilot field programmes. Further, mechanisms for capturing data on the effectiveness and safety of identified alternatives will be implemented coupled with training of pesticides handlers. A tracking system for capturing data on imports and exports of POPs Pesticides at points of entry will be developed and implemented.

An estimated amount of nine hundred and sixty nine million seven hundred and eighty thousand Kwacha (ZMK 969,780,000) equivalent to two hundred and seventy seven thousand United States Dollars (US$ 277,000) will be required to implement these activities.

3.3.3. Action Plan: Production, Import and Export, Use, Identification, Labelling, Removal, Storage and Disposal of PCBs and Equipment Containing PCBs *(Annex A, Part II Chemicals)*

Subject to the requirements of paragraph (a) of Part II of Annex A, each Party shall elimination the use of PCBs in equipment (e.g. transformers, capacitors or other receptacles contaminated with PCBs) by 2025, subject to review by the COP in accordance with priorities listed in sub-paragraphs (i) (ii) and (iii). Additional measures are outlined in paragraphs (b) – (h) of Part II of Annex A.

Action Plans to meet the above requirements of the SC with regard to, import, export, use, identification, labelling, removal, storage and disposal of PCBs and equipment containing or contaminated with PCBs have been developed.

The country will establish the PCB status to determine the quantity and distribution of PCBs through screening of all equipment likely to contain PCBs. The Gas Chromatography – Mass Spectrometer (GC-MS) analysis will be used to determine the presence and quantity of PCBs in oils, waste and other equipment. To prevent and control pollution arising from PCB releases, three identified storage sites (Luano, ZCCM-IH Kalulushi and Kariba) will be upgraded to international standards. The elimination of PCB containing equipment and waste by 2025 will be achieved through submission of management plans by all industrial facilities utilising PCB containing equipment and the final disposal of the same equipment and waste.

Action Plans to meet the above requirement are estimated to cost approximately five billion one hundred and seventy three million Kwacha (ZMK 5,173,000,000) equivalent to one million four hundred and seventy eight thousand United States Dollars (USD 1,478,000).

3.3.4.Action Plan: Production, Import and Export, Use, Stockpiles and Wastes of DDT (Annex B Chemicals)

Annex B, Parts I and II of the SC outline restrictive measures with regard to production, import, export, use, stockpiles and wastes of DDT. To meet the SC stipulations in this regard, Action Plans have been developed.

ECZ, MoH, NMCC and TDRC in collaboration with UNEP will identify alternatives to DDT and determine their efficacy and cost effectiveness. This will be achieved through desk analysis of potential alternatives to DDT and carrying out of vector susceptibility and bioassay studies of the alternatives. Specific Action Plans for the management of stockpiles and packaging of DDT waste arising from past and current uses will be spearheaded by ECZ, NMCC and MoH. Among the activities to accomplish this task will be the development of guidelines on procurement, transportation, storage, distribution, usage and mechanisms for disposal of stockpiles and wastes.

ECZ, MoH, NMCC, FDCL, UNZA, TDRC, NISIR and MACO will collaborate to determine the persistence of DDT in different matrices. This will be conducted through research to determine DDT levels in the environment vis-à-vis soil, water, vegetation, food and other media.

It is estimated that the overall Action Plan for this component will cost approximately eight hundred and fifty four million, five hundred thousand kwacha (ZMK 854,500,000) which is equivalent to two hundred and forty four thousand, one hundred and forty three United States Dollars (US$ 244,143).

3.3.5. Action Plan: Releases from Unintentional Production of PCDDs/PCDFs, HCB and PCBs.

Article 5 paragraph (a) of the SC stipulates that each Party shall develop an Action Plan or, where appropriate a regional or sub-regional Action Plan within two years of the date of entry into force of this Convention for it, and subsequently implement it as part of its implementation plans specified in Article 7, designed to identify, characterize and address the release of the chemicals listed in Annex C and to facilitate implementation of sub-paragraphs (b) to (e).

Consequently, Action Plans for releases from unintentional production of PCDDs/PCDFs, HCB and PCBs in Zambia incorporate the following features:

(i) Reduction of emissions by 75% of the value reflected in the 2004 base national inventory within the given timeframe. This will be done through ECZ in collaboration with Local Authorities (LAs), waste management companies, traditional leaders and ZRA so as to minimize PCDD/PCDF emissions from uncontrolled domestic waste burning. Further, waste collection units in LAs will be commercialized and BAT/BET such as promotion of waste segregation at source, recycling technologies for plastics, composting of biodegradable materials and reduction of use of polyethylene products will be implemented.

(ii) Reduction of emissions from medical waste incineration category by 95% of the value in the 2004 base national inventory. To minimize PCDD/PCDF emissions from medical waste incineration, ECZ, MoH, LAs and the private sector, will collaborate to train medical personnel and medical waste handlers in ESM. Coupled with this aspect, will be the establishment of centralized medical waste incineration facilities and upgrading of existing ones.

(iii) ECZ, LAs, private waste management companies, MTENR, MoFNP, MoCDSW, ZNFU, NGOs and traditional authorities will endeavor to reduce emissions of PCDDs/PCDFs from landfill forests, grassland fires and agricultural residue burning. Activities earmarked to achieve this task will include training of landfill managers, creation of financial incentives for landfill managers, provision of alternative income generation ventures for scavengers and the promotion of BAT/BEP.

(iv) Action Plans to minimize emission of PCDDs/PCDFs from mining, foundry and cement production activities will be spearheaded by ECZ in conjunction with MMMD, private mine operators, OSHS, foundry developers. The goal will be to improve mining, foundry and cement production technologies through upgrading of existing copper smelting, foundry and cement production technologies.

(v) To improve technology, ECZ and OSHS will partner to reduce PCDD/PCDF emissions from biomass fired boilers. Reduction in this aspect will consequently reduce Green House Gas emissions and contribute to mitigating Climate Change.

The estimated cost of implementing this component of this Action Plan is Sixty Nine Billion, Ninety Six Million, Three Hundred Thousand Kwacha (ZMK 69,096,300,000) which is equivalent to Nineteen Million, Seven Hundred and Forty One, Eight Hundred United States Dollars (US$ 19,741,800).

3.3.6. Strategy: Identification of Relevant Stockpiles, Articles-in-Use and Wastes – *Plan for Assessment and Mitigation of Releases from Stockpiles and Wastes: Pesticides, DDT, PCBs and HCB (Annexes A, B and C Chemicals).*

No significant stockpiles of chemicals listed under Annexes A, B and C Chemicals of the SC were found during the inventory carried out in 2004. However, Zambia is now importing DDT sachets, which are in continuous use for IRHS.

3.3.7. Action Plan: Identification and Appropriate Management of Contaminated Sites *(Annex A, B and C Chemicals).*

Article 6 paragraph (1) (e) of the SC, each Party shall endeavour to develop appropriate strategies for identifying sites contaminated by chemicals listed in Annex A, B or C; if remediation of those is undertaken, it shall be performed in an ESM.

Six sites contaminated with PCBs were identified as outlined in Section 2.3.6. Action Plans in this respect are designed as follows:

ECZ, GRZ and UNZA will endeavor to collaborate in the confirmation of suspected POPs contaminated sites through desk screening, site assessment, collection and analysis of samples from this type of sites. Additionally, ECZ and GRZ will formulate management strategies for confirmed POPs contaminated sites. Amongst the activities outlined to accomplish this will be the engagement of firms to carry-out a clean up of prioritized contaminated sites.

This Action Plan will be implemented for the identification and appropriate management of contaminated sites for the chemicals above and is estimated to cost Seven Billion, One Hundred and Thirty Five Million Kwacha (ZMK 7,135,000,000) which is equivalent to Two Million, Thirty Eight Thousand, Five Hundred and Seventy One United States Dollars (US$ 2,038, 571).

3.3.8. Action Plan: Public Awareness, Information and Training.

Article 10 of the SC obligates Parties to enhance capabilities to promote and facilitate public information, awareness and education.

To facilitate implementation of this Action Plan, ECZ will undertake the following:

1. Enhance research, information gathering and dissemination on POPs and available alternative technologies. This will be done through identification and collection of information on POPs, linkage of the ECZ website to relevant information sources and carrying out of ToT on POPs and related issues.
2. Develop and implement training programs for key target groups in control of POPs and information dissemination through identification of target groups, development of IEC materials and implementation of IEC programmes.
3. Establish a database on POPs and related issues.
4. Develop and implement guidelines and legislation on promotion of awareness amongst policy and decision makers.
5. Strengthen collaboration with the media with regard to information dissemination.

This action plan is estimated to cost One Hundred and Fifty Five Million Kwacha (ZMK 155,000,000) equivalent to Forty Four Thousand, Two Hundred and Eighty Six United States Dollars (US$ 44,286).

3.3.9. Action Plan: Monitoring and Reporting

Articles 11 and 15 of the SC articulates requirements for monitoring POPs and reporting mechanisms to the COP. Action Plans place the country to undertake research of residue levels in different matrices such as food, soil and water to determine levels of contamination arising from past and current use of POPs. Development of alternatives to POPs will be part of the research programmes to be developed.

Further, Zambia will strengthen capacity to screen all POPs containing equipment, infrastructure and sites through development and implementation of training programmes on POPs related issues, improvement of coordinating mechanisms and provision of appropriate testing equipment.

Relevant government wings will strengthen institutional capacity and mechanisms for monitoring the effects of POPs in humans and the environment. This will be achieved through enhancing partnerships amongst institutions involved in POPs monitoring as well as development of standards for monitoring.

It is estimated that Action Plans for this exercise will cost Six Hundred and Forty Five Million, One Hundred Thousand Kwacha (ZMK 645, 100,000) which is equivalent to One Hundred and Eight Four Thousand, Three Hundred and Fourteen United States Dollars (US$ 184,314).

3.3.10 Periodic Review and Updating Mechanism

Action Plans mandate the country to develop mechanisms for annual POPs updates and reporting of inventories through creation of POPs updating sub-committee within the IEC.

The cost of this action plan is estimated at Thirty Four Million, Eight Hundred and Fifty Thousand Kwacha (ZMK 34,850,000) equivalent to Nine Thousand, Nine Hundred and Fifty Seven United States Dollars (US$ 9,957).

3.3.11 Strategy for Research and Development

Strategies to meet the above obligations include the introduction of the subject of POPs in major research and higher learning institutions. Additionally, researchers must be encouraged to develop research proposals on POPs monitoring in the environment, food and health impacts in partnership with industry. Funding should be sourced from cooperating partners such as GEF, UNEP Chemicals and other UN agencies. It is envisaged that networks with regional/international institutions and organizations will be developed including the strengthening of national scientific and technical research capabilities.

The above are envisioned to be executed within the requirements of Article 11 of the SC.

3.4 Development and Capacity Building Proposals and Priorities.

Infrastructure and human resource development form the core of capacity building requirements.

3.4.1 Infrastructure Development Requirements

Laboratory capacity to undertake complex analyses such as PCDDs/PCDFs, PCBs, POPs pesticides and DDT needs to be expanded. This should include the capacity to manage domestic and hazardous waste including construction and management of state of the art landfills, modern hazardous waste disposal sites and environmentally acceptable temporal storage sites for PCBs, obsolete pesticides and hazardous waste.

3.4.2 Human Resource Capacity Building Requirements

Stakeholders will require various types of training ranging from POPs monitoring, research, management, and research for alternatives. It is proposed that POPs issues be introduced into curricula in institutions of learning. Training should also be conducted for government customs control and standards enforcement officers at points of entry.

3.5 Timetable for Plan Implementation and Measures of Success.

The implementation of the various action plans ranges from short term (one to five years); medium term (five to ten years) and long term (more than ten years). The majority of activities in the NIP fall under short and medium term timeframes. Details of the timeframe for implementation of specific action plans are provided in Annex 1.

3.6 Resource Requirements.

Details of funds and resources for implementation of specific action plans are tabulated in Annex 1. These funds though based on detailed calculations are indicative. Potential sources of support for the implementation of the NIP were identified to be; GRZ, UNEP, GEF, relevant local private institutions, national and international cooperating partners. It is envisaged that a third of the total budget will be covered by GRZ and its agencies, another third by private institutions and the remaining amount will be covered by external sources. Resources required for the implementation will include expert human resources, information, equipment, finances and infrastructure.

ANNEX 1: SPECIFIC ACTION PLANS OF THE NATIONAL IMPLEMENTATION PLANS OF POPs IN ZAMBIA

PCB ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead & other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Establishment of PCB status in country.	Establish PCB quantity and distribution in country by 2nd year of Project Implementation.	Screening of all 18,000 PCB suspected equipment using Clor-n-oil 50 test kits	Identification of 21 member screening team	Team of 21 members setup	2 weeks	ECZ	21 team members for screening team set up by end of 1st quarter of 1st yr of Project Implementation (PI)	List of screening team		0	ECZ
			Procure PPE for 21 team member	PPEs procured	1 month	ECZ	PPE and procured by end of 1st quarter of 1st year of PI	PPE receipted and in stock	PPE	5,250	ECZ/ UNEP
			18,000 test kits	18,000 test kits procured	1 Month	ECZ	Test kits procured by end of 1st quarter of 1st year of PI	test kits receipted and in stock	Test kits	630,000	ECZ/UNEP
			Notification of identified facilities with equipment suspected to contain PCB	Letters sent to all PCB suspected facilities	2 weeks	ECZ	Receipt of notification letters by end of 1st quarter of 1st year of PI	Conformation by facilities of receipt of notification letters		0	ECZ
			Carry out tests on all 18,000 suspected PCB equipment	Screening tests carried out on all 18,000 suspected PCB equipment countrywide	1 year	ECZ	Screening of 18,000 suspected PCB equipment carried out by end of 1st quarter of 2nd year of PI	Screening Report produced	Screening[10]	54,175	ECZ/UNEP
		Analysis of PCB oil using GC test	Identification of lab and securing of contract for GC analysis	letters of enquiry sent out to identified labs	1 months	ECZ	Lab identified by 2nd quarter of 2nd year of project implementation	Letter of acceptance obtained from lab for GC analysis	Communications	500	ECZ/UNEP
				Contract secured	1 month	ECZ	Contract signed by 3rd quarter of 2 year of Project Implementation	Signed contract with lab.	Courier	250	ECZ
			Procure UN approved packaging material for 6,000 samples	UN approved packaging material procured	1 month	ECZ	6,000 UN approved packing material procured by 3rd quarter of 2nd year of project implementation	6,000 UN packaging material delivered	Packaging	105,000	ECZ/UNEP/DONORS
			Transport samples for GC analysis at identified lab	Samples transported to lab for GC analysis	1 month	ECZ/ZESCO/Mines	Certificate of arrival of samples at lab for GC analysis by end of 3rd quarter of 2nd year of PI	Certificate of receipt of samples by lab	Freight	15,000	ECZ/ZESCO/MINES
			Analysis of samples	Samples analysed	1 month	ECZ	Samples analysed end of 4th quarter of 2nd year of PI	Certificate of analysis report	Tests[3]	1,470,000	ECZ
Adoption of international guidelines for the sound management of PCBs	Adoption of international of guidelines on PCBs management by 3rd year of PI	Hold 2 meetings on adoption of international guidelines	Hold Stakeholder meeting for 20 people	Stakeholder meeting held	1 day each meeting	ECZ	Guidelines adopted by end of 1st week of 3rd quarter of 3rd year of PI	International guidelines adopted	Conference; Venue	20,000	ECZ/UNEP
									Printing	500	

A

Control and prevent pollution arising from PCB releases	To control and prevent pollution arising from PCB releases by end 10th year of PI	Identification of 3 storage sites	Examine possible 3 sites for PCB storage based on PCB distribution	3 Sites identified	3 months	ECZ	Identification of sites by 1st quarter of 8th year of PI	List of storage sites	Fuel costs	1,000	ECZ
		Upgrade/modification of 3 storage facilities (i.e. Copperbelt, Midlands and southern regions)	Upgrade of storage sites	3 Storage facilities upgraded	12 months	ECZ	3 Storage sites upgraded by the end of 4th quarter of 8th year of PI	Upgraded storage facilities	Upgrade	300,000	ECZ/ZESCO/Mines/CEC
		Removal of decommissioned equipment and waste to storage sites	Tender for transportation of PCB equipment	Bids received	2 months	ECZ/ZNTB	Tender bids received by 1st week of the 2nd quarter of the 9th year of PI	Signed Tender document	Printing	10,000	ECZ/ZNTB
			Procurement of 1500* UN approved drums and transport to PCB waste sites	UN approved drums procured and transported to PCB waste locations	12 months	ECZ/ZNTB	UN approved drums procured by 3rd quarter of 9th year of PI	1500 UN approved drums at PCB waste sites	Procurement and transport	500,000	ECZ/UNEP/ ZEZCO/ Mines/CEC
			Transport decommissioned PCB equipment to storage sites	Decommissioned PCB equipment transported to storage sites	6 months	ECZ/ZESCO/ Mines	PCB equipment transported by 4th quarter of 10th year of PI	Decommissioned PCB equipment delivered to storage sites	Freight	200,000	ECZ/ZESCO/ CEC/Mines
Elimination of PCB equipment and waste	To eliminate PCB equipment and waste by 2025	Submission of management plans by facilities for PCB equipment in use	Demand Letters to all companies with PCB equipment in use	Submission of management plans for PCB equipment in use	6 months	ECZ	Submission of management plans for PCB equipment in use by 1st quarter of 11th year of PI	Submitted management plans	Stationery, fuel and postage	500	ECZ
		Final disposal of PCB equipment and waste from 3 storage sites	Identification of incineration facility	Incineration facility identified***	1 month	ECZ	Incineration facility identified by end of 1st quarter of 11th year of PI	Contract Document	Correspondence	200	ECZ
			Transportation of PCB equipment and waste to incineration facility	PCB equipment and waste transported to incineration facility	2 months	ECZ	PCB equipment and waste transported to incineration facility by 3rd quarter of 11th year of PI	Receipt of PCB equipment and waste in RSA	Freight	132,000	ECZ/UNEP/ Mines/CEC
			Incineration of PCB equipment and waste	PCB equipment and waste incinerated	1 month	ECZ	PCB equipment and waste incinerated by 4th quarter of 11th year of PI	Incineration certificate	Incineration cost	1,728,720	
Sub Total										5,173,095	

B

1. Notes:
1. Landing cost per clor-n-oil test kit $10.00 & clor-n-soil $ 18.00; cost for 18000 test kits (18000@$10.00=$180,000x3500)=K630, 000,000.00
2. Personal protective equipment will consist of:
    a. Apron
    b. Gloves
    c. Goggles
    d. Shoes
    e. Complete work suit

    Cost@ K250,000.00per suit x 21 =K5, 250,000.00
3. It is assumed 30% of the screened equipment will test positive. i.e. 5,400 samples, for working purposes 6000 samples will be subjected to GCMS analyses
4. Cost of packaging material is $5.00x 3500x6000=K105,000,000.00
5. DSA is rated K400,000.00; Transport refund K200,000.00;
6. Cost of packaging material for 6000 samples is rated at K17,500.00;Totaling K105,000,000.00
7. *** Incineration and analysis of samples is assumed to be done in RSA.
8. **Cost for analysis of samples was calculated as: 6000 x 245,000per 50ml sample = K1,470,000,000.00
9. Upgrade of three PCB storage sites is @ K100,000,000.00 per site
10. * Estimated costing

    The cost is calculated as:
    DSA: K400,000.00 x 21 people x 5 days=K 42,000,000.00
    Fuel: 90litres x 20 tanks x K6,000.00=K10,800,000.00
    Lunch Allowance: K65,000.00 x 3 trips x 5 people=K 975,000.00
    Transport refund:K200,000.00 x 2 people=K 400,000.00
    Total: K54, 175,000.00

C

DIOXINS AND FURANS ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objective	Activities	Tasks	Outputs	Time line	Lead/Other Agencies	Milestones	Performance indicator	Cost Estimate ZMK '000		Sources of Funding
Minimize PCDD/PCDF emissions from uncontrolled domestic waste burning	To reduce PCDD/PCDF emissions by 75 % of the value reflected in the 2004 base inventory within 7 years of project implementation (S, M)	Increase domestic waste collection in peri-urban and rural districts	Purchase 20 waste collection trucks (for major provincial centers as seed capital)	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	7 years	ECZ, Local authorities/Waste Management Companies, Traditional Leaders, Zambia Revenue Authority (ZRA)	50 % reduction in PCDD/PCDF emissions in the 2009 recalculated release inventory	Purchased trucks	20 tipper trucks	4,000,000	ECZ/Donors
		Commercialize waste collection units in municipal councils in major cities (Pilot for Nine provincial centers)	Hold consultative meeting for municipal heads on commercialization	Meeting held	1 month	Local Government/ECZ/Local Authorities	Functional committee setup within 1st yr of PI	Minutes of meeting	DSA	3,600	ECZ/Donors
									Transport refund	1,800	ECZ/Donors
			Implement the Zonal system in the pilot districts by relevant district authorities	Zonal system implemented	2 years	ECZ/Local Authorities	Zonal system implemented by 1st year of PI	Report of implementation from districts	Communication	1,000	ECZ/Local Authorities
			Progress review meetings	4 progress review meeting held	2years	E ECZ/Local Authorities	Two meetings held by end of 1st of PI	Minutes of meetings	DSA	14,400	ECZ/Donors
									Transport refund	7,200	
		Implement applicable BAT/BEP from the SC guidance document such as promotion of waste segregation at source, enhancement of recycling technology for plastics, composting of biodegradable materials including discouragement of use of polyethylene products by increasing taxes on importers and producers	National training of Trainers workshops targeting Community Based Organizations (CBO), Non-Government Organizations (NGOs), local authorities, private waste management companies as stakeholders	BAT/BEP practices enhanced	3 years	ECZ/Local Authorities	1 workshop held during the first year of implementation	Implementation of BAT/BEP by at least three provinces	Hospitality for 40 participants @ K100,000x 40 x2 days	8,000	ECZ/Donors
									Accommodation 36 x K 350,000x 2days	25,200	
									Transport refund	8,000	
									Venue/Meals K150,000 x 40x2 days	12,000	
									Stationery	500	
		Implementation of three BAT/BEP projects#	Select three pilot districts and projects*	Pilot projects and districts selected	1 month	ECZ/ Local Authorities	Pilot district Selected	Report	Internal cost	0	ECZ
			Hold planning meeting with districts	Planning meeting held with districts	1 month	ECZ/ Local Authorities	Project Implementation Plan	Workshop Report	Hospitality for 15 participants @ K100,000x 15 x 4days	6,000	ECZ/Donors
									Accommodation 15 x K350,000x 4days	21,000	
									Transport refund K200,000x15	2,400	

D

									Venue/Meals K150,000 x 15x4 days	9,000	
			Implement three pilot projects	Facilitate acquisition of funds	1 years	ECZ/Local Authorities	Project implementation funds sourced	Funds sourced	Internal	0	ECZ/Donors
				Projects implemented	3 year	ECZ/ Local Authorities	Pilot Projects Implemented	Project Completion report	costs Three pilot projects worthy K70,000,000 each	210,000	ECZ
				Evaluate project implementation	1 Month	ECZ	Project Evaluation report	At least two projects evaluated by the 3rd quarter	Consultancy cost	30,000	ECZ/Donors
Minimize PCDD/PCDF emissions from medical waste incineration	To reduce emissions from medical waste to 95 % of the value in the 2004 base inventory within 20 years after the start of project implementation (M)	Train medical personnel and medical waste handlers in medical waste management to update them on aspects of PCDD/PCDF emissions	Conduct training workshops for train of trainers (1 workshop/year per province) To be conducted every after three years	-Increased human resource capacity in medical waste handling -Enhanced segration of medical waste for sound incineration	5 years	ECZ, Ministry of Health, Private Sector, Local Authorities	3 workshops every 4 years in 20 years (Total 15 workshops)	Workshop reports	Hospitality for 15 participants @ K100,000x 15 x 4days x15w/shops	90,000	ECZ/Donors
									Accommodation 15 x K 350,000x 4days x 15 w/shops	315,000	
									Transport refund K200,000x15 x15 w/shops	36,000	
									Venue/Meals K150,000 x 15x4 days x 15 w/shops	135,000	
		-Create self-sustaining centralized incineration facilities and Upgrade incinerator technology	purchase of 30 high technology incinerators for 30 major hospitals	Modern incinerator technology availed at minimum cost	10 years	ECZ, Ministry of Health, Private Sector, Local Authorities	Purchase of 10 incinerators within five years of implementation	Documentation of purchase	30 high technology incinerators	2,070,000	ECZ/Donors
		-Employ appropriate alternative technologies Apply BAT/BEP from the SC guidance document	Purchase of 7 medical waste collection Vans to transport waste from satellite clinics to centralized incinerators	Medical collection Vans availed at minimum cost	10 years	ECZ, Ministry of Health, Private Sector, Local Authorities	Purchase of 3 Vans within five years of implementation	Documentation of purchase	7 medical waste collection Vans (@ US$ 50,000 per Van)	1,225,000	ECZ/Donors
Minimize PCDD/PCDF emissions from agricultural residue burning	To control agricultural residue burning 3 years from the start of project implementation (S)	-Promote awareness in the agricultural sector about PCDDs/PCDFs -Apply BAT/BEP as outlined in the SC guidance document	-Hold 3 training workshops stakeholders from the agricultural sector	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	3 years of entry into force	Ministry of Agriculture/ZNFU, Cooperatives, ECZ, NGOs, Traditional Leaders, Croplife Zambia ECZ	1 workshop held during the first year of implementation	3 Workshop reports	Hospitality for 15 participants @ K100,000x 15 x 4days x3w/shops	18,000	ECZ/Donors
									Accommodation 15 x K 350,000x 4days x 3w/shops	63,000	
									Transport refund K200,000x15 x 3w/shop	7,200	
									Venue/Meals K150,000 x 15x4 days x 3 w/shops	27,000	

E

Reduction of PCDD/PCDF emissions from secondary copper production – basic technology	To improve technology for secondary copper prod uction within 20 years of the start of project implementation (L)	Upgrade the existing copper smelting technology	Rehabilitate flue gas management systems	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	20 years of entry into force	Ministry of Mines and Minerals Development/ECZ/Private mine operators	Rehabilitation of one flue gas management system within 5 years of implementation	Documentation of purchase and installation	Rehabilitation of flue gas management system	4,500,000	Copper producing companies
		Use substitute and cleaner technology Apply BAT/BEP in phases as outlined in the SC guidance document	Application of BAT/BEP	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	20 years of entry into force	Ministry of Mines and Minerals Development/ECZ/Private mine operators	Implantation of BAT/BEP in at least a third copper industry with 10 years of implementation	Documentation of purchase and installation	Internal costs	0	Copper producing companies
Reduce PCDD/PCDF emissions from cement production utilizing wet kilns	To improve cement production technology utilizing wet kilns, especially for temperature greater than 300ºC within 20 years of the start of project implementation(L)	• Upgrade the existing cement production technology • Switch from wet to dry cement production technology • Apply BAT/BEP in phases as outlined in the SC guidance document	Rehabilitate flue gas management systems for 1 cement plant utilizing the wet technology	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	20 years of entry into force	Ministry of Mines and Minerals Development/ECZ/Private mine operators	Rehabilitation of one flue gas management system within 5 years of implementation	Documentation of purchase and installation	Rehabilitation of flue gas management system	4,500,000	Cement producing companies
Reduce PCDD/PCDF emissions from foundry technology utilizing dirty scrap, scrap preheating limited control	Improve foundry technology utilizing dirty scrap, scrap pre-heating limited control within 20 years of the start of project implementation (L)	Upgrade existing foundry technology by applying BAT/BEP in phases as outlined in the SC guidance document	Upgrade foundry technology per plant	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	20 years of entry into force	ECZ/OSHS	Upgrading foundry technology within 5 years of implementation	Documentation of purchase and installation	Upgrade foundry technology per plant	18,000,000	Foundry operators
		For new sources incorporate BAT/BEP in EIAs	BAT/BEP incorporated in new sources	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	From year one onwards	ECZ/developers	Documented reports of BAT/BEP incorporation in new facilities	EIA process incorporates BAT/BEP	Internal costs	0	ECZ/Developers
Source reduction of PCDD/PCDF emission from biomass fired boilers	To improve technology utilizing biomass fired boilers within 20 years of the start of project implementation(L)	Upgrade existing technology by applying BAT/BEP as outlined in the SC guidance document in phases	Upgrade 500 boilers countrywide	Minimized PCDD/PCDF emissions from the 2004 base inventory levels	20 years of entry into force	ECZ /OSHS	Upgrading 100 boiler technology within 5 years of implementation	Documentation of upgrade and installation	Upgrade 500 boilers countrywide	33,750,000	Biomass boiler operators
Subtotal										69,096,300	

(S = Short Term, M = Medium term, L = Long Term for PCDDs/PCDFs)

1. *The actual costs of individual projects will be established once projects have been selected.
2. #Three preliminary pilot projects will be undertaken after which an evaluation will followed to ascertain as to whether the projects would be replicated in the other districts

F

POPs PESTICIDES ACTION PLANS FOR ZAMBIAN NIP											
Identify and promote use of alternative methods for control of termites	Identify alternative methods for the control of termites by end of year 1 of project implementation	Literature review on existing alternative methods	Desk review	Desk review conducted	2 weeks	ECZ/NCC	Desk review completed by week 2 of 2nd quarter of year 1	Sources of information on alternatives identified	Communication	100	ECZ
									Refreshments	100	
			Compilation and production of report	Report on alternatives compiled and produced	2 weeks	ECZ/NCC	Literature relating to alternatives to termite control compiled by second week of month 1	report	Stationery	100	ECZ
									Printing	100	
		Conduct Field survey	Select areas for the survey	Survey areas selected	1 week	ECZ/NCC/MACo	Target areas selected by week 1 of quarter 2 of Y 1 of PI	List of selected target areas	Internal cost	0	ECZ
			Draw up Programme	Programme of activity drawn and endorsed	1 week	ECZ/NCC/MACo	Programme drawn up by week 3 of quarter 2	Programme document	Stationery	50	ECZ
			Develop research tools	Questionnaire developed	2 weeks	ECZ/NCC/MACo	Questionnaire developed by week 1 of quarter 2	Questionnaire	Stationery	200	
									Hospitality	3000	
			10 Data Training of data collectors	Collectors Trained	1 week	ECZ/NCC/MACo	10 Collectors trained by week 4 of quarter 3	Training report	Acc 15 parts x4nightsx250,000	15,000	ECZ
									Stationery	2,000	
									Food/venue 15xK150,000x3	6,750	
									Hospitality 15 xK100,000 x3	4,500	
									Transport Refund 5x K200,000	1,000	
			Conduct survey	Survey on alternatives carried out	2 months	ECZ/NCC/MACo	Survey on alternatives completed by quarter 3 of Y 1of PI	Survey Report	Allowances 15 persons x 5 x 400,000	30,000	ECZ/UNEP
									Fuel 90lx20x6000	10,800	
									Stationery	200	ECZ
			Produce survey report	Survey Report produced	2 weeks	ECZ/NCC	Report of survey completed by 2 week of quarter 4 of Y 1	Report	Stationery	100	ECZ
									Printing	500	
		Develop & implement Pilot field programme with relevant research institutions	Select pilot districts	Pilot districts selected	1 week	ECZ/MACo/NCC/Croplife	Pilot districts selected by quarter 1 of Y 2	List of pilot districts	Communication	100	ECZ

G

			Draw up the programme	Programme drawn	1 week	ECZ/MACo/NCC/Croplife	Programme drawn by end of Q/ter 1 of Y 2	Programme document	Internal cost	0	ECZ
			Hold Technical meeting with relevant research institutions	16 participants Technical Meeting held	2 week	ECZ/MACo/NCC/Croplife	Meeting held by quarter 2 of Y 2	Minutes of the meeting	Stationery	200	ECZ/UNEP
									Communication	300	
									Hospitality K250,000 x16	4,000	
			Carry out the pilot field Programme for 3 selected districts	Pilot field trials implemented	1 year	ECZ/MACo/NCC/Croplife	Trials completed by end of Y 2	Reports, minutes	Sampling costs 20,000,000 per district	60,000	ECZ/UNEP/ MACo/Donors
									Communication	1,000	
									Fuel 90Lx4tantsx3x6000	6,480	
									Allowances 400,000 2personsx 3sitesx3dayx 4visits	28,800	
	Promote the use of identified alternatives in the 3rd quarter of year 1	Hold stakeholder workshop	Identify and mobilize stakeholders	Stakeholders identified and mobilized	2weeks	ECZ	Stakeholders identified by 1st week of Quarter 3 of Y 1	List of stakeholders	Internal Cost	0	ECZ
			Send letters of invitation to identified stakeholder	Letters of invitation sent	2 weeks	ECZ	Invitations completed by 2 week of Quarter 3 of Y 1 of PI	List of stakeholders invited	Stationery	50	ECZ
									Communication	250	
			Hold workshop	20 participants Workshop held	3 days	ECZ/NCC/MACo/Croplife	Workshop held by end of Quarter 3 of Y 1 of PI	Workshop Report	Stationery	500	ECZ/UNEP
									Communication	100	ECZ/UNEP
									Conference venue	10,000	ECZ/UNEP
									Hospitality 20 x100,000x3days	6,000	ECZ/UNEP
		Re-training of Pesticide handlers	Identify participants	Participants identified	1 week	ECZ/NCC/Croplife	Participants identified by 1st week of 4th quarter	List of participants	Internal Cost	0	ECZ
			Prepare training materials	Materials prepared	3 weeks	ECZ/NCC/MACo Croplife	Training materials prepared by 2nd week of 2nd quarter of Y 1	Training materials	Stationery	1,000	ECZ/ MACo/ Croplife
									Communication	100	

H

			Conduct training	3days Training conducted for 20 participants	1 week	ECZ/NCC/MACo/Croplife	Training conducted by 4th quarter of Y 1	Training Report	Stationery	200	ECZ
									Communication	100	ECZ/UNEP
									Conference venue	10,000	ECZ/UNEP
									Hospitality	6,000	ECZ/UNEP
Develop mechanism for capturing data on pesticide POPs	Develop a tracking system on import, export and use of POPs pesticides by year 1 of project implementation	Constitute a 10 member multi stakeholder technical team	Identify stake holder	Relevant stakeholders identified	1 week	ECZ/NCC/MACo/Croplife	Relevant stakeholders identified by end of 2nd Quarter of Y1	List of relevant stakeholders	Secretariat meeting	0	ECZ/Croplife
			Convene with Identified stakeholders	Meeting held with stakeholders	2 weeks	ECZ/NCC/MACo/Croplife	Meeting with identified stakeholders by end of 2nd qtr	Minutes of the meeting	Venue/Meals	2,500	
									Hospitality K250,000x16 participants	4,000	
		Develop and strengthen capabilities for data capture at the points of entry	Interface Zambian Customs information system (ASYCUDA)	ASYCUDA accessed by ECZ and relevant stakeholders	1 year	ECZ/NCC/MACo/Croplife/MoFED	ASYCUDA accessed by end of year 2	ASYCUDA interface	Software	0	ZRA
									Communication (internet line 1PC,Modem,phone line)	8,000	ECZ
									Stationery	1,000	ECZ
			Train point of entry ECZ/Customs officers in data capture	30 ECZ and other relevant officers trained	1 month	ECZ/NCC/MACo/Croplife/MoFED	Officers trained by end of year 2	Training report	Venue/Acc/Meals	30,000	ECZ/UNEP/ Donors
									Stationery	3,000	
									Hospitality	12,000	
									Fuel/Tpt refund	4,000	
Evaluate the effectiveness and safety of alternative methods for control of termites (non POP's methods)	To evaluate the effectiveness and safety of alternative methods for control of termites (non POP's methods by year 5 of project implementation	Constitute a research team	Identify team members	5 Team members identified	1 week	ECZ	Members identified by end of 2nd qtr of Y2	List of team members	Internal cost	0	ECZ
			Convene with team members	Meeting held	2 week	ECZ	Meeting held by 2nd qtr of Y2	Minutes of meeting	Venue /food	3,000	ECZ/UNEP/ Donors
									Hospitality	2,500	
									stationery	100	
		Analyse trial results	Hold periodic meetings	Meetings held	2 years	ECZ/Research team	Meeting held twice by end of year 2	Minutes of meeting	Venue /food	6,000	ECZ/UNEP/ Donors
									Hospitality	5,000	
									stationery	500	
		Production of trial analysis reports	Produce trial analysis reports	Trial Reports produced	2 years	ECZ/MACo/Croplife	Draft report	Number of reports	Printing of 2,000 reports	25,000	UNEP/ECZ/ MACo & Croplife

I

	To adopt the identified non POPs control methods against termites by year 4 of project implementation	Adopt identified alternative control methods`	Conduct ToT for extension workers	extension workers trained	2 months	ECZ NGOs MACO	Effective alternatives adopted by year 5	Number of trainers	Venue, Acc, meals (7 provinces x 50,000,000 per training workshop for 30 participants at each workshop	350,000	UNEP/ECZ/ MACo & Croplife
									Hospitality	26,250	ECZ, NGO, MACo
									Training material	15,000	
									Fuel + Transport	26,250	
									Fuel for ECZ vehicle	6,000	
			Promoting alternatives control methods through farmer field schools	Number of farmers fields school set up	On going	ECZ NGOs MACo	Effective methods developed by year 4	No. of people adopting alternative methods	Allowance (Ext officer for 8 sessions per district @K100,000 x 72 districts	57,600	UNEP/ECZ/GEF AND OTHERS
								No. of field training programmes conducted	Demonstration material for 72 districts @ K2m per district	144,000	
Develop mechanism for capturing data on pesticide POPs	To develop a system of tracking Chlordane from import to usage by year 2 of project implementation	Constitute stakeholder working group	Identify roles of each stake holder	Working group on POPs tracking established	3 months	ECZ ZRA MCC Local Authorities Suppliers	Working group constituted and notified by week 2	Working Group	Internal Cost	0	ECZ
							Inaugural meeting held by week 4	Schedule of responsibilities of working group members	Venue	1,000	UNEP/ECZand Stakeholders
									Stationary	150	
			Establish tracking process	Certification/endorsement mechanisms	3 months	ECZ	Working group meetings	Endorsement schedule	Hospitality	2,500	UNEP/ECZ/GEF AND OTHERS
									Venue	1,000	
									Stationery	50	
	To develop and maintain database on POPs pesticides by year 2 of project implementation	Design database that incorporates importers, suppliers, users, use and location	Identify fields for data capturing	Database on POPs developed	1 year	ECZ	Draft ToRs by wk 3	TORs	Internal Cost	0	ECZ
							Engage consultant by week 7	Consultative meeting with stakeholders	Consultant Cost	5,000	ECZ/UNEP
									Hospitality	2,500	
									Venue	1,000	
									Stationery	200	
							Database development installed by Month 3	Database Installed	Consultant Cost	0	ECZ/UNEP/ Stakeholders
							Link web-based database to all stakeholder networks	Database Linked	Consultant Cost	0	
		Maintain and upgrade information in database	Input data	Upgraded database	5 years	ECZ	Database upgraded monthly	Upgraded database	Data entry	15,000	UNEP/ECZ
Sub total										969,780	

J

DDT ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead &Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Identification of alternatives, determination of efficacy and cost effectiveness	To identify alternatives, determine their efficacy and cost effectiveness by Year 3	Desk analysis of potential alternatives to DDT	Search for relevant information	Relevant information identified	1 month	MoH-NMCC, ECZ,	Sources of information identified within the month	List of identified relevant documents	Local travel Communication Consultant fees	1,000 500 3,500	MoH/ ECZ/ UNEP
			Produce a report on potential alternatives to DDT	Potential alternatives to DDT characterized	1 month	MoH - NMCC, ECZ	1st draft of report submitted for review within two weeks	At least 10 alternatives to DDT identified	Printing costs	500	ECZ
		Conduct vector susceptibility and bioassay studies of the alternatives	Draw up a programme for conducting the study	Study program	2 weeks	MoH-NMCC, TDRC, ECZ	All players in the studies hold first meeting in two weeks	Minutes of the meeting and study program	Hospitality	2, 000	UNEP, ECZ, MoH,
			Select pilot areas from all 15 IRHS Districts using geographical conditions	Pilot study areas identified	1 month	MoH-NMCC, TDRC, ECZ	Comparative study of IRHS districts done in two weeks	List of identified pilot areas	Hospitality	2, 000	UNEP, ECZ, MoH,
			Conduct the studies-collection and rearing, exposing of mosquitoes to the alternatives	efficacy of alternatives determined	2 years	UNEP, ECZ, MoH,	1st study conducted in Year 1 of the program	Efficacy studies conducted on all alternatives in all pilot areas	Sampling equipment : Field sampling: Rearing costs Exposing	15,000 60,000 1, 000 240,000	UNEP, ECZ, MoH,
			Produce a study report	Study report produced	3 months	UNEP, ECZ, MoH,	1st Draft report submitted within a month	Study report	Stationery and printing	1,000	UNEP, ECZ, MoH,
		Disseminate research results to stakeholders	Hold 1 day dissemination workshop for 100 stakeholders	Study results disseminated	1 month	UNEP, ECZ, MoH,	75% of invited stakeholders attend the workshop	Attendance list of the workshop	venue hospitality stationery	10, 000 8,000 10,000	UNEP, ECZ, MoH,

K

Management of stockpiles and packaging waste of DDT arising from past and current uses	To manage stockpiles and packaging waste of DDT arising from past and current use by year 3 of the program implementation	Identify and quantify stockpiles and packaging waste of DDT	Update the DDT inventory to include new areas of IRHS	Stockpiles and packaging waste of DDT identified and quantified	6 months	ECZ, MoH-NMCC	All stockpiles and packaging waste identified and quantified	Inventory report produced	Travel hospitality stationery	60,000	UNEP , ECZ,
		Develop a mechanism for disposal of stockpiles and packaging waste	Engage a consultant to advise on appropriate mechanisms	Appropriate mechanism developed	3 months	ECZ, MoH-NMCC, Technical Committee	Disposal options provided	Consultant report produced	Consultancy fee	15,000	UNEP/ ECZ/ MoH-NMCC
		Develop guidelines on procurement, transportation, storage, distribution, usage and safe disposal to ensure that there are no stockpiles and contaminated sites	Constitute a technical committee of relevant stakeholders to develop the guidelines	Technical committee constituted	1 month	ECZ, MoH-NMCC, Technical Committee	Technical committee holds first meeting by the end of the 1st month	Minutes of technical committee	Hospitality	10,000	UNEP/ ECZ/ MoH-NMCC
									Travel and accommodation	10,000	
				Draft guidelines developed	3 months	ECZ, MoH-NMCC, Technical Committee	!st draft of guidelines submitted for review by end of 1st month	Draft guidelines	Hospitality	10,000	
									Stationery	5,000	
			Hold consensus building workshop on the draft guidelines for 100 people	Consensus reached on DDT guidelines	3 days	ECZ, MoH-NMCC, Technical Committee	Consensus reached within 3 days	75% of relevant stakeholders attend workshop	Venue	40,000	UNEP/ ECZ/ MoH-NMCC
									Travel	5,000	
									Accommodation	60,000	
									Stationery	5,000	
			Adoption of the guidelines by the ECZ and MoH	Guidelines adopted	1 month	Technical Committee/ ECZ/MoH	Final guidelines produced and adopted within a month	Guidelines produced	Production costs (500 copies)	30,000	UNEP/ ECZ/ MoH-NMCC
			Conduct dissemination workshops in the provinces using DDT	Awareness of DDT guidelines raised	1 day X 5 provinces	ECZ, MoH-NMCC, Technical Committee	Provinces and districts aware of and own copies of guidelines	All districts using DDT present at dissemination workshop	Venue	20,000	UNEP/ ECZ/ MoH-NMCC
									Travel	5,000	
									Accommodation	20,000	
									Stationery	5,000	

L

Determine the persistence of DDT in different matrix	To determine the persistence of DDT in different matrix in IRHS districts by Year 3 of project implementation	Conduct a research to determine DDT levels in the environment- soil, water, vegetation, food and other matrix	Develop a programme for conducting the research in all (15) IRHS districts	Research programme developed	1 month	ECZ, MoH-NMCC, FDCL,UNZA, TDRC,NISIR,MACo	Lead Intuitions hold first meeting in 2 weeks	Number of leading institutions attend first meeting	Hospitality	10,000	ECZ,UNEP,WHO,FAO
									Travel accommodation	10,000	
			Conduct the study	Study results	3 years	ECZ, MoH-NMCC, FDCL,UNZA, TDRC,NISIR, MACo	Study conducted every year in all the IRHS districts	All 15 IRS districts Sampled	Sampling equipment:, (Water, Soil, Food/ Vegetation)	20,000	
									Field Sampling (Water, Soil, Food/Vegetation)	60,000	
									Analysis costs (Water, Soil, Food Vegetation)	20,000	
			Produce a annual reports	Annual study reports produced	Yearly reports	ECZ, MoH-NMCC, FDCL,UNZA, TDRC,NISIR,MACo	Baseline report produced after 6 months	At least 4 Annual reports produced by end of yr 3	Stationery and printing	5, 000	*
	Undertake research to evaluate the environmental transport, and effects of DDT in soil, water, vegetation, food and other matrix by Year 3 of project implementation	Undertake co-hort studies in areas where DDT is being used to evaluate impacts on human health	Develop a programme for conducting the research in all (15) IRS districts in spray operators and the residents and one negative control district	Research programme developed	1 month	ECZ, MoH-NMCC, FDCL,UNZA, TDRC,NISIR,MACo	Lead Intuitions hold first meeting in 2 weeks	Number of leading institutions attend first meeting	Hospitality	10,000	ECZ,UNEP,WHO,FAO
									Travel and accommodation	10,000	
			Conduct baseline study in at least 100 randomly selected persons	Study results	3 years	ECZ, MoH, UNZA and MACo	Study conducted every yr in all the 100 randomly selected persons in the IRHS districts and one negative control district.	All 100 randomly selected persons in the IRHS districts and one negative control district sampled	Sampling equipment (Blood, urine and breast milk samples,)	20,000	ECZ,UNEP,WHO,FAO
									Field sampling:	10,000	
									Analysis Costs	20,000	
			Produce a annual reports	Annual study reports produced	Yearly reports	ECZ, MoH, MACo, UNZA	Baseline report produced after 6 months	At least 4 Annual reports produced by end of yr 3	Stationery and printing	5,000	
Sub Total										**854,500**	

M

CONTAMINATED SITES ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead &Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Identification Of POPs* (Excluding PCBs) Contaminated Sites in the Country	Identification of POPs contaminated sites in the country by year two of PI	Desktop screening exercise of suspected contaminated sites	Set up 5 member task team to review inventory results & other sources	5 member task team setup	2 months	ECZ	Draft Report of contaminated sites countrywide produced within seven weeks	List of task team members and minutes of 1st Review meeting within the first month	Allowance for teams for four meetings	6,000	/ECZ/UNEP
		Site assessment and sampling of suspected contaminated sites	5 member Task team undertakes assessment of 10* (assumed) identified sites	Site assessment and sampling undertaken	2 months	ECZ	Sampling report of at least five sites within the first month	Resources secured and sampling program approved by first week	DSA for ten days and logistics	30,000	
		Analysis of type and extent of the contamination.	Lab test (Local)	Test carried out on samples	1 month	ECZ/ /UNZA	1st analysis lab report received by third week	Samples submitted to lab by first week	Lab costs for nine samples per site (9x10)	10,000	ECZ/UNEP
			Interpretation of results by task team	Extent of contamination of sites determined	1 month	ECZ/GRZ	Draft report produced by the end of the fourth week	Minutes of first Meeting by 2nd week	Allowance 5 member team for two meetings	3,000	
Management of identified POPs contaminated sites	Identify and cost contaminated sites requiring immediate clean by 2nd year of PI	Desktop ranking based of results of analysis of contaminated sites	Set up 5 member task team to rank contaminated sites requiring immediate clean up	Task team set up	1 month	ECZ	Meeting for task team meeting approved by fourth week	List of identified task team members	Internal cost	0	ECZ
			Rank sites requiring immediate cleanup	5* (assumed) contaminated sites requiring immediate cleanup identified	2 months	ECZ/GRZ	Draft Report of the ranking of contaminated sites produced within seven weeks	Minutes of 1st Ranking meeting within the first month	Allowance for teams for four meetings	6,000	GRZ/UNEP
		Costing for clean up of the 5 identified sites requiring immediate cleanup	5 task team Identify clean up options in/out of country	Clean up options identified	2 months	ECZ/GRZ	Draft report on clean up option s produced by the sixth week	Minutes of the first meeting	3 meetings allowances for task team	3,500	UNEP/GRS/Donors
			5 member task team cost clean options	Clean up of 5 sites costed	1 month	ECZ	Draft report on estimated costs of clean up option produced by the 4th wk	Minutes of the first meeting	3 meetings allowances for task team	3,500	UNEP/GRS/Donors
	Clean up of prioritized contaminated sites	Outline programme for clean up of prioritized sites	Develop plan of action based on identified disposal options	Plan of action developed by task team	1 month	ECZ	Draft report on estimated costs of clean up program produced by the fourth week	Minutes of the first meeting	3 meetings allowances for task team	3,500	UNEP/GRS/Donors
		Engage firms to carryout clean up of prioritized contaminated sites	Tendering for bids for clean up	Bids received	3 months	ECZ/GRZ	Advert for bids by the first month	List of bidders	Adverting costs	10,000	
			Selection of preferred bidder for clean up	Preferred bidder selected	3 months	ECZ/Tender Board	Bids Evaluation report produced and sent to Tender Board by 3rd month	Minutes of Evaluation meeting	Internal cost	3,000	UNEP/GRS/Donors

N

			Preferred bidder carry out clean up exercise	Contaminated sites cleaned up including disposal	3 years	ECZ// selected bidder	Clean up report submitted by end first year	Cleaning of at least on site b 1st year	Cost determined by firm	7,000,000	ECZ/UNEP/ Owners of Waste
	Verification of clean up sites	Conformity and audit sampling	Develop plan of action for the verification of clean sites by task team	Action plan developed	1 month	ECZ	Draft plan submitted by 2nd month	Minutes of meeting	One task team Meeting	1,500	UNEP/GRS/Donors
			Costing of the verification sampling exercise	Costing of verification exercise done	2 months	ECZ	Draft plan submitted by 2nd month	Minutes of meeting	Two task Meetings	3,000	UNEP/GRS/Donors
			Task team carryout verification sampling of cleaned up sites	Task team set up	2 months	ECZ	Verification Sampling report the five sites produced by end of 2nd month	Sampling program approved by first week	DSA for ten days and logistics	30,000	UNEP/GRS/Donors
			Lab test (Local)	Test carried out on samples	1 month	ECZ/ UNZA	1st analysis lab report received by third week	Samples submitted to lab by first week	Lab costs for five samples per site (5x5)	10,000	UNEP/GRS/Donors
			Interpretation of verification sampling results by task team	Effectiveness of contaminated sites clean up determined	1 month	ECZ/GRZ	Draft report produced by the end of the fourth week	Minutes of first Meeting by 2nd week	Allowance 5 member team for two meetings	3,000	UNEP/GRS/Donors
	Management of the 5* (assumed) sites not requiring immediate clean up	Identification of management options of contaminated sites not requiring immediate clean up.	5 Task team identify management options	Management options identified	2 months	ECZ/GRZ	Report of management options produced by 2nd month	Minutes of task team meeting	Allowance 5 member team for two meetings	3,000	UNEP/GRS/Donors
		Costing of management options	5 task team cost options	Options costed	2 months	ECZ/GRZ	Report on costs of management options produced by 2nd month	Minutes of task team meeting	Allowance 5 member team for two meetings	3,000	UNEP/GRS/Donors
		Develop plan of action based on identified management options	5 task team develop action plan	Action plan developed	2 months	ECZ/GRZ	Action Plan for managing contaminated sites produced by end of 2nd month	Minutes of task team meeting	Allowance 5 member team for two meetings	3,000	UNEP/GRS/Donors
Total										**7,135,000**	

O

AWARENESS ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead &Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Enhance research information generation and dissemination on dangers of POPs and available alternative technologies.	To enhance information dissemination on POPs related issues and alternatives by the end of 1st year	Identify and collect information on POPs.	Identify relevant information sources	An enhanced information generation system available and sources identified	2 months	ECZ	A list of sources available by end of 1st Month	List of Sources and available information	Information collection	500	ECZ/UNEP
		Link ECZ website to other relevant information sources and incorporate POPs issues	Redesign ECZ website to include relevant POPs related links and issues	information generation & dissemination on the dangers of POPs and alternative technologies availed through the website	2 months	ECZ	Website updated 2nd month	website Updated	Website Update cost	500	
		Conduct TOT on POPs and related issues	Hold sensitization workshop for TOT on POPs and related issues	information disseminated on the dangers of POPs and alternative technologies	2 months	ECZ	Stakeholders identified by 3rd Quarter. TOT Workshop held by end of 1st year.	Report of TOT Workshop	Venue/Meals	2,400	ECZ/UNEP
									Hospitality	1,500	
									Accomm.	4,000	
									Stationery	300	
									Transport refund	1,800	
Develop and implement training programmes for the key target groups in control of POPs and information dissemination	Build capacity in key target groups on control of POPs and information Dissemination by end of year 2	Identify target groups	Meeting with stakeholders to identify target groups	Key targets identified and trained in the control of POPs and dissemination of information	2 months	ECZ	Target Groups identified	Minutes of stakeholders meeting	Stakeholders meeting	2,000	ECZ/UNEP
		Develop IEC materials on POPs	Engage consultant to develop IEC materials	Materials developed	6 months	ECZ	Consultant Engaged	Consultant engaged	Consultancy	6,000	ECZ/UNEP
							Training programme produced	TOT Training materials	Printing	5,000	
		Identify institutions to carry out the IEC programmes	Conduct TOT for identified institutions	Train 10 institutions	1 month	ECZ	TOT training conducted	List of Trained Institutions	Hospitality	1,500	ECZ/UNEP
									Venue/Meals	3,000	
									Stationery	300	
									Transport refund	2,000	
									Accomm	5,000	
			Training of Target Groups	Training of 50 individuals nationwide	1 month	ECZ	Training for target groups conducted	Provincial Reports on Training Workshops	Target Group Training	18,550	

P

Establish a database on POPs and related issues.	To develop a database on POPs and related issues by end of year 1	Identify information sources on POPs	Sources identified	List of identified sources	6 Months	ECZ	Data Identified & collected by end of 2nd Quarter	List of identified Sources	Collection of POPs data	500	ECZ/UNEP
		Collection of identified data	Field visits to various information sources (for 3 staff)	Raw data collected	1 month	ECZ	Database developed by end 3rd Quarter	Acquisition List for database	DSA	3,450	
									Fuel	1,550	
		Development of POPs database system	Develop database management Software, Data Entry and Updates	Functional POPs database	2 months	ECZ	Data entered by end of 1st Year	POPs Database	Data Entry	5,000	
Enhance access to ICTs in learning institutions.	Enhance the use of ICTs in POPs by end of 3rd Year.	Identify learning institutions	Meeting to identify institutions	Institutions identified.	2 months	ECZ	Institutions identified by 1st quarter 0f year 3	Minutes of meeting And list of identified institutions	Meeting	500	UNEP
		Build capacity in key staff from identified institutions on how to access POPs related information for I day	Train key staff from 10 identified institutions	Key staff trained	2 months	ECZ	Key staff trained by 1st qtr of year 3	Training workshop held	Venue/Food	1,550	ECZ/UNEP
									Hospitality	1,000	
									Transport refund	2,000	
									Accomm.	2,500	
									Stationery	300	
		Establish a link between learning institutions and ECZ	Establish computer networks with identified institutions	ICTs in learning institutions enhanced	2months	ECZ	Networks established by end of 2nd year 3	Network established	Network	500	ECZ/UNEP
Develop and implement guidelines and legislation on promotion of awareness amongst policy and decision makers	Develop and implement Guidelines by end of 2nd year.	Identify issues to be addressed by the guidelines	Consultation with stakeholders	guidelines and legislation on promotion of awareness amongst policy and decision makers developed	1 year	ECZ	Issues on guidelines identified by end of 1st month	Minutes of meeting	Venue/Food	2,500	ECZ/UNEP
									Hospitality	2,500	
		Engage Consultant	Develop TORs Engage consultant	Draft Guidelines	6 months	ECZ	Consultant engaged by end of 3rd month	ToRs developed Consultant Engaged	Consultancy fees	8,000	ECZ/UNEP
									TOR development	0	ECZ
		Review Draft	Review draft regulations/legislation	Regulations Reviewed	2 months	ECZ	Draft regulations reviewed by the 3rd quarter	Draft regulations reviewed Regulations approved Regulations printed and disseminated	Hospitality	3,000	ECZ/UNEP
									Venue/Food	500	
									stationery	200	
		Production and Dissemination of guidelines to target groups	Submit for Approval to Cabinet, Print and Dissemination	Regulations approved	6 months	ECZ	Regulations printed and disseminated by the end of the fourth quarter	Printed Regulations	Printing & Dissemination	10,000	ECZ/UNEP

Q

Incorporate POPs issues in the schools curricula	Incorporate issues on POPs in school curricula by end of 5th Year.	Collaborate with the Curriculum Development Centre (CDC)	Meeting with Curriculum Dev Center	POPs issues incorporated in the School curricula	I year	ECZ	Meeting with CDC held in the first month	Minutes of meeting	Meeting minutes	1,000	ECZ/UNEP
		Review and include POPs issues in the environmental education school curricula	Engage Consultant to review EE in school curricula Review draft	Draft Report	6 months	ECZ	Consultant engaged by 2nd quarter of the year , Draft reviewed by 3rd quarter	Consultant engaged	Consultancy fees	10,000	ECZ/UNEP
		POPs curricular Materials Development	Review and adoption of draft	POPs curricular developed	3 Years	ECZ	Materials printed and incorporated in the school curricula by end of year five	POPs curricular materials	Review meeting	4,000	ECZ/UNEP
									Printing	15,000	
Enhance the ability of the ECZ to act as the focal point as a source of information	Enhance ECZ as a focal point for information source by end of 1st year.	Procurement of materials and ICT equipment	Procurement of equipment/software	Equipment and software procured	6monthsr	ECZ	Equip/software procured by 2nd quarter.	Software and computer purchased	Software and hardware	5,000	ECZ/UNEP
		Build capacity in personnel managing the information center	Training workshop for key staff	Key staff trained	3 months	ECZ	Key staff trained by end of 3rd quarter	Functional Focal point established	Key Staff training	2,000	ECZ/UNEP
Strengthen collaboration with the media on information dissemination	To raise awareness levels in the media on POPs related issues by end of first year.	Identify relevant media institutions and provide training	Training workshop for media for 20 participants	Media institutions trained	2 months	ECZ	Media sensitization workshop by end of 3rd quarter	Workshop Report Media Sensitized on POPs related issues	Venue/Food	2,500	ECZ/UNEP
									Accomm.	1,500	
									Transport refund	600	
									Fuel/communication	500	
									Hospitality	2,000	
		Provision of awareness raising materials on POPs	Development of awareness materials on POPs	Materials disseminated to media	1 month	ECZ	Materials developed and disseminated by end of 2nd month	Materials developed	Material s Development	6,000	ECZ/UNEP
									Printing	5,000	
Sub Total										**155,000**	

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MONITORING AND REPORTING ACTION PLANS FOR ZAMBIAN NIP											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead & Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Undertake research of residue levels in different matrices such as food, soil and water to determine level of contamination arising from past and current use of POPs	To establish the levels of POPs in the environment	Conduct research on effects of POPs	Develop TORs for Consultancy	Draft Report	6 months	ECZ	Consultant Engaged by 2nd Month	Consultant Engaged	Engage Consultant	15,000	ECZ/UNEP
		Disseminate Report on POPs in the environment	Review Draft Report	Draft report reviewed	1 month	ECZ	Report reviewed by end of first month	Final Report	Review and printing	5,000	
			Print & Disseminate Findings	Report disseminated	2 months	ECZ	Report printed and disseminated by end of 2nd month	Report Printed and disseminated	Printing	5,000	
									Dissemination of report	2,000	
Strengthen capacity to screen all POPs containing equipment, infrastructure and sites	To build capacity for detecting POPs containing equipment	Develop and implement training programmes on POPs related issues	Train Workshop Setup Coordination Committee	Key Personnel Trained	6 months	ECZ	Key Personnel trained	Training workshop report	Venue/Food	4,500	ECZ/UNEP
									Accomm.	4,500	
									Transport refund	600	
									Fuel/communication	500	
									Hospitality	2,000	
		Improve coordination mechanism	Setting up committee	Coordination committee set up	2 months	ECZ	Coordination committee established by 1st Quarter	Coordination Committee established	Internal costs	0	ECZ
Strengthen institutional capacity and mechanism of monitoring effects of POPs in humans and environment	To establish a mechanism for monitoring effects of POPs on humans and environment	Enhance partnership among institutions involved in monitoring of POPs	Establish a mechanism for sampling & analyzing POPs	A strengthened institutional capacity to monitor the effects of POPs	3 Years	ECZ, MoH, MLGH Chemical Society of Zambia	Sampling & analysing mechanism established by1st Quarter 2nd Year	Sampling & Analysing Mechanism in place	Sampling/Analysing	75,000	ECZ/UNEP
		Provide training on POPs related issues	Generate list of POPs related symptoms	List of POPs related symptoms	3 Years	MoH, ECZ	Survey done by 1st Year	Survey report	Consultancy	350,000	ECZ/UNEP
			Create linkages between institutions dealing with POPs	Institutional Network established	6 months	MoH, MTENR, ML, Private Sector	List of Focal Points & Stakeholder Meeting held by 3rd Month	Mechanism of Data Exchange, Meeting proceedings	Stakeholders List Compilation	0	ECZ/UNEP
									Stakeholder meeting	1,000	

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Undertake research to determine suitable alternatives to POPs	To determine suitable alternatives to POPs	Establish research programmes on POPs alternatives Encourage adoption of feasible alternatives	Develop TORs for consultant & Engage Consultant	Report on alternatives to POPs	6 months	ECZ	Engagement of consultant 2nd Month	Research Report	Engage Consultant	10,000	ECZ/UNEP
			Review Draft Report	Draft report review	6 months	ECZ, MACo, MoH, Mines, ZESCO	Review draft report by 4th Month	Final Draft	Consultancy	5,000	ECZ/UNEP
			Print & Disseminate	Disseminate Report	6 months	ECZ	Dissemination by end of 4 months	Final Report	Printing	50,000	ECZ/UNEP
									Dissemination	5,000	
Develop guidelines and standards for monitoring POPs.	To develop guidelines for sound management of POPs	Develop appropriate standards and procedures	Develop TORs for consultant Engage Consultant	POPs Monitoring Guidelines and Standards developed	6 months	ECZ	Engagement of consultant 2nd Month	Research Report	Engage Consultant	5,000	ECZ/UNEP
		Develop monitoring programme	Review Draft Report	Draft report review	6 months	ECZ	Review draft report by 4th Month	Final Draft	Consultancy	20,000	
			Print & Disseminate	Disseminate Report	6 months	ECZ	Dissemination by end of 6 months	Final Report	Printing & Dissemination	15,000	
		Monitoring of all POPs releases into Air, Water, Soil and residue	Sampling	Samples collected	1 months	ECZ	50% of samples collected by 2nd week	Field report	National sampling	50,000	
									Analysis	20,000	
Subtotal										**645,100**	

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REPORTING OF POPs EMMISIONS AND PREVALENCE INVENTORY											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead &Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Develop mechanism for annual POPs updates and annual reporting of inventory	To develop a mechanism for annual POPs updates by the 2nd year of PI	Create POPs updating Subcommittee within the IEC	Data capture for DDT and Chlordane imports and usage	Updated inventory	1 year	ECZ/ZESCO/Mines/NCC/MoH	Draft report by 8th month	Draft report	Data capture	0	ECZ/ZESCO/ Mines/NCC/MoH
			Data capture for PCBs Tests								
			Data capture for other POPs								
	To develop a mechanism for annual POPs Inventory Reporting by 2nd year of PI	Draw up ToRs for the subcommittee	Constitute Subcommittee	Inventory Report	1 year	ECZ/ZESCO/Mines/NCC/MoH	Subcommittee constituted by 3rn month	List of subcommittee member	Meeting	1,000	ECZ/ZESCO/ Mines/NCC/MoH
		Create POPs Inventory Annual Report Drafting Subcommittee within the IEC	Nomination of members by stakeholders	Drafting Subcommittee created	6 months	ECZ/ZESCO/Mines/NCC/MoH	Nomination of member done by 2nd month	List of subcommittee member	Communication	100	ECZ/ZESCO/ Mines/NCC/MoH
		Annual PCBs Test update	To input results from screening of exercise into NIP database	NIP Database updated with results from screening test	1 month (30 days)	ECZ	NIP Database updated by 2nd quarter of 2nd year of PI	NIP Database updated	Data entry	15,000	ECZ/other
			Data entry of PCB GC results from the lab	Database updated	2 weeks	ECZ	Database updated with GC results by end of 4th quarter of 2nd year of PI	Updated database	Data entry	1,250	ECZ
		Annual DDT usage reporting	Data entry of DDT	Database updated	2 weeks	ECZ	Database updated by end of 4th quarter of 2nd year of PI	Updated database	Data entry	1,250	ECZ
		Annual Chlordane and other POPs (excluding PCBs & DDT) usage reporting and	Entry of data	Database updated	2 weeks	ECZ	Database updated by end of 4th quarter of 2nd year of PI	Updated database	Data entry	1,250	ECZ
		Annual PCDD/PCDF releases reporting	To input results release emissions into NIP database	NIP Database updated	1 month (30 days)	ECZ	NIP Database updated by 2nd quarter of 2nd year of PI	NIP Database updated	Data entry	15,000	ECZ/other
Subtotal										**34,850**	

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ACTION PLAN: INSTITUTIONAL AND REGULATORY STRENGHTENING MEASURES											
Description of Action	Objectives	Activities	Tasks	Outputs	Time line	Lead &Other agencies	Milestones	Performance indicator	Cost Estimate K'000		Source of funding
Strengthening, harmonizing and enforcing existing legislation	To harmonize and strengthen existing legislation	To review existing legislation to establish the gaps/ deficiencies	Engage a consultant	Harmonized and strengthened legislation	2 year	ECZ/MJ/other stakeholders	Consultant engaged by 3rd month	Gaps analysis report		315,000	ECZ/MJ/other stakeholders
	To enforce existing legislation	To strengthen co-ordination and co-operation mechanism	Organize inter-agency meetings	Updated legislation enforced	2 years	ECZ/MJ/other stakeholders	1st Inter-agencies meeting held within six months	Minutes of 1st meeting	Hospitality	3,000	ECZ/MJ/other stakeholders
									Venue/Food	500	
									stationery	200	
Review and formulate POPs Specific legislation	To enact POPs specific legislation	Consultative meeting	Stakeholder meeting	Recommendation report	1 year	ECZ/MJ/other stakeholders	Consultative meeting held within six meeting	List of key stakeholders consulted	Hospitality	3,000	ECZ/MJ/other stakeholders
									Venue/Food	500	
									stationery	200	
		Engage consultant	Formulate ToRs for Consultant	Contract signed	6 months	ECZ	ToRs formulated within 2 months	Media advert	Advert cost	15,000	ECZ/UNEP/ Donors
									Consultant cost	150,000	
			Drafting of new legislation	Draft legislation	1 year	ECZ	1st draft produced by 7th month	1st Draft copy			
Periodic review and assessment of impacts of POPs	To assess the Socio-economic impacts of POPs	Engage consultant	Formulate ToRs for Consultant	Contract signed	1 year	ECZ/UNEP	ToRs formulated within 2 months	Media advert	Advert Cost	15,000	ECZ/UNEP/ Donors
			Survey of POPs impacts	POPs impacts assessment report	1year	ECZ/UNEP	1st draft produced by 8th month	1st Draft copy	Consultant cost	60,000	
Periodic review of National Profile	To review and update the National Profile	Engage consultant	Formulate ToRs for Consultant	Contract signed	1 year	ECZ/UNEP	ToRs formulated within 2 months	Media advert	Advert Cost	15,000	ECZ/UNEP/ Donors
			Updating National Profile and inclusion of POPs and potential POPs chemicals	Updated National Profile	1 year		1st draft produced by 6th month	1st Draft copy	Consultant cost	20,000	
Policy alignment at local and International levels	To incorporate the SC requirement into the National Environmental Policy(NEP)	Engage consultant to review NEP in line with SC requirements	Formulate ToRs for Consultant	Contract signed	1 year	ECZ/UNEP	ToRs formulated within 2 months	Media advert	Advert Cost	15,000	ECZ/UNEP/ Donors
			Updating NEP to include SC requirements	NEP updated	1 year		1st draft submitted by 6th month	Draft NEP copy	Consultant cost	20,000	
Subtotal										**632,400**	