

# **BASELINE STUDY TOWARDS NON TOXIC ENVIRONMENT IN AFRICA COUNTRY REPORT**

## **ZAMBIA**



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by**

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## ABBREVIATIONS & ACRONYMS

AMCEN	African Ministerial Conference on Environment
ASP	African Stockpile Programme
AU	African Union
BCRC	Basel Convention Regional Centre
CAER	Community Awareness and Emergency Response
CAS No	Chemical Abstract Service Number
CBOs	Community Based Organisations
CBU	Copperbelt University
COMESA	Common Market for Eastern and Southern Africa
DDT	Dichloro diphenyl trichloroethane
ECZ	Environmental Council of Zambia
EPPCA	Environmental Pollution Prevention and Control Act
ER	Emergency Response
EU	European Union
FDCL	Food and Drugs Control Laboratory
GDP	Gross Domestic Product
GEF	Global Environment Facility
FAO	Food and Agriculture Organization of the United Nations
GHS	Globally Harmonised System for the Classification and Labelling of Chemicals
Hazmat	Hazardous material
HCCS	Harmonisation of Chemical Classification Systems
HCS	Hazardous Chemical Substances
IFCS	Intergovernmental Forum on Chemical Safety
IOMC	Inter-Organization Programme for the Sound Management of Chemicals
ISO	International Standards Organisation
KemI	Swedish Chemicals Agency
MEAs	Multilateral Environmental Agreements
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
n/d	not determined
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organisations
NIP	National Implementation Plan
NP	National Profile [on Chemicals Management]
OECD	Organisation for Economic and Co-operation Development
OHS	Occupational Health and Safety
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PPE	Personal Protection Equipment
REACH	Registration, Evaluation and Authorisation system for Chemicals (EU)
SADC	Southern African Development Community
SAESI	Southern Africa Emergency Services Institute
SAICM	Strategic Approach to International Chemicals Management
SDS	Safety Data Sheet
SITC	Standard International Trade Classification
SMME	Small, medium and micro enterprise
TDRC	TDRC
Tremcard	Transport Emergency Card
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environmental Programme
UNITAR	United Nations Institute for Training and Research
UN CETDG	United National Committee of Experts on the Transport of Dangerous Goods
UNZA	University of Zambia
WCSZ	Wildlife Conservation Society of Zambia

## **Executive Summary**

Every year tonnes of chemicals and waste are either disposed or moved from one place to another. These movements pose a great risk not only to the handlers and the transporters but to many innocent lives. The United Nations has put in place several conventions to address some of the immediate dangers posed by chemicals and waste. The extent to which these conventions are understood varies, hence the need to assess the understanding and interpretation of knowledge and information by the consumers, the workers and the general public.

The current initiative between the Secretariat of the Basel Convention (SBC), the Basel Convention Regional Centre (For English Speaking African Countries) and the Swedish Chemicals Agency (KemI) aims to address the concerns of hazards from waste and chemicals and to improve the levels of understanding of the Stockholm Convention, the Rotterdam Convention and the Basel Convention. The project focuses on five SAICM themes, namely Risk Reduction; Knowledge and Information; Governance; Capacity Building and Technical Co-operation; and Illegal International Traffic of chemicals and waste. To achieve this, a review and an update of the chemicals' profile have been undertaken and a survey has been carried out in order to obtain stakeholder views and priorities for the country.

It is clear from the study that though chemicals are useful to man they continue to pose a great danger to human health and the environment. Human economic activities have associated waste that is a bother, whether toxic and hazardous or not. The Chemicals and waste conventions (Basel, Vienna, Stockholm and Rotterdam) all have one thing in common – to protect human health and the environment. Member countries that are party to these conventions have a duty to domesticate the conventions into laws and ensure their adequate enforcement.

The Zambian government is participating well in international conventions, having ratified most chemicals and waste conventions or being almost at ratification stage. The Basel, Vienna and Stockholm Conventions have been domesticated into national law.

The Strategic Approach towards International Chemical Management (SAICM) project contributes towards a toxic-free environment in Africa. The study has revealed glaring gaps in levels of understanding, interpretation and in the mode and type of response expected during chemical incidences.

The current Zambia National Chemicals Profile was updated in 2005 and is the second edition following the 1996 first edition. The second edition though still in draft form, was mere an integration of the POPs into the National profile. The main emphasis was to include chemicals covered by the Stockholm Convention into the National Profile. It did not represent a holistic review or update of the other non-POPs chemicals. The second edition leaves out many issues about other chemicals.

From the study it can be concluded as follows:

- (a) The majority of the chemicals needed in Zambia are imported and the lack of proper management throughout the lifecycle poses threats to human health.
- (b) The majority of waste and hazardous waste is disposed of arbitrarily. Zambia still lacks a comprehensive waste and hazardous waste management strategy, including basic elements like waste collection, waste treatment, disposal sites, etc.
- (c) There is a need to conduct several independent studies in the mining towns to ascertain waste and soil pollution problems.
- (d) Limited information is available about the quantity, type and toxicity of hazardous waste generated. Institutional capacity to deal with poisoning and chemical incidences is not available and there appears to be no training facilities to address these problems.
- (e) The major source of information on chemicals and waste is the Environmental Council of Zambia, UNEP and through internet search. The adequacy of information obtained from these institutions is very high. There is a significant awareness of GHS on Classification and Labelling of Chemicals and the GHS implementation in the country appears to have taken off. The stakeholders' knowledge and information of the role of Chemicals and waste convention is low and a thorough grounding on the objectives of the Chemicals and waste conventions must be enhanced.
- (f) The government of the Republic of Zambia's efforts to promote sound management for Chemicals and waste are highly recognised. Most stakeholders (more than 70%) have sufficient knowledge of the Stockholm, Basel Conventions and the ILO Chemical Safety Programmes, while the Montreal Protocol is least understood. Most stakeholders are not aware of the local focal points of these conventions. Neither do they know where the offices of the focal points are. The study reveals that stakeholders are not aware of how international conventions become ratified and the steps leading to domestication of the conventions into national laws.
- (g) The demand of capacity building and technical co-operation in chemicals and waste management is high and efforts to improve understanding of the effects of chemicals and wastes are welcome via the training of local individuals for sustainability. It is hoped that with the training of local personnel, expansion of the local laboratories and the creation of national emergency centres would go a long way in reducing the impact of chemicals and waste on to the environment and human health.
- (h) The study reveals that at least 60% of the stakeholders think that the impacts of chemicals and waste on human health and the environment are considerably known but that the nation has little to limited capacity to handle and prepare for these risks. Limitations arise from several dimensions including lack of readiness to tackle global concerns due to a number of constraints, such as the availability of trained human

resource, finance, lack of adequate political will and failure to link poverty and sustainable development.

- (i) Most stakeholders expressed little knowledge of the quantities, type and levels of toxicity posed by hazardous waste to the community and the environment. Knowledge is therefore scanty and inadequate.
- (j) There is limited institutional capacity to handle incidences and accidents from chemicals and hazardous waste. This is evidenced by the absence of emergency centres and local knowledge on how to treat victims of such incidences.
- (k) Much of the sources of knowledge and information on the effects of chemicals and waste on environment and health are sourced through the ECZ, UNEP and/or via internet search. The information obtained in this way is often adequate. It includes their potential effects on health and environment, their potential uses and some information on protective measures to prevent accidents. The GHS on Classification & Labelling of Chemicals is useful in dissemination of information hazards.
- (l) The stakeholders are aware of the government's promotion of sound management programmes for chemicals and waste. Most of the programmes are channelled through the ECZ.
- (m) Most stakeholders (60%) have sufficient knowledge of the conventions on chemicals and waste, however the knowledge of the process of domestication of the conventions is lacking.
- (n) Despite the effort of the government to include women in decision making processes there is still low participation of women at managerial level on environmental issues.
- (o) The country has a critical mass of personnel and structures that can be used in capacity building but it will require support in further training of core trainers in chemicals and waste management. The proposed BCRC-KemI SAICM training outline can be the starting point. This can include issues on poison centres and needs for emergency response.
- (p) Knowledge on Illegal International traffic in waste and banned chemicals is limited with more than 80% of the stakeholders not being aware of how for example the key chemicals and wastes convention such as Basel, Vienna, Stockholm and Rotterdam, conventions assist in curbing the Illegal International Traffic.

In conclusion, the SAICM project is timely and relevant to the development of the country. It is hoped that if all the proposals are put into place then all the conventions and the domesticated laws will have achieved their aims and the attitude of people towards chemical and waste would improve.

## **Recommendations**

In view of the above, the following recommendations are made:

### **1. Training and awareness:**

From the gap analysis it is possible to develop capacity building programmes through the BCRC-KemI programme to address the various components of SAICM as follows:

#### **(a) Risk Reduction**

The following issues need to be addressed:

- (i) Knowledge on the impact of chemicals and wastes on humans and the environment.
- (ii) Knowledge on incidences of chemical releases to the environment and the perception on the preparedness of the nation to these incidences.
- (iii) Awareness on the Quantity, type and toxicity of hazardous waste generated in Zambia.
- (iv) Awareness on how hazardous waste is treated and disposed.
- (v) Knowledge on institutions which recover and recycle hazardous materials and waste.
- (vi) Knowledge of institutions and local R&D producing new and safer chemical & biological materials.
- (vii) Knowledge on the role of chemicals and waste conventions in risk reduction.
- (viii) Training and awareness to deal with poisoning and chemical incidences.
- (ix) Institutional awareness on risk assessment, management and communication.
- (x) National capacity & readiness to tackle global concerns.

#### **(b) Knowledge and Information**

These are the areas of concern:

- (i) Information on chemical management throughout their life-cycle.
- (ii) Knowledge on the presence of national Laws ensuring confidentiality of commercial & industrial information.
- (iii) Knowledge on the extent to which own local institutions generate scientific information on chemicals & waste management.

- (iv) Extent of interface between local institutions and policy making bodies.
- (v) Awareness on information on hazard & risk assessments.
- (vi) Access to international database on chemical safety data to promote risk reduction strategies.
- (vii) Knowledge on the role of the Chemicals and waste Conventions in promoting knowledge and information.

**(c) Governance**

These are the issues of concern:

- (i) Close working with other sectors of the government in promoting sound chemicals and waste management and involvement in identifying priorities pertaining to the same.
- (ii) Knowledge of the “**corporate environment & social responsibility**” concept.
- (iii) The perception of the institutions on the corporate community’s code of conduct to observe good practices.
- (iv) Involvement of the country stakeholders in setting up policies.
- (v) Involvement of women in decision making processes.
- (vi) Knowledge on the link between trade and the environment.
- (vii) Knowledge of incentives which support business to develop and improve products that advance the strategic approach to chemicals management.
- (viii) Knowledge on the Montreal protocol as one of the chemicals and wastes conventions.
- (ix) Knowledge on how international agreements are ratified and domesticated.
- (x) Knowledge on the national focal points for the various chemicals and waste conventions including knowledge on how these focal points coordinate amongst themselves.

**(d) Capacity Building and International Cooperation**

- (i) Role of the chemicals and wastes conventions in capacity building and technical cooperation.

### **(e) Illegal International Traffic**

- (i) The roles of the key Chemicals and wastes conventions namely Basel, Stockholm and Rotterdam and the Montreal protocol in combating illegal international traffic.
- (ii) Knowledge on the extent of domestication of these Conventions into local laws.
- (iii) Knowledge of the extent to which the Government shares information with other Governments is far from adequate. This is an area of concern if these institutions have to play an active role in the prevention of illegal International traffic.

## **2 Training contents**

Of the ten stakeholders in the study only three gave responses to the questions on training needs in the country in support of sound chemical and waste management. This small sample is not representative enough for the study. Some respondents merely focused on needs for their work places as opposed to needs of the country.

In any case there has to be a starting point, and it is appropriate to begin by defining the contents of Agenda 21 of 1992, Rio de Janeiro Summit, and to explain how the chemicals and waste conventions help in reducing risks caused by chemicals and waste.

In addition, the topics proposed through the BCRC-KemI project to address SAICM which link environment and sustainable development are key in achieving a non-toxic environment in Zambia.

## **3 Building of Local training capacity**

In order to have local training capacity in the country, training of the local personnel is cardinal. Zambia has tertiary educational systems capable of offering quality training on chemicals and waste. These institutions have qualified personnel to take on the task. It will be important for SAICM to provide initial training to a core group of trainer of trainers (TOT). The training should include curriculum development and module development. The training outline proposed by SAICM can form the basis for further development of a curriculum to address chemicals and waste management.

## **4 Possible areas where specific country projects could be developed**

### **(a) Risk Reduction**

- (i) Risk assessment, management and communication
- (ii) Highly toxic pesticides-risk management and reduction
- (iii) Occupational health and safety
- (iv) Building of capacities to deal with poisoning and chemical incidences<sup>1</sup>
- (v) Formulation of prevention and response measures to mitigate environmental and health impacts.

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<sup>1</sup> The country needs an emergency centre and emergency responders SAICM can provide emergency centres especially in large municipalities.

- (vi) Waste management (minimisation)
- (vii) The role of GHS in risk reduction
- (viii) Chemicals of global concern

**(b) Knowledge and Information**

- (i) Highly toxic pesticides-risk management and reduction
- (ii) Research, Monitoring and data management<sup>2</sup>
- (iii) Information management and dissemination<sup>3</sup>
- (iv) Hazardous data generation and availability
- (v) Globally Harmonized system (GHS) of Classification and Labelling
- (vi) Creation of National and International Registers
- (vii) Use of indicators to monitor children's environmental health
- (viii) Life cycle management

**(c) Governance**

- (i) Implementation of integrated national programmes for sound management of chemicals
- (ii) Stakeholder participation in decision making process
- (iii) Assessment of national chemical management to identify gaps and prioritise action
- (iv) Social and economic consideration
- (v) EIAs to include chemicals and hazardous waste
- (vi) Legal, Policy and Institutional aspects
- (vii) International chemicals and waste conventions-promotion of ratification and synergies
- (viii) GHS (review of national legislation and align with GHS)

**(d) Capacity building and technical cooperation**

- (i) Formulation of preventive and response measures to mitigate environmental and health impacts
- (ii) Capacity-Building to support national actions
- (iii) Remediation of contaminated sites and poisoned individuals
- (iv) Capacity to implement GHS<sup>4</sup>
- (v) Waste management

**(e) Illegal international traffic**

Capacity-Building to support national actions to curb illegal traffic

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<sup>2</sup> SAICM should assist in developing a monitoring and evaluation procedure about the life cycle of the chemicals from the time of import to its disposal

<sup>3</sup> There is need to develop and sustain a national chemicals and waste database, and to improve information collection and dissemination at the ECZ and in the local authorities. There is need to identify all the important stakeholder handling bulk chemicals and/or waste to create local databases and info-centres.

<sup>4</sup> There is need to develop ECZ institutional capacity and to intensively promote GHS.

# 1. Introduction to the Document

## 1.1 Background

The Basel Convention Regional Centre in Pretoria (BCRC) and the Swedish Chemicals Agency (KemI) plan a regional cooperation in Anglophone Africa to enhance chemicals management through the implementation of the Strategic Approach towards International Chemicals Management (SAICM), the Stockholm Convention, the Rotterdam Convention and the Basel Convention.

An improved chemicals management will contribute to better health and a healthier environment. Important elements are the development of regulatory frameworks and institutional capacity, awareness raising and investing in better processes. Moving from end of pipe solutions to prevention will also contribute to better economy and poverty reduction.

With some initial funding from the Swedish Ministry of Sustainable Environment, BCRC and KemI will develop and begin an initial baseline study/needs assessment of four countries. The result of the study will contribute to the larger project.

Africa participated effectively during the Strategic Approach towards International Chemicals Management (SAICM) process which led to its adoption by the world environmental ministers in February 2006 in Dubai. The following five SAICM focus areas were adopted :

- a. **Risk Reduction**
- b. **Knowledge and Information**
- c. **Governance**
- d. **Capacity Building and International cooperation**
- e. **Illegal International traffic**

The Dubai meeting proposed quick start up actions towards the International Chemicals Management. This approach was also endorsed at the recent 11<sup>th</sup> African Ministerial Conference on Environment (AMCEN) meeting held in Congo Brazzaville from 22-26 May 2006 as a policy framework key to the realization of the 2020 Chemicals goal of the Johannesburg Plan of Implementation and called upon an all inclusive multi-sectoral and multi-stakeholder approach.<sup>5</sup> The African response towards SAICM implementation is articulated in the African plan for the implementation of SAICM. This plan sees challenges on how SAICM implementation can be raised as a priority issue at the national level, given the range of competing problems and issues facing most African countries. It also emphasizes the importance of defining how SAICM implementation activities can effectively support other programmes and objectives, recognising that managing chemicals is one component of **broader national** efforts to achieve environmental protection and sustainable industrial and agricultural development. Some of the key areas that have to be addressed are to demonstrate on how:

- SAICM can contribute to **national efforts** to promote pollution prevention and cleaner production, particularly within small and medium-sized enterprises.

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<sup>5</sup> African Action Plan on Implementation of SAICM

- decisions made in the context of SAICM implementation can have an impact on regional and international trade
- stronger management of chemicals positively might influence the country's international image and the market for its products
- Improvements in chemical safety enhance the health and quality of life of its citizens.

This project seeks to contribute to the first steps for the implementation of the SAICM.

A regional approach in the capacity building to address chemicals and waste issues has been re-emphasized and articulated through the recent AMCEN XI meeting held in Congo Brazzaville in June 2006 which emphasizes through Decision 5(j), “To request international and regional partners to support efforts to strengthen the ability of the Basel Convention regional centres to undertake capacity-building for chemicals and hazardous waste management in related multilateral environmental agreements in Africa, in line with the objectives of the Strategic Approach to International Chemicals Management and the environment initiative of the New Partnership for Africa’s Development (NEPAD)”. At the Cairo African Regional SAICM meeting held from 11-17<sup>th</sup> Sept 2006, the Regional action plan was endorsed for implementation. Thus the Kemi/BCRC project has adopted a regional approach in its activities.

## **1.2 The larger project**

In order to respond to these African concerns through a regional approach this KEMI/BCRC project has identified key interventions to be undertaken for a three year period. These are:

1. Foundation activities - National Chemicals and waste baseline data and assessment of the capacity and roles of key national players
2. Training and awareness
3. Integrated Regional Chemicals and Waste Information Management System
4. Institutional capacity development
5. Promotion of the Globally Harmonised System (GHS) for Classification and labelling of chemicals as a vehicle towards improving environmental aspects in chemicals management and trading
6. Pilot programme on cross-sectoral approach amongst the Chemicals Multilateral Environmental Agreements (MEAs)
7. Monitoring and evaluation
8. Dissemination of project results

These interventions are expected to contribute towards a non-toxic environment in Africa, through sound and coordinated management of chemicals and wastes. The proposed initial baseline study/needs assessment lays a foundation for the larger project

## **1.3 Project Output**

The relevant KEMI/BCRC project output related to this assignment is 1.1 and it relates to objective **1** of the project proposal as follows,

**Objective 1:** Key baseline data on National Chemicals and waste established including an assessment of and needs of the following: the capacity of national institutions to manage chemicals and waste, environmental legal frameworks, Government ministries responsible, regulations, Industries, Chemical importers/exporters, Chemical users, disposal facilities enforcement, training institutions, training curricula, Civil societies, projects-on going/completed.

Output	Description
1.1	<p>Baseline information identifying the gaps or needs on each of the following categories below:</p> <ol style="list-style-type: none"> <li>1. National Chemicals and waste data</li> <li>2. National Institutional arrangements: <i>(Ministries and organisations responsible for chemicals and waste management)</i></li> <li>3. Legal framework and law enforcement</li> <li>4. Administrative capacity</li> <li>5. Trade and manufacturing issues <i>(Chemical Importers/exporters, including hotspots of concern and identifying areas where industry possibly will grow)</i></li> <li>6. Chemicals Consumers <i>(Industrial and Agricultural)</i></li> <li>7. Environmental Civil societies</li> <li>8. Training institutions and training curricula</li> <li>9. Chemical laboratory infrastructure <i>(toxicology and eco-toxicology)</i></li> <li>10. Human resources capacity <i>(Chemicals and waste management)</i></li> <li>11. Chemical/waste management Projects-<i>(ongoing/completed)</i></li> <li>12. Any other relevant information central to the implementation of SAICM</li> </ol>

## 2. Overview of the Objectives

### 2.1 Introduction

SAICM aims at creating a further understanding and management of chemicals and waste in the main target areas under GHS: industrial production, agriculture, transport and consumers.

The four target sectors have been identified by the GHS as primary end-users of the hazard communication system. These sectors receive and use the information about hazardous chemicals in different ways. Employers and workers in the industrial production sector need to know the hazards and the specific protective measures required for the chemicals used or handled in the workplace. Farmers and farm workers are potentially at risk through the use of agricultural chemicals, such as pesticides and fertilizers. Those involved in the transport sector require information on general safe practices that are appropriate for all transport situations. Consumers are exposed to a wide variety of chemicals, which require labelling that is sufficiently detailed and relevant to ensure the safe use of the product.

SAICM includes waste handling and management. Hazardous waste comes in various forms, namely industrial waste chemicals and substances, municipal waste, clinical waste, etc. each with its own extent of hazardousness.

In addition SAICM aims to provide an understanding on the level of emergency preparedness in the event of incidences involving Chemicals and waste.

The SAICM objectives are classified into five(5) main categories:

**(1) Risk Reduction:** This objective focuses on the global concerns of the impacts of chemicals and waste on the environment and health; toxicology and eco-toxicology; waste minimization; building of capacities to deal with poisoning and chemical incidences; and linkages of the Chemicals and waste conventions to risk reduction.

**(2) Knowledge and Information:** This objective focuses on information management and dissemination; life cycle of chemicals from the production-use-disposal pattern; creation of national and international registers; the Globally Harmonized System (GHS) of Classification and Labelling; research, monitoring and data management; and linkages of the Chemicals and waste conventions to knowledge and information.

**(3) Governance:** This objective focuses on legal, policy and institutional aspects; GHS (review of national legislation and alignment with GHS requirements); social and economic considerations; assessment of national chemical management to identify gaps and prioritize action; stakeholder participation in decision making process; EIAs with a view to include chemicals and hazardous waste issues for protected areas; and International Chemicals and waste conventions, as well as the promotion of their ratification and synergies.

**(4) Capacity Building and Technical Cooperation:** This objective focuses on Capacity building to support national actions; formulation of preventive and response strategies to mitigate environmental and health impacts of emergencies involving chemicals; capacity to implement GHS; waste management; remediation of contaminated sites and poisoned individuals; and linkages of the Chemicals and waste conventions to capacity building and technical cooperation.

**(5) Illegal International Traffic:** This objective focuses on the prevention of illegal and dangerous goods; and linkages of the Chemicals and Waste Conventions to prevention of illegal international traffic.

Through these objectives, the SAICM project in the Africa Plan of Action hopes to put a framework to achieve stakeholder support concerning the reduction of dangers arising from chemicals and waste. A knowledge of the country's National Profile's contents by stakeholders, government and implementing agencies will be required. In addition, a SAICM training programme for stakeholders is envisaged and is central in the SAICM implementation Plan.

## **2.2 The Objectives of the Baseline study**

The main objectives of the baseline study are:

- To establish baseline data on National Chemicals and Wastes
- To assess the capacity of national institutions to manage chemicals and disposal facilities
- To review environmental legal frameworks and regulations
- To make an inventory of: (i) Industries using chemicals  
(ii) Chemical importers / exporters
- To assess the capacity and needs for training

### 3. Methodology

A brief account of the work done in conjunction with the initial basic tools provided by the Swedish Chemicals Agency (KemI) and the Basel Convention Regional Centre (BCRC), Pretoria, South Africa is given in this report.

The methodology for data collection included the dissemination of questionnaires to stakeholders and ministries /government agencies; person-to-person interviews; literature review on the various conventions on chemicals and waste management. A reference to the revised national profile (2005 Ed.) was made.

#### 3.1 Methodology followed:

In undertaking this exercise, we took advantage of information already available in the country through various national programmes and other expertise from various Regional and International institutions. The steps taken were as follows:

- I. Familiarisation with the concept of the SAICM and all relevant background information on the subject
- II. Review of relevant technical documentation available as outlined below with the help of country experts:
  - National Chemicals Profiles (2005 revised)
  - Reports of the National Implementation Plans (NIPs reports)
  - The 2005 Country report to Secretariat of Basel Convention Questionnaire
  - National Waste Management Handling, Classification and Disposal guidelines
  - Inventories of training providers, universities, NGOs etc.
  - Available Training curricula, training and awareness materials on Chemicals and wastes.
- III. Responding to the questionnaire developed by the BCRC in cooperation with KemI targeting the key stakeholders in Zambia

#### 3.2 Activities undertaken:

		WEEKS							
		1	2	3	4	5	6		
1	Collection of the Background National information								
2	Filling in the questionnaire from BCRC/KemI								
3	Compilation of the draft report								
4	Meeting with the BCRC/KemI team on Agreed dates								
5	Submission of the final report to the BCRC-in print and electronic form								

A sample of 10 stakeholders was surveyed. The sample was drawn from stakeholders in Government, quasi-government agencies, the private sector and NGOs. It should be emphasized that Zambia has always used a stakeholder driven approach to international issues involving chemical management. This consultative decision making approach ensures ownership of decisions taken through the central implementing agency - the Environmental Council of Zambia (ECZ).

The Questionnaires numbered 1-5 covered the following areas:

- Questionnaire 1: An update of the Zambia chemicals profile.
- Questionnaire 2: Situational analysis for the Key Areas within SAICM.
- Questionnaire 3: To establish the critical areas where specific projects could be developed.
- Questionnaire 4: Outline of the training contents to promote a non-toxic Africa.
- Questionnaire 5: Outline of training potential.

In each of the questionnaires (2-4) the five main objectives of SAICM on Risk reduction, Governance, Capacity-building and technical cooperation and Illegal international traffic were investigated.

The findings in this report were subject to certain limitations, among which are:

- The distribution of study sites did not cover the whole spectrum of stakeholders because of time limitations.
- The size of the sample of stakeholder was fixed at 10
- The limited study duration had an effect on the result, as it was not possible to pre-test the questionnaires for their effectiveness in bringing about desired outcomes.
- The study was unable to adequately assess stakeholder institutions that are located away from Lusaka.
- Some stakeholders took a long time to return the completed questionnaires.

## 4. Background Country Information



**Fig 4.1 Map of Zambia<sup>6</sup>**

### 4.1 Basic National Data

At a glance, Zambia can be summarized as follows:

- (a) Surface Area/size of the Country: 752 309 sq. km  
Land Use:  
Arable land: 6.99%  
Permanent crops: 0.04%  
Other uses: 92.97%  
Irrigated Land: 1 560 km<sup>2</sup>
- (b) Form of Government: *Democratic multi-party state*
- (c) Official Communication Language: *English*
- (d) Official local languages: *Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja and Tonga.*
- (e) Total population: 11 477 611 [*Ratio 0.99 males per female (2006 estimate)*]  
Population growth rate: 2.11%  
Average Age of the Population: 29 years

<sup>6</sup> Source: [media.maps.com/magellan/Images/ZAMBIA-W1.gif](http://media.maps.com/magellan/Images/ZAMBIA-W1.gif)

Population of Working Age (21-55yrs):

- 550 000 formal employment
- 1 500 000 non-formal employment

Birth rate: 41 births per 1 000 population

Total fertility rate: 5.39 children born per woman

Death rate: 19.93 births per 1 000 population

Life expectancy at birth:

- Total population 40.03 years
- Male: 39.76 years
- Female: 40.31 years

Population dynamics since the last National Profile document was prepared and most recent statistics are shown in Table 4.1 and Table 4.2 below.

**Table 4.1: Surface Area and Population Distribution by Province.**

Country/ Province	Population	Population Share (%)	Area (km <sup>2</sup> )	Population Density People/km <sup>2</sup>	Population Distribution (%)		
					Rural	Urban	Total
<b>Zambia</b>	9 885 591	100	752 612	13.1	65	35	100
<b>Central</b>	1 012 257	10.2	94 394	10.7	75	25	100
<b>Copperbelt</b>	1 581 221	16.0	31 328	50.5	21	89	100
<b>Eastern</b>	1 306 173	13.2	69 106	18.9	91	09	100
<b>Luapula</b>	775 353	7.8	50 567	15.3	85	15	100
<b>Lusaka</b>	1 391 329	14.1	21 896	63.5	19	71	100
<b>Northern</b>	1 258 696	12.7	147 826	8.5	84	16	100
<b>N/Western</b>	583 350	5.9	125 826	4.6	87	13	100
<b>Southern</b>	1 212 124	12.3	85 283	14.2	79	21	100
<b>Western</b>	765 088	7.7	126 386	6.1	89	11	100

Source: CSO 2003, "2000 Census of Population; Official Population Figures".

**Table 4.2: Zambia's Population Estimate for 2006.**

Distribution	Male	Female	Totals
<b>Rural</b>	3 761 403	3 788 166	7 549 569
<b>Urban</b>	1 975 836	1 952 206	3 928 042
<b>Grand Totals</b>	<b>5 737 239</b>	<b>5 740 372</b>	<b>11 477 611</b>

Source: CSO, 2006 "Selected Social Economic Indicators - 2004 -2005.

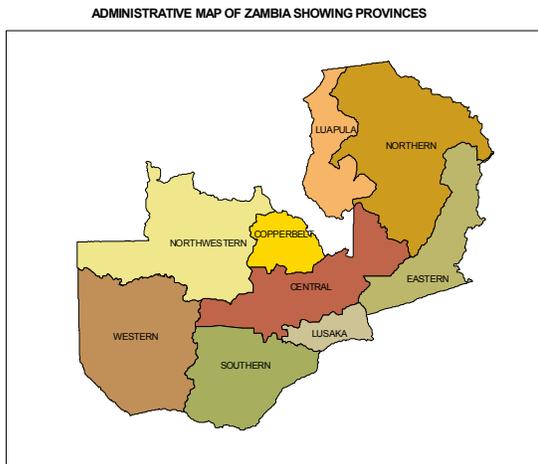
#### 4.1.1 Political/Geographic Structure of the Country

The Republic of Zambia, shortened as Zambia, lies in the southern hemisphere between Latitudes 8° - 18° S and between Longitudes 22°- 32° E and is 2 hours ahead of Greenwich Mean Time (GMT). The country is dry much of the year and has three distinct weather patterns: (a) From April to August there is dry and cold winter time with average lowest day temperatures ranging from 12-18°C; (b) From September to November there is dry and hot summer time with average highest day temperatures ranging from 31-35°C; and (c) From November to March it is wet and warm with an average annual rainfall of over 1500mm in the North and below 900mm in the South of the country with average highest day temperatures ranging from 28-30°C.

Much of the country is flat land with a few stretches of high lands mainly along the Luangwa River and the Zambezi River. The country enjoys the presence of vast wetlands of the Zambezi River in the western province and Chambeshi-Luapula Rivers wetlands in the Luapula province.

A Head of state, who is the President with a five-year term of office, rules the country. The current constitution requires the presidential candidate who has won a simple majority of vote to be appointed president of the republic. The constitution recognizes the separation of powers in the main organs of government as: Executive (Cabinet), Legislative (Parliament), and Judiciary (Courts of law).

Administratively, the country is sub-divided into nine (9) non-autonomous provinces (Figure 4.2), each having an administrative capital and several municipalities. Though most operations are centralised, the provincial centres play a major role in the administration of the country. For example the political head of the province is a Deputy Minister who is assisted by several District Commissioners while government is represented at Permanent Secretary level.



**Figure 4.2 Administrative map of Zambia showing the Provinces**  
Source: Government of Zambia

The districts are broken down into constituencies, each having a representation in parliament. Decisions at district level are made by local authority councillors headed by either a mayor or a chairman. The councillors are elected members from different political parties.

Attempts to decentralise government operations in the ministries of health, education, environment and home affairs are in place with decisions being fairly referred to and operationalised at district levels. Thus, each district has an environmental local authority council committee that looks at environmental issues affecting the district. The district environmental committees have limited power which they derive from local bye-laws but

must adhere to the environmental regulations enforced by the Environmental Council of Zambia (ECZ) on behalf of the government. The current linkage between the ECZ and the district environmental committees is weak and is suspect to manipulations and interferences.

#### 4.1.2 Industrial and Agricultural Sectors

The economy of Zambia relies heavily on the mining and extraction industry. Copper has been the main stay of the economy since early days of the country's formation as Northern Rhodesia through to independence time in 1964. During the period 1973-1999, the copper mining industry saw a drop in value of both the mines operations and products. This drop in income can be attributed to the following reasons, among others:

- (i) poor copper prices at the London Metal Exchange (LME),
- (ii) absence of re-investment in the industry,
- (iii) amalgamation and nationalisation of the mining industry leading to formation of the giant Zambia Consolidated Copper Mines (ZCCM),
- (iv) the ZCCM Conglomerate was too huge to administer properly,
- (v) unsound management practices and complacency,
- (vi) multiple non-direct mining operations engaged by the ZCCM.

The liberalization policy adopted by government in the late 1990's saw the collapse of the ZCCM and its being replaced by multiple players industry. Today the re-investment into the industry has revamped the sectors with new mines in the North-Western and Southern provinces taking centre stage.

The country is diversifying its mining base. Other minerals include gem stones, diamonds, while oil exploration show promising results.

The agricultural sector has steadily increased with a significant contribution (from K419 bn in 2001, to about K450bn over the period 2004/2005, Table 4.3) to the overall Gross Domestic Product (GDP). In particular, foreign exchange earning cash crop production is replacing the food production tradition maize. Several cash crops include tobacco, sunflower, paprika, and so on. The Zambia Export Growers Association (ZEGA) members take interest in the exporting of flowers, vegetables and beverages mainly to Europe.

**Table 4.3 Industry Share of GDP by Kind of Economic Activity 2001 – 2005.**

<b>GDP</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
<b>GDP at Current Prices (K Billion)</b>	13 132.7	16 260.4	20 479.2	25 997.4	32 456.3
<b>At Constant (1994) Prices (Billion)</b>	2 621.3	2 707.9	2 846.5	2 999.2	3 155.9
<b>Per Capita GDP: current</b>	1 301 621	1 562 085	1 906 038	2 344 290	2 836 723
<b>: constant</b>	259 806	260 138	264 930	270 540	275 830
Real GDP Growth	4.9	3.3	5.1	5.4	5.2
<b>Sectoral Contribution to GDP (1994)</b>					
<b>Agriculture; Forestry and Fishing (K Billion)</b>	418.9	411.7	432.5	450.8	448.3
<b>%</b>	16.0	15.2	15.2	15.0	14.2

<b>Mining and Quarrying (K Billion)</b>	182.9	212.9	220.2	250.9	270.8
<b>%</b>	7.0	7.9	7.7	8.4	8.6
<b>Manufacturing</b>	273.7	289.4	311.4	325.9	335.3
<b>%</b>	10.4	10.7	10.9	10.9	10.6
<b>Construction</b>	137.8	161.8	196.8	237.1	287.3
<b>%</b>	5.3	6.0	6.9	7.9	9.1
<b>Wholesale and Trade</b>	481.2	505.4	536.1	563.1	576.7
<b>%</b>	18.4	18.7	18.7	18.8	18.3

Source: "Selected Social Economic Indicators - 2004 -2005". Note: K4 000 = \$1.0

The manufacturing industry has always played a supportive role to either the mining or the agricultural industry. The construction industry has almost doubled its share of contribution to the GDP from 5.3% in 2001 to 9.1% in 2005, especially with the booming of the overall economic and investments climate in the country over the past five years. Other activities in the manufacturing industries in this category are cited in Table 4.4.

**Table 4.4: Structure of the Manufacturing/ Agricultural Sectors**

<b>Sector</b>	<b>Contribution to the Gross Domestic Product(%)</b>	<b>Number of Employees</b>	<b>Major Products in each Sector</b>
Industrial/ Manufacturing Sector <sup>2</sup>	59.36	154 442	Food beverage and Tobacco, Textiles and Leather products, Wood and wood Products, Paper and Paper Products, Chemical/Rubber/Plastics, Fabricated Metal Products
Mining and Extraction	7.92	45 621	Copper, Cobalt, Nickel
Agricultural Sector	15.12	56 139	Maize, groundnuts, seed cotton, sunflower seeds, soya beans burley & virginia tobaccos, paddy rice, sorghum, millet, mixed beans
Others	17.64	242 741	Electric power, personalised goods & services

Source: CSO 2005-6, 'selected social economic Indicators'

<sup>2</sup>This includes all manufacturing, production, formulation, assembly and related facilities

Table 4.4 and Table 4.5 provide a summary of the relative importance of the primary sectors of the economy, i.e. the industrial sector (which includes manufacturing and other production facilities) and the agricultural sector.

**Table 4.5: Overview of the Industrial and Agricultural Sectors**

Sector	Micro Farms/ Facilities <sup>a</sup>	Small Farms/ Facilities <sup>b</sup>	Medium Farms/ Facilities <sup>c</sup>	Big Farms/ Facilities <sup>d</sup>
Industrial/ Manufacturing Sector	9	7	7	12
Mining and Extraction	725	260	76	12
Agricultural Sector	1250	295	86	9
<b>Total</b>	1984	562	169	33

Source: CSO, 2002, "Central Register of Establishments"

Key: <sup>a</sup> 1 to 15 employs; <sup>b</sup> 16 to 100 employees; <sup>c</sup> 101 to 250 employees; <sup>d</sup> More than 251 employees

**Table 4.6: Breakdown of Agricultural Production by Provinces – 2004/2005.**

Province	Major Crops	Production (MT)	Size of Productive Areas (# hectares)
<b>Central</b>	Irish potatoes	2 711	161
	Maize	204 230	130 131
	Millet	770	3 391
	Sorghum	2 240	4 937
	Seed Cotton	29 233	36 205
	Sunflower	957	3 499
	Soyabeans	25 159	23 781
<b>Copperbelt</b>	Maize	118 737	64 599
	Sunflower	105	178
	Sorghum	2 690	3 312
	Irish Potatoes	294	90
	Soybeans	30 850	11 367
<b>Eastern</b>	Maize	169 395	202 375
	Sunflower	6 636	17 836
	Rice	2 834	4 192
	Soybeans	194	356
	Sorghum	880	2 782
	Seed Cotton	81 042	109 988
<b>Luapula</b>	Maize	31 883	23 251
	Rice	1 310	746
	Millet	1 929	261
	Mixed beans	126	-
	Groundnuts	-	-
	Sweet potatoes	-	-
<b>Lusaka</b>	Maize	33 061	29 322
	Sorghum	139	535
	Sweet potatoes	-	-
	Millet	-	-
	Sunflower	1 138	2 611

Province	Major Crops	Production (MT)	Size of Productive Areas (# hectares)
	Irish Potatoes	7 726	352
<b>Northern</b>	Maize	40 814	34 976
	Sorghum	856	1 145
	Millet	22 771	28 894
	Rice	6 807	6 269
	Mixed beans	808	1 679
	Sweet potatoes	5 684	2 169
<b>N/Western</b>	Maize	118 017	92 689
	Rice	212	299
	Millet	222	584
	Mixed beans	115	1 023
	Sorghum	4 013	4 728
	Sweet potatoes	5 684	2 169
<b>Southern</b>	Maize	120 518	172 746
	Sorghum	1 994	20 166
	Sunflower	688	6 246
	Millet	1 464	9 907
	Seed cotton	42 687	27 237
	Irish potatoes	2 801	142
	Mixed beans	115	1 023
<b>Western</b>	Maize	29 612	84 898
	Sorghum	5 359	18 858
	Millet	1 749	16 222
	Seed cotton	560	995
	Paddy rice	2 110	6 376
	Sweet potatoes	2 333	659

Source: MACO, 2006, "2004/2005 Crop Forecasting Survey"

#### 4.1.3 Industrial Employment by Major Economic Sectors.

Various industries require chemicals of some form and also produce waste either in the production line as raw materials or as by-products or end products. Employees are constantly exposed hazards arising from the core business of the industrial operations. Table 4.8 identifies the relative importance of different industries that may have implications for the safe management of chemicals. However, information needed for this section required time to gather and is therefore not available at the time of compiling the report. Employment figures are shown in Tables 4.7, 4.8, and 4.9.

**Table 4.7: Formal Sector Employment Trends By Industry.**

Year	Agricultural	Mining	Manufacturing	Electricity & Water	Construction	Trade	Transport	Business & Financial Services	Personal & Community Services	Total
2005	65 496	32 103	40 151	6 309	7 953	67 251	20 679	22 313	173 990	436 066
2004	65 136	46 078	45 340	12 346	5 787	44 460	26 510	31 880	138 691	416 228
2003	64 096	48 597	39 385	10 832	3 467	53 450	26 725	28 555	141 697	416 804
2002	43 819	37 245	67 752	7 316	2 406	50 812	21 566	52 727	145 763	429 406
2001	59 248	34 966	47 679	5 038	13 798	52 223	46 618	31 415	184 331	475 316

Source: CSO, 2006, "Selected Social Economic Indicators - 2004 -2005".

**Table 4.8: Number and Percentage Distribution of Employees by Industry, June 2006**

Industry	Percentage	Total Employees
Agriculture	11.3	56 139
Mining	9.2	45 821
Manufacturing	11.2	55 709
Electricity and Water	2.5	12 399
Construction	2.9	14 343
Trade	13.0	65 012
Transport	3.9	19 378
Business Services	10.8	54 032
Personal & Community Services	35.3	176 110
<b>Total</b>	<b>100</b>	<b>498 943</b>

Source: CSO, 2006, "Selected Social Economic Indicators - 2004 -2005".

**Table 4.9: Number of Employees by Sector**

Sector	Percentage	Total Employees
Industry	23.5	117 056
Central Government	1.6	7 771
Local Government	9.8	49 085
Parastatal	65.1	325 031
	<b>100</b>	<b>498 943</b>

Source: CSO, 2006, "Selected Social Economic Indicators - 2004 -2005".

## 4.2 Production of Chemicals

The production of chemicals for local use or export is minimal. The chemical needs of industry and other manufacturing entities are met through imports.

## 4.3 Chemical Imports

The chemical needs of industry and other manufacturing entities are met through imports. The value of total imports into Zambia was K4 733 billion in 2002, K7 440 billion in 2004, and K11 449 billion in 2005 (CSO, 2006; note K4 000 = US\$1.0). The major imports into Zambia over the period 2002-2005 (top ten) are shown in Table 4.12. Chemical imports represent an average of 18.5% of the total import commodities from 2002 to 2005.

The value of chemical imports almost doubled over the period 2002 to 2004, while the same statistic almost trebled over 2002 to 2005 with obvious inherent consequences in terms of requirements for sound management of the chemicals over their life cycle. Table 4.10 shows the Chemical importing companies and their reported 2006 imports as recorded by ECZ.

**Table 4.10 Chemical importing companies in Zambia.**

No	Name
1	Ace Past Control (Pvt Ltd)
2	Crop Chem Services Ltd
3	Croperve
4	Cure Chem Zambia Ltd
5	Farm Chem Services
6	Lomise Investments
7	Manal Investments Ltd
8	Omic Fertilizer
9	Prime Cropcare
10	Twinga Chemicals
11	Wanangwa wholesalers
12	Zambia Leaf Tobacco Ltd

Source: ECZ August 2007

**Table 4.11 2006 Chemical imports as reported by Chemical importing companies to ECZ**

	Imports
Kg	245,444
Litres	445,764

Source: ECZ 2007

**Table 4.12: Imports by SITC (K Billion) 2002 – 2005.**

SITC No.	Year Commodity	2002		2003		2004		2005	
		Value	Share	Value	Share	Value	Share	Value	Share
<b>0</b>	<b>Food and live animals</b>	509	11	761	10	469	5	498	4
<b>1</b>	<b>Beverages and Tobacco</b>	9	0	10	0	11	0	14	0
<b>2</b>	<b>Crude materials (excluding fuels</b>	154	3	279	4	329	3	395	3
<b>3</b>	<b>Mineral fuels, lubricants &amp; related materials</b>	312	7	611	8	1 164	11	1 197	10
<b>4</b>	<b>Animal and vegetable oils, fats and waxes</b>	100	2	157	2	197	2	186	2
<b>5</b>	<b>Chemicals</b>								
	<b>Fertilisers</b>	81	10	157	11	94	6	43	2
	<b>Pharmaceuticals (not medicaments)</b>	77	10	163	12	211	13	295	15
	<b>Urea</b>	55	7	67	5	144	9	112	6
	<b>Prepared explosives (excluding propellant powders</b>	27	3	30	2	46	3	39	2
	<b>Propylene</b>	25	3	44	3	72	4	77	4
	<b>Other chemical products</b>	23	3	36	3	48	3	28	1
	<b>Other acrylic polymers</b>	22	3	33	2	29	2	34	2
	<b>Others</b>	469	60	848	62	1 007	61	1 396	69
	<b>Chemicals – Sub-total</b>	<b>780</b>	<b>16</b>	<b>1 379</b>	<b>19</b>	<b>1 652</b>	<b>16</b>	<b>2 025</b>	<b>18</b>
<b>6</b>	<b>Manufactured goods</b>	657	14	1 182	16	1 501	15	1 810	16
<b>7</b>	<b>Machinery and Transport equipment</b>	1 572	33	2 385	32	3 204	31	3 610	32
<b>8</b>	<b>Miscellaneous manufactured articles</b>	635	13	672	9	1 742	17	1 701	15
<b>9</b>	<b>Unclassified commodities</b>	4	0	4	0	5	0	14	0
	<b>Totals</b>	<b>4 733</b>	<b>100</b>	<b>7 440</b>	<b>100</b>	<b>10 275</b>	<b>100</b>	<b>11 449</b>	<b>100</b>

Source: CSO, 2006, "Selected Social Economic Indicators - 2004 -2005" (note K4 000 = US\$1.0)

#### 4.4 Chemical Exports

The levels of external trade, for chemicals in particular, are relatively low compared to other imports. Table 4.13 shows comparison of exports from Zambia for the period 1999 – 2003. The total exports of chemicals and chemical-based products amounted to less than 1% per year (compare to 16% as imports)

**Table 4.13: Zambian Exports by SITC Section.**

Commodity	Value of Exports/year (K bn)				
	1999	2000	2001	2002	2003
Food	164.9	207.3	274.1	300.4	356.3
Beverages and Tobacco	27.8	34.5	50.3	72.4	97.9
Crude Material	538.0	220.6	192.7	318.7	425.4
Electricity and Mineral Fuel	12.9	28.6	35.9	33.5	64.6
Oil and Fats	1.5	0.7	0.5	1.1	2.1
Chemicals	22.4(1.1%)	14.0(0.5%)	20.7(0.6%)	49.6(1.2%)	44.7(1.0%)
Manufactures classified by materials	1 500.1	2 123.0	2 840.6	3 081.8	3 515.7
Machinery, Transport and Equipment	29.3	39.8	32.9	34.8	38.5
Other Manufactured Articles	25.7	30.6	14.7	75.3	51.4
Miscellaneous Transactions	5.3	17.3	74.7	102.2	29.4

Source: CSO 2006

#### 4.5 Chemical Consumption

Commodities of chemical nature are not effectively segregated at the point of both use and importation, so that it becomes almost impossible to make accurate inventories of the end use. However, for one commodity, namely fertiliser, there is a cadre of competent technical expertise, who records usage relative to expected yields. Hence it is possible to report used quantities as shown Table 4.15.

**Table 4.14 Chemical use in the country**

Type of Chemical	Number of Tons used per Year in the Country		
	2000	2001	2002
<i>Pesticides –Insecticides</i>			230 609
<b>Pesticides – Herbicides</b>			203 205
<b>Pesticides – Fungicides</b>			198 140
<b>Pesticides – Chlordane/DDT</b>	--/16	--/5.4	10/5.9
<b>Fertilizers</b>			120,089
<b>Petroleum Products</b>			433,087
<b>Industrial Chemicals (Used in manufacturing/Processing Facilities)</b>			
<b>Consumer Chemicals</b>			
<b>TOTAL</b>			

Source: National Chemicals Profile revised 2005

Table 4.15 shows the use of fertilisers in the country

**Table 4.15: Quantities of Basal Fertilizer applied to Crop in Kg in Provinces**

Province	Maize	Sorghum	Rice	Millet	Sunflower	Groundnuts	Total
Central	3 255 307			1 296	2 722		3 270 023
Copperbelt	1 386 685						1 386 685
Eastern	4 489 273				10 644		4 510 496
Luapula	589 231	799					591 336
Lusaka	998 946						998 946
Northern	2 645 747	9 582		45 684		15 993	2 718 993
N/western	610 217						610 217
Southern	5 403 564				14 976		5 418 540
Western	330 076		11 783	5 329			347 188
<b>Total</b>	<b>19 709 045</b>	<b>10 381</b>	<b>11 783</b>	<b>52 309</b>	<b>28 343</b>	<b>15 993</b>	<b>19 852 424</b>

Source: MACO

## 4.6 Production of wastes

### 4.6.1 Introduction

Due to the industrialisation and population growth in Zambia, waste generated is on the rise and poses a serious concern.

Waste in the context of Zambian law is defined dependent on whether it is hazardous or not, as follows:

- According to the Environmental Protection and Pollution Control Act (EPPCA) of 1990, amended in 1999, "waste" means garbage, refuse, sludges and other discarded substances resulting from industrial and commercial operations and from domestic and community activities, intended to be disposed of, or are disposed of or are required to be disposed of, but does not include waste water as defined in Part IV of the Act.
- According to the Hazardous Waste Management Regulations Statutory Instrument Number 125 of 2001 "hazardous waste" means waste, including objects, articles or substances, which is poisonous, corrosive, irritant, explosive, inflammable, toxic or harmful to man, animal, plant or environment.

Schedule 4 (Regulation 3), Schedule 5 (Regulation 3), Schedule 6 of the Hazardous Waste Management Regulations, 2001, provides a list of hazardous waste, a list of hazardous characteristics (Annex III of the Basel Convention) and categories of wastes to be controlled (Annex I of the Basel Convention) respectively.

#### 4.6.2 Municipal waste

An average Zambian produces about 0.45 kg of waste per day according to 1996 estimates.<sup>7</sup> Lusaka's waste alone was expected to rise from 220,000 tonnes in 1996 to 530,000 tonnes in 2011, which corresponds to an increase of 141%. This poses a great challenge. Municipal waste production per capita in Zambia ranges from 0.150-350t/yr out of which only 12.4% is disposed. Typical data for the waste generation for the City of Lusaka in 1996 are shown in the Table 4.16

**Table 4.16 Estimated yearly quantities of waste generated in Lusaka and its density (1996)**

Category of Waste	Estimated Quantities (tons/yr)	Percentage of Total quantity	Density (kg/m3)
<b>Domestic</b>			
High Density	169,143	69.5%	395
Medium Density	36,493	15.0%	309
Low Density	13,678	5.6%	447
<b>Trade and Industry</b>			
Hotels	1,392	0.6%	277
Markets	11,783	4.8%	207
Industry, Commerce	5,559	2.3%	51
<b>Others</b>			
Hospitals	52,811	2.2%	Not analysed
Total	243,329	100%	

Source: State of the Environment in Zambia 2000

The domestic waste in high density areas accounts for almost 70% of the total waste in Lusaka

#### 4.6.2 Industrial waste

Various industries such as manufacturing (edible oil, sugar), refining (petroleum), chemical (e.g. Nitrogen Chemicals of Zambia) and mining (e.g. privatised units of the Zambia Consolidated Copper Mines (ZCCM)) exist in Zambia. These produce a variety of wastes that are both hazardous and non-hazardous. From the Mining operations, there are 81 tailings and waste rock dumps scattered around the country around the following:

- (a) Chambishi Metals-1
- (b) Chibuluma-2
- (c) NFC Africa Mine-14
- (d) ZCCM Investment Holding -33
- (e) Konkola Copper Mine-14

<sup>7</sup> Source: State of the Environment in Zambia 2000

(f) Mopane Copper Mines-17

**Table 4.17 : Types and Quantities of Chemical Wastes Generated in from various industries in Zambia**

Waste Type	Tonne per Year
Soap stock, spent bleaching earth	15 060
Asbestos Cement	500
Broken glass	336
Wood splints/off specification materials	70
Chromium sludge	200
Molasses and bagasse	2 800
Acidified bitumen tar	1 080
Caked bitumen and sludge	10
Lime sludge	490
Paint sludge	100
Packaging materials/Paper	30
Textile sediment sludge	10
Petroleum sludge	4
Slag/broken battery containers	240
Chromium sludge/shavings	350
Boiler ash	27 000
Acid/calcline slurry	46 000
Sulphur dioxide gas (from mining, into Kafue river)	246 000

Source: ECZ, State of the Environment in Zambia 2000

#### 4.6.3 Hazardous waste

A hazardous waste inventory for the country was taken in 1997 by the Environmental Council of Zambia (ECZ) as shown in Table 4.18.

**Table 4.18 Hazardous waste generation in Zambia in 1997**

Waste Category	Quantity (tonnes)
Wood preserving Chemicals	70
Waste Oils	10,000
Petroleum refining	500
Explosives	750
Hexavalent Chromium Compounds	200
Lead	240
Lead, Zinc, Cadmium compounds	5,400
Bases in solid form (lime)	30,000
Asbestos	890
PCBs*	200

\* Stored inventories not expected to recur each year

Source: State of Environment the Environment in Zambia 2000

Healthcare is one of the streams that is becoming a major concern in the area of waste management. Daily National Healthcare waste (which is categorised as hazardous waste) and general waste generation in health facilities in the country is shown in Table 4.19 below

according to a World Bank 2003 Report. It is estimated that approximately 66,000 tons of both health-care and general/communal waste is generated daily countrywide at clinics, hospitals and other agencies. The bulk of the waste is disposed of indiscriminately, clearly indicating the magnitude of the potential chemical waste hazard arising from health-care waste disposal in Zambia.

**Table 4.19: Estimate of Health-Care Waste Generation in Zambia.**

Type of Health care Facility	Number Health care Facilities	Number of Beds/type of Health care Facility	National Estimated Waste Generation in kg/ patient day		
			Health-care Waste	General Waste	Total Estimated Waste
<b>Big and specialized hospitals</b>	9	16,988	8,494	33,976	42,470
<b>Small or medium size clinics</b>	1187	11,502	237.4	23,004	23,241.4
<b>Total</b>	1196	28,490	8,731.4	56,980	65,711.4

Source: A Y Mundia et al, 2003, "National Health-care Waste Management Plan for ZANARA - 2004 -2006"

Table 4.20 below show the official ECZ documented and reported annual rates of waste generation of various types based on Basel Convention Categories.

Exports of Hazardous waste are mainly PCB related and meant for disposal purposes. Canada assisted through the technical assistance project under phase II which ran from 1997 through to 2000. In 2002 Zambia sent PCB contaminated waste from the Zambia Consolidated Copper Mines and The Copperbelt Energy Company to Finland for destruction. The recent export was to South Africa. Several PCB wastes are still stored at Kariba North and Luena.

**Table 4.20: Total Amount of Hazardous Wastes and other Wastes Generated (metric tons) as reported by ECZ 2007.**

CATEGORIES		1998	1999	2000	2001	2002	2003	2004	2005
<b>Waste streams (Annex I to Basel Convention)</b>									
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics						30000		10000.
Y2	Wastes from the production and preparation of pharmaceutical products								
Y3	Waste pharmaceuticals, drugs and medicines								20000.
Y4	Wastes from the production..... of biocides and phytopharmaceuticals								
Y5	Wastes from the manufacture..... of wood preserving chemicals		70	70	n/d	n/d			
Y6	Wastes from the production, formulation and use of organic solvent								
Y7	Wastes from heat treatment and tempering operations containing cyanides								
Y8	Waste mineral oils unfit for their originally intended use		8000	8000	10000	13000	16000		20000.
Y9	Waste oils/water, hydrocarbons/water mixtures, emulsion								
Y10	Waste substances ....containing or contaminated with PCBs, PCTs, PBBs		200	200		235	200		
Y11	Waste tarry residues ... from refining, distillation and any pyrolytic treatment		500	500			n/d		
Y12	Wastes from production..... of inks, dyes, pigments, paints, etc						n/d		100.
Y13	Wastes from production.....resins, latex, plasticizers, glues, etc								
Y14	Waste chemical substances arising ..... environment are not known								
Y15	Wastes of an explosive nature not subject to other legislation		750			n/d	n/d		
Y16	Wastes from production, formulation and use of photographic chemicals...								
Y17	Wastes resulting from surface treatment of metals and plastics								
Y18	Residues arising from industrial waste disposal operations								
<b>Sub total of Y1 to Y18</b>			<b>9520</b>	<b>8770</b>	<b>10000</b>	<b>13235</b>	<b>46200</b>	<b>0</b>	<b>50100.0</b>
<b>Wastes having as constituents (Annex I to Basel Convention)</b>		<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Y19	Metal carbonyls								
Y20	Beryllium; beryllium compounds								
Y21	Hexavalent chromium compounds		200	200	200	200	200		200.0
Y22	Copper compounds								

Y23	Zinc compounds							
Y24	Arsenic; arsenic compounds							
Y25	Selenium; selenium compounds							
Y26	Cadmium; cadmium compounds	5400	5400	5400	5400	5000		5000.0
Y27	Antimony; antimony compounds							
Y28	Tellurium; tellurium compounds							
Y29	Mercury; mercury compounds							
Y30	Thallium; thallium compounds							
Y31	Lead; lead compounds	240	240	n/d	n/d			
Y32	Inorganic fluorine compounds excluding calcium fluoride							
Y33	Inorganic cyanides							
Y34	Acidic solutions or acids in solid form							
Y35	Basic solutions or bases in solid form	3000 0	n/d	n/d	n/d			
Y36	Asbestos (dust and fibres)	890	1200	2000	2300	2350		500000. 0
Y37	Organic phosphorus compounds							
Y38	Organic cyanides							
Y39	Phenols; phenol compounds including chlorophenols							
Y40	Ethers							
Y41	Halogenated organic solvents							
Y42	Organic solvents excluding halogenated solvents							
Y43	Any congener of polychlorinated dibenzo-furan							
Y44	Any congener of polychlorinated dibenzo-p-dioxin							
Y45	Organohalogen compounds other than ... (e.g. Y39, Y41, Y42, Y43, Y44)							
	Sub total of Y19 to Y45	367 30	7040	7600	7900	7550	0	505200
	Total Waste Generated under Annex I (Y1 - Y45)	462 50	15810	1760 0	21135	53750	0	555300
<b>Categories of wastes requiring special consideration (Annex II to Basel Convention)</b>								
Y46	Wastes collected from households		1000000		1400	1600		150 000

					000	000		
<b>Y47</b>	Residues arising from the incineration of household wastes					n/d		
	<b>Total Waste Generated under Annex II (Y46 - Y47)</b>			1,000,000	1,400,000	1600000		<b>150 000</b>

#### 4.6.4 Challenges in Waste management<sup>8</sup>

The current waste management situation in the country is far from satisfactory. Wastes generated in all sectors of the economy are currently not well managed. Disposal sites in almost all the districts are either not there or they are poorly managed. Data is also inadequate outside Lusaka and the Copperbelt.

Several complex waste streams composed of a very wide range of chemicals (including POPs) are produced in all sub-sectors of the Zambian industry such as electricity power generation (hydro-electric) and transmission; agriculture (fertilisers, pesticides); manufacturing (leather tanning, textiles industry); mining (exploration, processing, tailings); and semi-industrial (battery manufacture/repair, motor vehicle repair garages, fuel stations and petroleum storage facilities) activities. The afore-mentioned cocktails of potentially toxic and/or carcinogenic chemicals will, if discharged in significant amounts, create severe health risk for people and aquatic life as well as cause various lethal or chronic effects on the fauna and flora and receiving waters. Local capacity (human and technical) is still inadequate to effectively cope with the rising demand as the country seeks more advanced investments.

Very little point-of-generation information is available on quantities and classification of chemical wastes being generated in the country during the manufacturing and processing of various products. At present there is an apparent lack of capacity for the effective, safe and sound management of the huge quantities of wastes unleashed by human activity which eventually find their way into the environment.

The Government of Zambia outlined the following measures for follow-up:

- (a) Reducing waste production: Waste streams need to be identified and characterised according to potential impacts on the environment. Setting reduction targets for selected industrial waste streams would be given priority
- (b) Monitoring networks need to be established. This will ensure early warning of potential contamination at waste dumping sites as well as assessing the environmental impacts of current waste management practices.
- (c) Potential contaminated sites should be well documented. This will help in setting priorities and the planning of clean-up operations if necessary.
- (d) There is a need for developing the information base on the sources and composition of various waste streams and mounting a vigorous educational campaign on improving the public attitudes towards the generation of wastes necessary for implementing waste minimization and management initiatives.
- (e) Increased participation of the Zambian industry is necessary in the cleaner production programme, as well as a move towards continuity and self sustenance after the programme ends.

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<sup>8</sup> Source: Zambia Environment Outlook 2000

## 4.7 Priority Concerns related to Chemical Production, Import, Export and Use

### 4.7.1 Description of the problems areas

Table 4.21 summarises the problem areas.

**Table 4.21 Description of problem areas**

Nature of Problem	City/ Region	Brief Description of Problem	Chemical(s)/ Pollutant(s)
Air	Copperbelt/Lusaka	Dioxins & furans/Flue gases form mining	SO <sub>2</sub> , NO <sub>x</sub> , pH, /Particulate matter (cement)/dusts from quarrying
Soil	Copperbelt/Lusaka	Sludges from mining/ dust fall-out on plant leaves	pH, destructive metals, soil integrity
Water	Copperbelt/Lusaka/ Southern	Low pH/Contamination of drinking water	Fertiliser, Bagassiole, Chemical run-off into watersheds

Source: NIP, 2004 drafts

Table 4.22 summarises priority concerns related to Chemicals.

**Table 4.22: Priority concerns related to chemicals**

Nature of Problem	Scale of Problem	Level of Concern	Ability to Control Problem	Availability of Statistical Data	Specific chemicals Creating Concerns	Priority Ranking
Air Pollution	Medium	High	Medium	Low	SO <sub>2</sub> , NO <sub>x</sub>	High
Pollution of Inland Waterways	Medium	High	Medium	Low	Sludge and other mining waste	High
Marine Pollution	Low	Low	Medium	Low	Chemicals run-off from agriculture	Medium
Ground- Water Pollution	Medium	High	Medium	Low	pesticides, sludge	High
Soil Contamination					PCBs, agrochemicals	
Chemical Residue in Food	n/a	n/a	n/a	n/a	PCBs, DDT, Pesticides	n/a
Drinking Water Contamination	High	High	Medium	Low	Pesticides, agrochemicals, industrial waste	High
Hazardous Waste treatment/ Disposal	High	High	Medium	Low	POPs, clinical waste	medium

<b>Nature of Problem</b>	<b>Scale of Problem</b>	<b>Level of Concern</b>	<b>Ability to Control Problem</b>	<b>Availability of Statistical Data</b>	<b>Specific chemicals Creating Concerns</b>	<b>Priority Ranking</b>
<b>Occupational Health: Agriculture</b>	High	High	Medium	Low	Pesticides	High
<b>Occupational Health: Industry</b>	high	high	Medium	Low	Acids, Corrosive chemicals, SO <sub>2</sub> , NO <sub>x</sub>	High
<b>Chemical Accidents: Industrial</b>	Medium	High	Medium	Low	Acids, Corrosive chemicals	High
<b>Chemical Accidents: Transport</b>	High	High	Low	Low	Acid spills, volatiles,	High
<b>Unknown Chemical Imports</b>	Medium	Medium	Very low	Low	Varied	High
<b>Storage/ disposal of Obsolete Chemicals</b>	Medium	Medium	Very low	Low	PCBs, obsolete pesticides, pesticides wastes	High
<b>Chemical Poisoning/ Suicides</b>	Medium	High	Low	Low	Agrochemicals, pesticides	High
<b>Persistent Organic Pollutants</b>	Medium	Medium	Very low	Low	Chlordane, DDT	High

Source: NIP, 2004 drafts

## 5. Basic national set-up of management of the environment

### 5.1 Responsibilities of Different Government Ministries, Agencies and other Institutions

The responsibility of ensuring that chemicals do not present adverse effects to humans and the environment rests with various Government ministries and institutions through laws, regulations, guidelines and other measures that provide some degree of protection.

The ministries involved in ensuring that minimum damage occurs to the environment from the use of chemicals include the Ministry of Tourism, Environment and Natural Resources (MTENR), the Ministry of Health (MoH), the Ministry of Labour and Social Security (MLSS), the Ministry of Agriculture and Cooperatives (MACO), and the Ministry of Mines and Mineral Development (MMMD). The afore-mentioned lead ministries and many other line ministries involved in the routine management of chemicals are listed in Table 5.1 below.

**Table 5.1: Responsibilities of Government Ministries, Agencies and other Institutions**

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

**Source: National Chemicals Profile 2005**

The broader aspects relating to the POPs-related responsibilities of Government ministries, Agencies and other institutions are listed in Table 5.2 below.

**Table 5.2: Chemicals-related Responsibilities of Government Ministries, Agencies and other Institutions**

Stage of Life Cycle/ POP Category	Importation	Production/ Monitoring	Storage	Transportation	Distrib/ Marketing	Use/ Handling	Disposal	Disaster Preparedness
<b>Pesticides POPs/DDT</b>	ECZ	MLGH/ MLSS/ ECZ/MACO	ECZ/ MoH	ECZ	MoH/ZA A	ECZ/ MoH	ECZ	ECZ/ MoH
<b>Industrial Chemicals</b>	ECZ	MMMD/ ECZ/NCC /ZBS	ECZ	ECZ	ECZ	ECZ/ OHSSD OHSRB	ECZ	ECZ/MoH
<b>Dioxins &amp; Furans</b>	-	ECZ/MMM D MLGH	-	-	-	-	ECZ	ECZ/ MLGH /MoH
<b>Stockpiles and Wastes</b>	-	ECZ/MoH /MLGH	ECZ/M oH MLGH	ECZ	ECZ	ECZ	ECZ	ECZ/MoH

**Source: National Chemicals Profile 2005**

## 5.2 Descriptions of Ministerial Authorities and Mandates

In Zambia, ECZ, a quasi-government statutory body under the Ministry of Tourism, Environment and Natural Resources is the delegated National Focal Point in matters relating 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. The ECZ thus provides a systematic administrative conduit for matters relating to chemicals management and performs the overall Secretariat functions on programmes relating to chemical management.

ECZ has been working on programmes to strengthen Chemical Management and Administrative Framework to enhance enforcement capacity on the ground. In this regard, ECZ management instituted the Strategic Plan for 2001-2005, which specifically targets the adoption of focused directions, which include:

- engaging stakeholders in developing and implementing sound practices for solid waste management in Zambia e.g. by improving the management of disposal sites;
- reducing air pollution from industrial emissions in urban areas e.g. by providing baseline data and continuous information on emissions and ambient air quality as a tool for enforcement, awareness, planning and policy making;
- monitoring and improving the management of surface and ground water pollution e.g. by building a comprehensive and organised information base on surface and ground water pollution and its effects as a basis for licensing and monitoring;
- co-ordinating and advising stakeholders in the use of and management of natural resources e.g. by increasing community participation in the natural resources management, especially by building capacity in District Natural Resource

Committees, selected NGOs and community Based Organisations (CBOs) to provide awareness to stakeholders; and

- Improving the management of pesticides and industrial chemicals in Zambia, especially by ensuring that by the end of the plan at least 90% of the dealers in pesticides; 90% of the dealers in agrochemicals and 60% of the dealers in industrial chemicals are registered, and lastly ensure compliance with regulations

#### *Ministry of Tourism, Environment and Natural Resources*

In 1996 the ministry had its title changed from Ministry of Environment and Natural Resources (MENR) to Ministry of Tourism, Environment and Natural Resources (MTENR). It is mainly concerned with natural resource conservation, while the maintenance of environmental quality is the responsibility of the ECZ. This is done through the Pesticides and Toxic Substances (PTS), Water Pollution Control (WPC), Waste Management (WM), the Air Pollution and Noise Abatement (APNA) (incorporating the National Ozone unit) and the Environmental Impact Assessment Inspectorates.

#### *Ministry of Health*

The Ministry of Health (MoH) administers the following Acts:

- The Food and Drugs Act, administered through the Food and Drugs Board and the Inspectorate Officers based in MoH as well as other inspectors based in MLGH Public Health Departments of the Local Authorities: The Food and Drugs Board operates a referral laboratory which offers services to government agencies as well as the private sector. The laboratory also monitors the quality of chemicals and drugs;
- The Ionising Radiation Act, enforced through the Radiation Protection Services (RPS): The officers in this unit monitor all non-ionising and ionising radiation at places of work and in the general environment. They inspect machinery such as radiological equipment used in hospitals, for sources of radiation;
- The Pharmacy and Poisons Act, enforced through the Pharmacy and Poisons Board and Medical Supplies Department: It monitors all pharmaceutical and medical supplies including some chemicals (Class II poisons) which are imported into the country. The registration of all other non-medical chemicals is the domain of ECZ;
- The Pneumoconiosis Act, administered thorough the Occupational Health and Safety Research Bureau (OHSRB) based in Kitwe: OHSRB monitors occupational diseases of workers. It also carries out hazard assessment measurements at the work place. The institute has highly qualified personnel, namely medical doctors, health technicians, paramedics, industrial hygienists, nurses etc.;
- The Public Health Act, enforced through the Central Board of Health and Local Authorities under the ministry of Local Government and Housing.

#### *Ministry of Finance and National Development*

The Ministry of Finance and National Development (MFND) is an active participant in the management of chemicals through the strict border controls and surveillance undertaken by the

Zambia Revenue Authority (ZRA). ZRA, through the Customs and Excise Department, monitors and controls the importation and exportation of goods in conjunction with collaborator personnel from the ECZ to ensure that not only products are registered prior to importation into the country, but also that the correct revenues due in the form of duties and levies are collected.

#### *Ministry of Home Affairs*

The Ministry of Home Affairs (MHA), through the Drug Enforcement Commission (DEC), has meticulously mounted a rigorous programme aimed at ensuring that traffic in illicit drugs and other narcotic substances is curtailed whilst providing community public awareness raising and educational activities on the dangers inherent in drugs abuse and other related issues. The DEC also helps national healthcare agencies in the establishment and sustenance of rehabilitating facilities for local addicts. The DEC actively participates in inter-ministerial matters such as the collaboration with the Food and Drugs Control Laboratory (under MoH) and the Customs and Excise Department (under MFND).

#### *Ministry of Labour and Social Security*

This ministry is responsible for the administration and enforcement of the provisions of the Factories Act. This Act is enforced through the Occupational Safety and Health Services (OSHS) Department. The legislation is aimed at protecting workers against occupational accidents and diseases. The OSHS Department carries out systematic inspections of all premises covered by the factories Act, i.e. factories, construction sites, as well as farms, to ensure the protection of workers from the hazards inherent in chemicals and physical agents, and also biological, physiological, mechanical and psychological hazards.

#### *Ministry of Agriculture and Co-operatives*

This ministry, whose title has changed in 1996 from Ministry of Agriculture Food and Fisheries (MAFF) to Ministry of Agriculture and Co-operatives (MACO), administers the following Acts:

- the Fertilizer Act which controls the importation and use of fertilizers;
- the Phytosanitary Act which is aimed at the eradication and prevention of the spread of plant pests and diseases in Zambia as well as prevention of the introduction of plant pests and diseases from outside the country; and
- the Tsetse Control Act administered through the Department of Veterinary and Tsetse Control Services, which control and monitors general animal health and diseases.

The ministry also provides extension services to farmers in animal and crop production.

#### *Ministry of Mines and Minerals Development*

This ministry enforces the provisions of the Mines and Mineral Act through the Mines Safety Department, and is concerned with health and safety of mine workers and persons living in mining areas, and the protection of the environment both during the life of the mine, and after

cessation of active mining. The mining industry provides substantial employment opportunities. The ministry's responsibilities with respect to chemical management are similar to those of the OSHS Department (under MLSS), but are applicable only to the mining sector. The department has good monitoring equipment and qualified personnel. However, monitoring is weak.

*Ministries of Education (MoE), and Ministry of Science, Technology and Vocational Training (MSTVT).*

These two ministries have been split into two separate entities since 1966. The Ministries are now titled Ministry of Education and Ministry of Science, Technology and Vocational Training. The former deals with educational issues from the primary up to secondary level as well as university level, while the latter deals with post secondary skills and vocational training aspects. The two ministries therefore have a major role to play in the process of laying down a formidable foundation that is necessary for acquisition of information on the management of chemicals in the country through the provision and inclusion of environmental education in the curricula in formal education. Institutions within government that run relevant programmes include the University of Zambia (UNZA), Great East Road Campus in Lusaka; Copperbelt University (CBU), Riverside Campus in Kitwe; Technical Education and Vocational Training Authority (TEVETA) with over two hundred registered institutions spread over the whole country; Chainama Hills College of Health Sciences and Evelyn Hone College of Applied Arts and Sciences in Lusaka.

*Ministry of Commerce, Trade and Industry*

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

*Ministry of Energy and Water Development (MEWD)*

The Ministry maintains statistics on and controls the use of the water sector of the Zambian economy. The ministry enforces the usage of water and develops and maintains standards on water quality.

*Ministry of Foreign Affairs*

This ministry, in the absence of the designated National Authority and with the assistance from appropriate stakeholders and line ministries, controls all uses of chemicals related to defence and security in Zambia, in line with the OPCW.

**Comment/ Analysis**

From time to time, overlaps exist among ministries and statutory bodies in government, and other concerned bodies. The institutions share information through workshops and meetings. For instance, the ECZ (under MTENR) and the Occupational Safety and Health Services

Department, (OSHSD, under MLSS) continue to collaborate, as they have worked jointly in the past. This partnership will definitely augment future developments in chemical management. OSHSD and the Radiation Protection Services (under MOH) have similarly worked jointly on issues that affect them. The Public Health Department (under MOH) is a strong collaborator with an agency under MLGH, while OHSRB (also under MOH) collaborates very strongly with the Labour Department under MLSS on certain issues.

Furthermore, institutions share extensively in problem solving as they perform their respective functions. The setting up of the PIC Committee was aimed at addressing issues of chemical control, as well as to establish a think-tank that would offer sound advice to the government accordingly.

Most of the existing legislation does not adequately address current key issues and problems of chemical risk control and management. There is a need to progressively provide for continuous reviews and updates of the legislation so as to tailor it to suit, as well as enable it to attain the vital coping mechanisms to deal with new developments and future challenges.

Most institutions lack infrastructure and resources to enforce laws under their jurisdiction. The work, which the institutions are doing, is not up to acceptable standards because of constraints such as:

- poor funding
- poor administration
- lack of transport
- lack of equipment, and inadequate remuneration for qualified staff

## 5.3 Legal instruments and Non-Regulatory mechanisms for Managing Chemicals and waste<sup>9</sup>

### 5.3.1 Introduction

The objective of the legal component of this study is to provide a basis for determining whether the current legislative matrix provides a framework within which chemicals and hazard management activities as contemplated by the GHS system and waste management could be accommodated in the existing law or whether there would be a need to enact new legislation.

The approach to the legal component of the study has therefore been based on furnishing an overview of the current legislative situation in respect of chemicals and waste management by:

- identifying the relevant legislation;
- analysing the extent to which the principles underlying a regulatory approach to legislation have been given effect to;
- examining the extent to which chemicals and waste management is regulated throughout the life cycle of chemicals in the different sectors.

This chapter contains an overview of applicable legislation, a discussion on the extent to which the principles underlying a regulatory approach to legislation have been given effect to, as well as a discussion on the overarching regulatory framework, which applies to the sectors, viz. industry, transport, consumer and agriculture.

Zambia does not have one consolidated Act or law, which regulates the entire spectrum of chemicals management. The management of chemicals, from a regulatory perspective, is embodied in a matrix of legislation which is found in the following types of legislation:

- legislation pertaining to the management of pollution in general;
- transportation control;
- worker health and safety;
- environmental legislation;
- legislation regulating pharmaceuticals;
- food and drug legislation.<sup>10</sup>

These categories of legislation have different primary objectives and therefore foci. The focus of a legislation is a significant factor when analysing a legislation, as in general it will indicate the approach, extent and efficacy of the regulation in addressing chemicals and waste management. For example, whilst the focus of the Ministry of Labour's Occupational Health and Safety Act is primarily on worker's health and safety, the focus of the Ministry of Agriculture and Cooperatives is on chemical fertilizers distribution, sound pesticides handling and is charge to enforce regulations in the agricultural sector through registration and, thus indirectly, the protection of workers and consumers. The range of tools selected to achieve the aims of each Act are likely to be different. Whereas the former is likely to place more emphasis on the use of Material Safety Data Sheets (MSDSs) as a communication tool and signage in the

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<sup>9</sup> Reference Zambia Chemicals Profile draft 2005

<sup>10</sup> An analysis of legislation regulating food and medicines falls outside the scope of this study.

workplace, the latter will select tools such as labelling and advertising control. The complete overview of the current legislative situation therefore needs to take into account both a range of legislation as well as the purpose for which it has been promulgated.

Enforcement, especially the lack of it, is central to the protection of the environment and health. Quite often the legislation is there but enforcement may be wanting in some cases due to overlaps.

Given the range of legislation regulating chemicals, several different departments at multiple levels of Government administer these Acts. The institutional mandate of each department will therefore also influence the overarching approach and policy direction of the legislation.

Stringent controls in the use of chemicals is one of the ways through which chemicals posing risks to human health and the environment can be adequately managed. Controls are put in place through legislation, regulations, guidelines or codes of practice as minimum requirements to be observed in the handling, use, application, storage, and disposal of chemicals. Legal instruments can contribute to a more efficient approach to the sound management of chemicals provided that the instrument/ laws are adhered to by the targeted stakeholders, and that the enforcement mechanisms are applied strictly.

The laws in place require that chemicals used should be registered. Before a chemical is registered for use, evidence is required to show that it has been adequately evaluated for toxicity, biodegradability, persistence, and that the chemical will pose minimum adverse effects to users and the environment.

### **5.3.2 Overview of the National Legal Instruments which address the Management of Chemicals**

The enactment of the Environmental Protection and Pollution Control Act (EPPCA) No. 12 of 1990 paved the way for the consolidation and integration of various pieces of legislation into a single Act, in order to cover all aspects of environmental protection and pollution. The EPPCA covers all aspects of Air and Noise Pollution, Waste Management, Water Pollution Control, Pesticides and Toxic Substances, Ionising Radiation and Natural Resources Conservation.

In the health sector, controls by the Public Health Act ensure the prevention and suppression of diseases to man; disinfections; control of malaria and pollution of water sources. The Food and Drugs Control Act and the Pharmacy and Poisons Act ensure that medicaments and pharmaceuticals and other related products meant for human and animal consumption meet acceptable standards of quality.

The Factories Act is tailored to protect the health of workers, including those in the agriculture sector, from any adverse effects of chemicals at the work place.

The legal instruments and regulatory mechanisms of interest with respect to the Stockholm Convention covering the broad categories of the POPs, including pesticides, industrial chemicals, and unintentional by-products formed and/or released from thermal processes involving organic matter and chlorine, particularly in situations of incomplete combustion (such as PCDDs and PCDFs) from industrial production and waste management activities, include the following laws, as elaborated in Table 5.3:

- Environmental Pollution Prevention and Control Act CAP 204 No. 12, 1990
- Factories Act CAP 14, of 1967
- Public Health Act CAP 295,
- Local Government Act No. 22, of 1991
- Ozone Depleting Substances Regulations, S.I. No. 27 of 2000
- Hazardous Waste Management Regulations, S.I. No. 125 of 2001
- Noxious Weed Act CAP 343
- Tsetse Control Act CAP383
- National Council for Construction Act No 13, of 2003

Table 5.3 elaborates the numerous laws, resident in Government line ministries, which govern the day-to-day chemicals and waste management in Zambia.

**Table 5.3 : Existing Legal Instruments which Address Chemical and Waste Management<sup>11</sup>**

<b>Legal Instrument (Type, Reference, Year)</b>	<b>Responsible Bodies/ Ministries</b>	<b>Chemical Use Categories Covered</b>	<b>Objectives of Legislation</b>	<b>Relevant Articles/ Provisions</b>	<b>Resources Allocated (Fiscal Year 2003/4)</b>
<b>EPPCA CAP 204 No. 12, 1990</b>	ECZ- (MTENR)	Industrial and Agrochemicals	Environmental protection and pollution control; Establish ECZ	Part IV-X	
<b>Waste Management (Licensing of Transporters of Waste and Waste Disposal Sites) Regulations (under EPPCA) SI No. 71, of 1993</b>	<b>ECZ (Environmental Council of Zambia)</b>	Transportation of industrial and domestic waste	Regulation and control of waste disposal	Licence requirements for vehicles, pipelines and equipment for the transportation of waste to disposal sites/plants	(MTENR) 109 086 552 106
<b>The Water Pollution Control (Effluent and Wastewater) (under EPPCA) S.I. No. 72, of 1993</b>	<b>ECZ</b>	Waste water or other fluids of domestic origin	Ensure effluents/ Discharges conform to set standards	Requirements for licenses to discharge, Standards	
<b>Air Pollution Control (Licensing and Emission Standards) Regulations, S.I. No. 141 1996</b>	<b>ECZ</b>	Emissions from industrial processes	Licensing of industries that emit pollutants into the atmosphere  Issuance of Emission Standards	Requirements for emissions to the environment	(MTENR) 109 086 552 106

<sup>11</sup> Source Zambia Chemicals Profile draft 2005

<b>Legal Instrument (Type, Reference, Year)</b>	<b>Responsible Bodies/ Ministries</b>	<b>Chemical Use Categories Covered</b>	<b>Objectives of Legislation</b>	<b>Relevant Articles/ Provisions</b>	<b>Resources Allocated (Fiscal Year 2003/4)</b>
<b>Environmental Impact Assessment Regulations S.I. No. 28 of 1997</b>	<b>ECZ</b>		To contribute to sustainable development by ensuring that all developmental plans and projects take into account Environmental concerns	Ensuring all development plans and projects take into account environmental concerns	(MTENR) 109 086 552 106
<b>Hazardous Waste Management Regulations S.I. No. 125 of 2001</b>	ECZ (Environmental Council of Zambia)	Hazardous wastes	To control and monitor matters relating to generation, storage, transportation, pre-treatment, treatment, disposal, export, import and transboundary movement of hazardous wastes		
<b>Noxious Weeds Act CAP 343</b>	MACO (Ministry of Agriculture and Cooperatives)	Weed killers	To regulate the eradication of noxious weeds		(MTENR) 109 086 552 106
<b>Natural Resources Conservation Act CAP 315</b>	MTENR (Ministry of Tourism, Environment and Natural Resources)	All chemicals	Proper management of chemicals		(MTENR) 109 086 552 106
<b>Local Government Act No. 22, of 1991</b>	MLGH (Ministry of Local Government and Housing)	Trade effluents, various pests, larvae, weeds, petroleum products	To control weeds/pests and diseases, storage of petroleum, flammable substances/explosives, and solid waste disposal	Trade Effluents Regulations S.I. No 161, of 1986.	(MLGH) 41 986 819 098

<b>Legal Instrument (Type, Reference, Year)</b>	<b>Responsible Bodies/ Ministries</b>	<b>Chemical Use Categories Covered</b>	<b>Objectives of Legislation</b>	<b>Relevant Articles/ Provisions</b>	<b>Resources Allocated (Fiscal Year 2003/4)</b>
<b>Public Health Act CAP 295</b>	MoH/Local Authorities	Pesticides	To prevention and suppress diseases to man; disinfections; control of malaria and pollution of water sources by pesticides	Part XII article 89	802 399 491 433 (MoH)
<b>Pharmacy and Poisons Act CAP 536</b>	MoH (Ministry of Health)	Class II Poisons	To control of the Pharmacy Profession; trade in drugs and poisons	Part III Sections 11, 12 25 & 26 Parts IV, VI, VIII & XI	(MoH)
<b>Food and Drugs Act CAP 303</b>	MoH	Pesticide residues and Food additives	To control the content of toxic materials in food, and quality of drugs	Parts II-V	(MoH)
<b>Ionisation Radiation Act CAP 552  SI No. 171, of 1992</b>	MoH (Ministry of Health)	Radioactive materials	To protect users/and the public from ionising radiation sources and materials	Parts II, III, IV	(MoH)
<b>Mining (Amendment) Regulations, 1973</b>	Mine Safety Department (MMMD)	Inflammable materials; calcium carbide	Occupational safety in mining/ production activities	Part XXI Miscellany	(MMMD)
<b>Mines and Minerals Act No. 32, of 1976</b>	Mines Development Department (MMMD)	Metallurgical processing chemicals	To control of effluents/ discharges from treatments/ processes		(MMMD)
<b>Ventilation and Air Pollution Regulations</b>	Mine Safety Department (MMMD)	Emission of toxic gases	Occupational health and safety; Provision of adequate ventilation; Air pollution control	Mining Regulations Nos. 902 and 936	(MMMD)
<b>First Aid and Fire Fighting Regulations</b>	Mine Safety Department (MMMD)	Cyanides and antidotes	Occupational health safety in Emergency Preparedness	Part XII	(MMMD)

<b>Legal Instrument (Type, Reference, Year)</b>	<b>Responsible Bodies/ Ministries</b>	<b>Chemical Use Categories Covered</b>	<b>Objectives of Legislation</b>	<b>Relevant Articles/ Provisions</b>	<b>Resources Allocated (Fiscal Year 2003/4)</b>
<b>The Mines (Minerals Resources Extraction) Regulation SI No. 119, of 1994</b>	MMMD-Ministry of Mines and Mineral Development-Mine Safety Department)	Evolution of sulphur dioxide bearing emissions to the atmosphere	Environmental protection and pollution from fugitive gases; To regulate the prospecting for minerals; safety and health		(MMMD)
<b>Mines and Minerals Act CAP 213 No. 31, of 1995</b>	MMMD (Ministry of mines and Mineral Development)	Chemical substances in prospecting	Regulates the use of chemical substances in prospecting and provides for minerals. Ref: Part VI	Part VI Safety Letter No. A42	7 860 344 796 (MMMD)
<b>Control of Goods Act CAP 690 SI No. 381, of 1967</b>	MCTI (Ministry of Commerce and Trade)	Goods; various, especially chemicals	To control the import/ export, distribution, purchase, disposal of manufactured commodities	Section 3: Schedules 3&6	15 419 726 483 (MCTI)
<b>Standards Act No. 20, of 1994</b>	ZABS-(MCTI) (Zambia Bureau of Standards-Ministry of Commerce , Trade and Industries)	Manufactured products	Ensure quality and standardization of products, especially manufacturing processes involving chemicals		(MCTI)
<b>Water Act CAP 312</b>	MEWD (Ministry of Energy and Water Development)	Water pollution control	Environmental protection	Part VII Sections 56 & 57	31 336 706 490 (MEWD)
<b>The Agriculture (Fertilizers and Feeds) Act CAP 351</b>	MACO (Ministry of Agriculture and Cooperatives)	Fertilisers	Regulates and controls, importation, manufacture, processing, storage use/ handling, sale of fertilizers and farm feed.	Ref: Parts II, IV, V, VIII, IX	119 218 623 494 (MACO)
<b>Plants Pests and Diseases (Phytosanitary Act) CAP 346</b>	MACO (Ministry of Agriculture and Cooperatives)	Pesticides	To control plant pests and diseases through the use of pesticides	Sections 6-9,11 & 13	(MAC)

<b>Legal Instrument (Type, Reference, Year)</b>	<b>Responsible Bodies/ Ministries</b>	<b>Chemical Use Categories Covered</b>	<b>Objectives of Legislation</b>	<b>Relevant Articles/ Provisions</b>	<b>Resources Allocated (Fiscal Year 2003/4)</b>
<b>Tsetse Control Act CAP 383</b>	MACO (Ministry of Agriculture and Cooperatives)- Department of Veterinary and Tsetse Control Services-	Pesticides	To control and prevent the spread of tsetse flies	The Tsetse Control Pickets Regulations	15 419 726 483 (MCTI)
<b>Petroleum Act CAP 424, of 1985</b>	MEWD (Ministry of Energy and Water Development)	Petroleum	Regulates importation, storage, transportation and handling of petroleum and other inflammable oils and liquids.		(MEWD)
<b>Factories Act. CAP 14</b>	MLSS (Ministry of Labour and Social Security)	Vessels containing dangerous substances e.g. scalding/corrosive/poisonous liquids	To regulate and control the use, handling and processing of chemicals in the work place	Part VI Sections 33, 38, 39	343 056 000 000 (MLSS)
<b>National Council for Construction Act No.13 of 2003</b>	MLGH (Ministry of Local Government and Housing)		To regulate and control the use, handling and processing of chemicals in the construction industry		

Table 5.4 depicts below exclusive POP related laws resident in key line ministries.

**Table 5.4: Existing Legal Instruments which Address POPs –Related Chemical Management**

<b>POP Category/ Stage of Chemical Use</b>	<b>Importation/ Exportation</b>	<b>Production</b>	<b>Storage</b>	<b>Transport</b>	<b>Distribution/ Marketing</b>	<b>Use/Hand</b>	<b>Disposal</b>
<b>Pesticides</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA Public Health Act Phytosanitary Act Noxious Weed Act Tsetse Control Act OSH Act</b>	<b>EPPCA</b>
<b>Industrial Chemicals</b>	<b>EPPCA Control of Goods Act</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA</b>	<b>EPPCA Mine &amp; Minerals Act No. 31 of 1995</b>	<b>EPPCA Local Government Act Ozone Depleting Substances Regulations (SI 27 of 2000)</b>
<b>Dioxins &amp; Furans</b>	N/A	N/A	N/A	N/A	N/A	N/A	Local Government Act
<b>Stockpiles and Wastes</b>	<b>S.I. No 125 of 2001 HWM Regulations</b>	N/A	<b>S.I. No 125 of 2001 HWM Regulations</b>	<b>S.I. No.125 of 2001 HWM Regulations</b>			

Source Draft NP 2005

### 5.3.3 Summary description of Key Legal Instruments Relating to Chemicals and waste<sup>12</sup>

The principal legal instrument governing the environmentally sound management of chemicals in Zambia is the EPPCA. This Act regulates, inter alia, the following activities:

- Water pollution, by ensuring water quality; determining the conditions of discharge of effluents, as well as determining appropriate internationally recognised standards and analytical methods;
- Waste management, through the classification and/or analysis of wastes and waste disposal methods, as well as the monitoring and regulation of disposal sites;
- Pesticides and Toxic Substances management, through stringent registration and requirements with respect to the classification and labelling of chemicals and chemical products, packaging, storage, transportation, general handling, use and safety, and final disposal of these materials; and
- Air and Noise Pollution by providing baseline data and continuous information on emissions and ambient air quality as a tool for enforcement, awareness, planning and policy making

#### *Licensing for Chemical Management (Enforcement Capacity)*

This sector of chemical management mechanisms is based in the Pollution Control Division of the ECZ Inspectorate. The major players are the:

- Waste Management (WM) Unit;
- Water Pollution Control WPC) Unit;
- Air Pollution and Noise Abatement (APNA) Unit (incorporating the National Ozone unit);
- Pesticides and Toxic Substances (PTS) Unit, and
- Hazardous Waste Management Unit

Licensing under the sub-sector dealing in the importation of PTSs has made the most strides with 115 and 24 licenses (expiring in 2002/2003) having been issued, while 46 and 3 respectively for distribution. Other categories were recorded, i.e. 2 for the discharge of effluents (under water pollution), 4 for the transportation of wastes (under waste management) and 2 for emissions into the air (under air pollution and noise abatement) for 2003 compared to 2002 when 59 waste transportation, 19 effluent discharge, 6 pest control, 6 fumigation (both under PTS), 2 waste storage, 3 treatment, 1 incineration and 1 disposal licenses were issued.

Regulations under the EPPCA cover all classes of pesticides, industrial chemicals and hazardous wastes. The Pharmacy and Poisons Act covers Class II poisons and provides for their regulation. With respect to pesticides and toxic substances and residues in food, the Food and Drugs Act gives guidelines with respect to acceptance levels in foods, while the Explosives Act regulates the transportation of explosives. The Fertiliser Act provides for the control of the importation, use, storage and disposal of fertilisers, while the Petroleum Act regulates the management of petroleum products.

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<sup>12</sup> Zambia Chemicals Profile draft 2005

**Table 5.5: Existing Legal Instruments which Address Chemical Management**

<b>POP Category / Stage of Chemical Use</b>	<b>Importation/ Exportation</b>	<b>Production</b>	<b>Storage</b>	<b>Transport</b>	<b>Distribution/ Marketing</b>	<b>Use/Hand</b>	<b>Disposal</b>
<b>Pesticides</b>	EPPCA (Environmental Pollution Prevention and Control Act)	EPPCA	EPPCA	EPPCA	EPPCA	EPPCA Public Health Act  Phytosanitary Act Noxious Weed Act Tsetse Control Act OSH Act	EPPCA
<b>Industrial Chemicals</b>	EPPCA Control of Goods Act	EPPCA	EPPCA	EPPCA	EPPCA	EPPCA Mine & Minerals Act No. 31 of 1995	EPPCA Local Government Act Ozone Depleting Substances Regulations (SI 27 of 2000)
<b>Dioxins &amp; Furans</b>	N/A	N/A	N/A	N/A	N/A	N/A	Local Government Act
<b>Stockpiles and Wastes</b>	S.I. No 125 of 2001 HWM Regulations	S.I. No 125 of 2001 HWM Regulations	S.I. No 125 of 2001 HWM Regulations	S.I. No 125 of 2001 HWM Regulations	N/A	S I. No 125 of 2001 HWM Regulations	SI. No S.I. No.125 of 2001 HWM Regulations

Source: National Chemicals Profile draft 2005

### **5.3.4 Existing Legislation by Use Category addressing various stages of Chemicals from Production / Import to Disposal**

The EPPCA was enacted to cover all aspects of chemicals management under the authority of a single national institution. Other aspects of environmental management are still under different authorities, such as the control of levels of pesticide residues and toxic contaminants in foods; the transportation of inflammables, corrosives and chemical poisons, including matches, oily goods and compressed air; the importation, storage and use of fertilisers; the use of chemical substances in prospecting for minerals; and the control of emissions from metallurgical activities, especially the evolution of sulphur dioxide, among many others.

The Tsetse Control Act provides for the use of insecticides in the control of tsetse flies (*Glossina* spp) in infested areas. Occasionally, outbreaks of army worms (*Spodoptera* spp) and migratory locusts (*Locusta* spp) entail the use of large quantities of insecticides resulting in the release of large quantities of chemicals on to the ecosystem with attendant risks to both human health and the environment.

Table 5.6 below gives a broad outline of the various government authorities that are involved in the management of chemicals in specific categories of use.

**Table 5.6: Overview of Legal Instrument to Manage Chemicals by Use Category**

Stage/Class of Chemicals	Importation	Production	Storage	Transport	Distribution/ Manufacturing	Use/ Handling	Disposal
Pesticides (Agricultural, Public Health and Consumer)	✓	✓	✓	✓	✓	✓	✓
Fertilisers	✓	✓	✓	✓	✓	✓	✓
Industrial (Used in manufacturing /processing facilities)	✓	✓	✓	✓	✓	✓	✓
Petroleum Products	✓	✓	✓	✓	✓	✓	
Consumer Chemicals	✓	✓	✓	✓	✓		

Source: Zambia Chemicals Profile draft 2005

**Table 5.7: Approaches and Procedures for Control of Chemicals**

	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/Handling	Disposal
<b>Classification</b>	✓	✓	✓	✓	✓	✓	✓
Registration of Products	✓	✓	✓	✓	✓	✓	✓
Permits (e.g. discharge)							
Licenses (e.g. to operate)	✓	✓	✓	✓	✓		
Reporting Required	✓						
<b>Inspections</b>	✓	✓	✓	✓	✓	✓	✓
Information to Workers		✓	✓	✓	✓	✓	✓
Information to Public			✓	✓	✓	✓	✓

Source: Zambia Chemicals Profile draft 2005

### 5.3.5 Summary Description of Key Approaches and Procedures for the Control of Chemicals

The major approach to the control of chemicals is through product registration which is the stage at which a chemical is assessed for efficacy, safety of use, toxicity and eco-toxicity, persistence and behaviour in the environment. At the same time, the label is assessed for accuracy and completeness of information to the users. Requirements for registration of chemicals came into force in 1994, are on-going, and should benefit from current positive developments in chemical management. The registration provides for the issuing of a certificate of registration.

Permits are issued for the discharge of effluents, transportation of wastes and for the operation of disposal sites. A time-linked reporting system has been instituted in order to facilitate the monitoring of compliance in these cases. The Occupational Safety and Health Services Department (under MLSS) registers factories and construction sites, which are by law supposed to be regularly visited for necessary inspection to ensure conformance to set standards. The Inspectorate Units in various ministries visit industries to check on operations, collect samples and generally monitor compliance to relevant regulations.

With respect to the Prior Informed Consent (PIC) procedure, the interim decisions under consideration, subject to periodic review are tabulated below:

**Table 5.8 : Approaches and Procedures for the Control of PIC Chemicals table 4E: Approaches and Procedures for the Control of PIC Chemicals**

Product/ PIC Chemical	Comments	Remarks
Aldrin	Restricted. Final decision under active consideration	Product usage can be monitored; restricted to use in building foundations only.
Chlordane	Restricted. No action yet	Persistent in the environment; restricted to termite control in construction and building industries
Chlordimeform	No action yet.	Persists in the environment
Crocidolite	No action yet	
Cyhexatin (*)		Safer miticides available
DDT	Restricted.	Restricted to controlled use under WHO
Dieldrin	Restricted.	As for Aldrin.
Dinoseb Salts	No action yet.	Highly toxic
EDB	Restricted.	Highly toxic product; Use restricted to commercial farmers with appropriate equipment and expertise
Fluoroacetamide	Restricted.	Highly toxic rodenticide; safer alternatives available
HCH	Restricted.	Safer, non-persistent alternatives available
Heptachlor		Persists in the environment
Mercury Compounds	No action yet.	Highly toxic
Polybrominated Biphenyls (PBBs)	No action yet.	Persistent in the environment, bioaccumulates; has adverse effects on human health
Polychlorinated Biphenyls (PCBs)	No action yet.	Persists in the environment, bioaccumulate
T Tris- (2,3dibromopropyl) ph phosphate	No action yet.	

(\*) Information on original action is being reviewed; chemical may be removed from PIC list.

Source: Zambia Chemicals Profile draft 2005

### **5.3.6 Implementation of Legal Instruments**

Legal instruments require that chemicals do not, under normal conditions of use, cause harm to the user/handlers and the environment. It is for this reason that the chemicals' behaviour is assessed at registration.

During the period 2001 to 2003, Zambia was involved, as a pilot country in a Chemical Hazard Communication project aimed at raising awareness levels in the general public (the consumer in particular); the agricultural sector, the transport sector and industrial production sector with special reference to the environmentally sound use of chemicals, bearing in mind the hazards inherent in the nature of chemicals. Many of the project's outcomes point to the fact that certain aspects of the existing law have to be amended in order to harmonise local administrative aspects with the GHS. It is thus imperative that the registration system that was started in 1993 be given a chance to take root under the more universally established and acceptable system. Nevertheless, inspection and monitoring of operational facilities is on going.

#### ***Legal Requirements for the Managing of POPs***

Controls in place include legislation, regulations, guidelines, as well as codes of practice, as a minimum to be observed in the handling/use/application/storage/and use of POPs.

In implementing the Stockholm Convention, which requires (according to Article 6 of Annex A) Parties to identify, label and remove equipment containing PCBs from use and to dispose of PCB-containing materials in an environmentally sound manner, Zambia will endeavour to take all measures necessary to eliminate the use of PCBs in equipment by 2025.

### **5.3.7 Non-Regulatory Mechanisms for Managing Chemicals**

Through the leadership of the Zambia Agrochemicals Association (ZAA), the pesticides industry has, over the years, developed a voluntary Code of Practice aimed at encouraging its members to adhere to certain minimum professional as well as ethical standards of practice. However, the liberalised economic practices in commerce promoted by the Government since the early 1990s have created a situation in which there are pesticide dealers who are not members of ZAA, who may therefore not be easily persuaded to observe the code, thus reducing effectiveness of the benefits that could potentially accrue from this mechanism.

The Environmental Management System (EMS) encourages each individual facility to have a Corporate Environmental Policy in place, as a way of promoting environmental awareness on the part of management and workers. The environmental policy is a statement of observance of practices that do not endanger the environment. It takes the form of an internal organisational control put in place by the management, with the aim of monitoring other controls.

The Energy Regulation Board (ERB) and MoH have regulations and Codes of Conduct that control the players in the petroleum and health sub-sectors. The voluntary mechanisms discussed above and many others that might be introduced need to be backed by strong dedicated institutional bodies as well as individuals to lead and give guidance in order to enhance chances of success that may accrue in the long term. The Competent Authority has to lay down favourable incentives to encourage pro-active responses from targeted stakeholders.

### ***Non Regulatory Internal Controls on the use of PCB Containing Machinery***

The fact that Zambia has signed the Stockholm Convention places a lot of pressure on local technical and administrative authorities in charge of PCBs containing equipment to ensure conformance to the barest minimum requirements.

Strict requirements have been devised and instituted by the competent authority and placed on the following aspects of operation with respect to ensuring that PCB containing equipment is totally removed:

- use only in allowed locations for these items
- keep accurate records
- continuous monitoring
- ensuring that all offending materials are properly marked
- Disposal of the items

In the last resort, to ensure conformity with the Stockholm Convention, phasing out of non-compliant equipment currently in use has been set for 2015. No more PCB containing equipment are allowed into the country.

### **5.3.8 Comment/Analysis**

Most of the overlaps and gaps in the environmental management of chemicals have been taken care of by the enactment of the EPPCA. The overlaps between the Pharmacy and Poisons Act (covering Class II poisons) and the EPPCA on the registration of chemicals will, for some time, continue to exist until the laws are harmonised.

As regards the control of pests and diseases, there are also overlaps among the Local Government Act No. 22 of 1991; the Noxious Weeds Act Cap 343; the Plants, Pests and Diseases (phytosanitary) Act Cap 346 and the Public Health Act Cap 535 which will be resolved when the law is harmonised at the operational and administrative levels.

New regulations are now in place in those sectors that were in their infancy in 1996. These include Air and Noise Pollution Control (ANPC), Chemical Safety Regulation (CSR), Environmental Impact Assessment (EIA) and Occupational Health and Safety (OHS) Act to incorporate all institutions dealing with OHS.

However, available laws do not cover all foreseeable aspects. Thus there is a need for amendments to pertinent existing laws in order to provide for the inclusion of appropriate

technical specifications for the anticipated minimum quantities (mass/volume) to which the regulations may apply; and also to state how the law relates to pesticides imported by Donor Agencies; the need to place a mandatory requirement for Certificates of Analysis and SDSs (as part of documentation) to accompany shipments as a guarantee for the quality and safety of chemicals at or before importation.

The area of hazardous wastes still remains hazy as there are no specific guidelines in place to regulate the management of such special categories of wastes as health-care (hospital) waste, paints, solvents, used batteries, waste oils and lubricants from motor vehicle repair workshops (i.e. greases, brake fluids etc).

On the other hand, in order to effectively tackle POPs-related management issues in the sectors of the general public and consumers, as well as environmental health protection; protection of workers, especially those workers involved in insecticide spray operations in vector control and in agriculture, new regulations need to be developed to ensure conformance of the laws listed below to the Stockholm Convention:

- **Public Health Act;**
- **Local Government Act;**
- **Factories Act, and**
- **National Construction Council Act No 13, of 2003.**

Finally, it is envisaged, that in future it will be mandatory for each company or facility to have a company profile because this action will make data collection on chemicals much easier.

The critical issue regarding the need for the provision of adequate funding of the safety of operatives working at all levels must be vigorously addressed in order to not only facilitate, but also to guarantee the effective implementation of the administrative and legal requirements for the sound management of chemicals. In particular, it is necessary to point out that the budgetary figures allocated to line ministries should always be closely matched with the corresponding disbursements.

## 6. Status of Ratification of the various Chemicals and Waste Conventions

Zambia, like many other countries, is party to several international conventions and agreements aimed at sustaining the earth and its inhabitants. Signing of these conventions is indicative of the country's commitment and willingness to cooperate and work with other countries and international organisations.

The Ministry of Tourism, Environment and Natural Resources (MTENR) acts on behalf of the government to prepare the various conventions and agreements for enactment that may need to be domesticated in the interest of Zambia. Apart from the MTENR, several ministries may include some specific environmental mandates. The Environmental Council of Zambia is the lead agency that handles issues on environmental protection. In addition to the global international conventions and agreements, there are regional cooperation and agreements. Zambia is a member of SADC and COMESA for example. Adherence to the requirements of the agreements is mandatory.

The Conventions associated with chemicals and waste management are:

- (a) The Basel Convention
- (b) The Vienna Convention and The Montreal Protocol
- (c) The Kyoto Protocol
- (d) The Rotterdam Convention, and
- (e) The Stockholm Convention

Zambia is party to the following Multi-lateral Environmental Agreements (MEAs):

### **(a) The Basel Convention**

The Basel Convention was originally designed to address the uncontrolled movement and dumping, including incidents of illegal dumping, of hazardous wastes in developing nations by companies from developed countries. Categories of hazardous waste that are covered by the Convention include toxic, poisonous, explosive, corrosive, flammable, eco-toxicity and infectious wastes.

This convention was ratified by Zambia on 15<sup>th</sup> November 1994. The Country further went on to domesticate the provisions of the Basel Convention. This process culminated into the promulgation of the Hazardous Waste Management Regulations Statutory Instrument No. 125 of 2001. The implementation of the Basel Convention in the country has been through the enforcement of the Environmental Protection and Pollution Control Act No. 12 of 1993 Cap 204 of the Laws of Zambia and Statutory Instrument No. 125 of 2001.

**(b) The Vienna Convention for the protection of the Ozone Layer.**

This Convention was assented to by Zambia on January 24<sup>th</sup> 1990. On the same day, the Montreal Protocol on Substances that deplete the Ozone Layer was also assented to. Through a process of consultation, the Ozone Depleting Substances Regulations Statutory Instrument No. 28 of 2001 was promulgated. These Regulations are a domestication of the Vienna Convention for the protection of the Ozone Layer. Currently, Zambia is working on ratifying the Copenhagen, Beijing and Montreal Amendments to the Vienna Convention.

**(c) The Stockholm Convention on Persistent Organic Pollutants**

This convention was ratified by Zambia in 2006. This convention has not yet been domesticated. Suffice to mention, however, that the implementation of this convention is being done through the broader framework of the EPPCA No. 12 of 1993, Cap 204 of the Laws of Zambia and its subsidiary legislation, the Pesticides and Toxic Substances Regulations SI No. 20 of 1994 and the Hazardous Waste Management Regulations SI No. 125 of 2001.

**(d) The Rotterdam Convention on the Prior Informed Consent Procedure**

The current status of this convention is that the process of ratification is almost complete. It is envisaged that the process will be concluded at the end of 2007.

**(e) The United Nations Framework Convention on Climate Change and the Kyoto Protocol**

This United Nations Framework Convention on Climate Change was signed on June 6<sup>th</sup> 1992 and was subsequently ratified in 1993. In 2006, Zambia ratified the Kyoto Protocol.

Table 6.1 Summary shows international agreements that have been successfully domesticated.

**Table 6.1: Domesticated Conventions**

<b>Convention</b>	<b>Ratified</b>	<b>Equivalent Domesticated Act/ regulation</b>
<b>Basel</b>	1994	The Hazardous Waste Management Regulations (Statutory Instrument No125 of 2001); Also SI. 71 of 1993
<b>Vienna Convention &amp; Montreal Protocol</b>	Not yet	ODS Regulation S I No.28 of 2001
<b>Stockholm</b>	2006	As in Basel
<b>Rotterdam</b>	Not yet	The Pesticides And Toxic substances Regulations, SI No. 20 of1994

**Source: ECZ**

## 7. Key Stakeholders for the Study

### 7.1 List of Stakeholder Institutions

The approach adopted by institutions outside the government in relation to the management of chemicals is that of lobbying for action by interest groups. These institutions do not have legal mandates or powers to enforce. The institutions in this category vary, ranging from universities, and research institutions, professional bodies and industrial organisations and Non-Governmental Organisations (NGOs), as well as individuals with the necessary expertise, technical competences and experience in specialised areas (table 7.1). The effectiveness of their contributions depends largely on how wide their membership is and the relevance of their activities to national issues and chemicals management.

#### 7.1.1 Description of Organisations/Programmes

**Table 7.1 List of Stakeholder Institutions and Representative Persons**

No.	Name	Organisation	Status of Organisation	Importance to SAICM	Phone
1	Mazhamo M S	Food & Drug Control Lab;	Health	-Chemical analysis	01 25 2875
2	Kapelwa W	National Malaria Control Centre	Health	-Chemiciding as malaria control	097 787 3353
3	Zinyengere D	Chemtalk	Private sector	-chemical manufacturer; waste producer	097 7733 5076
4	Kancheya B S	Zambia Bureau of Standards	Commerce	-National standards certification	021 231385; 021 227075 btsoko@zabs.org.zm
5	Ndhlovu W	Lusaka City	Local Authority	-Municipal waste handling	01 25 2480
6	Mukosiku G	Ministry of labour	Labour, Factories inspectorate	Occupational and safety	097 770 0145
7	Simwanda L	Zambia National Farmers Union	Private sector	-Chemical consumer	097 784 8179
8	Mwansa S	Zambia Agro chemicals Association	NGO	Chemical importer	01 24 4274
9	Ndhlovu D J	Evelyn Hone College	Academia	Training	097 758 4503
10	Mwangala F S	NISIR	Research Institute	Training centre	096 675 0154
11	Masaninga F	WHO	Health	International and bi-lateral organisation	095 576 4117
12	Mundia A Y	CSZ/UNZA	Interest Group/Academia	Occupational and safety	095 585 4966
13	Banda S F	UNZA	Academia	Training	097 948 6601

**Source: Constructed by the Consultant**

Table 7.2 below gives an array of all available human resource expertise outside of government, some of whom can, and have been co-opted into the chemical management matrix.

**Table 7.2: A Summary of Expertise Available Outside of Government**

	Research Institutes	Universities	Industry	Environment and Consumer Groups	Labour Unions	Professional Organisations	International organisations e.g. (FAO/WHO)
Data Collection	✓	✓	✓			✓	
Data Collection	✓	✓				✓	
Risk Assessment	✓	✓	✓			✓	
Risk Reduction			✓	✓		✓	✓
Policy Analysis					✓	✓	
Training & Education	✓	✓	✓	✓	✓	✓	✓
Research Alternatives	✓	✓	✓			✓	
Monitoring	✓	✓	✓	✓		✓	✓
Enforcement							
Information to Workers	✓	✓	✓	✓	✓	✓	✓
Information to Public	✓	✓	✓	✓	✓	✓	

Source: Constructed by the Consultant

## 7.2 Comment/Analysis

The relationship that exists between NGOs and governmental institutions involved in chemicals management is very cordial and sound. The agencies outside of government which constitute the NGOs include membership from Employers, Employers' Organisations, Employees' representative organisations and/or Trade Unions, environmental watch-dog units such as the Wildlife Conservation Society of Zambia (WCSZ) and Citizens for Better Environment (CBE), as well as research and institutions of higher learning such as UNZA/CBU, NISIR, Mt. Makulu Research Station, Golden Valley Research Trust and other professional organisations. The afore-mentioned organisations contribute essential information to the government on issues of local and international concern connected to the sound management of chemicals in general, as well as issues relating to the management of POPs in particular.

The workers representatives (the unions) contribute by ensuring that awareness raising activities are undertaken at work places, and also that training programmes are promoted, arranged and executed effectively by employers among unionised institutional employees to inculcate the basic concepts and operational modes of sound chemical management. The methods of information transmission, among others, include the conduct of workshops and bipartite inspections of work places to verify information assimilation capacity. Learning institutions are encouraged to include rudimentary aspects of safe chemicals management in their curricula. The philosophy behind such activities is that pupils and students develop a sense of responsibility at an early stage in their education, so that by the end of their studies the crop of graduates will be more knowledgeable and competent in dealing with issues of chemicals management. Professional bodies such as the Agriculture Science Association of Zambia (ASAZ), Physics Association of Zambia (PAZ), Chemical Association of Zambia (CSZ) or Zambia Agrochemical Association (ZAA) provide exclusive components of their specialisations in making chemical management amenable to understanding by the public as well as in acting as the conduit through which issues of public concern can be digested for appropriate action by governmental agencies.

## 8. Situation analysis for the key areas within SAICM

### Stakeholders participating in the study

Zambia stakeholders		
No.	Name of organisation	Category
1	Food & Drug Control Lab;	Govt
2	National Malaria Control Centre	Govt
3	Chemtalk	Private sector
4	Zambia Bureau of Standards	Govt
5	Lusaka City	Local Govt
6	Ministry of labour	Govt
7	Zambia National farmers Union	Private sector
8	Zambia Agro chemicals Association	NGO
9	Evelyn Home College	Academia
10	National Institute for Scientific and Industrial Research	Research/Govt

### 8.1 Risk Reduction.

The Table 8.1 below gives a summary of stakeholder responses about **Risk Reduction** on chemicals and hazardous waste management.

Key to Scale of score range: Very much, Considerable, Moderate, Not much, None  
: Adequate, Inadequate, Not sure  
: High, Moderate, Low, Very low

**Table 8.1**

Q	Description	Stakeholder Response	Percent of Responses
1.1	Impact of chemicals and wastes on humans and environment	Considerable and above	90%
1.2	Measures in Zambia that protect human health and the environment from chemical exposure	Considerable and above	80%
1.3	Knowledge of National Institutes involved in risk management	Health & environ.	70%
		Social Econ. Analysis	60%
1.4	Institutional knowledge of stoppage of production and use of risk chemicals	Moderate & above	90%
1.5	Category of the measures cited in 1.4 above	Legal; Administrative	40%; 40%
1.6	Efficiency of measures in cited in 1.4 above	Inadequate	90%
1.7	Knowledge of incidences of chemical releases to environment	Yes	60%
1.8	If yes in 1.7 above; level of preparedness to address incidences	Low	83%
1.9	If yes in 1.7 above; source of information is?	TV; Papers	100%; 100%
1.10	Institutional awareness of Principle 15 of Rio Declaration	No	60%
1.11	Extent of Application & Promotion of Pollution Prevention	Moderate and above	80%
1.12	If "None" in 1.11 above; state reasons	-	-
1.13	National capacity & readiness to tackle global concerns	Low	60%
1.14	Challenges to 1.13	Moderate to high	70%
	a) Human resource		
	Challenges to 1.13	High	100%
	b) Financial resource		

Q	Description	Stakeholder Response	Percent of Responses
	Challenges to 1.13 <b>c) Lack of Political Will</b>	Moderate; High	40%; 40%
	Challenges to 1.13 <b>d) Administrative capacity</b>	Moderate	70%
	Challenges to 1.13 <b>e) Other Poverty &amp; Sustainable Development Priorities</b>	High	50%
	Challenges to 1.13 <b>f) Poor Linkage of Environment issues to Development</b>	High	60%
1.15	Quantity, type and toxicity of hazardous waste generation	Moderate	60%
1.16	Extent of awareness on <b>how</b> hazardous waste is <b>generated</b>	Moderate to high	90%
1.17	Extent o awareness on <b>how</b> hazardous waste is <b>stored</b>	Moderate to high	60%
1.18	Extent of awareness on <b>how</b> hazardous waste is <b>transported</b>	Moderate to high	80%
1.19	Extent of awareness on <b>how</b> hazardous waste is <b>treated</b>	Moderate and below	70%
1.20	Extent of awareness on <b>how</b> hazardous waste is <b>disposed</b>	Moderate and below	70%
1.21	Knowledge of institutions which recover & recycle hazardous materials and waste	Not much to none	70%
1.22	From 1.21; would you describe their operations as environmental friendly	Moderate and above	83%
1.23	Knowledge of cleaner production concept (theory& practice)	Moderate and below	70%
1.24	Knowledge of institutions in R&D producing new, safer chemical & biological materials	Moderate and above	60%
1.25	If score in 1.24 is 2-5; state names of organisations, and your area of concern	TDRC, Mpongwe Development Cooperation	-
1.26	Knowledge of role of chemicals and waste conventions in risk reduction	Moderate and below	50%
1.27	Any training and awareness to deal with poisoning and chemical incidences?	Not aware	70%
1.28	Knowledge of institutional awareness on risk assessment, management and communication.	Moderate and above	60%
1.29	If score is 2-5, Has your institution benefited from training & awareness?	Moderate and below	80%
1.30	Which institutions conducted training & awareness programmes?	NISIR, ECZ, Crop Int.	-
1.31	Any other views?	Environmental risk management will only improve with more manufacturer/user education and increased enforcement capacity on the part of the regulatory organisation, the ECZ	

## 8.2 Summary of Situational Analysis on Knowledge and Information.

The Table 8.2 below gives a summary of stakeholder responses about **Knowledge and Information** on chemicals and hazardous waste management.

Key to Scale of score range i.e.: Very high, High, Medium, Low, Not possible  
: Very much aware, Slightly aware, Not aware

**Table 8.2**

Q	Description	Stakeholder Response	Percent of Responses
2.1	Source of information on chemicals/waste	- Others (Internet, ECZ); - Foreign (UNEP)	60%; 30%
2.2	Adequacy of information for chemical management throughout life-cycle of chemical	Not much	80%
2.3	<b>Adequacy of Information:-</b> Complexity of Language used	High; Medium	40%; 30%
	Effects on health & Environment	High	40%
	Potential uses	High; Medium	50%; 40%
	Protective Measures	Medium; High	50%; 30%
	Regulations	High; Medium	50%; 30%
2.4	Popular modes of chemical information dissemination	Print Media	80%
2.5	Awareness of GHS on Classification & Labelling of Chemicals	Yes	80%
2.6	Has any work started on GHS implementation	Very much aware	40%
2.7	Has your institution benefited from any training?	No	60%
2.8	If 'yes' in 2.7, who conducted the training?	ECZ	100%
2.9	Presence of Laws ensuring confidentiality of commercial & industrial information.	Yes	60%
2.10	Is information on chemicals relating to health, safety & environment confidential?	Yes	60%
2.11	Extent to which institutions generate scientific information on chemicals & waste management.	Low	40%
2.12	Extent of interface between local institutions and policy making bodies	Low	40%
2.13	Awareness on information on hazard & risk assessments	Slightly aware	60%
2.14	If response in 2.13 is 2-3 dissemination; is via	Official means	78%
2.15	Any knowledge of National Environment Standards aimed at reducing chemical/wastes effects	Yes	90%
2.16	Is there consultation when National Environmental Standards are being set?	Yes	40%
		No	60%
2.17	Knowledge to international database on chemical safety and risk reduction strategies	Inadequate	70%
2.18	Extent of involvement in providing inputs, information, financial; to efforts to reduce unsound management of chemicals	Moderate and below	60%
2.19	If score in 2.18 is 1-2; describe the problem	Poor information flow	-
2.20	Knowledge & information on the role chemicals and waste conventions.	Moderate and below	70%

### 8.3 Summary of Situational Analysis on Governance.

The Table 8.3 below gives a summary of stakeholder responses about **Governance** on chemicals and hazardous waste management.

Key to Scale of score range i.e.: Very much, To some extent, Not at all  
: Very active, Active, Passive, Not all  
: Aware, Not aware

**Table 8.3**

Q	Description	Stakeholder Response	Percent of Responses
3.1	Promotion of sound management programmes for chemicals and waste	Moderate to high	70%
3.2	Your institution's working with other sectors in Govt in promoting sound chemicals mgt to all sectors	Not really	60%
3.3	Your institution's working with other sectors in Govt & Stakeholders in identifying priorities to chemicals mgt activities	Very much	50%
3.4	If score in 3.3 is 2-3; who provided training on how to identify priorities	Govt; International organization	50%; 50%
3.5	Is your institution aware on how national laws & regulations are enforced?	Very much	60%
3.6	Your comment	-	-
3.7	Your knowledge of "corporate environment & social responsibility" concept	To some extent to no.	50%
3.8	If score in 3.7 is 2-3; then rank the corporate community in observing, promoting relevant codes of conduct, including the concept	Moderate to low	75%
3.9	Involvement of women in decision making on chemicals policy and mgt.	Low	90%
3.10	If your response in 3.9 is 'Not at All', give your reasons	-	-
3.11	Knowledge of the need to promote mutual support between trade & environmental policies	Low	90%
3.12	If score in 3.11 is 2-3; state your extent of involvement	To some extent	71%
3.13	If score in 3.12 is 2-3; describe your participation	Active	60%
3.14	Knowledge of the incentives which support business to develop & improve products that advance strategic approach to chemicals mgt.	Aware	40%
3.15	Knowledge of Conventions		
	<b>a) Basel Convention</b>	Aware	80%
	<b>b) Stockholm Convention</b>	Aware	100%
	<b>c) Rotterdam Convention</b>	Aware	70%
	<b>d) Montreal Protocol</b>	Not Aware	60%
	<b>e) ILO on chemical Safety</b>	Aware	70%
3.16	Extent to which Focal points of the above conventions interact	Passive and not aware	50%
3.17	Extent to which your institution liaises closely with other stakeholders' management of chemicals & waste.	Active	50%
3.18	If your score in 3.17 is 2-4; how to you participate with other stakeholders	Formal structure	100%
3.19	What is the name of the structure referred to in 3.18?	NPCC	
3.20	Is there multi-sectoral/ multi-stakeholder mechanism to develop NPs & priority action?	Yes	70%
3.21	Knowledge on how international agreements are <b>ratified</b> via the National system	Not aware	60%
3.22	Knowledge on how international agreements are <b>domesticated</b> into National laws	Not aware	60%
3.23	Knowledge of the national Focal Points for various Chemicals & waste conventions	Not aware	60%

<b>Q</b>	<b>Description</b>	<b>Stakeholder Response</b>	<b>Percent of Responses</b>
3.24	How is coordination amongst the focal points effected?	No idea	60%
3.25	If score in 3.24 is 4; name the structure	ECZ	40%

## 8.4 Summary of Situation Analysis on Capacity Building & Technical Cooperation

The Table 8.4 below gives a summary of stakeholder responses about **Capacity Building & Technical Cooperation** on chemicals and hazardous waste management.

Key to Scale of score range : High, Moderate, Low, None

: Very much aware, Considerate, Moderate, Low, Not much, None

**Table 8.4**

<b>Q</b>	<b>Description</b>	<b>Stakeholder Response</b>	<b>Percent of Responses</b>
4.1	Capacity to train others <b>a) chemicals management</b>	Moderate to High	70%
	<b>b) waste management</b>	Moderate to High	60%
4.2	Information source for capacity building	Websites; Govt/ Agencies	80%; 70%
4.3	Awareness of role of chemicals & waste conventions on capacity building and tech. coop.	Moderate and below	80%

## 8.5 Summary of Situational Analysis on Illegal International Traffic

The Table 8.5 below gives a summary of stakeholder responses about **Illegal International Traffic** on chemicals and hazardous waste management.

Key to Scale of score range i.e.: High, Moderate, Low, Very low, None at all

: Very much aware, Considerable, Moderate, Not much, Not aware

**Table 8.5**

<b>Q</b>	<b>Description</b>	<b>Stakeholder Response</b>	<b>Percent of Responses</b>
5.1	Ranking of treaty in prevention of Illegal international traffic:- <b>(a) Basel</b>	Moderate to low	90%
	Ranking of treaty in prevention of Illegal international traffic:- <b>(b) Stockholm</b>	Moderate to high	70%
	Ranking of treaty in prevention of Illegal international traffic:- <b>(c) Rotterdam</b>	Low to none	70%
	Ranking of treaty in prevention of Illegal international traffic:- <b>(d) Montreal</b>	Low to none	70%
5.2	Extent of Domestication of treaty by government:- <b>(a) Basel</b>	Low to none	70%
	Extent of Domestication of treaty by government:- <b>(b) Stockholm</b>	Low to none	70%
	Extent of Domestication of treaty by government:- <b>(c) Rotterdam</b>	Low to none	90%
	Extent of Domestication of treaty by government:- <b>(d) Montreal</b>	Low to none	80%
5.3	Extent of Information sharing between your govt ant other govts on prevention and control of Illegal International Traffic	Low to none	80%
5.4	Awareness of role of chemicals and waste conventions on prevention of Illegal International Traffic	Moderate to not aware	60%

## Comment/ Analysis

The situational analysis on the management of chemicals and waste is as follows:

- (a) The impacts of wastes on human health and environment are well known and Zambia has and is putting significant measures in place to protect human health and the environment from chemical exposure. These measures are frustrated by a number of facts that include low national capacity and readiness to tackle global concerns arising from chemical releases to the environment and waste. The following issues are prominent challenges among others: inadequate trained human resource, low financial resources and the absence of political will.
- (b) Limited information is available about the quantity, type and toxicity of hazardous waste generated. Institutional capacity to deal with poisoning and chemical incidences is not available and there appears to be no training facilities to address these problems.
- (c) The major source of information on chemicals and waste is the Environmental Council of Zambia, UNEP and through internet search. The adequacy of information obtained from these institutions is very high. There is a significant awareness about GHS on Classification and Labelling of Chemicals and the GHS implementation in the country appears to have taken off. The stakeholders' view on knowledge and information of the role of Chemicals and waste convention is low and a thorough grounding on the objectives of the Chemicals and waste conventions must be enhanced.
- (d) The government of the Republic of Zambia's efforts to promote sound management for Chemicals and waste are highly recognised. Most stakeholders (more than 70%) have sufficient knowledge of the Stockholm Convention, the Basel Convention and the ILO Chemical Safety Programmes, while the Montreal Protocol is least understood. Most stakeholders are not aware of the local focal points of these conventions. Neither do they know where the offices of the focal points are. The study reveals that stakeholders are not aware of how international conventions become ratified and the steps leading to domestication of the conventions into national laws.
- (e) The demand of capacity building and technical co-operation in chemicals and waste management is high but efforts to improve understanding of the effects of chemicals and wastes are welcome via the training of local individuals for sustainability. It is hoped that with the training of local personnel, expansion of the local laboratories and the creation of national emergency centres would go a long way in reducing the impact of chemicals and waste on to the environment and human health.

## 9. Summary of Gap Analysis on SAICM Objectives

The situation analysis shows that there are a number of areas for concern, which have to be addressed in Zambia.

### 9.1 Risk Reduction

The following issues need to be addressed:

- (i) The knowledge on the impact of chemicals and wastes on humans and environment is inadequate.  
- **This is a relatively new area which has to be developed to cater for the various stakeholders and hence institutions have to be made aware of these fundamentals.**
- (ii) The knowledge on the incidences of chemical releases to the environment is fair (60%) and the perception on the preparedness to address is considered to be low.  
- **More work has to be done to both improve the channels of communication between the responsible institutions and to build capacity to address these incidences.**
- (iii) The awareness on the quantity, type and toxicity of hazardous waste generated in their own country is moderate.  
- **The custodian of this information is ECZ, it has to be made readily available.**
- (iv) The awareness on how hazardous waste is treated and disposed is low.  
- **This can be overcome through awareness and training programmes.**
- (v) The knowledge on institutions which recover and recycle hazardous materials and waste is very low.  
- **ECZ can play a role in the dissemination of such information.**
- (vi) The knowledge of institutions and local R&D producing new and safer chemical & biological materials is moderately known.  
- **Institutions generating such useful knowledge might not have all the skills and expertise to publicise it to the various audience and this is a specialized field needing assistance and support from the national government and other donor assisted programmes.**
- (vii) The knowledge on the role of chemicals and waste conventions in risk reduction is moderate (50/50).  
- **More awareness programmes have to market these conventions.**
- (viii) 70% of the stakeholders are not aware of the existence of training and awareness programmes dealing with poisoning and chemical incidences in the country.  
- **This has to be addressed through training.**

- (ix) The institutional awareness on risk assessment, management and communication is considerable (60%).  
**- There is still room for improvement to address the rest of the stakeholders who fall under the 40% of stakeholder not adequately aware.**
  
- (x) The national capacity & readiness to tackle global concerns is considered to be low due to the following main problems:
  - Inadequate financial resources
  - Low administrative capacity
  - Other poverty alleviation priorities
  - Poor linkage of environment issues to development**- It is important to mount awareness and training programmes to promote linkage between environment and development issues to address the global concerns through national actions**

## 9.2 Knowledge and Information

These are the areas of concern:

- (i) Information on chemical management throughout their life-cycle is low.  
**- Since this is a relatively new subject for the stakeholders, it has to be addressed effectively through awareness programmes.**
  
- (ii) Knowledge on the presence of national laws ensuring confidentiality of commercial & industrial information is fair. (60%).  
**- More knowledge and work has to be done to address the rest (40%) of the stakeholders, since they are key in the national development processes, where they could be consulted on national development issues seeking to balance between keeping confidentiality vis-à-vis protecting the environment.**
  
- (iii) Knowledge on the extent to which own local institutions generate scientific information on chemicals & waste management is generally low.  
**- Institutions generating such useful knowledge might not have all the skills and expertise to publicise it to the various audiences and this is a specialized field needing assistance and support from the national government and other donor assisted programmes.**
  
- (iv) The extent of interaction between local institutions and policy making bodies is low.  
**- This has to be improved through the programmes which build capacity of the various players to be active participants. Subjects can include communication and negotiating skills as well.**

- (v) The awareness on information on hazard & risk assessments is fair (60%) but more work has to be done to bring along the rest (40%).  
- **This is can be enhanced through awareness raising and training.**
- (vi) The access to international databases on chemical safety, necessary to promote risk reduction strategies is inadequate.  
- **ECZ can spearhead this with assistance from KemI.**
- (vii) Knowledge on the role of the Chemicals and waste Conventions in promoting knowledge and information is low.  
- **More publicity is needed and ECZ can play that role assisted through international cooperation with the various Secretariats of these conventions.**

### 9.3 Governance

These are the issues of concern:

- (i) The cooperation between the government and other sectors in promoting sound chemicals and waste management and involvement in identifying priorities pertaining to the same is far from ideal.  
- **A close working relationship, whether formal or informal, between the various institutions and the government is essential and has to be enhanced.**
- (ii) Knowledge of the “corporate environment & social responsibility” concept is on a borderline i.e. 50/50.  
- **Awareness on this subject is important and here the corporate sector has to work closely with national authorities and the rest of the public to raise their profile.**
- (iii) The perception of the institutions on the corporate community’s code of conduct to observe good practices is generally negative.  
- **It is important that the corporate community mounts relevant programmes in order to improve the image, as it might happen that most of them are good corporate citizens but this fact is hardly publicized.**
- (iv) Involvement of these institutions in setting up policies with Government.  
- **This is important and existing working networks can be enhanced and institutions empowered to be active participants in debates of national importance**
- (v) The involvement of women in decision making processes is inadequate.  
- **This is an area of grave concern which needs constant attention and actions to involve women in planning processes and hence empowered them to be active participants.**

- (vi) Knowledge on the link between trade and environment is inadequate.  
**-Without this knowledge, potential antagonisms will continue to exist and impact on the national development efforts, hence there is a need for proper knowledge on the subject for the sake of sustainable national development.**
- (vii) Knowledge of incentives which support business to develop and improve products and which advance the strategic approach to chemicals management is low.  
**- There has to be more awareness and knowledge on this subject and the government has to assisted in developing sound and effective awareness programmes.**
- (viii) The Montreal protocol is least known among the chemicals and wastes conventions.  
**- More awareness on the Montreal protocol has to be raised through workshops at every opportunity.**
- (ix) Knowledge on how international agreements are ratified and domesticated is low.  
**- Without this knowledge, support from various institutions on environmental programmes would suffer as they will not have a clear link between national efforts towards meeting international obligations and the role that these institutions could play in contributing towards these national efforts.**
- (x) Knowledge on the national Focal points for the various Chemicals and waste conventions including knowledge on how these focal points coordinate amongst themselves is low.  
**- Ideally, the focal points and their work should be made known through various workshops and sound communication strategies. ECZ has a strong role to play in this area.**

#### **9.4 Capacity Building and International Cooperation**

From the study, it is clear that the role of the chemicals and wastes conventions in capacity building and technical cooperation is hardly known amongst the key institutions.

**- More work has to be done on the part of the focal points to raise awareness through seminars. The BCRC-KemI project provides a chance to contribute towards this goal.**

## 9.5 Illegal International Traffic

- (i) The roles of the key Chemicals and wastes conventions namely Basel, Stockholm Rotterdam and Montreal protocol in combating illegal international traffic is hardly known.  
**- There is need for more training and awareness on these conventions.**
  
- (ii) Knowledge on the extent of domestication of these Conventions into local laws is hardly existent and hence far from ideal.  
**- There is need for more information sharing between the focal points and the key country stakeholders.**
  
- (iii) Knowledge of the extent to which the Government shares information with other Governments is far from adequate and constitutes an area of concern if these institutions have to play an active role in the prevention of illegal international traffic.  
**- The approach in the design of awareness programmes by the Government has to be improved to ensure that the public and all key institutions have a good understanding and hence represent a source of support to Government efforts to combat illegal international traffic.**

## 10. Summary of relevant areas where projects could be developed

### 10.1 Risk Reduction Statistical Data

Table 10.1 shows the ranking by stakeholders of relevant risk reduction areas, where projects can be developed.

**Table 10.1 Possible Areas for projects on risk reduction**

Intensity of Response	Stakeholder Responses (Number/10; Percent/100)				
	Very High	High	Moderate	Low	Not Important
<b>Risk Reduction Priorities*</b>					
1 Risk assessment, management and communication	8, (80%)	2, (20%)	0	0	0
2 Highly toxic pesticides-risk management and reduction	6, (60%)	4, (40%)	0	0	0
3 Occupational health and safety	6, (60%)	3, (30%)	1, (10%)	0	0
4 Building of capacities to deal with poisoning and chemical incidences	6, (60%)	3, (30%)	1, (10%)	0	0
5 Formulation of prevention and response measures to mitigate environmental and health impacts.	5, (50%)	5, (50%)	0	0	0
6 Waste management (minimisation)	5, (50%)	3, (30%)	2, (20%)	0	0
7 The role of GHS in risk reduction	1, (10%)	8, (80%)	1, (10%)	0	0
8 Chemicals of global concern	2, (20%)	5, (50%)	3, (30%)	0	0

Note: \* priority listed according to rank

### Comment

Based on the priorities above it is apparent that projects can be developed in the following areas which score high and very high:

- (a) Risk assessment, management and communication
- (b) Highly toxic pesticides-risk management and reduction
- (c) Occupational health and safety
- (d) Building of capacities to deal with poisoning and chemical incidences
- (e) Formulation of prevention and response measures to mitigate environmental and health impacts.
- (f) Waste management (minimisation)
- (g) The role of GHS in risk reduction
- (h) Chemicals of global concern

## 10.2 Knowledge and Information statistical data

Table 10.2 shows the ranking by stakeholders of relevant knowledge and information areas, where projects can be developed.

**Table 10.2 Possible Areas for projects on Knowledge and Information**

Intensity of Response	Stakeholder Responses (Number/10; Percent/100)				
	Very High	High	Moderate	Low	Not Important
<b>Knowledge &amp; Information Priorities*</b>					
1 Highly toxic pesticides-risk management and reduction	8, (80%)	2, (20%)	0	0	0
2 Research, monitoring and data management	8, (80%)	1, (10%)	1, (10%)	0	0
3 Information management and dissemination	7, (70%)	3, (30%)	0	0	0
4 Hazardous data generation and availability	6, (60%)	1, (10%)	3, (30%)	0	0
5 Globally Harmonized system (GHS) of Classification and Labelling	4, (40%)	3, (30%)	3, (30%)	0	0
6 Creation of National and International Registers	3, (30%)	5, (50%)	1, (10%)	1, (10%)	0
7 Use of indicators to monitor children's environmental health	4, (40%)	3, (30%)	2, (20%)	1, (10%)	0
8 Life cycle management	2, (20%)	4, (40%)	3, (30%)	0	0

Note: \* priority listed according to rank

### Comment

Based on the priorities above it is apparent that projects can be developed in the following areas which have scored high and very high:

- (a) Highly toxic pesticides-risk management and reduction
- (b) Research, monitoring and data management
- (c) Information management and dissemination
- (d) Hazardous data generation and availability
- (e) Globally Harmonized system (GHS) of Classification and Labelling
- (f) Creation of National and International Registers
- (g) Use of indicators to monitor children's environmental health
- (h) Life cycle management

### 10.3 Governance Statistical Data

Table 10.3 shows the ranking by stakeholders of relevant governance areas, where projects can be developed.

**Table 10.3 Possible Areas for projects on Governance**

Intensity of Response	Stakeholder Responses (Number/10; Percent/100)				
	Very High	High	Moderate	Low	Not Important
<b>Governance Priorities*</b>					
1 Implementation of integrated national programmes for sound management of chemicals	7, (70%)	2, (20%)	1, (10%)	0	0
2 Stakeholder participation in decision making process	5, (50%)	5, (50%)	0	0	0
3 Assessment of national chemical management to identify gaps and prioritise action	4, (40%)	5, (50%)	1, (10%)	0	0
4 Social and economic consideration	3, (30%)	6, (60%)	1, (10%)	0	0
5 EIAs to include chemicals and hazardous waste	2, (20%)	7, (70%)	1, (10%)	0	0
6 Legal, Policy and Institutional aspects	2, (20%)	6, (60%)	2, (20%)	0	0
7 International chemicals and waste conventions-promotion of ratification and synergies	2, (20%)	6, (60%)	2, (20%)	0	0
8 GHS(review of national legislation and align with GHS)	1, (10%)	6, (60%)	3, (30%)	0	0

**Note: \* priority listed according to rank**

#### Comment

Based on the priorities above it is apparent that projects can be developed in the following areas which have scored high and very high:

- (a) Implementation of integrated national programmes for sound management of chemicals
- (b) Stakeholder participation in decision making process
- (c) Assessment of national chemical management to identify gaps and prioritise action
- (d) Social and economic consideration
- (e) EIAs to include chemicals and hazardous waste
- (f) Legal, Policy and Institutional aspects
- (g) International chemicals and waste conventions-promotion of ratification and synergies
- (h) GHS(review of national legislation and align with GHS)

## 10.4 Capacity Building & Technical Cooperation Statistical Data

Table 10.4 shows the ranking by stakeholders of relevant areas under Capacity Building & Technical Cooperation where projects can be developed.

**Table 10.4 Possible Areas for projects on Capacity Building & Technical Cooperation**

Intensity of Response	Stakeholder Responses (Number/10; Percent/100)				
	Very High	High	Moderate	Low	Not Important
<b>Capacity Building &amp; Technical Cooperation Priorities*</b>					
1 Formulation of preventive and response measures to mitigate environmental and health impacts	8, (80%)	2, (20%)	0	0	0
2 Capacity-Building to support national actions	8, (80%)	1, (10%)	0	0	1, (10%)
3 Remediation of contaminated sites and poisoned individuals	5, (50%)	3, (30%)	2, (20%)	0	0
4 Capacity to implement GHS	(3, 30%)	7, (70%)	0	0	0
5 Waste management	(3, 30%)	4, 40%)	2, (20%)	1, (10%)	0

Note: \* priority listed according to rank

### Comment

Based on the priorities above it is apparent that projects can be developed in the following areas which have scored high and very high:

- (a) Formulation of preventive and response measures to mitigate environmental and health impacts
- (b) Capacity-Building to support national actions
- (c) Remediation of contaminated sites and poisoned individuals
- (d) Capacity to implement GHS
- (e) Waste management

## **10.5 Illegal International Traffic Statistical Data**

### **10.5.1 Illegal Traffic in Hazardous Wastes under the Basel Convention**

Under the Basel Convention, illegal traffic occurs if the trans-boundary movement of hazardous wastes is taking place under the following conditions:

- Without notification pursuant to the provisions of the Convention to all States concerned;
- Without the consent of a State concerned;
- Through consent obtained by falsification, mis-representation or fraud;
- When movement does not conform in a material way with the documents; or
- When movement results in deliberate disposal of hazardous wastes in contravention of the Convention and of general principles of international law.

Many cases of illegal traffic take the form of deliberate mixing of hazardous wastes with non-hazardous wastes. There are also cases involving large-scale illegal traffic of hazardous wastes, usually involving money laundering activities and sometimes linked to illegal trade in arms. There have also been cases of ships containing waste cargo wandering the world's oceans, seeking ports to discharge their waste cargos. Such "toxic trade" led to the creation of the Basel Convention.

Under the Basel Convention, illegal traffic in hazardous wastes is considered criminal. Each Party is expected to introduce appropriate national/domestic legislation to prevent and punish illegal traffic.

The convention states, "That Parties shall cooperate to prevent illegal traffic. In case of illegal traffic as the result of conduct on the part of the exporter or generator, the State of export shall ensure that hazardous wastes be taken back by the exporter, generator or itself or, if impracticable, otherwise disposed of in accordance with the Convention, importer or disposer. The State of import shall ensure that the wastes in question are disposed of in an environmentally sound manner by the importer, disposer or itself. If the responsibility cannot be assigned either to the exporter or the generator or to the importer or the disposer, the Parties concerned or other Parties shall ensure, through cooperation, that the wastes are disposed of in an environmentally sound manner."

The Basel Convention cooperates with Interpol in relation to illegal traffic in hazardous wastes. Moreover, both organizations participate in international conferences aimed at raising awareness concerning environmental crime.

**The System that Controls the Movement of Hazardous Waste**

Because hazardous wastes pose such a potential threat to human health and the environment, one of the guiding principles of the Basel Convention is that, in order to minimize the threat, *hazardous wastes should be dealt with as close as possible to where they are produced.*

Therefore, under the Convention, trans-boundary movements of hazardous wastes or other wastes can take place only upon prior written notification by the State of export to the competent authorities of the States of import and transit (if appropriate). Each shipment of hazardous waste or other waste must be accompanied by a movement document from the point where a trans-boundary movement begins to the point of disposal. Hazardous waste shipments made without such documents are illegal. In addition, there are outright bans on the export of these wastes to certain countries.

Table 10.5 shows the ranking by stakeholders of relevant Illegal International Traffic areas, where projects can be developed.

**Table 10.5 Possible Areas for Projects on Illegal International Traffic**

Intensity of Response	Stakeholder Responses (Number/10, Percent/100)				
	Very High	High	Moderate	Low	Not Important
Illegal International Traffic *					
Prevention of illegal traffic in toxic and dangerous goods	9, (90%)	1, (10%)	0	0	0

Note: \* priority listed according to rank

**Comment**

The table above shows a strong desire for actions that support capacity building to reduce Illegal International Traffic in chemicals and waste.

## 11. Comments on the outline of the training from country experts

Of the ten stakeholders in the study only three gave responses to the questions on training needs in the country in support of sound chemical and waste management. This small sample of three is not representative enough for the study. Some respondents merely focussed on needs for their work places as opposed to needs of the country.

Zambia has potential for training, which can be testified by the various institutions providing training both at universities and professional colleges. The following institutions have demonstrated capacities to train on issues involving Hazardous Waste Management and Chemical Management: University of Zambia and Copperbelt University, Natural Resources Development College, Evelyn Hone College, CropLife Zambia, Training Trust; The Zambia Agro-Chemical Association (ZAA), Beyond Petroleum(BP), Occupational Health and Safety Services(OHSS) in the Ministry of Labour and Social services and Local Authorities.

The training provided includes emergency response, Hazardous chemicals, GHS and in some case it is informal. The topics proposed as contents by SAICM such as Environment, Poverty Eradication and Sustainable Development, Chemicals and Waste Agenda and their Conversions, Risk Reduction, Knowledge and Information; Governance; Capacity Building and Technical Cooperation and Illegal International Traffic of chemicals and Waste as cited as among topics of interest. Table 11.1 shows some of the responses received from the stakeholders.

**Table 11.1 Stakeholder Responses on Training Outline**

Stakeholder	Training Needs	Views in Support
No.10	1. GHS Standard Implementation and Awareness Programmes	Currently, the Zambia is developing a standard on GHS, which requires a vigorous implementation plan and awareness programmes.
	2. Transportation of Dangerous Goods	As in (1) above , a national standard is being developed
	3. Consumer Participation and Awareness on Chemicals and Waste Management	A lot of education is required for the Consumer (citizens) on chemicals and waste management
No.3	1. Environmental Effects	There is need for a concerted effort to deliberately inform and educate the population and all stakeholders on this subject
	2. List of Toxic Substances and their Nature	An attempt should be made to educate on all the potential hazardous substances
	3. Governance	Issues of Legislation, accountability and Policing should be well addressed. These to include capacity building
No.2		Research, Monitoring and Evaluation of Non-Toxic (e.g. Biological Agents) in Disease Vector Control in Certain Epidemiological Settings
		Impact of Environmental Manipulation on Disease (e.g. Malaria) Vector Control Using Non-Chemical methods
		Information Education and Communication for Behavioural Change to Promote Use of Non-Toxic Agents in Disease/ Vector Control

**Note: List of Stakeholders in show in Table 7.1.**

## **11.1 Laboratory Infrastructure**

Zambia has few laboratories that can be used for training though they may not be internationally accredited. These laboratories include the following;

- (a) The National Institute for Scientific and Industrial Research (NISIR) laboratories in Kitwe, Lusaka and Chilanga
- (b) The University of Zambia laboratories in the Department of Chemistry, School of Agriculture and School of Engineering
- (c) The Geological Survey Department,
- (d) The Food and Drug Control Laboratory,
- (e) The Medical Stores laboratory in Lusaka
- (f) The Tropical Disease Research Centre laboratory in Ndola
- (g) The Alfred Knight Laboratories in Kalulushi

## **11.2 Poison Information Centre/ National Chemical Emergency Centre**

Zambia has no regular poison information or a national incidents emergency centre that can provide advice and assistance in cases where chemical hazards are concerned. Most sectors provide voluntary on-site first aid remedial measures at industry/company level.

The importance of a poison centre, the need for emergency centres and the training for first responders cannot be over emphasized as topics for training in SAICM.

## 12. Assessment of country potential trainers

Table 12.1 gives a summary of the past training and awareness programmes undertaken on Chemicals and Waste Management over the years.

**Table 12.1**

<b>Year</b>	<b>Training</b>	<b>Awareness</b>	<b>Duration</b>	<b>Sponsor</b>
2000	IPP	Air Pollution, HWM, EA, EIS	36 months	NORAD
1999	Cleaner Production	Waste Reduction	60 months	NORAD
2002	HWM	General and Clinical Waste	One Month	BCRC

### 12.2. Potential Trainers in Chemicals and Waste Management

<b>Name</b>	<b>Qualification</b>	<b>Institution</b>	<b>Years of Experience</b>	<b>Telephone Number</b>
Banda Samuel F.	PhD	UNZA	20	260-979486601
Mundia Aloysius Y	MSc	UNZA	6	260-955854966
Mwangala Felix S	PhD	NISIR	15	260-966750154
Mwansa Steve	BSc. Agric	ZAA	15	260-977809939
Ndhlovu David J	BSc.	Evelyn Hone College	13	260-977584503
Mwale Humphrey	BSc	ECZ	5	260-955769749

## 13. Conclusions and recommendations

### 13.1 Conclusions

It is clear from the study that though chemicals and wastes are useful to man they continue to pose a great danger to human health and the environment. Human economic activities have associated waste that is a toxic/hazardous or not. The Chemicals and waste conventions (Basel, Vienna, Stockholm and Rotterdam) all have one thing in common – to protect human health and the environment. Member countries that are party to these conventions have a duty to domesticate the conventions into laws and ensure their adequate enforcement.

The Zambian government is participating well on international conventions having ratified most chemicals and waste conventions or being almost at ratification stage. The Basel, Vienna and Stockholm Conventions have been domesticated into national law.

The Strategic Approach towards International Chemical Management (SAICM) project contributes towards a toxic-free environment in Africa. The study has revealed glaring gaps in levels of understanding, interpretation and in the mode and type of response expected during chemical incidences.

The current Zambia National Chemicals Profile was updated in 2005 and is the second edition following the 1996 first edition. The second edition though still in draft form, was mere an integration of the POPs into the National profile. The main emphasis was to include chemicals covered by the Stockholm Convention into the National Profile. It did not represent a holistic review or update of the other non-POPs chemicals. The second edition leaves out many issues about other chemicals.

It can be concluded as follows:

- (a) The majority of the chemicals needed in Zambia are imported and the lack of proper management throughout the lifecycle poses threats to human health.
- (b) The majority of waste and hazardous waste is disposed of arbitrarily. Zambia still lacks a comprehensive waste and hazardous waste management strategy, including basic elements like waste collection, waste treatment, disposal sites, etc.
- (c) There is a need to conduct several independent studies in the mining towns to ascertain waste and soil pollution problems.
- (d) Limited information is available on the quantity, type and toxicity of hazardous waste generated. Institutional capacity to deal with poisoning and chemical incidences is not available and there appears to be no training facilities to address these problems.
- (e) The major source of information on chemicals and waste is the Environmental Council of Zambia, UNEP and the internet. The adequacy of information obtained

from these institutions is very high. There is a significance awareness of GHS on Classification and Labelling of Chemicals and the GHS implementation in the country appears to have taken off. The stakeholders' awareness on knowledge and information of the role of Chemicals and waste convention is low and a thorough grounding on the objectives of the Chemicals and waste conventions must be enhanced.

- (f) The government of the Republic of Zambia's efforts to promote sound management for Chemicals and waste are highly recognised. Most stakeholders (more than 70%) have sufficient knowledge of the Stockholm Convention, the Basel Convention and the ILO Chemical Safety Programmes, while the Montreal Protocol is least understood. Most stakeholders are not aware of the local focal points of these conventions. Neither do they know where the offices of the focal points are. The study reveals that stakeholders are not aware of how international conventions become ratified and the steps leading to domestication of the conventions into national laws.
- (g) The demand of capacity building and technical co-operation in chemicals and waste management is high and efforts to improve understanding of the effects of chemicals and wastes are welcome via the training of local individuals for sustainability. It is hoped that with the training of local personnel, expansion of the local laboratories and the creation of national emergency centres would go a long way in reducing the impact of chemicals and waste on to the environment and human health.
- (h) The study reveals that at least 60% of the stakeholders' views are that the impacts of chemicals and waste to human health and the environment are considerably known but that the nation has little to limited capacity to handle and to prepare for these risks. Limitations arise from several dimensions including lack of readiness to tackle global concerns due to a number of constraints such as the availability of trained human resource, finance, lack of adequate political will and failure to link poverty and sustainable development.
- (i) Most stakeholders expressed little knowledge of the quantities, type and levels of toxicity posed by hazardous waste to the community and the environment. Knowledge is therefore scanty and inadequate.
- (j) There is limited institutional capacity to handle incidences and accidents from chemicals and hazardous waste. This is evidenced by the absence of emergency centres and local knowledge on how to treat victims of such incidences.
- (k) Much of the sources of knowledge and information on the effects of chemicals and waste on the environment and human health is sourced through the ECZ, UNEP and/or via internet search. The information obtained in this way is often adequate. It includes their potential effects on health and environment, their potential uses and some information on protective measures to prevent accidents. The GHS on

Classification & Labelling of Chemicals is useful in dissemination of information hazards.

- (l) The stakeholders are aware of the government's promotion of sound management programmes for chemicals and waste. Most of the programmes are channelled through the ECZ.
- (m) Most stakeholders (60%) have sufficient knowledge of the conventions on chemicals and waste, however the knowledge of the process of domestication of the conventions is lacking.
- (n) Despite the effort of government to include women in decision making processes, there is still low participation of women at managerial level on environmental issues.
- (o) The country has a critical mass of personnel and structures that can be used in capacity building, but it will require support in further training of core trainers in chemicals and waste management. The proposed BCRC-KemI SAICM training outline can be the starting point. This can include issues on poison centres and needs for emergency response.
- (p) Knowledge on Illegal International traffic in waste and banned chemicals is limited with 80% and above stakeholders not aware of how for example the key chemicals and wastes convention such as Basel, Vienna, Stockholm and Rotterdam, conventions assist in curbing the Illegal International Traffic.

In conclusion, the SAICM project is timely and relevant to the development of the country. It is hoped that if all the proposals are put into place then all the conventions and the domesticated laws will have achieved their aims and the attitude of people towards chemical and waste would improve.

## **13.2 Recommendations**

In view of the above, the following recommendations are made:

### **13.2.1 Training and awareness:**

From the gap analysis above it is possible to develop capacity building programmes through SAICM, in order to help in risk reduction, improvement of knowledge and information dissemination, governance, capacity building and technical cooperation and strategies that curb illegal international traffic. These are the specific areas of interest:

#### **(a) Risk Reduction**

The following are the issues to be addressed:

- (i) Knowledge on the impact of chemicals and wastes on humans and environment.
- (ii) Knowledge on the incidences of chemical releases to the environment and the perception on the preparedness of the nation to these incidences.
- (iii) Awareness on the quantity, type and toxicity of hazardous waste generated in Zambia.
- (iv) Awareness on how hazardous waste is treated and disposed.
- (v) Knowledge on institutions which recover and recycle hazardous materials and waste.
- (vi) Knowledge of institutions and local R&D producing new and safer chemical & biological materials.
- (vii) Knowledge on the role of chemicals and waste conventions in risk reduction.
- (viii) Training and awareness to deal with poisoning and chemical incidences.
- (ix) Institutional awareness on risk assessment, management and communication.
- (x) National capacity & readiness to tackle global concerns.

**(b) Knowledge and Information**

These are the areas of concern:

- (i) Information on chemical management throughout their life-cycle.
- (ii) Knowledge on the presence of national Laws ensuring confidentiality of commercial & industrial information.
- (iii) Knowledge on the extent to which own local institutions generate scientific information on chemicals & waste management.
- (iv) Extent of interface between local institutions and policy making bodies.
- (v) Awareness on information on hazard & risk assessments.
- (vi) Access to international database on chemical safety data to promote risk reduction strategies.
- (vii) Knowledge on the role of the Chemicals and waste Conventions in promoting knowledge and information.

### **(c) Governance**

These are the issues of concern:

- (i) Close working with other sectors of the government in promoting sound chemicals and waste management and involvement in identifying priorities pertaining to the same.
- (ii) Knowledge of the “**corporate environment & social responsibility**” concept.
- (iii) Perception of the institutions on the corporate community’s code of conduct to observe good practices.
- (iv) Involvement of the country stakeholders in setting up policies.
- (v) Involvement of women in decision making processes.
- (vi) Knowledge on the link between of trade and environment.
- (vii) Knowledge of incentive which support business to develop and improve products that advance strategic approach to chemicals management.
- (viii) Knowledge on the Montreal protocol as one of the chemicals and wastes conventions.
- (ix) Knowledge on how international agreements are ratified and domesticated.
- (x) Knowledge on the national focal points for the various chemicals and waste conventions including knowledge on how these focal points coordinate amongst themselves.

### **(d) Capacity Building and International Cooperation**

- (i) Role of the chemicals and wastes conventions in capacity building and technical cooperation.

### **(e) Illegal International Traffic**

- (i) The roles of the key Chemicals and wastes conventions namely Basel, Stockholm and Rotterdam and the Montreal protocol in combating illegal international traffic.
- (ii) Knowledge on the extent of domestication of these Conventions into local laws.

- (iii) Knowledge of the extent to which the Government shares information with other Governments is far from adequate. This is an area of concern if these institutions have to play an active role in the prevention of illegal International traffic.

### **13.2.2 Training contents**

Of the ten stakeholders in the study only three gave responses to the questions on training needs in the country in support of sound chemical and waste management. This small sample is not representative enough for the study. Some respondents merely focused on needs for their work places as opposed to needs of the country.

In any case there has to be a starting point, and it is appropriate to begin by defining the contents of Agenda 21 of 1992, Rio de Janeiro Summit, and to explain how the chemicals and waste conventions help in reducing risks caused by chemicals and waste.

In addition, the topics proposed through the BCRC-KemI project to address SAICM, which link environment and sustainable development, are key in achieving a non-toxic environment in Zambia.

The topics proposed as contents by SAICM such as Environment, Poverty Eradication and Sustainable Development, Chemicals and Waste Agenda and their Conversions, Risk Reduction, Knowledge and Information; Governance; Capacity Building and Technical Cooperation and Illegal International Traffic of chemicals and Waste are among topics of interest.

### **13.2.3 Building of Local training capacity**

To training of the local personnel is cardinal. Zambia has tertiary educational systems capable of offering quality training on chemicals and waste. These institutions have qualified personnel to take on the task. It will be important for SAICM to provide initial training to a core group of trainer of trainers (TOT). The training should include curriculum development and module development. The training outline proposed by SAICM can form the basis for further development of a curriculum to address chemicals and waste management. .

### **13.2.4 Possible areas where country projects could be developed**

These are as follows:

#### **(a) Risk Reduction**

- (i) Risk assessment, management and communication
- (ii) Highly toxic pesticides-risk management and reduction
- (iii) Occupational health and safety

- (iv) Building of capacities to deal with poisoning and chemical incidences<sup>13</sup>
- (v) Formulation of prevention and response measures to mitigate environmental and health impacts.
- (vi) Waste management (minimisation)
- (vii) The role of GHS in risk reduction
- (viii) Chemicals of global concern

#### **(b) Knowledge and Information**

- (i) Highly toxic pesticides-risk management and reduction
- (ii) Research, Monitoring and data management<sup>14</sup>
- (iii) Information management and dissemination<sup>15</sup>
- (iv) Hazardous data generation and availability
- (v) Globally Harmonized system (GHS) of Classification and Labelling
- (vi) Creation of National and International Registers
- (vii) Use of indicators to monitor children's environmental health
- (viii) Life cycle management

#### **(c) Governance**

- (i) Implementation of integrated national programmes for sound management of chemicals
- (ii) Stakeholder participation in decision making process
- (iii) Assessment of national chemical management to identify gaps and prioritise action
- (iv) Social and economic consideration
- (v) EIAs to include chemicals and hazardous waste
- (vi) Legal, Policy and Institutional aspects
- (vii) International chemicals and waste conventions-promotion of ratification and synergies
- (viii) GHS (review of national legislation and align with GHS)

#### **(d) Capacity building and technical cooperation**

- (i) Formulation of preventive and response measures to mitigate environmental and health impacts
- (ii) Capacity-Building to support national actions
- (iii) Remediation of contaminated sites and poisoned individuals
- (iv) Capacity to implement GHS<sup>16</sup>

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<sup>13</sup> The country needs an emergency centre and emergency responders SAICM can provide emergency centres especially in large municipalities.

<sup>14</sup> SAICM should assist in developing a monitoring and evaluation procedure about the life cycle of the chemicals from the time of import to its disposal

<sup>15</sup> There is need to develop and sustain a national chemicals and waste database, and to improve information collection and dissemination at the ECZ and in the local authorities. There is need to identify all the important stakeholder handling bulk chemicals and/or waste to create local databases and info-centres.

<sup>16</sup> There is need to develop ECZ institutional capacity and to intensively promote GHS.

(v) Waste management

**(e) Illegal international traffic**

Capacity-Building to support national actions to curb illegal traffic

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**15. Annexes**