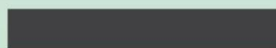




**THE NATIONAL IMPLEMENTATION PLAN (NIP)
FOR THE MANAGEMENT
OF PERSISTANT ORGANIC POLLUTANTS (POPs)
IN THE KINGDOM OF ESWATINI**



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Executive Summary

Eswatini, being Party to the Stockholm Convention (SC) is obliged to prepare and submit her National Implementation Plan (NIP) for the management of Persistent Organic Pollutants (POPs) to the Conference of the Parties (COP). The SC has 22 POPs listed which include 20 Annex A chemicals, two Annex B chemicals and one class belongs to Annex C. Annex A POPs, which are prohibited, should be reduced and eliminated, while Annex B POPs, severely restricted, maybe used for specific purposes approved by the Convention and hence, Parties must apply for exemptions. Finally, Annex C chemicals are unintentionally produced POPs (UPOPs), and measures should be taken to reduce their production. Some of the Annex A chemicals also qualify as Annex C POPs because they may also be unintentionally produced. All these POPs are further classified into three groups where sixteen are pesticides, seven are industrial chemicals while five are unintentional by-products.

The objective of the SC as set in Article 1 states that the SC is “Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the objective of this Convention is to protect human health and the environment from POPs”. The key obligation of Parties to the SC, as outlined in Article 7 (1) (a), is to draw up a NIP that is to be implemented by the party in order to fulfil its obligations under the Convention.

The first NIP in Eswatini was prepared and submitted to the SC COP in 2010 when there were still 12 POPs (the dirty dozen) listed in the SC. Subsequently, the number of listed POPs has increased to 23, requiring the country to review and update its NIP.

The Kingdom of Eswatini, through the Eswatini Environment Authority (EEA), requested technical support from United Nations Industrial Development Organisation (UNIDO) in its role as a Global Environment Facility (GEF) Executing Agency to help the country prepare and submit its proposal on POPs enabling activities to the GEF. This has resulted in a number of activities such as the preparation and documentation of the inventories of the new POPs, as well as, an update of the old ones. There was also national capacity assessment where priorities were set for the management of the new and old POPs and implementation of other relevant provisions of the SC. All these activities have played a major role in informing the drafting of the NIP for Eswatini.

The import, distribution, use and disposal of all chemicals in Eswatini are not properly regulated. This is because the country lacks policy framework that deals with chemicals, including POPs. But the country has policies, strategies and action plans aimed at achieving sustainable development. These can be used in the interim to address the issues of POPs.

There is also no specific law that regulates the management of POPs and articles that may contain POPs. Chemicals management is regulated via a multi-sectoral piece-meal legal framework and this system has been seen to be ineffective as there

is not coordination amongst the different sectors due to fragmentation. Eswatini has signed several major international Conventions which have a bearing on the management of chemicals such as the Rotterdam Convention, Basel Convention, the Rio Declaration on Environment and Development, International Labour Organisation (ILO) Safe Use of Chemicals Convention, to name but a few. The Strategic Approach to International Chemicals Management (SAICM) is another international instrument which has been adopted by the country, and it encourages the synergy of these Conventions for effective compliance.

The inventories which informed this NIP update revealed that Dichloro Diphenyl Trichloroethane (DDT) and endosulfan were the only POP pesticides of concern in Eswatini. These were found in much smaller amounts when compared with the initial NIP prepared in 2010. The observation was that the use of these pesticides may eventually phase itself out as their needs may not be there. This is true for DDT because most people currently own modern structures even in the malaria endemic regions, which may reduce the amounts used. The efficiency of DDT in these structures is limited as compared to the “stick and mud houses”.

Poly Chlorinated Biphenyls (PCBs) were also identified in some transformer oils found in various substations in the country. The Eswatini Electricity Company (EEC) is the major owner of these equipments. The findings from inventories suggest that it is the old power transformers which still use PCB contaminated oil. These are a minority as most power transformers were commissioned after the year 2000 and utilise mineral oil. The distribution transformers have a much shorter life span and hence the company replaces these frequently rendering a majority of them to be PCB free.

Polybrominated Diphenyl Ethers (PBDEs) were used in electrical and electronic equipment (EEE), as well as, in vehicles manufactured before the year 2005. The production of these chemicals has since stopped and are only found in the plastic components and polyurethane foams of the treated EEE and vehicles. Eswatini still has a significant amount of Cathode Ray Tube (CRT) televisions and computers and vehicles which might have been treated with PBDEs. The major challenge for the country is the comprehensive inventory and the environmentally sound disposal of these articles. The importation of near end-of-life articles is also of major concern, especially vehicles as the retail of second hand cars in Eswatini is a booming business.

Perfluorooctane Sulfonic Acid (PFOS) and its salts were not identified in the prioritized articles which were carpets and fire-fighting foam. This may be because manufactures are not obliged to disclose the presence of PFOS especially because if used, the amounts are very small.

The unintentionally produced POPs (UPOPs) were identified to originate from the waste incineration, heat and power generation, open burning and waste disposal. The major contributor was from the disposal group which contributed 60% of the total emissions, followed by the heat and power generation group with 18%

contribution. Eswatini needs to regulate this sector in order to reduce the POPs emissions of UPOPs. There is also a need to improve on the efficiency of incinerators and boilers in order to reduce the production of UPOPs.

For all the POPs found in Eswatini, the level of awareness in the general population is very low except in a few cases where the companies are required to monitor POPs, for example EEC which has to comply with regional and international standards as far as PCBs are concerned. There are also no regulations for controlling the import, distribution, use and disposal of all the POPs, hence there is no monitoring strategy for any of them.

The priorities for Eswatini therefore are as follows:

- To strengthen the existing legal framework in order to address POPs issues
- To domesticate the Stockholm Convention.
- To regulate the import, use, distribution and disposal of pesticides.
- To develop a phase out programme and effective management of PCBs.
- To phase out the use of DDT for disease vector control and evaluating the persistence of DDT in different matrices (soil, water, food, breast milk, etc.).
- To reduce emissions from burning of waste and establishing a monitoring system for emissions and their effects.
- To upgrade the infrastructure to accommodate POPs testing and analysis.
- To develop information, education and communication (IEC) to be used for public awareness and training.
- To identify and develop short and long-term waste disposal strategies which are in line with Best Available Techniques and Best Environmental Practices (BAT/BEP) for the disposal of all POPs and POPs contaminated articles and equipments.

The country therefore developed some action plans which were documented as objectives and activities. These were grouped into the different thematic areas identified to be important for Eswatini. The thematic areas identified were:

- Institutional, Policy and Regulatory Framework
- Annex A, Part 1, Chemical – Pesticides
- Annex A, Part 2 Industrial Chemicals – PCBs and PBDEs
- Annex B Pesticides – DDT
- Annex B Industrial chemicals – PFOS
- Annex C, PCDD/PCDF
- Public Awareness, Information and Education
- Participation in International Activities and Programmes in the field of POPs
- Reporting, Monitoring and Evaluation
- Research & Development on POPs and alternatives
- Socio-economic and gender analysis
- Technical and Financial Assistance

- We need a statement why we do not have an action Endosulfan

The objectives and activities are tabulated under each thematic area including the responsible institution and timeline for each activity. The estimated costs for each activity are also reflected where the total cost for the NIP implementation is estimated to be E114,121,000 which is equivalent to \$10,002,310 (at a rate of \$ = E11.41, January 2015 rate).

Due to the financial difficulties experienced, most of the activities could not be done as some of them needed funding from the GoE. This could also be due to poor implementation of the previous NIP as the post NIP activities step was not done, hence there were no specific projects set out to implement the NIP. It is therefore recommended that the post NIP activities be detailed out for this NIP in order to try and address some of the POPs issues in Eswatini. Nonetheless, some milestones were covered in some cases like the management of PCBs and the shipment of obsolete pesticides to Germany for disposal through the Basel Convention. Eswatini is part of the *Capacity Strengthening for NIP Implementation for SADC LDCs*. The project seeks to address legislative and regulatory frameworks, enforcement and administrative capacities; BAT/BEP for industrial production processes; reductions to POPs exposures; identification of contaminated land; dissemination and sharing of experiences and good practices for the sustainable, effective and comprehensive implementation of the NIPs and related chemicals management. Participating in this project means we are already addressing Action Plans 3.3.1, 3.3.5 and 3.3.6 of Eswatini's Initial NIP.

Further, Eswatini will be participating in a SADC wide project for the Southern African Power Pool (SAPP) electricity utilities on "*Demonstration of a regional approach to environmentally sound management of PCB liquid wastes, transformers and capacitors containing PCBs for countries of Southern African Region*". The major objective for the project is to carry out needs assessment in order to strengthen national capacities for the environmental sound management, phasing out, treatment and destruction of PCBs and wastes in the participating countries. Eswatini has already submitted the Letter of Endorsement to UNEP to enable them to apply for funding. The project will be implemented by the Eswatini Electricity Company with assistance from EEA. Indirectly, this project will address Action Plan 3.3.3 of our NIP. Eswatini is implementing a project titled "*Establishment of an efficient and effective data collection and reporting procedures for evaluating the continued need of DDT for disease vector control*". The project seeks to provide improved capacity for Parties to complete and timely report on use of DDT and its alternatives. It also seeks to improve reporting and increase the availability of comprehensive data sets on DDT for global evaluation by the COP. The project is implemented by the Ministry of Health (National Malaria Control Programme) supported by EEA and partly addresses Action Plan 3.3.4 of our NIP.

Eswatini is currently implementing a project on "*Managing and safeguarding obsolete pesticides*" supported by FAO. The project seeks to remove obsolete pesticides collected all over the country and stored at Kalanga RDA in the Lubombo region. The obsolete pesticides will be repackaged prior to its environmentally sound disposal in accordance with the requirements of the Basel and Stockholm

Conventions. The project is implemented by the Ministry of Agriculture with the assistance of EEA and partly addresses Action Plan 3.3.2 of our NIP.

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LIST OF ABBREVIATIONS

ABS	Acrylonitrile-Butadiene-Styrene
AMCEN	African Ministerial Conference on the Environment
ASP	Africa Stockpile Programme
BAT	Best Available Techniques
BEP	Best Environmental Practices
CL	Crown Land
c-OctaBDE	commercial Octa Polybrominated Diphenyl Ethers
COP	Conference of the Parties
c-PentaBDE	commercial penta Polybrominated Diphenyl Ethers
CRT	Cathode Ray Tube
CSO	Central Statistical Office
DANCED	Danish Cooperation for Environment and Development
DDT	Dichlorodiphenyltrichloroethane
EEE	Electrical and Electronic Equipment
ELV	End-of-Life Vehicles
EMA	Environmental Management Act
ESM	Environmentally Sound Management
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMP	Global Monitoring Programme
GoE	Government of Eswatini
HCB	Hexachlorobenzene
HIPS	High Impact Polystyrene
ICA	International Cooperation Agency
ICCM	International Conference on Chemicals Management
ICT	Information, Communication and Technology
IEC	Information, Education and Communication
IFCS	Inter-governmental Forum for Chemical Safety
IPM	Integrated Pest Management
IPP	Independent Power Producers
IVM	Integrated Vector Management
KVA	Kilo Volt Amperes
LLIN	Long Lasting Insecticidal Nets
M&E	Monitoring and Evaluation
MCLs	Minimum Contamination Levels
MDGs	Millennium Development Goals
MICT	Ministry of Information, Communication and Technology
MoA	Ministry of Agriculture
MCIT	Ministry of Commerce, Industry and Trade
MEPD	Ministry of Economic Planning and Development
MoF	Ministry of Finance

MoH	Ministry of Health
MoLSS	Ministry of Labour and Social Security
MHUD	Ministry of Housing and Urban Development
MTAD	Ministry of Tinkhundla Administration and Development
MOU	Memorandum of Understanding
MVA	Mega Volt Amperes
NAMBOARD	National Agricultural Marketing Board
NBSAP	National Biodiversity Strategy and Action Plan
NDS	National Development Strategy
NEP	National Environment Policy
NEPAD	New Partnership for Africa's development
NFP	National Focal Point
NGOs	Non-Governmental Organizations
NIP	National Implementation Plan
NMCP	National Malaria Control Programme
NPC	National Project Coordinator
NSC	National Steering Committee
NSWMS	National Solid Waste Management Strategy
PBDEs	Poly Brominated Diphenyl Ethers
PBT	PolyButylene Terephthalate
PCBs	Poly Chlorinated Biphenyls
PCDDs	Polychlorinated dibenzo-p-dioxins
PCDFs	Polychlorinated dibenzo furans
PCU	Project Coordination Unit
PFOS	Perfluorooctane Sulfonic Acids
PIC	Prior Informed Consent
POPRC	POPs Review Committee
POPs	Persistent Organic Pollutants
PRSAP	Poverty Reduction Strategy and Action Programme
PUR	Polyurethane
RBM	Roll Back Malaria
RSSC	Royal Eswatini Sugar Corporation
SABS	South African Bureau of Standards
SAICM	Strategic Approach to International Chemicals Management
SC	Stockholm Convention
SCARTA	Eswatini Commercial Road Transport Association
EEA	Eswatini Environment Authority
SEAP	Eswatini Environment Action Plan
EEC	Eswatini Electricity Company
EIPA	Eswatini Investment Promotion Authority
SNCP	Eswatini National Chemical Profile
SNL	Swazi National Land
SWASA	Eswatini Standards Authority
TDL	Title Deed Land

TEQ/a	Toxic Equivalent per annum
TOR	Terms of Reference
ToT	Training of Trainers
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNCED	United Nations Conference on Environment and Development
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organisation
UNESWA	University of Eswatini
UPOPs	Unintentionally Produced Persistent Organic Pollutants
USEPA	United States Environmental Protection Agency
WEEE	Waste of Electrical and Electronic Equipment
WHO	World Health Organization
WSSD	World Summit on Sustainable Development

CHAPTER 1

INTRODUCTION

1.1 Background Information

The Stockholm Convention (SC) has identified 23 Persistent Organic Pollutants (POPs) which have been listed and are of concern to human health and the environment. Eleven of these POPs have recently been added to the initially identified 12 POPs called the “dirty dozen”. Since the SC is a legally binding instrument in the identification, management and elimination of POPs and the Kingdom of Eswatini through Eswatini Environment Authority (EEA) acceded to this international Convention on the 13th January, 2006. The country is obliged to prepare and submit a National Implementation Plan (NIP) on how it will manage and eliminate the listed POPs. This is because the list of POPs is always subject to review where additions of new POPs can always occur. This therefore requires that all parties update their NIPs and incorporate the newly added POPs, as well as review the existing NIP, as stated in Article 7 of the Convention.

The first NIP in Eswatini was developed in 2010 when there were still 12 POPs (the “dirty dozen”) listed in the SC. Since then, the number of listed POPs has increased to 23, requiring that it be updated.

The activities that would enable Eswatini to eventually fulfil Article 7 were outlined in the United Nations Industrial Development Organisation (UNIDO) document entitled “Enabling activities to review and update the national implementation plan for the Stockholm convention on persistent organic pollutants (POPS) in the Kingdom of Eswatini”. The activities were divided into four components:

- Component 1: Coordination mechanism and awareness
- Component 2: Inventories of new POPs and NIP review
- Component 3: National capacities assessment and priority setting for management of new POPs
- Component 4: NIP formulation, endorsement and submission

This report therefore addresses the requirements of component 4, which is the final stage.

In preparing this revised version of the NIP report, Eswatini, through the national consultants and validation workshops, has consulted with a wide range of stakeholders from other agencies, industry organisations, academia, civil society and non-governmental organisations. In accordance with the UNIDO Guidelines,

the report describes Eswatini's profile (geography and population), legislation, on chemicals in general and POPs in particular, as well as, measures that Eswatini has taken to protect the population and the environment from POPs, so as to comply with the obligations of the Convention

1.2 Purpose and Structure

This National Implementation Plan (NIP) aims to assist the country to successfully implement the SC by undertaking various activities planned to ensure reduction/elimination of POPs and to meet other obligations of the Convention. The document therefore has 3 chapters as follows:

- Chapter 1: deals with the introductory elements.
- Chapter 2: provides the baseline, including the legislative framework and the current situation regarding POPs issues.
- Chapter 3: focuses on the action plans and strategies.

1.3 Persistent Organic Pollutants (POPs)

Persistent organic pollutants (POPs) are a group of chemicals that have been intentionally or inadvertently produced and introduced into the environment. Due to their stability and their transport properties, they are now ubiquitous around the world and are even found in places such as the arctic regions, far distant from where they had been intensively used.¹ They are found in environmental media like sediment, air, soil and biota.² Their presence in these environmental media results in human exposure through ingestion and inhalations. Some authors have reported that other human exposure pathways include dietary, dust inhalation and oral contact with consumer products containing these chemicals, such as toys or textiles.³ Occupational exposure to workers in industrial and recycling plants is also another exposure pathway for humans.

POPs have high fat solubility (lipophilicity) which allows them to bio-accumulate in animals, especially species at the top of the food chain.¹ Due to their lipophilicity, POPs (with the exception of PFOS, one related chemicals that rather bind to proteins) appear at higher concentrations in fat-containing foods, such as fish, meat, eggs and milk,¹ thus contributing to a long-term toxic exposure.⁴ Over the past decades, authorities have become aware of the potential adverse health effects of such chemical pollutants, and studies addressing this environmental concern have indicated that POPs are of particular concern.

The Stockholm Convention (SC) on POPs, administered by the United Nations Environmental Program (UNEP), is a global treaty that aims to protect humans and

the environment from toxic and persistent chemicals by reducing or eliminating their production and introduction to the environment.⁵ It was adopted at a Conference of Plenipotentiaries on 22 May 2001 in Stockholm, Sweden. The Convention entered into force on 17 May 2004.⁵ The initial list of POPs in 2004 included 12 chemicals called the “dirty dozen”. Nine new chemicals have since been added in an amendment that came into force in August 2009. In 2011, endosulfan became the 22nd POPs.¹ These 22 POPs are listed in Annexes A, B, and C of the SC. All the POPs listed are highly persistent, travel long distances through air and water, bio-accumulate in fatty tissue and they are highly toxic, even at low levels.⁶ The 22 POPs listed in the SC are listed in **Table 1.1**.

Table 1.1: The 23 POPs listed under the Stockholm Convention and their classifications

Listed chemical	Annex	Pesticide	Industrial chemical	By products
Aldrin	A	+		
Dieldrin	A	+		
α -hexachlorocyclohexane	A	+		
β -hexachlorocyclohexane	A	+		
γ -hexachlorocyclohexane	A	+		
Endosulfan	A	+		
Chlordane	A	+		
Endrin	A	+		
Mirex	A	+		
Lindane	A	+		
Pentachlorobenzene	A & C	+	+	
Chlordecone	A	+		
Heptachlor	A	+		
Toxaphene	A	+		
Hexachlorobenzene (HCB)	A & C	+	+	+
Hexabromobiphenyl (HBB)	A		+	
Hexabromodiphenyl ether and heptabromodiphenyl ether (c-OctaBDEs)	A		+	+
Tetrabromodiphenyl ether and pentabromodiphenyl ether (c-PentaBDEs)	A		+	+
Polychlorinated biphenyls (PCBs)	A & C		+	+
DDT	B	+		
Perfluorooctane sulfonic acid, its salts and perfluorooctanesulfonyl fluoride (PFOS)	B		+	

Polychlorinated dibenzo-p-dioxins (PCDD) & Polychlorinated dibenzofurans (PCDF).	C			+
Hexabromocyclododecane (HBCD)				

Nineteen of the POPs are listed in Annex A of the SC and Parties must take measures to eliminate their production and use unless Parties register for some exemptions. DDT and PFOS are listed under Annex B where Parties must take measures to restrict the production or use of these chemicals in light of any applicable acceptable purposes with specific exemptions. Finally, Annex C includes Polychlorinated dibenzo-p-dioxins (PCDD) & Polychlorinated dibenzofurans (PCDF), PCBs, HCB and pentachlorobenzene and these are unintentionally-produced POPs.

1.4 Main Obligations of the Convention

The SC aims to protect human health and the environment from the adverse effects of POPs (Article 1). It was adopted in 2001 and it is a legal and binding instrument, to all parties, in the identification, management and elimination of POPs. The Kingdom of Eswatini acceded to it on 13th January, 2006 and is legally bound by the provisions contained therein. The Convention preamble expresses awareness of health concerns, especially in developing countries, resulting from local exposure to POPs.

Under the terms of the Convention, Parties are to prohibit and/or take legal and administrative measures necessary to eliminate the production and use of all the POPs listed in **Table 1.1**. Article 7 of the SC requires that each Party signatory to the Convention shall review and update, as appropriate, its NIP on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties (COP). The first NIP in Eswatini was prepared in 2010 when there were still 12 POPs listed. Since then, 10 more POPs have been added which include chemicals like PBDEs, endosulfan and PFOS, to name a few.

1.5 Main findings of POPs inventories

There were four inventories which were carried out to gather information about Eswatini's situation as far as managing the listed 22 POPs. There were inventories on pesticides, industrial chemicals, UPOPs and the institutional and legal framework. These inventories gave an insight of the current situation in Eswatini.

For pesticides, only endosulfan, chlordane and DDT were found to be in use around the country. In 2014, the amount of endosulfan found had decreased from 281,000 litres to 13.5 litres of liquid formulations and 17.5 kg of solid formulations when compared to the amounts found in 2009 and it is used for agricultural purposes. DDT is used for malaria vector control since the country applied for exemption and quantities decreased from 6 to 3 tons between 2009 and 2014, respectively.⁷ Chlordane was also found in one location (only 10 Litres) where it is mainly used for non-agricultural purposes such as application at the foundations during construction to control termites.⁷ The decrease in the quantities found is a positive sign as the use of these pesticides may eventually be eradicated if efficient and cost effective alternatives are found and promoted, especially DDT

The amount of industrial chemicals contained in articles such as EEE, vehicles, electrical transformer oils were also estimated. The main sources of PBDEs were identified to be CRT computers and CRT televisions.⁸ This is because in Eswatini there are still significantly high numbers of these articles. Even though there are very few CRT computers and TVs being sold now, these articles are usually kept in use for very long periods, exceeding their life span. Vehicles manufactured before 2005 were also found to contribute to the amounts of PBDEs in the country.⁸ This is mainly because there are a lot of vehicles which are imported into Eswatini to be sold as second hand cars. A significant number of these vehicles were manufactured on or before 2004.

PCBs were still found in transformers oils in the country, especially substation transformers. It is mainly the older transformers (manufactured before the year 2000) which have PCB contaminated oil. For PFOS, not much information was documented especially because these compounds are not usually reflected to be present or absent in articles such as carpets and fire-fighting foam.⁸

The unintentionally produced POPs were also inventoried and the findings suggest that Waste Incineration, Heat and Power Generation, Open Burning processes and Disposal are the major contributors of UPOPs.⁹ With all these findings of these POPs and articles contaminated by POPs in Eswatini, the Institutional and Legal Framework Inventory concluded that there is currently no comprehensive legislation to deal with chemicals including POPs.¹⁰ There are several legislation which may address chemicals but in a fragmented manner. A holistic legal tool still needs to be enacted to cover the gaps in all the current legislation. The NIP therefore, outlines the objectives and activities identified by the selected thematic areas for the management of POPs in Eswatini.

CHAPTER 2 COUNTRY BASELINE

2.1 Country Profile

2.1.1 Geography and population

The Kingdom of Eswatini is situated in Southern Africa, and lies between latitudes 25° and 28° south and 31° and 32° east in the south-eastern part of Africa. The country covers an area of 17364 km² and it is landlocked. It is bordered by the Republic of South Africa in the north, west and south parts and the People's Republic of Mozambique in the east.

The Kingdom of Eswatini has a great variation in elevation, landscape, geology, vegetation and climate. The country is divided into six physiographic zones which are the Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range,¹¹ as shown in **Figure 2.1**.

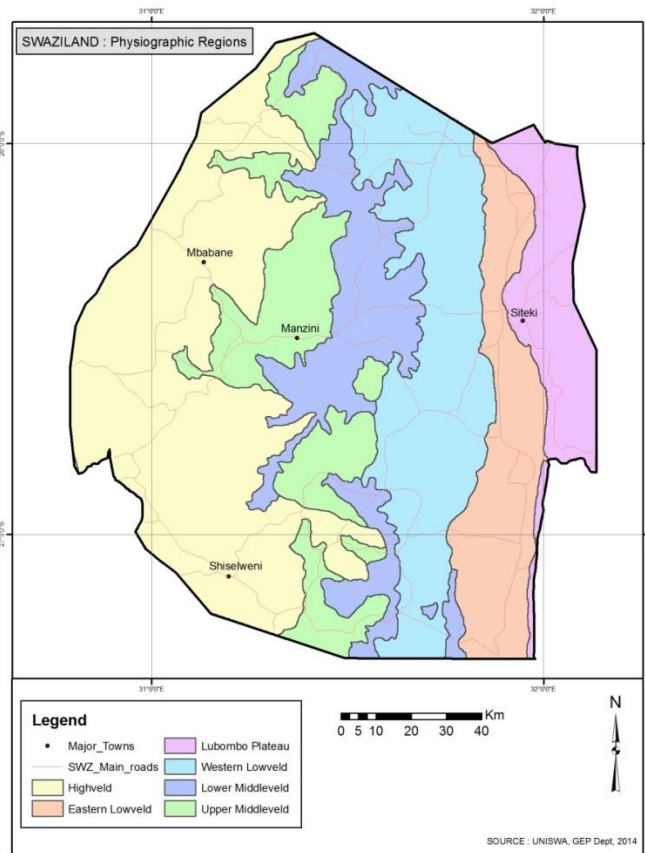


Figure 2.1: Map of Eswatini showing the six physiographic regions of the country

The descriptions of the different zones are given in **Table 2.1**.

Table 2.1: Description of the physiological zones of Eswatini.

Physiographic zone	Description
Highveld (accounts for 33% of the total land area)	Altitudinal range of 900 – 1400m above sea. Underlying geology predominantly granite. Characterised by steep slopes between low and high levels, dissected plateaux, plateau remnants, and associated hills, valleys and basins. Vegetation consists of grassland with patches of forest.
Upper Middleveld (14% of total land area)	Altitudinal range 600–800m. The underlying geology is granodiorite/granite base. Characterized by strongly eroded plateau remnants and hills. Vegetation is mainly tall grassland with scattered trees and shrubs
Lower Middleveld (14% of total land area)	Altitudinal range is 400-600m. The underlying geology is predominantly Gneiss. Characterized by strongly eroded foot slopes rolling plains with basins and isolated hills. Vegetation type is broad-leaved savannah.
Eastern Lowveld (20% of total land area)	This is the piedmont zone of the escarpment lying at an altitude range of 400–600m. Underlain by sedimentary and volcanic Karroo beds consisting of sandstone and claystone. Topography is an undulating plain. Vegetation is mainly mixed savannah.
Western Lowveld (11% of total land area)	Altitude at 200– 300m. Also underlain by sedimentary and volcanic Karroo beds with basalt. The plains of this region take a gentler undulating form than those of the Western Lowveld. The vegetation is acacia dominated savanna.
Lubombo Plateau (8% of total land area)	The Lubombo plateau is a cuesta with a steep escarpment bordering the Eastern Lowveld. It has a gradual dip slope of about 1:20 descending east. The underlying geology is ignimbrite made up of mainly rhyolite and andesite. The landscape is an undulating plateau with steeply dissected escarpment. The Lubombos are characterised by hillside bush and plateau savannah.

Obtained from NBSAP report.¹²

According to the 2007 census report, the population of Eswatini was estimated to be 1,020,102 and was projected to reach 1,106,189 by 2014. This translates to a population density of 63.76 h/km².¹³ The population is evenly distributed across the

four administrative regions (Hhohho, Manzini, Shiselweni and Lubombo shown in **Figure 2.2**), reflecting that there are no barriers inhibiting human settlement within the country.

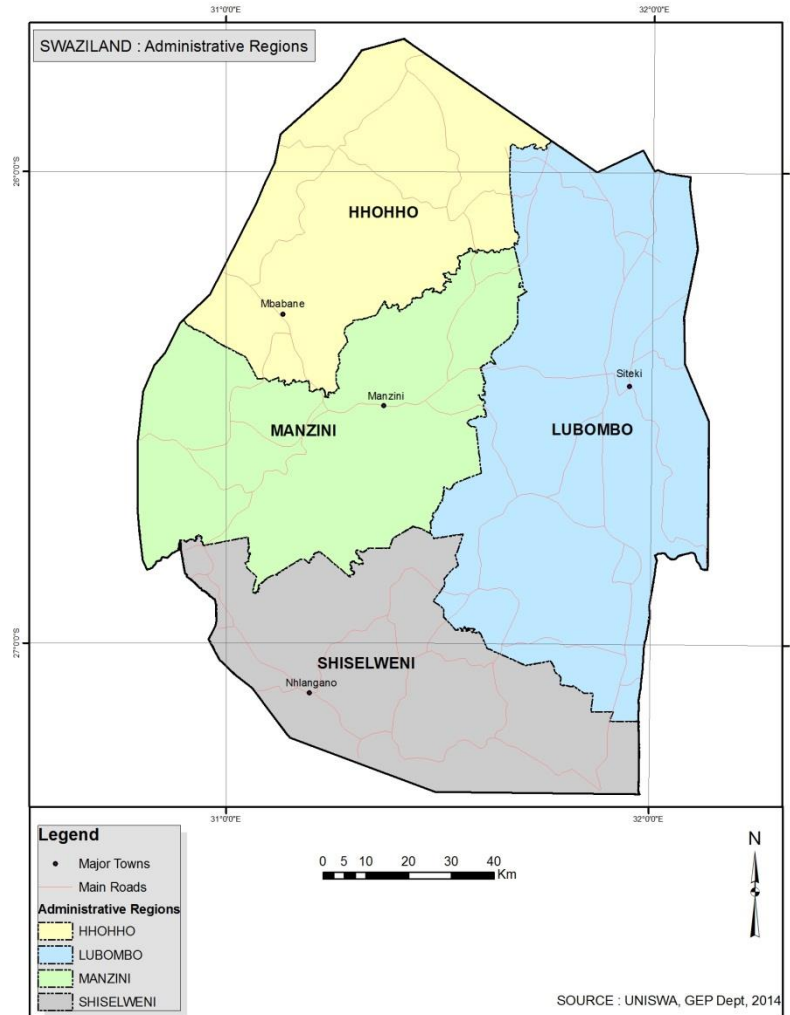


Figure 2.2: Map of Eswatini showing the four administrative regions of the country

The demographic distribution is such that 22% of the population lives in urban areas and 78% in rural areas as reported by the Central Statistics Office (CSO) in their 2007 report. Urban migration occurs at an average rate of 0.2% per annum, based on the projected increase of urban populations.¹³ In 2012, life expectancy at birth was projected to be 43.33 years for male and 47.41 for females, the fertility rate is 3.68 children born and the infant mortality rate was assumed to be 100.1 deaths/1000, for both males and females. The general population growth rate was projected to be at 0.824% per annum between 2007 and 2030.¹³

The population is young and characterised by a population pyramid, which has a broad base as illustrated in **Figure 2.3**.

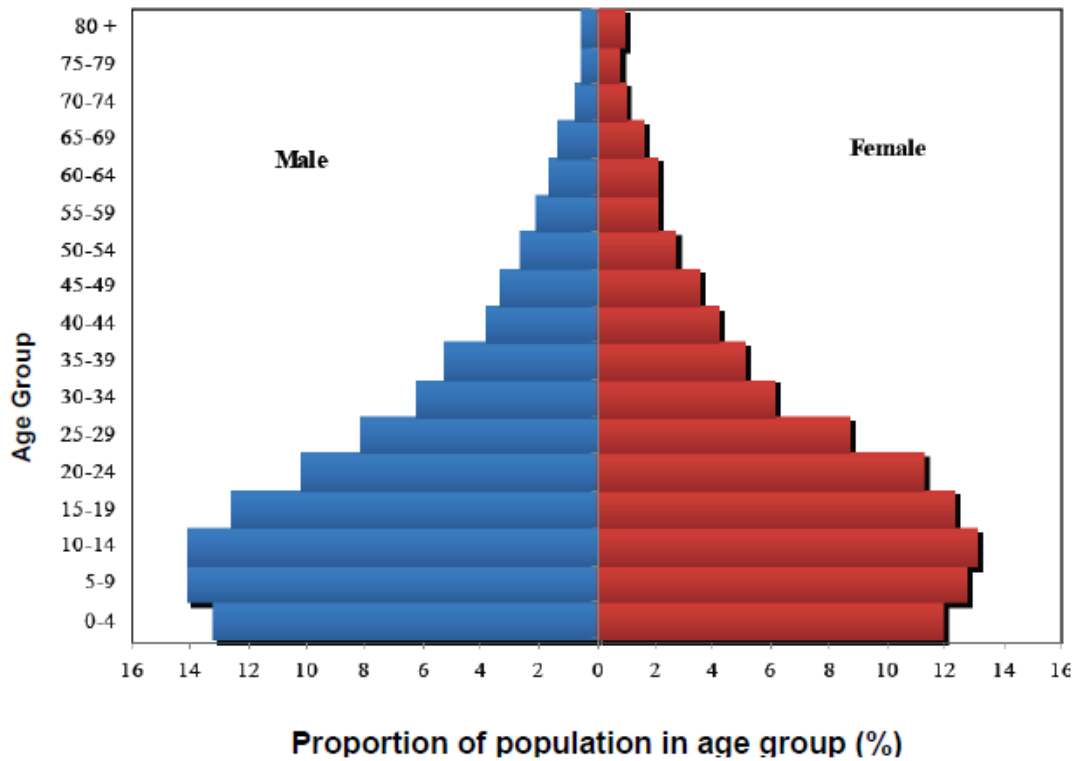


Figure 2.3: Structure of the population of Eswatini.^{14,12}

2.1.2 Political Profile

The Kingdom of Eswatini is governed through the Tinkhundla System with executive power vested in the Head of State, His Majesty King Mswati III. The Government is headed by the Prime Minister who works with Cabinet Ministers appointed from the members of both the Houses of Parliament. The Legislature comprises the houses of Senate and the National Assembly. The House of Assembly has 65 seats, 55 of which are filled by members elected by the population from their constituencies called Tinkhundla. The Monarch appoints the 10 additional members. From the 65 members, the House of Assembly appoints 10 members into the House of Senate, whereas the Monarch appoints 20 members into the House of Senate. The Judiciary consists of the Supreme Court, High Court, Industrial Relations Court, and Subordinate Courts.

2.1.3 Economic Profile

Eswatini has a relatively small, but strongly export-oriented economy. The agricultural sector plays a very important role in the national development of

Eswatini, and is one of the leading sectors contributing to the Gross Domestic Product (GDP). It is a major source of employment for rural households with over 70% of the population relying on this sector for their income. Eswatini's manufacturing and processing sector is traditionally dominated by the private sector. The manufacturing sector has diversified since the mid-1980s. Sugar, wood and citrus remain important foreign exchange earners. Mining has declined in importance in recent years with only coal and quarry stone mines remaining active. An iron ore exporting company started operating in 2011 and suspended its operations in late 2014. Eswatini is heavily dependent on the Republic of South Africa for both imports and exports. The GDP per capita is \$5,200 (2006 est.) and the GDP composition by sector is summarised in **Figure 2.4**.

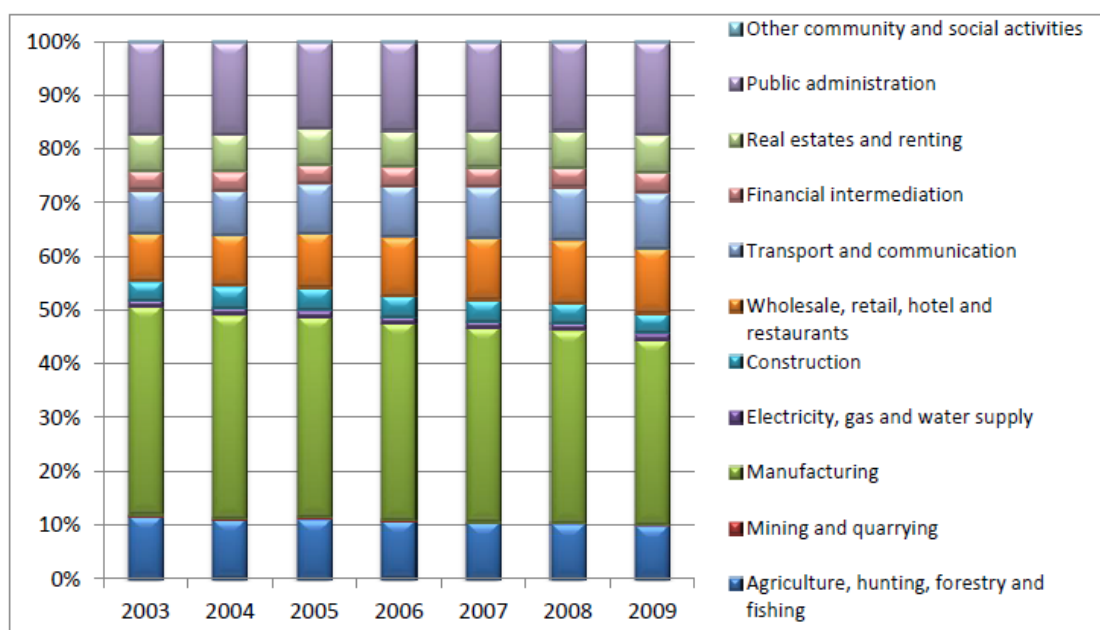


Figure 2.4: Contribution of the different sectors to Eswatini's GDP from 2003 to 2009

2.1.4 Environmental overview

The key environmental impacts of development in Eswatini have come from infrastructure development, urbanisation, agriculture and manufacturing. There are other attributes such as drought, overgrazing, erosion etc., which constitute further environmental challenges. Overgrazing, soil depletion, drought, and sometimes floods persist as problems that will require further scrutiny and applicable interventions in the future.¹⁵

The land tenure system in the country plays a crucial role in the management of land and the environment. There are three recognised classes of land tenure in

Eswatini, and these are the Swazi Nation Land (SNL), Title Deed Land (TDL) and Crown Land (CL). SNL is held in trust by His Majesty the King on behalf of the Swazi Nation, TDL is private freehold land and CL is land over which the GoE has title.¹⁵

Overgrazing is most prevalent on SNL, especially in the Lower Middleveld and Western Lowveld. The average stocking rate is about 1.77 head per hectare, but actual rates vary within the country as different households have different amounts of livestock as shown in **Figure 2.5**.¹² There are no effective mechanisms in place to address the problem, as overgrazing and soil erosion have reached critical levels in some parts of the Lowveld. In 1998, soil losses through erosion were estimated at 250 t/ha per annum. This problem is also prevalent in the Highveld, where steep slopes are vulnerable to erosion after the removal of vegetation cover.¹⁵

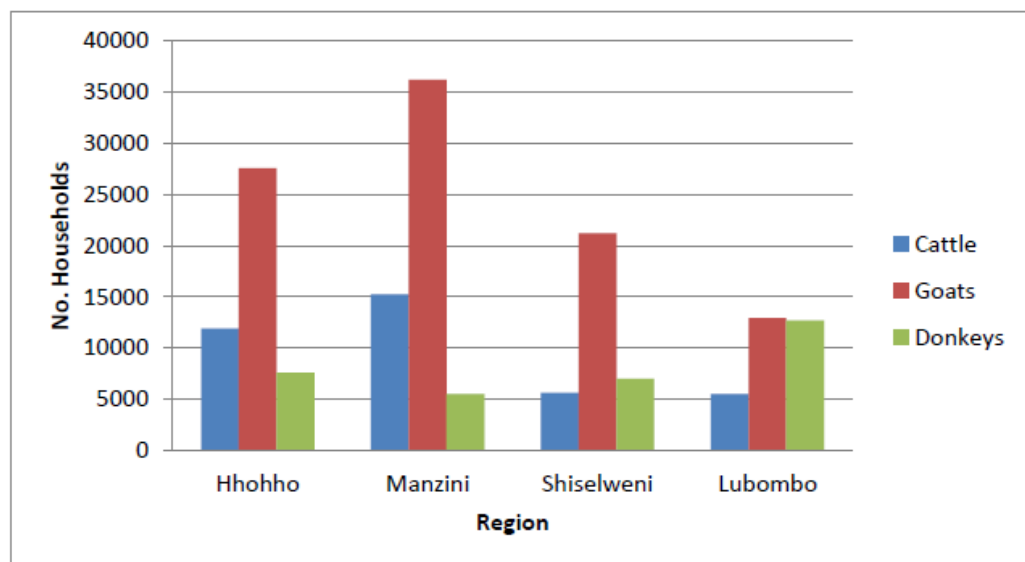


Figure 2.5: Number of households from the different administrative regions of Eswatini rearing the different livestock species.¹²

Agriculture also has a significant role in causing undesirable effects on the environment. Some of the negative effects are caused by clearing of vegetation, mono-cropping, and the prevalence of exotic plantations. Fertilisers and pesticides are also commonly used in agriculture to boost yield of the planted crops. Chemicals such as DDT, endosulfan, Chlordane and Dieldrin have been used although their application has declined over the years. The use of pesticides in general, contributes to soil and water pollution as these pesticides can be washed into water bodies.¹⁵

The harvesting of timber and fuel wood is also widespread, especially on SNL, and this contributes to undesirable environmental impacts. Effective management of these practices is difficult due to communal ownership and utilisation. Trade in fuel

wood in parts of the Middleveld and Lowveld has grown significantly in the past few years without any apparent control, although there is provision for doing so through the Flora Protection Act of 2001. The report on the revision of the national biodiversity strategy and action plans reported a number of forest services enjoyed by the Swazi people as illustrated in **Figure 2.6**. The use of forest trees for firewood is one of the major services used in all regions of the country. This is of relevance to the SC as the use of firewood can lead to the production of UPOPs.

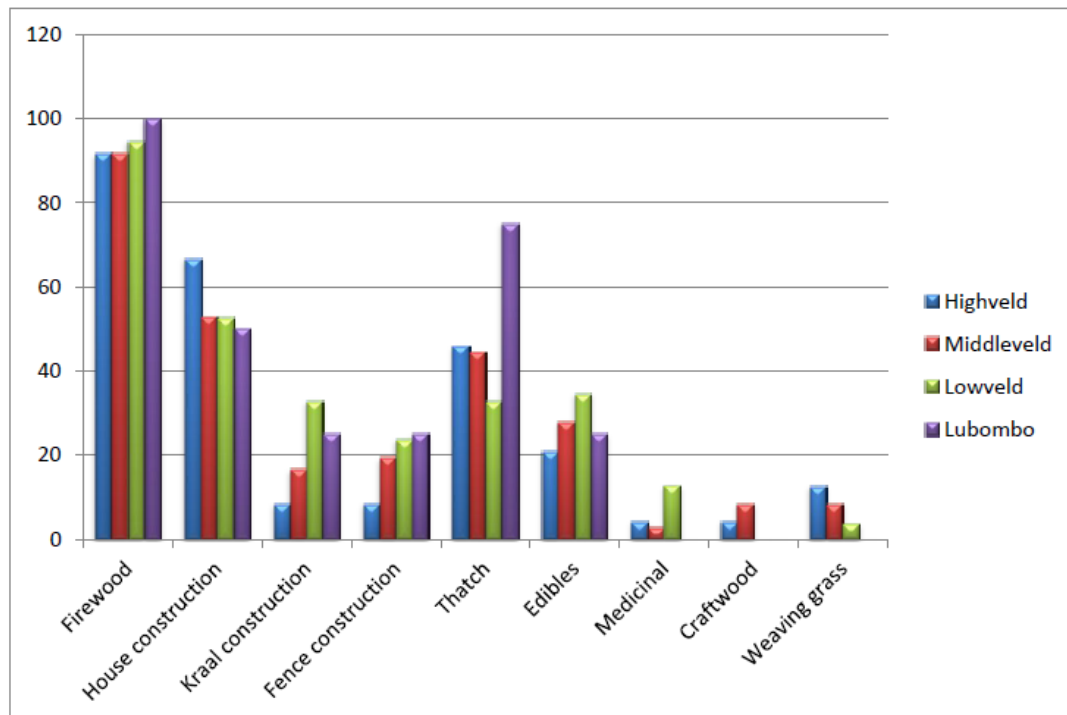


Figure 2.6: Percentage of households harvesting materials for various purposes.¹²

Drought is also another factor that affects the environment in Eswatini. This is because drought is an inherent feature of the semi-arid Lowveld climate of Eswatini as shown in **Figure 2.7a**. The Lowveld usually receives the least amount of rainfall (with or without a drought season) of less than 600 mm per annum as shown in **Figure 2.7b**.¹² The impact of drought has led to more than one-fourth of the population requiring emergency food aid in 2004 - 10.¹⁵

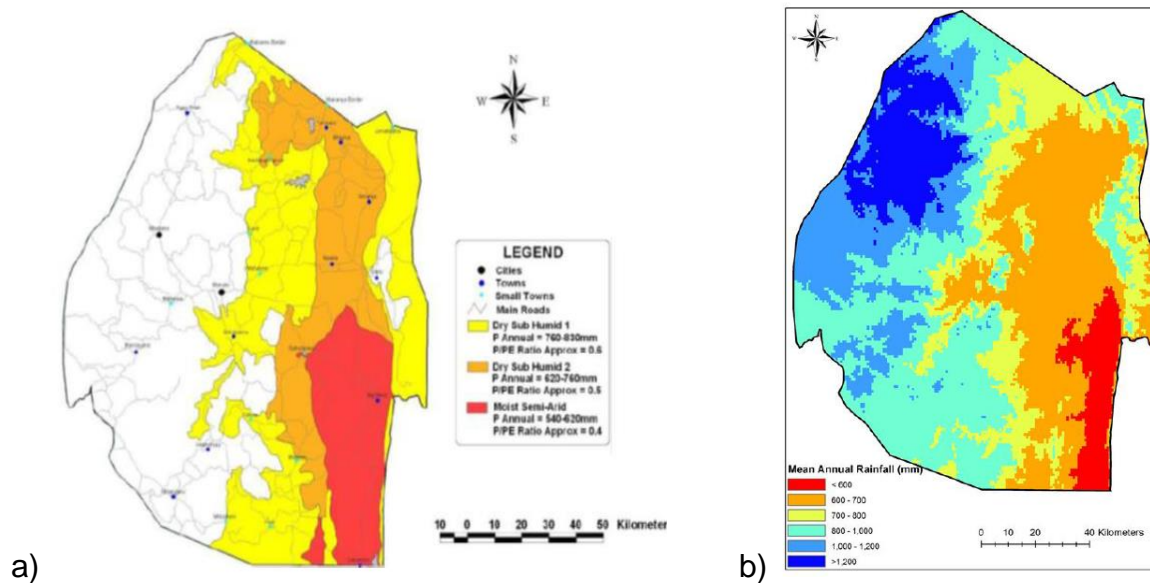


Figure 2.7: a) Location of Drylands in Eswatini while b) shows the mean annual rainfall distribution.¹²

Urbanisation occurs at an annual rate of 0.2 % according to the Eswatini Sector Specific Population Projections (2012).¹⁶ This rate has resulted in an increase in pressure on urban infrastructure, especially waste management services. For example, it is estimated that only 60% of the urban population has access to safe sanitation. There has also been a recent increase of unplanned settlements in peri-urban areas, particularly around Mbabane, Manzini and Matsapha, due to the high demand for housing. This has led to the loss of agricultural land.

2.2 Institutional, policy and regulatory framework

2.2.1 Environmental policy, sustainable development policy and general legislative framework

2.2.1.1 Current Policy framework

Current policy frameworks do not specifically address POPs.^{10,15} However, the Government of Eswatini has formulated policies, strategies and action plans aimed at achieving sustainable development. Among these are the National Development Strategy (GoS, 1999), the Economic and Social Reform Agenda, Poverty Reduction Strategy and Action Programme completed in 2003 and the Environmental Policy in 1999.

The Constitution became supreme law in 2005 to establish an environment of good governance, peace, stability and sustainable economic and human development.

The Kingdom of Eswatini has generated several policies in order to address various national challenges. Some policies (some of which are still in draft form) that have a bearing in the support, management and compliance with the Stockholm Convention on POPs include:

i. The National Development Strategy, 1999

The main vision of the National Development Strategy (NDS) is that “By the year 2022, the Kingdom of Eswatini will be in the top 10% of the medium human development group of countries founded on sustainable economic development, social justice and political stability”. One of the main priorities of the NDS is environmental management, which is viewed as an important and necessary condition for the attainment of sustainable development.

ii. The Economic and Social Reform Agenda, 2003

The Economic and Social Reform Agenda was a programme of action, driven by the office of the Prime Minister, that sets target dates for the completion of tasks that are necessary for the economic and social development of the country.

iii. The Swaziland Environment Action Plan, 1997

The Swaziland Environment Action Plan (SEAP) is a broad framework which attempts to integrate environmental issues into Eswatini’s overall macro-economic framework. The SEAP complements the NDS in that it pushes issues of environmental sustainability into government’s socio-economic development goals.

iv. The National Solid Waste Management Strategy, 2000

Eswatini developed a National Solid Waste Management Strategy (NSWMS) with the assistance of the Danish Co-operation for Environment and Development (DANCED), that concerns itself with the promotion of integrated waste management. This policy framework is suitable to help select the environmentally sound management options to address articles and wastes that contain or might contain PBDEs or PFOS.

v. The National Environment Policy, 1999

The National Environment Policy (NEP) is an important and key component for integrating and coordinating the other sectorial policy frameworks thereby ensuring sustainable development.

vi. The Draft National Land Policy, 2000

The Draft National Land Policy forms part of the long-term NDS vision of improving the quality of life of individuals through poverty reduction, job creation and gender equality. It is therefore, a very broad policy for achieving development, but is silent on pollution as a consequential by-product of the accelerated production brought about by the NDS.

vii. The National Biodiversity Strategy and Action Plan (NBSAP), 2007

The National Biodiversity Strategy and Action Plan acknowledges that it is the Eswatini Environmental Authority's (EEA) prerogative to ensure that environmentally sound management practices are adhered to. The value of Eswatini's biodiversity has long been recognised and is used on a daily basis for various reasons such as traditional medicine, food, building material, traditional attire, etc.

viii) The National Pharmaceutical Policy (2011)

The Eswatini National Pharmaceutical Policy seeks to improve the health of the Eswatini population by ensuring equitable access to, and rational use of efficacious, high quality essential medicines, and medical supplies and devices at affordable cost particularly for vulnerable groups. The National Pharmaceutical Policy recognizes the widespread use of traditional medicine in Eswatini and notes the lack of a policy framework on complementary medicine.

ix) The National Gender Policy (2010)

The National Gender Policy provides guidelines for attaining gender equity in the Kingdom of Eswatini in line with MDG 3 and the provisions of the National Constitution. The Policy notes that women and other vulnerable groups have had minimum input in development, as well as, in policy making, implementation and decision-making processes. The policy also notes the dependence of vulnerable groups on the environment for their basic needs such as fuel, water, food and medicine and the vulnerability of women in particular, to the effects of environmental mismanagement.¹²

2.2.1.2 Current Legislative Framework on POPs

The process of the NIP update requires reviewing and updating the country's Legal, Institutional and Policy Frameworks for the Stockholm Convention on POPs which

was documented by Thwala (2014).¹⁰ It was stated that Eswatini's legislative framework requires a review because it is old, out-dated and fragmented.

It was observed that there is still no specific law that properly regulates the management of POPs or articles that may contain POPs in Eswatini. Chemicals management is regulated via a multi-sectorial piece-meal legal framework.¹⁰ Some of these instruments have built-in administrative and management mechanisms such as permits, licences, codes and classification systems, restriction mechanisms, reporting and feedback with mechanisms for monitoring implementation. Independent legal entities (who are principal owners of these statutes) converge at the ports of entry in order to provide a legal infrastructure for managing the import and export of goods, including chemicals in Eswatini.

The latest inventory on the legal, institutional and policy frameworks identified the following legal instruments, which regulate various aspects of the environmental management, including the use of chemicals (which includes POPs):

- The Constitution of the Kingdom of Swaziland Act No.1/2005
- Customs and Excise Act, No. 21 / 1971
- Swaziland Revenue Authority Act No.1/ 2008
- Environment Management Act, No. 5/ 2002
- Noxious Weed Act 19/1929
- Cotton Act. No 26/1968
- Dairy Act. No 28/1968
- Grass Fires Act 44/1955
- Sugar Act, No. 4/ 1967
- Citrus Act. No 22/1967
- Pine Apple Act. No 8/1967
- Cane Growers' Act, No. 12/ 1967
- Animal Diseases Act. No 7/1965
- Private Forest Act, No. 3/ 1951
- Plant Control Act, No. 8/ 1981
- Tobacco Act, No. 52/ 1933
- Cooperatives Act, of 2003
- Public Health Act 5/1969
- Pharmacy Act. No 38/1929
- Building and Housing Act. No. 38/1968
- Control of Slaughter-Houses Act, No. 10/ 1964
- Natural Resources Act. No.71/1951
- Water Act, No. 7/ 2003
- Electricity Act, No. 3/ 2007

- Occupational Safety and Health Act No.9/2001
- Road Traffic Act No. 6/ 2007
- Road Transportation Act, No. 5/ 2007
- Factories, Machinery and Construction Works Act, No. 17/ 1972
- Swaziland Investment Promotion Act, No. 1/ 1998
- Standards and Quality Act, No. 10 / 2003
- The National Agricultural Marketing Board Act, No. 13 / 1985
- The Environmental Audit, Assessment, and Review Regulation, 2000
- The Waste Regulations, 2000
- Control of Radio-Active Substances Act, No. 23/1964
- Urban Government Act, No. 8/ 1969
- Mines, Works and Machinery Act, No. 61/1960
- The Air Pollution Control Regulations, 2010
- The Water Pollution Control Regulations, 2010
- Biosafety Act of 2011
- Biodiversity Management and conservation Bill of 2007
- Pesticide Management Bill (2011)
- Public health bill (2000)
- Litter regulations (2011)
- Ozone depleting Substances Regulations (2003)

These pieces of legislation, though not specific to POPs, provide the institutional mechanism necessary to implement the NIP to ensure effective cross sector coordination.

2.2.1.3 Current international conventions

Eswatini, in her quest to be at the same level as the international community has signed several conventions which may be related to the SC or may help the country manage chemicals in general. These include:

- Stockholm Convention on POPs
- The Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade – PIC (Declaration Form for Both Importer and Exporter)
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- The World Summit on Sustainable Development
- The Strategic Approach to International Chemicals Management (SAICM)
- Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

- The Rio Declaration on Environment and Development, 1992
- The Bamako Convention on the Ban of Export to Africa of Hazardous Waste and their Disposal
- The International Labour Organisations Conventions on Safety and Health in Agriculture (Convention 184).
- ILO Safe Use of Chemicals Convention, No. 170 (1990)
- The United Nations Framework Convention on Climate Change (UNFCCC)
- FAO International Code of Conduct for the Distribution and Use of Pesticides (as amended in 2003).

2.2.2 Roles and responsibilities of ministries, agencies and other governmental institutions involved in POPs life cycles

2.2.2.1 Government Ministries

Different government ministries are responsible for different roles which may somehow address the issue of POPs in the country. The roles and responsibilities of the different ministries that are somehow involved in POPs life cycle are summarised in **Table 2.2**.

Table 2.2: The Roles and Responsibilities of the Various Government Ministries

MINISTRY	MANDATE	RELEVANCE TO THE STOCKHOLM CONVENTION
Agriculture (MoA)	Responsible for the import, use and disposal of all agricultural chemicals including POPs pesticides.	16 of the 22 POPs chemicals are pesticides some of which are used in the agricultural sector.
Economic Planning & Development (MEPD)	Responsible for issues of National Economic Development including financial resources' mobilisation.	Programmes on the environment are financed from funds channelled through MEPD.
Foreign Affairs and International Co-operation (MFAIC)	Responsible for Foreign Direct Investments and the ratification by Eswatini of international treaties.	Convention came to be binding on Eswatini on the basis of ratification by MFAIC. Ministry is further responsible, internationally, for Eswatini's ability and/or inability to domesticate the Convention..
Health (MoH)	The ministry is responsible for the import, use and disposal of	The Ministry has a duty to report to WHO and the

MINISTRY	MANDATE	RELEVANCE TO THE STOCKHOLM CONVENTION
	DDT for malaria vector control and of clinical wastes.	Stockholm Convention through EEA on Government's handling of its DDT usage for vector control and residual obsolete stockpiles.
Housing and Urban Development (MHUD)	This ministry is responsible for waste management in urban areas.	The unintentionally produced POPs come out of the waste management processes (that is, leachate from improperly managed waste disposal sites and waste burning).
Justice and Constitutional Affairs (MJCA)	Is responsible for providing legal support to Ministries in the preparation of legislative enactments (drafting) aimed at ensuring public order and safety.	Has to pilot laws on POPs management.
Natural Resources and Energy (MNRE)	Ministry manages Sectors that are very critical in the POPs campaign such as; <ul style="list-style-type: none"> - Management of effluent waste in urban areas; - The management of mining sites; - The control of the oil petroleum industry; - The provision of safe drinking water. 	The Ministry is responsible for certain sectors which are critical in ensuring that sound POPs management practices are maintained in order to help reduce harmful exposures.
Public Works and Transport (MPWT)	Promote and maintain an adequate transportation network so as to contribute to the economic development of the country.	Ministry is responsible for supervising the transportation, distribution and storage of POPs containing chemicals Uses of POPs chemicals in termites control (building sector)
Tinkhundla Administration and Development (MTAD)	Responsible for the informal settlements in peri-urban areas	Unintentionally produced POPs from open burning of domestic waste.

MINISTRY	MANDATE	RELEVANCE TO THE STOCKHOLM CONVENTION
Tourism and Environment Affairs (MTEA)	In charge of environment management issues in the country.	Fostering environmentally sustainable economic practices/ development.
Labour and Social Security (MoLSS)	Ministry is responsible for workplace issues including safe working environment	Develop and enforce legislation on occupational health and safety including the safe use of chemicals.
Ministry of Education and Training (MET)	The Ministry is responsible for the provision of education to learners.	Schools and institutions of higher learning procure and store large quantities of chemicals for learning purposes. The challenge is in respect of their handling and their ultimate disposal. There's a need to incorporate chemical issues in the curriculum

Source: Adapted from Thwala, M. (2014)¹⁰

2.2.2.2 Governmental Agencies

Government agencies which may be involved in the handling, monitoring or regulation of POPs chemicals to different degrees include:

i) **Eswatini Environment Authority (EEA)**

Initially established in terms of the Swaziland Environment Authority Act, No. 15 of 1992, and then EMA 2002, the EEA is charged with four main responsibilities, which are to:

- Promote the development of policies, legislation necessary for sound environmental management, including their enforcement;
- Coordinate activities of bodies (both local and international) that are involved in matters pertaining to the environment;
- Monitor trends in the state of the environment;
- Promote research in environmental matters and increase public awareness and participation.

ii) **The Eswatini Revenue Services (ERS)**

The ERS is an agent that is responsible for (among other things) the issuance of permits for importation of all goods into the country and is therefore key in the

monitoring and preservation of records of chemical imports. However, for the ERS to be able to play a meaningful role in this regard, a linkage would have to be created with and between it and other government agencies that are responsible the use of chemicals which may contain POPs.

A noticeable challenge in the effectiveness of the role that the ERS could play is that processes that are used under the Customs and Excise Department, such as the ASSYCUDA software which does not accommodate chemicals or issues of chemicals classification and coding to assist in data collection. As a result, Customs software lumps all chemicals together without any differentiation, according their nature.

iii) Eswatini Water Services Corporation (EWSC)

The Eswatini Water Services Corporation (EWSC) is a government parastatal charged with the duty to deliver safe water supply and collecting, treating and disposing sewage in areas designated by gazette. The parastatal can play an important role in the monitoring of POPs as their presence in water affects their primary mandate of delivering safe drinking water to the population.

iv) Eswatini Standards Authority (SWASA)

The Eswatini Standards Authority (SWASA), as an institution, is very key to the issue of POPs especially since there is a pressing need to establish guidelines for the safe use of chemicals and laboratory facilities with the capacity to test for POPs within the industry, commerce, and public sectors.

v) The Eswatini Energy Regulatory Authority (ESERA)

The newly established Eswatini Energy Regulatory Authority regulates the generation, transmission, distribution, and supply of electricity. Its mandate include ensuring that all installations for the generation, transmission, and distribution of electricity are built and operated in accordance with legislation on health, safety and environmental standards (**Section 61 of the Electricity Act No.3 of 2007**). ESERA could complement any efforts of regulating the use and production of POPs and UPOPs within the electricity sector.

vi) Eswatini Investment Promotion Authority (EIPA)

The Eswatini Investment Promotion Authority (EIPA), through the Swaziland Investment Promotion Act (1998), is mandated to attract, facilitate and promote local and foreign investment, initiate, coordinate and implement GoE policies and

strategies on investment; and provide one-stop information and support facility for local and foreign investors. EIPA can therefore communicate Eswatini's commitment to upholding the SC to potential international investors.¹⁵

vii) Tripartite Advisory Technical Committee for Occupational Health and Safety

This is a Committee of experts established pursuant to the provisions of the Occupational Safety and Health Act, No.9 of 2001 (Section 20). It is a multi-sectorial committee made up of experts in sectors that are relevant to issues of POPs both within government and Industry.

viii) Royal Eswatini Police Services and Umbutfo Eswatini Defence Force

The responsibilities of police and the defence force are to protect the nation as well as help in the implementation of regulations. They are very important for POPs management especially the importation of goods which may contain POPs

2.2.3 Relevant international commitments and obligations

With regard to the sound management of chemicals, including POPs, Eswatini is Party to a number of international agreements, conventions and networks and these include:

i) Stockholm Convention on POPs

The Stockholm Convention seeks to protect human health and the environment from the effects of POPs.

ii) The Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade – PIC (Declaration Form for Both Importer and Exporter)

Eswatini is Party to this global agreement having ratified it and it sets up a Prior Informed Consent (PIC) procedure amongst parties in the international trade on certain hazardous chemicals, in order to protect human health and the environment. Both this Convention and the Stockholm Convention bestows the right upon Parties to have listed a chemical, which it considers to pose hazardous risks either to human health and/or the environment. Article 6 of the Rotterdam Convention sets out such procedure whilst same is set out under Article 8 in the Stockholm Convention.

iii) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Eswatini is party to this agreement which focuses on the control of the challenges posed by the trans-boundary movement and management of hazardous wastes including those consisting and/or containing and/or contaminated with POPs. The Basel Convention uses a Prior Informed Consent (PIC) procedure to control trans-boundary movement of hazardous waste thereby rendering illegal the shipment of waste from one country to the other without their consent including countries of transit.

iv) The Strategic Approach to International Chemicals Management (SAICM)

The SAICM, consisting of the “Dubai Declaration on International Chemicals Management”, the “Overarching Policy Strategy (OPS)” and the “Global Plan of Action (GPA)” gives recognition to the need of government’s commitment to the sound management of chemicals as essential for environmental sustainability and protection of human health, which, in turn, is a prerequisite for sustainable development as a whole.

v) Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

This system defines and classifies the hazards posed by various chemicals. It also communicates health and safety information through the use of labels and material safety data sheets. Under GHS, the label elements cover hazard statements which define the nature of the hazard e.g. “flammable,” “corrosive.” In addition, there are accompanying pictograms such as “cross & bones” for toxic products.

vi) The Rio Declaration on Environment and Development, 1992

This is a list of principles to guide the world on issues of development and the environment. Under Principle 15 thereof, states committed themselves to adopt the precautionary principle in order to protect the environment from serious or irreversible damage.

vii) The Bamako Convention on the Ban of Exports to Africa of Hazardous Waste and their Disposal, 1991

This is an African Regional Convention providing for the ban of the import, into Africa, of hazardous wastes including issues of trans-boundary dealings in

hazardous wastes within the Continent. However, the country needs to ratify the Convention.

viii) The International Labour Organisations Conventions on Safety and Health in Agriculture (Convention 184).

This is an International Labour Organisation (ILO) Convention and was adopted by the Conference to protect workers in the agricultural sector. The use of chemicals with toxic effects such as pesticides within the agricultural sector clearly exposes people to the risk of injury and death. The Convention therefore advocates for the development, within states, of good chemical management practices. However, it should be mentioned that the country has not ratified it.

ix) ILO Safe Use of Chemicals Convention, No.170 (1990)

This is an Occupational Safety and Health Convention aimed at preventing and reducing incidences of chemically induced injuries at work, as well as, ensuring the effective control of chemical risks at the work place.

x) The United Nations Framework Convention on Climate Change (UNFCCC)

UNFCCC sets an overall framework for intergovernmental efforts to tackle the challenges posed by climate change. The Convention advocates for Green House Gases (GHG) information gathering and sharing, launching national strategies for addressing GHGs and cooperating in preparing for adaptation. UNFCCC is relevant in POPs management as it relates to all processes that are aimed at reducing emissions into the atmosphere such as municipal waste incineration, open agricultural burning, and vehicle emissions.

xi) FAO International Code of Conduct for the Distribution and Use of Pesticides (as amended in 2003).

FAO is one of the international bodies that have significant roles in formulating and implementing policies to reduce hazards associated with the production, use, disposal, and reuse of chemicals especially in areas dealing with food and agriculture.

2.2.4 Description of existing legislation and regulations addressing POPs

Eswatini's legislative framework does not deal specifically with POPs. However, some control measures via sectoral legal instruments are present and usable within

the framework. Herewith are some legal instruments that were considered and somehow relevant in addressing POPs.¹⁰ These include all the legal instruments listed in **Section 2.2.1.2**.

2.2.4.1 The Constitution of the Kingdom of Swaziland Act No.1/2005

The Constitution of Eswatini is the supreme law of the country. Although the Constitution does not specifically spell out the issue of sound chemical management it enjoins (CHAPTER XII) both the State and the individual to have due respect for the environment.

2.2.4.2 Legislation and related regulatory instruments

- **Customs and Excise Act, No. 21/1971**

This Act is critical in POPs management as it regulates the establishment of places through which goods may be imported, exported, and/or landed for purposes of onward transit. It brings together all the key role players in the implementation of the Stockholm Convention, such as the customs and excise regulator, the transporters, the manufacturer or supplier or shipper, the depot operator and the owner/receiver of the consignment. Further, both Article 3 of the SC (which seeks to regulate the trans-boundary movement of POPs) and Article 13 of the Rotterdam Convention (on the Prior Informed Procedure for Certain Hazardous Chemicals and Pesticides in International Trade) encourages the engagement of the World Customs Organization as central in operationalizing the Harmonized Custom Code System for Chemicals that includes POPs.

- **Swaziland Revenue Authority Act No.1/2008**

In terms of the Act, ERS is responsible for the regulation of the importation and exportation of all goods in and/or out of Eswatini.

- **Environment Management Act, No. 5/ 2002**

The EMA is a piece of legislation whose purpose is the protection and management of the environment. This Act seeks to provide for the promotion, enhancement, protection and conservation of the environment as well as sustainable management of natural resources. Through this Act, the country has been able to promulgate and enact various regulatory instruments aimed at controlling the handling and management of chemicals substances in Eswatini. However, certain sectors still remain unregulated such as the agricultural sector.

- **Noxious Weed Act 19/1929**

The Act prescribes measures to be undertaken by land owners/occupiers to clear noxious weeds. It empowers the Minister of Agriculture to list and gazette certain plants to be noxious weeds and thereafter prescribe the method(s), other than clearing, for their destruction. This suggests the use of chemicals, which in turn would lead, if left unmonitored, to the spread of persistent organic pollutants.

- **Cotton Act. No 26/1968**

The Act establishes the Cotton Board, a body corporate whose duties and functions include the purchase and /or acquisition, for purposes of supply to growers, of insecticides and fungicides necessary for the production of cotton. This Act, though relevant to Eswatini's obligations 15 under the Convention is evidently silent on the control and regulation of POPs in or within the cotton production industry.

- **Diary Act. No 28/1968**

This Act establishes a body corporate called the Eswatini Dairy Board (SDB) that is to ensure that the quality of dairy products is of a standard suitable for public health. The worth of the SDB for the purposes of Eswatini's ability to conform to the Stockholm Convention is its regulatory capacity within the dairy industry in Eswatini, including imports.

- **Grass Fires Act 44/1955**

This Act prescribes for a general prohibition against the burning of grass, whether accidentally or wilfully. Grass fires can only be lit and set upon issuance of a permit by the Director of Agriculture or a duly appointed nominee of the Ingwenyama in the case of Swazi Nation Land.

The Act is obviously very oblivious of neither the Stockholm Convention nor Eswatini's obligations thereto. Its relevance to POPs is demonstrated by the country's willingness to control the setting of fires, in general, which aspect is now known to contribute in the formation of dioxins and furans.

- **Sugar Act, No. 4/ 1967**

This Act provides for the central control of this industry, without specific reference to the production, use and/or disposal of any POPs chemical compounds that may result there from.

- **Citrus Act. No 22/1967**

The Citrus Act establishes the Citrus Board that is vested with sufficient authority to control issues within the Citrus Industry. The Act, however, makes no reference to POPs within the Citrus Industry.

- **Pine Apple Act. No 8/1967**

The Act provides for the registration, as an association, not for gain, of the Eswatini Pineapple Association, with power to regulate, generally, the pineapple industry including issues of research and/or biotechnology that may be beneficial to it.

- **Cane Growers' Act, No. 12/ 1967**

The Act constitutes into a body corporate, the Eswatini Cane Growers Association, and thereafter goes on to regulate its internal constitutive structures. Its relevance is that it provides an institutional body that may be used in the advancement of the goals and aspirations of the Stockholm Convention.

- **Animal Diseases Act. No 7/1965**

The Act aims at the prevention and control of diseases in animals. The Act grants the Ministry of Agriculture power to direct matters of inoculation, disinfection, cleaning and dipping of animals, premises and other receptacles wherein animals are kept and/or conveyed. Whilst the Stock Diseases Regulations, 1933, do make specific mention of the chemical solutions to be used in an effort to control the spread of animal diseases, they do not, in their extent, cover POPs issues.

- **Private Forest Act, No. 3/ 1951**

This Act was promulgated for the regulation and protection of private forest owners in Eswatini. It effectively vested private title deed land owners upon which trees were growing, legal protection against trespassers and illegal entry. Its relevance is that it afforded forest entities the legal right to establish and maintain forest fire protection measures.

- **Plant Control Act, No. 8/ 1981**

The relevance of this Act to the Convention is only to the extent that potentially harmful chemicals may be used to control the spread of insect pests in timber; noxious land weeds and red and brown locusts (plant phytosanitary issues). To this

extent, the Act is silent on the legality or otherwise of the use of 9 chemicals of the listed 12 POPs.

- **Tobacco Act, No. 52/ 1933**

This is an Act that is intended for the control and regulation of the tobacco trade. Its relevance in Eswatini is the small remnant of farmers that practice tobacco farming, thereby falling within the ambit of those farmers likely to use the nine (9) banned POPs chemicals.

- **Cooperatives Act, of 2003**

This Act promotes the establishment of cooperative societies with their central activity being agricultural activities mainly based in the rural areas. The societies serve as independent functionaries/suppliers of agricultural produce to the dominant players of the market/industry.

- **Public Health Act 5/1969**

This Act, which is currently under review, is responsible for the preservation of human health in Eswatini. It provides for issues of sanitation, vaccines, monitoring and prevention of communicable diseases. The Public Health Regulations, 1935, grants the Health Department the power to spray premises with an insecticide for the purposes of malaria control. It is also relevant in so far as it houses the Environmental Health Inspectorate Division, an institution that is critical in public health monitoring processes.

The Act allows for the possibility of importing agricultural POPs into Eswatini through Sections 9 and 10 that allows general dealer license holders to sell poisons for any industrial or agricultural purposes for the destruction of vermin or insect pests or for the treatment of diseases in animals or plants.

- **Pharmacy Act. No 38/1929**

The Act allows for the possibility of importing agricultural POPs into Eswatini through Sections 9 and 10 that allows general dealer license holders to sell poisons for any industrial or agricultural purposes for the destruction of vermin or insect pests or for the treatment of diseases in animals or plants. Whilst the Act may appear to be old,

several amendments have been effected to bring it in line with modern trends, the last of which was in 1993, particularly on the penalties for drug trafficking.

- **Building and Housing Act. No38/1968**

This Act controls the construction of buildings, issues of safety and matters incidental thereto. Its relevance to POPs is through the Standard Building Regulations, 1969 that prescribes the control of termites using chemicals, and the use of regional cooperation in areas where there may be domestic technical deficiencies.

- **Control of Slaughter-Houses Act, No. 10/1964**

This Act Controls the establishment of slaughtering houses of animals for human consumption. Its relevance is the location of slaughter-houses away from POPs contaminated sites.

- **Natural Resources Act. No.71/1951**

The Natural Resources Act provides for the conservation of Eswatini's natural resources (therein defined as soil, water, minerals, animal, bird, fish life and other, that is, landscape and scenery) through the Natural Resources Board. The Board has powers to control the burning of grass and other vegetation (dioxins and furans). However, it is oblivious of the PCB producing effect of either the domestic burning of bio-fuels.

- **Water Act, No. 7/2003**

The Act establishes the National Water Authority and gives it powers to control water pollution (Part VIII). The Authority also recommends to the Minister the adoption of water quality standards. The Purification of Industrial Water and Effluent Regulations, 1967 provides for the clearing and purification of water that has been used for industrial purposes. The Water Pollution Control Regulations, 2010 issued under the Environment Management Act 2002, envisages the role of multiple authorities in the control and monitoring of water quality. The aims and purpose is to establish general water quality standards.

- **Electricity Act, No. 3/2007**

The objective of this Act is to regulate, the generation, transmission, distribution, and sale of electricity in Eswatini. The Act is at the centre of complying with the Stockholm Convention where Section 61 provides that all electrical installations must be operated in accordance with legislation on health, safety and environmental standards

- **Occupational Safety and Health Act No.9/2001**

This Act provides for the safety and health of persons not only within the workplace but also against hazards to the safety and health of persons other than persons at the workplace caused by the activities of persons in the workplace. Section 9 obliges employers to ensure that the working environment is kept free from any hazards. It is a known fact that human exposure to dioxins, PCBs and HCB can be through occupational exposure.

- **Road Traffic Act No. 6/2007**

This Act prohibits the operation of a motor vehicle, on a public road, whose engine emits excessive smoke or fumes (Section 73 (2)). Whilst the Act is not expansive on its definition of excessive smoke or fumes, regulations could be made to cover the dioxins and furans associated with this industry.

- **Road Transportation Act, No. 5/2007**

This Act, through a permit system, controls the haulage of goods on public roads. Applicants for the permit are obliged to furnish certain information to the Board pertaining the nature of their business. This “disclosure clause” can therefore be useful in regulating the haulage of POPs chemicals on public roads. Other POPs issues that can be regulated through the polluter pay principle in the instances where the transporters have taken the risk to provide haulage of toxic cargo.

- **Factories, Machinery and Construction Works Act, No. 17/1972**

This Act introduces within the factories sector, the power of inspectors to take samples for analysis, where he/she has reason to believe that it is likely to cause bodily injury to persons working at the factory (Section 9). This Act may be used to give effect to the provisions of the Stockholm Conventions within the factory industry.

- **Swaziland Investment Promotion Act, No. 1/ 1998**

This Act was promulgated to ease the bottlenecks encountered by investors by creating a one-stop service for investors. Whilst the Act upholds the freedom of investment to both Swazi and non-Swazi citizens, such investments excludes hazardous waste treatment or disposal (Section 19 (2) (d)). The Act can be used to enforce Eswatini's obligations under the Convention, as well as, prohibit the importation of hazardous waste as articulated by Article 4 of the Basel Convention

- **Biosafety Act, 2012**

This act aims to provide for the safe handling, transfer and use of genetically modified organisms and other matters incidental thereto.

- **Standards and Quality Act, No. 10/2003**

The Act prohibits any person from making any reference to a standard approved or purporting to have been approved by the Council unless such person possesses a license issued by the Authority allowing him/her to apply such certification mark to any commodity or product or for the manufacture, production, processing, or treatment of that commodity or product (Section 18 (7)). The Act establishes the Eswatini Standards Authority (SWASA) that can assist Eswatini in her efforts to comply with the provisions of Article 16 of the Convention. This Act can be used together with the Environment Management Act and the Public Health Act to develop standards and systems by which POPs and other banned chemicals can be monitored.

- **Litter Regulations, 2011**

The Litter regulations were developed as part of waste management and they are specific to litter management in the country. They introduce spot fines for offenders. These regulations also introduce the notion of litter wardens which involves neighbourhood watch community programmes on waste management.

- **Ozone depleting substances regulations, 2003**

The ODS Regulations, 2003, regulates the import, trade and use of these substances, provides a system of data collection (through the licensing system), which facilitates compliance with reporting requirements under the Montreal Protocol. Customs officers are designated as inspectors and are mandated to inspect documentation (import permit) and goods during importation of ODS.

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

There are no specific approaches and procedures for chemicals management in the country due to the absence of policy and regulatory frameworks. This includes industrial chemicals as well as pesticides. Even though chemical substances are used by many players, no chemicals management plan is in place to oversee and control their use. Further, most of the pieces of legislation reviewed were enacted to operate independently of each other without any linkages. As a result, the management of used empty chemicals and pesticides containers is a major problem. It is particularly the case for the DDT's empty sachets in malaria endemic areas of the country and in general, other containers that previously contained chemicals.

There are also no specific regulations for the management of articles contaminated with POPs such as electrical transformers, CRT computers and CRT TVs, end-of-life vehicles, carpets and fire-fighting foam. These articles are imported into the country while there is no way of monitoring whether they are contaminated by POPs or not. Once in the country, there are also no law to manage their usage as well as disposal.

Unintentionally produced POPs are also poorly regulated in Eswatini. This is mainly due to the fact that knowledge about these POPs is very limited amongst the general population. As a consequence legal and regulatory as well as policy frameworks are currently lacking in the country for the identification of suitable BAT and BEP measure and their implementation.

2.3 Assessment of the POPs issue in the Country

The initial SC list of POPs in 2004 included 12 chemicals called the "dirty dozen". Nine new chemicals have since been added in an amendment that came into force in August 2009. In 2011 and in 2013, endosulfan and hexabromocyclododecane respectively became the 22nd and the 23rd POPs.¹ These 23 POPs are listed in Annexes A, B, and C of the SC. All the POPs listed are highly persistent, travel long distances through air and water, bio-accumulate in fatty tissue and they are highly toxic, even at low levels.¹⁷ Twenty of the POPs are listed in Annex A of the SC and Parties must take measures to eliminate their production and use unless Parties register for some exemptions. DDT and PFOS are listed under Annex B where Parties must take measures to restrict the production or use of these chemicals in light of any applicable acceptable purposes with specific exemptions. Finally, Annex C includes Polychlorinated dibenzo-p-dioxins (PCDD) & Polychlorinated

dibenzofurans (PCDF), PCBs, HCB and pentachlorobenzene and these are unintentionally-produced POPs.

The intentionally produced POPs are classified as either industrial chemicals or pesticides and a majority of them are pesticides while PCBs, PBDEs and PFOS are classified as industrial chemicals. Others are by-products hence they are unintentionally produced. Each country therefore must first assess which ones are relevant (i.e those manufactured, imported, exported and in use). In Eswatini, these were assessed and the results obtained were used to inform this document.

Assessment with respect to Annex A POPs

2.3.1.1 Pesticides

- ***Production, import, export and use (present, past and future)***

Eswatini has never produced nor exported POPs pesticides; hence all pesticides found in the country are imported. In the 2012 pesticides inventory, the only POPs pesticides identified in Eswatini were Chlordane (10 L liquid formulation) and Endosulfan (13.5 L liquid formulation and 29.5 kg solid formulation).⁷ According to Ndlela (2014), the absence of records at end users or providers prevents provision of any information on historical importations and uses. Lindane and Chlordecone (and other Annex A pesticides) could not be found at any of the visited hot spots, leading to the conclusion that the country has limited quantities of POPs pesticides.

The amount of Endosulfan recorded in the 2009 NIP was much higher than what was found in the year 2012. A total amount of 281,000 L were reported to be in the country in 2009 versus 13.5 L liquid formulation and 29.5 kg solid formulation found in 2012.⁷ This shows a significant decline in the usage of this newly listed POP pesticide.

- ***Existing Policy and Regulatory Framework for pesticides***

Eswatini is still to enact a legal instrument to control the import and use of pesticides including the phasing out of those pesticides that are banned under the Convention. The institutional capacity is however present through the Ministry of Agriculture, Eswatini Environment Authority, Eswatini Revenue Services and the Eswatini Standards Authority. Currently, there is a draft Pesticides Management Bill which was prepared with the assistance of FAO. The purpose of the Bill is to control the importation, distribution, handling, and use of pesticides in Eswatini. The Ministry of Labour & Social Security is also currently piloting the enactment of Regulations for

the safe use and handling of chemicals within the workplace (Draft Safe Use of Chemicals Regulations).

The national framework for the management of chemicals is multi-sectorial as a result of which, there are a number of piecemeal legal instruments addressing various aspects of chemicals management. Some of the relevant authorities are:

- EEA
 - SWASA
 - EWSC
 - The Directorate of Medical Services
 - Department of veterinary services at the Ministry of Agriculture
 - Environmental Health Department
 - Home Economics Department
 - Plant Protection Unit
- ***Summary of available monitoring data (environment, food, humans) and Health Impacts***

Due to lack of sufficient knowledge and weak awareness on pesticides in general, the country does not have any monitoring programme. This applies to all the sectors that may be impacted by pesticides such as food, environment and human health.

2.3.1.2 PCBs

- ***Production, import, export and use (present, past and future)***

PCBs are used in electrical equipment for regulation of heat and temperature fluctuations and as additives in the paint industry, pesticide formulations, etc. They are not produced or manufactured in Eswatini, but enter the country through importation as oils or as part of electrical equipment such as capacitors and transformers.

Previously the most significant amounts of PCBs were found to be contained in transformer oils of which most are owned by the Eswatini Electricity Company (EEC). The updated PCB inventory concentrated on the analysis of transformer oil using the DEXIL LC2000 PCB Analyser.⁸ A total of 72 oil samples were analysed from 38 transformers around Eswatini which belong to EEC. A majority of the transformers were manufactured after the year 2000, even though there were some transformers from as early as 1968. Most of the contaminated transformers were manufactured before 2000 while those manufactured after this year had low concentration or even undetected PCB concentrations. The highest concentration

detected was 437.75 ppm from a transformer, manufactured in 1991, while almost 43% of the oil samples had undetected levels of PCBs.⁸

Only power transformers oil were analysed because they have a drain valve hence oil samples could be collected without affecting the efficiency of the transformer. Based on the number of power transformers, their year of manufacture, the amount of contaminated oil in Eswatini was estimated to be 146,220 kg.

Oil from distribution transformers could not be sampled because they do not have a drain valve and oil cannot be drained from these transformers. These distribution transformers have a short lifetime as they easily get damaged by lightning and other faults. This calls for their frequent replacement whereby the faulty transformer is taken for repair at a company contracted for the repair of all EEC transformers, called Fletcher Electrical. Those that cannot be repaired are usually sold to metal recyclers like Euro Swazi.⁸

During the repair process, the oil is sometimes drained and replaced with new oil or recycled oil. The drained oil is sent to South Africa (to a company called Enviro oil) for recycling purposes. This company then sells new and recycled oil, which they use to refill drained transformers. Oil samples from the distribution transformers as well as recycled oil from Fletcher Electrical were collected and tested for PCBs. Some of the drained oil was PCB contaminated but all recycled and new oil is PCB free. It was not possible to quantify the amount of PCB contaminated oil from distribution transformers but at least the companies which have transformers are doing all they can to eliminate PCBs.⁸

- ***Awareness level on PCBs***

The level of awareness at EEC was satisfactory amongst the employees who work directly with transformers. The sugar companies in the country also produce electricity at a smaller scale compared to EEC. Interviews with one of the company employees also showed that they were well aware of the issues of PCBs, especially those directly working in the production of electricity. The observed education and awareness at EEC and the sugar companies may be because both companies must adhere to international standards which require that they monitor PCBs in their transformers on a regular basis. It is suspected though that other companies who are dealing with other types of oils (lubricating oils which do not need PCB treatment) may still have a very low level of awareness about PCBs.⁸

- ***The year of manufacture of the equipment***

From the sampled transformers, the analysis based on their year of production is shown in **Figure 2.8**. It is clear that more than 50% of the power transformers were manufactured between 2000 and 2011 while about 13% are for the period between 1990 and 1999. This implies that a majority of the transformers are relatively new.⁸

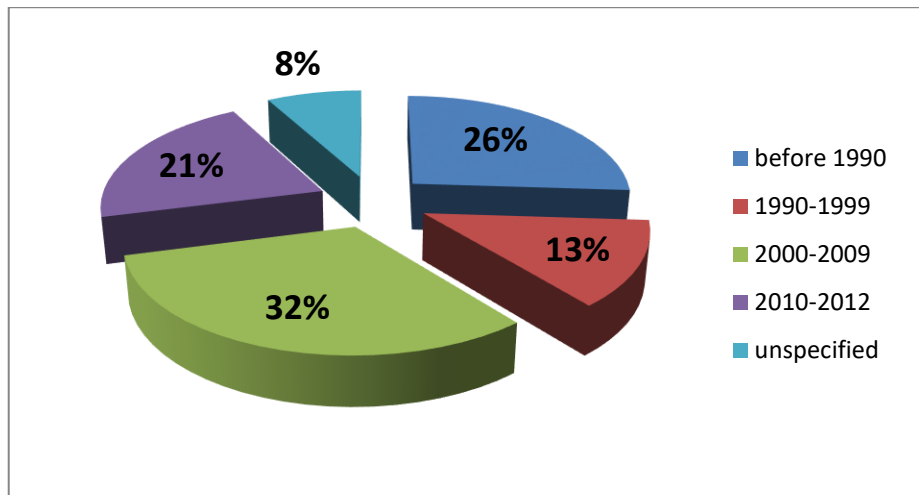


Figure 2.8: Percentage of sampled transformers per year of manufacture.⁸

Information obtained from EEC revealed that the power transformers that the company possesses were manufactured between 1963 and 2011 as shown in **Figure 2.9**. This data is useful in for the development of a phasing out plan considering a 30 year life span of a transformer.

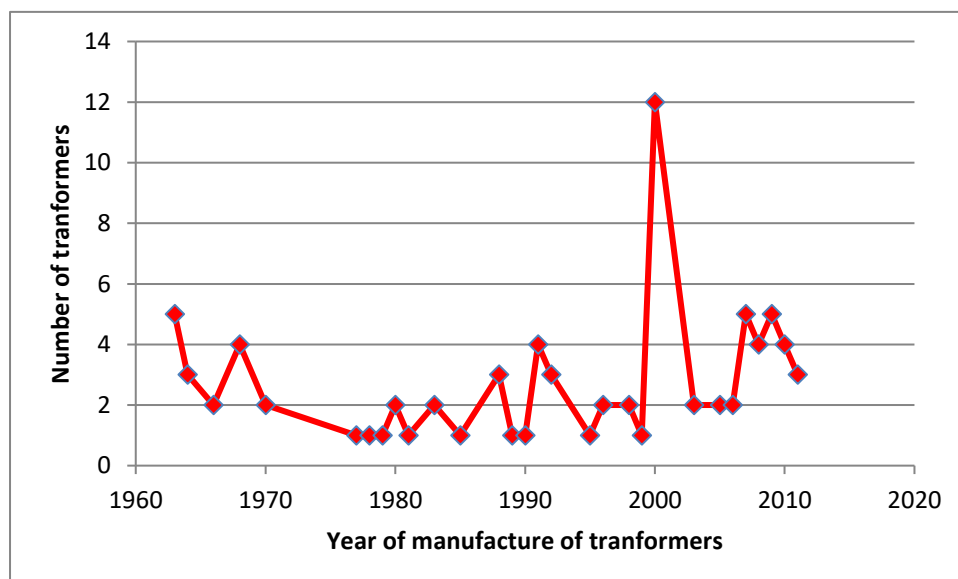


Figure 2.9: The number of EEC power transformers and their year of manufacture.⁸

From **Figure 2.9**, it is obvious that some of the transformers have already exceeded the 30 year life span which is recommended by the Basel Convention. This suggests that the oldest transformers that should be in use during the inventory year (2012) should have been manufactured in the year 1982. Therefore of the 82 power transformers that EEC had in 2012 (inventory year), 22 should have been phased out already, based on the expected average life of a power transformer.⁸

- ***Existing Policy and Regulatory Framework for PCBs***

There is currently no national Regulatory instrument used to regulate the import, use and disposal of PCBs and PCB contaminated oil or equipment in Eswatini. Since PCBs usually enter the country as part of oil used in electrical equipment, the companies that have transformers are usually guided by international standards which also promote the elimination of PCB contaminated oil.⁸

- ***Summary of available monitoring data (environment, food, humans) and Health Impacts***

Because there are no regulations for controlling the import, use and disposal of PCBs in Eswatini, there is also no monitoring data yet.

2.3.1.3 PBDEs

These are chemicals from a group of hydrophobic brominated flame retardants. They are produced by brominating diphenyl ethers in the presence of a catalyst.¹⁸ This can result in the formation of many different products which have different levels of bromination. such as TriBDE, tetraBDE, pentaBDE, hexaBDE, heptaBDE, OctaBDE, NonaBDE and DecaBDE which have three, four, five, six, seven, eight, nine and ten bromine atoms, respectively. These are referred to as PBDE congeners or homologues.

Not all PBDEs are listed as POPs under the SC. The listed congeners are tetraBDE, pentaBDE, hexaBDE, and heptaBDE. The unlisted ones are also of concern because upon debromination, some of them may result in the formation of the listed POP congeners. There were three commercial mixtures of PBEDs: c-PentaBDEs, c-OctaBDEs, and c-DecaBDEs made up of different congeners with varying degrees of bromination.¹⁹ c-PentaBDEs consisted mainly of tetraBDE and pentaBDE while c-OctaBDEs are made of hexaBDE and heptaBDE which are listed in the SC. c-DecaBDEs consists of OctaBDE, NonaBDE and DecaBDE, of which all of the congeners are not listed in the SC.

- ***Production, Import, Export and Use (present, past and future)***

Brominated Flame Retardants (BFRs) are generally entering Eswatini incorporated in products and not as raw material as PBDEs have never been produced in the country. UNEP estimated that the distribution of c-PentaBDE use was 36% in transport, 60% in furniture and 4% was residual in other articles [18].²⁰ c-OctaBDE was incorporated in Acrylonitrile-Butadiene-Styrene (ABS) polymers, which were used for housings/casings of Electrical and Electronic Equipment (EEE), particularly for Cathode Ray Tube (CRT) housings and office equipment such as copying machines and business printers. Both c-PentaBDE and c-TetraBDE were phased out since 2004, hence electronic equipment and vehicles manufactured after 2004 are assumed to be POP-PBDE free.

In Eswatini, POP-PBDEs have never been produced and articles containing POP-PBDEs have never been manufactured. Articles which may contain POP-PBDEs have been imported into the country for a long time.⁸

The estimated amount of c-OctaBDE in imported articles (CRT computers and TVs) was 226.21 kg. The amount of c-OctaBDE stocked in households, government sector and institutional and corporate institutions was estimated to be 2,528.90 kg, 21.57 kg and 471.84 kg respectively. c-OctaBDE which originated from WEEE was estimated to be 317.80 kg. These values were used to calculate the amount of each individual homologue of c-OctaBDE, and 392.30 kg and 1,533.52 kg were the amounts of hexaBDE and heptaBDE respectively estimated to be in Eswatini for the inventory year, 2012.⁸

The same survey was done for c-PentaBDE which was mainly used in the transport sector. The total estimated amount of c-PentaBDE was 2,099.26 kg originating from imports (179.9), vehicles currently in use (1,854 kg), end-of-life vehicles (0.56 kg) and vehicles which were disposed of in the past (64.8 kg).⁸

From the inventory, it was evident that there are still POP-BDE contaminated articles entering Eswatini, therefore safe handling and disposal of waste containing c-penta- and c-octaBDE will be an important task for the country's waste management and possible recycling for some years to come.⁸

- ***Existing Policy and Regulatory Framework for PBDEs***

There is currently no national Regulatory instrument used to regulate the import, use and disposal of PBDEs and PBDE containing articles such as electronic equipment and vehicle.

- ***Summary of available monitoring data (environment, food, humans) and Health Impacts***

Since there are no regulations for controlling the import, use and disposal of PBDEs in Eswatini, there is also no monitoring data yet.

2.3.2 Assessment with respect to Annex B chemicals

2.3.2.1 DDT

- ***Production, Import, Export and Use (present, past and future)***

Eswatini is still one of the countries where malaria is endemic. The National Malaria Control Program (NMCP) within the Ministry of Health is responsible for malaria vector control. DDT is the main chemicals used for vector control in the fight against malaria. In-door residual house spraying (IRS) with both DDT 75% wettable powder and Pyrethroids (ICON 10cs) of 93% and 94% respectively.⁷ Under the integrated vector management policy within NMCP, all traditional structures made of mud are sprayed with DDT 75% WP and all modern structures made of cement or other materials are sprayed with the synthetic pyrethroid, ICON 10CS. According to Ndlela, (2014) during the malaria season between 2012–2013, 27,963 structures were sprayed with DDT and 45,254 structures sprayed with ICON 10CS.⁷ This shows that DDT is still in use in the country, thus exemption needs to be obtained from the SC.

The EEA is responsible for coordinating and submitting DDT exemption applications to the SC on behalf of the Kingdom of Eswatini. Once the exemption is granted, the Ministry of Health then obtains DDT through the tendering system. Whoever gets the tender uses the exemption to source DDT supplies from India, the only supplier.⁷

Since DDT has never been manufactured in Eswatini before, all DDT in the country is imported. About 3,000 kg of DDT was found during the inventory collection stage which was held by the NMCP for malaria vector control. This is a significant decrease from the amount found in the year 2009, which amounted to 6 tons.⁷

After meeting her 2010 targets of the Roll Back Malaria Partnership, Eswatini was among other countries identified for malaria elimination and achievement of malaria related Millennium Development Goals (MDGs) by 2015 by both SADC and African Union. Eswatini adopted the use of Integrated Vector Management (IVM) using both Long Lasting Insecticidal Nets (LLIN) and Indoor Residual Spraying (IRS) with Pyrethroids.¹⁵

- ***Existing Policy and Regulatory Framework***

DDT is used by the ministry of Health for vector control of malaria. There is currently no regulation prohibiting other people from using DDT.

- ***Future DDT usage***

According to the NMCP, the continued use of DDT is facing serious challenges as more and more modern structures are being built at the malaria endemic areas. This is because DDT can only be applied to indigenous mud houses. This has resulted in the decrease on the amount of DDT procured year after year. There are some challenges for using DDT which include the fact that there is no specific legislation for monitoring use and disposal, lack of disposal facility for used DDT sachets and the slow pace in finding alternatives to DDT.

- ***Current levels of information, awareness and education on the dangers of DDT among the target groups***

The strategy put in place by the NMCP through community education before spraying has led to certain levels of information dissemination to the population on the hazards associated with the use of DDT. However, more IEC awareness creation is required as some people interviewed already reported experiencing problems with sinus and asthmatic attacks after spraying operations.

- ***Summary of available monitoring data (environment, food, humans) and Health Impacts***

Currently, Eswatini does not have any environmental and/or bio-monitoring programme on DDT. The NMCP requires capacity to develop guidelines to carry out health impact tests on spray operators and host communities, as well as, environmental surveillance in hotspot areas. There is a need to design systems to ensure that DDT does not get into the wrong hands, and also undertake research and monitoring efficacy studies. This could require upgrading an existing laboratory to undertake chemical testing on DDT and its alternatives, including building a facility for ESM sachet disposal.

2.3.3 PFOS

PFOS is a fully fluorinated anion (**Figure 2.10**), which is commonly used as a salt in some applications or incorporated into larger polymers. PFOS is produced synthetically from PFOSF, and PFOS can be derived from its salts when dissolved. The term "PFOS-related substances" is used for all substances that contain one or more PFOS groups and that can, or are assumed to, be degraded to PFOS in the environment.

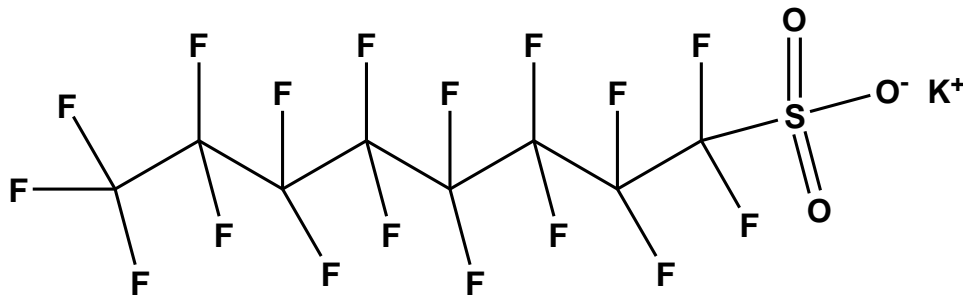


Figure 2.10: Structural formula of PFOS shown as its potassium salt.

PFOS and its related compounds are known to have both fat and water repelling properties thus they were used for surface treatment hence common in non-stick products and stain-resistant fabrics such as carpets. They were used as surfactants in a number of applications such as in fire-fighting foams. For the purposes of the Eswatini NIP, carpets and fire-fighting foams were identified as part of the scope for the PFOS inventory.

- ***Production, Import, Export and Use (present, past and future)***

PFOS and its salts have never been manufactured in Eswatini hence the inventory concentrated on articles that may have PFOS incorporated. The imports data revealed that 31,580 carpets were imported during the inventory year. The weights and sizes of these were not specified. The same kind of data was obtained for fire-fighting foam where 851 fire-fighting foams were imported in 2012.⁸ The data was lacking information on whether these articles contained any PFOS. The retailers and users had no knowledge of the presence of these chemicals in the articles. Most of the carpets sold around the country did not have any special properties like stain or oil repellents. For fire-fighting foam, the only compounds listed in the containers were ammonium phosphate and nitrogen or carbon dioxide.

Since PFOS have never been produced in Eswatini and there is not information about whether there are articles that contain PFOS and its related compounds, the inventory could not estimate PFOS quantities in Eswatini.⁸

- ***Existing Policy and Regulatory Framework***

There is no regulatory framework for PFOS and there are no monitoring programmes in place for PFOS and its related compounds in the country.

- ***Summary of available monitoring data (environment, food, humans) and Health Impacts***

Because there are no regulations for controlling the import, use and disposal of PBDEs in Eswatini, there is also no monitoring data yet.

2.3.4 Assessment of releases from unintentional production of Annex C Chemicals (PCDD/PCDF)

PCDDs/PCDFs are formed as unintentional by-products of numerous industrial and domestic activities generally involving combustion processes. The findings from the 2012 inventory indicated that the total emissions were calculated to be 74.44 g TEQ/a.⁹ The study revealed that there was an increase in the 2012 emissions as compared to the 2006 results when using the 2013 Toolkit. In the first study the emissions totalled 51.16 g TEQ/a. The major contributor to the emissions was found to be the waste from the Disposal Source Group which contributed 44.6 g TEQ/a (60%). The second to the Disposal Group was Heat and Power Generation at 13.2 g TEQ/a (18%), followed by Open Burning Processes at 12.1 g TEQ/a (16%) and Waste Incineration at 4.5 g TEQ/a (6%).⁹

The biggest contributors in each of the groups are:

- Disposal Source Group – sewage treatment
- Heat and Power Generation Source Group – bagasse boilers
- Open Burning Processes Source Group – domestic waste burning, sugarcane burning and fires at waste dumps
- Waste Incineration Source Group – medical waste

Table 2.3 provides total emissions of Eswatini calculated using the UNEP Standardised Toolkit for the year 2012.

Table 2.3: National Inventory of PCDD and PCDF in Eswatini for 2012.⁹

Cat.	Source Categories	Annual Releases (g TEQ/a)				
		Air	Water	Land	Product	Residue
1	Waste Incineration	4.50	0.00	0.00	0.00	0.04
2	Ferrous and Non-Ferrous Metal Production	0.00	0.00	0.00	0.00	0.00
3	Heat and Power Generation	6.75	0.00	0.00	0.00	6.49
4	Production of Mineral Products	0.01	0.00	0.00	0.00	0.00
5	Transportation	0.00	0.00	0.00	0.00	0.00
6	Open Burning Processes	11.67	0.00	0.42	0.00	0.00
7	Production of Chemicals and Consumer Goods	0.00	0.00	0.00	0.00	0.00

8	Miscellaneous	0.00	0.00	0.00	0.00	0.00
9	Disposal	0.00	0.05	0.00	0.00	44.52
10	Identification of Potential Hot Spots				0.00	0.00
1-9	Total	22.93	0.05	0.42	0.00	51.04
Grand Total		74.44				

(Mathunjwa, 2014)⁹

The highest emitter was found to be in the Disposal Group which mainly originated from sewage treatment. Open Burning Processes are also significant contributors and these originate from fires at dumpsites, sugarcane burning, forest fires an open burning of domestic waste. The Heat and Power Generation contributes through bagasse boilers while Waste Incineration originates mainly from medical waste incineration.⁹ The results were compared with the study done in 2006, but employing the 2012 toolkit. The general observation is that there is an increase in the total emissions.⁹

The current situation in Eswatini as far as dioxins and furans are concerned is basically characterized by a total absence of awareness and knowledge on these chemicals. As a consequence of this, there is mismanagement of waste in general, due to insufficient information and education on “cleaner production” and “cleaner waste management” concepts. This calls for the introduction of BAT and BEP in the industry, in waste management and other relevant sectors. More specifically, if the wood pulping facility were to be reactivated, it would require the use of non-elemental chlorine-based technology for paper bleaching in order to mitigate dioxins emission.⁹

Some of the waste disposal practices in Eswatini are illustrated in **Figure 2.11**. These facilities are not regulated in the country. Anyone with waste can burn them as and when they please without using the proper condition resulting in the production and emission of these UPOPs.⁹

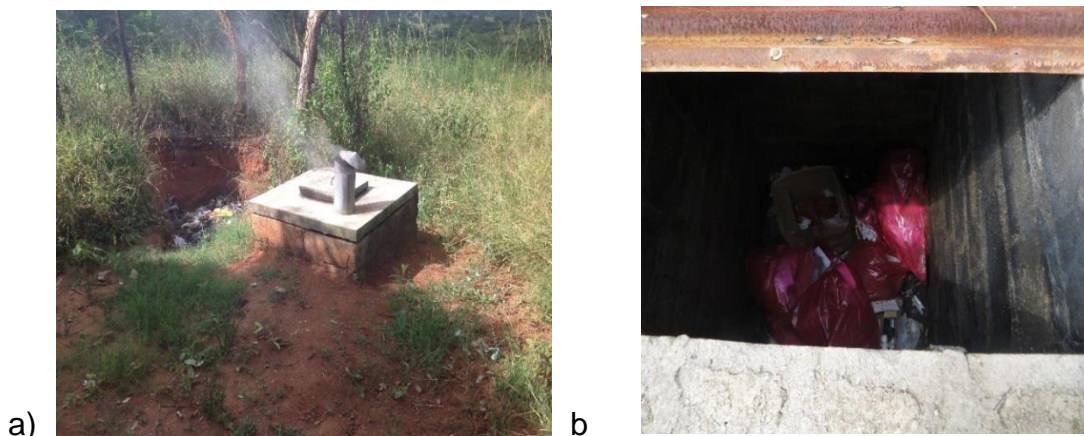




Figure 2.11: a) Waste pit with chimney and b) Open waste pit c) Open burning of animal carcasses.⁹

- ***Existing Policy and Regulatory Framework***

There is no regulatory framework for UPOPs, therefore there is a need to strengthen the legislative and regulatory framework to address UPOPs-related issues including the setting up of standards to cover major sources with consideration of Annex C part II and part III sources.

2.3.5 Information on the state of knowledge on stockpiles, wastes and contaminated sites and remediation measures.

Article 6 of the Stockholm Convention renders it obligatory for a Party to take appropriate measures to reduce or eliminate releases from POPs stockpiles and wastes. The inventory studies through data collection found that there were generally no regulations, guidance, remediation measures and data collection noted on releases from contaminated sites. There are also no specific approaches and procedures for POPs management in the country due to the absence of policy and regulatory framework.^{10,7,8,9}

2.3.5.1 Pesticides

a. Stockpiles

The inventory by Ndlela (2014) identified KaLanga as stockpile site for obsolete pesticides in Eswatini.⁷ Small obsolete stocks were also discovered at Swazican in Malkerns. The obsolete pesticides stocks at KaLanga had been repackaged and ready for disposal according to the processes of the Basel Convention. This was done through the Ministry of Agriculture and with financial help from the FAO. The

Ministry has just completed a 3 years Technical Cooperation Project (TCP) funded by FAO and there is now an obsolete stocks project office. In trying to enhance local capacity, Viola, an overseas company, partnered with Swazi Hazmat, a local company to repackage the obsolete stocks at KaLanga.⁷ The obsolete pesticides stocks have since been shipped to Germany for treatment and dispose.⁷

b. Contaminated sites

Sites get contaminated through spillages during formulation, wash up of spraying equipment, transportation and storage. The 2009 inventory exercise identified that Ngcayizivele, Mpumalanga Malaria campsites and KaLanga as contaminated sites, particularly the spray wash-up areas.⁷ Although DDT soil toxicological tests as well as areal dispersion tests have not been done during this inventory, the conditions of these sites remain contaminated. Contamination was noted during formulation, transportation of already formulated pesticides to spray sites, during the washing of spraying equipment and at the pesticides storerooms. These sites are also in close proximity to residents. The KaLanga site is about 50 m away from human settlements. The Ngcayizivele and Mpumalanga spray men camp sites and offices are less than 20 m from DDT storerooms. There is potential threat to water bodies at all the sites as river courses pass within less than 20 m from the sites.⁷

2.3.5.2 PCBs

a. Stockpiles

According to the inventory by Ndlovu (2014), EEC usually sends faulty transformers to Fletcher Electrical for repair. Those that cannot be repaired are usually sold to metal recyclers like Euro Swazi.⁸ During the repairing process, they sometimes have to drain the oil and replace it with new oil or recycled oil. The old oil is then sent to South Africa (to a company called Enviro oil) for recycling purposes. The new and recycled oil which is used to fill the transformers was found to be PBC free. This suggests that the stocks of contaminated oil at Fletcher Electrical is continually sent for recycling thus there was no contaminated oil accumulation. Transformers that cannot be fixed are drained and sold to metal recyclers who sell their metal to companies in South Africa or overseas.⁸

b. Contaminated sites

The powered transformers for EEC are quite well maintained with little or no contamination. Some of the contaminated sites reported in the previous inventory still qualify as potentially contaminated sites such as Euro Swazi and some EEC premises. This is because these companies are continually handling transformer oil

hence in the case of accidental spills, this may result in environmental contamination. Euro Swazi may even pose higher risks as they deal with end-of-life transformers which may include transformers with old and contaminated oil. **Figure 2.12** shows some of the waste generated during their processes.⁸



Figure 2.12: Transformer waste.⁸

Other places which may have potential contaminated sites include Fletcher Electrical which deals with faulty transformers. This company drains old oil from transformers which have been submitted by EEC for repairs. They use special pumps for the draining and refilling the oil, but they did mention that they do have occasional spillages of oil.⁸

2.3.5.3 PBDEs

a. Stockpiles

POPs flame retardants present in Waste Electrical and Electronic Equipment (WEEE) were very difficult to trace. This is because from the inventory, most of the EEE, are widely distributed in institutions, government as well as individual homesteads. The common disposal practice is to either keep them in a corner in the house, or dispose it off with normal waste, mainly for households. Institutions either sell old computers to their employee hence they end up in households or they are kept in designated storerooms for extended periods of time as shown in **Figure 2.13**. There was therefore no specific site where stockpiles of WEEE were found. This was common for both computers and TV sets. There are also no recycling plants to collect stockpiles of WEEE.⁸



Figure 2.13: Old computers stored in one of the institutional consumers premises.⁸

Stockpiles of end of life vehicles which may contain PBDEs could not be identified with certainty as well. This is because most of the vehicles that have reached their end of life are usually sold to scrap metal recyclers who claim to only take the metal parts of the car and they do not know where the owners take the plastic components. Some of the plastic parts are found lying on the ground in many garages around the country. There is therefore no specific place for the disposal of the plastic components of vehicles, with or without PBDEs.⁸

b. Contaminated sites

For both Oct-BDE and Penta-BDE, the dumpsites are suspected contaminated sites as some of the WEEE and ELV parts end up there. All car garages are also suspected contaminated sites as they deal with all ages of vehicles, some of which maybe PBDE contaminates. Some of the plastic components of old vehicles are usually lying around the garage and sometimes they are eventually buried by the soil or sent with municipal waste to landfills.⁸

Those managing the landfills do try to eliminate WEEE and other large plastics, but this process is not always efficient as only the large items are spotted. Many dealers who know that they cannot throw away their old computers with general waste usually strip of these computers into smaller parts and send them to landfills.

2.3.5.4 PFOS

The inventory could not ascertain whether there were carpets and fire-fighting foam with PFOS in the country. Therefore there were no stockpiles found. Contaminated sites may be those places where fire training is done, only if the fire-fighting foam is contaminated.

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

2.3.6.1 DDT

Eswatini does not produce any POPs but imports all her stocks. DDT is of main concern as it is still in use for malaria vector control. The indication from the inventory is that the amount of DDT used in the country decreases every year. Eswatini registers for DDT exemption, regularly reports to the SC and ensures that DDT use under the exemption is carried out in a manner that prevents human exposure and release into the environment.

2.3.6.2 PFOS

PFOS and its related compounds are not produced in Eswatini and they could not be identified in the country. There is need for further investigation as to whether these are used or not used locally. Otherwise currently, there is no need for an exemption as there is no proof that this chemical is being used in Eswatini.⁸

2.3.6.3 Endosulfan

Endosulfan was found at His Majesty's Correctional Services (HMCS) where it is probably used for agricultural purposes. The amount found was much smaller than what was inventoried in 2009. This suggests that the use of endosulfan may not be significant in the country and hence it may be phased out automatically in the next few years.

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

2.3.7.1 Monitoring of impacts on the Environment

Article 16 provides for effectiveness evaluation, four years after the Stockholm Convention enters into force, and thereafter periodically as determined by the COP.

Parties are therefore requested to contribute to the activities of the Global Monitoring Programme (GMP). For this to be effective in Eswatini, there is a strong need for analytical capacity strengthening and the country should undertake efforts to join the GMP activities that started on the continent since 2008. In Eswatini, there has never been nor is there a POPs Monitoring Programme. Even though POPs releases to the environment were physically noted at various sites, the study found that there is currently no database for monitoring uses and releases to the environment. There are also no chemical safety data sheets and incidents inventories within government as evidence for monitoring.

The country relies on some aspects of the Public Health Act 1969 (which is currently being updated), the Environmental Management Act 2002, and Water Pollution Control Regulations of 2010 to conduct some sort of monitoring through routine inspection of suspected sites. The University of Eswatini, through students' research projects, also conducts some short term studies some of which determine concentrations of environmental pollutants such as DDT. Most of these studies are not able to provide the true dimension of the national situation with respect to POPs. Further, the research findings end up being shelved at the university departments and they never reach the intended stakeholders and/or affected communities.

This may be because there is lack of a sufficient forum to publicise the results. There is therefore a need to find ways so that these findings get published and attain their usefulness. The lack of monitoring mechanisms in Eswatini is also partially attributed to lack of background information for studying these types of pollutants. Further, there is lack of trained personnel and laboratories (accredited laboratories) with the necessary equipment and standards for the accurate detection of organic chemicals, including POPs. The problem is exacerbated by limited awareness of interested parties and the shortage of research programmes in general.

The country therefore relies on international and regional bodies which may assist in meeting some of the SC obligations. An example of such a body is the Southern African Power Pool (SAPP) which has developed guidelines for PCB management including storage and disposal for utilities within SADC. EEC as a member of this body is obliged to comply with the requirements of SAPP, hence forcing the utility to comply with the convention.

The trade between local companies and European countries also helps these companies to use environmentally friendly chemicals. The sugar industry cannot use POP pesticides as well as other hazardous pesticides when growing their sugar cane. This may not be the country's regulation, but these companies are forced comply in order to be able to trade.

2.3.7.2 Monitoring of impacts on Human Health

There is no specific organisation responsible for epidemiological monitoring of the impacts of POPs on the health of the people of Eswatini. But the Public Health Act (1969) and the Occupational Health and Safety gives the Ministry of Health (MoH) and the Ministry of Labour and Social Security (MLSS), respectively, the mandate to ensure a healthy nation. They are mainly concerned about immediate health impacts while there is no capacity to look at long term impacts, which is mainly the case with POPs. The hospitals and clinics lack systematization with respect to pesticides and other chemicals, including POPs. The inventories conducted found general shortage of reliable statistics in this area. The lack of monitoring data for the environment or humans is closely related with the lack of awareness and knowledge on POPs. The weakness of the technical infrastructure and the shortage of trained personnel is another contributing factor. This has to be suitably addressed in the NIP, and assist the country to participate in the GMP activities.

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

The initial NIP process resulted in some enhanced knowledge on POPs in the selected sectors but the level of awareness is generally low for all the POPs especially amongst the general public. An improvement was observed among people who work with some of the articles that may contain POPs, especially PCBs. The level of awareness at EEC was very satisfactory amongst the employees. This may be because the company has to comply with international and regional standards that promote the use of PCB free oil. This may have prompted the company to empower its employees on issues of PCBs. The sugar companies in the country also produce electricity at a much smaller scale compared to EEC. These companies also continually monitor their oils for PCBs as they also have standards to comply with. It is suspected though that other companies who are dealing with other types of oils (lubricating oils which do not need PCB treatment) may still have a very low level of awareness about PCBs.

For PBDEs, PFOS, UPOPs and pesticides, the level of awareness was very low in the country. The efforts by EEA on awareness raising are still continuing where they use burners, regional and national workshops for targeted groups like farmers, environmental health, labour, sugar industry, agricultural extension officers. The NSC is also diverse as it has members from different stakeholders

2.3.9 Relevant activities of non-governmental stakeholders

The Global Fund and UNICEF have been funding activities of the NMCP for some time, particularly the purchasing of long lasting treated bed nets. Non-Governmental Organisations such as consumer forum, SHERQ forum have played a more direct role in educating the public on environmental management initiatives that included taking actions on hazardous chemical exposure of workers. However, nothing specific to POPs has been done yet.

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

2.3.10.1 Technical infrastructure for POPs disposal

From the 2012 inventories, pesticides (including DDT), WEEE and such facilities are not a priority concern for the country except the need of an ELV are of major concern in Eswatini. The country does not have any disposal facilities to cater for these chemicals or articles. There are also no recycling companies especially for WEEE and ELV which eventually are left to be buried on the ground or taken to dump sites. The country therefore needs to have a storage facility for contaminated articles while it tries to address issues of ESM.

Pesticides are usually left as stockpiles in the premises of retailers or large scale users of such chemicals. Recently, huge stockpiles of pesticides were sent to Germany for disposal through a Basel Convention project. This helped to eliminate some of the old pesticide stockpiles which were in the country. There is therefore a need to have ESM disposal of used DDT sachets and other pesticides in used around Eswatini as well as temporal storage facilities.

2.3.10.2 POPs analysis instrumentation

Eswatini does not have any accredited laboratory facilities for POPs testing. This gap could be addressed in the short or medium term through the upgrading of existing laboratories with suitable equipment and personnel training. Of these, the Eswatini Water Services Corporation (EWSC) is partially accredited by the South African Bureau of Standards. These laboratories use internationally recognised protocols like those of the United States Environmental Protection Agency (USEPA) and OECD.

In addition to suitable equipment and training of the personnel, there is need to:

- Establish national programmes for proficiency testing and accreditation
- Have these laboratories accredited through the South African Bureau of Standards in order to establish capacity to perform PCB, PBDEs, PFOS and pesticide testing for chemical management.
- Expand the instrument base to be capable of pesticide and PCB analysis.

2.3.10.3 Overview of technical training and education programmes

The country has the basic infrastructure and personnel that can assist in mounting a sound chemical management system. The University of Eswatini (UNESWA), within the Faculty of Health Sciences has courses which address issues of environmental health such as solid waste management, air pollution, environmental impact assessment, environmental pollution, environmental toxicology, instrumental methods for environmental analysis. The Faculty of Science, offers programmes in Integrated Environmental management and Resources Management; and Analytical/Environmental Chemistry with aspects of pesticides analysis, toxicology, Geographic Information Systems. The Southern African Nursing University (SANU) also has a programme on environment health management.

The weakness of these facilities includes:

- i) The lack of accreditation and proficiency testing schemes
- ii) The lack of international chemical libraries in all the institutions
- iii) Insufficient instrumentation like the GC/MS at the University for validation of data between the institutional laboratories
- iv) The lack of local and international networks between laboratories.

2.3.10.4 Linkages to international programmes / projects

As a result of the above mentioned weaknesses and gaps, Eswatini has limited existing international monitoring programmes. There has been an attempt to conduct ambient Air Quality Monitoring (AQM) in the country using an AQM station that was purchased by government. However, the analysers in the station have been non-functional most of the time impeding on the data collection. The existing Air Pollution Control Regulations (2010) have ambient air quality objectives but lack emission standards for enforcement purposes. The Regulations still require amending for them to be enforceable.

The country does conduct periodical inventories to inform the National Communications as per the requirements of the United Nations Framework Convention on Climate Change (UNFCCC). These inventories, however, are derived using emission factors and activity data and not direct measurements.

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

Exposure risk is not assessed due to lack of knowledge, weak infrastructure and shortage of relevant equipment and skilled personnel. This has led to lack of monitoring data and ignorance on the threats to public health and the environment from exposure to POPs in Eswatini. From current status on the usage of POPs pesticides in the country, the impacted environments and communities are those of the malaria endemic areas. One is at Ngcayizivele in Big Bend and the other at Mpumalanga. DDT spray operators and the recipient communities are impacted groups of concern.

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

Eswatini has no Research and Development (R&D) chemical industry and such system based on the precautionary approach is not relevant for the country. However, the country needs to support the work of POPRC, for other chemicals that may be listed as POPs in the future.

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

Eswatini does not have such a system and this is a major gap particularly for the registration of pesticides. However, there are processes which are being developed for the management and registration of chemicals such as pesticides through the Pesticide Management Bill of 2011, the Prior informed consent procedure under the Rotterdam convention which regulates the international trade of pesticides listed under Annex 3 of the convention. SAICM is also coming up with a framework to manage chemicals in a sound manner and this includes POPs.

CHAPTER 3

Strategy and Action Plans

3.1 Policy Statement

Recognising the importance of preserving the environment and the welfare of the Swazi people, the Government of Eswatini (GoE) signed the Stockholm Convention in 2001 and became a party in 2006. Consequently, the GoE through EEA and its stakeholders has spearheaded efforts towards the sound management of POPs through the preparation of the NIP. POPs of primary concern in Eswatini are DDT, PCBs, Dioxins and Furans, PBDEs and the disposal of obsolete stock. As a Party to the Convention, the country is bound by the provisions enshrined therein, and is committed to meet her obligations under the SC through the implementation of NIP. The Stockholm Convention requires Parties to take measures to eliminate or reduce the release of listed POPs into the environment. The Kingdom of Eswatini is therefore committed to the protection of the human health and the environment from the harmful effects of dangerous chemicals, including POPs. This is evidenced from provisions of environmental management in several Acts and the Constitution.

The GoS has generated several policies and action plans in order to address various national challenges, but none are specific to chemicals, in particular, POPs. The NIP proposes actions for phasing out various POPs sources and the reduction and the elimination of existing stockpiles in the short, medium and long terms. The country's goal is to eliminate POPs as soon as practicable through the implementation of the NIP.

The implementation of the NIP will contribute to the national efforts of combating poverty and improving environmental quality and avoiding possible human health effects of POPs. It will also provide the country with opportunities to identify and build synergies with other Conventions and international agreements to which the country is Party to. Therefore, the NIP complements other national policies, development plans, as well as, the overall vision of the country to improve the quality of life for Swazi people. The following are policy pronouncements on the NIP to facilitate review, amendment and eventual adoption and approval by stakeholders and the Government of Eswatini:

- **Recognising** the risks posed by POPs to human health and the environment, the Government of Eswatini commits itself to progressive reduction in the usage and eventual elimination of all stocks of POP pesticides including DDT, PCBs, PCB containing equipment, PBDE and PFOS contaminated articles and minimising the exposure to unintentionally produced Dioxins and Furans.

- **The underlying principles** will include strategies and activities for the management of POPs based on a risk assessment approach justified by internationally accepted risk factors.
- **Raising awareness** will be achieved through education and communication on POPs related issues to all stakeholders and the public.
- **Integrating** management strategies for POPs with other existing strategies on hazardous waste and national solid waste strategies to achieve a harmonised approach to environmental and chemicals management.
- **Continuous** participation and involvement in relevant international efforts to meet the obligations of the SC and to support its initiatives and commitments.

3.2 Implementation Strategy

In order to ensure a coherent approach to hazardous chemical and waste management at all levels, the GoE in collaboration with other stakeholders, will develop post-updated-NIP project outlines (as stated in the TORs section 4.2.1) which will ensure that actions and modalities to implement the NIP are designed to comply with the Convention and are consistent with other national environmental strategies and action programmes including the Strategic Approach to International Chemicals Management (SAICM). It is envisaged that the NIP for Eswatini will be implemented through a multi stakeholder approach.

To facilitate communication both at national and international levels, a National Focal Point (NFP) was appointed to act as an effective conduit for communication on strategic approach matters. SAICM promotes the synergies of the Basel, Rotterdam, Stockholm and Vienna Conventions. It is envisaged that the NIP for Eswatini will be implemented through a multi stakeholder participatory approach where EEA will continue to be the leading institution in its role as the NFP for the SC

The current NSC consists of an Inter-sectorial Coordinating Mechanism to and is responsible for the coordination of the implementation of the NIP. This committee comprises of relevant ministries involved in POPs management such as agriculture, environment, health, industry and labour. In addition, the academia, civil society and public interest groups are integrated into this framework. The outlined institutional and legal framework will facilitate implementation of the NIP through responsible ministries and agencies as provided for in the Action Plans.

The overall objective of the strategy for the NIP is to protect human health and the environment from impacts that are associated with the releases through progressive mainstreaming of chemical safety issues in national poverty reduction and

sustainable development strategies. This will ensure that actions and modalities to implement the NIP are designed to comply with the Convention and be consistent with other national environmental strategies and action programmes.

3.2.1 Priority Concerns

The priorities, covering the main obligations of the Convention, are aligned to the twelve thematic areas chosen by Eswatini to comply with the Stockholm Convention as shown in **Table 3.1**. There were a number of objectives which were identified to be common amongst all the POPs thematic areas, hence their implementation requires that all the thematic areas are covered, as outlined by Dlamini (2014).²¹ These would help meet, to different degrees, some of the priorities set out in **Table 3.1**.

Table 3.1: List of Priority Concerns

N°	Thematic Area	Priority
01	Institutional, Policy and Regulatory Framework	Enact and upgrade the legislation to allow the country to address POPs as well as capacity building for key institutions.
02	Annex A, Part 1, Chemical – Pesticides	Phasing out of residual usages, prevention of future accumulation of POP pesticides and management of contaminated sites (Art. 3 and Art. 6).
03	Annex A, Part 2 Industrial Chemicals – PCBs and PBDEs	Establish a programme to systematically replace all PCB contaminated equipment (phase out program) and develop strategy for and ESM of waste and contaminated sites (Art. 3 and Art. 6). The concentrations of PCBs in oil used in all electrical appliances is to be monitored For PBDEs, the import of contaminated articles needs a proper monitoring tool as well as their disposal.
04	Annex B Pesticides – DDT	Seeking alternatives to phase out the use of DDT & minimize human exposure & environmental contamination from DDT (Art.3; 4 and 6).
05	Annex B, Industrial Chemicals – PFOS	Embark on research that will enable the country to determine whether PFOS contaminated articles are used in Eswatini.
06	Annex C, PCDD/PCDF	Improve waste management and introduce BAT/BEP in the industry and other relevant sectors (Art. 5)
07	Public Awareness, Information and Education	Development of communication, education and training strategy on POPs and their alternatives (Art. 9 and Art. 10).
08	Participation in International Activities and Programmes in the field of POPs	Support the work of the POPs Review Committee, report to Convention and participate in the effectiveness evaluation (Art. 8 , Art. 15 and Art. 16).
09	Reporting, Monitoring and Evaluation	Building capacity for monitoring, evaluation and reporting on POPs

N°	Thematic Area	Priority
		at national, regional and international levels (Art. 15 and Art. 16).
10	Research & Development on POPs and alternatives	Technical capacity to laboratories and research institutions to analyse & research on POPs (Art. 11).
11	Socio-economic and gender analysis	Make sure the implementation of the NIP covers both socio-economic and gender issues.
12	Technical and Financial Assistance	Need of support from the International Community for national capacity strengthening and additional funding to implement the NIP (Art. 12 ; 13 and 14)

3.3 Strategies and Action Plans

The key objective of this step is to identify possible options for the management of new POPs to meet the Convention's obligations and country objectives. The main outcome is a detailed road map for reaching country objectives with respect to each of the nine new POPs, with responsibilities clearly assigned and implementing mechanisms well defined. Nonetheless, each section of the initial NIP was reviewed to identify areas that need to be updated.

This section therefore discusses the Action Plans developed for the implementation of the NIP in Eswatini with specific resource allocation for each aspect. In the priority setting, some objectives were identified to be common amongst most of the thematic areas and these are shown in **Table 3.2**.

Table 3.2: General objectives for all the thematic areas

Objectives	Activities	Indicators	Expected outcomes	Responsible institutions
Create & strengthen public awareness on POPs in the country	Develop Information Education & Communication (IEC) material & train communities & other	Developed IEC material	Available IEC material	EEA*, MOET, private sector, media, community leaders, and

Objectives	Activities	Indicators	Expected outcomes	Responsible institutions
	stakeholders on POPs			local governments
	Conduct awareness raising campaigns to inform the general public about POPs	Recorded campaigns at communities, cities and towns on POPs as well as media programs	Informed stakeholders & communities	EEA*, EEC, media, Local governments, & private sector
	Develop & strengthen capacity of politicians on POPs	Workshop reports	Informed politicians	EEA*, private sector, EEC, NMCP, MHUD & development partners
Develop & strengthen the capacity of ERS & other border posts workers to support in the management of POPs in the country.	Establish a data collection tool for ERS to capture imports of POPs contaminated and potentially contaminated commodities.	Developed tool & workshop reports for training users of the tool	Record of imports of POPs contaminated and potentially contaminated commodities available at ERS	ERS*, EEA & private sector
	Build capacity of ERS staff working on imports of goods & staff of other organisations as well as other government officials working at border posts to monitor the importation & smuggling of POPs contaminated	Workshop reports	Good control of imports of POPs contaminated goods	EEA, ERS, Ministry of Home Affairs, Ministry of Defence and the Royal Swazi Police

Objectives	Activities	Indicators	Expected outcomes	Responsible institutions
	commodities into the country			
Develop a waste disposal & storage site in line with BAT/BEP by finalising negotiations for the selected site and constructing the necessary infrastructure	Seek final political approval for the selected site	Site approved	Functional waste storage & disposal site	EEA, communities, private sector, MHUD, MoH, MTEA & MoF.
	Develop infrastructure & facilities including human resources required at the site	Constructed facility with trained personnel		
	Provide information to households & other stakeholders about the disposal site for all POPs contaminated & potentially contaminated commodities	Workshop reports	Informed stakeholders & families	
Participate in the review of the national waste management strategy with the objective of incorporating POPs	Organize a stakeholders meeting, review the strategy incorporating POPs, develop the strategy implementation plan and conduct regular monitoring and evaluation of the implementation of the strategy	Workshop report	Strategy that incorporates POPs	EEA, communities, private sector, MHUD, MoH & MTEA
Identify and rehabilitate POPs contaminated sites. This	Engage an expert to evaluate POPs levels at contaminated &	Report that determines which sites are contaminate		National Fire & Emergencies Services, EEA, MoA,

Objectives	Activities	Indicators	Expected outcomes	Responsible institutions
objective will cover rehabilitation of confirmed and potentially contaminated sites for all POPs in the country	potentially contaminated sites.	d & to what extent		NMCP, EEC, MoH, MoF & development partners
	Engage an expert to identify possible rehabilitation methods for contaminated sites, incorporating BAT/BEP	Report of possible rehabilitation methods for contaminated sites		
Develop environmentally sound management systems for POPs	Engage an expert on POPs who will develop environmentally friendly systems for managing each of the POPs including their disposal	Reports on all POPs management		EEA, EEC, MHUD, MoH, NMCP, MoF, Tinkhundla centers, development partners & private sector
	Develop ISO standards which promote environmentally friendly practices	Developed ISO standards		
Develop & implement national POPs projects which are in line with regional & international projects, as well as, international best practice	Participate in regional & international meetings/events to learn BAT/BEP & latest regional & international initiatives	Workshop & meeting reports from participants	Trained personnel who develop project proposals to address POPs & adoption of BAT/BEP	EEA*, MoH, MoA, NMCP, EEC, UNESWA, MoF, various government ministries & agencies & private sector

Objectives	Activities	Indicators	Expected outcomes	Responsible institutions
Facilitate the delegation of activities & shared responsibility among government & development partners for implementing SC	Stakeholder consultation meetings	Workshop reports	Implementation of MOUs	EEA*, various government ministries & relevant stakeholders
	Develop MOUs & partnerships	Signed MOUs		EEA*, various government ministries & relevant stakeholders

* Lead Institution

The objectives in **Table 3.2** are also reflected in the different thematic areas to different degrees, depending on their relevance.

3.3.1 Action Plan: Institutional, Policy and Regulatory Frameworks

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

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

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

The Inventory on Institutional, Policy and Regulatory Framework done by Thwala (2014) concluded that there are still various gaps in the existing legislative, institutional and regulatory framework for hazardous chemicals management which includes POPs, in Eswatini.¹⁰ The Government of Eswatini (GoE) has generated several policies in order to address various national challenges. However, none of

them is specific to chemicals in general, pesticides or POPs. These barriers need to be properly addressed in order to help Eswatini meet the Convention's obligations. To accomplish this, the country will need support from local and external sources to cover costs for consultancies, meetings, surveys, legal services and development of publicity materials.

In order to meet the above Convention obligations, the country has set out objectives which will be under the leadership of EEA, as illustrated in **Table 3.3**. The strategies developed under the Institutional, Policy and Regulatory Framework are basically to evaluate the current legislation which have a bearing on chemicals. This will lead to the identification of gaps within the identified legislation. Hence, upon inclusion of POPs in the country's policies, a bill needs to be drafted which will be comprehensive on the management of chemicals, including POPs.

The second objective under this thematic area includes the management of chemicals in Eswatini. This involves strengthening institutional arrangements on chemicals management including POPs to avoid the current fragmentation as far as chemicals management is concerned. This will help in the monitoring and enforcement of the current and future legislation on chemicals. Regulations that designate ERS staff as inspectors should also be put in place. This may be accompanied by continuous training of ERS personnel, as there is a high rate of staff turnover.

Table 3.3: Objectives and activities under the Institutional, Policy and Regulatory Frameworks thematic area

Goal: To strengthen the legislative, institutional and regulatory framework in order to comprehensively cover POPs issues.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline (From-To)	Source of Funding	Costs
To put in place a comprehensive legal framework on chemical management including POPs by 2017	Collate & review existing legislation that address the management of chemicals including POPs	Synthesis Report on legislation dealing with chemicals management	EEA*	3 months from date of commission and availability of funding	GoE & Donors	E75,000 (\$6,573)
	Identify gaps and detail recommendations on areas of amendment	Detailed recommendations on areas of amendment	EEA*	3 months from date of commission and availability of funding		E75,000 (\$6,573)
	Ensure that the chemicals management policy incorporates POPs	Policy document that incorporates POPs	EEA*	Collaborate with SAICM on the development of chemicals management policy		E75,000 (\$6,573)

Goal: To strengthen the legislative, institutional and regulatory framework in order to comprehensively cover POPs issues.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline (From-To)	Source of Funding	Costs
	Draft the comprehensive bill on chemicals management which has a chapter on POPs	Draft Bill	EEA*, AGs Office, MTEA, MHUD, MNRE, MOA, MOH, MOJ, MOLSS, Academia, members of the Bar and Bench, NGOs, CBOs etc.	6 months after receipt of synthesis report, not later than 2017		E100,000 (\$8,764)
	Stakeholder consultations	Workshop reports	EEA*, AGs Office, MTEA, MHUD, MNRE, MOA, MOH, MOJ, MOLSS, Academia, members of the Bar and Bench, NGOs, CBOs; MTA portfolio committees.	5 workshops in line with the above activity schedule		E75,000 (\$6,573)

Goal: To strengthen the legislative, institutional and regulatory framework in order to comprehensively cover POPs issues.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline (From-To)	Source of Funding	Costs
Establish and/or strengthen institutional arrangements on chemicals management including POPs	Designate through legislation, an agency to oversee/coordinate chemical management issues	Designated agency	EEA	2018	GoE & Donors	E45,000 (\$3,944)
	Establish an inter-sectorial coordinating committee & standing sub-committees for chemical management	Established inter-sectorial coordinating committee on chemicals management	EEA*	2018	GoE & Donors	E45,000 (\$3,944)
	Constitute POPs sub-committee under the inter-sectorial committee	List of sub-committee members	EEA*	2018		E 40,000 (3,506)
	Enhance the capacity of key players to conduct leading role in chemicals management including POPs		EEA*	2019		E100,000 (\$8,765)
	Enhance collaboration with key stakeholders		EEA*	2019		E80,000 (\$7,012)
Total						

Goal: To strengthen the legislative, institutional and regulatory framework in order to comprehensively cover POPs issues.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline (From-To)	Source of Funding	Costs
						E710,000 (\$62,227)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.2 Action Plan: Production, Import and Export, Use, Stockpiles and Wastes of Annex A Chemicals

The SC requires that each Party shall prohibit and/or take legal and administrative measures necessary to eliminate the production, use, import and export of all chemicals listed in Annex A. In addition, the convention states that each Party shall ensure that stockpiles consisting of or containing chemicals listed either in Annex A or Annex B and wastes, including products and articles upon becoming wastes, consisting of, containing or contaminated with a chemical listed in Annex A, B or C, are managed in a manner protective of human health and the environment.

Annex A chemicals are divided into two categories which are pesticides and industrial chemicals.

3.3.2.1 Pesticides

A pesticide is defined in the International Code of Conduct on Pesticide Management as any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth.²² In Eswatini, such substances are widely used by farmers in the agriculture sector to boost the yields of crop products. Other pesticide users include public health officials to control disease vectors such as mosquitoes, flies, ticks, and rats. Foresters, golf course owners, learning institution, retail businesses, businesses, and individual home owners also use pesticides to kill or repel unwanted insects, houseflies, cockroaches, ants, moths and fleas. Therefore this shows that the use of pesticides is very broad and therefore pesticides need to be properly monitored as some of them are very toxic and are classified under Class I and II by the WHO. Others are very persistent and toxic and they even bioaccumulate in living organisms, hence their classification as POPs.

Pesticides have never been manufactured in the country but they are all imported. This therefore means that the country has to have action plans for the control of imports, transport, distribution, uses and disposal. In Eswatini, a very small percentage of the pesticides in use are POPs. In the current inventory, endosulfan, chlordane and DDT were the only POPs pesticides found around the country while lindane and Chlordecone could not be found anywhere.⁷ Only 10 litres of Chlordane were found at Malkerns Research station. This amount is smaller than the amount found in the 2009 inventory. In this regard, only endosulfan and chlordane are Annex A pesticides and should be eliminated.

Specific Action Plans to help Eswatini meet her obligations to the SC as far as Annex A pesticides are concerned are shown in **Table 3.4**.

Table 3.4: Objectives and activities under the Production, Import and Export, Use, Stockpiles and Wastes of Annex A Pesticides

Goal: Create an enabling environment for POPs pesticides management in Eswatini						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To reduce usage of annex A chemicals	Conduct a national inventory which will act as a database for pesticides used in Eswatini. This should be updated periodically.	Periodic reports available	EEA*, MOA, MOH, UNESWA	2014 and continuous	GoE, FAO, UNIDO, WHO, GEF, Private sector	E70,000 (\$6,135)
	Create database on alternative to POPs	Functional data base	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	June 2015 – Dec 2015		E100,000 (\$8,764)
	Identify, test, select, promote and avail new alternatives to POPs in all sectors.	Alternative pesticides available	EEA*, MOA, MOH, UNESWA	Jan 2016- June 2016		E100,000 (\$8,764)
	Train pesticides users on IPM to reduce reliance on synthetic pesticides.	Trained pesticide users on IPM & reduced reliance on synthetic pesticides.	EEA*, MOA, MOH, UNESWA	June 2016 – Sep 2016		E75,000 (\$6,573)

Goal: Create an enabling environment for POPs pesticides management in Eswatini						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Train and encourage suppliers/ retailers of POPs pesticides & users to voluntarily and continuously submit data on POPs pesticides to EEA	Data submitted to EEA & voluntary submission of POPs data	EEA*, MOA, MOH, UNESWA	June 2016 – Dec 2016		E50,000 (\$4,382)
To regulate import, use, distribution & disposal of POPs pesticides	Conduct a chemical advocacy workshop for members of parliament for political support	Workshop report	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	Jun 2015 – Dec 2015	GoE*, FAO, UNIDO, WHO, GEF, Private sector	E50,000 (\$4,382)
	Formulate and validate regulations under the Pesticide Management Bill.	Report of validation workshop	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	2015-2017		E60,000 (\$5,259),
	Establish the office of pesticides registrar to regulate import	Operational registration office	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	2017-2018		E100,000 (\$8,764)
	Build capacity and develop IEC material for key stakeholders on POPs management	Workshop report and IEC material	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	2015 continuous		E350,000 (\$30,675)
Management & disposal of obsolete pesticides	Update the inventory on obsolete pesticides	Up-to-date inventory report of obsolete pesticides	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	on-going	GoE, FAO, UNIDO, WHO, GEF, Private sector	E75,000 (\$6,573)

Goal: Create an enabling environment for POPs pesticides management in Eswatini						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Identify site & build proper storage facility	Proper storage facility constructed		On-going		E2,000,000 (\$175,285)
	Rehabilitate kaLanga sites	Rehabilitated KaLanga storage facility		2016-2022		E300,000 (\$26,293)
	Identify potentially contaminated sites, sample, conduct test & adopt low cost reclamation technologies	Contaminated sites identified and reclaimed		2016-2022		E200,000 (\$17,528)
Total						E3,530,000 (\$309,377)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.2.2 Polybrominated Diphenyl Ethers (PBDEs)

In Eswatini the source of polybrominated diphenyl ethers (PBDEs) was mainly identified to be from imports of potentially contaminated articles including CRT TVs, CRT computers and second hand vehicles that were manufactured before 2005.⁸ An action plan is required for a comprehensive inventory of such articles in the country and to establish a national scheme for the ESM of their waste within the framework of the national solid waste management policy. The main challenge with PBDE containing articles in Eswatini is their disposal. This is because Eswatini does not have a recycling plant for plastics in general as well as PBDE contaminated material. The disposal of these articles therefore is of major concern.

The country therefore has the following objectives listed in **Table 3.5**, to help the country comply with its obligations to the SC. Eswatini intends to monitor the import, distribution and disposal of all EEE as well as vehicles. An awareness raising program is also key to the management of PBDE contaminated articles especially because there are also significant amounts of EEE and vehicles which is in the possession of individuals. This will help in the strategies to collect WEEE and ELVs in central places around the country which will function as temporary storage centres while disposal arrangements and strategies (BAT/BEP) are considered.

Table 3.5: Objectives and activities under the Production, Import and Export, Use, Stockpiles and Wastes of Annex A Industrial chemicals – PBDEs

Goal: Take effective measures to phase out articles containing PBDEs by 2020 and make effort to achieve ESM of their waste.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To establish national baseline on articles that may contain PBDEs through comprehensive inventory	Undertake comprehensive inventory of second hand vehicles	Up-to-date inventory of second hand vehicles	EEA*	Jan 2016- Dec 2016	EEA*	E300,000 (\$26,762)
	Undertake comprehensive inventory of all categories of EEES/WEEES	Up-to-date inventory of all EEES/WEEES				
To regulate import, use, distribution & disposal of EEES & vehicles	Develop IEC material for raising awareness on the PBDE contaminated articles for government and customs officials as well as the public.	IEC material developed	EEA*	2015-onwards	EEA,	E200,000 (\$17,528)
	Prohibit the import of EEES & vehicles that are almost at their end of life	No EEES and cars older than 15 years allowed into the country	ERS*, MoF, Motor registry	2015-2022	EEA, ERS, MOF	E100,000 (\$8,764)
	Regulate computer donations to institutions as	Regulations in place and implemented with clear storage	MEPD*, MICT*, MoE*, MOE, MHUD, EEA,	2015 on-going	MOE, Donors,	E100,000 (\$8,764)

Goal: Take effective measures to phase out articles containing PBDEs by 2020 and make effort to achieve ESM of their waste.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To establish national baseline on articles that may contain PBDEs through comprehensive inventory	Undertake comprehensive inventory of second hand vehicles	Up-to-date inventory of second hand vehicles	EEA*	Jan 2016- Dec 2016	EEA*	E300,000 (\$26,762)
	Undertake comprehensive inventory of all categories of EEEs/WEEEs	Up-to-date inventory of all EEE/WEEEs				
	well as their storage and disposal.	and disposal arrangement	Donors, manufacture		EEA, MHUD	
	Development of BAT/BEP practices for the management & disposal of PBDE contaminated articles	BAT/BEP manual/ guidelines for safe disposal of PBDEs contaminated articles	EEA*, research institutions	2015 on-going	EEA, research institutions	E1,000,000 (\$87,642)
Collection of WEEE and the plastic components of ELV in temporal regional centres	Identify and construct an appropriate temporary storage facility in each of four regions of the country for the collection of all WEEE and ELV (plastic components)	Temporary storage facilities in each of the four regions	EEA*, MHUD	2015-2016	EEA, MHUD	E2,000,000 (\$175,285)
	Collaboration with international companies	MOUs signed	EEA, MoFA	2015-2017	MTEA, MHUD	E100,000 (\$8,764)

Goal: Take effective measures to phase out articles containing PBDEs by 2020 and make effort to achieve ESM of their waste.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To establish national baseline on articles that may contain PBDEs through comprehensive inventory	Undertake comprehensive inventory of second hand vehicles	Up-to-date inventory of second hand vehicles	EEA*	Jan 2016- Dec 2016	EEA*	E300,000 (\$26,762)
	Undertake comprehensive inventory of all categories of EEES/WEEES	Up-to-date inventory of all EEES/WEEES				
	for the safe disposal of contaminated articles					
Total						E3,500,000 (\$333,509)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.2.3 Polychlorinated Biphenyls (PCBs)

The SC requires that all Parties eliminate the use of PCBs in equipment (such as transformers, capacitors or other receptacles contaminated with PCBs) by 2025. The PCBs inventory identified mostly old transformers to be contaminated with PCBs, that is those with levels above the 50 ppm recommended by the SC. About 26% of the transformers had reached their end of life, that is, they had been in use for more than 30 years, which is recommended by the SC. This suggests that these need to be replaced immediately with new, uncontaminated transformers.

The country therefore needs to develop an ESM system for PCBs and their waste that is required by the Convention for the management of other transformers which may or may not be contaminated. The areas which usually handle transformers such as those that service them as well as those that buy transformers for metal recycling are possible contaminated sites, as some of the oil in these electric equipment was PCB contaminated.

There is draft phase out plan which requires the phasing out of old transformers even though this will require some external funding. The PCB contaminated oil can be sent to recycling companies in South Africa while the equipment will have to be disposed of in an environmentally safe way. The oil in all transformers which is PCB contaminated must be replaced with PCB free oil. The country's objectives are shown in **Table 3.6**.

Table 3.6: Objectives and activities under the Production, Import and Export, Use, Stockpiles and Wastes of Annex A Industrial chemicals – PCBs

Goal: Take effective measures to phase out PCB containing equipment by 2025 and make effort to achieve ESM of waste containing PCBs by 2028 as well as phase out transformers older than 25years						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Replace transformers which have reached their end of life (30 years of use)	Identify transformers more than 30years	Updated and reliable data base of transformers including transformer life	CSO*, EEC & IPP (independent power producers), EEA, ESERA	2015-2022	EEC&, IPP	E50,000 (\$4,382)
	Replace transformers with new transformers which are PCB free	PCB free transformers	EEC* & IPP	2015-2022		E20,000,000 (\$1,752,848)
Monitor PCB concentration in available equipments including transformers	Identify equipment containing PCBs and transformers containing PCB contaminated oil	Updated and reliable data base of transformers including transformer oils content	CSO*, EEC and IPP (independent power producers), EEA, ESERA, research institutions	2015-2022	EEC, IPP, EEA	E200,000 (\$17,528)
	Replace PCB contaminated oil with PCB free oil.	PCB free equipment	EEA*, EEC & IPP	2015-2022		E500,000 (\$43,821)
To establish an import and export mechanism for	Promulgate regulations aimed at prohibition and restricting the	Regulations	EEA*,	2015-2016	EEA	E100,000 (\$8,764)

Goal: Take effective measures to phase out PCB containing equipment by 2025 and make effort to achieve ESM of waste containing PCBs by 2028 as well as phase out transformers older than 25years						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
PCB suspected material	importation of PCB based equipment					
	Develop Import and Export guidelines & procedures for PCBs suspected materials.	Guidelines document and SOPs	EEA*, ERS	2015-2016	EEA	E100,000 (\$8,764)
	Establish testing procedure for PCBs in suspected equipment entering the country	Testing procedure manual	EEA*, research institutions, EEC, IPP, ESERA	2015-2016	EEA	E150,000 (\$13,146)
	Procure PCB testing equipment	Testing equipment and training manual	EEA*, EEC, IPP, research institutions	2015-2016	EEA	E1,500,000 (\$131,463)
	Train users and other relevant stakeholders including Customs Officers on PCBs testing procedures.	Training report	EEA*, ERS, consultant	2015-2016	EEA	E50,000 (\$4,382)
	Upgrade a suitable laboratory to analyse POPs, including PCBs	Accredited laboratory identified	EEA*, Research institutions	2015-2016	EEA	E5,000,000 (\$438,212)

Goal: Take effective measures to phase out PCB containing equipment by 2025 and make effort to achieve ESM of waste containing PCBs by 2028 as well as phase out transformers older than 25years						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Train key stakeholders on the management of PCB contaminated sites and equipment.	Training report	EEA*, research institutions, EEC, IPP	2015-2017	EEA, IPP, EEC	E50,000 (\$4,382)
	Issuance of permits for cross border movement	Permits issued	EEA*, ERS	2015-2016	EEA	E200,000 (\$17,528)
	Develop and implement monitoring mechanism	Mechanisms developed	EEA*, ERS	2015-2017	EEA	E200,000 (\$17,528)
To dispose of all PCB contaminated materials no later than 2025	Construct a central facility for interim storage of PCB contaminated equipment in line with BAT/BEP	Central facility constructed	MHUD*, EEA, Industry, EEC, IPP	2015-2017	MHUD, EEA	E2,000,000 (\$175,284)
	Undertake collection of PCB equipment to interim storage	PCB equipment stored in one site. Records /report	EEC*, IPP, Industry	2015- on-going	EEC, IPP, Industry	E200,000 (\$17,528)

Goal: Take effective measures to phase out PCB containing equipment by 2025 and make effort to achieve ESM of waste containing PCBs by 2028 as well as phase out transformers older than 25years						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Develop and implement a project for the disposal of PCB contaminated equipment.	Project proposal and approved project document, report	EEA*, EEC, IPP, Industry	2015-2025	EEA, EEC, IPP, Industry	E200,000 (\$17,528)
	Develop and implement a project for low cost remediation of PCB contaminated sites.	Project proposal and approved project document, report	EEC*, EEA, IPP, Research institutions	2015-2025	EEA, IPP, EEC	E500,000 (\$43,821)
	Maintain an up to date register of sites contaminated with PCBs	Data base	EEC*, EEA, CSO, ESERA	2015-2025	ESERA, CSO, EEA	E35,000 (\$3,067)
	Develop & implement guidelines on handling PCB contaminated equipment.	Guidelines and report	EEA*, EEC, IPP, ESERA	2015-2017	EEA	E100,000 (\$8,764)
	Purchase of specialized protective clothing & equipment for	PPE	EEC*, IPP, Research institutions, ERS, EEA	2015-2025	ERS, EEC, EEA, Research	E100,000 (\$8,764)

Goal: Take effective measures to phase out PCB containing equipment by 2025 and make effort to achieve ESM of waste containing PCBs by 2028 as well as phase out transformers older than 25years						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	handling PCB contaminated equipment				institutions, IPP	
To conduct a Socio-economic Assessment of ESM for in use Equipment	Engage a consultant to show the possible PCBs management options by means of socio-economic cost/benefit analysis in order to ensure that implementation of SC will be socially & economically feasible.	Socio-economic impacts report on the ESM of electrical equipment	EEA*			E100,000 (\$8,764)
Total						E31,335,000 (\$2,746,275)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.3 Action Plan: Production, Import and Export, Use, Stockpiles and Wastes of Annex B Chemicals

Parties must take measures to restrict the production or use of Annex B chemicals in light of any applicable acceptable purposes with specific exemptions. These chemicals include DDT and PFOS.

3.3.3.1 Dichlorodiphenyltrichloroethane (DDT)

In Eswatini, the use of DDT is mainly for the vector control of malaria, hence the Ministry of Health through the NMCP, handle all of the DDT imported into the country. The amount of DDT being used year after year seems to drop especially because there is an increase in modern structures sprayed using synthetic pyrethroids rather than DDT.⁷ There is still a concern about the use of DDT as it is persistent and it is used indoor, resulting in the exposure of spray operators and recipient communities. There are also significant DDT releases into the environment due to the cleaning of spray pumps, handling of DDT empty sachets. The NMCP introduced an alternative material to use in the control of disease vectors.

The developed Action Plans include the reduction of the reliance on DDT where by other alternatives are to be promoted. Ways of disposal of DDT containers and unused sachets is also a concern and hence there is a need for Eswatini to design and promote environmentally sound technologies (BAT/BEP) for the disposal of DDT wastes. These objectives and activities are summarised in **Table 3.7**.

Table 3.7: Objectives and activities under the Production, Import and Export, Use, Stockpiles and Wastes of DDT

Goal: To minimize the use, human exposure to and environmental contamination from DDT by the year 2016 with the view of eliminating its use and importation						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To reduce (by 50%) usage of DDT by 2017	Create database on alternative to DDT	Functional data base	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	June 2015-Dec 2015	GoE & Donors	E50,000 (\$4,382)
	Identify, test, select, promote and avail alternatives of DDT.	Alternative pesticides available	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	Jan 2016-June 2016		E1,000,000 (\$87,642)
	To strengthen existing integrated vector management interventions	Workshop reports & increase use of IVM interventions	EEA*, MOA, MOH, pesticides suppliers, industries & UNESWA	June 2016-Dec 2016		E200,000 (\$17,528)
To minimize risks on environment and human health from DDT by 2015	To establish database of all DDT suspected contaminated sites.	Register of DDT contaminated sites.	NMCP*, EEA		GoE & Donors	E150,000 (\$13,146)
	To conduct training workshops for communities and spray operators on the dangers of DDT contamination	Workshop reports by NMCP.	NMCP*, MoH			E100,000 (\$8,764)
	To undertake epidemiological studies on communities and spray operators.	Medical exam reports for spray operators & communities in endemic areas.	NMCP*, EEA			E350,000 (\$30,674)

Goal: To minimize the use, human exposure to and environmental contamination from DDT by the year 2016 with the view of eliminating its use and importation						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	To develop projects to remediate DDT contaminated sites.	Remediated sites accompanied by remediation reports	NMCP*, EEA, NGOs			E2,000,000 (\$175,285)
	To design and promote environmentally sound technologies for the disposal of DDT wastes.	Use of environmentally sound technologies (BAT/BEP) for the disposal of DDT wastes.	NMCP*, EEA			E2,000,000 (\$175,285)
Total						E5,850,000 (\$512,708)

* Lead institution, Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.3.2 Perfluorooctane Sulfonic Acids (PFOS) and PFOS-related substances

The inventory could not find specific uses and quantities of PFOS in Eswatini especially in the prioritised articles, which were synthetic carpets and fire-fighting foam. This may be because the use of PFOS in Eswatini is not regulated and the carpets found around the country did not have specific properties such as water or fat resistance.

For fire-fighting foam, the amounts of PFOS usually used are so small that the manufacturing companies and distributors are not obliged to declare their presence. It was observed though that some of the furniture shops around the country sell a 'stain guard', of which its contents are not known. Investigations still need to be conducted on the contents of this stain guard.

The fact that there is no evidence of PFOS in Eswatini yet, does not mean that action plans cannot be drawn. The country is therefore prepared to conduct research to find out if there are PFOS chemicals and PFOS contaminated articles in Eswatini. There is need to devise a strategy to monitor the import, use, distribution and disposal of suspected articles.

Table 3.8: Objectives and activities under the Production, Import and Export, Use, Stockpiles and Wastes of Annex B Industrial chemicals – PFOS

Goal: Take effective measures to phase out articles containing PBDEs by 2020 and make effort to achieve ESM of their waste.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Conduct research to establish whether there are PFOS contaminated sites and commodities in the country	Raise awareness on PFOS and PFOS contaminated articles through workshops for relevant stakeholders	Workshop reports	EEA*	2015-onwards	EEA	E50,000 (\$4,382)
	Engage and expect on how to measure PFOS in carpets and fire-fighting foam	Report on options to measure PFOS in relevant commodities	EEA*	2015-	UNESWA, EEA, Development partners & the private sector	E150,000 (\$13,146)
	Measure the amount of PFOS in suspected commodities and suspected contaminated sites	Report on PFOS in Eswatini & proposed mechanisms to deal with them	MOE*, MHUD, EEA, Donors	2015 on-going	MOE, Donors, EEA, MHUD	E150,000 (\$13,146)
	Development of BAT/BEP practices for the disposal of PFOS contaminated articles	BAT/BEP manual/guidelines for safe disposal of PFOS contaminated commodities	EEA*, research institutions	2015 on-going	EEA, research institutions	1,000,000 (\$87,642)
Enact regulations to restrict the	Draft a bill or incorporate the restriction of PFOS	Draft Bill	EEA*	2015-2016	EEA, MHUD	E100,000 (\$8,764)

Goal: Take effective measures to phase out articles containing PBDEs by 2020 and make effort to achieve ESM of their waste.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
importation of PFOS contaminated commodities	importation in existing legislation					
Total						E1,450,000 (\$127,080)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

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

Article 5 of the SC stipulates that each Party shall develop an Action Plan within two years of the date of entry into force of this Convention. The plan must, to the extent possible, link-up with any regional plan on the subject as per Article 5 and 7 of the SC as listed in Annex C and to facilitate implementation of sub-paragraphs (b) to (e). The Plan adopted by the country must apply Best Available Techniques (BAT) and Best Environmental Practices (BEP) as required by the Stockholm Convention.

The latest inventory done for the year 2012 reported that the four highest emitters that account for almost 100% of the emissions are the Disposal Group at 44.6 g TEQ/a (60%), Heat and Power Generation Group at 13.2 g TEQ/a (18%), Open Burning Processes Group at 12.1 g TEQ/a (16%) and Waste Incineration Group at 4.5 g TEQ/a (6%).⁹

The challenge for the country is the reduction of emissions from the waste burning, the establishment of proper waste disposal facilities, and encouraging recycling and reduction of waste. Further, the construction and maintenance of proper landfills, incinerators, as well as, the training of staff to efficiently manage these facilities is important.

The Action Plans were therefore focused on the reduction of emissions from burning of waste and establish a monitoring system for UPOPs emissions & their effects on human health and environment as illustrated in **Table 3.9**.

Since there are several groups contributing to this category, the action plans developed try to address each of them. The main goal in this category is to reduce emissions from any of the source groups. For medical waste and boilers, these emissions are encouraged by the fact that the boilers and incinerators are not up to standard hence they need to be upgraded or replaced completely.

Other issues involve open burning which covers burning of domestic waste in households, sugar cane burning and forest fires. These need to be controlled and the public need to be sensitised about their effects to try and minimise them. The objectives are therefore outlined in **Table 3.9**.

Table 3.9: Objectives and activities under the Releases from Unintentional Production of PCDDs/PCDFs, HCB and PCBs

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To create and strengthen public awareness on UPOPs	Stakeholder mapping (identification) e.g. Sugar industry, timber industry, MOH, local governments, EWSC.	Effective participation by all stakeholders & support their own policies	EEA*	March 2016		E100,000 (\$8,764)
	Develop training IEC material and publish it which includes: <ul style="list-style-type: none"> • Burning of biomass • Forest and bushveld fires • Green harvesting • Proper operation & incineration of waste (follow product specification and best practices) • Sludge treatment (waste water effluent) 	Availability of the IEC material. Pamphlets, breakfast shows, posters, flyers brochures, media etc	EEA*, MoH, Sugar millers, EWSC	June 2015	Still to source	E500,000 (\$43,821)
	Conduct awareness raising to the general public,	Political support and buy-in	EEA*	September 2015		E200,000 (\$17,528)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	politicians and decision makers.					
	Conduct the training <ul style="list-style-type: none"> • Politicians, SHERQ officers, 	Commitment – UPOPs policies	EEA*	December 2016		E100,000 (\$8,764)
Develop medical waste disposal and heating facilities in line with BAT/BEP	Engage an expert to evaluate the efficiency of existing incinerators & boilers	Report on effectiveness of available incinerators	MoH*, EEA, MoPS & development partners	Dec 2015		E100,000 (\$8,764)
	Upgrading the existing incinerators to achieve the required temperatures and install temperature control gauges	Upgraded incinerators	MoH*, MoF, EEA, MHUD & development partners	Dec 2017		E500,000 (\$43,821)
	Install Air Pollution Control Systems (APCS) with easy to read gauges in all incinerators	Installed APCS	MoH*, EEA, MoF, MoCIT & development partners	Dec 2016		E500,000 (\$43,821)
	Engage a consultant identify proper disposal practices for used and contaminated APCS	Report on disposal options for APCS	MoH*, MoF, EEA, MHUD, UNESWA & development partners	Dec 2017		E100,000 (\$8,764)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Train incinerators & boiler operators on how to operate upgraded incinerators & boilers	workshop reports	MoH*, MoF, EEA, MoPS, MHUD, MTEA, MoLSS, private sector & development partners	Dec 2015		E100,000 (\$8,764)
	Construct Centralized incinerators in health centres for use by clinics and other relevant institutions	Constructed centralised incinerators	MoH*, MoF, EEA, MHUD & development partners	Dec 2016		E10,000,000 (\$876,424)
	Identify and pilot other environmentally friendly options besides incineration for the treatment and disposal of medical waste e.g. sterilization of some medical waste	Report on other options for medical waste treatment	MoH*, EEA, MHUD, MoF & development partners	Dec 2018		2,000,000 (\$175,285)
Participate in the review of the national waste management strategy with the	Develop guidelines for best practices in waste (sewage, domestic, cleaner production) management	Guidelines available	EEA*	December 2016		E350,000 (\$30,675)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
objective of incorporating UPOPs.	Prohibit the importation of certain packaging materials					
Develop environmentally sound management systems for UPOPs.	Engage a consultant to develop guidelines for the environmentally sound management of UPOPs which will incorporate: <ul style="list-style-type: none"> • Maintaining firebreaks • Strengthen forest guides • Promote eco-friendly alternative technologies. • Promote green harvesting of cane through research and learning from other countries • Strengthen the implementation of rural electrification project to scale down on the use of 	Consultant's report	EEA*, MNRE, EEC, Sugar industry	December 2016		E500,000 (\$43,821)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	firewood by rural poor communities.					
	Training of rural households on fuel efficient stoves, POPs management and other environmental issues	Workshop reports	MNRE*, EEA, private sector, community leader	Dec 2015		E200,000 (\$17,528)
	Conduct fire prevention campaigns	Records of campaigns conducted	EEA*, MoPWT, MoA, National fire & emergency services, MTEA, private sector, forest plantation managers	2017		E200,000 (\$17,528)
Develop and implement national UPOPs projects which are in line with	Development of proper waste management facilities where feasible; landfills	Proper waste disposal facilities even in rural areas	EEA*, MoHUD, Tinkhundla	December 2017	GoE & Donors	E5,000,000 (\$438,212)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
regional and international projects, as well as, international best practice.	Conduct workshops to strengthen backyard composting and recycling	Workshop reports				
To reduce emissions from open burning	Adopt and implement UNIDO projects relating to emissions from open burning	Project report	EEA*	December 2015		E1,000,000 (\$87,642)
	Promote green cane harvesting	Use of green cane harvesting	EEA*, SSA, MoA, private sector	2018		E100,000 (\$8,764)
	Promote the use of fuel efficient stoves, POPs management & other environmental issues	Workshop reports	EEA*, Tinkhundla	2018		E100,000 (\$8,764)
	Accelerate the promulgation of the plastic regulations	Gazetted plastic regulations	EEA*, MoCIT, private sector, households & development partners	Dec 2015		E100,000 (\$8,764)
To reduce emissions originating from landfills, waste	Promote the harvesting of combustible gases for electricity generation & installation of APCS	On-going projects on gas harvesting	MHUD*, EEC & EEA	Dec 2017	GoS & Donors	E3,000,000 (\$262,927)

Goal: To establish a national programme to minimize and ultimately eliminate the release of PCDD/PCDF by 2018.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
dumps & mixed wastes						
To establish a monitoring system for UPOPs emission and their effects on human health and environment	Design and implement projects for the adaptation of the UNEP standardized toolkit for emissions monitoring in conformity with the realities of Eswatini.	M&E system on UPOPs emissions	EEA*	December 2016	GoS & Donors	E200,000 (\$17,528)
	Establish standards for the importation of cars with less emissions	Standards on importation of cars	EEA*, ERS, SWASA			E200,000 (\$17,528)
	Update the dioxins and furans inventory, regularly.	Up to date inventory of UPOPs	EEA*	2018		E100,000 (\$8,764)
	Develop reporting framework of UPOPs.	Guidelines available	EEA*	2018		E100,000 (\$8,764)
Total						E 25,350,000 (\$2,221,729)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.5 Action Plan: Public Awareness, Information and Training

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

The national inventories done for the year 2012 revealed that the POPs issues are still not well understood by many people in Eswatini. As such, law makers, farmers, decision makers, professionals and the public lack awareness, information and training regarding the nature of these toxic and persistent substances. The release sources, various uses and their health and environmental impacts are unknown. Also, the country does not have applicable knowledge on the availability, affordability and environmentally friendly alternatives. A few people were found to have some understanding of POPs, especially personnel working in companies which have ISO standards to meet or other international standards.

Eswatini intends to meet her obligation under Article 10 regarding POPs and also pave the way for the development of an operational national strategy for communication and training in the field of chemical safety, and in accordance with the SAICM recommendations by building the capacity in key target groups on control of POPs, information dissemination and publicizing the Stockholm Convention to all stakeholders.

In order to implement this Action Plan, some of the activities to be undertaken includes the objectives and activities listed in **Table 3.10**. The objectives of awareness raising are also alluded to in some of the thematic areas.

Table 3.10: Objectives and activities for Public Awareness, Information and Training

Goal: To develop & start implementing a strategy for information education and communication (IEC) on POPs, which will serve as the foundation of a national programme for communication and training in the field of chemical safety						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To build capacity in key target groups on effects of POPs and information dissemination	Identify organizations to carry out IEC programs and train them on effects of POPs and dissemination of information.	List of agencies, Training workshop reports	EEA*	By June 2015		E50,000 (\$4,382)
	Convene a meeting of the thematic group to organize the IEC process.	Minutes of meeting of thematic groups	EEA*	Sep 2015		E50,000 (\$4,382)
	Engage a consultant to identify sources and compile information on POPs into a database.	Compendium or Information Database on POPs	EEA*	Jan 2016- June 2016		E200,000 (\$17,528)
	Identify and train the various target groups on POPs and their alternatives.	List of all target groups and reports	NGOs*, EEA	June 2016- Dec 2016		E500,000 (\$43,821)
	Establish link between formal learning institutions and EEA	Copies of MOUs and revised curricula	EEA*, UNESWA	By Dec 2016		E100,000 (\$8,764)
To Publicize the Stockholm	Recruit national consultants to simplify	A Siswati and Braille version of the	EEA*	By Dec 2016		E200,000 (\$17,528)

Goal: To develop & start implementing a strategy for information education and communication (IEC) on POPs, which will serve as the foundation of a national programme for communication and training in the field of chemical safety						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Convention to all stakeholders	the Stockholm Convention and translate into SiSwati and Braille.	simplified Stockholm Convention.				
	Develop and distribute booklets, brochures, ICT based training materials on POPs.	A number of booklets, brochures, ICT-based training materials readily available	NGO*, EEA	From June 2016 continuous		E2,000,000 (\$175,284)
	Enhance research, information gathering and dissemination on POPs and available alternative technologies.	Reports	EEA*, UNESWA	By 2017		E1,000,000 (\$87,642)
	Develop and implement training programs for key target groups in the field of information dissemination.	List of trained group in information dissemination.	EEA*, Media houses	By Dec 2016		E1,000,000 (\$87,642)
	Strengthen collaboration with the media with regard to information dissemination on POPs.	MOUs between media and EEA on information dissemination	EEA*, Media houses	By Dec 2016		E200,000 (\$17,528)
	Develop & implement communication and awareness projects on	Number of communications projects on POPs	EEA*, NGO	By June 2017		E200,000 (\$17,528)

Goal: To develop & start implementing a strategy for information education and communication (IEC) on POPs, which will serve as the foundation of a national programme for communication and training in the field of chemical safety						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	POPs with the NGO community.					
	Mainstream and articulate POPs issues within the Climate Change Programmes.	Revised Climate Change programmes with focus on POPs	National Climate Change Project Focal Point*, EEA	By Dec 2016		E200,000 (\$17,528)
	Engage a consultant to develop a POPs communication strategy.	Consultant's report.	EEA/NGOs*	By Dec 2016		E150,000 (\$13,146)
	Collaborate with the National Curriculum Centre in order to incorporate POPs issues in school curriculum.	POPs inclusion in school curricula	EEA*, National Curriculum Centre, UNESWA	By 2017		E100,000 (\$8,764)
Total						E5,950,000 (\$521,147)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.6 Action Plan: Participation in the International Activities and Programmes in the field of POPs.

Eswatini is Party to the SC, and by virtue of article 8, 15 and 16, she is expected to participate in the national, regional and international programmes in the field of POPs and in Conference of the Parties (COP). The country is already participating in the COP even in the absence of the NIP. With the completion of the NIP, there will be need for capacity building in terms of meeting reporting and COP meeting requirements to enable the country to gain maximum benefit from the Convention.

This Action Plan seeks to build the capacity of the EEA and key stakeholders dealing with chemicals to effectively participate and contribute to the SC activities and the NIP implementation.

Table 3.11: Objectives and activities for Participation in the International Activities and Programmes in the field of POPs

Goal: To strengthen the country's participation in the SC programme						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To build capacity of EEA staff to effectively participate and contribute to the SC activities and NIP implementation	Seek national budgetary allocation to maintain, train and strengthen the NCC for the implementation of the NIP.	Reports on training programs. Financial reports	EEA* & NCC members	Yearly		E500,000 (\$43,821)
	Prepare NIP Implementation reports.	EEA Reports to SC Secretariat	EEA*	Yearly		E450,000 (\$39,439)
	Disseminate new developments on POPs and COP decisions	POPs briefing newsletter, newspaper articles	EEA*, media	Yearly		E150,000 (\$13,146)
	Participation of at least 3 key actors in POPs at regional and international meetings each year.	Conference reports	EEA*	As and when required		E400,000 (\$35,057)
	Carry out POPs surveys.	Survey reports	EEA*	Biannually		E500,000 (\$43,821)
	Participate in the work of the POPRC.	EEA reports	EEA*	As and when required		E60,000 (\$5,259)

	Participate in the Convention's effectiveness evaluation as per article 16.	Convention's Evaluation reports	EEA*	As and when required		E100,000 (\$8,764)
	Follow up on the implementation of the objectives, activities as well as timelines set out in the NIP	Effective NIP implementation	EEA*	Yearly		E200,000 (\$17,528)
Total						E2,360,000 (\$206,835)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.7 Action Plan: Reporting, Monitoring and Evaluation

This Action Plan is, in part, in line with other activities at the international level under new POPs identification and Global Monitoring Plan. However, article 16 of the SC stipulates that four years after NIP implementation at country level, there should be regular reporting and proper evaluation of the status of the POPs. Article 11 and 15 then articulates requirements for monitoring POPs and reporting mechanisms to the COP on measures that have been taken by Parties to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention.

The inventories undertaken by Eswatini revealed that the main POPs of concern were PCBs, DDT, Dioxins and Furans. POPs pesticides were on the main, purely obsolete stocks. Eswatini uses DDT for vector control and in terms of the SC she is required to provide to the Secretariat statistical data on total quantities imported, conditions and relevance to the Malaria disease management strategy. The reporting format is decided by the COP in consultation with the WHO. Concerning dioxins and furans, there is generally lack of monitoring capacity, lack of standards and guidelines for monitoring, limited institutional capacity in terms of specialised skills, equipment and financial resources for carrying out the monitoring function.

Table 3.12: Objectives and activities for Reporting, Monitoring and Evaluation

Goal: To build capacity for monitoring, evaluation and reporting on POPs information at international, regional, sub regional and national levels.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To fulfil the reporting requirements of the Stockholm Convention	Develop and implement standards for monitoring and evaluation.	Monitoring and evaluation reports	EEA*	By Dec 2016		E100,000 (\$8,764)
	Create partnerships among key actors involved in POPs monitoring.	MOUs and monitoring and evaluation reports	EEA* & NGOs	By June 2016		E400,000 (\$35,057)
	Evaluate effectiveness of mitigation measures taken by actors against hazardous effects of dioxins and furans	Evaluation reports	EEA*, industry	Yearly		E200,000 (\$17,528)
	Strengthen linkages between POPs organizations at national, regional & international levels	SC Secretariat reports, linkages established	EEA*, POPs related organizations			E250,000 (\$21,901)
To strengthen institutional capacities for reporting on the	Set up a national coordination modality for reporting on POPs information.	Electronic retrieval of reports, Coordination reports	EEA*	By 2017		E200,000 (\$17,528)

Goal: To build capacity for monitoring, evaluation and reporting on POPs information at international, regional, sub regional and national levels.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Stockholm Convention from 2014	Develop projects to strengthen information exchange mechanisms.	Project reports	NGO*, EEA	By 2017		E100,000 (\$8,764)
	Carry out capacity needs assessment to identify reporting limitations by stakeholders	Needs assessment reports	EEA*	By 2017		E80,000 (\$7,011)
	Identifying financial constraints and financial solutions about reporting to the SC secretariat.	Gap analysis report on reporting limitations	EEA*	By 2017		E60,000 (\$5,259)
	Create a POPs information system (database) to make it easy for actors to report periodically on emission rates, imports and disposal.	Stakeholder reports, policy developed	EEA*	By 2018		E250,000 (\$21,911)
	Create and update focal point website to incorporate POPs information.	EEA website with link to POPs website	EEA*, SC Secretariat	By Dec 2015		E160,000 (\$14,022)
	Develop reporting guidelines for local	Guidelines document	EEA*	By Dec 2016		E100,000 (\$8,764)

Goal: To build capacity for monitoring, evaluation and reporting on POPs information at international, regional, sub regional and national levels.						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	stakeholders to EEA POPs office.					
	Systematic reporting of adopted measures taken by actors against hazardous effects of dioxins and furans.	Hazardous waste reports	EEA*			E100,000 (\$8,764)
	Implement voluntary and regulatory systems for reporting on POPs information.	Mandatory and non-mandatory reports on POPs, COP reports.	EEA*, POPs stakeholders	By Dec 2016		E70,000 (\$6,135)
Total						E2,070,000 (\$181,408)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.8 Strategy: Research and Development

As a Party to the SC, Eswatini is bound by article 11, paragraph 1 to participate, within her capabilities, in research & development activities related to POPs namely to develop safer alternatives to POPs. Eswatini also has the obligation to participate in the implementation of Article 16 for the assessment of the effectiveness of the convention through the Global Monitoring Plan (GMP) activities.

The POPs inventories conducted in 2009, as part of developing the NIP, identified significant deficiencies and gaps for the sound and safe management of the few POPs found. As an example, the country does not have a reference laboratory to test POPs in the various environmental matrices. The analytical capabilities in terms of personnel, skills, infrastructure, equipment and materials are limited and costly. However, the limitations can be improved with national, regional, and international technical and financial assistance.

In order to holistically address these problems, there is a need to identify and suitably equip (technical and human resource infrastructure) a technical laboratory of national interest and have it accredited to conduct analysis and research on POPs and other persistent toxic substances.

Table 3.13: Objectives and activities for Research and Development

Goal: To build technical capacity on POPs analysis and undertake research on POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To encourage and undertake appropriate research & development on POPs & their alternatives	Identify and equip one technical laboratory to conduct analysis and research on POPs and have it accredited.	Procurement of equipment, signed MOU, and Inter laboratory liaison	EEA*, UNESWA, EWSC, NWA, MoH	By 2018	GoE & Donors	E15,000,000 (\$1,314,636)
	Develop Memorandum of Understanding (MOUs) and Public Private Partnerships (PPP) for research and development with partner industries	Signed MOUs to undertake joint research work	EEA*, UNESWA, industries and funding agencies	By 2017		E350,000 (\$30,675)
	Develop research proposals and commission research projects on various POPs themes.	Approved Research proposals, published articles from the research undertaken Membership certificates	EEA/UNESWA*, funding agencies	By 2018		E400,000 (\$35,057)
	Establish and promote networks with national, regional, international institutions and organizations on POPs issues.	Reports from EEA	EEA*, POPs agencies	By 2017		E80,000 (\$7,011)

Goal: To build technical capacity on POPs analysis and undertake research on POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	Undertake technical training of staff to conduct POPs sampling and tests, using various techniques.	Skills Training reports, EEA reports	EEA*, UNESWA, EWSC and MOH Mbabane Government Hospital	By 2017		E800,000 (\$70,114)
	Provide training on the methodology of risk assessment for contaminated sites.	Contaminated sites risk assessment reports.	EEA*, UNESWA	By 2019		E600,000 (\$52,585)
	Domesticate international analytical procedures and methods for POPs.	Documented analytical procedures manual on POPs.	EEA*, UNESWA, EWSC, Malkerns research laboratory & Mbabane Government referral Hospital			E800,000 (\$70,114)
	Disseminate research findings to the public.	Research reports and dissemination of research findings workshop reports	UNESWA*, EEA, industry, stakeholders	As soon as research findings are documented		GoE & Donors
Total						E18,130,000 (\$1,588,956)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.9 Strategy: Socio-economic and Gender Analysis

Eswatini is characterised by pervasive poverty and wide disparities in the distribution of wealth with a low proportion of the population (about 10%) controlling a large proportion of the wealth. The country's economy is mainly agro based where exports form the basis of the economy. The manufacturing sector also remain an important section in Eswatini.¹² About 70% of people are employed in agriculture while 69% are still living below the poverty line of E128.60 per month (US\$ 22).²³ This is because the economic background is characterised by increasing poverty and economic stagnation. This is exacerbated by the fact that HIV/AIDs affects a considerable proportion of the Swazi Population.

The agricultural industry is a major user of pesticides which are imported into the country. Agricultural companies mainly employ male workers to work in their farms while small farmers and domestic farming is mainly in the hands of women. The advantage of working in big companies such as the sugar industry is that the companies export their products to the international market such as Europe. The exporters therefore have to comply with international standards where the use of toxic and persistent pesticides is restricted. This therefore implies that workers in these companies may be safe from the exposure to POPs. The same cannot be said for small farmers who grow crops for the local market. In these cases, there are no set standards to comply with, hence farmers can use any pesticide they wish to use since pesticides are not sufficiently regulated in Eswatini.

Other POPs like PBDEs are found in articles in the possession of companies and households to different extent, exposing all sectors of the population. The issue of POPs therefore has a huge bearing on exposure which can happen at the work place as well as at home. The other challenge is that the disposal of these articles is not regulated and it is done in a non-environmentally sound manner, exposing both humans and the environment to these persistent and toxic PBDEs.

The subject of chemicals, including POPs is therefore a very sensitive issue in the world today. As much as there are several people who may understand what POPs are, this subject goes deeper than that. This is because men and women respond differently to these chemicals because of their physiological differences. POPs therefore need to be addressed in such a way that men and women are catered for when managing them and their impacts. Different socio-economic groups which have different vulnerabilities to POPs, hence these groups have to be catered for when making action plans to deal with POPs.

Socio-economic and gender issues are cross cutting, they cannot be implemented as stand-alone strategies, and hence they should be mainstreamed in the other

thematic areas. **Table 3.14** illustrates the objectives and activities to be considered when dealing with socio-economic and gender activities.

Table 3.14: Objectives and activities for Socio-economic and Gender Analysis

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Create and strengthen public awareness on POPs in the country	<p>Develop IEC material for all target groups that is gender responsive and address issues of socio-economic development by a team of experts under the guidance of the coordinator. The IEC material should appeal to all socio-economic sectors of society & gender groupings (civic and formal education)</p> <p>Information packaging to reach all targeted groups and social networks using online, electronic & social and traditional media.</p> <p>Information presented in a language that the targeted population</p>	IEC materials that are gender responsive & cover socio-economic issues in all official languages of Eswatini	EEA*, NCC, PPCU, ICT, Tinkhundla, FSE & CC, GFIU, ENYC, urban local GoE, Industry Private Sector & unions.	By June 2016	GoE & Donors	E500,000 (\$43,821)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	understands i.e. English, SiSwati and Sign Language					
	Conduct awareness raising campaigns for the general public & key affected populations	Informed & empowered communities on issues of POPs management				E200,000 (\$17,528)
	Formal Children & Youth Debates and Competitions, Essay Writing Teachers' colleges In-service training for <ul style="list-style-type: none"> Women groups-community level – lutsango, imbali, women working in industry e.g. textiles, women in communities especially malaria 					

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	<p>affected communities</p> <ul style="list-style-type: none"> • Men- Emphasis on work place related exposure to POPs and household related POPs • Business Community- Training them on alternatives 					
Develop & strengthen the capacity of ERS and other personnel at points of entry to support in the management of POPs in the country	Establish a data collection tool for ERS to capture the import of POPs contaminated & potentially contaminated commodities	Capacity development Framework	EEA*, ERS, USDF, RSP & immigration	2015 July	GoE & Donors	E1,000,000 (\$87,642)
	Conduct stakeholder workshops to develop the appropriate data collection in line with gender requirements Convene a stakeholder meeting to validate the					E100,000 (\$8,764)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	draft Chemicals Management bill.					
	Promulgate Chemical Management Bill.					E100,000 (\$8,764)
	Publicize the Chemical Management Bill					E100,000 (\$8,764)
	Review relevant legislation to incorporate reporting obligations to the SC. Display of IEC materials & brochures					E150,000 (\$13,146)
Develop Environmentally sound management systems for POPs	Develop environmentally sound systems for managing each of the POPs' transportation, storage & disposal taking into cognisance of gender and age groups	Environmentally sound systems programs & plans.	EEA*, SWASA, EEC, MHUD, MOH, NMCP & MOF	2015 July	GoE & Donors	E1,000,000 (\$87,642)
	Encourage SWASA to facilitate the development of ISO standards which promote environmentally safe activities & responsive to gender					E80,000 (\$7,011)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Develop waste disposal sites in line with BAT/BEP by finalising negotiations for the selected sites & constructing the necessary infrastructure	Site selection, development of infrastructure & training of human resource to operate the facilities	Availability of a properly designed disposal site.	EEA*, Community leadership, private sector & municipalities	2015	GoE & Donors	E5,000,000 (\$438,212)
	Training of users, suppliers & communities about the disposal sites for all POPs contaminated & potentially contaminated materials.	Workshop reports				E100,000 (\$8,764)
	Train informal waste management stakeholders (recyclers)	Workshop reports				E100,000 (\$8,764)
	Monitor the impacts (harmful effects) of the sites' on environment & human health in line with gender, age groups and socio economic status	Project reports				E200,000 (\$17,528)
5. Review of national waste management	Organize meetings for stakeholders to review the strategy in line with Gender mainstreaming &	Reviewed strategy	EEA*, MHUD, MOH, MTEA, private sector	2015 December	GoE & Donors	E100,000 (\$8,764)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
strategy to incorporate POPs	socio-economic development					
	Develop the strategic implementation plan & conduct regular monitoring & evaluation of the implementation of this strategy					E500,000 (\$43,821)
Identify and rehabilitate POPs contaminated sites including effects on victims	Engage experts to evaluate POPs levels at contaminated & potentially contaminated sites. Identify victims & mitigate pollution.	Compilation & identification of the contaminated sites	EEA*, MOA, UNESWA	2017 December	GoE & Donor Funds	E400,000 (\$35,057)
	Identification of the types of POPs in the contaminated or potentially contaminated sites responsive to key affected population groups.					E250,000 (\$21,911)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Develop and implement national POPs program with projects which are in line with regional & international projects	Encourage EEA and other stakeholders to participate in regional and international meetings and events to learn and share BAT/BEP. Encourage gender balance in attendance of such meetings.	Pops Program developed with gender and socio-economic aspect	EEA*, MOH, MOA, NMCP, UNESWA, MOF & various government ministries & agencies (including farmers & private sector)	2016 July	GoE & Donor Funds	E60,000 (\$5,259)
	Organize international meetings to share experiences (among participating countries) on gender mainstreaming and socio economic development practices					E500,000 (\$43,821)
Strengthen skills & management practices at suspected contaminated sites	Assess the availability of skills among men & women and different socio-economic groups to manage, repackage and label obsolete POPs pesticides	Training program relevant to the needs of the socio - economic groups	EEA*, MOLSS, UNESWA, SWASA, MoA & NMCP	2016 December	GoE & Donor Funds	E100,000 (\$8,764)

Goal: To mainstream POPs and gender issues in socio economic activities related to the management of POPs						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
Facilitate the delegation of activities & shared responsibilities among government & development partners for the implementation of the SC	Development of project proposal for resource mobilization covering gender & socio-economic issues	Project proposals developed with relevant gender and socio-economic aspect	EEA*, MHUD, Gender Unit, MoA, UNESWA & NMCP	2015 December & on-going	GoE & Donor Funds	E150,000 (\$13,146)
	Conduct research on the impact of POPs on men & women & other socio-economic groups					E250,000 (\$21,911)
Total						E10,940,000 (\$958,804)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.3.10 Strategy: Technical and Financial Assistance

This strategy is based on the provisions of articles 12, 13 and 14 of the Stockholm Convention that deal with the technical assistance and financial resources and mechanisms needed to achieve the objectives of the Convention. The inventory on POPs noted that there was need for support from GoE and the International Community for national capacity strengthening and funding to implement the NIP. The GoE is committed to avail resources to the extent possible to kick start the process. However, it is necessary to obtain additional resources from national private sector entities, bilateral donors and the Convention's financial mechanism to ensure successful implementation of the NIP. The objectives and activities for this thematic area are therefore shown in **Table 3.15**.

Table 3.15: Objectives and activities for Technical and Financial Assistance

Goal: To mobilise sufficient national and international technical and financial resources to support compliance with the obligations under the Stockholm Convention and NIP implementation						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
To procure national and international technical and financial assistance for the organizational strengthening of agencies responsible with implementing the Stockholm Convention and its NIP	Request government resources to kick-start the NIP implementation.	Government Budget allocation to the POPs programme	MTEA*, EEA	By June 2015	Donors	E1,000,000 (\$87,642)
	Explore means and modalities for obtaining technical and financial assistance from developed countries and international cooperation agencies	Procedures manual on technical and financial assistance on POPs issues	SC Secretariat*, EEA	June 2015 on-going		E80,000 (\$7,011)
	Engage consultants to develop project proposals to address national priorities on POPs and strengthen national institutions.	EEA POPs project reports, List of project proposals sent for funding, EEA reports, ToRs, contracts, work reports, written, reviewed and approved proposals	EEA*	By Dec 2016		E500,000 (\$43,821)
	Identify and create a list of Governments, Non-Governmental Organizations (NGOs), and International Cooperation Agencies	List of ICAs and other local regional partner organizations, ICAs database and signed MOUs, signed agreements	GoE*, ICAs & industries.	By Dec 2015		E70,000 (\$6,135)

Goal: To mobilise sufficient national and international technical and financial resources to support compliance with the obligations under the Stockholm Convention and NIP implementation						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	(ICAs) that can cooperate in the implementation of the NIP via prioritized project proposals.					
	Encourage investment and contribution into POPs activities through resources and budget by national institutions (public, private and mixed)	National and POPs programme Budget	EEA*, ICAs, GoE.			E300,000 (\$26,293)
	Dispatch prioritized project proposals to regional, bilateral and/or multilateral agencies	Number of Regional, multilateral and/or bilateral agencies briefing notes	EEA*, NCC.		Donors	E250,000 (\$21,911)
	Visit ICAs to establish areas of cooperation and obtain feedback on submitted project proposals.	dates of visits, minutes from meetings with ICAs	EEA* & stakeholder agencies			E250,000 (\$21,911)
	Submit implementation reports for the financed projects and/or activities, and establish working	completed technical and financial reports	EEA*, MoA, other Stakeholders			E60,000 (\$5,259)

Goal: To mobilise sufficient national and international technical and financial resources to support compliance with the obligations under the Stockholm Convention and NIP implementation						
Objectives	Activities	Indicators/Expected outcomes	Responsible Institutions/ relevant stakeholders	Timeline From - To	Source of financing	Costs
	relationships with the ICAs.					
Total						E2,510,000 (\$219,983)

* Lead institution

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.4 Development and capacity-building proposals and priorities

Infrastructure and human resource development form the core of capacity requirements in Eswatini. These capacity building requirements have been addressed in previous action plans. Top on the list of infrastructure requirements is the need for laboratory capacity to undertake complex analyses such as PCDDs/PCDFs, PCBs, PBDEs, PFOS, POPs pesticides and DDT. This is followed by capacity to manage hazardous and domestic waste including construction of landfills. A modern hazardous waste facility and temporal storage sites for PCBs equipment needs to be constructed including the disposal of obsolete pesticides and hazardous waste. From the human resources point of view, stakeholders require training ranging from POPs monitoring, research, and analysis. One salient proposal is to include issues of POPs in school curricula and in institutions of higher learning. Training should also be conducted for SWASA to develop the appropriate standards and ERS officers based at the points of entry into the country to identify and curb the influx of POPs.

The following represents priorities to be followed by the country in the course of NIP implementation:

- Development of a national policy for chemicals management in line with SAICM
- Strengthening of the legal, regulatory and institutional framework
- Management of PCBs and introducing a phase out programme
- Management of PBDE contaminated articles and development of proper disposal facilities
- Identification and management of contaminated sites
- Mitigation of UPOPs releases from waste
- Introduction of BAT/BEP in industries
- Environmental education programmes
- Introduction of the concept of cleaner waste management in the national waste management system
- Making sure that all the strategies set address socio-economic and gender issues.

3.5 Resource Requirements

Potential sources of support for funding the implementation of the NIP were identified to be the GoE, UNIDO, UNEP, GEF, and relevant local private institutions, national and international cooperating partners. This basically includes GoE, local institutions/industry and international donors. It is envisaged that about a third of the total budget will be covered by GoE and its agencies, and private institutions and

the remaining amount will be sourced from external bilateral and multilateral institutions. Resources required for the implementation will include expert human resources, information, equipment, finances and infrastructural developments. **Table 3.16** shows potential contributions from national and external sources to fund the action plans where the total estimated amount for the implementation of the NIP is E113,821,000 (\$9,975,548).

Table 3.16: Estimated Contributions for Action Plans

N ^o	Action Plan	Estimated Cost	National Contribution (%)		External Funding Needed (%)
			GoE	Private Sector	
01	Strengthening of Institutional, Policy and Regulatory Frameworks	E710,000 (\$62,227)	30	-	70
02	Import and Export, Use, Stockpiles and Wastes of Annex A Pesticides POPs	E3,530,000 (\$309,377)	10		90
03	Import and Export, Use, Identification, Labelling, Removal, Storage and Disposal of PCBs, PBDEs & Equipment Containing PCBs & PBDEs (Annex A, Part II Chemicals)	E35,135,000 (\$3,079,784)	10	30	60
04	Import and Export, Use, Stockpiles and Wastes of DDT (Annex B Chemicals)	E5,850,000 (\$512,707)	10		90
05	Import and Export, Use, Stockpiles and Wastes of PFOS (Annex B Industrial chemicals)	E1,450,000 (\$127,080)	10		90
06	Unintentional Production of PCDDs/PCDFs, HCB and PCBs	E25,250,000 (\$2,221,729)	10	20	70
07	Public Awareness, Information and Training	E5,950,000 (\$521,147)	30		70
08	Participation in International Activities and Programmes in the field of POPs.	E2,360,000 (\$206,835)	20		80
09	Reporting, Monitoring and effectiveness Evaluation of the Convention	E2,070,000 (\$181,408)	10		90
10	Research and Development	E18,130,000 (\$1,588,956)	5		95
11	Socio-economic & gender analysis	E10,940,000 (\$958,804)	20		80

1	Technical and Financial	E2,510,000	0		100
2	Assistance	(\$219,983)			
Total NIP estimation		E114,121,000			
		(\$10,002,310)			

Dollar to Lilangeni rate at \$1 = E11:41 (at January 2015)

3.6 Progress from previous NIP

The Kingdom of Eswatini acceded to the SC on 13th January, 2006 and submitted its first NIP in 2009. During that time, the SC only had 12 POPs listed, referred to as the dirty dozen. In that NIP, objectives and activities were set out in order for Eswatini to meet its obligations to the SC. The total budget for that NIP was estimated to be US\$49 017 313.07, which shows that implementing the NIP is a very costly exercise, especially for a small country like Eswatini which has been facing financial difficulties in the past five years which started during the economic meltdown that hit the whole world.

Due to the financial difficulties experienced, most of the activities could not be done as some of them needed funding from the GoE. Another reason that may have caused the poor implementation of the previous NIP was that the post NIP activities step was not done, hence there were no specific projects set out to implement the NIP. It is therefore recommended that the post NIP activities be detailed out for this NIP in order to try and address some of the POPs issues in Eswatini. Nonetheless, some milestones were covered in some cases like for PCBs and obsolete pesticides.

3.6.1 Polychlorinated Biphenyls (PCBs)

PCBs are mainly used in electrical equipment such as transformers. Since the first NIP, Eswatini Electricity Company (EEC) has managed to identify and label all PCB contaminated power transformers. This may be because the company also has to comply with international and regional standards. In cases where there is need to replace the oil in a transformer, all new oil is PCB free. Most distribution transformers are PCB free as these transformers use mineral oil which is PCB free. This is because the life span of these transformers is very short and hence all transformers used to replace faulty ones have PCB free oil.

Power transformers, on the other hand, have a very long-life span and some of those in the country were commissioned as early as the year 1968. The company is determined to replace all PCB contaminated oil with PCB free oil as soon as economically feasible.

A phase out plan for the power transformers owned by EEC is shown in **Table 3.17** which shows that there are already 22 transformers that are already not in use. The disposal and replacement of these transformers puts great pressure on EEC and the country as the cost of power transformers is very high. Thus, there is need to source external funding in order to replace these and comply to the SC.

Table 3.17: Summary of the phasing out plan for EEC transformers

Year of manufacture	Oldest transformer	Number of transformers to be phased out
2012	1982 & earlier	22
2013	1983	2
2015	1985	1
2018	1988	3
2019	1989	1
2020	1990	1
2021	1991	4
2022	1992	3
2025	1995	1

3.6.2 Pesticides

During the 2009 inventory, there was a huge stock of obsolete pesticides stores at KaLanga. These pesticides were collected from around the country for shipment to Germany for proper disposal through a Basel Convention project. These pesticides had stayed in that site for over five years while trying to finalise the protocol of transporting these hazardous chemicals. Fortunately all the obsolete pesticides at KaLanga were repackaged properly and eventually shipped to Germany for disposal.

For DDT, the MoH had observed a decline in the amount of DDT being used. This has been attributed to the fact that people in rural areas as well as those malaria prone areas are continually building modern structures that are no longer compatible with the use of DDT, hence more synthetic pyrethroid pesticides are used instead of DDT. This does not mean that the use of DDT has been stopped but the quantities are getting lower every year.

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