REPUBLIC OF MOZAMBIQUE

NATIONAL IMPLEMENTATION PLAN II (NIP II) FOR THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPs)

Reviewed

Final Version

MINISTRY OF LAND, ENVIRONMENT AND RURAL DEVELOPMENT

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The successful compilation of the National Implementation Plan-II (NIP-II) for the Stockholm Convention on Persistent Organic Pollutants (POPs) is a reflection of hard work, co-operation and support by many individuals and institutions that deserve a vote of thanks. The Project was coordinated by the National Directorate of Environment, who served as the National Coordinating Institution.

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Last but not least we are thankful to all stakeholders and Technical Committee Members, who in one way or the other, contributed in this very important process of updating the National Implementation Plan (NIP) for the Stockholm Convention on

Persistent Organic Pollutants in Mozambique.

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Permanent Secretary

Ministry of Land, Environment and Rural Development (MITADER)

ÍNDICE

LIST OF ABBREVIATIONS

ASR	Rapid Social Evaluation
BATs	Best Available Techniques
BEPs	Best Available Practices
BRS	Basel, Rotterdam and Stockholm
CBO	Community Based Organizations
CDN	National Steering committee
CIGQ	Intersectoral Commission for Chemicals Management
COP	Conference of the Parties
CRT	Cathode Ray Tubes
CTN	National technical Committee
EDM	Electricity Supplier of Mozambique
EEE	Electrical and electronic equipment
HCB	Cahora Bassa Hydro-Electric Dam
KAP	Knowledge, Attitude and Practices
MAE	Multilateral Environmental Agreements
MASA	Ministry of Agriculture and Food Security
MCTESTP	Ministry of Science and Technology, High Education and technical professional
MINT	Ministry of Home affairs
MIREME	Ministry of Mineral Resources and Energy
MISAU	Ministry of Health

MITADER	Ministry of Land, Environment and Rural Development
MITRASS	Ministry Of Labor and social affairs
MTC	Ministry of Transports and Comunications
NPAICM	National Profile and Assessment of infrastructure of Chemical Management
ONGs	Non-Governmental Organizations
PCDD	Polychlorinated dibenzo-para-dioxins
PCDF	Polychlorinated dibenzofurans
PNA	National Environment Policy
POPs	Persistent Organic Pollutants
SAICM	Strategic Approach for International Chemical Management
SC	Stockholm Convention
UNCED	United Nations Conference on Environment and Development
UNEP/ PNUMA	United Nations Environmental Program
UNIDO	United Nations Industrial Development

LIST OF TABLES

LIST OF FIGURES

PREFACE

Persistent Organic Pollutants (POPs) present unique challenge as they persist in the environment, bio-accumulate in fat tissues of living organisms and cause adverse effects to human health and the environment.

The Stockholm Convention on POPs (SC) was adopted at a Conference of Plenipotentiaries (COP) on 22 May 2001 in Stockholm, Sweden with the objective of protecting human health and the environment against adverse effects of toxic and hazardous POPs. The Convention entered into force on 17th May 2004, initially listing twelve (12) chemicals as POPs. Mozambique ratified the Stockholm Convention on 30th April 2004 and, in fulfillment of Article 7 of the Convention, developed and transmitted its first (original) National Implementation Plan (NIP) in 2006.

The Convention focuses on three broad areas namely:

- POPs which are intentionally produced and used;
- POPs which are unintentionally produced, and released from anthropogenic sources; and
- POPs in stockpiles, wastes and contaminated sites.

The Convention requires each Party to prohibit and/or take any legal and administrative actions required for the elimination/reduction of POPs production and use, export and import, as well as to take actions to minimize or prevent POPs releases. For management options, the SC is grouping POPs in three Annexes, which are: (i) Annex A for elimination, (ii) Annex B for restriction and (iii) Annex C for continuous minimization and ultimate elimination where feasible. These Annexes include all POPs starting from the initial twelve POPs identified in May 2001. During meetings of the COPs in 2009, 2011, 2013 and 2015, additional new chemicals were included in the list, totaling to 26 controlled chemicals as of now. The list consists of **Pesticides** (Aldrin, Chlordane, Dieldrin, DDT, Endrin, Heptachlor, Mirex, Toxaphene, Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Chlordecone, Pentachlorobenzene (PeCBz), Technical Endosulfan and its related isomers, Pentachlorophenol (PCP) and its salts and esters and Lindane); **Industrial**

chemicals (Polychlorinated Biphenyls (PCBs), Hexabromocyclododecane (HBCD), Hexachlorobutadiene (HCBD), Hexabromobiphenyl, Hexabromodiphenyl ether and heptabromodiphenyl ether (homologues of commercial octabromodiphynel ether), Pentachlorobenzene (PeCBz), Perfluorooctane sulfonic acid (PFOs), its salts and perfluorooctane sulfonyl fluoride (PFOS-F), Polychlorinated naphthalenes (PCNs), Short-chain chlorinated paraffins (SCCPs) and **unintentionally produced by-producs chemicals** (Polychlorinated *para*-dibenzodioxins (PCDD), Polychlorinated dibenzofurans (PCDF), Hexachlorobenzene (HCB), Polychlorinated biphenyls (PCBs), Pentachlorophenol (PeCBz) and Polychlorinated naphthalenes (PCNs).

According to Article 7 of the SC, the Parties have the obligation of developing, implementing and periodically reviewing and updating the National Implementation Plan (NIP) on POPs.

The updated NIP-II for Mozambique elaborates existing situation on the issue of POPs in the country, based on changes in Annexes as well as domestic changes and state commitments and actions, that it intends to undertake in the management and control of POPs for a duration of 10 years, starting from 2020, whose budget planning and review tends to be made from five (5) to five (5) years.

The NIP-II has identified national challenges in the management of POPs such as poor inventory data for certain groups of POPs; inadequate policy and regulatory regime; weak institutional capacity in terms of human resources infrastructure; lack of facilities for sound disposal of wastes consisting of, containing or contaminated with POPs; very limited financial and technical resources for remediation of contaminated sites; lack of POPs release monitoring schemes; inadequate application of Best available techniques and best environmental practices (BAT/BEP) for reduction of unintentional releases of POPs; and low awareness from the general public.

The focus of the NIP-II is in line with the National Strategies for Growth and Reduction of Poverty (NSGRP) and the Mozambique's Development Vision 2025, and the Sustainable Development Goals (SDG), all of which calling for improvement of quality of life and social well-being. The NSGRP is the guiding policy framework for Mozambique in its quest for sustainable development.

The SDGs serve as the guiding targets for the NSGRP on reduction of poverty, diseases and environmental degradation. The implementation of the NIP will therefore contribute to the national efforts for combating poverty and improving environmental quality. Recently, there have been many emerging global environmental concerns, which demand joint efforts in reducing impacts to human health. POPs and other toxic chemicals pose challenges in protecting human health and the environment. This NIP is meant to be dynamic as well as to accommodate new interventions to the emerging global environmental concerns, which require similar approaches to deal with. Therefore, it is necessary to promote synergies among related Conventions and International Treats on chemicals management such as the Basel, Rotterdam, Minamata Conventions and the Strategic Approach for the International Chemicals Management (SAICM) in order to obtain multiple benefits such as maximizing use of resources, share of knowledge and experiences and integrate capacity building. In view of the above, the Government of Mozambique is determined to implement the NIP-II and has already incorporated provisions for POPs management in the Environmental Management Act of 2004 and shall make every effort to allocate funds and encourage participation of stakeholders in addressing the challenges posed by POPs. Recognizing the fact that the environment is a common heritage for present and future generations, the Government welcomes support of the relevant stakeholders in the struggle to eliminate POPs and other toxic substances.

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1. EXECUTIVE SUMMARY

1.1 Persistent Organic Pollutants and their effects

Persistent Organic Pollutants (POPs) are highly toxic chemicals of anthropogenic origin causing an array of adverse health effects, notably death, birth defects among humans and animals, cancer and tumors at multiple sites, neuro behavioral impairment including learning disorders; immune system changes; reproductive deficits of exposed individuals as well as their offspring; and diseases such as endometriosis, increased incidence of diabetes and others. Persistent Organic Pollutants are produced intentionally and used as pesticides or consumed in industrial processes; and some of them are generated unintentionally as by-products of various industrial or combustion processes. At present, there are 26 chemicals that have been proven to exhibit POPs characteristics.

1.2 Purpose of NIP Updated or NIP-II

The National Implementation Plan-II (NIP-II) for the Stockholm Convention is an output of the project titled "*Enabling activities to review and update the NIP for SC on POPs*" in the Republic of Mozambique, funded by the Global Environmental Facility Fund (GEF). The United Nations Industrial Development Organization (UNIDO) was the Implementing Agency providing technical guidance and facilitating administrative matters between GEF and the Government of Mozambique.

This NIP-II document elaborates the current situation on POPs and states the country's commitments and actions that it intends to undertake in respect of the management and control of POPs for the 5 years period, commencing in 2020.

NIP objectives

The objectives are:

i) To demonstrate the commitment of the Government of Mozambique to the objectives of the Stockholm Convention and to achieving compliance with the obligations assumed as Party to it;

ii) To present the ground information and associated analysis supporting the

development and implementation of effective Action Plans and Strategies to achieve the reduction and elimination of POPs, with associated improvement of environmental quality and human health;

iii) To provide basis for monitoring the country's progress in addressing the POPs issue, specifically, the effectiveness of the actions, the country has committed to in reducing or eliminating POPs use and release to the environment;

iv) To facilitate public awareness, education and participation in respect of the POPs issues and overall improvement of environmental and public health protection;

v) To provide the operational and institutional framework for attraction of international assistance such as might be provided under Convention's permanent financial mechanism for actions on POPs; and

vi) To promote synergies with other related Conventions and international processes on chemicals management.

1.3 NIP-II Development Process

The development of the NIP-II involved six main phases, namely:

I. Establishment of coordination mechanism and process planning;

II. Final Evaluation of NIP-I Activities;

III. Establishment of POPs inventories and assessment of national infrastructure and capacity;

IV. Priority assessment and objectives setting;

V. Formulation of the NIP-II and its validation by stakeholders;

VI. Endorsement by the government before official submission to the secretariat of the SC.

1.4 NIP-I Activities Evaluation

The evaluation of NIP-I proposed activities from 2006-2017 was taken from the priorities of the NIP-I including its related projects. The process involved

identification and quantification of POPs releases, assessment of legal and institutional framework for management of POPs, assessment of POPs management practices, monitoring capacity and experience on POPs, identification of POPs contaminated sites and identification of public information, awareness and education tools and mechanisms. Part of the information came from the country reports that were consulted, and the achievement revised in a national consultative workshop; report on baseline of the inventory of PCBs in the main transport power line and contaminated equipment was also considered from the past inventory. Through a FAO Project implemented by MASA in conjunction with MITADER, past obsolete pesticides projects were assessed and the outputs considered under the NIP-II development process.

The achievements of the previous NIP were noted by milestone as following:

- Institutional, Regulatory and Polices Strengthening;
- Increased use of substitutes and other alternative approaches to POP and PIC pesticides and safe disposal of POP pesticides;
- PCB Management, improvement of the database, and disposal of oil and solid waste containing PCBs;
- Strengthening Management and control of DDT and Safe disposal of DDT waste;
- PCDD (Dioxins) / PCDF (Furans) sources' Management;
- Information Exchange and Public information, education and awareness;
- Research & development;
- Reporting to the SC secretariat;
- Participation in the effectiveness evaluation.

1.5 Coordination Mechanism and NIP-II Proposed Priority Activities

Two Committees were created: Technical Committee and Interministerial Steering Committee.

The Technical Committee is made up of technical staff from several Institutions that deal with POPs; and the Steering Committee, composed of decision-makers from

Institutions dealing with POPs.

The NIP-II proposed priority activities were summarized from the non-achieved activities or activities that need to be in place for the operationalization of all POPs management categories of the 12 old POPs and the new POPs as well.

The summary of NIP-1 activities and NIP-II proposed priority activities are listed below:

a) Strengthened POPs coordination on management of POPs and other chemical pollutant;

b) Increased use of substitutes and other alternative approaches to POP and PIC pesticides, Safe disposal of POP pesticides Substitutes and alternatives to the chemical Pesticides;

c) PCB management, improvement of the database, and sound disposal of oil and equipment containing PCBs;

d) Strengthening management and control of DDT, Safe application monitoring storage, management and disposal of DDT waste;

e) Strengthening Capacity management and control PCDDs/PCDFs sources and enhance the promotion of BEP/BAT;

f) Take appropriate measures for controlling articles containing PBDEs and its waste;

g) Increased use of substitutes and Strengthening management and control of PFOs, Information exchange, public information, education and awareness;

h) Chemical and POPs Database establishment and Reporting to the National Institute of Statistics.

In order to address gaps and weaknesses that were identified from the inventory of POPs, and from the National Profile and Assessment of Infrastructure of Chemical Management (NPAICM), necessary measures as well as national objectives and priorities (at short, medium and long-term) were formulated. Prioritization of measures was based on the following criteria in line with Articles 3,4,5,6, 10,11,12,15 and 16 of the Stockholm Convention:

Measures to reduce or eliminate releases from intentional production and use, register of specific exemptions, measures to reduce or eliminate releases from unintentional production, measures to reduce or eliminate releases from the stockpiles and wastes, public information, awareness and education , research, development and monitoring, technical assistance, financial resources and mechanisms, reporting and effectiveness evaluation.

In order to operationalize the above mentioned articles, the following indicators were taken into consideration:

(1) Environmental health impacts;

(2) Institutional capacity;

(3) Economic and social benefits;

(4) Perception by different stakeholders;

(5) Affordability and availability; and

(6) Elimination of all PCB equipment no later than 2025 and establishment of PCB waste management strategy no later than 2028.

1.6 Assessment of POPs issue in Mozambique

1.6.1 POPs Pesticides

From the documents, reports and the control and supervision measures inside the pesticide regulation brings to the conclusion that apart from DDT, there is no intentionally produced, imported and utilized POPs pesticides in Mozambique. If they do exist then, it is a matter of regulation enforcement and supervision. The baseline for 2017 revealed that there are no stockpiles of POPs-Pesticides remained in Mozambique.

There are only untreated contaminated sites resulting from removal of the obsolete pesticides, which still need attention. The contaminated sites were supposed to be treated after removal of the obsolete pesticides. They are composed by excavated soil with certain level of contamination.

In 2009, the regulation on Pesticide Management, was approved under Decree nr 6

of March 31st, and is clearly about the POPs Pesticides. They are prohibited for production inside the territory as well as their importation. Only DDT is accepted for the purpose of Malaria vector control, after the permit grant by the Stockholm Convention focal point.

1.6.2 POPs-PCBs in Electrical Equipment

The PCB verification inventory involved several private and public institutions in order to verify the presence and levels of PCB concentrations in suspect equipment. In total, 214 suspect equipment, including switches, transformers, capacitors and voltage regulators were subjected to PCB screening. Of which 64 are owned by the public company EDM and the rest are distributed among 7 private companies operating in the country. The survey included equipment spread throughout the three regions of the country (South, Center and North part of the Country).

The inventory covered different types of electrical equipment, being the most covered by the inventory, the transformers then the switches and finally the voltage regulators and capacitors, with the same number of equipment inventoried.

1.6.3 PCDDs/PCDFs

Data from the economic year 2016 was used for all identified activities and the emissions factors from the Toolkit were applied.

The annual emission is expressed in grams of TEQ. From the inventory was found the total emission of dioxins and Furans of 548.7 g TEQ/year, which corresponds to 30.5 µg TEQ/person/year and 686 µg TEQ/Km2/year. The highest percentage of the release of these products corresponds to emissions from residues of about 64.5% to air. The total emission to residues was 353.5 g TEQ, from which 351.1 g TEQ, represents uncontrolled combustion. In category of uncontrolled fires, the waste municipal burning, burning of agricultural residues and uncontrolled forest fires are the main sources of emissions.

The national emission inventory on PDDD (Dioxins)/PDDF(Furans) in Mozambique (2017) was done through an update of the preliminary report, on which the calculations were based on the manual for emission quantification inventory of

PDDD (Dioxins) / PDDF (Furans) - toolkit 2003.

The present update was done taking into consideration the recent version of the guide lines inventory of PDDD (Dioxins) / PDDF (Furans) - toolkit 2015.

From the inventory update, it is notable a significant decrease of PCDDs/PCDFs emissions, because of a number of measures like: public awareness campaign against bush fire (PECODA Program), Plastic regulation, solid waste management regulation taken by the Ministry of environment (MICOA) and ongoing recycling practices and the introduction of the regulation for plastic management.

1.6.4 PFOs

The main objective of the inventory was to obtain the information needed for several important decisions related to the management of POPs- PFOs and its related substances including implementation of the obligations within the Stockholm Convention.

From the preliminary source characterization overview, the major importation sources of PFOs, in the SADC Region, are from South Africa, China and India.

1.6.5 PBDEs Polybrominated dipheny etheres

These chemicals have been widely used in many industrial sectors for the manufacture of a variety of products and articles, including consumer articles. For example, POP-PBDEs have been used in the electronics industry for the manufacture of plastic casings for computer equipment and in the transport industry for the manufacture of foam cushioning in automobiles.

In Mozambique there is no accurate information on the goods, vehicles, electronic devices containing PBDEs. Nevertheless, for the present report, data from the national statistical institute based on importation cost, population data and extrapolations were used including UN COMTRADE.

The total importation volumes are 198,565,857 Kg.

From this number, it is necessary to calculate the various forms of PBDEs and their derivatives.

There are also potential contaminated sites, like the followings:

- Scrap yard Lopes, Bairro Luís Cabral
- Scrap yard Vulcano, Chamanculo
- Scrap yard Chambule, near by Cinema charlot
- Reclame, Matola
- Majugar, Machava

1.7 Overview of National Priorities, Implications and Impacts of Addressing Them

The Government intends to take appropriate measures to ensure implementation of the national priorities on POPs as specified in the Action Plans.

The main priority issues are grouped in major areas like, strengthening legal and institutional framework for managing POPs and chemical pollutants; establishment of monitoring scheme of POPs and other chemical pollutants; enhancement of transfer mechanisms of appropriate technology for control of POPs release; and improvement of public information, awareness and education.

The specific priorities vary for the different Action Plans. These cover disposal of POPs wastes, capacity building in terms of human resources and technical infrastructures, remediation of contaminated sites, establishment of POPs monitoring schemes, policy strengthening and regulatory regime and awareness raising. The priority needs were endorsed on October 3rd 2018 in the priority setting meeting of the NIP-II.

1.8 Implementation Timetable and Targeted Milestones and Measures to Reduce and Eliminate POPs under the Stockholm Convention

The timeframe of the NIP-II is 5 years commencing in 2020, considering that 2019 will be the year for fund raising and partnership for the implementation of NIP-II. This NIP covers short, medium and the long-term actions. More measures may be incorporated as the country gains more experience in addressing concerns of POPs and hence necessitating the review of the Action Plans.

Table 1.1: Summary of the Budget for Measures and Action Plans.

Order	Measures and Action Plan	Amount in USD	Amount in MZM
1st	Strengthening National Institutions and Country Legal Framework on POPs Management	1.100.000	66.000.000
2nd	Treatment, remediation and management of the POPs contaminated sites.	6.250.000	375.000.000
3rd	Awareness, Education and Dissemination of Information	1.430.000	85.800.000
4th	Training and Capacity build on POPs Analytical and Monitoring methodology	340.000	20.400.000
5th	POPs non Intentional emission reduction	2.750.000	165.000.000
6th	PCBs Management	6.200.000	372.000.000
7th	PBDEs e PFOs Management	540.000	32.400.000
Total of the NIP Cost		**18.610.000,00**	**1.116.600.000,00**

1.8.1 Overall financial requirements

The estimated cost for the implementation of updated NIP is **USD 18,610,000.00**, overall budget of the short and medium terms actions for a period of 5 years, starting in 2020.

From the realist point view, other needs and activities need are to be budgeted for long term period, after the implementation of short and medium terms activity period 2020-2025 and also for the long term 2026-2030 should be used the same approach. The funds are to be raised from the internal, external and private sector, through the partnership in activities like infrastructure construction for residues management and inventories of equipment containing POPs.

Out of the total amount, it is expected that the Government contribution will be around 10% and the remaining contribution (90%) will come from various partners such as donors and the private sector.

1.8.2 Government commitment

The Government of Mozambique is determined to eliminate the intentionally produced POPs, and to reduce unintentionally produced POPs through the implementation of the NIP. It is the intention of the Government of Mozambique to undertake review of the relevant policies and legislation for effective implementation of the Stockholm Convention and the related conventions and international treaties on chemicals management.

1.8.3 Qualification or conditionality

Successful implementation of the Updated NIP is subject to socio political stability and availability of financial and technical resources from both government budget allocations and external sources to support activities identified in the Action Plans.

2. CHAPTER I: INTRODUCTION

2.1 Introduction

The Stockholm Convention on persistent organic pollutants of May 22, 2001 binds its Parties to the elimination of production and use, or to the limited use of selected substances. The lists of selected intentionally produced substances are found in Annexes A and B of the Convention. Annex C lists unintentionally produced substances released during technological processes able to escape into the atmosphere as pollutants.

There are currently 26 POPs, including 12 POPs initially listed in the convention. In 2009 the list was expanded, following the decision of 4th Conference of the parties to include 9 more substances. In 2011 Endosulfan was Added. At COP-6 in May 2013, Hexabromocyclododecane also was added.

All the substances are listed in three annexes:

Annex A - Elimination: Prohibited use and commitment to be disposed of within specified time limits.

Annex B - Restriction: some uses allowed as an acceptable purpose, if there is no viable substitute.

Annex C - Unintentional production: substances that can be generated via combustion process or intermediate substances in industrial chemical reactions.

The list consists of **Pesticides** (Aldrin, Chlordane, Dieldrin, DDT, Endrin, Heptachlor, Mirex, Toxaphene, Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Chlordecone, Pentachlorobenzene (PeCBz), Technical Endosulfan and its related isomers, Pentachlorophenol (PCP) and its salts and esters and Lindane); **Industrial chemicals** (Polychlorinated Biphenyls (PCBs), Hexabromocyclododecane (HBCD), Hexachlorobutadiene (HCBD), Hexabromobiphenyl, Hexabromodiphenyl ether and heptabromodiphenyl ether (homologues of commercial octabromodiphynel ether), Pentachlorobenzene (PeCBz), Perfluorooctane sulfonic acid (PFOs), its

salts and perfluorooctane sulfonyl fluoride (PFOS-F), Polychlorinated naphthalenes (PCNs), Short-chain chlorinated paraffins (SCCPs) and **unintentionally produced by-producs chemicals** (Polychlorinated *para*-dibenzodioxins (PCDD), Polychlorinated dibenzofurans (PCDF), Hexachlorobenzene (HCB), Polychlorinated biphenyls (PCBs), Pentachlorophenol (PeCBz) and Polychlorinated naphthalenes (PCNs).

2.2 NIP - Update Development Process

The development of the NIP-II involved four main phases, namely:

- Establishment of coordination mechanism and process planning;
- Establishment of POPs inventories, assessment of national infrastructure, capacity and evaluation NIP-I activities;
- Priority assessment and objective setting; and
- Formulation of the NIP update and its endorsement by stakeholders, validation and transmission to the SC Secretariat.

2.3 Establishment of Coordination Mechanism, Process Planning and Organization

In this phase, the National Committees (NC) namely National Steering committee and National technical Committee were established and an inception workshop was organized to promote awareness and build capacity on various topics about NIP-II process preparation by key stakeholders.

The members of the National and technical Committees were selected from sectors of Environment, Customs, Health, Transport and Communication, Agriculture, Industry, Minerals and Energy, Government, Private sector , NGOs and Academia.

From 2012 to 2017 various meetings and awareness workshops were held, related to POPs, Stockholm Convention, Inventory Methodology and about the information exchange systems and access to various data base on chemicals.

In parallel with the above activities, was appointed the national consultant

based on the procurement process for contracting National Consultant for NIP-Update.

The NIP-I Implementation activities were evaluated, assessed and taken into consideration.

2.4 Establishment of POPs Inventories and Assessment of National Infrastructure and Capacity

The inventory of POPs involved identification and quantification of POPs releases, assessment of legal and institutional framework for management of POPs, assessment of POPs management practices, monitoring capacity and experience on POPs, identification of POPs contaminated sites and identification of public information, awareness and education tools and mechanisms. This resulted into country reports that were reviewed in a national consultative workshop held in 2017, inventory of old and new POPs and contaminated equipment and sites was undertaken in the whole country. The POPs were assessed and the outputs taken into account in the inventory of POPs under the NIP update development process.

2.5 Priority Assessment and Objective Setting

This phase involved identification of measures as well as formulation of national objectives and priorities (short, medium and long-term) to address gaps and weaknesses that were identified from the inventory of POPs and the NPAICM. Prioritization of measures was based on the following criteria in line with Article 4, 5, 6, 10, 11, 12, 15 and 16, of the Stockholm Convention. Also were considered measures to reduce or eliminate releases from intentional production and use, register of specific exemptions, measures to reduce or eliminate releases from unintentional production, measures to reduce or eliminate releases from the stockpiles and wastes, public information, awareness and education , research, development and monitoring, technical assistance, financial resources and mechanisms, reporting and effectiveness evaluation. Measures to reduce or eliminate releases from intentional production and use, register of specific exemptions, measures to reduce or eliminate releases from unintentional production, measures to reduce or

eliminate releases from the stockpiles and wastes, public information, awareness and education , research, development and monitoring, technical assistance, financial resources and mechanisms, reporting and effectiveness evaluation.

In order to operationalize the articles above the following indicators were taken into consideration:

(1) Environmental health impacts;

(2) Institutional capacity;

(3) Economic and social benefits;

(4) Perception by different stakeholders;

(5) Affordability and availability;

(6) Elimination of all PCB equipment no later than 2025 and establishment of PCB waste management strategy no later than 2028.

2.6 Formulation of the NIP-Update and its Endorsement by Stakeholders

The phase 4 involved, among others, drafting of the NIP in accordance with the UNEP Guidelines on NIP Update (2014) and based on the partial reports as stated before, prepared by local consultants and from government departments and agencies, academic and research institutions, NGOs and private sector. The Draft NIP - Update Document has been reviewed and updated and its priorities endorsed in a National Consultative Meeting organized by MITADER on 3rd October 2018, with the participation of various stakeholders.

It is important to note that during all the above mentioned phases, training of the teams in inventory of POPs and workshops on Action Plan development were conducted by international and regional experts from UNIDO. In result, many stakeholders became aware of the Stockholm Convention and were sensitized to incorporate measures that reduce releases of POPs in their ongoing initiatives. However, awareness creation needs to be continued mainly for the new POPs and the positive lessons learned need to be capitalized in the following phases of the NIP update execution.

2.7 The Motivation for the NIP Update and Review

Mozambique being a signatory of the Stockholm Convention on POPs (2001) was eligible for financial support from GEF through UNIDO for the development of the National Implementation Plan (NIP) through the Project known as “Activities to facilitate Early Action on the Implementation of the Stockholm Convention on Persistent Organic Pollutants”. Article 7 of the Stockholm Convention requires each Party to develop an Action Plan on POPs. The development of NIP will facilitate Mozambique to meet obligations under the Stockholm Convention. The Convention entered into force in May 2004.

Mozambique became a Party to the Convention in April 2004 and was expected to have submitted its NIP to the Conference of the Parties of the Convention by August 2006.

In 2009 during the COP-4, 9 additional chemical POP substances were added namely Chlordecone, Hexabromobiphenyl Hexabromodiphenyl ether and heptabromodiphenyl ether, Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Lindane Pentachlorobenzene (PeCB), Tetrabromodiphenylether and pentabromodiphenyl ether.

The COP-5 in 2011 added Endosulfan in Annex A. Therefore, Mozambique as Party of the Convention has the obligation to implement these amendments. Along with, there is need to consider any significant domestic change liked with the implementation of the NIP. This is the rationale of the NIP update and review project.

2.8 Purpose of the updated National Implementation Plan (NIP)

The updated National Implementation Plan (NIP-II) for Mozambique elaborates current situation on POPs taking into account the added new POPs during the COPs and states commitments and actions that it intends to undertake in the management and control of POPs within the Stockholm Convention. Article 7 of the Convention encourages Parties to integrate their NIP into their national sustainable development plans where appropriate. Therefore, the Plan presents the strategic measures, mechanisms and detailed activities that must be

developed and implemented to make the elimination of POPs a reality.

The NIP is intended to achieve the following objectives:

a) To demonstrate commitment of the government to the objectives of the Stockholm Convention and to achieving compliance with the obligations assumed as a Party to it;

b) To provide a national policy instrument and framework within which POP issues are to be addressed as part of national policies on chemicals management, environmental protection, public health and sustainable development;

c) To present an information base and associated analysis supporting the development and implementation of effective Action Plans and Strategies to achieve reduction and elimination of POPs, with associated improvement of environmental quality and human health;

d) To provide an operational and institutional framework for eligibility for financial assistance that might be provided under the Stockholm Convention permanent financial mechanism for actions on POPs;

e) To provide basis for monitoring the country's progress in addressing the POP issues, and specifically the effectiveness of the actions it had committed to in reducing or eliminating POPs use and release to the environment;

f) To facilitate public awareness, education and participation in respect of the POP issues and overall improvement in environmental and public health protection;

g) To facilitate on-going efforts of dealing with broader environmental issues such as pollution and hazardous waste control and overall pollutant releases and the development and strengthening of national sustainable development strategies;

h) To facilitate country's overall efforts in coordinating national approaches to other chemical related Regional and International Agreements and international processes on chemicals management; specifically, the Rotterdam Convention on the Prior Informed Consent Procedure for

Certain Hazardous Chemicals and Pesticides in International Trade; the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; and the Strategic Action for International Chemicals Management.

The National Directorate of Environment of MITADER was the National Focal Point to the Stockholm Convention Unity, and is the National Lead Agency in the preparation of the NIP update.

A national consultant was hired for drafting the NIP final updated document, based on the partial reports prepared by different experts and technicians from relevant sector Ministries, government agencies, NGOs and academic and research institutions. The consultant charged with the preparation of the NIP update Document was involved in the whole process of review and execution of the NIP.

The composition and terms of reference of the National Technical Committee were reviewed to incorporate new key-players and responsibilities as specified in the Action Plans in order to tap their wealth of knowledge and experiences during NIP update execution phase.

The legal and institutional basis for effective implementation of the NIP were reviewed by the National Steering Committee and MITADER in order for providing decisive policy, opportunity for linkage and synergy to other relevant program and policy initiatives within MITADER and within other ministries and local authorities. This of course, was conducted within the framework of the National Environmental Law (1997) and other legal provisions already in place and should also take into account the existing sectorial mandates of environmental authority on environmental management functions of cross cutting nature.

2.9 Preparation and Endorsement

The process of developing NIP has involved many stakeholders including those shown in Annex A2. During inventory of POPs stakeholders had an opportunity to provide baseline information through questionnaire and targeted visits.

Throughout the process, stakeholders played a key role of reviewing the NIP updated reports through workshops.

Four national stakeholders workshops were organized namely, (i) review of the NIP update structure Draft NIP update document, (ii) inventory reports, (iii) validation of POPs priorities and (iv) review of the updated NIP. The workshops drew participants from government departments and agencies, academic and research institutions, private sector and NGOs.

After the NIP update process, the NIP-II document will be endorsed by the higher authorities in the Office of the Minister of MITADER.

2.10 Received Assistance

Following the obligation of the SC under the article 12 and 13 namely technical and financial assistance, Mozambique was beneficiary of technical and financial assistance to update the NIP.

Mozambique being a signatory to the Stockholm Convention after the NIP-I was able to access financial and technical support from the Global Environment Facility (GEF) through the United Nations Industrial Development Environment (UNIDO) to assist in the development of National Implementation Plans (NIP), covering the phases I to III of the Process in the total amount of US $70,000.00 plus international consultancy.

The Government provided basically in kind contribution in terms of personnel, office space, utilities and communication services totalizing to about 250.000,00 USD from the Ministry of Agriculture, Ministry of Land Environment and Rural Development, Ministry of Industry and Trade, Ministry of High Education, Science and Technology, Ministry of Health, Ministry of Mineral Resources and energy and National Quality Standardization Institute. The private sector also contributed in the same manner, namely the Electricity Supply Company (EDM), Hydroelectric of Cabora bassa, ABB- Tecnel. Some organizations as Industrial Association of Mozambique, Confederation of Economical association and NGOs such as the Africa Foundation for Development Justiça Ambiental, Livaningo also participated in the same way. Academic institutions such as

Eduardo Mondlane University and other were also instrumental with their contribution.

3. CHAPTER II: COUNTRY BASELINE

3.1 Country profile

3.1.1 Political system

Mozambique has three main political powers namely the Legislative, the Executive and the Judiciary Powers. The Highest Executive is the President, who is the Leader of the Republic of Mozambique, the Head of State, the Head of Government and the Commander-in-Chief of the Armed Forces. The Prime Minister coordinates the Cabinet Ministers, has authority over the control, supervision and execution of the day-to-day functions and affairs of the Government and also performs any other matter that the President directs.

Local Government Authorities exist for the purpose of consolidating and giving more power to the people to competently participate in the planning and implementation of development programs within their respective areas. Local Government Authorities are mandated to play two main functions of administration, law and order; and economic and development planning in their respective areas of jurisdiction. Local Government Authorities are classified into two main categories – the City Municipal Councils and District Administrations. In one way or another, all this institutions deal with the environmental matters at their respective level.

The area of Environment in the Government is guided by MITADER, which has the mandate to control, manage and prevent the damage of the environment. It is within this power frame that the legal and regulatory provisions pertaining to environmental affairs are prepared and taken into law. At the provincial levels, the Provincial Director for Environmental Affairs is the corresponding controller on behalf of MITADER.

The normal pathway for the legal provisions on the environment starts with MITADER who draft the legal acts, discuss them with other Ministries and the stakeholders and then submit to the Cabinet for approval, after which it is sent to the Parliament for adoption.

3.1.2 Location

The Republic of Mozambique lies on the eastern coast of Southern Africa between parallels 10^{o} 27' and 26^{o} 52' south latitude and between meridians 30^{o} 12' and 40^{o} 51' west latitude and covers an area of approximately 800,000 square kilometers, out of which13, 000 are made of interior waters and the rest is firm land.

Mozambique has 4,330 km of land borders; being Tanzania to the north, to the west Malawi, Zambia, Zimbabwe, and the South African province of Mpumalanga. To the south Mozambique borders with Swaziland and the South African province of KwaZulu Natal. All of Mozambique's neighboring countries are members of the Commonwealth.

Mozambique' Indian Ocean coastline stretches over 2700 km. The country is divided into a coastal lowland plateau of 200-600 meters in the center and south of the country, rising to 1,000 in the Northeast. All of Mozambique's 25 major river systems flow into the Indian Ocean. The largest and most historically significant is the Zambezi, whose 820 km Mozambican section is navigable for approximately 460km (INE 2017).

3.1.3 Demographic Aspects and Basic Indicators

Women represent more than 52% of the population. More than 45% of the population is below 15 years old, while 2.5% are more than 64 years' old. The economically active population (15-65 years) is about 52%. The population growth rate is estimated to be 1.9%, fertility rate of 5 births/woman, the birth rate is 45/1000, life expectance of 50 years. The literacy rate is around 45%. The majority of literate people have only the basic education. Unemployment reaches about 30% of economically active population, being more sever among the females (INE, 2017)

Table 3.1: Population statistics by Province.

	Houses	Families	Population		
			Total	Men	Woman
Mozambique	6,529,877 6	6,746,496	28,861,863	13,800,857	15,061,006
Niassa	414,039	519,035	1,865,976	906,680	959,296
Cabo Delgado	554,302	559,947	2,333,278	1,131,236	1,202,042
Nampula	1,453,123	1,473,792	6,102,867	2,941,344	3,161,523
Zambézia	1,171,073	1,190,552	5,110,787	2,422,399	2,688,388
Tete	595,887	615,843	2,764,169	1,349,992	1,414,177
Manica	381,202	396,598	1,911,237	915,621	995,616
Sofala	440,643	470,203	2,221,803	1,071,830	1,149,973
Inhambane	357,630	358,062	1,496,824	809,722	687,102
Gaza	323,534	317,253	1,446,654	666,656	779,998
Maputo Província	613,648	602,957	2,507,098	1,178,487	1,328,611
Maputo Cidade	224,796	242,254	1,101,170	529,510	571,660

Source: INE Preliminary 2017 Cense results.

The official language is Portuguese, and there are about 30 native languages. The Main ethnic groups are:

- *Emakwas*, which is the major group account for 2/3 of the population, covering four center-northern provinces, namely Zambezia, Nampula, Cabo Delgado and Niassa;
- *Sena, Nyunguwe and Ndaus*, occupying the central region, in the provinces of Tete, Manica and Sofala;
- *Tsongas, Bitongas and Chopes*, covering the Southern region, in the provinces of Gaza, Inhambane and Maputo.

Mozambique has a democratic elected government headed by an elected executive President. The Country is divided in 11 Provinces as shown in the Map below. The local government consists of villages and districts administrations and city municipal councils. This pattern, combined with the influence of the warm current of the Mozambique Channel, offers the country conditions for the humid tropical climate. The average annual temperature varies between 20°C in the South and 26°C in the North, with an average rainfall ranging from 2,000 mm in the mountains to 800 mm in the coast. The zone stretching from Lake Niassa to Gorongosa results from the tectonic depressions of the Rift Valley.

The country's economy is predominantly based on agriculture with few alternatives that can reduce the pressure on natural resources. Agriculture employs 70% of the population, especially women, contributing about 22% of GDP, of which 80% comes from the rural family sector.

The interior, characterized by mountains, has an average altitude of about 800 meters, with Mount Binga in Chimanini, Manica Province, with its 2,336 meters, is the highest point in the national territory. Also exists Manica escarpment and mountain systems Chire - Namuli, Maravia Angonia, Maniamba Amaramba and Small Libombos.

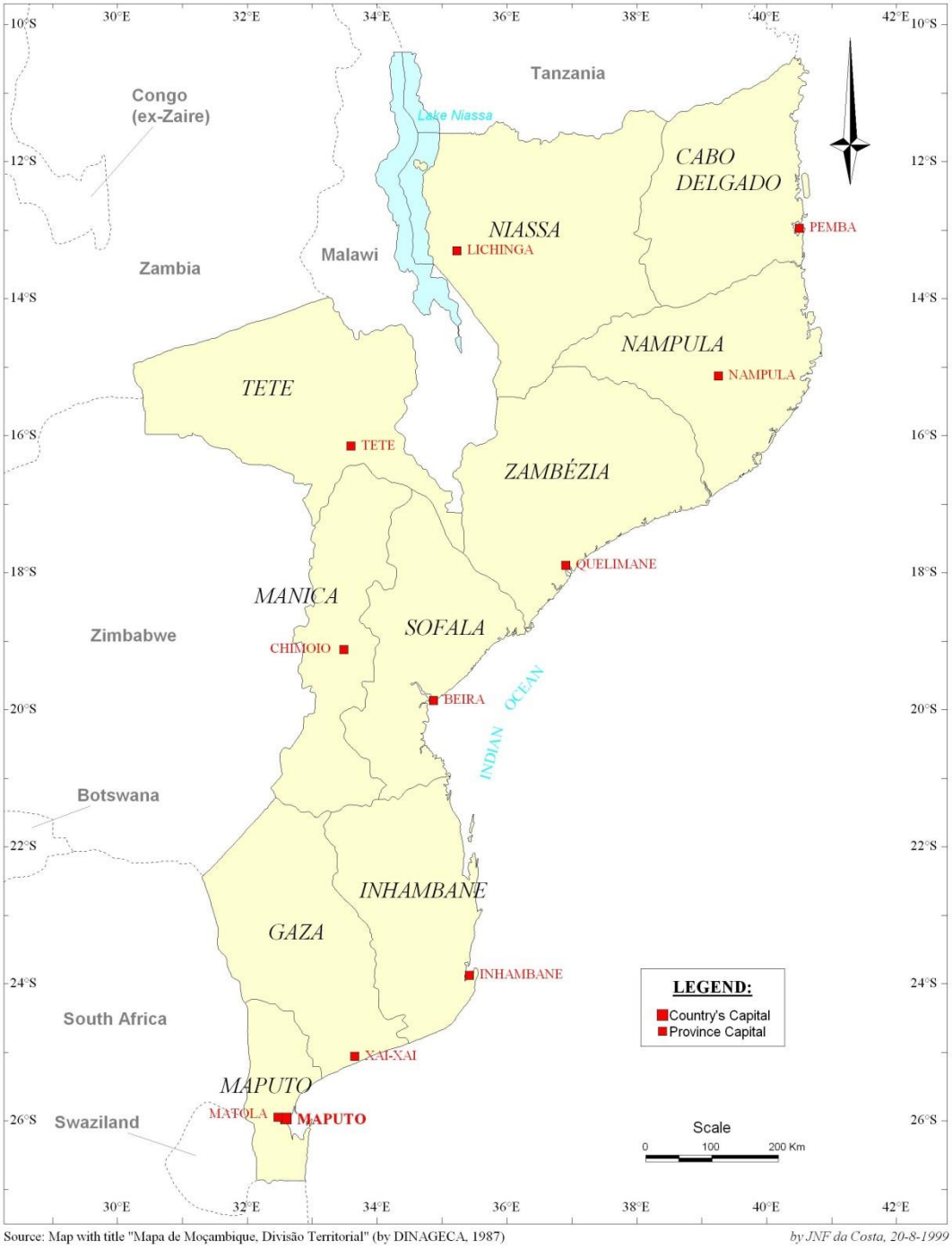

Figure 3.1: Country Administrative Division

3.1.4 The Macro-economy figures of Mozambique

The Mozambican economy had a significant growth for the last two decades. The PIB per capita presented significant growth from 144 USD in 1995, to 400 USD in 2007. This growth rate tendency was continued in the subsequent years to 426 USD in 2010. In 2014 it went up to 692 USD and decreased in 2016 to USD 411(see Table below).

Table 3.2: Real growth rate (%), inflation evolution (%), and evolution of growth rate per Capita for the period 2010 – 2016.

Year/Designation	PIB grouth (%)	Inflation(%)	PIB per capita (MT)	PIB per capita (USD)
2010	7.10	12.40	13962.10	425.8
2011	7.10	5.50	16560.00	552
2012	7.20	5.50	18275.00	643
2013	7.10	5.50	19791.00	662
2014	7.40	1.90	21235.00	692
2015	6.60	10.60	23011.00	601
2016	3.80	25.30	26083.00	411

Source: Preliminary Daft of State Environmental Report 2018 (16).

3.2 National Chemical Profile

In 2018 a National Profile to assess the National Infrastructure for Managing Chemicals (NCMP) was revised with the aim of having an authoritative national reference document on state of affairs regarding chemical management in the country. The document highlights strengths and weakness of chemical management. Among other strengths findings of the NCMP, it was noted that personnel handling management of chemicals might need additional specialized training. In addition, it was found that the research and development institutions and Universities have relatively better technical infrastructure in terms of expertise and analytical equipment for management of chemicals, though still with some critical handicaps. The Profile identified the following weaknesses: the infrastructure for transporting, handling, storing, formulating and applying chemicals is not adequate; the existence of threat of adverse

effects of chemical exposure to human health and the environment; low awareness on chemical hazards; lack of government policy on management of chemicals; the existence of several fragmented legal instruments to manage various aspects of environmental management/pollution cannot assist the efforts of managing chemicals without a proper enforcement regime. The profile further acknowledged the weak mechanisms for inter-ministerial co–ordination and co-ordination with international organizations both in practice and procedures. The preparation of NCMP involved various stakeholders including government, academies, research and development and nongovernmental institutions under the coordination of the Ministry of Land, Environment and Rural Development.

For better controlling the POPs import, there is a need to include in the Country customs or customs system the detailed harmonized custom codes. The present codification system has limitations on detailing the imported chemicals. A lot of chemicals are grouped into one code that's make it very difficult to know which chemical is imported (name) into the country.

3.2.1 Human resources evaluation

The knowledge about the POPs is differentiated among the different population groups, taking into account the different level of education of the citizens. Very few of the educated people are aware compared to those who are not educated, which represents a huge challenge, due to the fact that this group is the biggest social group. This biggest social group is working in the agricultural fields where pesticides are being used for pest control. Some of the people of that group also work in the waste management sector, namely waste segregation e.g. scavenger activities and other for the livelihood. On the other hand, the last years were characterized with the recent discovery of oil and gas, which constitutes a challenge for such industry to bring much chemicals, oils, gases, fire retardants and firefighting chemicals.

The country doesn't produce pesticides. In the country is prohibited to produce and import POP- pesticides.

There is undergoing initiative in the agricultural sector in order to introduce an integrated pest management approach and use of traditional and organic compounds, but remain the challenges related to the quantities, content and effectiveness of such applied organic products.

3.2.2 Infrastructure capacity of POPs Management (Laboratories, storage, disposal proper waste management landfills, incinerator)

The knowledge on the new POPs mainly composed by the electronic waste, fire retardants and extinguish products still continue to be a challenge, because the population including the civil servant, private companies are not aware and should be a priority area in the new POPs project portfolio or NIP-POPs investment plan.

The Profile identified the following weaknesses: the infrastructure for transporting, handling, storing, formulating and applying chemicals is not adequate; the existence of threat of adverse effects of chemical exposure to human health and the environment; low awareness on chemical hazards; lack of government policy on management of chemicals.

3.3 Institutional, Policy, Legal Framework and Conventions

3.3.1 Environmental policy and sustainable development

Mozambique adopted the National Environmental Policy (NEP) in 1997. Since environmental management involves multi-sectorial as well as multi-dimensional issues, this Policy is a framework document, which gives direction on elements to be considered in order to mainstream environmental matters into sectorial policies. The importance of environmental management for sustainable development has been clearly stipulated in the NEP.

The Policy provides framework for environmental management issues for various sectors in order to achieve sustainable development. The objectives of the Policy include:

i) To ensure sustainability, security, and equitable use of resources to meet the basic needs of the present population, without compromising those of the future generation, without degrading the

environment or risking health or safety.

ii) To focus on preventing degradation of land, water, vegetation and air, which are crucial elements for life. The policy advocates for development and application of environmentally friendly pest control methods without specific reference to POPs.

iii) The policy underscores the need for promotion and application of environmentally friendly technologies such as reducing, recycling, reuse and safe waste disposal.

Since environmental pollution does not recognize national boundaries, the environmental policy emphasizes the importance of international cooperation with regard to environmental issues. In that spirit therefore, Mozambique participates and implements relevant bilateral, sub-regional, regional and international treaties and programs that are related to environmental protection such as the control of toxic substances. These include the Bamako, Basel, Rotterdam and Stockholm Conventions.

In1997, the Parliament of the Republic of Mozambique Approved the Environment Law 20/1997. The Law provides the legal and institutional framework for sustainable management of environment. It also provides principles for environmental management, impact and risk assessments, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; and basis for implementation of international instruments on environment.

Moreover MITADER provides mechanisms for implementation of the National Environmental Policy and it establishes the National Fund for Sustainable Development.

Talking of POPs Management, the Law empowers the Minister of MITADER, in conjunction with other Ministers of areas related to POPs, to prepare regulations covering among others compliance with international obligations; promotion of alternatives to POPs; disposal of obsolete stocks of POPs; and regulation of imports and exports of POP chemicals.

Unfortunately, the present legal framework on POPs and other toxic chemicals does not cover all the issues, for example: compensation, clean-up and emergency response to spills and accidents as well as the national, Provinces, city, municipal, town and village contingency plans. Therefore, it was necessary to draft or review the specific legal command on POPs for Mozambique. Not only POPs are in this situation but also other chemicals. Mozambique now is drafting and discussing the national chemical regulations including for POPs.

3.3.2 International environmental conventions and treaties

The Constitution of the Republic of Mozambique has no express provision on environmental rights, but it has clauses for the protection of natural resources and the rights for a safe environment. According to the Constitution, every person is obliged to safeguard and protect the natural resources of the Republic of Mozambique, State properties and jointly owned by the people, as well as to respect another persons' property". The provision on the protection of the natural resources can logically be extended to cover the environment.

In Mozambique, there are many pieces of legislation dealing with different aspects related to the utilization and management of natural resources, and controlled by the respective governmental area. Most of such legislation put great emphasis on regulating access to and control of the use of natural resources, such as land, minerals, water, forestry and wildlife. The sectorial legislation empowers Ministers to enact regulations, which elaborates specific provisions of the sectorial laws and sets enforcement mechanisms. Both statutory laws and customary laws are accepted and govern access and use of natural resources in Mozambique, especially the land.

In terms of Environmental Management provisions, further to the Environmental Policy and Law, it is also important to notice that there some regulatory instruments, which are already in place.

The environmental issue is one of the cross-cutting areas of the five year governmental program, and it is in various aspects of environmental issues. These aspects are included in the themes that make up the environmental vision, such as agriculture, energy, mining, industry, etc., which are

fundamentally based on the Constitution of the Republic of Mozambique (2004) and in its specific revision of 2017, in the Environment Law 20/97, of October 1, and in the respective regulations, approved by Decree of the Council of Ministers.

The adoption of specific policies and legislation, in the last years, represents more progress made in this area. For example, new policy, legislative and strategic initiatives were undertaken including the Strategic Plan for the Development of the Agricultural Sector (PEDSA 2010-2019); IIAM Strategic Plan (2011-2015); Action Plan for the Reduction of Absolute Poverty (PARPA), (2011-2014); Policy on Climate Change and the Environment of Mozambique (2013); National Development Strategy (2013); National Strategy for Adaptation and Mitigation of Climate Change (2013-2025)

3.3.3 International and regional conventions and treaties

- ✓ Mozambique is a signatory and part of the following international conventions and treaties:
- ✓ Convention on Climate Change, Kyoto Protocol and Paris agreement;
- ✓ Vienna Convention on Substances that Deplete the Ozone Layer and its Protocols: Montreal, Beijing and Kigali;
- ✓ Stockholm Convention on Persistent Organic Pollutants;
- ✓ Basel Convention on the Trans-boundary Movement of Hazardous Waste;
- ✓ Bamako Convention on interdiction of the Import of hazardous waste to Africa and control of transboundary Movement of waste in Africa and its management;
- ✓ Rotterdam Convention on Chemical Information and Prior Informed Consent;
- ✓ Minamata Convention on Mercury;
- ✓ Convention on Biological Biodiversity;
- ✓ Ramsar Convention on Wetlands; and

- ✓ CITES Convention on Endangered Species.

3.3.4 Policies and specific legislation adopted in recent years for the environment sector

- ✓ Green Economy Transition Action Plan (2013 - 2014).
- ✓ Gender, Environment and Climate Change Strategy and Action Plan (2010-2014).
- ✓ National Strategy for Adaptation and Mitigation of Climate Change (2013-2025).
- ✓ New and Renewable Energy Development Strategy (2011 - 2025).
- ✓ Integrated Plan (Environment and Rural Development Sector) (2017 - 2018).
- ✓ Strategy and Plan of Action for the Conservation of Biological Diversity in Mozambique (2015-2035).
- ✓ Energy Strategy (2009).
- ✓ Biofuel Policy and Strategy (2009).
- ✓ New and Renewable Energy Development Policy (2009).
- ✓ Conservation Policy and Implementation Strategy (2009).
- ✓ Directive on the Expropriation Process for Territorial Planning (2010).
- ✓ Environmental Regulation for Petroleum Operations (2010).
- ✓ Regulation on the Environmental Audit Process (2011).
- ✓ Regulation on environmental standards and emission limits (of 2004 and its changes in 2010).
- ✓ Regulation of biofuels and their mixtures with fossil fuels (2011).
- ✓ Designation of Lake Niassa as a location on the List of Wetlands of International Importance (2011).
- ✓ Creation of the Foundation for the Conservation of Biodiversity - BIOFUND Public (2012).

- ✓ Regulation on International Trade in Endangered Species of Wild Fauna and Flora (2013).
- ✓ Area Conservation Law (2014).

On the other hand, the budget earmarked for the environmental sector, both by the government and by cooperation partners and other actors, has improved significantly. Other government and civil society initiatives have also been implemented.

In the ambit of strengthening the institutional capacity to implement the regulatory framework of the environment sector, processes of elaboration and revision of regulatory instruments and strategic documents took place. Of these, it should be noted that the following were approved:

- ➢ The Regulation of Management and Control of the Use of Plastic Bags, by Decree 16/2015 of August 5;
- ➢ The Regulation on the revised Environmental Impact Assessment Process, by Decree 54/20015;
- ➢ The Environmental Quality Standards and Regulations;
- ➢ The Updated pesticide management regulation decree 6/2009 of 31st March that already includes POPs; and
- ➢ Decrees 83 and 94/2014 of 31 December on the management of hazardous waste and solid waste, which mention the prohibition of burning of waste, as a way of reducing emissions of POPs, specifically Dioxins and Furans.

The implementation of the PNI-I took into account the elaboration of specific regulation on chemicals, including POPs.

One thing becomes clear, that some legal provisions on the Environment need revision, particularly the Environmental Management Policy so that it effectively promotes the reduction and eventual elimination of discharges/emissions of toxic chemicals such as PCBs, PCDD and PCDF from industrial sources, in order to support national and international development goals. Therefore, the NIP-I update process also represents an opportunity to produce

recommendations to incorporate policy amendments that take into account POPs issues.

It is important to note that there is a multi-sectorial consultative committee, the so called National Council for Sustainable Development (CNDS). Its duties include providing technical advice on the overall protection and management of the environment in line with the sustainable development. This committee is also charged with the functions of providing overall guidance and overseeing implementation and review of policy and legal issues and endorsement of national documents. The CNDS members are derived from government ministries/institutions, academic institutions, NGOs, and the private sector.

3.4 National Profile Assessment of the POPs issues in Mozambique

3.4.1 Assessment of POPs – Pesticides (Annex A, Part I Chemicals)

At present Pesticides including POP Pesticides are controlled by the Plant Protection Department of MASA, and there are legal provisions stipulating requirements for registration, manufacturing/formulation, importation, sale, use, transportation and disposal of pesticides wastes and their empty containers. However, the Ministry of Agriculture has put in place, in coordination with MITADER, a procedure mechanism to deal with all aspects of import, use, handling and disposal of pesticides in Mozambique. Currently the POP Pesticides have been cancelled from the list of registered and approved pesticides in Mozambique.

Possible alternatives to POP Pesticides or chemical pesticides are acceptable in the country, but a detailed study on availability, effectiveness, safety, social and economic aspects need to be conducted. These alternatives are subject to machinery availability. The small farmers know the alternatives, but it is difficult for them to process in large scale or considerable botanic or biological pesticide quantities without the necessary machinery.

The base survey conducted in 2017 revealed that there are no stocks of POP pesticides in Mozambique. There are only untreated contaminated sites resulting from the removal of obsolete pesticides that still need attention.

Contaminated sites should be treated after the removal of obsolete pesticides, but due to the scarcity of financial resources still to be treated today. They are composed of excavated soils with a certain level of contamination.

In 2009 the regulation on Pesticide Management, Decree 6 of 31st March was approved and is clearly related to POP Pesticides. The POP Pesticides are prohibited for production inside the national territory as well as their importation. Only DDT is accepted for the purpose of Malaria vector control, following the permit grant by the Stockholm Convention focal point.

3.4.2 Inventory of POPs -pesticides Added in 2009 (New POPS)

3.4.2.1 Chlordecone

This is a pesticide used in banana plantations. Although Mozambique has big commercial banana farmer plantation nomenly Novosun, Bananalandia, in the south and Matanuska in the North there is no information on availability of this pesticide in the country.

3.4.2.2 Alpha and beta hexachlorocyclohexane

There is no information on availability of this pesticide in the country, use and stock and products containing these substances.

3.4.2.3 Endossulfan (commercial name Thiodan)

This substance has been used as phytosanitary insectisid in the agriculture controlling pests in citrus, cotton and also used for controlling flies TseTse. After several operations on removal of pesticides including POPs, only remain contaminated sites In Muziva - Zambézia Province and in Lamego - Sofala Province.

3.4.2.4 Lindane (gamma HCH)

Lindane is an insecticide for the human health and has been used in the past. Also was used in the treatment of seeds, soil, wood against ectoparasites. Presently, is no longer used in Mozambique.

3.4.2.5 Pentachlorobenzene (Pesticide)

There is no data information about this pesticide about the import/export, use and stocks in the country.

3.4.3 Preliminary conclusions of the POPs-pesticide inventory

The inventory shows that there is no official data on POP pesticides importation in Mozambique and they are prohibited by law for importation and production. **Only contaminated sites exist from the old stores, from where the pesticides were removed.** The only POP-Pesticide being imported is DDT for malaria vector control purpose.

The obsolete pesticides removal operations were done by DANIDA/DANCED-Project on inventory and disposal of obsolete pesticides in Mozambique during the period 1997-2000. The Project on inventory and disposal of obsolete pesticides in Mozambique was implemented under Africa Stockpile program in the period 2006-2009, as well as the new Pesticide management regulation Stockpile program has been implemented. The implementation of the new Pesticide Management Regulation Decree nr 6/2009 of March 31st taking into consideration the articles on prohibition of production of pesticides under the annex A of Stockholm convention (nr 3 of article 21) has been carried out, including the restricted products needs within the list of the focal point (nr12 article 23).

In the POP-Pesticide survey of 2017 were not found POPs, only DDT for malaria control and contaminated sites that were left from the pesticides removal operations.

3.4.4 Recommendations

- There is a need of creation of Pesticide importation Database.
- Integrated pest management using botanical pesticides need to be emphasized.
- Processing botanical pesticides Machinery need to be promoted.

- To encourage studies on alternative methods of malaria and other vectors control.
- The Ministry of Agriculture should make more efforts in the import supervision in order to avoid POPs dumping in the country.
- Issue to customs and other relevant Government institutions appropriate instructions for clearance of chemicals, as required by the Stockholm Convention.
- To develop contingency plans for empty containers and look at possibilities to include in purchase orders for pesticides certain clauses for example the taking back of unused quantities after e.g. one year, a local system of taking back empty containers and their acceptable local disposal.
- To set up a multidisciplinary team entrusted with the authority to review and monitor pesticide use and pesticide purchase proposals.
- To set up a sustainable system of periodic controls of pesticide stores of the private sector and enforce related sanctions.
- To collaborate with national NGOs in order to reach an agreement on a mechanism of public awareness raising and possibly independent monitoring of pesticide use.

3.4.5 Priorities on POPs- Pesticides

Mozambique is a country where 80% of the population works in the agricultural sector. Consequently, linked to the significant use of pesticides.

In recent years there has been a significant increase in commercial farmers, such as farmers of banana, citrus, pineapple, soybean, cashew nut and macadamia, sugar cane and other crops.

Although the production, import and use of POP pesticides is prohibited, careful monitoring of pesticides is necessary to avoid illegal traffic.

Table 3.3: The identified priority actions for POP Pesticides.

1	Treatment of contaminated sites
2	Enforcement of the regulation including means for inspection (office Equipment and vehicles) for plant protection Department.
3	Training of the technical staff on POPs issues.
4	To incorporate detailed harmonized customs codification in the customs database for easy inventory and import control.
5	To incentive integrated pest management and industrializing the processing of the organic pesticides.
6	To built network on reporting pesticide importation from the Customs offices in order the report of importation can be directly from the customs office whit harmonized codification system.
7	Sensitization and Awareness actions on POPs for the small agricultural fields with emphasis women

3.4.6 Contaminated Sites with POPs

Contaminated sites in the country result from the old storage posts of pesticides and obsolete pesticides, which were removed. The sites, some information and actions are summarized as shown in the map below:

Figure 3.2: Map of sites contaminated with pesticides.

3.4.6.1 Brief description of locations considered most critical

a) Contaminated Site of Muziva - District of Nicoadala, Zambézia Province

Available data:-190 m^3, about 342 tones to eliminate.

Primary pollutant: Endossulfan 352 mg/kg.

The site with contaminated soil, which attracted the most attention was the case of Muziva, in the district of Nicoadala, Zambezia province, where in 1987/88 had an open hole in which obsolete pesticides were deposited, burned and buried. This site is prone to flooding in the rainy season and local people have used soils from this location for fishing activities. Faced with this situation, a

parallel study was carried out by the Faculty of Agronomy of Eduardo Mondlane University, which verified the existence of contamination in that location and that in fact the populations used those soils contaminated for fishing.

b) Contaminated Site of Lamego - Nhamatanda District, Sofala Province

Available Data:

- 80 m^3, about 144 tons to be excavate and transported; contaminated by Endosulfan (16000 mg / kg);
- 80 m^3, Approximately 144 tons for disposal; contaminated with Endosulfan 370 mg / kg;
- 32 m^3, of 57.6 tones resulted from demolition of the warehouse, for disposal (contaminated storage); contaminated by Endosulfan.

c) Contaminated Site of Matola (Matola City), Maputo Province.
Available Data:

- 245 m^3, approximately 441 tones for disposal; contaminated with Arsenic (626 mg/kg), Trifluralin (956 mg/kg), Toxaphene (1400 mg/kg) (Probably stored before 2014).

3.5 Assessment of Industrial POPs

3.5.1 Overview and Legal Framework

The only regulation that establishes the prohibition on POPs is the pesticide regulation Decree nr 6 of 31st March, and now there is a draft of chemical regulation including POPs under discussion. In addition to the chemical regulation under discussion the current PCB project has provision on specific PCB legal framework and management guidelines.

3.5.2 Evaluation and inventories of PCBs

In Mozambique, Polychlorinated Biphenyls (PCBs) are mainly associated with the use of transformer's oil containing these chemicals as additive, in electrical equipment. These products pose a risk for the environment and human health due to its high toxicity potential and high persistence in the environment.

However they have been used for more than 50 years in the world, due to the dielectric properties they give to the oil in transformers and capacitors, hydraulics system and ink/paint solvents products. Mozambique is not a producer, then all quantity of transformer oil containing PCBs has been imported.

3.5.3 Preliminary PCBs inventory results

Distribution of electrical equipment by Institution under inventory:

The PCB verification inventory involved several private and public institutions to verify the presence and concentration levels of PCBs in suspected equipment. In total, 214 suspected equipment, including switches, transformers, capacitors and voltage regulators were subjected to PCB screening. Of which 64 are owned by EDM and the rest are distributed among 7 private companies operating in the country. The survey included equipment scattered throughout the three regions of the country (South, Center and North).

The inventory covered different types of electrical equipment, but the most covered by the inventory were the transformers then the switches and finally the voltage regulators and capacitors, with the same number of equipment inventoried. The table below shows the equipment quantification according to its typology.

Table 3.4: Type and quantity of inventoried equipment.

TYPE OF EQUIPMENT	QUANTITY OF INVENTORIED EQUIPMENT
Voltage regulators	1
Switches	4
Transformars,	208
Capacitors	1
TOTAL	**214**

3.5.4 Analysis of the concentration of PCBs in inventoried electrical equipment

The tests carried out on electrical equipment made it possible to identify equipment containing concentrations above 50 ppm of PCBs. Of the 214 equipment covered by the inventory, 17 showed positive results (more than 50 ppm of PCBs), 58 with PCBs below 50 ppm and 139 totally negative tests.

Analysis of the distribution of equipment with more than 50 ppm of PCBs per Institution:

Of the total universe of inventoried equipment that tested positive for PCBs, four of them belong to private institutions and 13 belong to EDM, which makes EDM the largest owner of equipment with tested positive equipment.

Description of equipment with more than 50 ppm of PCBs per Institution

Private institutions: The equipment that presented more than 50 ppm of PCBs are transformers with the year of manufacture that varies between 1970 to 2009, being 2 belonging to Kenmare Moma Mining LTD and 2 belonging to Maragra sugar cane factory.

3.5.5 Location of equipment with more than 50 ppm of PCBs

The location of equipment with more than 50 ppm of PCBs is of great importance because it will influence the definition of locations for temporary storage. Looking at this aspect it is necessary to take into account all the data about the equipment and its location. The figure below shows the locations of transformers with more than 50 ppm of PCBs.

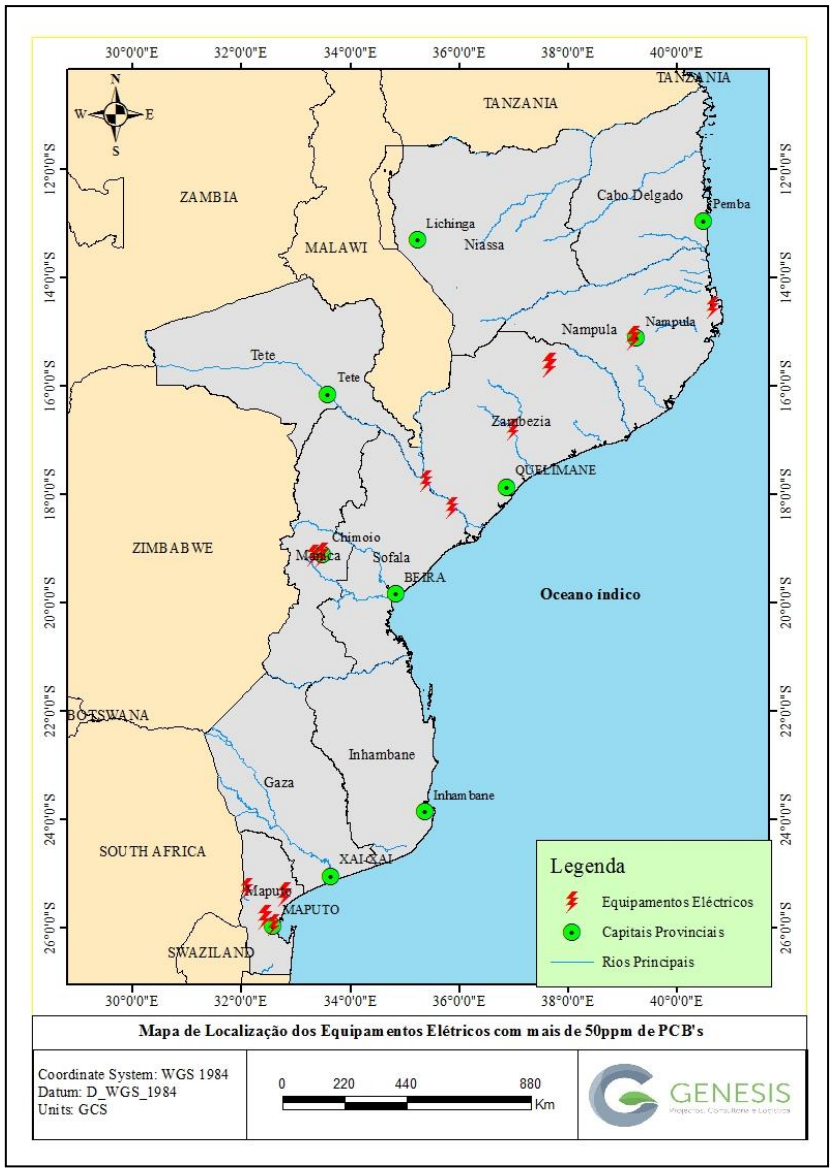

Figure 3.3: Location of transformers with more than 50 ppm of PCBs.

<u>Transformers were inventoried from the following companies</u>:

Cahora Bassa Hydroelectric Plant, Electricidae de Moçambique (EDM), Motraco, Xinavane Sugarcane, Maragra Sugarcane, Gigawatt, Sasol SA, Coal Mine Vale Mozambique, Moma Heavy Sand - Kenmare, Mozal Aluminum Casting, most transformers inventoried were imported from Europe, with few exceptions of some imported from South Africa. The capacity of transformers varies according to the projected capacity of electric power generation for different uses. In some cases, it was not possible to identify the manufacturers of the transformers or even the type of oil contained therein, specifically for the

transformers of the 50s, 60s and 70s years.

Compared to the 2006 Preliminary inventory data, the situation has changed due to the fact that the changes / substitutions made and the policies adopted by the World Bank, African Development Bank and other organizations, including government instructions through MITADER that recommend to all new development projects not to purchase equipment containing PCBs.

3.5.6 Conclusions of the PCB inventory

In summary the Preliminaries findings of the Inventory were:

a) The presence of PCBs in old electrical installations owned both privately and by the Mozambique Electrical Supply Company (EDM);

b) Workers handling transformer oils were not properly cautioned and instructed by the company which installed the transformers;

c) Most of the workers dealing with transformer oils were not aware of adverse health effects of PCBs;

d) Workers in the sector handled the oils without appropriate protective equipment;

e) There are alternatives to PCBs in the country i.e. Mineral oil and SF6;

f) Malpractices i.e, misuse of transformer oils;

g) Burning of electrical equipment that may contain PCBs in the scrap metal yards can be potential sources for PCDD and PCDF;

h) There is no specific regulation on the management of PCBs and equipment containing PCBs.

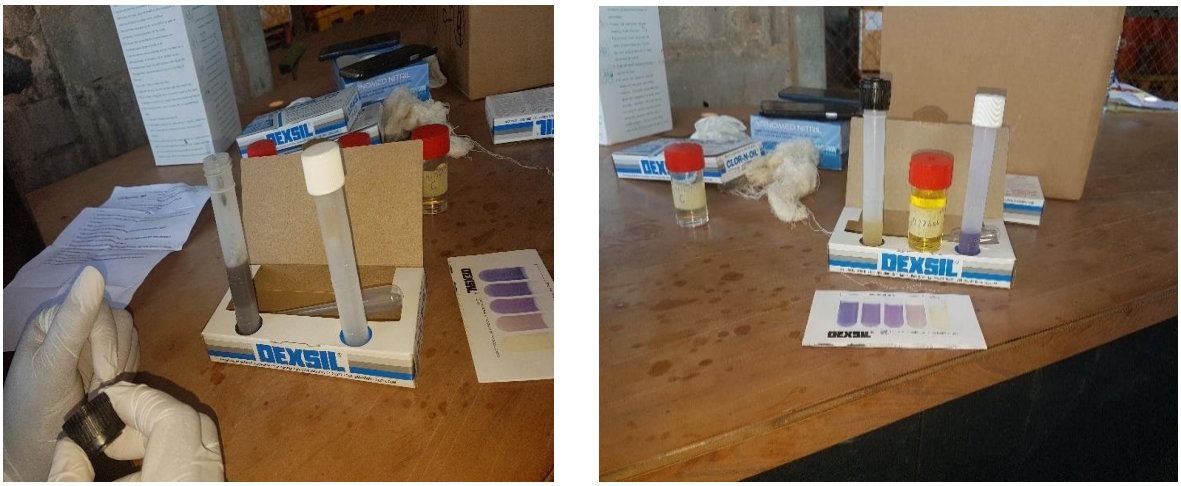

Figure 3.4: Workers of the Cahora Bassa Dam during the qualitative analysis of the chlorine content by the CLOR_ON_OIL method in 2018.

3.5.7 The priority actions identified for PCBs management

Table 3.5: Identified priority actions for POPs-PCBs.

1	Identification and Treatment of contaminated sites.
2	Continuously Training of the Companies technical staff on PCBs issues
3	Inventory of Equipment containing PCBs In the cities distribution lines
4	To build PCB transformers data base control, including the movements/the changes of transformers occurred in the electricity Network.
5	To build Central or regional storages for waste containing PCBs in the country
6	To incentive the use of Mineral oil
7	To build network on reporting Transformer importation from the Customs offices using International Harmonized System Codification
8	Sensitization and Awareness actions on PCBs inside the electricity companies, transformer maintenance companies and Scrap yards

Source: *Preliminary Report of the Regional Project of Safe Management of PCBs-Component Mozambique*

***Hexachlorobenzene* (Industrial chemicals)**

There is no information on the use or stocks of this chemical in the Country.

3.6 Assessment of the POPs-PBDEs (Annex A, part IV and Part V chemicals) and HBB (Annex A, Part 1 chemicals) New POPs

In May 2009, the conference of the parties amended the Stockholm Convention on persistent organic pollutants (POPs) to add new 9 POPs. From the nine POPs, Some of them were certain brominated flame retardants (BFRs) to annex A:

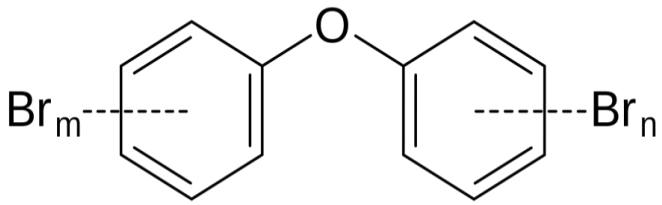

Figure 3.5: Structure of polybrominated diphenyl ethers (PBDEs).
Source: Guidiline for inventory of PBDEs, UNITAR, UNEP 2012.

In 2011 was approved the amendment to the list of convention. In the **Annex A** were listed 2 industrial Chemicals Polybrominated diphenyl ether and heptabromobiphenyl, subdivided into OctaBDEs that is composed by Hexabromobiphenyl ether, which makes up the commercial octaBDE and PentaBDE (composed of tetrabiphenyl and pentabromobiphenyl), with commercial name pentabromobiphenyl ether and Hexabromobiphenyl (HBB), and pentachlorobenzene (PeCB). In the **Annex B** industrial chemicals were also listed: Sulfonic acid perfluoroctane (PFOs) and its salts perfluoroctane sulfonyl fluoride (PFOSF). Recently was added in the annex A another industrial chemical product: hexabromocyclododecane.

3.6.1 Hexabromobiphenyl (HBB)

This is a chemical product which belongs to the group of Polibrominated biphenyl (PBBs) manufactured with the commercial names and products Hexabromobiphenyl, Octabromo biphenyl and decabro mobiphenyl (HARD, 2002, UNEP 2006). There is no much information on use or stock of this chemical in Mozambique. The production of HBB was stopped in 1970 and the majority of articles containing HBB were disposed decades ago and the stocks may be limited.

There are two Polybrominated diphenyl ether both refered to as POPs-PBDEs:

- Hexabromodiphenyl Ether and Heptabromodephenyl Ether;
- Tetrabromodiphenyl Ether and Pentabromodiphenyl Ether.

In accordance with the decision SC1/12 of the COP, the parties need to acquire a sound understanding of their national situation concerning these chemicals, by making the inventory, updating their NIPs and developing effective strategies that can lead to the elimination of the listed BFRs and endorsed by that COP (decision SC-2/7).

Table 3.6: Commercial PentaBDE (c-PentaBDE, **c**-Octabromodiphenyl Ether (C-OctaBDE and their Homologues).

Name	Chemical name/IUPAC	CAS nr	Annex A of the convention
Commercial PentaBDE (c-PentaBDE)			
The Homologues			
Tetrabromodiphenyl Ether	2,2',4,4'Tetrabromodiphenyl Ether (BDE-47)	CAS nr 40088-47-9	
Pentabromodiphenyl Ether	2,2,4,4,5-Pentabromodiphenil Ether (BDE-99)	CAS Nr 32534-81-9	
c-Octabromodiphenyl Ether (C-OctaBDE			
The Homologues	2,2,4,4,4,5,5 hexabromodiphenyl Ether(BDE-153)	CAS Nr 68631-49-2	
	2,2,4,4,5,6hexabromodiphenyl Ether(BDE-154)	CAS Nr 207122-15-4	
	2,2,4,4,5,6 heptabromodiphenyl Ether(BDE-175)	CAS Nr 446255-22-7	

	2,2,3,4,4,5,6 heptabromodipheny l Ether(BDE-183)	CAS Nr 207122-16-5	

3.6.2 Production of commercial PBDE mixtures

C-PentaBDE was produced in China, Israel, Japan, the United States and the European Union (EU), (UNEP, 2006a, 2010b; Li, 2012; Li et al., 2014). Production in the EU ceased in 1997. It is assumed that since the late 1990s POP-PBDEs were mainly produced in the United States and to a lesser extent in China and this production was discontinued in 2004 (UNEP, 2006a, 2010b; Li, 2012; Li et al., 2014).

C-OctaBDE was produced in the Netherlands, France, the United States, Japan, United Kingdom and Israel. The production was discontinued in the EU, United States and the Pacific Rim in 2004, and there is no information indicating that it is being produced in developing countries (Annex 3; BSEF 2007).

The compilation of PBDE production data prepared for the POPs Review Committee (POPRC) of the Stockholm Convention estimated the total production of all PBDEs from 1970 to 2005 to be 1.3 million to 1.5 million tones (Table 3; UNEP, 2010a). The total amount of c-PentaBDE and c-OctaBDE used in the world was estimated at around 100,000 tones each.

The production of c-DecaBDE, which is not listed in the Convention, but is currently under evaluation in the POP Reviewing Committee for listing (UNEP, 2014a, UNEP 2015, UNEP 2016), was estimated at over 1.1 million tones until 2005. While the production of POP c-PentaBDEs and c-OctaBDEs ended in 2004, the production of DecaBDE continues (2013, 2014a; Li et al., 2014).

Table 3.7: Total production of PBDEs commercial mixtures.

Commercial mixture	Tones
c-PentaBDE	91,000 to 105,000
c-OctaBDE	102,700 to 118,500
c-DecaBDE	1,100,000 to 1,250,000

Source: *UNEP, 2010a; derived from Schenker et al., 2008 and Li et al., 2010*

3.6.3 Legal framework PBDEs related

In 2018, the Goverment imposed by the regulation, no import permition and adopted hight taxes for the importation of the used vehicles with more 7 years after production.

The reason associated to this regulation are mainly environmental, in order to reduce the polution from mobile sources. This regulation is considered starting point and may be used as measure to control PBDEs in the country in the transport sector.

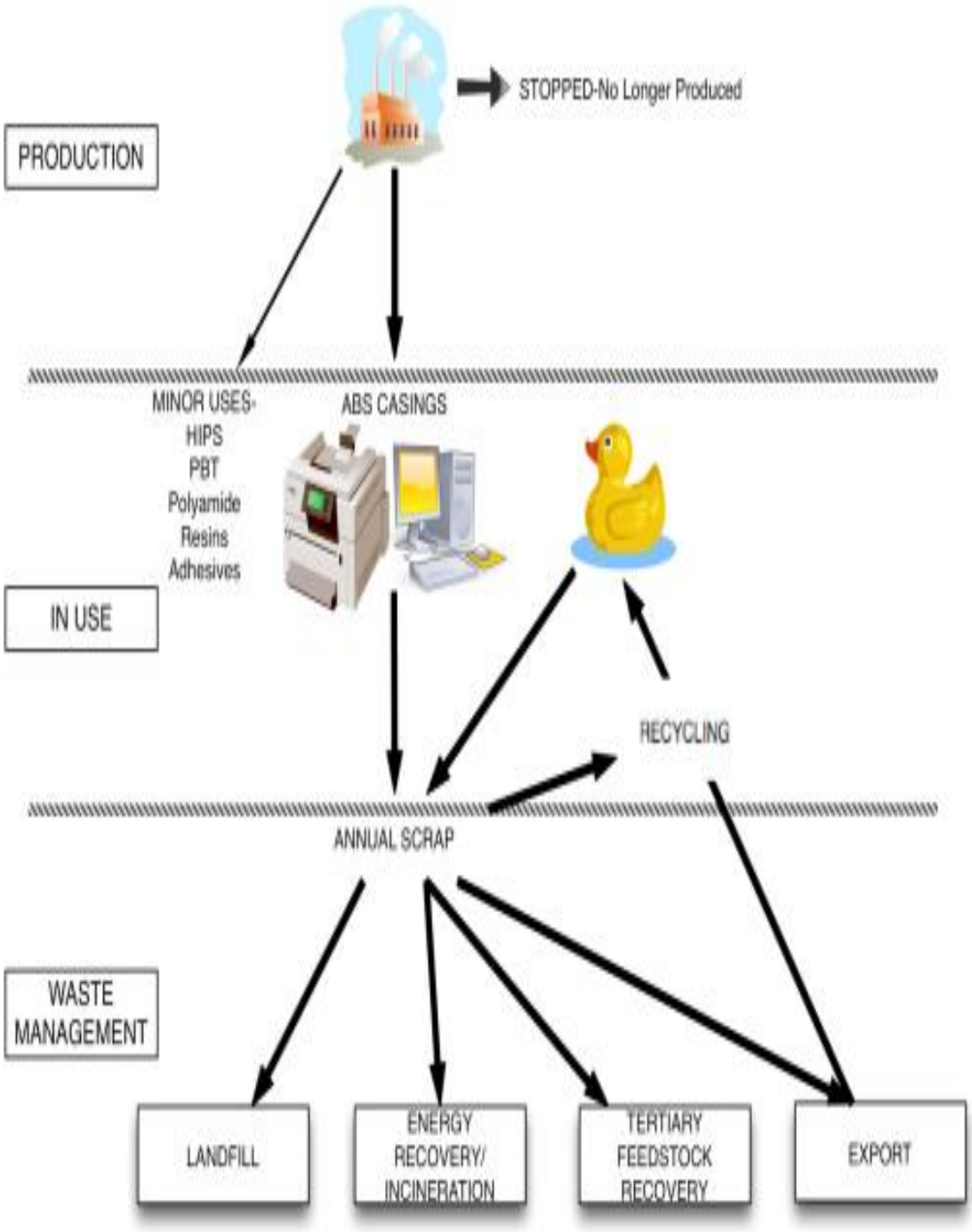

Figure 3.6: Schematic diagram of the life cycle.

3.6.4 Heptabromodiphenyl Ether (Commercial Octabromodiphenyl Ether): Commercial C- Octa-BDE Comercial

In the past the main usage of the C- Octa-BDE was in the acrylonitrile-butadiene-styrene (ABS), supplied by the European Union, representing about 95% C- Octa-BDE. The treated ABS is mainly used in the boxes and covers of

electrical and electronic equipment (EEE), in cathode ray tubes (CRT) and also in office equipment such as photocopiers, printers and copiers.

The country has intensive Communication development program promoting communication networks for the various public and private administrative sectors. There is no accurate information on waste management of the articles containing C- Octa-BDE or electric - electronic waste in the country from services using mobile and fixed devices such as computer, mobile phones, TVs, etc.

Figure 3. 7: Some equipment that uses PBDEs**.**

3.6.5 Inventory/estimation of Polybrominated diphenyl Ethers (PBDEs)

These chemicals are widely used in many industrial sectors to manufacture a variety of products and articles, including consumer articles. For example, POP-PBDEs are used in the electronics industry to manufacture plastic casings for computer equipment and in the transport industry for the manufacture of foam cushioning in automobiles. They also are used in variety of products including building materials, furniture, motor vehicles polyurethane foams, textiles, cushions, airplanes, electronic products, and upholstery.

In Mozambique there is no accurate information on the goods, vehicles, electronic devices containing PBDEs from the importation, but the country has been importing and continues to import electronic products, used cars and other materials that may contain this group of POP substances.

The country also has significant amount of scrap and obsolete electronic

products that may contain brominated flame retardants such as PBDEs that causes risk to human health and environment.

From the scientific data available, there are three types of commercial product contain a mix of PBDE blends that have been used in consumer products, namely c-Penta-BDEs, c-Octa-BDEs and Deca-BDEs. Because of the luck of information the country estimation Inventory was based on the existing data from the national statistical institute, on population data and assumptions and extrapolations including use of **UN COMTRADE /Global Harmonized System DATABASE, and SH codification for import and export**.

The Following HS code were considered (see Table 3.8):

Table 3.8: HS code and the concerning goods related to the importation to Mozambique.

HS CODE	Designation	Years (2085-2016)	Netweight In Kg	Quantity unity
8528	Television receivers, video monitors, projectors	2012-2016	53,469,382	1,370,089
8471	Automatic data processing machines (Computers)	2013-2016	32,676,134	1,159,056
8443	Printing and ancillary machinery.	1985-2004	442,298	136, 594
8470	calculators, cash register, Tickets Machines	1985-2004	67,205	345,853
8517	Electric apparatus for line telephone, telephone	1985-2004	1,061,364	676,567
8527	Radio, radio telephone receivers.	1985-2004	1,061,579	1,533,543
8540	Thermionic and cold cathode valves and tubes	1985-2004	83,142	7,759
8519-	Electronic sound reproducing equipment non recording.	1985-2004	55,156	72,480
8521	Video recording and	1985-2004	206,595	207,431

	reproducing apparatus			
8525-	Radio and TV type passenger motor vehicles	1985-2004	1,633,687	1,728,673
8702	Public transport passenger motor vehicle.	1990-2015	27,609,020	2,380,679
8703	Motor vehicle for transport of persons (except buses)	1990-2015	80,200,295	6,978,270
Total volume			**198,565,857**	**13,931,255**

The total preliminary estimation of volume of PBDEs importation to the county is of about (**198,565,857 Kgs)** of plastic containing goods (computer, mobile phones, TVs).

3.6.6 Assessment with respect to DDT (Annex B, Part II chemicals)

Only DDT is accepted for the purpose of Malaria control, after permit grant by the Stockholm convention focal point. Although the country has imported some quantities of DDT in the period of 2012 -2016, it has been never reported to the SC secretariat. (*Source, SC Secretariat*).

Presently the DDT stored in various provinces in the country, is only for Malaria control purposes. The baseline inventory revealed that DDT, which was mainly imported, has been used in the country including in 2017.

3.6.6.1 DDT Preliminary Inventory

The Table 3.9 shows the Dicloro-Difenil-Tricloroetano (DDT) use in the country.

Table 3.9: Usage of Dicloro-Difenil-Tricloroetano (DDT) in Mozambique.

Importation in 2014: 72,400 Kg	**Distribution by Province**	**Received 2014**	**Used 2014**	**Used 2015**	**Remain Stock 2015**	**2017**
	Maputo	27,148.00	1,622.89	17,380.82	3,747.75	
	Gaza	10,197.40	4,513.12	5,952.28	0.00	
	Sofala	11,390.00	0.00	6,378.40	0.00	

	Tete	20,971.00	6,872.19	15,616.00	0.00	
	C.Delgado	2,694.00	2,694.00			
Total		**72.400,40**	**15702,20**	**45327,50**	**3747,75**	**25T0N Re-exported to Germany**

Source: MISAU (Ministry of Health) 2017/ National Malaria Program.

Documented 25 Tons none used DDT were re-exported to Germany for disposal in December 2017 (Surce: MITADER).

3.6.6.2 Conclusions of DDT inventory

- There is a need to discuss the importation figures of DDT among customs, Plant Protection Department, MITADER and National Directorate of Commerce.
- There is a lack of information on the results of residual monitoring of areas, formerly where DDT was applied and areas used for DDT storage.
- There is no location and mapping of DDT storage locations across the Country, including their respective geographical coordinates or georeferencing.

3.6.6.3 Recommendations of DDT inventory

- To establish a DDT Central and provincial Databases.
- To set up reporting system on waste Management including tank/residual sludge disposal or Residues after spray or washing the tank sprayer.
- To map DDT storages around the country including the GIS coordinates.
- Effective Implementation of the pesticide regulation on the articles related to DDT as well as compliance with transparency, import

procedures and adequate transparency, communication and written permits under the pesticide regulation even in case of emergency.

- The country must report permanently the import and use of DDT to the secretariat of the Stockholm Convention.

3.7 Assessment of PFOSs, CAS No 1763-23-1, its Salts and PFOSF CAS No 307-35-7 (Annex B, Part III chemicals)

3.7.1 PFOs, its related substances, characteristics and the listing in the Stockholm Convention

PFOs are fully fluorinated (per fluorinated) substances, which are commonly used as salts in some applications. PFOs are also commonly incorporated into polymers or other substances such as sulfluramid.

While PFOs can exist in anionic, acid and salt forms, the PFOs anion is the most common form in the environment and in the human body (Environment Canada, 2006). The aim of listing PFOs, its salts and PFOSF in the Stockholm Convention is to restrict the use and production of PFOs and its related substances. The term "PFO-related substances" is used for all substances that contain one or more PFOs moiety (defined as C8F17SO2). Since PFO-related substances are considered PFO precursors, the related substances will be considered to have the same POP characteristics as PFOs. These PFO-related substances are restricted through the listing of PFOSF, the basic material for their manufacture, and the listing of PFOs in the Convention. PFOSF is an intermediate material for production of all PFO related substances, and they are all restricted to the uses listed as acceptable purposes and specific exemptions under the Convention. For the use of PFOs for acceptable purposes, countries should request specific exemptions from the Convention secretariat.

Many more PFO-related substances exist, and they are all regulated under the Convention. There are several references listing the PFO-related substances, of which the most comprehensive is the list compiled by the Organization for Economic Co-operation and Development (OECD, 2007). PFO-related substances refer to a larger group of substances containing perfluorinated

sulfonyl with eight-carbon chain length, which may be simple salts of PFOs (e.g. potassium, lithium, ammonium, and ethanolamine) or polymers that contain PFOs.

Although the net contribution of individual PFO-related substances to the total environmental load of PFOs cannot be readily predicted, there is a potential that any molecule containing the PFOs carbon chain could be a precursor to PFOs. PFOs can be formed by environmental microbial degradation or by metabolism in larger organisms from PFO-related substances (UNEP, 2006b).

3.7.2 Production and use of PFOs and its related substance

PFOs are typically used for surface treatment, and are common in non-stick products, stain-resistant products and all-weather clothing. Their unique physical properties, being both fat and water repelling, have made them popular in several products.

Due to their surface-active properties, they are used in a wide variety of applications, including firefighting foams and surface resistance/repellence to oil, water, grease or soil.

Mozambique, is not a PFOs producer, but imports it for use. They are imported from overseas, being the major users: firefighters, air ports, fuel terminals, coal miners, harbour or ports.

3.7.3 Inventory/Estimations based on statistics

If import, manufacturing and export statistics were available, it might be possible to estimate the annual net consumption of PFOs and their related substances. To quantify the amounts of PFOS in all use categories (listed in annex 2 of the UNEP Guideline), data can be processed through statistics on manufacture, export and import volumes from a national statistics bureau. The net consumption can be calculated by using the following formula:

Annual net consumption of PFOs in [country] = [manufacture + import – export] of PFOs containing products or articles x PFOS content*

* *The average content of PFOs in various articles or products is given below.*

The statistics bureau may provide foreign statistics (import and export) for different product [article/substances] codes. Calculations based on the statistics must be regarded as estimates of real net consumption of PFOs.

The information to be obtained from the inventory includes:

- Production and use of PFOs and its related substances at the national level;
- Presence of products and articles containing PFOs and its related substances in the consumer market;
- Flows into the country of products and articles containing PFOs and its related substances;
- Waste fractions of specific importance;
- Disposal practices for products and articles containing PFOs and its related substances when they become wastes;
- Stocks;
- Releases of the PFOs to the environment from point sources;
- Potential contaminated sites;
- Potential harmful exposure of humans and environment.
- Existing information from South African Department of Environment presented

In the regional workshop on NIP update preparation organized by the secretariat BRS convention, held in Pretoria (June 2018) revels that Mozambique is the major importer of PFOs from South Africa in the SADC region with **700 kg** for the period **2010-2013**.

3.7.4 Preliminary inventory and status of PFOs in Mozambique

The following demonstration illustrates the state of the situation related to the PFOs in the Country and directs to a reflection. In Mozambique there is no accurate and structured information or database as required for the PFOs Inventory. The existing data of goods, devices containing PFOs from the

National Statistical Institute are structured taking into account only importation cost, that makes very difficult to separate the quantities of each or group of goods containing PFOs.

The inventory using questionnaires was not successeful, because of that, the team used UN COMTRADE/Global Harmonized System DATABASE, SH codification in order to collect data from the Countries sources for the inventory. The following HS codes were used for the estimation:

Table 3.10: Reverse search data from COMTRADE database on imports from Mozambique 2013-2016.

HS CODE	Designation	Years	Netweight In kg	Quantity units
HS :291590	PFOs	2013-2016	17,138	17,138
HS :290490	Perfluorooctane sulfonic acid (PFOs), its and perfluorooctane sulfonyl fluoride(PFOSF), FC-95	2013-2016	12,956	12,956
HS :382200	PFHxS	2013-2017	2,487,004	2,487,004
Total			**2,517,098**	**2,517.098**

The total quantity of PFOs imported during the period **2013-2017** is approximately **2,517 tones.**

3.7.5 Main Priorities and Recommendations of the Preliminary Inventory of PFO - POPs

- Assessment of the main sources of chemical substances such as fire-fighting foams used by firefighters in firefighting, from companies such as Extin Maputo, Moz fire-oil terminals, mining companies, Hulene landfill, the main scrap yards in the city of Maputo, sensitization of workers dealing with these products and the general public.
- Regulatory framework.
- Incentives to alternatives to PFOs.

3.8 Assessment of releases of unintentional produced chemicals (Annex C chemicals)

Annex C of Stockholm Convention includes **Dibenzo-p- Dioxins Polychlorinated** and **Dibenzofurans** (**PCDDs/PCDFs), Hexaclorobenzene (HCB), Polychlorinated biphenyls (PCBs)** as product causing unintentional emissions.

Pentachlorobenzene has been included in the list of unintentional formed POPs, released from thermal processes involving organic matters and chlorine as a result of uncompleted combustion or chemical reaction. These substances are also considered in the group of Dioxins and Furans.

3.8.1 Dioxins e Furans

The assessment of unintentional releases is part of the obligation under Article 5 of the SC for measures to reduce the total releases from anthropogenic sources of chemicals listed in Annex C, with the aim of their continued minimization and where possible their elimination.

Inventory data for economic year 2017 was used for all identified activities and Toolkit emission factors were applied. The National Emissions Inventory for PDDD (Dioxins) / PDDF (Furanos) in Mozambique (2017) is the first accurate inventory of the general assessment of dioxins and furans. This overall evaluation inventory made had less uncertainties related to undefined emission factors compared to the past inventory made on the basis of Toolkit 2003.

The work team decided not to take into consideration the general evaluation inventory based on Toolkit 2003, but rather to make a new inventory based on the revised Toolkit 2015 and to make some comparison of some results.

The elimination of PCDD / PCDF releases depends greatly on the transfer of appropriate technologies; adoption of BATs and BEPs; strengthening of relevant laws and their application; greater public awareness of the dangers of PCDD / PCDF; use of various tools and toolkits developed by the Stockholm Convention, establishing appropriate standards and protocols for monitoring and strengthening monitoring capacity. Since PCDD / PCDF is a new area,

academic support and experience is needed to support the Country in the implementation of its PCDD / PCDF Action Plan.

Considerable measures to reduce emissions were taken after the country ratified the SC. Since 2006, measures such as the public awareness campaign against forest fires (PECODA programme), plastics regulation, solid waste management regulation no. 94/2014 of December 31, taken by the Ministry of the Environment (MITADER), regulation of the use of unleaded gasoline, practices of continuous recycling, production and gas consumption by the Country allowed the expansion of its use in the domestic industry and kitchen.

According to the Toolkit, activities that generate dioxins and furans can be grouped into 10 major categories, which in turn are divided into subcategories. In Table 3.11 below, all categories are listed and "X" indicates the possible release routes.

Table 3.11: Main categories of sources and Potential Release routes.

		Release routes				
#	**Main source categories**	**Air**	**Water**	**Land**	**Products**	**Residues**
1	Waste incineration	**X**				**X**
2	Ferrous and non-ferrous metal production	**X**				**X**
3	Power generation and heating	**X**				**X**
4	Production of mineral products	**X**		**X**		**X**
5	Transport	**X**				**X**
6	Open burning process	**X**				
7	Production and use of chemicals and consumer goods	**X**	**X**	**X**		**X**
8	Miscellaneous	**X**	**X**		**X**	**X**
9	Disposal	**X**	**X**	**X**	**X**	**X**
10	Identification of potential hot -spots	**X**	**X**	**X**		**X**

From the inventory, the total emission of dioxins and furans was 548.7 g TEQ /

year, corresponding to 30.5 µg TEQ / person / year and 686 µg TEQ / Km^2 / year. The highest release percentage of these products corresponds to 64.5% waste emissions and 35.2% to the atmosphere. The total emission for waste was 353.5 g TEQ, of which 351.1 g TEQ, representing uncontrolled combustion / open burning.

In the category of uncontrolled or open burning, burning of municipal waste, burning of agricultural waste and biomass and uncontrolled forest fires are the main sources of emissions.

3.8.2 Summary of the inventory of Dioxins and Furans

Considering that the objective of this inventory was to estimate the magnitude of the emissions and to identify the main sources, it can be concluded that the methodology used represents a cost-benefit ratio. The result obtained should be considered as the first approximation, because there is a considered degree of uncertainties regarding the factors used in each case.

Table 3.12: Summary of estimates of all emissions.

		Annual releases/ emissions				
No	Main source categories	Air	water	Land	Product	Residue
1	Waste incineration	0,605	0,000	0,000	0,000	0,001
2	Ferrous and non ferrous metal production	0,140	0,000	0,000	0,000	0,350
3	Energy generation and hitting	9,101	0,000	0,000	0,000	1,822
4	Mineral product production	1,420	0,000	0,000	0,000	0,282
5	Transport	0,506	0,000	0,000	0,000	0,000
6	Open burning process	181,087	0,000	1,810	0,000	351,082
7	Production and use of chemicals and consumer goods	0,000	0,001	0,000	0,000	0,000

8	Miscellaneuos	0,066	0,000	0,000	0,000	0,000
9	Disposal	0,000	0,000	0,000	0,000	0,000
10	Potential hot spots	X	X	X		X
	Total	**192,925**	**0,001**	**1,810**	**0,000**	**353,536**

The above data is indicative of a preliminary assessment but may change after a detailed inventory at the time of implementation of this updated NIP.

3.9 Evaluation of new non-intentional POP Pentachlorobenzene (PeCB)

Pentachlorobenzene has been included in the list of unintentional formed POPs, as the result of an incomplete or reactive chemical reaction. This is also part of the dioxin and furan groups. This new unintended POP was not inventoried in 2018.

There is no information on the export, use and stock, also on thermal processes, where it appears as a by-product that can cause contamination.

3.9.1 Control of unintentional produced POPs

There is no integrated action plan for the control of unintentionally produced POPs.

Each sector, such as agriculture and forestry, civil protection firefighters and municipalities have taken their own measures to reduce and control open burning, but without assessing the effects on human health.

3.9.2 Main priorities and recommendation actions for unintentional produced POPs

Table 3.13: Main recommendations and priorities for POPs produced non Intentionaly.

Recomendations	Main priority action
For the reduction of emissions, it is recommended that large polluters eliminate the use of unsafe production practices	✓ Introduction of best available technology
Uncontrolled waste burning and uncontrolled forest burning or of	✓ Enforcement of the existing solid waste regulation, forests

biomass are the major sources of Dioxins and furans in Mozambique	and uncontrolled burning ✓ Environmental inspection and inspection are recommended to act in accordance with the regulations on open burning waste, such as in Municipality Councils and waste management operators ✓ Monitor the availability of sensatization programs prohibiting the waste open burning
There is a need for continuously update	✓ New detailed inventories, introducing new and concrete information, which should be considered indicator of minimization / reduction of emissions ✓ Continuing training of the various stakeholders

3.9.3 Candidate locations for contaminated sites by PFOs, PBDEs, Dioxins and Furans

From the preliminary characterization of sources, the main sites with PFOs and PBDEs in the country resulting from chemical substances such as fire-fighting foams used by firefighters in fire-fighting are companies such as Extin Maputo, oil terminals, mining companies, as well as the Hulene dump and the main scrap yards in the city of Maputo. These sites are suspected of being sites contaminated by the fact that, for many years, several articles were deposited in them with PFOs and PBDEs, and in some cases the garbage was burned causing Dioxins and Furans.

Further studies should be done to determine the levels of contamination at these sites. Table 3.14 below shows potential sites Contaminated Candidates.

Table 3.14: Candidate sites for sites contaminated by PFOs and PBDEs.

Candidate sites for sites contaminated	Possible contaminants	owner	Location
Hulene dumping Site	PFOs, PBDEs, Dioxins and Furans	Maputo Municipality	Hulene Neighborhood

Matola dumping Site	PFOs, PBDEs, Dioxins and Furans	Matola Municipality	Malhampsene Neighborhood
Scrap yards, (scrap Lopes)	PFOs, PBDEs also may contain PCBs, Dioxins and Furans	União de Sucatas (Private)	Luís Cabral Neighborhood
Vulcano scrap yards	PFOs, PBDEs also may contain PCBs, Dioxins and Furans	Sucata Vulcano (Private)	Chamanculo Neighborhood
Chambule scrap yards	PFOs, PBDEs also may contain PCBs	Sucata Chambule (Private)	Alto Maé, near Charlot Theater

Figure 3.8: Metal Scrap Candidates for Contaminated Sites.

Contaminated sites are, for example, the large scrap yards around Maputo City, Vulcan Scrap, Junk Union (Lopes scrap) and Chambule Scrap, the last is in Alto Maé, near residential areas.

3.9.4 Permission to import PFOs and electrical-electronic equipment containing PBDEs

At present, the question of the country requesting exemption to continue to use products containing PFOs and PBDEs is not yet fully defined. It is necessary to consult with the private sector and other stakeholders and to assess the socio-economic impact of the measure in order to establish requirements for exemptions. It should be noted that some exemptions have already been discontinued.

3.10 Existing Monitoring Programs

Mozambique needs not only a specific law on POPs, but also laboratory infrastructures to analyze POPs in the environment and in human organisms or in the food chain. Eduardo Mondlane University, the Ministry of Agriculture and the Ministry of Health have laboratories with some capacity to analyze POPs, particularly pesticides, but some of their analytical equipment is significantly obsolete and is no longer adequate for an accurate analysis of POPs in water, air or soil. Technical personnel also need specific training on the type of laboratory analysis to be performed. Above all, it is necessary to establish a national POPs control plan, which will establish a planned and coordinated action for the monitoring of POPs throughout the country, creating the necessary requirement for POPs emissions control in industrial, agricultural and anthropogenic activities in Mozambique.

In terms of training to monitor POPs in Mozambique, the only activities carried out were basically the training of one or another MITADER person and seminars on identification, inventory and risk estimation. Therefore, much needs to be done to establish an effective capacity to monitor the environmental and health impacts of POPs, which should be part of the updated NIP activities. However, it is important to note that the Ministry of Agriculture and MITADER have technicians with necessary capabilities, who may be instrumental in planning the capacity needed to monitor POPs in Mozambique.

Capacity building for POPs monitoring should first include the evaluation of

existing laboratories in order to identify existing capacities and establish the needs and the best strategy to be followed for the necessary national capacity building.

Two preliminary studies on dioxin and furan releases were carried out by MITADER, but little came out of them, as it was extremely difficult to collect data from industrial sources, although industrial emissions were believed to be very low. The main source of these emissions has been identified as the burning of waste and biomass for various purposes.

In conclusion, it can be said that there is no monitoring program in Mozambique to control the emissions of POPs, and that the challenges that must be overcome to establish this monitoring are as follows:

- ✓ Few data on POPs available, and the one existing are fragmented and scattered among different institutions namely MISAU, MASA and MITADER;
- ✓ The Ministry of Industry and Trade has no infrastructure, neither to collect data nor to analyze POPs industrial emissions or even a program pursuing that objective;
- ✓ There is no coordination and exchange of information among the mentioned institutions;
- ✓ There is almost no laboratory capacity to analyze POPs, particularly those of main concern such as PCBs, dioxins, furans, unintentionally produced POPs, although some capacity exist for pesticides.

The coordination between MITADER as the focal point of the EC and other institutions such as the Ministry of Mineral Resources and Energy, Ministry of Industry and Trade, Ministry of Agriculture, Ministry of Health needs to be well established for the purpose of monitoring emissions of POPs.

3.11 Current level of information, awareness, and education among target groups; existing systems to communicate such information to the various groups

Rapid Social Assessment is one of the recommended methodologies, which

has been used by NGOs, where throughout the process should be a tool to ensure the involvement and ownership of stakeholders in the implementation of the NIP.

Lobbying should be carried out to raise the problems of POPs to an acceptable level at the top of the national agenda, as severe financial constraints, limited knowledge and commitment at the decision-making levels, and difficulties in understanding the inter- POPs and public health, and poverty elimination, are directly linked to the achievement of sustainable national development, including ensuring sustainable food production, reliable quality water supply, sanitation, waste management, and fostering public health. At present there is a relatively small number of stakeholders, aware of the problems related to POPs, seriously concerned about various environmental and health impacts, and considers mitigation and elimination of POPs as a priority.

Most stakeholders consulted, while appreciating the seriousness of potential problems, do not place comprehensive mitigation and management of POPs as a priority in everyday life. Awareness of environmental and health problems related to PCBs/Dioxins/Furans is almost non-existent and has no comparison with the public or private priorities of the first line. The poor knowledge of POPs and total lack of knowledge of POPs by various population groups, such as farmers, company employees, children or students, is related to the lack of institutionalized communication channels, inefficiency of existing information, insufficient environmental dissemination, very insipid communication and education.

Training initiatives within NIP implementation should consider some NGOs that may need training on the role they can play in addressing POPs issues.

3.12 Mechanism to Report under Article 15 on Measures Taken to Implement the Provisions of the Convention and for Information Exchange with Other Parties to the Convention

The only measure that has been implemented so far to comply with Article 15 by the Country is the removal of obsolete pesticides under the program to

reduce the accumulation of obsolete pesticide stocks in Africa and subsequently exported to AVR-Netherlands and Germany in 2008, and approximately 30 tons of DDT residues, which were predestined to control the malaria vector in the health sector, were exported to Germany in late 2017.

3.13 Relevant Activities of Non-Governmental Stakeholders

During NIP update activities on raising awareness, the local NGO - Africa Foundation for Development, funded by the GEF UNEP Project for POPs within WWF, had the task of sensitizing communities and preparing an appropriate approach to POPs. Thus, the preparation of the respective strategy by the NGO Africa Foundation for Development is ongoing.

3.13.1 Activities of NGOs

MIITADER, as the coordinating institution for the implementation of the SC in the Country, involved the most relevant NGOs interested in POPs issues. They were invited to participate in an action planning seminar and in local training. The selected NGOs were: Livaningo, Environmental Justice and Foundation for Africa Development (environmental protection organizations). In this initiative, public and private companies, Eduardo Mondlane University, international consultants and advisors, helped to address a variety of social factors critical to successful implementation of the NIP. The affected local communities were not included in this initiative. Some awareness-raising activities on POPs were also carried out by MITADER among members of the Mozambican Parliament.

Several activities were carried out by national NGOs between the 1st and the updated NIP period, such as public awareness and awareness on the Stockholm Convention.

The NGO Livaningo was one of the most active in raising awareness about the lack of industrial efficiency by burning waste in an uncontrolled way in the Hulene wastebasket in Maputo, thus requesting the closure of it by the Municipal Council of Maputo City.

Unfortunately the disaster happened, when the rains caused the demolition of part of the mountain of garbage and as a consequence several houses were destroyed killing 17 people.

3.14 Overview of Technical Infrastructure for POPs Assessment, Measurement, Analysis, Alternatives and Prevention Measures, Management, Research and Development – Linkage to International Programmes and Projects

There are no technical infrastructures in the country for evaluation, measurement, analysis, design of alternatives and prevention of POPs, management of research and development, linkage to international programs and projects.

3.15 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

3.15.1 Impacts of POPs on human health and the environment

In the past, according to the inventory of obsolete pesticides and MASA records, most pesticides used in Mozambique were found to be organochlorine pesticides (POPs), which include all pesticides listed in the POPs Convention. These agro-toxicants pose a major health and environmental risk because of their high toxicity, persistence and potential for bioaccumulation. In 1999, the use of these substances was prohibited in Mozambique, but their intensive use in the past, persistence in the environment and health risks make them a health and environmental concern. However, such pesticides were re-exported to Europe. At present, priority is given to the proper management of contaminated sites, including contaminated soils requiring attention. The negative impact of POPs on flora and fauna is completely unknown. From these findings, it is clear that studies and research on the impact of POPs on health and the environment are necessary.

Poor enforcement of specific rules and work instructions related to storage, transportation, preparation, use of pesticides, etc., as well as insufficient public

awareness of the health risks associated with pesticides, has led to multiple breaches of the regulations on handling of toxic substances, including the uncontrolled use of pesticides in individual farms. This has led to occupational health problems for many people directly involved in handling pesticides. It also contributed to pesticides entering the environment and circulating in food chains. It is advisable for Mozambique to investigate food chains suspected of being contaminated with pesticide residues, such as cereals, fruits, canned products, dairy products and meat, to determine the level and frequency of contamination and their relationship to human exposure POPs and others. Some samples relevant for analysis may be the breast milk of women and body fluids of people living in places where significant quantities of these pesticides have been applied. The toxic effects of POPs on exposed persons include reproductive dysfunctions and other functional disorders in women, as well as increased frequency of male sterility, the incidence of both being related to the level of exposure to pesticides. These are the main factors that should be considered in gender studies.

Epidemiological studies should also be performed to reveal the correlation, if any, between the level of use of POPs in previous years and morbidity due to chronic hepatitis and liver cirrhosis in the researched areas of Mozambique. This study may indicate the level of correlation between the general level of pesticide use and child mortality, immune system disorders, as well as cases of physical and mental retardation in the areas of interest. The extent of health problems related to the number of people and affected areas will also be another indicative result of an epidemiological study on POPs. The study is relevant not only because of the past application of pesticides but there are likely to be people using POPs pesticides on an individual basis.

3.16 Details of any Relevant System for the Assessment and Listing of New Chemicals

3.16.1 Listing of new chemicals

There is no functioning system, even under research institutions.

3.16.2 Regulation of chemicals already in the market

There is a new proposal for regulation of chemicals management, including POPs under discussion, but is not yet approved. This Regulation should make room for the adoption of the new POPs as soon as the secretariat adds them to the list.

Mozambique, like many other developing countries, does not yet have a chemical control system on the market to verify its characteristics in relation to POPs.

3.17 Economic Assessment

Mozambique is basically an agricultural country, where about 80% of the population lives on the basis of agriculture. Income crops, such as cotton and tobacco, are major agrarian activities with a major impact on the economy, since they are export products (apart from fishery products). The industry in Mozambique still shows very few activities since the need to recover from the recent economic crisis, the current international context and globalized markets do not favor an industrial boom in Mozambique that could produce a considerable quantity of POPs. In addition, Mozambique does not produce any of the products listed in the SC in addition to the POPs. The needs for pesticides and other products containing POPs are met through import, which is done under very weak control that needs to be strengthened and operationalized.

As indicated above, another source of POPs in Mozambique are transformers and other equipment that work with oils containing PCBs. For many years, Mozambique was involved in the civil war, which destroyed the national industry and, together with the centrally planned economy, did not allow the industry to flourish. The privatization of the industry adopted as a result of the country's economic restructuring and democratization since 1992 has not produced positive changes in industry. Exception should be made for pesticides, for which a control system for import and use already exists. Therefore, the economic impact of POPs in Mozambique should be analyzed in terms of socio-economic costs resulting from high pesticide-consuming agricultural

activities and the production and distribution of electricity.

During the preparation of the NIP update, the consultant institution engaged a consultant who conducted an economic assessment based on cost benefits and health impacts of POPs analysis, based on the cost-benefit analysis of mitigation and management options. The study presents some numbers that reflect cost-benefit comparisons of some POPs management options, as summarized below:

Table 3.15: Cost-benefit analysis of POPs management options.

Management Options for POPs	Units	Cost Benefit Balance
Control using Laws/regulations	USD	7.100.000,00
Economic Instruments	USD	12.315.000,00
Incineration	USD/Ton	30,74
PCBs public awareness campaigns	USD	1.305.000,00
Steam sterilization	USD	>1.305.000,00

Any economic assessment of environmental management and mitigation options is usually based on the availability of data on environmental monitoring, epidemiology, population and their temporal and spatial dimensions, to establish and quantify direct response and other relationships between individual POPs and measurable environmental and health effects. The conditions and assumptions indicated above are not yet established in Mozambique, so the greater value of this report falls, in some way, on the difficulties and constraints. On the other hand, the Mozambican market does not appreciate the value of the environmentally correct production, use and disposal of POPs, translating them into the prices practiced, so that the benefits can be well considered. In addition, the cost of externality is also not in force. Therefore, the attempt made to calculate the cost-benefit of the POPs management options presented above is doubtful and needs to be reviewed in the steps that will follow in the implementation of the NIP update.

It may be best to use the benefit transfer approach to estimate the cost-effectiveness of the various alternative options for dealing with POPs-related problems based on the inventory already carried out. Again, at this stage, only make available the results of this socio-economic assessment in a way that serves to identify corrective measures for the action plans.

4. CHAPTER III: STRATEGY AND ACTION PLAN

4.1 Policy Statement

The Government, particularly through MITADER and MASA, is very concerned about POPs and other toxic chemicals that have probably entered the water, soil and food chain on which all living beings, including humans, depend on for its existence. However, awareness of the dangers of POPs is not yet widespread in all affected and interested parties, such as companies that market or use products, NGOs and the general public. This is one of the challenges to be taken into consideration in the implementation of the NIP.

Mozambique needs to develop a holistic National Policy on POPs and other hazardous chemicals within the NIP implementation process. This policy should provide for the establishment of a national chemical safety management system, applying the precautionary, prevention and polluter pays approach to identifying pressures and impacts of chemicals, evaluating remedial options and implementing effective measures to avoid environmental degradation, and particularly health impacts. The elaboration of the policy on POPs can constitute an opportunity for the revision of the National Policy of the Environment.

In fact, by signing the Stockholm Convention, the Government of Mozambique is obviously considering the POPs and other toxic chemicals highlighted in the Convention - a cause of concern, and therefore a priority for the country. This position of the government promotes modernization of the existing system of control and management of national chemicals with a view to environmentally sound management of toxic, persistent, harmful and bio-accumulative substances in living beings. The minimization and final elimination of pressures and impacts related to POPs in the natural and human environment should be an integral part of the National Environmental Policy. It is considered environmentally sound management of chemicals, if properly configured and functional, an important element that contributes to the country's well-being, sustainable development of the society and the alleviation of poverty. The proper resolution of problems related to POPs pesticides and the proper

management of other banned and unused agricultural chemicals are considered to be important steps towards the promotion of environmentally clean agricultural products in Mozambique. It is for this reason that the seminar from 9 to 10 December identified specific regulations on POPs as national priorities.

The policy should also recognize the need to apply a precautionary, prevention and polluter-pays approach to the identification of POPs and the implementation of cost-effective measures to prevent environmental degradation and negative social, particularly health, impacts. Finally, the Policy should establish goals to minimize problems related to POPs according to the criteria and priorities to be defined in the appropriate forum.

The Government is strongly committed to making every effort to secure funding from both the national budget and bilateral and multilateral cooperation to support the implementation of the NIP. The Government will also undertake the institutional, regulatory and legislative reforms necessary to incorporate the issue of POPs into its varied socio-economic agendas in Mozambique.

4.2 Country Strategic Vision

The Country strategy for establishing a nation-wide chemical safety management system and solving of POPs priority problems is based on the policy statement and encompasses the aspects and objectives in the following areas:

- ✓ Policy;
- ✓ Legislation;
- ✓ Management;
- ✓ Financial Resources and Mechanisms;
- ✓ Human Resources;
- ✓ Strategic Approach and Objectives;
    - Strategic formulation;
    - Strategic objectives.

- ✓ Chemicals Management Structure;
- ✓ Information Exchange;
- ✓ Public awareness, information and education.

4.2.1 Policy

- Obligations under the Stockholm Convention are only a subset of broader international obligations of Mozambique, which may be defined as “environmentally sound and integrated management of chemicals”. The links and Operational platform among the Stockholm Convention, the Basel Convention and other relevant international conventions should be established.
- The national environmental and sectorial policies, strategies and programs should be modernized (updated) and must reflect POPs priority elements, as well as other dangerous and toxic substances management issues. The flexibility mechanisms shall be built-in to allow timely and efficient adjustment and updating when warranted. The policies, strategies and programs shall provide prioritization of action, based on cost -benefit analysis and potential threat of POPs to human health, welfare and the environment.

4.2.2 Legislation

- Existing regulatory gaps have to be filled-in and legislation has to be amended to ensure cross-sectorial and media consistency and timely transposition of international obligations. The legislation shall address some specific POPs issues, which are not currently covered by existing legal and regulatory framework, both at the national and sectorial levels. Particularly it should be established regulations of great concern for Mozambique on: **PCBs, Dioxins and Furans, DDT, all new POPs and industrial chemicals in general**.
- Implementation regulations, procedures, standards and guidelines shall be drafted in an integrated manner, clarifying monitoring, reporting, control, implementation and enforcement responsibility of

the respective ministries and agencies, and creating a unified and integrated computerized system of tracking regulated POPs, dangerous and toxic substances and other chemicals through their life cycle.

- The revision of the environmental standards related to the management of hazardous chemicals will focus not only on numerical values, but on a broad reform encompassing the principles and the legal basis for standards setting. The provision and stipulations from legal and regulatory acts should be also transferred to the practical and operational guides, as well as presented for the general public in simple and understandable mode.
- The number of regulated polluting substances should be limited to these: with the highest threat to human health, regulated under applicable international obligations, and that can be effectively monitored with the limited technical capacity and human resources available.
- An integrated environmental permitting should be developed, consistent with the applicable international requirements. Provisions for BAT and BEP, regarding POPs sources (new and existing) should be clearly addressed in legislation.

4.2.3 Management

- To support activities of implementation of the Stockholm Convention and of other international conventions in that field, MITADER should consider the possibility of creating the coordinating board for Chemicals Management (CCM) to coordinate and manage Mozambican international obligations under the Basel, Stockholm, and other conventions, thus attracting the investments and technologies for the implementation of the international treaties and for the NIP, and gaining synergies, as well as improving and increasing efficiency, cost-effectiveness, transparency and accountability.
- POPs-related obligations of various ministries and agencies require

focusing, fine-tuning of authority and responsibilities, as well as better coordination and proactive cooperation –MITADER shall be assigned lead responsibility and given relevant powers to ensure enforcement.

- A possibility of creating a centralized computerized system – a unified databank (integrating information and data from various registers, lists, sectorial monitoring systems of different hierarchy), based on upgraded centralized monitoring and laboratory capabilities and complemented by focused training of selected staff, should be explored.
- Coordination, compatibility and integration of monitoring, laboratory and control capabilities shall be enhanced, in order to improve POPs cycle information and data management and facilitate more effective and efficient national programming, planning and decision-making.
- Environmental audits should include POPs concerns and should be used more extensively and consistently to review performance, collect data and develop mitigated plans for various economic entities, as well as identify and assign environmental liabilities.
- Improve the Customs Authority's system for POPs import, export and transit tracking and reporting, monitoring, control and enforcement, including computerized and integrated information and data management and sharing, particularly regarding labeling and compliance with licenses and permits stipulations on quantities and consistency of brand names/chemical compositions.

4.2.4 Financial resources and mechanisms

- Explore opportunities for POPs-related investments and technical assistance, as well as for utilization of existing projects financed by international and bilateral financial institutions in various sectors, like agriculture, energy, and transport. Implementation of joint nationally and internationally supported efforts is a strategic pathway for solving POPs and other chemicals issues in Mozambique.
- Plan a phased increase in public environmental expenditures parallel

to overall economic recovery, or, at least, ensure timely release and efficient execution of budgetary allocations for priority POPs issues. It is important to establish sustainable co-financing and contributing platforms between national, regional and local sources, government and private ones, national and international financial flows.

- Provide incentives to increase the share of local public and private sector financing in the management of local, enterprise and site-specific POPs and other priority chemicals related environmental problems.
- Streamline environment-related taxation and improve collection, expand economic incentives, increase fines for POPs and other chemical pollutions, as well as for non-compliance to reflect the scarcity of natural resources and significance of environmental and health impacts; these should be timely indexed to reflect inflation rates.
- It is important that the Government of Mozambique increases its contribution, through the national budget to support implementation of Stockholm Convention related activities.

4.2.5 Human resources

- Strengthen and improve chemicals safety skill-mix of the MITADER MASA, MISAU, MIC, MINT, UEM and Customs with well-trained environmental professionals, including senior managers, technical and media experts, economists and lawyers, through a comprehensive capacity building program.
- Ensure integrated development of country resources at various levels (national, regional, local), including all players (governmental agencies, public authorities, private sector, general public) in decision making, sharing of responsibilities, training and educational programs.
- Increase the role of local public authorities, providing managerial skills and financial authority for POPs and other harmful chemicals combating efforts.

- Seek negotiating bilateral (twinning) agreements with the respective environmental agencies for technology, know-how transfer and training.

4.2.6 Coordination mechanism and role of stakeholders

MITADER – This ministry, in addition to its mandate, will be responsible for coordinating and reporting the results to donors and to the Secretariat of the Stockholm Convention.

MIREME (DNE) – Alongside its mandate, will have the responsibility of providing information on use of PCBs containing equipment in use in mining and in the generation and/or transformation of energy, as well as facilitate the elaboration of regulations and directives.

MISAU – Along with its mandate, this institution should provide health information and toxicology information related chemicals and POPs.

MITSS – Along with its mandate, they should provide occupational health information related to chemicals and POPs.

ONGs **–** Conscientialize civil society on issues related to POPs.

MIC (DNI) – Alongside its mandate, it should provide information on import and export, including on possible industries that use POPs.

MEF – In addition to its mandate, it should provide information on the costs related to POPs and the revenues of the industries concerned.

Alfandegas – Alongside its mandate, it should provide information on the type of POPs imported into Mozambique and record imports.

MTC - Alongside with its mandate, it should provide information on the transportation of POPs.

MCTESTP - Alongside with its mandate should contribute with reaserch of the POPs substitutes.

Instituições de pesquisa – They will contribute with scientific information on PCBs found in the country and provide expertise on POPs.

Empresas – Companies will contribute with field information about the POPs

used in their company.

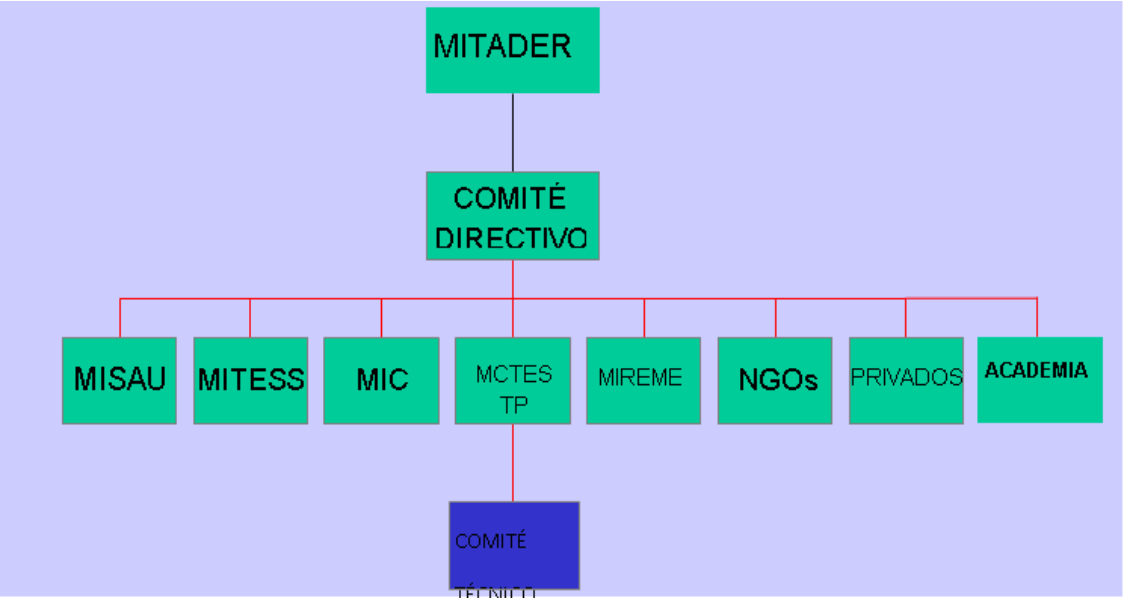

Figure 4.1: Organization chart of the coordination structure for implementation of the Stockholm Convention.

Figure 4.2: Photo of the Seminar on NIP priority setting, organized by MITADER.

4.2.7 Strategic Approach towards Stockholm Convention

Acknowledging that meeting the Stockholm Convention requirements is an important step towards ensuring the overall national chemical safety, the strategic approaches of Mozambique in this field can be formulated as follows:

- Step by step approach, followed by good planning and definitive agreements between stakeholders, beneficiaries and financial agencies is a prerequisite for the implementation of Stockholm Convention requirements;
- The NIP is a basis for relevant actions and negotiations with international financial institutions;
- Specific implementation actions included in the NIP should be focused on eliminating/reducing the priority health and environmental threats posed by POPs chemicals, by means of affordable and cost-efficient measures;
- The NIP should provide flexibility for implementation mechanisms and operational plans, and implementation agencies should have a sort of maneuvering, in order to reach established national goals timely and efficiently, but strictly considering the principles of safe and environmentally sound measures;
- The NIP should be periodically evaluated by means of established criteria and indicators, analyzed by stakeholders and revised if appropriated.

4.2.8 Strategic Objectives towards Stockholm Convention

Mozambique has identified, as strategic objectives pertaining the fulfillment of the requirements of the Stockholm Convention as following: Protect the human health and the environment by reducing and/or eliminating the use of POPs through appropriate measures:

- ✓ Legal, Regulatory and Institutional;
- ✓ Capacity Building;
- ✓ Prevention and remediation of contaminated sites;

- ✓ Public Awareness, Training and Education;
- ✓ Reduction and/or elimination of use of intentional chemicals;
- ✓ Reduction of unintentional emissions.

The appropriate measures are proposed in the table below as the Priority Action to be taken.

Table 4.1: Summary of Priority actions to be carried out.

Action	Goal
Legal, Regulatory and Institutional	These actions are targeted at amending the current legislation specifically related to the Stockholm Convention and incorporating provisions for establishing a broader chemical safety approach in the country. They also include drafting specific regulatory acts and supporting operational guidelines and practical handbooks. An important element is the creation of adequate institutional arrangements for the coordination of POPs related activities country-wide and the dissemination of experience gained for overall chemical safety aspects.
Capacity Building	This category includes actions related to the training of professionals and decision makers, improvement of POPs inventories, increasing the capabilities for hot-spots identification, reporting, monitoring and control, research and development. All these need to be well identified during next stages of NIP document revision.
Contaminated Sites Preventive and remediation Measures	The remediation includes the repackaging and centralization of obsolete pesticides from the local storage facilities, the identification of the

	most appropriated solution for their final elimination, low-cost measures to minimize impacts from abandoned storage facilities, collecting old DDT stocks from the rural households, and remediation measures at the pesticide dumps around the country and eventual stockpiles of out of-use capacitors and other electrical equipment containing PCBs. The prevention includes the introduction of new technology options for converting industrial technologies producing POPs emissions, the use of non-PCBs containing oils in electrical devices, the adoption of effective incinerators, and the introduction of integrated pest control systems
Public Awareness, Training and Education	The measures responding to the most urgent needs refer to raising public awareness and ensure proper communication on POPs-related issues, and incorporation of POPs issues in educational programs carried out by MITADER and other cooperating entities.
Reduction and Elimination of intentional chemicals	The measures should include pesticide use reduction enhancing Integrated pest management in the agriculture and reconversion of technology and row material in the industries
Reduction of Unintentional emissions	The measure should include preventive, regulatory, BAT and BEP

4.2.9 Action: Institutional and regulatory strengthening measures

4.2.9.1 Problem description

This action results from inadequate legislation on POPs as well as lack of knowledge and awareness of the effects of POPs among relevant stakeholders, such as policy makers, legislators, the judiciary, industry (employers and employees), including those involved in the management of these products and civil society in general. This situation is complemented by the use of old technologies by the chemical and thermal industries, unconscious and uncontrolled procedures in the burning of garbage, uncontrolled fires, high level of use of biomass for heating and cooking, low standardization in the incineration of hospital waste and lack of capacity of scientific research on alternatives, as well as the lack of legislation and a large number of public institutions with a leading role in the management of chemicals, including POPs; corroborate the inefficiency of the management system. These issues form the main points for approach in this project.

4.2.9.2 General objective

The development a harmonized national legislation framework for POPs management, which will concur for control, reduction and eventually elimination of country's POPs emissions.

4.2.9.3 Specific objectives

- To Review and harmonize all legislation related to POPs management.
- To develop new legislation if needed and establish compliance and enforcement mechanisms on POPs management.
- To build capacity of targeted institutions by training and creation of awareness in environmental law related to POPs management.

4.2.10 Action: Production, import and export, use, stockpiles, and wastes of Annex A POPs pesticides (Annex A, Part I chemicals) Update and add new pesticides

The operationalization of measures to reduce the use of chemical pesticides will be carried out through activities of integrated pest management.

4.2.10.1 Problem description

In Mozambique, as in most developing countries, there are outbreaks of pests and crop diseases, causing problems for agricultural production. The only way to combat these pests has been to use chemicals.

Overuse of agro-toxic and sometimes incorrectly can lead to problems such as: destruction of the natural enemy of pests, phytotoxicity, pollution of the environment and resistance of pests to pesticides.

The accumulation of outdated or obsolete pesticides has been recurrent, although several removal operations and specific regulation have been carried out.

The poor implementation of the pesticide regulation and lack of supervision of importers, related to the lack of financial and material resources of the supervisory authorities (MASA), means that the problem of accumulation of pesticides and their packaging prevails.

4.2.10.2 General objective

Reduction of the use of chemical pesticides with emphasis on the implementation of integrated pest, disease and weed management techniques increasing agricultural income for small farmers.

4.2.11 Action: Production, import and export, use, identification, labelling, removal, storage, and disposal of PCBs and equipment containing PCBs (Annex A, Part II chemicals)

4.2.11.1 Problem description

With regard to equipment containing PCBs, there are the following points of concern:

- Deficient management and storage of electrical equipment containing PCBs;
- Possible leakage of some used and unused PCBs into the environment and consequent contamination of the soil and ground water;
- Lack of guidelines of handling, storage, transportation and suitable disposal facilities of PCBs;
- Cross contamination of non PCB containing equipment oil through retro filling;
- Low level of awareness of user institutions and of the general public on the health risk associated with PCBs;
- Lack of infrastructures for sound management of PCBs (Warehouses and other infrastructures for their management);
- Lack of detailed inventories on PCB containing equipment in the Cities distribution networks.

4.2.11.2 General objective

Reduction of the use of PCB-containing oils in electrical equipment and the safe management of their waste.

4.2.11.3 Specific objectives

- Create environmental units in companies.
- Sensitization and training of users of PCB equipment for good management, namely: EDM, HCB, Gigawatt, Motraco, Sasol, coal miners and maintenance companies (ABB-Tecnel, Effacec and others).

- Detailed inventory of equipment containing PCBs in companies.
- Feasibility studies for the phase-out option of equipment containing PCBs.
- Establish an appropriate management system for equipment containing PCBs.
- Feasibility study and site selection, and partnerships for the establishment of infrastructures, for the good management of PCBs.

4.2.12 Measures to reduce releases from Unintentional Production (Article 5)

The measures in consideration are related to thermal and burn actions. In the case of Mozambique, emphasis is placed on issues of open burning (waste, biomass and forest fires) and industrial technology BAT and BEP.

4.2.12.1 Problem description

- ✓ Lack of awareness about dioxins and furans.
- ✓ Old technologies used in the chemical and thermal industries.
- ✓ Uncontrolled burning of waste.
- ✓ Uncontrolled forest fires.
- ✓ Low standardization of hospital waste incinerators.
- ✓ High level of use of biomass for heating and cooking.
- ✓ Insufficient scientific knowledge.

4.2.12.2 General objective

To reduce releases of unintentional production by appropriate measures.

4.2.12.3 Specific objectives

Reduction of unintentional emissions through:

- ✓ Inventory of technologies currently used in target industries;

- ✓ Preparation of guidelines and development of procedures for treatment of domestic and industrial waste;
- ✓ Promotion of the use of new technologies for waste treatment and heating technology, which does not use biomass combustion;
- ✓ Conversion of the use of biomass to natural gas and risk assessment in contaminated sites.

4.2.12.4 Priorities for reducing unintentional emissions

- ➢ Conversion of industrial technologies.
- ➢ Incentive to programs for the use of natural gas in automobiles and for domestic consumption.
- ➢ Encouraging recycling programs as a form of waste treatment, as well as reducing open burning.
- ➢ Discouragement of uncontrolled waste fires.
- ➢ Infrastructures for emission reduction and sound management of non-intentional emissions.

4.2.13 Action: Public Awareness, Training and Education (Article 10)

4.2.13.1 Problem description

- ✓ Limited access to information on POPs by the public and industry.
- ✓ Language barrier, as the available information is in English.
- ✓ Low sensitivity of the managers of POPs-generating industries.
- ✓ No comprehensive inventories and comprehensive POPs surveys showing potential risks and hazards.
- ✓ Limited financial resources in the industry to embark on environmentally sound options.

4.2.13.2 General objective

In relation to public information, awareness and education (Article 10), the objective is: To increase public awareness in Mozambique on POPs, generating a general understanding of their dangers and risks to human health

and the environment, based on the appropriate Communication Strategy.

4.2.13.3 Specific objectives

- Change of perception (knowledge), behavior (attitude) and practices (mechanisms / actions) of workers and managers of POP production facilities.
- Public awareness (communities, media, schools, NGOs, universities) to recognize the dangers and risks of POPs and defend measures to reduce POPs.
- Empowering legislators to understand the importance of the Stockholm Convention and other international treaties, and the members of the Government to adequately address the issue of POPs. Incorporation of POPs into educational programs carried out by MINEDH, MITADER, MCTESTP and other entities.

4.2.14 Action: Production, import and export, use, stockpiles, and wastes of hexaBDE and heptaBDE (Annex A, Part IV chemicals) and tetraBDE and pentaBDE (Annex A, Part V chemicals) (and HBB, where applicable (Annex A, Part I chemicals)) and production, import and export, use, stockpiles, and wastes of PFOs, its salts and PFOs (Annex B, Part III chemicals)

4.2.14.1 Problem description

The problems related to PFOs and PBDEs in Mozambique are as follows:

- ✓ Poor awareness of PFOs and PBDEs;
- ✓ Import of used / old means of transport and old technologies;
- ✓ Weak scientific knowledge.
- ✓ Luck of infrastructures for sound Management of PFOs e PBDEs

4.2.14.2 General objective

To reduce the import of PFOs and PBDEs.

4.2.14.3 Specific objectives

- Awareness program at all levels and at national level.
- Inventory of recent technologies used for target industries.
- Promotion of domestic and industrial use of products that do not contain PFOs and PBDEs.
- Inclusion of PBDEs and PFOs in chemical management regulations and preparation of directives for their management.
- Acquisition of technological means of investigation and monitoring (updating laboratories).
- Waste Management containing PBDEs (Electronic Electrical Waste), PFOs (Fire retardant foams).
- Risk assessment of contaminated sites (Risk assessment).

4.2.15 Action: Register for specific exemptions and the continuing need for exemptions (Article 4)

At the time of signature of the agreement, the country requested the exemption of some of the first 12 POPs, substances such as PCBs in electrical equipment, Chlordane and DDT for the control of malaria.

It is the responsibility of the Ministry that oversees the environmental area and the Focal Point, through the process of institutional consultations and recommendations, based on specific studies, to request exemptions for the country from the Secretariat of the Stockholm Convention.

4.2.16 Waste (Article 6)

There is a regulatory framework in place, but there is a lack of supervision, as the main categories of activities are prohibited, such as open burning and waste management.

4.2.17 Financial resources to implement the NIP (Article)

It is the responsibility of the government through MITADER to mobilize funds through the private sector and international donors to implement this National

Plan.

The government may also use public-private partnerships and concessions through the existing legal provisions.

4.2.18 Action: Facilitating or undertaking information exchange and stakeholder involvement (Information Exchange - Article 9)

Several training activities took place to access and exchange information using the Internet. This activity included access to several international databases of chemicals where these products are described according to the classification of degree of hazard.

Information exchange:

i) It is necessary to establish an information network for the exchange of information on POPs in particular and on the Stockholm Convention in general, among the institutions involved, such as MITADER, MASA, MIC, MTC, MISAU, MCTESTP, NGOs, sector private, academy, etc;

ii) To develop communication strategies and establish mechanisms for the exchange of information to be implemented by MITADER and NGOs.

The following will be considered:

i) Provision of information on POPs to the public and industry;

ii) Documents relating to POPs, including all other documents relating to the Stockholm Convention should be translated into Portuguese to enable better understanding for most actors and stakeholders. It is clear that all of the above actions can only be implemented if funds are available, so MITADER must commit itself to mobilizing sufficient financial resources to enable implementation of the priorities identified above.

4.2.19 Action: Effectiveness and evaluation (Article 16)

Up to date there is no assessment of effectiveness with regard to the

Convention, although Article 16 provides for the need to assess such effectiveness. Only regional meetings for the sharing of experiences were held.

4.2.20 Action: Reporting (Article 15)

The country has not yet reported to the EC secretariat since ratification of the convention. Urge to reverse this situation so that the country is not sanctioned.

4.2.21 Action: Research, development and monitoring (article 11)

In relation to research, development and monitoring (Article 11) it is important to mention:

- The research and development strategy will need to be targeted and phased, showing a high degree of flexibility, in order to be easily adapted as new data are collected;
- To develop environmental and health-oriented monitoring strategies and start implementation step by step from 2019, starting with the priority areas;
- Undertake a study on the capabilities of national laboratories to address relevant issues on POPs and other chemicals and, therefore, establish the necessary laboratory infrastructure and capabilities.

4.2.22 Action: Technical and financial assistance (Articles 12 and 13)

In relation to Technical Assistance (Article 12):

- The Government should promote an extensive and specific technical assistance program for POPs by accelerating the negotiation process with the international community and involving potential international funding sources with technology transfer options.

With regard to financial sources and mechanisms (Article 13):

- Likewise, the Investment Program related to POPs should be promoted, accelerating the negotiation process with the international community and involving potential international financial sources.

4.3 Implementation Strategy for the Updated Stockholm Convention Plan

4.3.1 Implementation, evaluation and updating

The updated NIP is an operational document that provides the framework for the implementation of the Stockholm Convention in Mozambique. The current NIP is only a second step in meeting the obligations under the Stockholm Convention and is mainly focused on the short-term priorities of the current POPs, covering a five-year implementation period. The NIP implementation is based on the following platforms:

- The NIP was updated through an extensive stakeholder consultation process, having gone through all national coordination procedures. The involvement of all stakeholders in the implementation of the NIP is one of the preconditions for achieving the expected results. Clear sharing of responsibilities and tasks is a key element of NIP implementation and requires close inter-ministerial and cross-sectorial coordination and cooperation;
- The overall operational coordination of the implementation of the updated NIP will be the responsibility of MITADER. Supervision and evaluation of the implementation of the NIP will be carried out by the National Coordination Committee of the Stockholm Convention (CNC), which will decide on its revision or update if necessary. The Commission will ensure effective and efficient inter-ministerial coordination and cooperation and promote the incorporation of NIP requirements into other national strategies, policies and plans. It is recommended to create a National Chemical Management Council of Mozambique, using existing platforms, thus bringing several focal points of related international conventions to a single committee, facilitating the implementation of measures related to the management of all chemical substances in the Country;
- The NIP will complement the ongoing national activities in this area, specifically the activities conducted by MITADER, MASA, MIREME, MIC, MTC, MINT with regard to the safe management of POPs and their wastes. It will build synergy with other development projects, such as

improved pest management in crops, energy projects, etc. The NIP may also be linked to one or another partner-supported project, particularly related to the development of customs training for POPs monitoring, import / export, transport, identification and reporting.

Some of the updated NIP actions will be very expensive. Adequate support from national and international sources is therefore a crucial pre-condition for the successful implementation of the NIP, both for technical assistance and for investment.

For the implementation of its updated NIP, Mozambique needs technical assistance in the following areas:

- ✓ Improvement, greater coherence and harmonization of the national and international legal framework for POPs and the design of innovative financial mechanisms (eg "debt swap for nature", HIPC, etc.);
- ✓ Support for the implementation of the NIP, the evaluation and progress reports of the NIP and related conventions and protocols;
- ✓ Establishment of a national information system, a comprehensive, accurate and regularly updated aggregate information database on POPs, and other chemicals, enhancing MITADER's capacity for data management and presentation;
- ✓ Strengthen environmental and health monitoring, including analytical and reporting capabilities;
- ✓ Support to the energy sector in the identification of PCBs in power equipment and in subsequent PCB elimination actions;
- ✓ Professional staff training;
- ✓ Support in the identification, management and remediation of contaminated sites;
- ✓ Feasibility studies for planned local measures;
- ✓ Design and implement public training and awareness programs

based on the "right of the community to know and participate".

Mozambique should also raise financial support for the implementation of local remediation measures such as:

- ✓ Precautionary and rehabilitation measures for sites contaminated by pesticides, PCBs and other chemicals under the SC;
- ✓ Disposal of obsolete pesticides;
- ✓ Disposal of PCB oils, equipment contaminated with PCBs (eg condensers) and waste;
- ✓ Remediation of contaminated sites;
- ✓ Identification, evaluation and dissemination, and introduction of new environmentally friendly technologies, replacing equipment currently in use, which impose real problems related to POPs.

Progress evaluation is an important component of the NIP. It will make it possible to assess to what extent the objectives of the NIP are being achieved and which are the components of the NIP that need to be updated. Performance evaluation will be done in a transparent manner, through a participatory process involving all stakeholders. Your results will be made available to the general public.

The NIP should include a set of evaluation criteria that allow for progress, efficiency and implementation issues to be assessed. The evaluation criteria should be agreed at the next stage of the review of the NIP to be carried out, including numerical indicators and the qualitative evaluation, which will be used. A range of verifiable indicators of the implementation of the updated NIP can be designed and discussed during NIP implementation. CDN, with close monitoring of MITADER, will be responsible for collecting relevant information, assessing performance indicators, assessing implementation needs, assessing progress and problems encountered throughout the process.

MITADER will periodically report its findings to the Conference of the Parties and perhaps to the National Commission on Sustainable Development. Notification procedures should be developed and all parties involved should be

trained accordingly.

Ministries and other state agencies will be responsible for monitoring and evaluating the NIP in their sectors. The results should be part of the decision-making process. Local authorities will have monitoring and evaluation responsibilities in their areas of jurisdiction. The individual project implementation units will be responsible for monitoring and reporting to whom it might concern.

The purpose of the evaluation indicators is to assess how the updated NIP activities affect the direction of change in environmental quality and measure the magnitude of this change. While most of the updated NIP indicators will allow quantitative evaluation of the implementation process and the impacts of various activities, other indicators will seek to measure qualitative aspects, eg monitoring the evolution of public attitudes towards POPs problems, through opinion polls and surveys.

The updated NIP document is a dynamic document and will be subject to regular revisions and updates, for example every five years. Obviously, this activity will be linked to the performance appraisal process and the introduction of new chemicals into the Convention. The primary responsibility for evaluating and updating NIP performance belongs to MITADER and CDN.

The implementation of the NIP will be carried out through activities with indicators that will be subject to mid-term review, final review, internal review (collective and individual stakeholders), external review by partner agencies or any other external donor.

Table 4.2: Summary of the Budget for Measures and Action Plan.

Order	Measures and Action Plan	Amount in USD	Amount in MZM
1st	Strengthening National Institutions and Country Legal Framework on POPs Management	**1,100,000.00**	**66,000,000**
2nd	Treatment, remediation and management of the POPs contaminated sites.	**6,250,000**	**375,000,000**
3rd	Awareness, Education and Dissemination of Information	**1,430,000**	**85,800,000**
4th	Training and Capacity build on POPs Analytical and Monitoring methodology	**340,000**	**20,400,000**
5th	POPs non Intentional emission reduction	**2,750,000**	**165,000,000**
6th	PCBs Management	**6,200,000**	**372,000,000**
7th	PBDEs e PFOs Management	**540,000**	**32,400,000**
Total of the NIP Cost		**18,610,000.00**	**1,116,600,000.00**

Table 4.3: Summary of the Budget for measures for strengthening national institutions and country legal framework on POP management.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
1- Action Plan for measures of strengthening national institutions and country legal framework on POP management					
POP-Pesticides	Effective Implementation of the pesticide regulation	100,000	6,000,000	MASA	
	Effective Implementation WHO guidelines on DDT management and monitoring	150,000	9,000,000	MISAU	
POP Contaminated Sites	Preparation of POPs contaminated sites Guidelines and discussion in National and Provincial seminaries	200,000	12,000,000	MITADER	
U-POPs	Preparation of waste management guidelines, landfill management guidelines , Recycling and Incineration Guidelines	250,000	15,000,000	MITADER	
PCBs	Preparation of the guidelines on PCBs Management	200,000	12,000,000	MITADER	
PBDEs and PFOs	Preparation of the guidelines on PBDEs and PFOs Management	200,000	12,000,000	MITADER	
TOTAL		**1,100,000**	**66,000,000**		

Table 4.4: Summary of the Budget measures on treatment, remediation of the POPs Contaminated Sites.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
2 - Action Plan on treatment, remediation of the POPs Contaminated Sites					
POP Pesticides (U-POPs, PCBs, PBDEs PFOs)	Travel visits on Experience Exchange about treatment, remediation of the POPs Contaminated Sites in SADC countries and African Continent with similar Characteristics	50,000	3,000,000	MASA MISAU, MITADER, MIC	
	Preparation Review of the Action Plan for treatment, remediation of the POPs Contaminated Sites.(pesticides, PBDEs, PFOs, PCBs, non-intentional or dioxins and furans releases)	200,000	12,000,000	Academy and Research Institution	
	Treatment based on contaminated soils removal	6,000,000	36,000,000	MASA	
	Mapping and adoption of precautionary measures (signalization, fencing)	50,000	3,000,000	MITADER	
TOTAL		**6,250,000**	**375,000,000**		

Table 4.5: Summary of the Budget on measures of awareness, education and dissemination of information.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
3- Action Plan for Awareness, Education and Dissemination of Information		**1,430,000**	**85,800,000**		
POP Pesticides	Pesticide good housekeeping manner	100,000	6,000,000	MASA / NGOs	
	Incentive Integrated pest Management	150,000	9,000,000	MASA / NGOs	
	Dissemination of the Legal Instruments	210,000	12,600,000		
contaminated sites	Awareness raising about the Contaminated Sites	210,000	12,600,000	NGOs / MITADER	
U-POPs	Awareness raising to avoid forest and solid waste open burning and sensitization of the industrial sector about good and best practices and clean technologies	300,000	18,000,000	NGOs / MITADER	
	Dissemination of the Legal Instruments,	210,000	12,600,000	NGOs /	

	Incentive to solid waste segregation from the source and recycling			MITADER	
PCBs	Public awareness and awareness of the workers managing transformers and equipment containing PCBs	50,000	3,000,000	MIREME / NGOs / Electricity utility and maintenance Companies	
PBDEs and PFOs	Awareness, raising for the used electric electronic devices importers and fire retardants and extinguish substances importers	200,000	12,000,000	MIC, MINT, MITADER	
TOTAL		**1,430,000**	**85,800,000**		

Table 4.6: Summary of the Budget on measures of actions on training, and capacity building on POP analyzes and monitoring.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
4- Measures of Actions on Training, and capacity building on POPs Analyzes and Monitoring					
POP Pesticides	Technical capacity building on sampling and pesticides residual content analyses	30,000	1,800,000	Universities chemical laboratories / Research Institutes / MCTESTP	
	Acquisition of the laboratory and monitoring equipment i	100,000	6,000,000	Universities chemical laboratories / Research Institutes / MCTESTP	
Contaminated Sites	Capacity building on sampling and analyzes of the site contaminants	20,000	1,200,000	Universities chemical laboratories / Research Institutes /MCTESTP	
	Acquisition of Laboratory and monitoring equipment for Contaminated sites	30,000	1,800,000	Universities chemical laboratories / Research Institutes /MCTESTP	

U-POPs	Technical Capacity building on emission quantification	20,000	1,200,000	Universities chemical laboratories / Research Institutes /MCTESTP	
PCBs	Technical Capacity building on qualitative and quantitative analytical methods analyses of oil containing PCBs	20,000	1,200,000	Universities chemical laboratories / Research Institutes /MCTESTP	
	Acquisition of Laboratory and monitoring PCB equipment	30,000	1,800,000	Universities chemical laboratories / Research Institutes /MCTESTP	
PBDEs and PFOs	Determination of the PBDE contents in electric electronic components / devices and e Determination of PFOs foam and firefighting materials	50,000	3,000,000	Universities chemical laboratories / Research Institutes /MCTESTP	
	Acquisition of Laboratory and monitoring PFO and PBDE equipment	40,000	2,400,000	MITADER / MCTESTP	
TOTAL		**340,000**	**20,400,0000**		

Table 4.7: Summary of the Budget on measures for emission reduction of non-intentional POPs.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
5- Action Plan for emission reduction non Intentional POPs					
U-POPs	Review and National plan for reduction of uncontrolled Bushfire, biomass and uncontrolled burning	150,000,00	9,000,000	MITADER	
	Public- Private partnership Plan Preparation and acquisition of 11 appropriate incinerators for biomedical waste (Medical, slaughterhouses, veterinary)	2,300,000	138,000,000	MISAU, MITADER, MASA	
	Plan for reduction non intentional emission in open dump sites and recycling and composting regulation	150,000,00	9,000,000	MITADER, Municipalities	
	Industrial and transport technologies reconversion into the gas	100,000,00	6,000,000	MITADER, MTC, MIREME, MIC	
	Campaign on incentive for use of gas for domestic purpose	50,000	3,000,000	MIREME, MITADER	
TOTAL		**2,750,000**	**165,000,000**		

Table 4.8: Summary of the Budget on measures for PCB reduction

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
6- PCB Action Plan					
PCBs	Inventory on electrical equipment containing PCBs in the City distribution network	5,000,000	300,000,000	MITADER Utility Companies, MIREME	
	Construction of 3 regional Infrastructures / Storages for oil and electrical equipment containing PCBs	1,200,000	72,000,000	MITADER Utility Companies, MIREME	
TOTAL		**5,200,000**	**372,000,000**		

Table 4.9: Summary of the Budget on measures for PBDE e PFO reductions.

Plan		**Amount in USD**	**Amount in MZM**	**Responsible**	**Timeframe 2020-2025**
7- **Action Plan for PBDEs and PFOs management**					
PBDEs and PFOs	National Inventory on PBDEs and PFOs	200,000	12,000,000	MITADER/ MTC	
	Creation public-private partnership for storages Construction of electric-electronic and partnership with countries producers for recycling	40,000	2,400,000	MITADER	
	Construction of 3 regional Centers/ Storages for electric electronic waste	300,000	18,000,000	MITADER / Private sector	
TOTAL		**6,200,000**	**372,000,000**		

Table 4.10: Chronogram of the NIP Activities.

ACTOIN PLANS		**TIMEFRAME 2020 - 2025**																			
1- Action Plan on Strengthening of National capacity and country legal framework for POPs Management		Year 1				Year 2				Year 3				Year 4				Year 5			
Activities	Efective Implementation of the pesticide regulation																				
	Efective Implementation of WHO guidelines on DDT management and monitoring																				
	POP Contaminated site Guidelines preparation for discussion in regional and national Seminaries																				
	Solid waste management guidelines, landfill, recycling and incineration regulations preparation																				

	PCBs Management guidelines preparation																				
	PBDEs and PFOs Management guidelines preparation																				
2- Action Plan for management of POP Contaminated Sites		Year 1				Year 2				Year 3				Year 4				Year 5			
Activities	Visits for exchange of experience in treatment and remediation of contaminated sites with similar characteristics in SADC countries and African continent																				
	Preparation and review of an Action Plan for the management, treatment and remediation of POPs contaminated sites (pesticides, PBDEs, PFOs, PCBs, unintentional releases of Dioxins and Furans)																				
	Treatment, decontamination and remediation of pesticide contaminated sites (PBDEs, PFOs, PCBs,																				

	unintentional or release of Dioxins and Furans)																				
	Treatment of contaminated sites based on the removal of contaminants and contaminated soils																				
	Mapping and preparation of precautionary measures (signaling, fences)																				
3- Action plan for dissemination of information, awareness and education		Year 1				Year 2				Year 3				Year 4				Year 5			
Activities	Preparation of Manual on Pesticide Care for Communities																				
	Incentive to integrated pest management																				
	Dissemination of legal instruments																				
	Awareness of hazards of contaminated sites																				

	Avoid forest fires and open burn solid waste; and awareness of the industrial sector to opt for good practices and clean technologies																						
	Dissemination of legal instruments, incentive to recycling and segregation of solid waste at the source																						
	Public awareness and workers' awareness of PCB-containing equipment																						
	Public awareness, users, importers of used electrical and electronic goods, importers of retardants and fire-extinguishing substances																						
4- Action Plan for Improvement, Analytical Capability and POPs Monitoring		Year 1				Year 2				Year 3				Year 4				Year 5					
Activities	Training of sampling technicians to analyze residual pesticide contents																						

	Acquisition of laboratory equipment and pesticide monitoring material																			
	Training of technicians in the quantification of emissions																			
	Qualification of technicians in analytical methods of determination and quantification of oils containing PCBs																			
	Acquisition of laboratory equipment and PCB monitoring material																			
	Qualification in analysis protocols for determination of PBDEs in electrical-electronic components and determination of PFOs in foams and fire-fighting material																			
	Acquisition of laboratory equipment and monitoring material for PBDEs and PFOs																			

5- Action plan to reduce unintentional emissions of POPs		Year 1				Year 2				Year 3				Year 4				Year 5			
Activities	Review and update of the National Plan for the reduction of uncontrolled fires and biomass burn																				
	Preparation of the Public-Private Partnerships Plan and acquisition of 11 appropriate incinerators for incineration of biomedical waste (hospital, slaughterhouses, veterinary and livestock)																				
	Plan for the reduction of unintentional emissions in the dumps and Regulation of recycling and composting																				
	Project for the conversion of industrial and automotive technologies for gas use																				

	Campaign to encourage people to use domestic gas (LPG)					
6- PCB Management Action Plan		Year 1	Year 2	Year 3	Year 4	Year 5
Activities	Inventory of electrical equipment containing PCBs in the energy distribution grid					
	Construction of 3 regional infrastructures for the storage of oils and electrical equipment containing PCBs					
7- Action Plan for the Management of PBDEs and PFOs		Year 1	Year 2	Year 3	Year 4	Year 5
Activities	Detailed inventory of national PBDEs and PFOs					
	Creation of public-private partnerships for the construction of electric and electronic waste storage centers and partnerships for recycling					

	in producer countries			[redacted]																
	Construction of 3 regional centers for the storage of electrical and electronic waste					[redacted]														

5. BIBLIOGRAPHICAL REFERENCES

1. Text of Stockholm Convention on persistant organic pollutants.
2. Mozambique PNI-POPs-I report 2003 (1st Mozambique Baseline inventory Report on Dioxinas and Furans, José João Miguel, PhD & Felício Fernado (MSc in Analytically Chemistry),2006.
3. Mozambique Pesticide inventory Report Khalid Kassam & Samson Cuamba.
4. Report Guidance on NIP Review and Update, UNITAR 2012.
5. Guidance for PCB Containing equipment Inventory.
6. Guidance for the inventory of the polybrominated diphenyl Ethers (PBDEs) listed under the Stockholm Convention on POPs, UNITAR July 2012.
7. Guidance for the inventory of Perfluorooctane Sulfonic Acid (PFOS) and related chemicals listed under the Stockholm Convention on POPs, UNITAR Draft 31March 2014.
8. Toolkit on quantification of emission on Dioxins and Furans, May 2013.
9. Mozambique biannual Statistical Report on importation and exportation 2015- 2016, INE, Mozambique.
10. Mozambique State Raport on Environment 24 May 2011.
11. Nine additional NEW POPS, SC.
12. COP-4 Report, May 2009; SC.
13. Inventory report on POP- PBDEs, PFOs and PCBs (industrial chemicals) and contaminated Sites in Swaziland-2014.
14. Mozambique State of Environment first Draft Report – 2017.
15. PBDEs &PFOS Report of Department of Environment South Africa.
16. Mozambique PCB preliminary Inventory repport 2018.

6. ANNEXS

6.1 ANNEX-1: Summary of POPs list of the Stockholm Convention, 2016

Name of the Chemical	Pesticide	Industrial chemical	Unintentional production	Annex and Management measure
P**erfluorooctane sulfonic acid (PFOS) its salts & perfluorooctanesulfonyl fluoride (PFOS-F) CAS Nr 1763-23-1 (PFOS) CAS Nr307-35-7 (PFOSF)**		**x**		**Annex B** – phase out with acceptable purpose and specific exemptions
Aldrin No. CAS: 309-00-2	**x**			**Annex A** – Elimination for production, limited used as local ectoparasiticide
Alpha Hexachlorocyclohexane (alfa HCH)	**x**		**x**	**Annex A**
Beta Hexachlorocyclohexan (Beta HCH)	**x**		**x**	**Annex A**
ChlordaneNo. CAS: 57-74-9	x			**Annex A** – exemption for production in countries

				registering exemptions, limited use
Chlordecane	x			**Annex A**
DDT , CAS 50-29-3	x			A Annex B – Restricted use for malaria vector control and under exemption for use as an intermediate in the production of dicofol
Dieldrin~~nr~~ CAS: 160-57	x			**Annex A** – Elimination for production, limited use in agricultural operations
Dioxins (PCDDs)		x	x	**Annex C** - Implement measures to reduce or eliminate released from unintentional production
Endossulphan	x			**Annex A**
Endrinnr CAS: 72-20-8	x			**Annex A** – Elimination
Hexabromodiphenyl ether and heptabromodiphenyl ether, main				**Annex A** – Elimination for production, exemption for use

components of **octabromodiphenylic commercial Ether (C-CtaBDE)**				as articles containing these chemicals for recycling
Tetrabromodiphenylic Ether (tetraBDE) and Pentabromodiphenylic Ether (PentaBDE), main components **Pentabromodiphenylic commercial Ether (C- PentaBDE)**				**Annex A** – Elimination for production, exemption for use as articles containing these chemicals for recycling
Furans (polychlorinated dibenzofurans), PCDFs			x	**Annex C** - Implement measures to reduce or eliminate released from unintentional production
Heptachlor No. CAS: 76-44-8	x			**Annex A** – Elimination for production, limited use
Hexabromophenil (HBB)		x		**Annex A**
Hexabromociclododecano (HBCD)		x		**Annex A**
Hexachlorobenzene No. CAS: 118-74-1	x	x	x	**Annex A** – exemption for production in countries registering

				exemptions, limited use **Annex C** - Implement measures to reduce or eliminate released from unintentional production
Lindan	x			**Annex A** – exemption for production in countries registering exemptions for use as a human health pharmaceutical
Mirex	x			**Annex A**
Polychlorinated Biphenyls (PCB)		x	x	**Annex A** and **C**
Pentaclorobenzen (PeCB)	x	x	x	**Annex A**
Toxaphene No. CAS: 8001-35-2	x			**Annex A** – Elimination

Souce: Stockholm convention and COP-4 report

6.2 ANNEX 2: Stakeholders and respective areas of interest during the NIP update

	Sectors	Institutions	Tematic area of interest
1	National Directorate of Environment	Ministry of Land Environment and Rural Development	all the thematic areas
2	National Fund for Sustainable Development	Ministry of Land Environment and Rural Development	Financial Institution for environmental sector, tax collection from regulations of the environmental sector
3	National Agency for Environmental Quality	Ministry of Land Environment and Rural Development	Supervision
4	National Directorate of customs	Ministry of Economy and Finance	good and chemical importation Statistics
5	Department of Studies and Policies	Ministry of Economy and Finance	Incentives
6	Plant protection Department	Ministry of Agriculture e Food Security	DDT, Pesticides
7	Agricultural Development Fund	Ministry of Agriculture e Food Security	Financial Institution for agrarian Programs, tax collection from regulations of the agricultural sector
8	National Directorate of Energy	Ministry of Mineral Resources and Energy	Defines polices for the energy sector
9	National Directorate of Hydrocarbons	Ministry of Mineral Resources and Energy	Area of interest: Dioxins and Furans
10	National Fund of Energy	Ministry of Mineral Resources and Energy	Area of interest: PCBs

11	INATER – National Institute of Terrestrial Transport	Ministry of Transport and Communications	Vehicle registration, sector regulator Area of interest: PFOs, PBDEs, Dioxins and Furans
12	National Transport and Communications Fund	Ministry of Transport and Communications	Sector financial institution: Area of interest: PFOs PBDEs (Electric Electronic waste and vehicles)
13	National Institute of Communications	Ministry of Transport and Communications	Communication equipment regulator Area of interest: PFOs and PBDEs (Electric and Electronic waste
14	National Directorate of Industry	Ministry of Industry and Commerce	Chemical Importation
15	National Directorate of Labour	Ministry of Employment, Labour and Social Affairs	Heath and safety at work place
16	National Malaria Programme	Ministry of Health	DDT, Public health
17	Manhiça Malaria Research Institute	Ministry of Health	DDT, Public health
18	National Institute for health development	Ministry of Health	DDT, waste burning *Dioxins and Furans
19	National Directorate of Forest	Ministry of Land Environment and Rural Development	waste burning *Dioxins and Furans
20	Department of Public Health	Ministry of Health	DDT, Dioxins and Furans (Hospital Incinerators)

21	Maputo Municipality	Ministry of State Administration and Public Affairs	Burning waste, Dioxins and Furans
22	Matola Municipality	Ministry of State Administration and Public Affairs	burning waste, Dioxins and Furans
23	National Public Protection Service - Firefight	Ministry of Internal Affairs	PFOs/ retardants and fire extinguish products
24	Eduardo Mondlane University	Ministry of Science, Technology, High , Technic Professional Education	**research**/ Laboratorial needs
25	Ministry of Science, Technology, High , Technic Professional Education	Ministry of Science, Technology, High , Technic Professional Education	Research and professional education
26	Africa Foundation for Development	local	Public awareness
27	LIVANINGO	local NGO	Public awareness
28	WWF Mozambique	local NGO	Public awareness
29	Justiça Ambiental	local NGO	Public awareness
30	National Association of Municipalities of Mozambique	Associations	Public awareness Dioxins and Furans
31	ABB/ Tecnel	Transformer maintenance Company	PCBs
32	EFACEC	Transformer maintenance Company	PCBs
33	Hidro - Eléctrica de Cahora Bassa	Dam-Electricity producer Company	PCBs
34	Electricidade de Moçambique	Electricity transport rand distribution Company	PCBs
35	Açucareira de Xinavane	Sugar Company	PCBs, Dioxins and Furans
36	Gigawat	Electricity producer Company	PCBs

37	Motraco	Electricity Company	PCBs
38	Açucareira de Maragra	Sugar Company	PCBs, Dioxins and Furans
39	MOZAL	Aluminum Smelter company	PFOs, PCBs, Dioxins and Furans
40	Vale Mozambique	Coal mining Company	PCBs, PFOs
41	Kenmar Mozambique	Heavy sand mining Company	PCBs, PFOs
42	Sasol SA-Mozambique	Oil and gas Company	PCBs, PFOs
43	Extin Lda/ Suppliers of anti-fire foam	foam Importer and firefighting equipment maintenance equipment company	PFOs
44	Moza Fogo	Firefight maintenance equipment Company	PFOs
45	Inter Cimento	Cement Company	PCBs, Dioxins and Furans
46	UNDP- Mozambique	UNDP Local representative - Mozambique	Interest / technical assistance
47	UNIDO- Mozambique	UNIDO Local representative -Mozambique	technical assistance
48	WHO Mozambique	WHO Local representative - Mozambique	technical assistance
49	Aeroportos de Moçambique	Airports Company	PFOs
50	Mcel	Mobile telecommunication company	PBDEs
51	Vodacom	Mobile telecommunication company	PBDEs
52	Movitel	Mobile telecommunication company	PBDEs
53	TDM	Mozambique telecommunication company	PFOs
54	Imprensa Nacional	Ministry of justice	PBDEs, PFOs

55	Xerox Mozambique	Company	PBDEs, PFOs
56	Canon Mozambique	Company	PBDEs, PFOs
57	Intertek Testing Mozambique	Company	Importation of the chemicals
58	Mozambican broker association	Association	Importation of the chemicals
59	Mozambican Confederation o economical activities - CTA	Association	All thematic areas
60	Pesticides importers	Pesticides importers Companies	Pesticides
61	Banana Producers Association	Association	Pesticides
62	EnviroServ waste management	Waste management Company	PFOs, PBDEs, PCBs Contaminated sites
63	Electric Electronic waste management Association	Association	PBDEs waste

6.3 ANNEX 3: Stakeholders and participants in the NIP update

	Name	Institutions /Sector
1	National Directorate of Environment	Ministry of Land Environment and Rural Development
2	National Fund for Sustainable Development	Ministry of Land Environment and Rural Development
3	National Agency for Environmental Quality	Ministry of Land Environment and Rural Development
4	National Directorate of of customs	Ministry of Economy and Finance
5	Department of Studies and Policies	Ministry of Economy and Finance
6	Plant protection Department	Ministry of Agriculture e Food Security
7	Agricultural Development Fund	Ministry of Agriculture e Food Security
8	National Directorate of Energy	Ministry of Mineral Resources and Energy
9	National Fund of Energy	Ministry of Mineral Resources and Energy
10	INATER – National Institute of Terrestrial Transport	Ministry of Transport and Communications
11	National Transport and Communications Fund	Ministry of Transport and Communications
12	National Institute of Communications	Ministry of Transport and Communications
13	National Directorate of Industry	Ministry of Industry and Commerce
14	National Directorate of Labour	Ministry of Employment, Labour and Social Affairs
15	National Malaria Programme	Ministry of Health
16	Manhiça Malaria Research Institute	Ministry of Health
17	National Institute for health development	Ministry of Health
18	National Directorate of Forest	Ministry of Land Environment and Rural

		Development
19	Department of Public Health	Ministry of Health
20	Maputo Municipality	Ministry of State Administration and Public Affairs
21	Matola Municipality	Ministry of State Administration and Public Affairs
22	National Public Protection Service - Firefight	Ministry of Internal Affairs
23	Eduardo Mondlane University	Ministry of Science, Technology, High , Technic Professional Education
24	Ministry of Science, Technology, High , Technic Professional Education	Ministry of Science, Technology, High , Technic Professional Education
26	Africa Foundation for Development	local
27	LIVANINGO	local NGO
28	WWF Mozambique	local NGO
29	Justiça Ambiental	local NGO
30	National Association of Municipalities of Mozambique	Associations
31	ABB/ Tecnel	Transformer maintenance Company
32	EFACEC	Transformer maintenance Company
33	Hidro- Eléctrica de Cahora Bassa	Dam-Electricity producer Company
34	Electricidade de Moçambique	Electricity transport rand distribution Company
35	Açucareira de Xinavane	Sugar Company
36	Gigawat	Electricity producer Company
37	Motraco	Electricity Company
38	Açucareira de Maragra	Sugar Company
39	MOZAL	Aluminum Smelter company
40	Vale Moçambique	Coal mining Company
41	Kenmar Mozambique	Heavy sand mining Company

42	Sasol SA-Mozambique	Oil and gas Company
43	Extin Lda/	foam Importer and firefighting equipment maintenance equipment company
44	Moza Fogo	Company
45	Inter Cimento	Company
46	UNDP - Mozambique	UNDP Local representative - Mozambique
47	UNIDO - Mozambique	UNIDO Local representative -Mozambique
48	WHO Mozambique	WHO Local representative - Mozambique
49	Mozambique Airport Company	Company
50	Mcel	Mobile telecommunication company
51	Vodacom	Mobile telecommunication company
52	Movitel	Mobile telecommunication company
53	TDM	Mozambique telecommunication company
54	Imprensa National	Ministry of justice
55	Xerox Mozambique	Company
56	Canon Mozambique	Company
57	Intertek Testing Mozambique	Company
58	Mozambican broker association	Association
59	Mozambican Confederation o economical activities -CTA	Association
60	Pesticides importers	Pesticides importers Companies
61	Banana Producer Association	Association
62	EnviroServ waste management	Company
63	Electric Electronic waste management Association	Association
64	Mozambique Airport Company	Company

6.4 ANNEX 4: Evidence from the consultation process during the NIP update - Priority setting meeting.