



UNEP / GEF / NEA

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National Implementation Plan  
under the  
Stockholm Convention on POPs  
for The Gambia

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## II. PREFACE

The use of Chemical products to enhance and improve life is a widespread practice worldwide: they protect agricultural crops against disease and infestation, they remove weeds where they are not needed, they combat vermin in and around homes and above all, they enhance all other industrial processes. However, as beneficial as these products may be, their unguided use pose potential Hazards to the user and the Environment.

For the past 40 years, awareness has been growing about the threats posed to human health and the global environment by the ever-increasing release in the natural environment of synthesized chemicals. Mounting evidence of damage to human health and the environment has focused the attention of the international community on a category of substances referred to as Persistent Organic Pollutants (POPs).

Persistent Organic Pollutants (POPs) are chemicals that persist in the environment accumulate in high concentrations in fatty tissues and are bio-magnified through the food chain. Hence they constitute a serious environmental hazard that comes to expression as important long-term risks to individual species, to ecosystems and to human health.

Health effects of POPs chemicals on humans may include cancer, allergies and hypersensitivity. They may cause disorders in the reproductive and immune systems as well as in the developmental process, and constitute a particular risk to women and children who may be exposed to high levels through breast-milk and food.

With the evidence that POPs are transported to regions where they have never been used or produced, the international community decided in 1997 to work towards a convention that will serve as an international legally binding instrument to reduce and /or eliminate releases of twelve POPs identified by a UNEP Governing Council Decision.

Some of these substances are pesticides, while others are industrial chemicals or unwanted by-products of industrial processes or combustion.

The initial list of POPs contains nine pesticides including aldrin, chlordane, DDT, dieldrin, Endrin, Toxaphene, heptachlor, hexachlorobenzene, and mirex.

combustion by-products, dioxins and furans.

The UNEP Governing Council also requested that criteria and a procedure be developed to identify further POPs as candidates for international action. This request has been complied with and more substances are therefore likely to be included in the list.

Aware of the health concerns resulting from local exposure to Persistent Organic Pollutants, and in particular impact upon women and, through them, upon future generations, and considering the vulnerability of a population with a low level of awareness, The Gambia, has recognised the need and has over the years taken courageous steps towards the development of an institutional framework for the sound management of chemicals to support a rapidly growing industrial and agricultural sector.

The Gambia ratified the SC on POPs in June 2003, and has also signed and ratified a number of other International and Sub-regional accords and agreements for the sound Management of Chemicals including the Rotterdam Convention on Prior Informed Consent (PIC), the Basel Convention on the Transboundary movement of hazardous wastes and their disposal, the Bamako Convention, the Montreal Protocol on substances that deplete the ozone layer, and the Common Regulations for the Registration of Pesticides in the Sahel.

The Stockholm Convention aims at the reduction or complete elimination of Persistent Organic Pollutants (POPs), which pose a major threat to human health and the environment. Under the Convention, all signatories are required to develop National Implementation Plans (NIP) to demonstrate how the obligations of the convention will be implemented. A salient part of the NIP is for parties to create a POPs inventory and to make an assessment of contaminated equipments and sites.

The Gambia received through UNEP as GEF implementing agency GEF capacity building support for enabling activities to strengthen her ability to implement a systematic and participatory process for the preparation and production of the NIP through multi-stakeholder participation.

The overall objective of the NIP Project is to strengthen National

Capacity in developing a national framework for the effective and sound management of chemicals in general and POPs in particular.

develop a national framework for the protection of human health and the environment from the negative effects of POPs, through

The Gambia is committed to the full Implementation of the Stockholm Convention on Persistent Organic Pollutants and there are indications of consistent Multi-sectoral and High-level participation by stakeholders.

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### III. EXECUTIVE SUMMARY

The National Implementation Plan is a requirement for the implementation of the Stockholm Convention on the reduction and ultimate elimination of pops in The Gambia The project is a Global Environment Facility (GEF) funded project being executed by UNEP and implemented by NEA on behalf of the Gambia Government.

The primary objective of the Project is to develop a national framework, and Strengthen National Capacity for the effective implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in the Gambia.

Recognizing the importance of stakeholder participation, the inception workshop was held on the 15th of January 2003 at the Palm Grove Hotel, to map out strategies of implementation and to identify roles and responsibilities for different stakeholders in the Management of POPs.

The first phase of the project entails the establishment of the National Coordination Committee (NCC) and a Technical Coordination Body called the Project Coordination Unit (PCU). The NCC is comprised of institutions (both public and private) that are involved in POPs management in the Gambia.

During this phase, Consultations were held with heads of key institutions to determine the level of involvement and awareness of these institutions with regards to POPs issues. This was followed by a high-level meeting of stakeholders and policy makers to secure commitment in the implementation of the project.

During the second phase which entailed the establishment of a POPs Inventory and Assessment of Infrastructure, five multidisciplinary task teams, each headed by a team leader, were established around the following areas of interest:

1. Updating of the National Profile developed in 1997;
2. POPs pesticides including DDT;
3. PCBs;
4. Unintentionally Produced POPs;

## 5. Information Dissemination, Education and Awareness Raising.

In instances where the local expertise was not assured international consultants (Mr. Yves Guibert, Mr. Derek Chartwood and Mr. Patrick Dyke) were hired to assist with PCB inventory, the DDT alternatives assessment, and the inventory of Dioxins and Furans respectively.

The National Profile on Chemical Management which was developed in 1997, was updated to take on board new developments with regard to chemical management and POPs;

The study which covered both agriculture and vector control POPs revealed that POP pesticides are not currently used in the country. The study has not however ruled out possible entry through our porous borders to weekly (“Loomo”) markets.

The inventory on the unintentionally produced POPs indicates that the principal sources of releases of dioxins and furans in the Gambia are: dumpsite fires; open burning of domestic and other wastes in streets and road sides; forest and bush fires; the burning of agricultural residues; and the use of biomass for cooking;

Under the area of Information Dissemination, Education and Awareness Raising, three sub task teams were established: Level of Awareness; Knowledge of health implications of Chemical especially POPs; Existence of appropriate information systems. All task team reports were validated at a multi stakeholder workshop and by the NCC.

During the fifth and final phase of the NIP process, a training workshop was sponsored by UNITAR to develop national capacity and skills in developing appropriate action plans to control or phase out POPs.

Based on the objectives prepared under the fourth phase, consultants were recruited to prepare action plans and strategies in: POP pesticides; PCBs, and on unintentionally produced POPs; and the establishment

A two-day stakeholder workshop was held to put these 3 specific action plans as well as the major findings and recommendations of other reports produced in the framework of this project together, under the guidance of a UNEP identified international consultant Mrs. Katarina Magulova. At the same time the participants validated all priority problems, objectives and management options as well as the



structure and content of the NIP, in particular the action plans and strategies, and produced the first draft of the NIP document.

National consultants were hired for the above work in each of these areas: POP pesticides; PCBs; unintentionally produced POPs; and establishment of a POP information system.

Report in each case study has been reviewed and present to NCC for validation.

During the fifth and final phase of the NIP process which entails the development of the National Implementation Plan and Endorsement by Stakeholders, a training workshop was sponsored by UNITAR to develop national capacity and skills in developing appropriate action plans to control or phase out POPs.

Based on the objectives prepared under the fourth phase, consultants were recruited to prepare action plans and strategies in: POP pesticides; PCBs, and on unintentionally produced POPs.

A two-day stakeholder workshop was held to put these 3 specific action plans as well as the major findings and recommendations of other reports produced in the framework of this project together, under the guidance of a UNEP identified international consultant Mrs. Katarina Magulova. At the same time the participants validated all priority problems, objectives and management options as well as the structure and content of the NIP, in particular the action plans and strategies, and produced the first draft of the NIP document.

This draft was again reviewed and supplemented by the project team as necessary and appropriate, commented and validated by the NCC. The final draft was presented countrywide and finally endorsed by a larger stakeholder group

#### **IV. List of acronyms and abbreviations**

<b>ADB</b>	African Development Bank
<b>AFPRC</b>	Arm Forces Provisional Ruling Council
<b>AOAC</b>	Association of Official Analytical Chemists
<b>APMU</b>	Agricultural Pest Management Unit
<b>CIEN</b>	Chemical Information Exchange Network
<b>CILLS</b>	Comite Interetat pour la Lutte contre la Sacheresse dans le Sahel
<b>CIPAC</b>	Collaborative International Pesticides Analytical Council
<b>CRD</b>	Central River Division
<b>DCC</b>	Divisional Co-ordinating Committee
<b>DHT</b>	Divisional Health Team
<b>DNA</b>	Designated National Authority
<b>DoSA</b>	Department of State for Agriculture
<b>DoSFE</b>	Department of State for Forestry and Environment
<b>DoSH</b>	Department of State for Health
<b>DSTIE</b>	Department of State for Trade, Industry and Employment
<b>DWR</b>	Department of Water Resources
<b>EIA</b>	Environmental Impact Assessment
<b>EQME</b>	Environmental Quality Monitoring and Enforcement
<b>FAO</b>	Food and Agricultural Organization
<b>FFS</b>	Farmer Field Schools
<b>FID</b>	Flame Ionisation Detector
<b>GBA</b>	Greater Banjul ARea
<b>GC</b>	Gas Chromatography
<b>GEAP</b>	Gambia Environmental Action Plan
<b>GEF</b>	Global Environmental Facility
<b>GLP</b>	Good Laboratory Practice
<b>GTTI</b>	Gambia Technical Training Institute
<b>HCB</b>	Hexachlorobezene

<b>HCPCMA</b>	Hazardous Chemicals and Pesticides Control and Management Act
<b>HCPCMB</b>	Hazardous Chemicals and Pesticides Control Management Board
<b>IAEA</b>	International Atomic Energy Agency
<b>ICCS</b>	International Conference on Chemical Safety
<b>IFCS</b>	Inter-government Forum on Chemical Safety
<b>ILO</b>	International Labor Organization
<b>IOMC</b>	International Organization for the Sound Management of Chemicals
<b>IPCS</b>	International Program on Chemical Safety
<b>IPM</b>	Integrated Pest Management
<b>ISIC</b>	International Standard Industrial Classification of all Economic Activities
<b>ITC</b>	International Trypanotolerance Center
<b>ITN</b>	Insecticide Treated Net
<b>LAN</b>	Local Area Network
<b>LGA</b>	Local Government Authority
<b>LOCUSTOX</b>	Pesticide laboratory for Sahel
<b>LRD</b>	Lower River Division
<b>MB</b>	Medicines Board
<b>MDFT</b>	Multidisciplinary Facilitating Team
<b>MRC</b>	Medical Research Council
<b>NaNA</b>	National Nutrition Agency
<b>NARI</b>	National Agricultural Research Institute
<b>NAWEC</b>	National Water and Electricity Company
<b>NBD</b>	North Bank Division
<b>NCC</b>	National Coordination Committee
<b>NEA</b>	National Environment Agency The Gambia
<b>NEMA</b>	National Environment Management Act
<b>NEMC</b>	National Environment Management Council
<b>NGO</b>	Non-governmental Organization
<b>NIBP</b>	National Insecticide Impregnated Bed net Programme

NIP	National Implementation Plan for POPS
NMCP	National Malaria Control Programme
NSGA	Nova Scotia-Gambia Association
ODS	Ozone Depleting Substances
PC	Personal Computer
PCB	Polychlorinated biphenyl
PCCDF	Polychlorinated dibenzofurans
PCDD	Polychlorinated dibenzo-para-dioxins
PCP	Pentachlorophenol
PCU	Project Coordination Unit
PHC	Primary Health care
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
RVTH	Royal Victoria Teaching Hospital
SCPP	Senegalogambia Crop Protection Programme
SER	State of the Environment Report
SPC	Sahelian Pesticide Committee
TLC	Thin Layer Chromatography
UN	United Nations
UNDCP	United Nations Drug Control Program
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNITAR	United Nations Institute for Training and Research
URD	Upper River Division
VCU	Vector Control Unit
WD	Western Division
WHO	World Health Organization
WRC	Water Resources Commission



## 1. INTRODUCTION

### 1.1 Background

For the past 40 years, awareness has been growing about the threats posed to human health and the global environment by the ever-increasing release in the natural environment of synthesized chemicals. Mounting evidence of damage to human health and the environment has focused the attention of the international community on a category of substances referred to as Persistent Organic Pollutants (POPs). Some of these substances are pesticides, while others are industrial chemicals or unwanted by-products of industrial processes or combustion. POPs are characterized by persistence – the ability to resist degradation in various media (air, water, sediments, and organisms) for months and even decades; bio-accumulation - the ability to accumulate in living tissues at levels higher than those in the surrounding environment; and potential for long range transport – the potential to travel great distances from the source of release through various media (air, water, and migratory species).

Specific effects of POPs can include cancer, allergies and hypersensitivity, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system. Some POPs are also considered to be endocrine disruptors, which, by altering the hormonal system, can damage the reproductive and immune systems of exposed individuals as well as their offspring.

The realization of these threats led a number of countries to introduce policies and legal and regulatory instruments to manage an increasing number of these substances. However, because of POPs persistence and propensity to undergo trans-boundary movement, countries began to seek multinational co-operative actions.

Momentum to this process gave the 1992 Global Rio Conference on the Environment, where the principle of Sustainable Economic Development was introduced.

Concerning POPs the Chapter 19 of Agenda 21 is of special importance. A goal to be met by the year 2000 was set to achieve worldwide environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products. Pursuant to this the Stockholm Conference established in 1994 the Inter-governmental Forum on Chemicals Safety (IFCS), through which countries regularly discuss their activities and priorities for the sound management of chemicals. Further, FAO, OECD, ILO, UNIDO, UNEP and WHO established in 1995 the Inter-Organization Programme for the Sound

Management of Chemicals (IOMC), a co-operative agreement to co-ordinate linking and integrating their respective programmes in the area of chemical management and safety.

What was achieved so far thanks to these joint international efforts:

- The Basel Convention on Trans-boundary Movements of Hazardous Waste was adopted in 1989 and entered into force 1992. 170 states, including The Gambia are parties to this convention.
- The Rotterdam Convention on Prior Informed Consent was adopted in 1998 and entered into force 24. 2. 2004. It has 73 signatories and 90 parties, including The Gambia.
- The Stockholm Convention on Persistent Organic Pollutants has been adopted in 2001. It entered into force 17. 5. 2004. It has 151 signatories and 98 parties, including The Gambia .
- UNITAR/IOMC Programme on National Profiles for Sound Management of Chemicals was developed in the late 90-ties. To date 60 countries, developed their National Profiles, 22 are in the process to do so and 30 requested funding to elaborate their NP.
- On regional level the Protocol on POPs to the UN ECE Convention on Long-range Trans-boundary Air Pollution has been adopted 1998, and has 36 signatories and 17 parties and entered into force in October 2003
- The Bamako Convention on the ban of the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa was adopted in Bamako, Mali, on 30 January 1991. The Bamako Convention came into force on 10 March 1999.
- Sahel: Conscious of disastrous consequences that massive application The Common Regulations for the Registration of Pesticides in the of pesticides could have on an already disturbed fragile ecosystem as a result of drought, the nine (9) member countries of CILSS established the common regulations for pesticides in 1992 with the following main objectives:
  - a. To put together the expertise of the Sahelian countries
  - b. To avoid free circulation of banned products from one country to another.

- c. To reduce the cost of pesticide registration on individual countries.

GEF through its implementing and executing agencies is facilitating the worldwide implementation of the Stockholm Convention. Parties to the Stockholm Convention are required to develop National Implementation Plans (NIPs) describing how they will meet the obligations set by the Convention. The Gambia received through UNEP as GEF implementing agency capacity building support for enabling activities to strengthen its ability to implement a systematic and participatory process for the preparation of the NIP, and for the NIP production.

## 1.2 Relevant Activities Preceding this Project

The Gambia, although faced with numerous constraints has already made some remarkable steps in the field of chemicals management, notably there is:

- A functional multi-sectoral Hazardous Chemical Management Board in place;
- Pesticides Regulations operational with enforcement mechanisms in place;
- Hazardous Chemicals Regulations in place;
- Pesticide Formulation Laboratory established;
- An Inspectorate established;
- A viable registration scheme in place (prior to the adherence to the common CILSS registration system);
- Environmental Management and Discharge Permit Regulation in place
- A National Profile to assess the country's capacity to manage chemicals prepared;
- A National Action Plan for Integrated Chemicals Management prepared;
- Sensitisation and Education programs on going;
- Database set up at Inspectorate (on imports, licenses, cases of violations);
- A National Action Plan for Implementation of the Rotterdam Convention elaborated.

### Implementation arrangements

The NIP is a GEF funded project being executed by UNEP and implemented by NEA on behalf of the Gambia Government.



### 1.3 The Objectives of the Project

The overall objective of the Project was to develop a national framework for the protection of human health and the environment from the negative effects of POPs, through

Preparation of ground for implementation of the Stockholm Convention in the Gambia;

Assist the Gambia to meet reporting and other national obligations under the Convention;

Strengthen National Capacity for the effective and sound management of chemicals in general and POPs in particular;

### 1.4 Project Implementation Method

To facilitate successful project implementation, the participation of all stakeholders in the management of POPs was found essential.

Recognizing the importance of stakeholder participation, the inception workshop was held on the 15th of January 2003 at the Palm Grove Hotel, to map out strategies of implementation and to identify roles and responsibilities for different stakeholders.

#### Project phases

The preparation of the NIP entails 5 phases:

Phase 1- Determination of Coordination Mechanisms and Organization of Process;

Phase 2- Establishment of a POPs Inventory and Assessment of Infrastructure;

Phase 3- Priority setting and Development of Objectives;

Phase 4- Formulation of Specific Action Plans and Strategies;

Phase 5- Development of the National Implementation Plan and Endorsement by Stakeholders.

#### Activities by phases

## **PHASE 1**

- Establishment of the National Coordination Committee (NCC) and a Technical Coordination Body called the Project Coordination Unit (PCU). The NCC is comprised of institutions (both public and private) that are involved in POPs management in the Gambia. These are:
  - National Environment Agency (NEA)
  - Permanent Secretary, Forestry and Environment (Chair)
  - DAS (Department of Agricultural Services), Department of State for Agriculture
  - Department of Livestock Services (DLS)
  - National Agricultural Research Institute (NARI)
  - Department of State for Health (DOSH)
  - Attorney General's Chambers
  - Gambia Chamber of Commerce and Industry (GCCCI)
  - The Association of Non-governmental Organisation (TANGO)
  - Customs and Excise Department
- An International Consultant (Mr. Patrick Dyke) was identified and hired to assist in the implementation of the first phase and to make recommendation for the second phase based on findings of the first;
- Consultations were held with heads of key institution to determine the level of involvement and awareness to these institutions with regards to POPs issues;
- A high-level meeting was convened of stakeholders and policy makers to secure commitment in the implementation of the project.

## **PHASE II**

Five multidisciplinary task teams, each headed by a team leader, were established around the following areas of interest:

1. Updating of the National Profile developed in 1997;
2. POPs pesticides including DDT;
3. PCBs;
4. Unintentionally Produced POPs;
5. Information Dissemination, Education and Awareness Raising.

## **PHASE III**

International consultants (Mr. Yves Guibert, Mr. Derek Chartwood and Mr. Patrick Dyke) were hired to assist with PCB inventory, the DDT alternatives assessment, and the inventory of Dioxins and Furans.

- The National Profile on Chemical Management developed in 1997, was updated to take on board new developments with regard to chemical management and POPs;
- A comprehensive data base has been established for PCBs and PCBs containing equipment.
- The study which covered both agriculture and vector control POPs revealed that POP pesticides are not currently used in the country. The study has not however ruled out possible entry through our porous borders to weekly (“Loomo”) markets.
- The inventory indicates that the principal sources of releases of dioxins and furans in the Gambia are: dumpsite fires; open burning of domestic and other wastes in streets and road sides; forest and bush fires; the burning of agricultural residues; and the use of biomass for cooking;

Three sub task teams were established under the Education and Awareness Creation issue: Level of Awareness; Knowledge of health implications of Chemical especially POPs; Existence of appropriate information systems.

All task team reports were validated at a multi stakeholder workshop and by the NCC.

#### **PHASE IV**

Activities under this phase included:

- A review of phase II activities;
- Identification, prioritization and development of objectives concerning POPs issues;
- A socio-economic analysis of POP management and control;
- A socio-economic analysis of the impacts of alternatives.

National consultants were hired for the above work in each of these areas: POP pesticides; PCBs; unintentionally produced POPs; and establishment of a POP information system.

Report in each case study has been reviewed and present to NCC for validation.

#### **PHASE V**

A training workshop was sponsored by UNITAR to develop national capacity and skills in developing appropriate action plans to control or phase out POPs.

Based on the objectives prepared under the fourth phase, consultants were

recruited to prepare action plans and strategies in: POP pesticides; PCBs, and on unintentionally produced POPs.

A two-day stakeholder workshop was held to put these 3 specific action plans as well as the major findings and recommendations of other reports produced in the framework of this project together, under the guidance of a UNEP identified international consultant Mrs. Katarina Magulova. At the same time the participants validated all priority problems, objectives and management options as well as the structure and content of the NIP, in particular the action plans and strategies, and produced the first draft of the NIP document.

This draft was again reviewed and supplemented by the project team as necessary and appropriate, commented and validated by the NCC. The final draft was presented countrywide and finally endorsed by Secretary of State for Forestry and the Environment

### 1.5 NIP structure and contents

The National Implementation Plan for The Gambia has the following structure and contents:

#### Country baseline:

This section is providing basic background information relevant to the NIP. It describes the current situation and state of knowledge in The Gambia about POPs and status of institutional and other capacity to address the problem.

The Country Profile chapter gives a brief country profile in order to place the NIP strategies and action plans in a country-specific context. It summarises information on geography and population, membership of regional and sub-regional organisations, the political and economic profile, profiles of potentially important economic sectors in the context of the POPs issue and provide an overview of overall environmental conditions and priorities in the country.

#### Institutional, Policy and Regulatory Framework

This section describes the present overall institutional, policy and regulatory framework within which the NIP will be implemented. It will also cover more detailed baseline information about the POPs issue such as status of action and implementation activities under related Conventions or regional/sub regional agreements. It describes in detail the roles and responsibilities of State Departments, Agencies and other governmental Institutions involved in POPs life cycles management: source through to disposal, environmental fate and health monitoring.

## Assessment of the POPs Issue in The Gambia

This section of the NIP is providing the current state of knowledge about POPs in The Gambia. It is addressing each POP listed in the annexes of the Convention and the various subject areas addressed in the Convention articles, including inventory information, current technical, management and monitoring capacity, potential impacts and the level of public awareness and concern.

Each sub-chapter is ending with description of issues of concern, definition of priority problems for the particular area, setting of objectives to address the priority problems and identification of suitable management options in order to meet the objectives.

## Strategy and Action plan section of the NIP

This section details the actions included in the NIP to meet the obligations of the Stockholm Convention in The Gambia, reflecting her specific situation. Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs, options were identified for institutional and regulatory strengthening, POPs management, awareness raising activities and research and development.

The proposed options are subject of the particular action plans. For each option an explanatory text describes the rationale behind selecting the particular option as well as the expected capacity of the option to meet the Stockholm Convention requirements.

An implementation strategy table contains information on activities associated with the particular option, implementation timelines, responsible and supporting agencies for implementation, and indicators of success. Links to existing country programmes on chemical management, environmentally sound waste management and environmental pollution control, as well as with the national activities on sustainable development are provided.

In the resource needs assessment human, capital and operation costs of the identified activities are described, considering the established timeline.

A summary table provides an overview of all action plans and the respective management options with information about the timeframe of their implementation (short, medium and long-term); necessary implementation costs (low, medium, high) as well as possible sources of funding (state budget, private sector, external funding).

## 2. COUNTRY BASELINE

### 2.1. Country Profile

#### 2.1.1. Physical and Demographic Context

Located on the West African coast, the Gambia stretches about 480-kilometre inland from West to east on either side of the River Gambia. The country varies in width from approximately 50km near the mouth of the River to about 24 kilometres upstream. The Gambia is bound to the North, South and East by the Republic of Senegal and to the West by the Atlantic Ocean. The river Gambia runs the entire length of the country, thereby dividing its land area of 11,295 square kilometres almost equally into two halves- the South Bank and North Bank.

Fig. 1: Map of The Gambia



The Gambia attained internal self-government from British rule in 1963 and full independence on the 18th February 1965. The country became a sovereign Republic within the Commonwealth in 1970. Maintenance of multi-party democracy and the adherence to the rule of law constitute an integral part of the country's political framework, which basically comprises of executive, the Legislature, the Judiciary and the Press. The President, who is elected every five years by universal suffrage, heads the government. Elections are also held every five years for members of the country's National Assembly.

English is the official language of the country on which all government matters are transacted. In addition to this, a number of local languages are spoken including,

Mandinka, Fula , Wollof, Jola, and Sarahule.

The population of the Gambia is currently estimated at 1,364,507(2003 censures?). With its land area, this makes The Gambia one of the most densely populated countries in Africa with 128 persons per square kilometre. Out of this population, the urban population accounts for 40 % whilst 60 % accounts for the rural population. This distinction between urban and rural is predominantly based on the general occupation of the majority of the population. Thus the rural economy is predominantly agricultural with urban settlements characterised by intense commercial activities as well as formal and informal sector employment.

In terms of gender distribution, there are 687,781 females to 676,726 males as of 15th April 2003. The population is characterised by a youthful population with 44% below the age of 15 years. Average life expectancy is 55 years. Currently, the literacy rate, which is barely 40%, is higher among males (55%) than female (27%). There is an improvement, however, as the current Gross Enrolment Ratio (GER) at the basic education level incorporating Madrassa, is at 83%, of which girls enrolment is faster than that of boys.

#### 2.1.2. Political and Economic Profile

The Gambia is divided into seven Administrative Divisions including the city of Banjul and Kanifing municipality. Five of the divisions is further divided into Districts, which are headed by Chiefs, with a total 42 Districts in the country.

Under the new Local Government reforms and decentralisation, the country is divided into 8 Local Government Areas, two municipal Authorities (Banjul and Kanifing) and six Local Government Authorities (Brikama, MansaKonko, Kerewan, Kuntaur, Janjanbureh and Basse).

An analysis of the population by Local Government Areas (LGAs) shows that, Banjul, Kanifing and Brikama account for 2.6, 23.6 and 28.8 percent of the total national population, respectively. This implies an over concentration of 55% of the population in these three LGAs while the 45% live in the other 5 LGAs.

### 2.1.3. Overview of Industrial and Agricultural Sectors

In common terms the Gambia is classified as a Least Developed Country (LDC) and is ranked 149 out of 161 in the United Nations Development Program Human Development Index, 2001. Like other countries in this category, it is characterised by a significant large agricultural and natural resources sector, a relatively small industrial sector and a large services sector dominated by government.

The agricultural sector is characterised by crop production and livestock production and fisheries contributes 22-23% of GDP, while industry and manufacturing sectors account for 12% and 11% GDP respectively. The services sector, which is dominated by the hotel industry and a vibrant informal sub-sector, contributes about 67% of GDP and is the main foreign exchange earner. The mineral resources in the Gambia include heavy mineral deposits such as ilmenite, quartz sand, kaolinite clay stones, plastic clay, laterite and cockleshells. The potential of the country regarding zircon is being investigated.

#### Structure of the sectors

The structure of the sectors is shown in Table 2. The Gambia's industrial (manufacturing and fish processing) is dominated by small facilities, 82%. Micro facilities form 14% while medium facilities form 7%.

**Table 1: Overview of the Industrial and Agricultural Sectors**

Sector	Contribution to Gross Domestic Product (%)	Number of employees / farming population	Major products	Remarks
Industrial / Processing / Manufacturing Sector	23	2862 (1995)	Fish, fruits, beverages, wood, iron and still, cement etc.	
Mining and Extraction	0.09	2500	Sand Clay Gravel	
Agricultural Sector	22 - 23	759,016	Groundnut Rice Coarse grains Millet Maize Sorghum	Unlike 1994 / 95 cotton has not featured as a major crop in 2002/2003. This may also account for the



				reduction of the sectors contribution to GDP which stood at 23.8% in 1994 / 95
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**Table 2: Structure of the sectors**

Sector	Micro Farms/Facilities	Small Farms /Facilities	Medium Farms /Facilities	Big Farms /Facilities
Industrial / Manufacturing Sector	4	23	2	NA
Agricultural Sector	NA	274,685	766,676	31,549
Total	NA	NA	NA	NA

The formal manufacturing sector of The Gambia is dominated by the food industry, which include beverage facilities, and fish processing plants, abattoir, sweets and milk processing plants. There are four small/micro-mining facilities for sand and gravel mining to serve the building industry. Carnegie Corporation Company used one big facility in the mining sector, to test mining Zircon. Samples were collected and taken to Australia for further testing. If results are positive, the company could engage in large-scale mining of Zircon.

Three facilities are involved in the production of timber, also serving the building industry. The government owns two of these facilities. They each employ an average of five people and produce between 0.5 and 0.9 cubic meters of timber per day. Two facilities foam manufacturing and plastic production plants are in the chemical and plastic plant product category. The foam plant produces mattresses from Freon 11, and the plastic plant produces plastic containers using polyethylene pellets. Two facilities manufacture simple farm implements and garden tools. There is one facility that produces ceramic tiles.

Employment is highest in the food industry followed by: mining and extraction, electric generation, chemical/plastic products etc. Except for the mining and extraction sub-sector whose output value was given as D10, 561,690 for 2002-2003, information on the output value of on the other industrial sub -sectors is not forthcoming.

The Gambia's production of chemicals is very minimal if not negligible. On the other hand, it imports a large quantity of chemicals ranging from agricultural,

industrial to consumer chemicals.

Power production, transmission and distribution

The National Water Electric Company (NAWEC), is solely responsible for electricity production, transmission and distribution nation-wide, and has seven generating stations. As primary energy heavy and light fuel oil is used and solar energy is utilised as well. Substantial power generation takes place also in the private sector using private generators. These generators are either used as back-ups to NAWEC's facilities, or as sources of electricity in places not covered by NAWEC.

Environmental Overview

Estimation of emissions due to fuel combustion during the National Inventory of Green House Gases in 1993, consist of a total of 181,064 tones (t) of CO<sub>2</sub>, 2,911 t CH<sub>4</sub>, 40 t N<sub>2</sub>O, 2,224 t NO<sub>x</sub>, 54,536 t CO and 6,987 t of NMVOC (non-methane volatile organic compounds). The inventory indicates that the bulk of the CO<sub>2</sub> emissions came from road transport, representing 60% while industries emitted 30% of CO<sub>2</sub>. The residential sub-sector emitted 99% CH<sub>4</sub>. The energy and manufacturing, construction industries emitted 94% and 6% of N<sub>2</sub>O respectively. The residential and road transport sub-sectors contribute to 93% of NO<sub>x</sub> emitted while industries emit about 7%. A Memorandum of Understanding was signed between the Department of Water Resources (Focal Point for UNFCCC) and key institutions to make data available as and when required for up-date.

The priority concerns related to chemical import and use are varied. In the Greater Banjul and Kombo areas, the concern stems from problems such as pollution (air and water) clinical and industrial wastes to consumer chemicals such as used batteries. Outside these areas, the problem is mainly pesticides and other agrochemicals. The low level of awareness coupled with the unavailability of data in most cases; contribute to the difficulty to address such concerns.

## 2.2. Institutional, Policy and Regulatory Framework

Overview of National Legal Instruments which Address the Management of Chemicals

### **The Gambia Environment Action Plan 1992 (GEAP)**

The Gambia Environment Action Plan (GEAP) adopted in 1992 forms the main policy framework for environmental planning and decision-making. It came to reinforce government's program on sustainable development, such as the Poverty Reduction Strategy (PRSP). It emphasises the need for national development without compromising the environment. The main objective of the GEAP is the

conservation and rational use of natural resources, the strengthening of institutional and regulatory framework, and the raising of awareness in environmental issues. The big challenge in the Gambia is to alleviate poverty, because poverty is a vicious cycle culminating in ill health and vice-versa.

### **The National Environment Management Act (1994)**

The Act provides both regulatory and legislative framework for environmental management in The Gambia. It is not specific to hazardous chemical or pesticides but covers all environmentally related issues, and therefore indirectly deals with POPs.

The NEMA established the National Environment Management Council (NEMC) and the National Environment Agency (NEA).

NEMA empowers the NEA to instruct the seizure or closure of an activity which negatively affects the environment and to carry out inspections, studies, monitoring to ensure compliance with established environmental legislation and conventions.

It establishes also the Technical Advisory Committee (TAC), the Technical Working Groups (TWG), and Local Environment Committees (LEC). Pollution Control is established under part VIII of the Act. This part prohibits the discharge of materials, substances and oil into the environment, and also provides for the formulation of the Environmental Management Discharge Permit Regulations.

### Environmental Management Discharge Permit Regulations (2001)

The National Environmental Agency under the powers of the NEMA 1994 has a duty to prevent pollution of the environment and specifically control discharge of dangerous materials or polluting substances.

The NEA is currently implementing the Environmental Management Discharge Permit Regulations (2001) under the NEMA 1994. The purpose of the permitting system is to control discharges from industries and other establishments, including households operating or carrying out processes potentially harmful to the environment. The first stage is to register all industries and establishments operating in the Gambia currently producing wastes or emissions discharges to water, land or air. This is to ensure that discharges of hazardous substances in the environment are minimised and controlled.

### **The Hazardous Chemicals and Pesticides Control and Management Act (1994)**

In 1994 the Hazardous Chemicals and Pesticides Control and Management Act was enacted to regulate the indiscriminate sale and misuse of chemicals, particularly pesticides. The Act calls for the mandatory registration of all hazardous chemicals and provides a wide and comprehensive framework for the control and management of the manufacture, distribution and use of hazardous chemical and pesticides. The NEA is administering the Hazardous Chemicals and Pesticides Control and Management Act of 1994. The Act covers pesticides and all other hazardous chemicals from consumer, industrial, to agricultural chemicals.

The Act provides for:

- The establishment of a multi-sectoral Board with final authority to register and control all hazardous chemicals in the country (from importation to disposal);
- The position of a Registrar to implement the decisions of the Board;
- Technical committees to advise the Board when required;
- System of registration of pesticides and chemicals- provisional clearance, restriction and banning of pesticides;
- Labelling, advertising and packaging of pesticides;
- Licensing of dealers and the payment of fees for Licenses and Certificates;
- Enforcement- designation of inspectors and analyst;
- Penalties for infringement- Fines for offences against the Act;

- For powers to make regulations.

The Hazardous Chemicals and Pesticides Control and Management Act is the only one that addresses the various stages of the lifecycle of the chemical (from importation to disposal).

The Act is very general and does not specifically deal with POP pesticides. It should be noted that some of the POP pesticides are already banned in The Gambia. These include ALDRIN, CHLORDANE, DDT, DIELDRIN, HEPTACHLOR, HEXACHLOROBENZENE.

Section 3 of the Act provides for the monitoring and control of the import, manufacture, distribution, storage, use, sale and disposal of pesticides

Section 10 of the Act provides for the mandatory registration of all pesticides, even though the function of registration by the Board has been relinquished to a central sub regional body since the adherence of The Gambia to the Common Regulations for Pesticide Registration in the CILSS Member States, in 1997.

Section 13 of the HCPCMA provides for exemptions in import, use and manufacture of restricted and banned pesticides for scientific and educational purposes.

Section 37 and 38 of the HCPCMA provide for penalties and sanctions in cases of violation of the Act with regard to import, sale, use, manufacture, export of a banned or restricted pesticide.

The Hazardous chemicals and Pesticides Control and Management Act is the only national legal structure at the moment that apply and sufficiently addresses the control and management of chemicals other than pharmaceuticals. It does not conflict with the Medicines Act, which addresses Pharmaceuticals, or with the Water Resources Act, nor the Plant Protection Act. The Act uses language and concepts consistent with international laws (such as the FAO Code of Conduct and the PIC Procedure) and provides for international notification procedures. It has three sets of Regulations:

The Pesticide Registration Regulations 1994

(Part A and B of these Regulations lay down the procedures for registration and licensing of pesticides respectively, and Part C deals with procedures for inspection, analyses, disposal in water and land and the application of the Prior Informed Consent Procedure.)

The Pesticide Licensing regulations 1994

The Hazardous Chemicals Regulations 2001

(Although these Regulations deal with chemicals other than pesticides, under Schedule 3 containing Group I chemicals, all chemicals subject to the Stockholm (POP) Convention are included. Part II, Section 11 of these Regulations prohibits the importation, manufacture, distribution or sale of chemicals of Group I without

prior authorization from the Board.)

The following existing legal documents are also addressing various stages of live-cycle management of chemicals:

### **Local Government Act 2002**

This Act establishes under Schedule 1, Part 1 seven Local Government Areas (Central River Division, Lower River Division, North Bank Division, Upper River Division, Western Division, City of Banjul and Kanifing Municipality) each with Area Council or Councils with designated jurisdictions, which have very wide powers of regulation, supervision, inspection and management. The Act still establishes the Banjul City Council as the authority for the administration of the city of Banjul.

With regard to chemical management, Paragraphs 1 and 3 and 18 (m), of Schedule II, Part II of the Act are the most relevant. These three paragraphs respectively provide for Local Governments to:

- Control pests of all sorts, including tsetse flies, mosquitoes, and weeds;
- Prohibit, restrict and control the planting, harvesting and possession of noxious or poisonous plants;
- Prohibit, restrict, regulate or license the burning of rubbish or grassland;
- Area Councils are primarily involved in the use of chemicals. Noxious or poisonous plants may also contain some chemical elements whose control is generally vested on the Area Council. Likewise, the regulation of consumable taken care of by subparagraph (iii) in effect, the area councils are indirectly involved in the management of chemicals albeit in a limited capacity.

The wide powers of inspection granted to the Councils in the former Act (1963-1984) (powers to provide for the inspection of all other food stuff of whatever nature, and of liquids intended for human consumption, whether exposed for sale or not, and to seize, destroy or otherwise deal with all such foodstuff or liquids as are found to be unfit for human consumption and to supervise and control all manufacturers and foodstuff of whatever kind or nature and of liquids intended for human consumption) are not provided for in the new Act.

## **The Petroleum Exploration and Production Act (1986)**

This Act Contains provisions dealing with exploring for and producing petroleum generally. It does not deal specifically with the production of petro-chemicals. The only relevant provision is section 20 (a), which gives the Secretary of State For Energy power to make regulation controlling the flow and prevention of the escape of petroleum, water or gasses (other than petroleum) or other noxious or deleterious matter. This Act is under review and The Petroleum Exploration and Production Act 2003 is being drafted.

## **The Fisheries Act**

The only section relevant to chemicals is Section 3a which prohibits the use explosives, poison or other noxious substances for the purpose of killing, stunning, disabling or catching fish or in any way rendering fish to be more easily caught. The penalty is severe (minimum of 5 years).

## **Waste Management Bill 2003**

A Waste Management Bill is currently being finalised by a legal consultant. It will provide for the disposal of POPs chemicals.

The Bill will take into account The Gambia Waste Management Strategy of 1997 and international conventions namely the Basel and Bamako Conventions on Trans-boundary Movement of Hazardous Wastes and their Disposal. The hazardous wastes identified in that Strategy, are including PIC chemicals, and industrial as well as agricultural wastes. The Gambia does not manufacture any PIC chemical.

Section 4.7 of the Strategy recommends the Hazardous Chemicals and Pesticides Unit of the National Environment Agency to continue recording all pesticides that become waste, and investigate suitable disposal methods for each type. It further recommends that individual farmers and suppliers who own the pesticides, when they became waste, to shoulder the financial burden of disposal. Further, it recommends that the Department of Agriculture makes arrangements with incinerator and landfill operators, for environmentally sound disposal.

Hazardous waste is covered under Article 29 of the Bill and included under Special Waste.

Special Waste will be adequately defined to cover waste of PIC and POP chemicals. Provision is made in Article 29 giving powers to the Secretary of State to make Regulations dealing with Special Waste.

### **The Medicines Act**

This Act addresses Drugs and Pharmaceuticals.

### **The Water Resources Act.**

This Act has an overall object of promoting good management of water resources and the abatement of harmful effects through the formulation of water policies.

### **The Public Health Act.**

This Act makes provision for public and environmental health. It addresses the designation of health areas, the establishment of health services institutions, safe food and beverage, infection, offences and penalties

### **Plant Importation Act**

This Act makes provision for the importation of plants with a view to the prevention of the introduction and spread of pests and disease affecting vegetation.

### **Prevention of Damage by Pests Act.**

This Act makes provision for preventing loss of food by infestation.

### **Environmental Impact Assessment Regulations**

This is another legal instrument that indirectly controls chemicals, in this case industrial pollution. It ensures that all new projects undergo environmental impact assessment.

#### 2.2.2. Institutional and Regulatory Background and Procedures

Following institutions are playing a key role in chemical management in The Gambia:

#### **National Environment Management Council (NEMC)**

The Council is chaired by the Head of State and is comprised of all Secretaries of State whose Departments of State have a stake in the management of the Environment, such as the Departments of State for Natural Resources and Fisheries, Forestry and the Environment; Agriculture; Health; Local Government and Lands; Finance and Economic Affairs; Trade, Industry and Employment; and others that the President may co-opt. The Executive Director of the NEA is the Secretary of the Council. The Council is the policy-making organ of the National Environment Agency.



## **The Department of State for Forestry and Environment**

The NEA, which is hitherto, an agency of the Department of State for Fisheries, Natural Resources the Environment, is now operating under the Department of State for Forestry and the Environment.

## **The National Environment Agency (NEA)**

The NEA is operating under the Department of State for Fisheries, Natural Resources and the Environment. The Hazardous Chemicals and Pesticide Control and Management Act (1994), mandates it to control the use of chemicals and pesticides in the Gambia. This Act established the Hazardous Chemicals and Pesticide Management Board and the office of the Registrar of Hazardous chemicals and Pesticides.

The Board has representatives from the following Institutions:

- I NEA (Chairperson and Secretariat of Board)
- II Department of Agricultural Services (DAS)
- III Department of Livestock Services (DLS)
- IV National Agricultural Research Institute (NARI)
- V Department of Health Services
- VI Attorney General's Chambers
- VII Gambia Chamber of Commerce and industries
- VIII Customs and Excise Department

The functions of the Board are to:

- Monitor and control the importation, manufacture/production, sale, use, distribution, storage and disposal of chemicals, including pesticides;
- Prepare guidelines on the environmentally sound management of chemicals and pesticides;
- Conduct public educational campaigns;
- Publish list of prohibited and accepted chemicals and pesticides;
- Establish technical committees when necessary.

Under the auspices of the Board, a National Coordinating Committee (NCC) and a Project Coordinating Unit (PCU) were established for the purpose of the preparation of the national implementation plan under the Stockholm Convention. The NCC is a policy making body, whereas the PCU is the technical arm of the

Project.

An Inspectorate is set up at the NEA to monitor compliance with regard to certain environmental laws.

Part IX of National Environment Management Act 1994 (NEMA) gives duties and powers to environmental inspectors. Further, VII of the HCPCMA 1994 also gives powers to inspectors with regard to monitoring and inspection of chemicals.

These two Acts empower the inspectors to enter any premises, seize any object or stop any activity which is suspected to be deleterious to the environment, or in non compliance with the laws.

In 1996, a consignment of mosquito coils containing 10% of DDT was intercepted by the inspectors. The consignment was returned to the country of origin, and neighbouring countries alerted.

Due to the inadequate number of environmental inspectors, under the auspices of the Board, a network of enforcement personnel is established in all the divisions of the country to control the entry of banned and illegal pesticides, and to conduct sensitization campaigns.

The National Environment Agency (NEA) has put into place a discharge Permitting Regulations (2001) under the NEMA 1994, for all companies, operators and processes that have a potential of polluting the environment, the release and production of chemicals included.

The Permit contains the following elements:

- The conditions stating the requirements that the permit holder, his employees and site should meet;
- Record keeping and reporting;
- Notifications to the NEA in case of any unusual release;
- The treatment of wastes, releases or effluents;
- An agreed improvement program;
- Monitoring and sampling of releases;

### **The Department of State for Agriculture (DOSA)**

This is the major importer of agro-chemical used in agriculture for pest control, in livestock production & health and also fertilizers for the improvement of crop yields. It works in close collaboration with the NEA in controlling pesticides. It is primarily responsible for the use and application of pesticides. It conducts training for farmers on the use of agricultural products and input, including pesticides. They can be very instrumental in the control of POPs, through education, sensitization and enforcement of the laws.

DOSA is also responsible for the distribution of pesticides emanating from government grants, through well-established distribution points. It is also responsible for the government stocks of pesticides, and played an active role in the clean up and transport of obsolete pesticides to Britain for high temperature incineration, in 1999.

The Department should come up with concrete strategies to avoid accumulation of illegal and unwanted pesticides.

### **The Department of Health Services**

It is the mandate of this Department to control diseases including their vectors. The Department therefore is actively engaged in programs to control malaria. It uses among other things insecticides. It will therefore be highly involved in the decision and eventual use of DDT as a control of the vector of malaria. With partners such as UNICEF and the Medical Research Council, the Department imports pesticides for vector control.

DDT was also used for agricultural purposes until the early 60s. It was used as a contact insecticide, in different formulations. In 1975, the use of DDT was replaced by insecticides such as Pynerzone EC24, Abate 500E and granules, Malathion and Vapona.

### **The Department of State for Trade, Industry and Employment**

This is the Ministry responsible for industrial development and promotion. It monitors the effective/proper usage of investment incentives (such as duty waiver concessions, expatriate quotas, etc) to companies and organizations. Companies/enterprises that utilize chemicals as raw materials in their production processes are requested to provide detail information (on toxicity levels, residual effects etc) about such materials.

### **National Nutrition Agency (Na NA)**

This is a new Agency responsible for nutrition and nutritive values. It is aiming to set standards to food and nutrition in the country. It also has plans to establish in collaboration with DOSA residue analyses laboratories. POPs residues in breast milk and in food will eventually have to be determined by this Agency.

### **The Customs and Excise Department (Department of State for Finance and Economic Affairs)**

The role of this institution is to control the entry of POPs at the entry points. With the right and adequate training they can be instrumental enforcement scheme. They also form part of the enforcement personnel set up to monitor the import and use of pesticides.

### The National Agricultural Research Institute (NARI)

This institute is under the Department of State for Agriculture and has the mandate to conduct research on agricultural produce and inputs. NARI also conducts research in alternatives to POP pesticides.

### The Attorney General's Chambers (Department of State for Justice)

This institution is responsible for drafting new laws and regulations, and plays an active role in the process of ratification of conventions.

### The Gambia Chamber of Commerce and Industries (GCCCI)

GCCI represents the private sector in the management of chemicals including pesticides. A large number of pesticides are imported and distributed by the private sector. Most of them represent the pesticide manufacturers outside The Gambia. Their role in the control of POPs through sensitization and participation in stewardship programs cannot therefore be over emphasized.

### The Sahelian Pesticide Committee (SPC)

The SPC was established following the signature of the Common Regulations for Pesticide Registration for the Sahel countries. The SPC is comprised of experts from each member state and other experts in the disciplines of pesticide management. The SPC meets twice a year in Bamako, and review dossier from pesticide manufacturers. The review process is done in accordance with internationally accepted methods. Laboratories have been identified for field trials and analyses. The SPC determines and advises governments of member states on pesticides that should enter the sub region. The accepted pesticides are granted registration status and numbers. Since the inception of the SPC, no POP pesticide has been registered.

The structure is not a regional economic integration organization to which member states have transferred competence in respect of matters governed by the Stockholm Convention, and cannot therefore accede to the Convention on behalf of member states. However the SPC can advise and guide governments through its mandate as a registration body on the control of pesticides, and can use its discretion to reject POP pesticides.

### Existing Monitoring Programs

Enforcement of the law related to chemical management is carried out through, licensing, permitting, inspection, monitoring, as well as through sensitisation and education programs.

Due to the geographical position of The Gambia, the entry of goods from the

neighbouring countries is very easy. Chemicals, especially pesticides, enter the country through illegal channels. The Sunday markets commonly known as "lumos", are regularly monitored to ensure that pesticides vendors are registered and that no banned or unregistered pesticides are sold.

Pesticides pass through a registration process, which involves the completion of forms where the applicant is required to supply information on him, the manufacturer and on the efficacy, toxicity (to human and to the environment) of the products and on safety measures. A Certificate is issued after a satisfactory assessment. In addition Licenses are issued to dealers and Permits to importers.

The management of chemicals is also effected through training of applicators and sensitisation of the general public and through the confiscation of banned and unregistered pesticides and through sanction of defaulters. The Divisional Co-ordinating Committees (DCCs) have identified campaign teams that are responsible for the registration and management of pesticides within the divisions.

#### The Pesticide Formulation Laboratory

A Pesticide Formulation Laboratory, located at Abuko, about 13 km from Banjul is responsible for the analyses of pesticides. There is, however, no residue laboratory. The Abuko Laboratory employs internationally accepted analysis methods. Occasionally, results from the laboratory are referred to GTZ laboratories for cross checking and they have high acceptance rate.

The laboratory staff participates in sampling, and sensitisation activities. Studies are underway to institute a more coherent payment of fees for analyses to cater for the sustainability of the laboratory. A training seminar on pesticide quality control and the use of GC was organised for the staff of the laboratory and other external laboratories, in 1997. The chemist was sent for various long and short-term training between the 1997 and 2003. There are still plans to upgrade the laboratory into a sub regional reference laboratory.

The major constraints are the lack of adequate staff, lack of regular supply of reference standards and the absence of a High Pressure Liquid Chromatography for the analyses of certain active ingredients.

### 2.2.3. Non-regulatory Measures and Relevant Initiatives

#### **In country programs or initiatives**

- National Implementation Program on Persistent Organic Pollutants (NEA, APMU, NARI, DOSH etc). The NIP project was implemented in the period 2003-2006 with GEF/UNEP assistance.
- National Profile (NP) on Chemicals and Management (NEA, DWR, APMU, NARI etc.). The first NP was elaborated in 1997 with UNITAR assistance, and it was updated and extended to accommodate the POPs issue in 2003.
- Agricultural Pest Management Unit as the technical support to provide crop protection services (APMU, DAS, NARI, NEA etc).
- Training in the Implementation of Integrated Pest Management Farmer Field Schools in Sustainable Small-holder Farmers Horticulture Production Systems (FAO, DAS, APMU, NARI etc).
- Research on Plant Protection and IPM Technologies (NARI, DAS, APMU, NEA etc ).
- National Nutrition Agency's food safety programme.

#### **Regional and sub regional programs**

- Chemical Information Exchange Network (CIEN) (NEA, APMU, NARI, DOS H, etc).
- Senegalogambia Pesticide Management Initiative.
- Sahelian Pesticides Committee (SPC)
- IPM/FFS regional programs (West Africa- Senegal, Burkina, Mali) (East Africa- Kenya, Uganda, South Africa)
- LOCUSTOX (Pesticide laboratory for Sahel - Dakar).

#### Relevant International Commitments and Obligations

The Gambia is party to the following international commitments:

The Montreal Protocol

This instrument controls the emissions of Ozone Depleting Substances (ODS) into

the atmosphere. Ozone depleting substance study was completed, indicating the types and quantities that were used, sold or stored in The Gambia for the period 1995 to 1997. Training programs were organized for mechanics and repairers on retrofitting refrigerating and air conditioning equipment. Custom inspectors were trained in setting up and enforcing a system for the identification, monitoring and control of imported ODS. Assistance was provided to the Karan foam manufacturing plant in Banjul to convert its block foaming machine to a non-CFC consumption plant. This has resulted in a reduction in the annual consumption of between 8 tons of CFC at the plant.

### The Basel and Bamako Conventions

These Conventions are related to trans-boundary movement of hazardous wastes and their disposal. The Stockholm Convention refers to the guidance documents elaborated under the Basel Convention with regard to environmentally sound disposal of POPs containing/contaminated wastes.

The Gambia is party to the Basel Convention since 1997 and to the Bamako Convention since 2001

### The Rotterdam Convention on Prior Informed Consent (PIC)

The PIC Procedure is based on the principle of prior informed consent, that international shipment of a chemical, that is banned or severely restricted to protect human health or the environment, should not proceed without the agreement, or contrary to the decision of the Designated National Authority (DNA) in the participating importing country. The DNA is the government authority responsible for the administration of the PIC Procedure in the country. In The Gambia, the National Environment Agency is the DNA for PIC Procedure.

The objective of the Convention is to foster a shared responsibility to protect human health and the environment between exporting and importing countries.

It enables the world to monitor and control the trade in certain hazardous chemicals. It gives importing countries the power to decide, which of these chemicals they want to receive and to exclude those, they cannot manage safely. If trade does take place, requirements for labelling and provision of information on potential health and environmental effects will promote the safe use of these chemicals.

The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by participating Parties. Severely hazardous pesticide formulations that present a hazard under the conditions of use in developing country Parties or Parties with economies in transition may also be included. Twenty-seven chemicals including severely hazardous pesticide formulations are currently on the PIC List.

The Convention, which was ratified by The Gambia in November 2001, principally provides for:

- Procedures for banned, severely restricted chemicals and severely hazardous pesticide formulations;
- Designated National Authorities (DNA);
- Listing of chemicals;
- Chemicals already listed;
- Removal of chemicals;
- Obligation in relation to exports and imports;
- Export notifications;
- Information exchange;
- Implementation of the Convention;
- Technical assistance;
- Non compliance and settlement of disputes.

Obligations of Parties:

The Convention obliges Parties to obtain and disseminate information and decisions taken regarding those chemicals and pesticides on the list;

Countries participating in the interim PIC procedure must designate one or more national authorities (DNAs) to act on their behalf in the performance of the administrative functions required by the Convention;

Parties must notify all regulatory actions taken on chemicals including pesticides;

Exporting Parties must notify and obtain consent from importing Parties.

The Stockholm Convention on Persistent Organic Pollutants (POPs)

Initially 12 POPs are targeted for international action. These include pesticides and industrial chemicals such as DDT and PCBs, which were or are being used in The Gambia. DDT is an insecticide both for agricultural and public health use, and PCBs are found in some transformer oils in the country.

The Convention, which was ratified by The Gambia in June 2003, provides principally for:

- Measures to reduce/ eliminate releases from intentionally and unintentionally produced POPs;
- Registration of specific exemptions;



- Measures to reduce or eliminate releases from stockpiles and wastes;
- Implementation Plans;
- Information exchange and awareness and education;
- Research and monitoring;
- Technical and financial arrangements;
- Reporting and evaluation;
- Non compliance and settlement of disputes.

#### Obligation of Parties:

Parties should immediately stop using the following POPs pesticides: Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex and Toxaphene;

Severely restrict the use of DDT. Annex B provides for the restriction of DDT to vector control and use in accordance with specified WHO guidelines. Parties using or producing DDT have to sign up to a Register. For other Parties, the use and production have to be eliminated. However, all exemptions are for a fixed period of time, and subject to review;

Restrict the use of PCBs to closed systems with the aim of their phasing out and environmentally sound disposal by 2025 (equipment) or 2028 (wastes);

Measures should be taken to eliminate or reduce releases from unintentionally produced POPs;

Parties should develop implementation plans for the implementation of their obligations under the Convention;

Parties should establish mechanisms and schemes for awareness raising and information;

Parties should encourage the undertaking of research geared towards the elimination of POPs and the finding of alternatives.

Six of the pesticide POPs have already been banned and the others are not registered or used in The Gambia.

The most important pesticide POP in The Gambia is DDT. Although it is banned, there is an ongoing national debate to revert to its use, as the most effective insecticide against mosquitoes, the vector of the malaria parasite, malaria being still the leading killer-disease in the country. In the past, DDT was used in The Gambia as an insecticide both for agricultural and public health use.

The Common Regulations for Pesticide Registration in the CILSS member States

1992 the ministers of the countries belonging to the Permanent Interstate Committee for Drought Control in the Sahel (CILSS), comprising of such states as The Gambia, Senegal, Cape Verde, Burkina Faso, Guinea Bissau, Mali, Mauritania, Niger and Chad met in Ouagadougou, Burkina Faso, to adopt common regulations for the registration of pesticides, for the CILSS member states. The decision was prompted by the fact that large quantities of agro-chemicals, especially pesticides, were being used by member countries to prevent food losses and ensure food security for our people, since the Sahel ecosystem is very fragile and vulnerable to these hazardous substances. A common registration system is feasible because of the similarity in our ecosystems and populations.

Consequently, a Sahelian Pesticide Committee (SPC) or CSP (French Acronym), was established. This Committee is mandated to prohibit or permit the entry of pesticides into the sub-region.

The Common CILSS regulations provide among other things for:

- Registration conditions and procedure for pesticides;
- Protection of confidential data;
- Information provision;
- Labelling and packaging;
- Field trials;
- Emergency situations;
- Post registration control by member states;
- Composition and functions of the CSP;
- Appeals.

The Gambia ratified the Common Regulations in July 1997 and its amendments in 2003.

The Gambia has entered into bilateral co-operation program with Senegal in the area of chemicals, especially pesticides management. Under the program, NEA's Pesticide Formulation Laboratory undertakes the analysis of pesticide formulation for both countries, while Locustox laboratory in Senegal conducts analyses in pesticide residues also for The Gambia.

#### 2.2.5. Priority problems and objectives for institutional and regulatory strengthening

Assessment of the existing legal and institutional framework in The Gambia revealed that since the main objective of the Stockholm Convention is to protect human health and the environment from the harmful effects of POPs, the spirit and intent of this Convention is therefore synonymous with that of the Principal Act (HCPCMA). The Stockholm Convention can therefore be incorporated under the general powers conferred on the Secretary of State, in consultation with the Board, to make regulations for the effective carrying out of the objectives of the Act. The Regulations make the POPs applicable to The Gambia. The relevant provisions can be detailed in a Schedule prohibiting the production, use, import and export of the chemicals listed in the annexes of the Convention, unless it is done in accordance with the Convention.

Following is the assessment of the strengths and weaknesses of the legal and institutional frameworks laid down for the control of PRODUCTION, USE, IMPORT, EXPORT and DISPOSAL of chemicals (listed in Annex A II and Annex B III), as well as with the UNINTENTIONAL PRODUCTION (Annex C chemicals) and determine whether the current situation meets the requirements of the Stockholm Convention.

#### PRODUCTION

Necessary amendments to The Gambia Hazardous Chemicals and Pesticide Control and Management Act 1994, should be made that Mirex and Toxaphene, which are not reflected in the aforesaid Act, be incorporated therein.

As far as the National Environment Management Act, (NEMA) 1994 is concerned, there is nothing mentioned about the control of production of Chemicals listed in Annex A II and Annex B III of the Stockholm Convention. It is therefore recommended that, the aforesaid Act be amended so that it will incorporate the aforesaid provision of the Stockholm Convention.

As far as the Hazardous Chemicals and Pesticides Control and Management Act 1994 is concerned, Section 3 of this Act contains an effective control of production of the Chemicals listed in Annex A II and Annex B III of the Stockholm Convention. Section 3 of the aforesaid Act says: " No person shall Import, Manufacture, Sell or Use any pesticides unless the pesticide is registered in accordance with the common registration regulations in scheduled 1 of these regulations".

From the above, it could be deduced, that there is an effective control of production of the concerned pesticides, because "Manufacture" is tantamount to

production and no person can produce or manufacture any of the concerned pesticides, without registering them in the first place in accordance with the aforesaid regulations. To do otherwise, would be an offence under the aforesaid Act.

As far as the Pesticides and Hazardous Chemicals Act 1994 Regulations are concerned one effective control of production of pesticides that are unregistered, is that before they are Manufactured, Imported, or Used one of the 7 conditions which must be satisfied by an applicant is that the applicant should state in writing to the Board and disclose "the special precautionary measures taken to ensure that the pesticide is not likely to cause adverse effects to human health, animals, plants or the environment." This is Section 25 - (1) (f) of the aforesaid regulations. This control of production of the aforesaid unregistered pesticides is based on the precautionary principle, which is a well-known principle in Environmental Law and Management.

As far as the Hazardous Chemicals Regulations 1999 are concerned, Section 3 (4) of these Regulations takes care among other things, of the "production" of Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

## USE

As far as the National Environment Management Act, (NEMA) 1994 is concerned, there are no provisions for the "USE" of the Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

It is therefore recommended that (NEMA) 1994 be amended so that it will contain the aforesaid important provisions of the Stockholm Convention.

As far as the Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA) 1994 is concerned, Section 3 of this Act, takes care among other things, of the "USE" of Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

The aforesaid Section 3 reads: "No person shall Import, Manufacture, Sell or Use any Pesticides unless the Pesticide is registered in accordance with the common registration regulation in Schedule 1 of the regulations".

As far as the Hazardous Chemicals Regulations 1999 are concerned, Section 3 (4) of these Regulations takes care among other things, of the "USE" of Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

As far as the Pesticides and Hazardous Chemicals Act 1994 Regulations are concerned Section 27 (2) has stringent conditions relating to the "use" of Chemicals listed in Annex A II and Annex B III of The Stockholm Convention, which must be satisfied in totality before the Board can issue a licence for their use.

The aforesaid Section 27 (2) reads -"the Board shall in considering the applicant

satisfy itself that:

- The applicant has sufficient training to handle the application of Pesticides on a large scale
- The applicant has suitable equipment that is in a good state of repair.
- The applicant has trained employees in the safe 'use' of pesticides.
- The applicant has suitable management plan and response
- The applicant has protective clothing to be used by employees in the application of pesticides
- The applicant shall satisfy such other requirement as may be determined by the Board”

#### Specific exemption for PCB use in closed systems

There is a specific exemption under the Stockholm Convention enabling the use of PCBs in closed systems until 2025 and final disposal of PCBs containing wastes until 2028.

There is no specific Regulation under the Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA) 1994, which would cover all aspects of the management (inventory, labelling, reporting), handling (maintenance, transport, disposal) and phasing out of PCB's and PCBs containing material (equipment and wastes). Therefore it is recommended to elaborate such a Regulation under HPCMA.

#### IMPORT

As far as the Importation of Chemicals/Pesticides, which are listed in Annex A II and Annex B III of the Stockholm Convention, is concerned under Section 15 (1) of Hazardous Chemicals and Pesticide Control and Management Act (HCPCMA) 1994 “ No person shall import a pesticide into The Gambia without a licence issued by the Board.”

As far as the importation of the chemicals and pesticides listed in Annex A II and Annex B III, of the Stockholm Convention is concerned, the Pesticides and Hazardous Chemicals Act 1994 Regulations provide the following:- Section 13 (1) of the aforesaid Regulations says “ No person shall import a pesticide into The Gambia without a licence issued by the Board under these Regulations.”

As far as the National Environment Management Act (NEMA) 1994 is concerned, there are no provisions for the Import of the Chemicals listed in Annex A II and

Annex B III of the Stockholm Convention.

It is therefore recommended that (NEMA) 1994 be amended so that it will contain the aforesaid important provisions of the Stockholm Convention.

As far as the Hazardous Chemicals Regulations 1999 is concerned, there are no provisions for the Import of the Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

It is therefore recommended that the aforesaid regulations be amended so they will contain the aforesaid important provisions of the Stockholm Convention.

## EXPORT

As far as the Exportation of the Chemicals and Pesticides listed in Annex A II and Annex B III, of the Stockholm Convention is concerned, the Pesticides and Hazardous Chemicals Act, 1994 Regulations provide the following: - Section 17 (1) of the aforesaid Regulation says " No person shall 'export' a Pesticide from The Gambia with out a licence issued by the Board under these Regulations."

As far as the exportation of Chemicals from The Gambia that are listed in Annex A II and Annex B III, of The Stockholm Convention is concerned Section 19 (1) of the Hazardous Chemicals and Pesticide Control and Management Act (HCPCMA) 1994 Says- "No person shall Export a Pesticide from The Gambia without a licence issued by the Board."

As far as the National Environment Management Act, (NEMA) 1994 is concerned, there are no provisions for the Export of the Chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

It is therefore recommended that NEMA 1994 be amended so that it will contain the aforesaid important provisions of the Stockholm Convention.

As far as the Hazardous Chemicals Regulations 1999 is concerned, there are no provisions for the export of the chemicals listed in Annex A II and Annex B III of the Stockholm Convention.

It is therefore recommended that the aforesaid Regulations be amended so they will contain the aforesaid important provisions of the Stockholm Convention.

## Unintentional releases of POPs

Part VIII of the NEMA 1994 prohibits the discharge of materials, substances and oil into the environment and also provides for the formulation of the Environmental Management Discharge Permit Regulations 2001 under NEMA 1994. The issue of unintentional releases of POPs, hence also PCDD/PCDF emissions, is indirectly addressed by these Regulations, specifically dealing with the discharge of dangerous substances into air, water or land in the Gambia. The Regulation includes, in Section 5, provision for the use of Best Available Techniques and best Environmental Practice in order to minimise releases of unintentional releases of

hazardous substances (including POPs), as required by the Article 5, para. (d) of the Stockholm Convention.

Another important legal document is the The Waste Management Bill 2003 (not yet enacted), since the majority of PCDD/PCDF emissions is released from uncontrolled burning of waste. The Bill provides for the formation of Waste Management Authority and a strong enforcement of environmentally sound management of wastes. The enactment of this Bill will contribute to the reduction of PCDD/PCDF emissions.

## DISPOSAL

As far as the National Environment Management Act (NEMA) 1994 is concerned, there is no provision for the disposal of the Chemicals / Pesticides listed in Annex A II and Annex B III of the Stockholm Convention. It is therefore recommended that this Act be accordingly amended, in order to bring it in line with the Stockholm Convention.

As far as the Hazardous Chemical and Pesticide Control and Management Act, 1994 is concerned, there is no provision for the disposal of the Chemicals / Pesticides listed in Annex A II and Annex B III of the Stockholm Convention. It is therefore recommended that this Act be accordingly amended, in order to bring it in line with the Stockholm Convention

As far as the Pesticides and Hazardous Chemicals Act 1994 Regulations are concerned, there is no provision for the disposal of the Chemicals / Pesticides listed in Annex A II and Annex B III of the Stockholm Convention. It is therefore recommended that these Regulations be amended accordingly, so as to make them consistent with the Stockholm Convention.

As far as the Hazardous Chemicals Regulations 1999 are concerned, Section 9 empowers the Board to "determine the most environmentally sound manner for disposing of the chemical." This Section refers to "a Chemical that is banned or whose registration is cancelled"-see Section 9 (1) of the aforesaid 1999 Regulations. It is of paramount importance to note that the aforesaid regulations do not specifically provide a mechanism for the disposal of the Chemicals / Pesticides listed in Annex A II and Annex B III of the Stockholm Convention. However, Section 9 (3), which has been quoted above, provides the Board with a discretion of coming up with a disposal mechanism in respect of the aforesaid Chemicals / Pesticides, as it deems fit. A good case in point was the 1999 obsolete Pesticides exported to the U.K for disposal (high incineration.

### Priority problems

The National Environment Management Act, (NEMA) 1994 does not contain provisions for control of production of chemicals listed in Annex A II and Annex B III of the Stockholm Convention;

The National Environment Management Act, (NEMA) 1994 does not contain provisions to control the use of chemicals listed in Annex A II and Annex B III of the Stockholm Convention;

There is no specific Regulation under the Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA) 1994, which would cover management, handling, phasing out and disposal of PCB's and PCBs containing material;

There are no specific provisions under the Hazardous Chemicals Regulations 1999 to control the import of the chemicals (other than pesticides) listed in Annex A II and Annex B III of the Stockholm Convention;

There are no specific provisions under the Hazardous Chemicals Regulations 1999 to control the export of the chemicals (other than pesticides) listed in Annex A II and Annex B III of the Stockholm Convention;

The Environmental Management Discharge Permit Regulations 2001 under NEMA 1994 does not require the use of BAT and BEP for new installations;

There are no specific provisions for disposal of chemicals listed in Annex A II and Annex B III of the Stockholm Convention neither in the NEMA 1994, nor in the HCPCMA 1994 or in the enforcement regulations.

## Objectives

To address the gaps in the successful implementation of the NIP in The Gambia identified above, the following objectives were set:

- Amend the existing legal documents in order to contain provisions for control production, use, import and export of Annex A II and Annex B III chemicals;
- Elaborate and put in place Regulation under HCPCMA (1994) on Management, Handling, Phasing-out and Disposal of PCBs and PCBs containing waste;
- Include requirement of BAT and BEP use for new installations into the Environmental Management Discharge Permit Regulations 2001 under NEMA 1994.
- Include specific provisions for disposal of chemicals listed in Annex A II and Annex B III of the Stockholm Convention in the in the Waste Management Bill)

## Management options



Following management options were identified to meet the above objectives:

1. Include provisions for control of the production and use of Annex A II and Annex B III chemicals into the NEMA 1994;
2. Implement the necessary provisions with regard to PCBs import (ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999;
3. Elaborate and put in place Regulation under the Waste Management Bill on Disposal of PCBs and PCBs containing waste;
4. Include provisions to control the import and export of Annex A II and Annex B III chemicals (other than pesticides) into the Hazardous Chemicals Regulations 1999;
5. Include specific provisions for disposal of chemicals listed in Annex A II and Annex B III of the Stockholm Convention in the Waste Management Bill 2003.

## 2.3. Assessment of the POPs Issue in The Gambia

### 2.3.1. POPs pesticides

#### Introduction

Nine of the twelve chemicals listed by the Stockholm Convention for global phase-out are the following POPs-pesticides: aldrin, dieldrin, DDT, endrin, mirex, toxaphene, chlordane, hexachlorobenzene, and heptachlor. Some of them have been extensively used also in The Gambia in the past. The following chapter is summarising the results of a country-wide survey on past and present uses of POPs pesticides, evaluates the compliance status with the international treaties and the national policy, identifies the major problems/gaps/shortcomings and needs. The survey focused on the following:

- Conduct Inventory of POP-Pesticides listed in Annex A and B of the Convention, Persistent Organic Substances (Hexachlorobenzene, HCB) and other pesticides, with details of stock locations and contamination points in the field and storage facilities;
- Gather information on stockpiles or wastes containing or suspected of containing POP-pesticides;

- Identify gaps in information necessary for developing the NIP;
- Assess capacity building needs;
- Identify the relevant issues of concern, priority problems and objectives for management of pesticides and meeting the commitments under the Stockholm Convention in The Gambia.

### Relevant Stockholm Convention Requirements

**Parties shall:** [Article 3, para. 1]

(a) “prohibit and/or take the legal and administrative measures necessary to eliminate”:

(i) production and use of chemicals in Annex A<sup>1</sup> and

(ii) import and export of chemicals in Annex A

- *i.e.*, trade is restricted [see paragraph (2)]

(b) “restrict its production & use” of chemicals in Annex B<sup>2</sup>

- “acceptable purposes” specified for these chemicals

**Parties shall:** [Article 6]

- develop and implement strategies to identify stockpiles [para. 1 (a)(i) and 1 (b)]
- manage stockpiles in a safe, efficient and environmentally sound manner (ESM) until they are deemed to be wastes [paragraph 1 (c)]
  - *i.e.*, no remaining uses by Party
    - no *specific exemption* or *acceptable purpose*
  - does not apply to stockpiles that may be exported
    - per Article 3, para. 2
- develop strategies to identify [para. 1 (a)(ii)]
  - products and articles in use, and
  - wastes
    - that consist of, contain or are contaminated with a POP in Annex A, B or C
- endeavor to develop strategies for identifying sites contaminated by POPs in Annex A, B or C<sup>3</sup> [para. 1 (e)], and
- if remediation is attempted, do it in an environmentally sound manner

### Situation in The Gambia

#### Historical Importation and Use of POP-Pesticides, 1970-1994

The history of POP-pesticides import and use can be traced back to the 1970s by the Crop Protection Services, now renamed Agricultural Pest Management Unit, under the Department of Agricultural Services.

<sup>1</sup> Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, Toxaphene, Polychlorinated biphenyls (PCBs)

<sup>2</sup> DDT

<sup>3</sup> PCDD/PCDF, hexachlorobenzene, PCBs

The types of POP-pesticides imported were mainly grants donated to The Gambia Government from US and European countries to control agricultural crop pests in the field and stores and also for vector control. These POP-pesticides included Aldrin, Dieldrin, DDT but no records of such grants are currently available.

The enactment of the Hazardous Chemicals and Pesticides Control and Management Act in 1994, was to regulate the indiscriminate sale and misuse of chemicals particularly pesticides. With the enforcement of the Act, some POP-pesticides (Aldrin, Dieldrin, DDT, Heptachlor, Chlordane, Hexachlorobenzene and Lindane) were banned for importation, sale, storage and use in Gambia. Up till now the ban remains in force. Data on the quantities of POP pesticides that have been imported prior to 1994 are not available.

In a bid to clear the country of its obsolete and waste stocks of pesticides, which included some quantity of POPs, as well as confiscated stocks of banned pesticides, The Gambia repackaged and exported for destruction in the United Kingdom about 13.5 tons of such stock.

### **Pesticides Production, Import, Export and Use (1999 – 2003)**

The Gambia does not manufacture any pesticides including POP-pesticides. The inventory exercise did not uncover any production of pesticides.

No importation of POP-pesticides from 1999 to 2003 was observed by the survey. Nonetheless, other pesticides used particularly for agriculture, public health, and industries were imported during the period in question.

The total Pesticides imported from 1999-2002 according to the NEA Database and shown in Table 3 was 1,222.5 tons for solids and 1,581.9 m<sup>3</sup> for liquids, involving 20 trade names of insecticides, herbicides and fungicides combined.

The NEA database on pesticides imported is kept and maintained at the NEA inspectorate. It includes all categories of pesticides destined for agricultural, public health, research and home use. This database contains information on product types, active ingredient content and their quantities, information on origin of products and importers amongst others.

The figures obtained during the questionnaire-inventory for the same period were 39 tons and 27.5 m<sup>3</sup> for solids and liquids respectively. This difference between the NEA database and the inventory shows a huge margin. However, some of the reasons for this difference may be explained by the fact that the NEA database also includes household pesticides which is a significant quantity and which was not reported by any of the respondents of the inventory.

What has been reported in the inventory may be termed to constitute the legal importation. However, it is a fact that a substantial amount of pesticides are also illegally brought into the country via several channels notably Senegal. No quantified data on this illegal trade is available. Spot-checks at the Lumos (the weekly markets) indicate that some of the products illegally brought into The Gambia include products that have been banned e.g., Spiridur containing methyl parathion, Lindane etc.

**Table 6: Total Sum of Pesticide Imports by Year Registered at the NEA Inspectorate Database**

Year	PESTICIDE	
	Solid (Kg)	Liquid (L)
1997	249,488	18,925
1998	37,747	361,939
1999	985,089	203,864
2000	33,695	419,315
2001	178,334	693,586
2002	25,365	265,133
Sub-Total (1999 – 2002)	1,222,483	1,581,898
GRAND TOTAL	1,509,718	1,962,762

A joint (Senegal-Gambia) border survey would be essential to ascertain the type and amount of pesticides involved in the cross border trade. This issue was discussed during the fourth Senegalo- Gambian bilateral meeting held in Dakar, Senegal in March 2003 and a date is expected to be agreed upon to conduct this exercise.

#### **Exportation of POPs and Other Pesticides**

About 13.5 Tons of obsolete and / or banned pesticides were in 1999 exported to the UK for destruction. The survey revealed no historical or current exportation of any pesticides including POP-pesticides.

#### **Distribution and Sale of Pesticides**

The following three categories are involved, depending on how they deal with pesticides namely importer-user, distributors and users. Importer-user both import/acquire and use pesticides and they include mainly commercial farms and government. The distributors, examples of which include government units and local weekly markets (Lumos), obtain and distribute pesticides to their clients. Users are generally any entity that uses pesticides for its specific need and the major ones are the commercial pesticide applicators.

#### **Mechanism of Tracking Imports**

As far as the survey results indicate, there has not been any documented mechanism for tracking imports of pesticides through to end-use and disposal.

#### **Illegal Supply of Pesticides**

All aspects of pesticide importation, storage, distribution, sale and use are regulated by the Pesticides Regulations of 1994. Dealers and distributors have been found to be sometimes in breach of the law by illegally supplying and / or

selling pesticides without the proper valid documents such as licenses. This has been found to be more rampant in the Lumos where a significant amount of pesticide products enter via the border with Senegal. This trade is believed to be widespread but no data is yet available as to the amount involved. It is believed that a cross-border survey will address this data gap.

#### **Industrial and Pesticide Use of Hexachlorobenzene**

None of the respondents during the inventory reported any historical or current use of Hexachlorobenzene either as an industrial chemical or pesticide. No records of any importation of this chemical was recorded in the NEA database for the period under study.

#### **Waste Pesticides and Contaminated Sites**

Obsolete and or Waste Pesticides were nowhere observed or reported in the country in the course of the survey except in traces at few areas. Unlabelled dust formulations totaling 2.5 Kgs were observed at the LUMOs of Sare Bojo, Bureng and Wassu. Samples of these and another from the store of the Divisional Agricultural Coordinator in Jenoi were collected and delivered to the Pesticide Formulation Analysis Lab of the NEA, but these are yet to be conclusively identified.

The commercial farms and major pesticides dealers kept good records and stock management of their pesticide products. They reported that demand exceeds supplies and therefore no obsolete stocks occur. In the commercial farms, empty pesticide containers are sold to collectors who usually sell them to the public to general use. The sale of pesticide containers to the public who end up using it for food or water storage is illegal and therefore these containers are confiscated whenever they are found.

#### **Survey of Contaminated Sites**

During the 1999 obsolete pesticides cleanup, the pesticide stores were properly decontaminated. These sites were revisited during the inventory exercise and no contamination was observed or reported.

#### **Disposal of Waste Pesticides, Containers and Safety**

The respondents in the survey did not clearly explain how waste pesticides and pesticides are disposed of. The information gathered indicated selling containers to collectors or individuals, who would re-use them for purposes that are not clear. Some would say that they don't have wastes at all.

The safety equipments reported to be in use include dust masks, gloves, goggles and rain-boots. However, most of the respondents indicated no use of any of the above-mentioned safety materials.

## Priority problems and objectives for POPs management

Studies conducted during the NIP project phases 2 and 3 revealed the following facts and gaps:

**Awareness and information gap;** Sixty (60%) percent of the population are generally ignorant of the effects of POPs. Out of the remaining 40% some have very low levels of awareness.

Low awareness among policy and decision makers with regards to persistent organic pollutants, and the lack of comprehensive data on this issue and no priority strategies to address this gap.

Large-scale illegal entry and cross border trade in pesticides. Illegal trade of pesticides and other products through our porous borders might have also contributed immensely to the lack of comprehensive national data on the past and current use/ importation of POPs in The Gambia. If unchecked, this can negate achievements of previous phases when all obsolete and POP pesticides were gathered and sent to UK for high temperature incineration.

Limited sensitisation on effects of pesticides in general and POPs in particular. Source of environmental information to media houses on ad-hoc basis as environmental information is yet to reach optimal standard. Although there are some print media personnel handling environmental issues, there are no tailor-made radio or TV programmes at GRTS or other radio houses for environmental education. These, being the most popular and outreaching media houses in The Gambia, can play a major role in this regard.

Lack of data on groundwater contamination by POPs is another important concern. A lot of organochlorine compounds were brought and used in the country during the late 70s and early 80s by the erstwhile department of crop protection services. There were places designated as storage points where groundwater around those areas could be contaminated.

Lack of coordinated research effort in the search for alternatives to DDT in vector and crop pest control programmes.

Although there has been some effort in establishing poison report centres, the performance of these centres is less than satisfactory.

Weak regional and sub-regional linkages on issues of POPs and pesticide management in general.

### Priority problems

Low awareness on POPs issues among general public as well as

policy and decision makers;

Large-scale illegal entry and cross border trade in pesticides;

Limited sensitisation on effects of pesticides in general and POPs in particular;

Lack of data on groundwater contamination by POPs;

Lack of coordinated research effort in the search for alternatives to DDT in vector and crop pest control programmes;

Weak regional and sub-regional linkages on issues of POPs and pesticide management;

Non-satisfactory performance of the poison report centres.

## Objectives

To address the gaps in the successful implementation of the NIP in The Gambia identified above, the following objectives were set:

- To develop strategies for the control and prevention of entry of POP pesticides in The Gambia by 2010;
- To revitalise and update the poison record/control centres by 2008;
- To strengthen analytical capacity of stakeholder (NEA, DOSH, NARI and APMU) laboratories by 2015;
- To identify and develop alternatives to DDT for vector and crop pest control that will meet the requirements of the Stockholm Convention by 2010;
- To sensitise the policy makers and general public on effects of POPs on the environment. (Ensuring participation of local authorities and decision makers in enforcement measures may be critical to the success of POP specific programmes. Raising awareness of the general public in particular in relation to the role they could play in address compliance and enforcement of existing regulation is also vital);
- Human capacity development of stakeholders. (Training and capacity building activities on various issues such as sound pesticide management practices, POPs environmental impact assessment, effective legislation and regulation, good storage and management including pesticide waste management).



## Management options

Following management options were identified to meet the above objectives:

1. Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia;
2. Functional poison control centres should be established in all the major health centres;
3. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;
4. Identify and develop alternatives to DDT for vector and crop pest control ;
5. Awareness raising on effects of POPs on human health and environment;
6. Human capacity building in stakeholder institutions;
7. Training of farmers and other end-users on pesticides – methods of application, handling and safety measures (including residual management and disposals).

Note: Management option 1 will be partly implemented in the AP on Legal and Institutional Strengthening, and management option 5 will be implemented under the AP on Awareness Raising and Information Dissemination.

## PCBs

### Introduction

PCBs were used also as pesticides in the past, but are commonly known as industrial chemicals, broadly used in open and in particular closed applications such as transformers and capacitors. They are subject of all three international conventions related to hazardous chemicals, namely Basel, Rotterdam and Stockholm Conventions.

The following chapter is summarising the results of a country-wide survey of PCBs, evaluates the compliance status with the international treaties and the national policy, identifies the major problems/gaps/shortcomings and needs. The survey focused on the following:

- Review and assessment of the legal and institutional background;
- Inventory of PCBs uses in closed and open systems;
- Identify and document conditions of equipment, monitoring systems and facilities for preventing and managing spills;
- Identify PCB waste and potentially PCB contaminated material and sites;

#### Relevant Stockholm Convention Requirements

Annex A requires all Parties to cease production of new PCBs immediately (*i.e.*, entry into force)

All Parties using the (Part II) PCB specific exemption shall:

- eliminate use of in-place equipment containing PCBs by 2025:
  - make determined efforts to identify, label & remove from use equipment with >10% or >0.05% and >5 liters of PCB
  - endeavor to identify & remove from use equipment with >0.005% (50ppm) and >0.05 liters of PCB
  - give higher priority to equipment with higher PCB levels
- promote measures to reduce exposures and risk:
  - use PCBs only in intact and non-leaking equipment and only in areas where risk of environmental release can be minimized and quickly remedied
  - forbid use in food and feed production and processing areas
  - when used in populated areas (schools, hospitals, etc.)
    - take all reasonable measures to protect from electrical failure which could result in a fire
    - inspect regularly for leaks in equipment

- not export or import PCB equipment, except for the purpose of environmentally sound management (ESM) of waste
- not recover liquids with more than 0.005% PCBs for reuse in other equipment, except for maintenance and servicing
- make determined efforts to achieve ESM of wastes containing >0.005% PCBs ASAP, and **by 2028**
- endeavor to identify articles with >0.005% PCB for ESM
- report to the COP every five years on their progress in eliminating PCBs [per Article 15]

COP will review progress toward the 2025 and 2028 targets at 5 year intervals, taking into account reports from Parties

## Situation in The Gambia

### **Legal and institutional background**

There is no specific Regulation under the Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA) 1994, which would cover all aspects of the management (inventory, labelling, reporting), handling (maintenance, transport, disposal) and phasing out of PCB's and PCBs containing material (equipment and wastes).

The National Water and Electricity Company of The Gambia (NAWEC) is the company in charge of all transformers in The Gambia. It is headed by a Managing Director with a Manager in charge of transmission and distribution of electricity. Transformer management, including the PCBs issue is under the responsibility of this manager.

The existing NAWEC law on utility management is silent on PCBs. However, with the awareness gained through recent projects dealing with PCBs and in fulfilling the requirements of the NIP for POPs, NAWEC has now established a monitoring and management system for its PCBs identified equipment.

A database has been created wherein all PCBs equipment have been clearly identified with capacity, location, condition and equipment type known.

Prevention and management measures for spills have also been put in place. A new type of transformer plinth has been designed. This plinth has a trench that is designed to contain any spillage from the transformers.

For contaminated soil in transformer stations the ground is scooped and put in waterproof containers at Half Die stores.

### **The transformer inventory**

The first PCBs inventory in The Gambia was conducted in the year 2001 in the framework of a UNEP project. It was updated in the framework of this project. At the same time an electronic database of all transformers was elaborated containing important technical data as well as data related to environmental risks. This database is located at NAWEC and will be an important tool for elaboration of a PCBs phase out plan.

All NAWEC transformers manufactured before 1990 were tested, labelled, identified and recorded. PCBs oil screening tests were used, indicating possible PCBs contamination in the case of positive test (positive test=chlorine content).

For the purpose of the inventory The Gambia has been divided into 3 zones: (1) the Banjul area; (2) the Kombo area; and (3) the provinces.

The inventory results may be summarised as follows:

A total of 294 transformers have been inventoried. The PCBs testing has been limited to transformers manufactured before 1990, considering that the transformers manufactured after 1990 are PCBs free.

Four transformers, labelled by the trade name ASKAREL were considered as 100% PCBs containing (weight of oil 1 825 Kg) .

Test kits were used to identify possible contamination of transformer mineral oils by PCBs. 19 765 Kg of transformer oils were identified as PCBs contaminated and 37 692 Kg of transformer oils are assumed to be PCBs contaminated (they could not be tested due to inaccessibility).

### **Table 4: Summary of the transformer inventory results**

Include:

**PCB Inventory Report  
NEA and NAWEC**

**October 2003.**

### **Methodology of inventory :**

1 – The PCB detection has been limited to transformers manufactured before 1990 considering that the transformers manufactured since 1990 are guaranteed PCB free by the manufacturer.

## 2 – Criteria of sampling result :

The following criteria have been used :

<b>Head line : PCB analysis performed</b>	
not tested	
Not requested	Manufactured after 1990
PCB > 50 ppm	Positive test : red color
Empty	Drained transformer : no dielectric
PCB < 50 ppm	Negative test : green color
No sampling access	Lindley Thomson
100% PCB	Dielectric pure PCB : red color
Water	Dielectric containing water, and not applicable for PCB detection
dark oil	Color of oil not applicable for the colorimetric reaction
No site access	Especially pole mounted transformers

## 3 – General results

<b>PCB analysis performed</b>	<b>Data</b>	<b>Total</b>
<b>100% PCB</b>	Total numbers of transformers	4
	Total weight (kg)	7 130
	Weight of Oil (kg)	1 825
<b>dark oil</b>	Total numbers of transformers	1
	Total weight (kg)	2 175
	Weight of Oil (kg)	514
<b>Empty</b>	Total numbers of transformers	7
	Total weight (kg)	9 907

	Weight of Oil (kg)	3
		725
	Total numbers of transformers	39
<b>No sampling access</b>	Total weight (kg)	81
		002
	Weight of Oil (kg)	25
		020
	Total numbers of transformers	2
<b>No site access</b>	Total weight (kg)	4
		235
	Weight of Oil (kg)	1
		035
	Total numbers of transformers	51
<b>Not requested</b>	Total weight (kg)	113
		807
	Weight of Oil (kg)	28
		315
	Total numbers of transformers	12
<b>not tested</b>	Total weight (kg)	45
		985
	Weight of Oil (kg)	10
		093
	Total numbers of transformers	33
<b>PCB&gt; 50 ppm</b>	Total weight (kg)	66
		733
	Weight of Oil (kg)	17
		940
	Total numbers of transformers	3
<b>Water</b>	Total weight (kg)	1
		410
	Weight of Oil (kg)	456
<b>(vide)</b>	Total numbers of transformers	
	Total weight (kg)	
	Weight of Oil (kg)	

<b>PCB &lt; 50 ppm</b>	Total numbers of transformers	119
	Total weight (kg)	179
	Weight of Oil (kg)	526
<b>Pole mounted no access</b>	Total numbers of transformers	10
	Total weight (kg)	5
	Weight of Oil (kg)	875
<b>Total numbers of transformers</b>		<b>544</b>
<b>Total weight (kg)</b>		<b>281</b>
<b>Weight of Oil (kg)</b>		<b>517</b>
		<b>785</b>
		<b>135</b>
		<b>907</b>

#### PCB contamination level:

Number of transformers tested	156 units
Number of positive tests	33 units
Number of negative tests	119 units
Percentage of positive	27 %

#### 5 – Results per zone :

##### 5.1 – Half Die Storage :

PCB analysis performed	Données	Total
<b>Empty</b>	Total numbers of transformers	4
	Total weight (kg)	1550
	Weight of Oil (kg)	1191

<b>No sampling access</b>	Total numbers of transformers	4
	Total weight (kg)	8814
	Weight of Oil (kg)	2149
<b>Not requested</b>	Total numbers of transformers	7
	Total weight (kg)	5595
	Weight of Oil (kg)	1125
<b>PCB &lt; 50 ppm</b>	Total numbers of transformers	22
	Total weight (kg)	24460
	Weight of Oil (kg)	5373,5
<b>PCB &gt; 50 ppm</b>	Total numbers of transformers	6
	Total weight (kg)	4898
	Weight of Oil (kg)	1098
<b>Water</b>	Total numbers of transformers	1
	Total weight (kg)	0
	Weight of Oil (kg)	0
<b>(vide)</b>	Total numbers of transformers	
	Total weight (kg)	
	Weight of Oil (kg)	
<b>Total numbers of transformers</b>		<b>44</b>
<b>Total weight (kg)</b>		<b>45317</b>
<b>Weight of Oil (kg)</b>		<b>10936,5</b>

## 5.2 – Booster Storage :

<b>PCB analysis performed</b>	<b>Data</b>	<b>Total</b>
<b>100% PCB</b>	Total numbers of transformers	1
	Total weight (kg)	960
	Weight of Oil (kg)	230
<b>Empty</b>	Total numbers of transformers	1
	Total weight (kg)	3800



	Weight of Oil (kg)	965
<b>No sampling access</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	1
<b>Not requested</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	4 3610 675
<b>PCB &lt; 50 ppm</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	4 4080 1006
<b>PCB &gt; 50 ppm</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	3 6275 1096
<b>Water</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	4 1410 456
<b>(vide)</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	
Total numbers of transformers		18
Total weight (kg)		20135
Weight of Oil (kg)		4428

### 5.3 Results of Kombo area

<b>PCB analysis performed</b>	<b>Données</b>	<b>Total</b>
<b>100% PCB</b>	Total numbers of transformers Total weight (kg)	1

	Weight of Oil (kg)	1020
<b>Empty</b>	Total numbers of transformers	1
	Total weight (kg)	1060
	Weight of Oil (kg)	2235
<b>No sampling access</b>	Total numbers of transformers	20
	Total weight (kg)	11600
	Weight of Oil (kg)	39284
<b>Not requested</b>	Total numbers of transformers	36
	Total weight (kg)	45265
	Weight of Oil (kg)	196692
<b>not tested</b>	Total numbers of transformers	7
	Total weight (kg)	8160
	Weight of Oil (kg)	40360
<b>PCB &lt; 50 ppm</b>	Total numbers of transformers	67
	Total weight (kg)	32485
	Weight of Oil (kg)	126275
<b>PCB &gt; 50 ppm</b>	Total numbers of transformers	18
	Total weight (kg)	14806
	Weight of Oil (kg)	53456
<b>Pole mounted no access</b>	Total numbers of transformers	7
	Total weight (kg)	700
	Weight of Oil (kg)	2875
<b>(vide)</b>	Total numbers of transformers	
	Total weight (kg)	
	Weight of Oil (kg)	
<b>Total numbers of transformers</b>		<b>157</b>
<b>Total weight (kg)</b>		<b>114076</b>
<b>Weight of Oil (kg)</b>		<b>462197</b>

#### 5.4 Results of Provinces

PCB	Data	Total
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<b>analysis performed</b>		
<b>Not requested</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	4 2540 3615
<b>not tested</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	4 0 0
<b>PCB &lt; 50 ppm</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	14 5318 20594
<b>(vide)</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	
<b>Total numbers of transformers</b>		<b>22</b>
<b>Total weight (kg)</b>		<b>7858</b>
<b>Weight of Oil (kg)</b>		<b>24209</b>

### 5.5 – Results of Banjul area

<b>PCB analysis performed</b>	<b>Data</b>	<b>Total</b>
<b>100% PCB</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	2 1595 5150
<b>No sampling access</b>	Total numbers of transformers Total weight (kg) Weight of Oil (kg)	16 11746 34534
<b>No site access</b>	Total numbers of transformers	1

	Total weight (kg)	400
	Weight of Oil (kg)	2000
<b>Not requested</b>	Total numbers of transformers	10
	Total weight (kg)	13085
	Weight of Oil (kg)	56430
<b>PCB &lt; 50 ppm</b>	Total numbers of transformers	10
	Total weight (kg)	2166,5
	Weight of Oil (kg)	8306,5
<b>PCB &gt; 50 ppm</b>	Total numbers of transformers	6
	Total weight (kg)	3475
	Weight of Oil (kg)	13514
<b>(vide)</b>	Total numbers of transformers	
	Total weight (kg)	
	Weight of Oil (kg)	
Total numbers of transformers		45
Total weight (kg)		32467,5
Weight of Oil (kg)		119934,5

## 6 – Requirements for PCB storage

### 6.1 - Half Die storage

<b>Empty</b>	Total numbers of transformers	4
	Total weight (kg)	1550
	Weight of Oil (kg)	1191
<b>No sampling access</b>	Total numbers of transformers	4
	Total weight (kg)	8814
	Weight of Oil (kg)	2149
<b>PCB &gt; 50 ppm</b>	Total numbers of transformers	6
	Total weight (kg)	4898
	Weight of Oil (kg)	1098
<b>Total numbers of transformers</b>		<b>14</b>
<b>Weight of Oil (kg)</b>		<b>4 500</b>

	<b>kgs</b>
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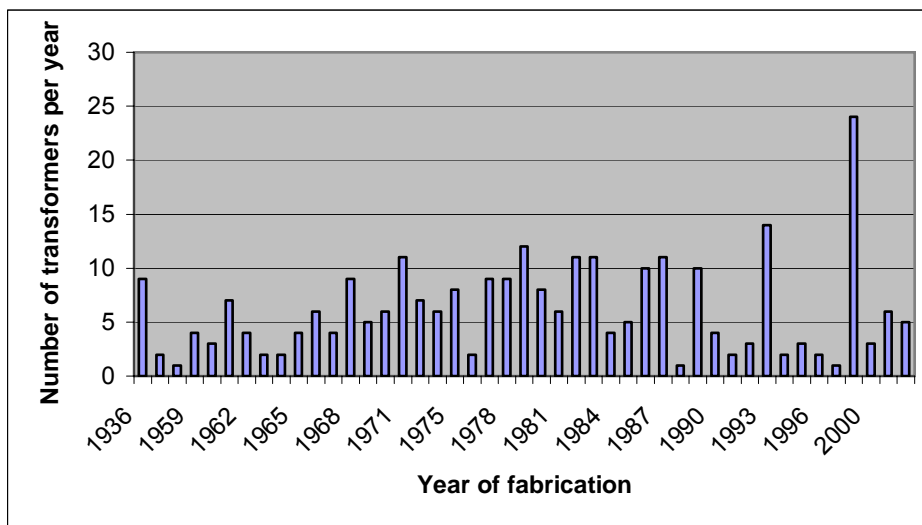
1 x 20' feet container for drained transformers	1 500 USD
1 20' feet container for liquid drums	1 500 USD
25 metallic drums ( UN specification)	1 000 USD
1 retention tank	1 000 USD

## 6.1 - Booster storage

**Figure 2: Transformer age curve.**

I

### Curve of Age



### Capacitors

There are no large and old capacitors in the NAWEC system. Recently four new capacitors were introduced, but since these are all manufactured after the year 2000, they should not contain PCBs.

Most of the inspected small capacitors were produced after 1990 and therefore assumed to be PCBs free. It is therefore concluded that even if small capacitors that are made before 1990 (and possibly PCBs containing) do exist in The Gambia this must be minimal.

### Contaminated sites

Some sites in The Gambia have been identified as PCBs contaminated. These are

the sites where transformer oil spillage occurred during transportation, explosions (due to over voltage, overload or lighting) or during repair and maintenance. The identified spills contain more than 200 l of oil. The Half Die Workshop in Banjul is considered with spills over 1000 litres as the most contaminated. Four sites are identified in the Kombo area (Old MRC sub-station in Bakau; Iceman Junction; Md. Muhammad Njie sub-station Bakau; Gamtan) and two in the provinces (Bansang and Basse).

### Priority problems and objectives for POPs management

Studies conducted during the NIP project phases 2 and 3 revealed the following issues of concern with regard to PCBs:

There is no adequate legislation in place to manage and control the PCBs issues in their complexity, comprising: import ban; management which would cover all aspects of the management (inventory, labelling, reporting), handling (maintenance, transport, disposal) and phasing out of PCB's and PCBs containing material (equipment and wastes).

It is a common practice of NAWEC to refill (topping) transformers. The topping oils are not tested to ascertain presence of PCB, therefore cross-contamination of the transformer oils may take place. Most of the transformers included into the NAWEC network are second hand transformers. There is high probability that these transformers are contaminated with PCBs, even if they are declared to be PCBs free. Therefore all transformers should be tested for PCBs content also those, produced after 1990. NAWEC personnel with limited protective gear can easily be contaminated whereby causing risk to human health.

The environment can also be polluted through spills. The possibility of the Kotu stream being contaminated by run off from dissolved or suspended particles in the water is quite high. This has the potential of negatively impacting on people coming into contact with the water. Farmlands along the course of the water can also be polluted. Cleaning up can be expensive and hazardous. Contamination of the water table is therefore highly possible.

At Half Die Workshop, where transformers are serviced and maintained, for work carried out on them, including PCB transformers, it is necessary to monitor the presence of PCB in the environment and the personnel handling the equipment be well informed about the hazards of PCB. The proximity of this work area to sea does not make an ideal place for such work and transformer storage. Rain and sewerage water runoffs into the sea are common in the areas. Thus, the presence of any contaminant, not only PCB, in the environment could easily find its way into the sea.

The two facilities (Half Die and Booster) are not adequate for safe storage. The oil

is left in the transformers and no proper arrangements made to address leakage. The environmental risk due to the two storage facilities requires urgent attention.

It is also discovered that some transformers containing mineral oil are leaking into the ground. This issue can be more serious during the rainy season, as oil can be washed away to water bodies or farmlands, destroying useful crops and polluting water. Requirements for adequate storage conditions for PCB containing equipment are not adhered to at NAWEC.

Two storage facilities were identified during previous studies, Half Die and Booster. The environmental risk assessment of the two storage facilities indicates that very URGENT remedial action is required. In both areas transformers containing mineral oil are leaking into the ground. This is compounded by rain especially at Half Die which is close to the sea.

A transformer was discovered at Abuko thrown in a field, deteriorating and leaking. Leakages resulted in the contamination of the immediate surrounding. This transformer is not NAWEC's but was bought by GAMTAN, a private enterprise for the factory use.

A crane was used to lift the transformer from the swamp and to deliver it to NAWEC's Transformer Workshop in Half-Die. The contaminated ground was scooped and the contaminated soil was put in four waterproof bags for storage. The area scooped was 2mx2m and half a metre deep. The oil found in the GAMTAN transformer was tested and found to contain > 50 ppm PCB.

Although the above measures taken were a positive step in the right direction, more would have to be done in future to prevent contamination and recurrence. There is likely pollution of the soil and water, and it is important to note that there are no disposal facilities in the Gambia.

The level of awareness is very low with regard to POP in general and PCBs in particular. The study reveals that apart from the NEA and NAWEC, the awareness level about PCBs even within the target groups is very low. The revelation that the level of awareness and knowledge is low, is indeed a concern in view of the fact that:

- It is a common habit to recycle waste from metallic into other equipment or utensil by local smiths. These wastes can contain PCBs;
- Used oil, including oil from NAWEC appliances, may be used for other purposes, including lubrication for engines and other machines;
- Change of transformer oil through topping and refilling is a common practice at NAWEC;

- Workers handling PCB containing equipment or oil are not adequately protected or sensitised;
- Little is known of PCBs not inventoried under the NIP Project.

Against the above background, sensitization and awareness raising programs should be developed for the public at large, and for other target groups such as NAWEC staff, local government authorities, and other appropriate technicians dealing with transformers and capacitors in particular.

The central framework of any awareness-raising program should focus on the ways human beings and environmental media are likely to be contaminated or polluted with PCBs, type of precautionary measures to be taken, alternatives to PCBs and effects of contamination with PCBs.

There is no laboratory in The Gambia, experienced and equipped for PCBs analysis. The test kits indicate only presence of chlorine hence, possible PCBs contamination. To estimate whether it is PCBs and what the actual concentration is, GC analysis is necessary. The NEA lab which is currently equipped with a GC should be able to conduct such analysis if provided with relevant accessories. Exact information with regard to PCBs content is necessary to decide on the most appropriate and cost-effective way of final disposal of the PCBs equipment.

#### Priority problems

- Non-sustainable management of PCBs;
- Inadequate legislation and institutional framework;
- Lack of awareness and capacity;
- Inadequate monitoring and enforcement strategies.

#### Objectives

To address the priority problems in identified above, the following objectives were set:

- Strengthen the legal and institutional framework for PCBs management and phase out;
- Develop and implement sustainable management practices for PCBs equipment in use;
- Strengthen PCBs monitoring capacities.
- Create awareness on POPs issues among all stakeholders;

#### Management options

1. Implement the necessary provisions with regard to PCBs import



(ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999;

2. Elaborate and put in place Regulation under the Waste Bill (yet to be passed) on Disposal of PCBs and PCBs containing waste;
3. To review NAWEC's mandate with the view of covering management of transformers and other PCBs containing equipment outside its purview;
4. Establish and put in place NAWEC guidelines for equipment management and handling;
5. Elaborate and put in place NAWEC guidelines for PCBs equipment phase out, transportation, storage, and disposal;
6. Establish or upgrade existing laboratories for PCBs testing;
7. Develop and implement adequate training modules for all PCB regulators and users;
8. Develop and implement awareness raising programmes on PCBs for the general public;
9. To develop and implement standards for maximum limits of PCBs in different media;

Note: Management options 1 and 2 will be implemented in the AP on Legal and Institutional Strengthening, and management option 8 will be implemented under the AP on Awareness Raising and Information Dissemination.

### 2.3.3. DDT

#### Introduction

**Malaria, caused mainly by Plasmodium falciparum, is a major public health concern in many African countries particularly in The Gambia where it is endemic with cases seen all year round.**

**Since the endorsement of the WHO coordinated Global Malaria Control Strategy in 1992, The Gambia has made significant efforts to the establishment of a sound basis for reducing the impact of malaria nationally. Although malaria control program started earlier in 1990 under the auspices of the Ministry of Health, there was no definitive policy document on malaria then.**

DDT has been used for the malaria vector control for many years. It is now banned in almost all countries for the use in agriculture and a number of countries have extended this ban to public health applications. However, in some countries, where the local malaria vector is still susceptible, DDT is used for indoor residual spraying. Under the POPs Convention, several other countries are considering or have decided to phase out DDT use in their public health services over periods of between 3 and 8 years (WHO Expert Committee 1998).

An extensive review was performed under the NIP project in order to:

- Review and assess the Malaria Control programme and the need to use (reintroduce) DDT in future programmes;
- Assess the role of DDT and its merits and demerits;
- Cost benefit analysis of the current and the latter;
- Risks associated with reintroduction of DDT and management including alternative products and strategies; and
- Potential adverse effects of DDT to humans and the environment.
- The following chapter is summarising the findings of this review and evaluating them against the Stockholm Convention requirements. Finally, priority problems and objectives are identified, as well as proposals for further actions.

Therefore, this review recommends that:

- The present ITN programme be expanded to include eaves-strips, curtains, foldable shields and fly curtains;
- Large-scale operational use of insecticide-treated materials should be actively promoted, especially in those areas with stable malaria transmission and high drug resistance;
- Various options for the promotion, distribution, treatment and re-treatment of materials should be investigated to address issues for adequate coverage, equity and sustainability;
- Evaluation and surveillance of bed net use should continue to be an integral component of malaria control;
- Insecticide resistance in malaria vectors should be carefully monitored. This should preferably be carried out in the networks as recommended by WHO as this is designed to build up technical expertise at community level to provide guidance for appropriate use of available insecticides and management of vector resistance;
- The search for non-pyrethroid alternatives should be stimulated and encouraged through collaborations with existing national institutions;

- Although considerable hope is now centered on the reuse of DDT for the NIBP programme, this can be only for a while inline with the phasing out strategy of the Stockholm Convention. Therefore, a high priority must be given to the search for non-pyrethroid insecticides that may be equally effective for treating materials
- The search for effective and practical strategies for management of insecticide resistance in mosquitoes should be encouraged;
- Every effort should be made to prolong the useful life of available insecticides by adopting a selective integrated vector management approach;
- The NMCP may pilot the use of DDT for vector control, if the human and technical capacity to control its limited use could be met coupled with the fulfilment of all the conditions outlined by the WHO;
- In the event of a final reintroduction, Health authorities should institute strict control measures to prevent the DDT getting into the wrong hands and that it is used only for selective targeted application.

### Relevant Stockholm Convention Requirements

**Parties shall:** [Article 3, para. 1]

(b) restrict its production & use" of chemicals in Annex B

- "acceptable purposes" specified for these chemicals

**All Parties shall eliminate DDT production and use except** Parties that notify the Secretariat of their intention to produce and/or use DDT in disease vector control programs (an "acceptable purpose" in Annex B):

these Parties will be included in a special publicly available DDT Register maintained by the Secretariat

a Party may withdraw from the DDT Register at any time

production and/or use must be in accordance with WHO recommendations and guidelines on use of DDT, and only when locally safe, effective and affordable alternatives are not available to the Party

### Situation in The Gambia

Since the endorsement of the WHO coordinated Global Malaria Control Strategy in 1992, The Gambia has made significant efforts to the establishment of a sound basis for reducing the impact of malaria nationally. Although a malaria control program started earlier in 1990 under the auspices of the Ministry of Health, there was no definitive policy document on malaria then.

The Government using the multi-sectoral approach, held consultations with

communities, donors and other sectors, to develop a National Health Policy (NHP) which was launched in 1994. In addition to this in 1998, the National Health Development Project (HNDP) was launched. Further to this, the African Heads of State adopted the African Initiative for Malaria in April 1998 and six months later in October 1998, WHO in collaboration with UNICEF, UNDP and the World Bank launched the Roll Back Malaria (RBM) Initiative. A recent strategy is the integration of the Malaria Control Program activities with that of the Divisional Health Teams (DHT) established under the Primary Health Care (PHC) strategy adopted in 1979.

A desk review of malaria in The Gambia commissioned by The Government of the Gambia and the WHO in the year 2000, revealed three main sources of financing for the public health services sector. These are allocations by Government through recurrent and development budgets, donors through contributions in development budgets and thirdly other external and community assistance through a recovery program. The estimated malaria program cost in the Health Action Plan for the five year period 1999-2003 as reported by Palmer et, al. (2000) is US\$ 6,095,597 accounting for 4% of the total health program cost. Almost 82% of this amount is destined for promoting the use of preventive measures such as insecticide dipped bed nets and strengthening the capacity of the Vector Control Unit.

### **Vector Control Activities**

Prior to independence on 18<sup>th</sup> February 1965, there was an Anti-Malaria Unit responsible for malaria control activities in The Gambia. Then in 1965 following a re-organisation of the sector, the Vector Control Unit (VCU) was established under the Ministry of Health. This Unit continued to handle all vector borne diseases until in 1990/91 when the importance of malaria as a major health concern in the Gambia was recognized that the VCU was re-organised and a separate unit, the Malaria Control Unit (MCU) was formed. This Unit had the specific mandate of developing programmes for the control of malaria in The Gambia. To make the unit more proactive, efficient and to maximized resource efficiency, another re-organisation reassigned the MCU to the Directorate of Disease Control in 1993 and later in 1996, the MCU was merged with the VCU form what is now known as the National Malaria Control Programme (NMCP).

### **Malaria Vectors**

In The Gambia, the malaria parasite is transmitted by three types of mosquitoes belonging to the *Anopheles gambiae* complex. These are *A. gambiae* s.s, *A. melas* and *A. arabiensis*. *Anopheles gambiae* s.s breeds in fresh water and is efficient at transmitting malaria. *A. melas* which breeds in salt water on the other hand is less efficient at transmitting malaria. *A. arabiensis* another fresh water breeder is found only in few scattered fresh water pockets in The Gambia and mainly Northern Senegal.

The behaviour of the *A. gambiae* is believed to be both endophilic and endophagic meaning it feeds and rest indoors. A study by the Malaria Control Program between 1994 and 1998 depicted the peak biting activity of both *A. gambiae* and *A. funestus* to be between 22:00 hours and 5 'o clock in the morning.

### **Use of insecticide-treated Nets (ITNs) in The Gambia**

In The Gambia, the NMCP has been promoting under the National Insecticide Impregnated Bednet Programme (NIBP) for some time now the use of insecticide treated nets, to reduce the transmission of malaria by the vectors. According to figures supplied by the NMCP, the estimated national insecticide requirement for scaling up the use of ITNs in 2003 was for K-Othrine tabs 594, 711 and 47, 513 litres of permethrin, valued at an estimated cost of US\$ 329, 866.6 and US\$ 712, 695.00 respectively.

The amount of insecticide brought into the country for ITN program varied from one year to another with the year 2003 having the highest amount over 10, 000 liters (various types) of insecticides and 50, 000 tabs of deltamethrin (Table 5).

**Table 5: Insecticides brought into the country for vector control**

TYPE	INSTITUTION	QUANTITY	YEAR
Permethrin	WHO	2, 000 liters	1997
Permethrin	WHO	8, 880 liters	1998
NA	NA	NA	1999
NA	NA	NA	2000
Permethrin	WHO	1, 680 liters	2001
Permethrin	UNDP	3, 125 liters	2002
Permethrin	WHO	900 liters	2002
Deltamethrin 1 liter Bottles	UNICEF	1, 960 liters	2002
Deltamethrin Tablets	WHO	50, 000 tablets	2003
Permethrin	UNICEF	6, 200 liters	2003
Deltamethrin in Drums	DOSH	2, 000 liters	2003
Deltamethrin in 200 liter Drums	DOSH	2, 000 liters	2003

(Source Malaria control program Banjul)

Figures of actual net usage and insecticide treated nets in The Gambia in 2003

varied within and among communities and divisions. The figures depict a relatively low bed net usage 14 – 50% by the populations in the different divisions covered in the study. On the other hand, percentage coverage of insecticide treated nets is relative good and higher than net usage figures for all the divisions with three of the divisions LRD, CRD and URD above the national average (Table 6).

Western division had the highest net count but the lowest percent coverage possibly due to low acceptance of the safety of ITN. Inversely it had the highest forecast insecticide allocation for the scaling up of the use of ITNs.

### **Community Involvement**

Malaria control is an integral part of the activities of the Multi-Disciplinary Facilitation Team (MDFT), which is composed of field workers and community representatives at the district level. The communities have as part of their responsibilities:-

- Social mobilization;
- Distribution of ITNs and insecticide;
- Sensitisation of households to prevent and recognized signs and symptoms and seek treatment for malaria;
- Resource mobilisation for malaria control activities;
- Environmental management;
- Conduct annual bed net census.

**Table 6: Population and insecticide treated nets per division 2003**

DIVISION	POPULATION	NET COUNT	PERCENTAGE NET USAGE	TOTAL NETS DIPPED	% COVERAGE
LRD	72, 546	36, 606	50.1%	29, 856	81.60%
CRD	186, 038	68, 335	36.7%	57, 523	84.30%
URD	183, 033	42, 462	23.20%	28, 620	67.40%
NBD(East)	85, 525	23, 912	27.10%	12, 939	55.90%
NBD(West)	87, 281	13, 882	15.90%	5, 805	49.80%
WD	750, 225	105, 944	14.10%	23, 296	21.90%
NATIONAL	1364648	291141	27.9%	158, 039	60.20%

(Figures supplied by the malaria control unit Banjul)

### **Mortality and morbidity patterns**

Out of the 100 countries or territories in the world considered being prone to malaria, almost half are in Africa, south of the Sahara and more than 2400 million of the world's population is still at risk (WHO, 1998).

Garabrant et al. (1992) has estimated the incidence of malaria worldwide to be 300–500 million clinical cases each year, with about 90% of these occurring in Africa, south of the Sahara. Malaria the Garabrant study went on to say is thought to kill annually between 1.1 and 2.7 million people world-wide, out of which about 1 million are children under the age of 5 years in Africa, south of the Sahara with fatality rates of 10–30% among children referred to hospital with severe malaria. These rates they concluded are even higher in rural and remote areas where patients have restricted access to adequate treatment. Looking at the statistics of malaria in The Gambia, the situation is similar to that of the rest of Africa where malaria is endemic.

In The Gambia, as in many other sub-Saharan countries, malaria remains a national health priority and a big concern to Government. A review conducted by Palmer et. al (2000) in The Gambia reported at least one episode per child in rural areas, one in five antenatal visits, lost days of productivity and 40% of all deaths in children between the ages of 1-4 years a figure higher than the continental average of 10-30%. This trend seems to persist to date. Recent figures from the AFPRC Hospital in Farafenni revealed similar patterns with malaria accounting for 40% of all deaths in children and significant lost in days of productivity especially in resistant cases.

### **Drug resistance and vector sensitivity patterns in The Gambia**

One of the greatest challenges facing malaria control worldwide is the spread and intensification of parasite resistance to antimalarial drugs. The limited number of such drugs has led to increasing difficulties in the development of antimalarial drug policies and adequate disease management.

In The Gambia like many other tropical countries, there is growing concern over the increasing resistances to chloroquine which until now was the first line drug recommended for the treatment of malaria in most African countries. Chloroquine is the first line drug recommended in The Gambia for treatment of uncomplicated malaria in adults and children.

Palmer et al. (2000) stated that following the first report of chloroquine resistance in 1987, there has been an increase in both clinical and parasitological resistance. A recent study conducted by MRC and Department of Medical and Health in the Brikama area in Western Division showed a resistance level of about 27%, which is higher than the WHO recommended threshold of 25%.

This increasing trend of resistance warrants the implementation of an effective vector control as a viable strategy to combat malaria in the Gambia.

### **Vector Sensitivity Patterns**

Recent studies by Palmer et al. (2000) suggested that the behaviour of the Anopheles mosquitoes to the insecticides used in the ITN program remained unchanged since then there is very little information if any no routine surveillance of insecticide susceptibility. An earlier susceptibility study from 1990 –1993 reported by same authors, permethrin was found effective against the mosquitoes.

### **Cost-effectiveness of preventive measures**

Too little is known about the true cost of malaria control and the cost-effectiveness of different interventions in different epidemiological circumstances. Such issues should be addressed: every control program should be evaluated, costed and compared with similar program in different epidemiological conditions.

The economic effects of malaria are especially noticeable in rural areas, where malaria frequently strikes at the time of year when there is greatest need for agricultural work. Furthermore, the disease is a common cause of school absenteeism, reaching as high as 28% in some places. The estimated annual direct and indirect cost of malaria in Africa alone is more than US\$ 2,000 million (Expert Committee 1998).

WHO (1998) reported increased knowledge of the heterogeneity of malaria transmission patterns in Africa, south of the Sahara: transmission patterns reflect changes in human-related factors such as urbanization of the population, infrastructure and social development. Urbanization the report continued has raised awareness of the need for malaria control, and political commitment to support this control has simultaneously increased. The urban environment (managed properly) has offered better opportunities for selective vector control.

The report noted the following developments as having been made in rural areas:

- Where malaria transmission is stable, the use of insecticide-treated materials is the preventive method of choice when used correctly;
- Where transmission is unstable, indoor residual spraying may be appropriate, provided the infrastructure to maintain the programme is available. In recent years, indoor residual spraying campaigns have become increasingly selective, partly because of the implementation of the Global Malaria Control Strategy;
- In a few areas where both impregnated materials and indoor spraying would be feasible, the desirability, cost-effectiveness and possible synergy of both methods are being explored;

In epidemic-prone areas and areas with a very short malaria transmission season,



indoor spraying is more suitable than using impregnated materials to contain epidemics.

### Assessment, Priority problems and objectives for POPs management

After a careful review of available information on malaria control in The Gambia, particularly the malaria vector control, and having also reviewed WHO guide lines and various other recommendations on the use of insecticide treated materials for the control of malaria the following conclusions were made:

- The insecticides currently used for the ITN programme are still effective in controlling the mosquitoes (until there is other data to prove otherwise).

An extensive review was performed under the NIP project in order to:

- Review and assess the Malaria Control programme and the need to use (reintroduce) DDT in future programmes;
- Assess the role of DDT and its merits and demerits;
- Cost benefit analysis of the current and the latter;
- Risks associated with reintroduction of DDT and management including alternative products and strategies; and
- Potential adverse effects of DDT to humans and the environment.
- The following chapter is summarising the findings of this review and evaluating them against the Stockholm Convention requirements. Finally, priority problems and objectives are identified, as well as proposals for further actions.

### Management options

The following management options were identified to meet the above objectives:

1. Strengthen the capacity of NMCP in support of alternatives to the reintroduction of DDT for "acceptable purposes";
2. Widen and strengthen the present NIBP programme (including sensitization of the public);
3. Develop and implement guidance for appropriate use of available insecticides at community level;

4. Promote research on non-pyrethroid alternatives to existing insecticides.

During the national development process, it was found to hire an external consultant to assess the malaria control in the country vis-à-vis the need for re-introduction of DDT into the country. The consultancy determined the following conclusions and recommendations:

### Conclusions

Although IRS might be introduced, on a commercial basis, in urban areas it is not recommended for rural areas. Even if IRS is used in urban areas the insecticide should not be DDT. The costs, and potential costs of using DDT, will far exceed any potential benefits from this particular insecticide.

In general, the control community, public health scientists and donors will require new ways of working to optimise investment in research into new tools for disease control to guarantee access to those tools by those who most need them.

## Recommendations to the Government of The Gambia

- Given present financial limitations, the malaria control programme should concentrate on provision and delivery of mosquito net re-treatment to rural areas. For malaria control in rural areas the use of VHWs to provide a customer, rather than product or technique, oriented approach is advocated. It is suggested that VHWs receive all five Dalasis presently charged for net re-treatment but that they undertake value-added activities (such as, repairing torn nets etc.) in addition to treating them.
- The emphasis in future should be on the purchase and delivery of re-treatment rather than the purchase of more nets. The Gambia would appear to be spending considerably more on its insecticide than is necessary. Purchase of tablets for re-treatment should be both for mass net treatment and individual re-treatment kits. This should result in considerable savings.
- In urban areas, the establishment of qualified entrepreneurs that offer a range of services, including larval control and indoor residual spraying (but not with DDT) should be encouraged.
- There is need to develop cross-border malaria prevention and control strategies to address the high burden for populations at risk living in border areas of Senegal and The Gambia. The provision of Artemisine suppositories for the treatment of comatose children available at the border with Senegal and eventually in villages may save many lives.
- Change to a more effective combination therapy, only available orally, for the treatment of malaria would not only save lives but also reduce risk derived from chloroquine injections. Treatment should be provided by a village health worker rather than by home treatment.
- The establishment of a Department of Vector Ecology and Epidemiology at the recently formed University of The Gambia whose activities should be linked to those of the malaria control programme, would enable independent assessment of the effects of interventions to be monitored.
- It would seem apposite to sort out the problems in mosquito net re-

treatment before looking for alternatives.

- The health information system, incorporating spatial as well as temporal variation, needs to be strengthened.
- Estimates of the cost of larviciding should be available.
- Training of staff during the large-scale intervention trial, by larval control, soon to be undertaken in The Gambia should be encouraged and should allow the intervention to go to scale easily.

The findings did not necessitate the request for exemptions for DDT use under Annex 2 of the Stockholm Convention.



- Considering the current insecticide channelling for the ITN programme the risk of DDT ending up in the wrong hands and hence into the environment is very high
- Inter sectoral collaboration in the fight against malaria even though enshrined in the NMCP strategies and evident at decision-making level is weak on the ground at implementation level.
- There is also room for the widening of the scope for the current ITN programme to make it more user friendly to address the high discrepancy between actual number of bed nets and insecticide treated nets.
- There is also need for inter-sectoral collaboration to determine and manage the major mosquito breeding sites in the different communities for selective targeting of houses in hot spot areas.
- There is need for well-coordinated sensitivity study to determine the present levels of resistance to the currently used insecticides.

“The highly developed nations of the world rid their populations of malaria decades ago. They achieved this by using DDT and other insecticides, draining wetlands, providing physical barriers like screens and nets to keep mosquitoes away from people and using anti-malarial agents”, Koenig (2000).

If the above statement by Harold M. Koenig (President of The Annapolis Centre) is anything to go by, then the eradication of malaria or its vector is a complex issue that must be viewed with a multifaceted approach. These include the vector, the parasite, the environment, the socio-economic status of the population concerned and the control measures/strategies employed. The use of the multifaceted approach must be guided by the principle of not allowing a single agenda to force the development of a policy without thinking through the possible repercussions.

Therefore, this review recommends that:

- The present ITN programme be widened to include eaves-strips, curtains, foldable shields and fly curtains;
- Large-scale operational use of insecticide-treated materials should be actively promoted, especially in those areas with stable malaria transmission and high drug resistance;

- Various options for the promotion, distribution, treatment and re-treatment of materials should be investigated to address issues for adequate coverage, equity and sustainability;
- Evaluation and surveillance of bed net use should continue to be an integral component of malaria control;
- Insecticide resistance in malaria vectors should be carefully monitored. This should preferably be carried out in the networks as recommended by WHO as this is designed to build up technical expertise at community level to provide guidance for appropriate use of available insecticides and management of vector resistance;
- The search for non-pyrethroid alternatives should be stimulated and encouraged through collaborations with existing national institutions;
- The search for effective and practical strategies for management of insecticide resistance in mosquitoes should be encouraged;
- Every effort should be made to prolong the useful life of available insecticides by adopting a selective integrated vector control approach;

#### Priority problems

Insufficient justification for, and high risks connected with re-introduction of DDT for malaria vector control;

Weak intersectoral cooperation in the fight against malaria on the ground at implementation level;

Discrepancy between number of bed nets and number of treated bed nets;

Need to determine and manage the major mosquito breeding sites;

Need for a sensitivity study to determine the present level of resistance to currently used insecticides.

#### Objectives

To address the priority problems identified above, the following objectives were set:

- Widen and strengthen the implementation of the present NIBP programme;
- Make effort to prolong the useful life of existing

- insecticides;
- Search for effective non-pyrethroid alternatives to existing insecticides and management of vector resistance.

### Management options

The following management options were identified to meet the above objectives:

5. Strengthen the capacity of NMCP in support of alternatives to reintroduction of DDT;
6. Widen and strengthen the present NIBP programme (including sensitization of the public);
7. Develop and implement guidance for appropriate use of available insecticides at community level;
8. Promote research on non-pyrethroid alternatives to existing insecticides.

### 2.3.4. Requirements for exemptions under the Annex 2 of the Stockholm Convention

#### Relevant Stockholm Convention Requirements

**Parties shall:** [Article 3, para. 1]

(b) “restrict its production & use” of chemicals in Annex B

- “acceptable purposes” specified for these chemicals

**All Parties shall eliminate DDT production and use except** Parties that notify the Secretariat of their intention to produce and/or use DDT in disease vector control programs (an “acceptable purpose” in Annex B):

these Parties will be included in a special publicly available DDT Register maintained by the Secretariat

a Party may withdraw from the DDT Register at any time production and/or use must be in accordance with WHO recommendations and guidelines on use of DDT, and only when locally safe, effective and affordable alternatives are not available to the Party



## Introduction

Polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) are environmental contaminants detectable in almost all compartments of the global ecosystem in trace amounts. These compound classes in particular have caused major environmental concern. In contrast to other chemicals of environmental concern such as polychlorinated biphenyls (PCB), polychlorinated naphthalenes (PCN), and polychlorinated pesticides like DDT, pentachlorophenol (PCP) or others, PCDD/PCDF never were produced intentionally. They are formed as by-products of numerous industrial activities and all combustion processes. 90 % of PCDD and PCDF human exposure is via the food chain. Other important routes may be inhalation and ingestion of dust particles.

The following chapter is describing the results of the first inventory in The Gambia, identifies issues of concern and priority problems, as well as objectives and management options to address them.

## Relevant Stockholm Convention Requirements

**Parties shall, at a minimum, take measures to address the following:**

- **action plan**
- release reduction or source elimination
- substitute materials, products, processes  
new and existing sources
  - best available techniques (BAT)
  - best environmental practices (BEP)
- **An action plan shall:** [Article 5, para. (a)]
  - be developed within 2 years of entry into force
    - may be national, regional, or sub-regional
    - constitutes part of the overall implementation plan in Article 7
  - identify, characterize and address release of chemicals in Annex C
  - facilitate implementation of other requirements in Article 5
  - be implemented!
- **For industrial sources that Party identifies as having potential for comparatively high formation & release of POPs to environment (*including* those in categories in Annex C Part II), Party must:**

- for new sources warranting such action:
  - promote, and as provided for in an action plan, require use of best available techniques (BAT) [Article 5, para. (d)]
    - phase in any BAT requirements for new sources in categories in Annex C Part II as soon as practicable but *no later than 4 years after entry into force*
  - promote use of best environmental practices (BEP) [Article 5, para. (d)]
- for existing sources, promote use of BAT & BEP [Article 5 (e)]

### Situation in The Gambia

The first inventory of unintentionally produced POPs in The Gambia has been performed according to the UNEP Toolkit for the Identification and Quantification of Dioxins and Furans. According to this inventory some of the ten main source categories were absent in The Gambia and most of the categories identified produced only small quantities (below 10 tons of product per annum). The table below summarizes the PCDD/PCDF releases in The Gambia for the year 2 000. The table identifies uncontrolled burning as the major source of releases accounting for more than 98% of the national total. Power generation and cooking, the second major source of releases, contributed about 2% to the national total. The contributions of the rest of the categories to the national total were insignificant.

The origin of the data used to perform the inventory, whether from the formal or informal sectors, would influence the accuracy of the release figures. Formal sector data would tend to be more reliable as some data capture always exists, for example data on petroleum products. Informal sector data, on the other hand were based on certain assumptions that might be less reliable. An example was data on the production of aluminium. Assumptions on the population, number of marriages, the number of cooking pots given out as presents during a marriage ceremony, average weight of a cooking pot etc were used to arrive at the assumed figure of 0.08 tons of aluminium production per year.

**Table 7: PCDD/PCDF Releases in The Gambia, year 2000**

Category	Activity	/	Release (gTEQ)
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	Quantity	Air	Water	Land	Residue
1. Waste Incineration	38.2 tons	0.18			0.0008
2. Fe & None Fe Metals	342.08 tons	0.011			0.017
3. Power Generation, Heating & cooking	Petrol. 38,814 tons Wood 17,986 TJ	0.08 1.8			0.4
4. Mineral Products	10,051 tons	0.0025			
5. Transport	39,154 tons	0.040			
6. Uncontrolled Combustion	46,952,118 tons	105	3.3		65
7. Production & Chemical Use			0.66		
8. Miscellaneous		0.07			0.002
Total		107	3.96		65.4

There are no waste incinerators in The Gambia except the medical waste incinerator at MRC in Fajara. MRC operates facilities at its other field stations (Farafenn, Basse, Keneba) to burn medical wastes. These facilities, however, do not have temperature and air pollution control systems in place.

Medical wastes arising at the Medical Research Council facilities (at Fajara, Keneba, Basse and Farafenni) are incinerated on-site in purpose built incinerators. The incinerator at Faraja is the only one that has temperature and air pollution control systems. At the other MRC facilities, the incinerators are small rectangular box constructions with a single burner and small chimney.

Some other medical facilities either burn their wastes in brick built units with grates and short chimneys or dump their wastes in dumpsites or burn them in the open. Emissions from these sources are accounted for under the section on open burning. Releases from medical waste incineration accounts for less than 0.0008% of the country total of PCDD/PCDF emissions. There are plans for an incinerator at the Royal Victoria Teaching Hospital.

The releases of dioxins and furans from medical waste incineration are minimal since only MRC has a medical waste incinerator. However, the enforcement of a new regulation by the NEA may compel other health facilities to come up with either individual incinerators at their facilities or communal incinerators at strategic locations. This new regulation, the Environmental Management Discharge Permit Regulations (EMDPR) 2001, requires all health facilities to ensure that their wastes are disposed of in the most environmentally sound manner. Medical waste incineration and invariably the releases from them would most likely increase in the near future.

Metal production in The Gambia is dominated by the informal sector. It produces most of the aluminum products. The iron foundry at GTTI represents the only production facility in the formal sector. Some records are kept at the foundry.

PCDD/PCDF releases associated with fuel consumption in the generation of electricity are small. HFO and diesel respectively accounted for 3.7% and 0.5% of the releases in their category while fuel wood for cooking accounted for 95.7% of the total releases. Of the country total, power generation accounted for about 2% and about 0.7% of releases into air and residues respectively. These percentage figures may be small but the category is the second most significant source of emission in the country.

Fuel wood constitutes almost the only source of household energy. Electricity, petroleum products and LPG are also used in very small quantities. The pattern of household fuel consumption has generally followed the trend in the growth of the population. Releases emanating from cooking accounted for about 95.3% of the releases compared to 4.7% for petroleum used in both power generation and transportation in the same category.

The dependence on fuel wood in the home is expected to grow in tandem with the growth of population leading to corresponding growth rates in the releases of PCDD/PCDF. Economic improvement may lead to change habits and increase in the demand for energy. The likelihood of substitute energy forms is a possibility worth considering. The proposed LPG facility that is to be located at Bonto may make LPG gas more affordable and available to local consumers and therefore could be a possible substitute for fuel wood in the future.

Lime and brick production are the main sources of releases into the air in the Production of Mineral Products category. Lime is derived from burning oyster shells in the informal sector while the firing of bricks is carried out by one factory, Marisa Bricks. The factory uses firewood, sawdust and oil sludge as fuel.

Lime production is not expected to grow significantly in the future due to the expected dwindling supply of the raw material. Brick production may however, grow. Where production becomes significant, releases may also become significant.

In transport sector, The Gambia imports a high proportion of second-hand vehicles and diesel driven engines. Second-hand vehicles and diesel are cheaper. This trend is reflected in the petroleum products import numbers. Whereas the petrol (leaded) figures have declined over the ten-year period, those of diesel have increased strongly.

Increase in population, urbanisation, and expansion in road infrastructure, economic prosperity etc will lead to increase in demand for energy in transportation. This in turn will lead to increase in emission releases from the transport sector. However, other factors may mitigate the tendency towards

increase in emission releases. Leaded petrol may be phased out in favour of unleaded which has a much lower emission factor. Environmental legislation may work against the importation of second-hand vehicles. With economic affluence and greater environmental awareness even the demand may go down. The growth of emission releases may therefore slow down and thus delay emission releases from this sector reaching the threshold even further.

The category Uncontrolled Combustion Processes accounts for more than 98% of the national releases into the air, more than 83% of releases into water and more than 99% of the residues. It is by far the most significant source of releases.

The Table 6 shows that The Gambia is a low producer of PCDD/PCDF with only category 6 as the only significant source of releases. The major sub-categories are landfill fires, agricultural residues and forest and bush fires. These are none industrial activities and records are difficult to acquire.

The Table 8 below illustrates the specific activities of the category.

**Table 8: Uncontrolled Burning by Sub-category**

Source	Activity	Distribution			
		Mile 2	Bakoteh	Home	Rest
Biomass	343,434 tons				
Agricultural Residues	465,000 tons				
Waste Banjul	15,951 tons	15,951			
Waste KM	79,935 tons		52195	20805	6935
Waste Brikama	48,691 tons			36518	12173
Waste Rest of Country	51,100 tons			25550	25550
Total	1,004,111	15,951	52,195	82,873	44,658

Landfill fires: There are two landfill sites, Mile II and Bakoteh. The two contributed 6.8% to the country total PCDD/PCDF releases.

All domestic wastes generated in Banjul are dumped at the Mile II dumpsite. Banjul has thus a very high waste collection rate.

Kanifing Municipality generated 79,935 tons of waste, and 8% of the country total. 52,195 tons of this waste or 65.3% is dumped at the Bakoteh dumpsite and 20,805 tons or 26% is burnt at home. Brikama generated 48,691 tons of waste, which is 4.8% of the country total. 36,518 tons of this, that is, 75% is burnt at home. 51,100 tons, or 5.1% of country total domestic waste was generated in the rest of the country. Half of this waste was burnt at home. The total domestic waste burnt at home was 82,873 tons or 8.3% of the country total.

Biomass, that is, forest fires, contributed 343,434 tons or 34.2% of the country total. Agricultural residues contributed 465,000 tons or 46.3% of the country total.

195,677 tons of domestic waste was generated and only 68,146 tons or 34.9% were dumped at the landfill sites. 42.4% of the domestic waste was burnt in the homes. The uncontrolled burning of domestic and other waste is wide spread through out the country. Most people use burning as the most convenient disposal method and therefore most of the waste that could be burnt ends up being burnt either at home or at the dump sites. There has not been any formal study of waste management at the national level. The only studies done were in the GBA and Brikama. The figures on the percentage of waste burnt were mainly arrived at by expert judgement.

The waste management system in The Gambia is weak and under-funded. The collection, transportation and disposal systems do not have both the adequate human and financial resources and there are no sanitary landfill sites. Waste is not separated into its various categories or components before final disposal, and this represents a significant risk to human health. The poor collection rate has led to substantial burning of waste in the backyards and in the streets in order to reduce volumes and get rid of the stench.

As part of the implementation of the Gambia Solid Waste Management Strategy 1997, the Gambia Government initiated a comprehensive waste study of the GBA and Brikama. The purpose of the study was to develop a viable waste management system for GBA and Brikama (52% of the national Population 2003 census) and recommend the resources necessary to implement the study. The study, which was completed this year (2004) recommended among other things the eventual closure of both Bakoteh and Mile II dumpsites and proposed a new sanitary landfill at Tambana near Brikama. Government is currently soliciting funds to implement the recommendations of that study. The implementation of such a system is expected to significantly reduce emissions from open burning of municipal wastes as well as landfill fires.

The National Environment Agency, Department of State for Health and the councils are working individually and collectively in collaboration with other institutions to sensitise people on the environmentally sound management of wastes.

The Department of Forestry has done some work that is beginning to stem the incidence of uncontrolled fires. There are significant increases in the area of forest under controlled management in all the regions. The trend is expected to continue due to National Forestry policy and Action plan, Forestry regulations that are in place, which should contribute to reduction of forest fires.

Issues of concern, priority problems and objectives for POPs management

The most significant contributor to PCDDs/PCDFs emissions in The Gambia is the category uncontrolled combustion processes, which includes landfill/dumpsite

fires and open burning of domestic wastes. This category accounts for more than 98% of the national releases into the air, more than 83% of releases into water and more than 99% of the residues. It is by far the most significant source of releases in The Gambia.

Due to poor infrastructure and capacity and rapid population growth, this category is expected to remain the most significant emission source in The Gambia. Therefore this issue needs to be given the highest priority to ensure that most Gambians are protected from exposure to these chemicals.

Power generation is also expected to become a significant source of emission in the future due to the high demand for electricity even though it currently accounts for less than two percent of the national energy balance.

The level of industrial activities in the country is rather low and therefore many PCDD/PCDF source categories, normally associated with this sector, are absent. Because of the low activity level of these few industries, PCDD/PCDF emissions are insignificant.

The most critical factor in the reduction of PCDD/PCDF emissions in The Gambia is public sensitisation. The public needs to be informed about the sources of PCDD/PCDFs and the impacts of the chemicals on human health and the environment.

PCDD/PCDF releases cannot be reduced without the requisite knowledge of the stakeholders whose collective actions are necessary to bring about the required changes in behaviour. Knowledge about the releases will lead to the better appreciation of the need for action. This should include willingness to commit needed resources - human, financial, institutional, material - necessary for the efficient management of PCDD/PCDF releases.

The implementation of the Action Plan should be coordinated by the National Environment Agency. The NEA is an established functional institution for natural resources and environment management and planning working within a legal and regulatory policy framework for the environment. Working Groups representing the key actors in each sector are established in all programme areas and the network of these groups serves as a permanent mechanism for continuous consultations and dialogue among the various stakeholders.

#### Priority problems

- Non-adequate legal and institutional framework for effective control of unintentional releases of hazardous pollutants (including POPs);
- Weak waste management system (uncontrolled burning of waste);
- Low awareness of hazards connected with unintentional releases in the general public;

## Objectives

To address the priority problems identified above, the following objectives were set:

- Put in place adequate laws and regulations;
- Ensure effective enforcement of the law and regulations;
- Put in place effective waste management procedures;
- Put in place effective monitoring and evaluation strategy;
- Put in place effective sensitisation programmes.

## Management options

Following management options were identified to meet the above objectives:

1. Enact the Waste Management Bill 2003;
2. Strengthen the capacity of NEA Inspectorate to enforce effective pollution prevention and control;
3. Strengthen capacity of institutions for waste management (waste collection, transportation and storage equipment, and sanitary landfill facilities);
4. Training of local authorities (NEA and DOSH) in sound municipal waste management;
5. Awareness raising on proper waste management practices to general public;
6. Regular updating of emission inventory.

Note: Management options 1 will be implemented in the AP on Legal and Institutional Strengthening, and management option 5 will be implemented under the AP on Awareness Raising and Information Dissemination.



### 2.3.5. POPs Awareness, Availability and Access to Information

#### Introduction

Awareness of the POPs issue is critical for all players: for policy makers- in order to develop the right policies and legal framework for their prevention and control; for the local and regional authorities- to implement and enforce the legal documents; for experts-to search for right solutions; for managers- to put in place appropriate management procedures; for concerned workers-to handle POPs in safe manner; and last not least for the general public- to promote correct behaviour patterns and prevent unsafe handling and habits.

Essential in support of the above is availability and access to information.

POPs awareness in the various population groups as well as availability and access to POPs related information were thoroughly reviewed during the NIP project. The following chapter is providing an summary of the main findings of this review as well as identifying the main gaps and needs for strengthening.

#### Relevant Stockholm Convention Requirements

Article 10 Public information:

**Parties shall, within their capabilities:**

- ensure public has access to up-to-date information [para. 2]
- encourage industry and professional users to promote and facilitate provision of information at national & other levels [para. 3]

**Parties may:**

- use range of approaches to provide information, and may establish information centers at national & regional levels [para. 4]
- develop mechanisms (such as Pollution Release and Transfer Register) to collect and disseminate information on annual amounts of POPs in Annex A, B or C that are released or disposed of [para.5]

#### Situation in The Gambia

##### Access to information

The use of most of the POPs have been banned in the Gambia, and the NEA pesticides and hazardous chemicals program have been monitoring imports and use of chemicals in the country.

Although the use of POPs pesticides are legally disallowed in The Gambia, the country cannot be declared a POPs free zone because of the following reasons:

- Other countries may still be using POPs pesticides in agricultural and industrial production. Hence, imported food may have level of concentration above the acceptable standard.

Food contamination monitoring systems should be in place to ensure that tolerance levels are not exceeded. When incidents of contamination are suspected, The Gambia should have contingency plans to identify, detain and dispose of unsafe food. The exposed population should be examined in terms of exposure (e.g. measuring the contaminants in blood or mother's milk) and effects (e.g. clinical surveillance to detect signs of ill health).

- Certain industrial goods, such as some transformers used in electricity generation system, may have components that have PCBs (one of the 12 POPs). These transformers could be imported.
- Some evidences have shown that trade in chemicals takes place in The Gambia, in particular, in weekly markets (LUMOS). It is believed that the chemicals are illegally imported from neighbouring countries where some of the POPs are still in use.
- Because of their persistent nature POPs can be transported from one continent to another through wind and water.
- Some of the POPs are unintentionally produced, e.g. furans and dioxins. They can contaminate food. There is no country in the world that is completely free from dioxins.

The GEAP M&A strategy established a statistical system for collecting and analyzing data for the State of the Environment Report of the Gambia (SER). The system which is to be implemented and coordinated by the NEA depends largely on multi-sectoral support, in terms of the provision of data, collected through administrative records, surveys and censuses, to the NEA by the collaborating institutions, in particular, the data centres.

A close examination of the system has revealed that quantitative data on chemical pollutants, in particular, the twelve POPs is virtually not available.

A number of databases and reports have emerged from the system. There is no satisfactory, organized, and sustainable statistical system for collecting relevant data that could be used for reporting the management of POPs.

The NEA inspectorate is currently developing a database in Microsoft Access. The database may be ready in short time. The database has a number of folders covering a number of items. One of the folders is labelled Data, this folder has a sub-directory labelled Importation of pesticides. The spreadsheet of this sub-directory has the following information: date of import, importer, trade name, active ingredient, chemical composition of product, given concentration, quantity

imported, and total active ingredient. The complete database in Access would be useful for preparing sampling frames of major importers and dealers of pesticides and other hazardous chemicals. It would be useful if the same set of information is provided for re-export pesticides.

Plans to create a website for the NEA is already in progress. The implementation of this plan is perhaps currently faced with financial difficulties. The estimated cost of the website is \$200. The Internet is hosted by an international body. The Internet service provider is GAMTEL and it will be promoted by this company. The website will be indexed into search engines and directories. The website will be used for general presentation of the institution.

Any future POPs section could use the website for presenting information relating to POPs management in accordance with the approved reporting format.

Only 13.5 % of the respondents reported that their institutions have special units that collect and analyse environmental data. Two of the institutions are developing a unit that would collect and analyse data about their activities that relates to the environment. Over 50 % of the institutions keeping regular records, manually summarize some of their records. The content of the summaries are generally not suitable for the proposed reporting format on POPs management.

A good number of respondents complained about slow computer processing because the computers used are running out of hard disc storage space.

The absence of IT personnel or computer hardware technicians in many institutions contribute significantly to the lose of data and delays in reports.

Most of the databases seen have been built by external consultant, this implies that personnel in charge of data and records in most of the institutions lack skills in managing databases, in particular, construction of database and dynamic analysis using menu graphical user interface or program base command.

Most of the ad hoc surveys were done by external consultants. Skills in sampling and estimation techniques are in acute short supply.

Only three of the 32 institutions visited have their own websites, viz, the Department of State for Health, NARI and the Gambia Horticultural Enterprise. However, about two institutions one of which is the NEA, and the other, the Central Statistics Department envisaged having their own websites.

About 62.5 % of the respondents reported that they have access to computers, and 51.6 % said that their institutions have access to the internet. Since less than 22.6 % of the institutions have local area network one may conclude that some personnel that have access to relevant data may sometimes not have easy access to the Internet. In fact in some of the institutions only one computer has Internet facility, and the computer is sometimes in an office which has no form of data on the environment.

The department of state for health perhaps has BUS type connectivity for its area network which connects DHTs country wide. One major problem with this network type is message queuing, serving one DHT at a time or one PC at a time. A great deal of time is wasted before one gain access.

Over 90 percent of the institutions having Internet access exchange data and information with other institutions using the Internet facilities.

There is no reliable data on the quantity of waste generated by type in area councils, municipal councils and health centres. Records of trips of truck or donkey cart of wastes are available in few councils and health centres. However, wastes, which are not collected by these councils and health centres, are not accounted for.

NEA does not have the required equipment to perform chemical residue analysis. Senegal however has; perhaps for a start the NEA may have to collaborate with the relevant laboratories in Senegal or other foreign countries.

### Awareness

Apart from few officials in the NEA and Institutions represented in the NCC, knowledge about the 12 POPs is very low in institutions both public and private.

The mean percentage of respondents not knowing other POPs, excluding DDT, is over 60 %. About 32.4 % of the respondents did not know even DDT. The mean percentage of respondents who did not know each of the other POPs is about 62.5 %.

This emphasized the urgency of multi-sectoral training forums on the POPs as part of the POPs phase-out process.

A study was performed with the attempted to assess the knowledge, attitude and practices of farmers, gardeners, businessmen, agriculture extension workers and health works on persistent organic pollutants.

The study has revealed that pesticides are widely used in the farming and gardening communities and that some of the farmers are able to describe the types of insecticides used, but they were not able to give their names. The majority of the farmers interviewed received no training on mode of applying the pesticides and the necessary precautionary measures to be taken. This lack of training may be the reason why some of the farmers do not take adequate precautionary measures like putting on protective clothing. The study also found that farmers do apply the pesticide on their plants at various stages during the development of the plant, even around harvesting time. The majority of the farmers are aware of the dangers associated with pesticide exposure, what to do and where to go in the event of accidental pesticide poisoning.

Hospital and health facility workers said they are able to diagnose cases when reported to their facilities. Only three facilities said they received pesticide related

illnesses during the past two months and last year respectively. The study also suggests that the majority of the health workers know about the health damaging effects of pesticide poisoning.

The majority of the agricultural extension workers said they know about POPs and its damaging on the environment including human and wildlife. They are also conversant with the banned POP's in the country. They know about the precautions to be taken when applying the pesticides. Almost all of the respondents said that they ever experience pesticide related illnesses in their communities.

The businessmen interviewed obtained their pesticide supply mainly from the UK and Senegal. They all seemed to be aware of the health hazards associated with pesticide exposure, the precautionary measures to be taken. They also claimed to give such information to their clients. However, the businessmen used different methods like burning and burying to destroy the empty pesticide containers. However, the manner in which the destruction is done may not be satisfactory.

Priority problems and objectives for POPs management

### **Strenghts**

Knowledge about the 12 POPs is high in the NEA in varying degree among its personnel.

The POPs have been banned in The Gambia well before the adoption of the Stockholm Convention. The NEA enforces compliance with the ban through its inspectorate, which is part and parcel of the Chemicals and Pesticides Control and Management Programme. The inspectorate maintains data on alternative pesticides. The Environmental Quality Programme maintains data on manufacturing processes.

The NEA disseminates environmental information through the State of the Environment Report (SER), the biannual EARTH newsletter and other media or channels.

Backed by NEMA and other relevant regulations, in fulfilling its role of controlling the use and discharge of chemicals, pesticides and wastes in the environment, the NEA collects and collates environment-related data.

Implementation of the GEAP Monitoring and Assessment (M&A) strategy enabled the NEA to collect data from lead departments, in particular, including the health and agriculture sectors.

Hospital and health facility workers are able to diagnose cases when reported to their facilities.

Some of the respondents (health facilities) do keep records of their activities, and

also use annual reports or publications to disseminate information about their activities.

The NEA and a number of relevant government departments have access to the Internet, mainly through dial-up telephony. The Internet is sometimes used for exchange of information between departments. Plans to create a website for the NEA is at an advanced stage. If it is available, it will facilitate dissemination of information about POPs management. Very few institutions already have a website, e.g., NARI and DOSH.

The UNEP and GEF are already giving support to the country's effort in managing POPs through the preparation of the National Implementation Plan (NIP) for POPs. Opportunities exist for selecting from a wide range of alternatives to POPs.

### **Issues of concern**

Internet access along with the necessary infrastructure (LAN, network connections, computers, IT management etc.) is very limited in most of the institutions, NEA in particular. This hampers not only the information exchange and dissemination but also the every day work of the NEA employees.

Apart from the NEA, knowledge about the 12 POPs is relatively low in the health sector and other target groups interviewed. Some know about or have heard about DDT. This substance was widely used in the Gambia for the control of malaria vector or parasite. Dieldrin and Endrin, known by some of the respondents, were widely and intensively used in agricultural production in the Gambia.

The NEA and other laboratories such as in the health sector are poorly equipped. It might be difficult to carry out tests such as chemical residue analysis in order to determine the level of concentration of chemicals, in particular, POPs in human fat tissues or body.

Although the POPs, in particular, those produced intentionally, are banned in the Gambia, we cannot claim that the country is completely free of POPs. Owing to their persistent nature, POPs in air and water can be transported to the Gambia through these media. There has not been any test to confirm releases of POPs from wastes. There are evidences of large quantities of unlabelled chemicals entering illicitly through cross border trade. There is therefore an urgent need to test unlabelled chemical substances for POPs. We cannot rule out the possibility of some labelled pesticides having traces of POPs residue. This has to be verified in systematic sample tests.

The Gambia imports large quantities of food items from countries in which authorities may have little or no knowledge about the extent to which they used POPs pesticides or other sources of unintentional POPs. Here also the urgent need to put in place an effective surveillance system which will enable the country to more effectively detect food items with POPs residue.

In 2001, a brand of mosquito coil was found to contain DDT as an active ingredient. This product was already banned in The Gambia. Ingestion of contaminated drinking water, inhalation of contaminated air and dermal contact with contaminated soil surfaces is possible routes of human exposure to POPs.

The NEA inspectorate is developing a database on chemicals, pesticides and manufacturing processes. Notwithstanding the usefulness of the database as a sampling frame, it was not specifically designed to generate information for monitoring and assessing the POPs phase-out processes.

There was no empirical example or experience about the effects of POPs in the Gambia. Information about the effects of most of the POPs was obtained from the Internet through other sources such as UNEP and WHO websites.

None of the health centres visited in the Gambia associated a particular disease with any of the POPs. There were, however, reported cases of illnesses resulting from accidental ingestion or dermal contact with unidentified chemicals. These cases are not clearly reflected in any health report. The proposed information system and in-patient register should be able to capture these cases.

Proven source of intentional POPs, such as Dieldrin, DDT and PCBs, was importation for agricultural, health and electricity purposes. The following sources of unintentional POPs, Furans and dioxins, have been proven in some countries: municipal waste incineration; medical waste incineration; cement kilns; industrial untreated wood burning; secondary copper smelting; forest fires; diesel fuel combustion; residential untreated wood burning; hazardous waste incineration; and sewage sludge incineration.

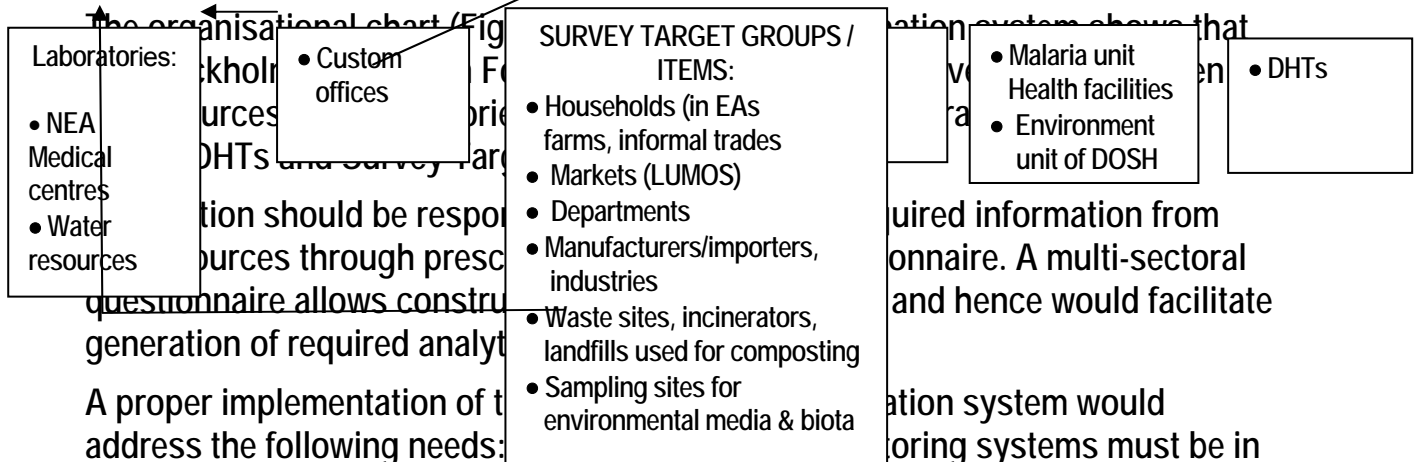
The POPs have some health effects. The magnitude of the effects depends on the quantity involved, duration of exposure and the way they enter the body. The toxicity of the POPs varies from one to the other. The carcinogenicity of some of the POPs have been proven in experimental animals but not in humans. The WHO evaluation for DDT is that it is possibly carcinogenic to humans. DDT has a very low toxicity. In the Gambia, consultations about its possible reintroduction for use in the health sector of The Gambia, are high in some forums.

### **Possible solutions**

There is an urgent need to train laboratory personnel and other personnel whose work concern identification of chemicals. The ability of these personnel to recognize all the 12 POPs through chemical formulation and residue analysis should be enhanced.

There is also an urgent need to train other personnel who are engaged in the collection and analysis of data relating to the management of chemicals, pesticides, and their effects. The ability of these staff to recognize all the 12 POPs at least through labels, trade names, name of active ingredient, HS tariff codes, the use of visual and, if not dangerous, olfactory detection should be enhanced.

Institutions covered in this survey and very few others not covered should be given priority.



A proper implementation of the system should be responsible for addressing the following needs:

The services of an in-country expert will be required to design the standardized multi-sectoral questionnaire, the POPs database fitted with automatic tabulation button, select indicators for the POPs' reporting format and, train NEA personnel in the use and preparation of the database.

To prepare a comprehensive programme design to promote and facilitate public awareness creation and participation in the management of POPs, the services of an in-country expert will be solicited.

Provisions should be made to monitor and assess the implementation of the programme through baseline and impact assessment surveys.

The proposed POPs information system will depend largely for its success on improved capacities in laboratories. There is a need to purchase laboratory equipment, accessories, and reagents for the NEA laboratory and others. In the absence of chemical residue analysis laboratory in The Gambia, the NEA in the short term developed some links with the laboratory in Senegal, which has the capacity to perform chemical residue analysis.

Country wide surveys to estimate the quantity and type of wastes generated by methods of waste disposal in the Gambia would help the proposed POPs information system in many ways.

The NEA should promote research on POPs (intentional and unintentional) alternatives both in private and government institutions. One respondent maintained that neem tree extract can provide cheap and effective alternatives to POPs pesticides.

Institutions named for the proposed POPs information system would each need a computer and its accessories. This equipment would be used mainly for POPs issues. All institutions within the POPs information system should have easy access to Internet.



Adequate and modern cleansing service equipment and facilities should be made available to local government authorities. They should be encouraged to keep regular records of the quantity and type of wastes they handled by methods of disposal.

In designing a survey it is very important to bear in mind that informed and effective policy and programme decisions can be made only by giving due consideration to the results of a well-planned scientific survey. An essential element of a scientific survey is the use of appropriate estimation procedure based on the type of sampling procedure used for selecting samples.

## Priority problems

Limited Internet access and weak technical infrastructure to support an electronic information system in most relevant institutions, NEA in particular;

Weak or non-existent components of POPs information system and reporting;

Low POPs awareness in most of the target groups;

Purely equipped laboratories for POPs residue analysis;

No surveillance system for POPs contamination of imported food;

No systematic recording of waste generation data;

No systematic reporting of poisonings by un-identified pesticides;

Almost non-existent POPs information / education in schools curriculum eg Gambia College, RDI, GTTI, UTG;

Weak and limited environmental clubs in schools and local communities;

Limited research on POPs and related chemicals;

Lack of information centres / systems for POPs in Health facilities;

Limited data on waste generated by types and areas;

Low POPs awareness among the wider civil society (non-state actors).

## Objectives

To address the priority problems identified above, the following objectives were set:

- Strengthen the capacity (both technical and human) of NEA and other stakeholder institutions to implement a POPs information system;
- Develop and put in place a POPs information/reporting system;
- Put in place surveillance of POPs residues in selected media;
- Put in place effective sensitisation programme for all target groups;
- Strengthen the waste management / recording / reporting

system;

- Put in place a system for reporting of pesticide / chemical poisoning cases.

## Management options

Following management options were identified to meet the above objectives:

1. Strengthen the capacity (both technical and human) of NEA and other stakeholder institutions to implement a POPs information system;
2. Develop and put in place a strategy for POPs information/reporting;
3. Design and implement a POPs monitoring programme in selected matrices;
4. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;
5. Include provisions for waste recording and reporting into the Waste Management Bill 2003;
6. Intensify / develop and put in place effective sensitisation programme as follows:
  - Awareness raising on effects of POPs on human health and environment;
  - Awareness raising programme on PCBs for the general public;
  - Awareness raising on proper waste management practices to general public;
7. Develop and put in place a system for reporting of pesticide / chemical poisoning cases;
8. Regular updating of emission inventory;
9. POPs information needs assessment;
10. Message development;
11. Development of an effective communication strategy and its implementation;
12. Training of farmers and other end-users on chemicals and pesticides – methods of application, handling and other safety measures (including residual management and disposals);

13. Training and sensitization of the private sector actors in the chemical business.

Note: Option 2 is subject of a separate chapter. Option 4 will be implemented under AP on Pesticides. Option 5 will be implemented in the AP on Legal and Institutional Strengthening. Target group of the sensitization programme (option 6) will be the general public. Sensitization and training of the authorities, experts, managers and workers (options 12 and 13) will be implemented under the subject specific action plans. Option will 7 be implemented under the AP on Pesticides and option 8 under the AP on Unintentional By-products.

### 2.3.7. Monitoring

#### Introduction

Monitoring of POPs content and its trends over the time is essential to perform risk assessment as well as evaluate effectiveness of adopted strategies for POPs prevention and control.

The POPs monitoring issue has been addressed in the previous chapters, where also the issues of concern and proposals for strengthening are provided.

It has to be stressed however, that The Gambia as a developing country has only very limited resources for POPs monitoring, being particularly demanding in terms of laboratory facilities and consumables, as well as highly skilled personnel.

The Gambia will therefore opt for design and implementation of a global POPs monitoring / risk assessment programme, operated under a carefully selected UN Agency for implementation (with possible GEF support) in benefit of all countries; in particular the least developed ones. Since POPs pollution is a global issue, such global monitoring programme could be implemented in the most effective way utilising uniform analytical methods and procedures, hence producing coherent data, in already existing laboratory capacities across all Regions of the Earth.

#### Relevant Stockholm Convention Requirements

**Parties must, within their capabilities**, address the following obligations in preparing action plans to address research, development and monitoring measures (Article 11):

- At the national and international levels, encourage and/or undertake research, development, monitoring and cooperation on all aspects of POPs, their alternatives and candidate POPs, including on their:
  - Sources and releases into environment;
  - Presence, levels and trends in humans and the environment;
  - Environmental transport, fate and transformation;
  - Effects on human health and the environment;
  - Socio-economic and cultural impacts;
  - Release reduction and/or elimination; and
  - Harmonized methods for making source inventories and analytical techniques for measuring releases.
- In undertaking the actions in paragraph 1 (para. 2)

- Support and further develop international programmes, networks and organizations to define, conduct, assess and finance research, data collection and monitoring;

## STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

### 3.1.3. Policy Statement

The sound management of chemicals and POPs in particular is consistent and mutually reinforcing to the Millennium Development Goals in relation to the Gambia's MTP/ PRSP targets of combating poverty, hunger, disease, environmental degradation, and discrimination against women.

### 3.2. Implementation Strategy

This section details the actions included in the NIP to meet the obligations of the Stockholm Convention in The Gambia, reflecting her specific situation. Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs, options were identified for institutional and regulatory strengthening, POPs management, awareness raising activities and research and development.

The proposed options are subject of the particular action plans. For each option an explanatory text describes the rationale behind selecting the particular option as well as the expected capacity of the option to meet the Stockholm Convention requirements.

An implementation strategy table contains information on activities associated with the particular option, implementation timelines, responsible and supporting agencies for implementation, and indicators of success. Links to existing country programmes on chemical management, environmentally sound waste management and environmental pollution control, as well as with the national activities on sustainable development are provided.

In the resource needs assessment human, capital and operation costs of the identified activities are described, considering the established timeline.

The National Implementation Plan contains six action plans and one strategy as follows:

1. Action Plan: Institutional and Regulatory Strengthening Measures;

2. Action Plan: POPs Pesticides;
3. Action Plan: DDT;
4. Action Plan: PCBs and Equipment Containing PCBs;
5. Action Plan: Unintentionally Produced POPs
6. Strategy: Information Exchange and Reporting;
7. Action Plan: Public Awareness, Information Dissemination and Training;

The issues related to pesticide and PCBs stockpiles, as well as to pesticides, PCBs and PCDD/PCDF wastes and contaminated sites, are included in the respective action plans.

Some of the overlapping issues, such as institutional and regulatory strengthening measures or awareness raising activities are mentioned in the subject-specific action plans with the reference to the specific action plans, where they are elaborated in detail.

A strategy for information exchange and reporting provides the base for the reporting to the COP as well as for the future evaluation and updating of the NIP.



### 3.3. Strategies and Action Plans

#### 3.3.1. Action Plan: Institutional and Regulatory Strengthening Measures

##### Management options

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs management, the following options were identified for institutional and regulatory strengthening:

1. Implement the necessary provisions with regard to PCBs import (ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999;
2. Elaborate and put in place Regulation on Disposal of PCBs and PCBs containing waste;
3. Include provisions to control the import and export of Annex A II and Annex B II chemicals (other than pesticides) into the Hazardous Chemicals Regulations 1999;
4. Include specific provisions for disposal of chemicals listed in Annex A II and Annex B II of the Stockholm Convention in the Waste Management Bill.

The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.

**1. Implement the necessary provisions with regard to PCBs import (ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999**

Legislative reform for the management (inventory, labelling, reporting), handling (maintenance, transport, disposal) and phasing out of PCB's and PCBs containing material (equipment and wastes) is an urgent need. Import of new PCBs (e.g. as contamination in transformer oils filled in the imported transporters) should be avoided by all means.

Relatively high health, safety and environment risks associated with PCBs were identified and in the absence of effective recording, labelling, reporting mechanism, there is a significant shortage of reliable data in order to arrive at decision and policies with regard to their phase out and final disposal by the year 2025 for equipment, and 2028 for wastes respectively.

Therefore there is an urgent need for an integrated law to effectively manage existing PCBs stocks in order to regularly update the PCBs inventory and gradually phase out the PCBs containing equipment as well as dispose of the PCBs containing waste (see also management options 3 and 5).

	Option Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities / projects/ issues
0	1	2	3	4	5
2.	<b>Implement the necessary provisions with regard to PCBs import (ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999</b>				
2.1	Draft PCBs regulation	2008/9	AG chambers, NEA	PCB regulations drafted	Development and legal drafting of the regulations,
2.2	Obtain necessary approvals	2008	NEA	PCB regulation approved	Develop a cabinet paper
2.3	Gazette the regulation	2008/9	NEA	PCB regulation gazetted	
2.4	Develop Guidelines & Standards for PCB life cycle management/control	2008/9	NAWEC	Standards and Guidelines for PCB management and control developed	
2.5	Develop system to monitor the fate of the existing PCB containing equipments and	2009	NAWEC	Monitoring system for existing PCB	

	repairs			containing equipment developed	
2.6	Implement the regulations	2009/10	NEA, NAWEC	PCB regulation implemented	
2.7	Monitor Compliance	2010 cont.		Monitoring system for compliance to PCB regulations in place	

Note: The guidelines under 2.4 and 2.5 are subject of the AP on PCBs (management option 4)

**2 Elaborate and put in place Regulation under the Waste Management Bill on Disposal of PCBs and PCBs containing waste (this will depend on when the waste Bill will become an Act)**

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success of	Related activities / projects/ issues
0	1	2	3	4	5
3.	<b>Elaborate and put in place Regulation under the Waste Management Bill on Disposal of PCBs and PCBs containing waste</b>				
3.1	Development and incorporation of PCB regulations PCB containing waste disposal .	2008/2009	NEA, AG chambers	Regulations on PCB and PCB containing WASTE Developed and Gazetted.	Legal drafting, cabinet paper, formal approval
3.2	Enforce the regulations	2009	NEA, DOSA, DOSH, GRA	Amount of PCB and PCB containing waste being disposed inappropriately	Establishment of a network of inspectors
3.3	Monitor enforcement	2010	NEA,	Quarterly reports	Trekking, visiting entry

					points and report writing
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**4. Include provisions to control the import and export of Annex A II and Annex B III chemicals (other than pesticides) into the Hazardous Chemicals Regulations 1999**

Even though The Gambia has ratified/signed international conventions on the control of transboundary movement of hazardous waste, these has not been translated into domestic legislation which is require in order to effectively control the importation of such chemicals/wastes.

Import and use of pesticides are being controlled through the HCPCMA 1994. But there is no regulatory mechanism to control POPs other than pesticides in The Gambia. Therefore the highest priority should be given to the prevention of fresh stocks of POPs chemicals coming into the country in the form of pure chemicals, POPs containing equipment or as waste materials.

**5. Include specific provisions for disposal of chemicals listed in Annex A II and Annex B III of the Stockholm Convention in the Waste Management Bill**

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5
5.	<b>Include specific provisions for disposal of chemicals listed in Annex A II and Annex B III of the Stockholm Convention in the Waste Management Bill</b>				
5.1	Draft the necessary amendments	2008/2009	NEA, AG chambers	Regulations Hazardous	Legal drafting,

				Chemicals Updated to include Annex A II and B III	cabinet paper,
5.2	Obtain necessary approvals	2009	NEA, AG chambers	Amendments approved	Cabinet paper
5.3	Gazette the regulation	2009	AG chambers,	Amendments publish in Government gazette	

### 3.3.2. Action Plan: POPs Pesticides

#### Management options

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs management, the following management options were identified:

1. Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia;
2. Establish functional poison control centres in all the major health centres;
3. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;
4. Identify and develop alternatives to DDT for vector control ;
5. Awareness raising on effects of POPs on human health and environment;
6. Human capacity building in stakeholder institutions;
7. Training of farmers and other end-users on pesticides – methods of application, handling and safety measures (including residual management and disposals).

Note: Management option 1 will be partly implemented in the AP on Legal and Institutional Strengthening, management option 4 under AP on DDT, and management option 5 will be implemented under the AP on Awareness Raising and Information Dissemination.

The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.

#### Implementation strategy

The Action Plan on Pesticides envisages linking and integrating measures and activities aimed at meeting the obligations of the Stockholm Convention with existing national programmes on

poverty reduction, sustainable development, and in particular programmes on chemicals management and industrial pollution control.

The action plan on POP pesticides in particular aims to engage all the relevant stakeholders through radio programmes, TV shows, workshops, participatory activities and joint implementation of programmes (NGOs and government) reflecting the true multisectoral nature of managing pesticides in general and POP pesticides in particular.

The action plan also provides the framework for identification of management options, including phasing out and risk reduction options. Most importantly, it address the major information and awareness gap by developing a participatory strategy for information exchange, education, communication and awareness raising by using existing media houses (both print and electronic), taking into account the perception of POPs by the average Gambian.

Being one of the pilot countries for GHS implementation, The Gambia has recently developed GHS regulations which have been harmonised with existing Hazardous Chemicals and Pesticides Control and Management Regulations for the implementation of GHS by 2008.

#### 1. Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia

Large-scale illegal entry and cross border trade in pesticides takes place. Illegal trade of pesticides and other products through our porous borders might have also contributed immensely to the lack of comprehensive national data on the past and current use/ importation of POPs in The Gambia. If unchecked, this can negate achievements of previous phases when all obsolete and POP pesticides were gathered and sent to UK for high temperature incineration.

It is planned to develop strategies for the control and prevention of entry of POP pesticides in The Gambia by 2010 in cooperation with neighbouring Senegal authorities.

	Option Activities	/ Timeframe	Responsible / supporting Institution(s)	Requested output indicator success	/ of projects/ issues
0	1	2	3	4	5

1.	<b>Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia</b>				
1.1	Update and strengthen enforcement of regulations	06/2009 onwards	National Ass. Attorney; GC;NEA; DOSA; DOSH; DOSFEA	All chemical-related conventions incorporated into national legislation.	Ministerial action necessary
1.2	Bilateral consultations with enforcement authority in neighbouring Senegal	Quarterly	DOSFA, DOSA, NEA, DOSFEA, Civil society	Minimised illegal entry of pesticides across borders	Technical collaboration between the two countries
1.3	Training of enforcement personnel	Oct. 2009 to Dec. 2013	DOSFA, DOSA, NEA, DOSFEA, PMO	Highly qualified middle-level personnel	Internships
1.4	Sensitisation of community elders and opinion leaders	Feb. 2009 onwards	DOSA, NEA, Divisional Authorities	Community sensitised	TV and Radio broadcasts
1.5	Establishment of pesticide monitoring committees at district or ward level to report illegal entries	Feb. 2009 onwards	DOSH, NEA, DOSLG/&L /Area Councils, BCC, KMC	Monitoring committees set at ward, district and municipal levels	Meetings, Capacity building

## 2. Establish functional poison control centres in all the major health centres

Although there has been some effort in establishing poison report centres, the performance of these centres is less than satisfactory.

It is planned to revitalise and update the poison record/control centres by 2009.

Option Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities / projects/ issues
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0	1	2	3	4	5
2.	<b>Establish functional poison control centres in all the major health centres</b>				
2.1	Establishment of poison record and control centres in major health facilities	March 2010 onwards	DOSH, NEA	Record and control centres established	Capacity building; Format development
2.2	Identification and training of personnel for running of such centres	March onwards	DOSH, NEA	Well-trained Health personnel nationwide	Training to be done by the Teaching Hospital
2.3	Procurement and installation of equipment for the poison control centre	March onwards	DOSH, NEA	Equipment procured and installed at the Health Centres	Tender processing and award of contracts

### 3. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis

Lack of data on groundwater contamination by POPs is another important concern. A lot of organochlorin compounds were brought and used in the country during the late 70s and early 80s by the department of agriculture. There were places designated as storage points where groundwater around those areas could be contaminated. There is no capacity at the moment to perform analysis of POPs residues in The Gambia.

It is planned to strengthen analytical capacity of Stakeholder (NEA, DOSH, NARI and APMU) laboratories by 2010

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5
3.	<b>Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis</b>				

3.1	Analysis of present equipment and determination of strengthening needs				
3.2	Procurement of equipment and laboratory supplies	March 2007 to August 2009	NEA, DOSFEA, Bilateral Sources	Inventory of capital items, supplies and structural facilities	Installation and calibration of equipment
3.3	Manpower development of personnel	March 2009 to Dec. 2009	NEA, DOSFEA, Bilateral Sources	Highly qualified professional staff e.g. chemical analysts, IT specialists	Internships and local consultancy

#### 4. Identify and develop alternatives to DDT for vector and crop pest control

There is lack of coordinated research effort in the search for alternatives to DDT in vector and crop pest control programmes.

It is planned to identify and develop alternatives to DDT for vector and crop pest control that will meet the requirements of the Stockholm Convention by 2010.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5
<b>4. Identify and develop alternatives to DDT for vector and crop pest control</b>					
4.1	Pesticide efficacy studies to determine alternatives to DDT for vector control	March 2009 onwards	DOSA, NEA, DOSH	Identification of efficacious alternatives	Training sessions

4.2	Develop integrated Vector/Pest Management strategies as an alternative to DDT use	March 2009 onwards	DOSA, NEA, DOSH	Pest management strategies developed	Introduction of farmer field school concept at model farms
4.3	Training of extension and NGO personnel on IPM strategies to reduce dependency on pesticides	Feb.2009	DOSA, NEA, DOSH	Trained Extension and NGO personnel	Farmer Field concept to be applied

**5. To sensitise the policy makers and general public on effects of POPs on the environment.**

Significant awareness and information gap has been identified with regards to persistent organic pollutants and their adverse effects onto the environment. Sixty percent (60%) of the population are generally ignorant of the effects of POPs. Out of the remaining 40% some have a very low level of awareness, particularly among policy and decision markers. There is also lack of comprehensive data on this issue and priority strategies to address this gap.

Ensuring participation of local authorities and decision makers in enforcement measures may be critical to the success of POP specific programmes. Raising awareness of the general public, in particular in relation to the role, they could play in addressing compliance and enforcement of existing regulation, is also vital.

	Option / Activities	Timeframe	Responsible Institution(s) supporting	Requested output / indicator of success	Related activities/ projects/ issues
0	1	2	3		
5.	<b>Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia</b>				
5.1	Workshop for policy and decision makers on effects of POPs	April 2009	NEA, DOSA, DOSH	Workshop reports	Follow-up missions on participants or their respective institutions

5.2	Radio and television programmes to create public awareness on effects of POPs	Quarterly Starting March 2009	Private sector, GCCI, DOSA, NEA, DOSH	Documentary evidence of radio and T modules	Development and distribution of posters and leaflets
5.3	Sensitisation of village heads and community leaders at community level	March 2009	NEA, DOSA, DOSH and the Community	Sensitised communities	Use of services of traditional media

## 6. Human capacity building in stakeholder institutions

Training and capacity building activities on various issues such as sound pesticide management practices, POPs environmental impact assessment, effective legislation and regulation, good storage and management including pesticide waste management will be implemented.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities / projects/ issues
0	1	2	3	4	5
<b>6. Human capacity building in stakeholder institutions</b>					
6.1	Identify necessary capacity building needs	2009 onwards	All stakeholder institutions	Capacity building needs identified	Facilitate participation in trainings; and MSc. level studies
6.2	Promote human capacity building by all means	2009 onwards	All stakeholder institutions	Human capacity strengthened	

## 7. Training of farmers and other end-users on pesticides – methods of application, handling and safety measures (including residual management and disposals)

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities / projects/ issues
0	1	2	3	4	5
<b>7. Training of farmers and other end-users on pesticides – methods of application, handling and safety measures (including residual management and disposals)</b>					
7.1	Prepare appropriate training modules	2009	NEA, DOSA	Training modules developed	
7.2	Provide training to the trainers	2009/2010	NEA, DOSA	Trained trainers	
7.3	Provide training countrywide	2010	NEA, DOSA	End-users trained	

### 3.3.3 Action Plan on DDT

#### Management options

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs management, the following management options were identified:

1. Strengthen the capacity of NMCP in support of alternatives to reintroduction of DDT;
2. Widen and strengthen the present NIBP programme (including sensitization of the public);
3. Develop and implement guidance for appropriate use of available insecticides at community level;
4. Promote research on non-pyrethroid alternatives to existing insecticides.

The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.

#### Implementation strategy

1. Strengthen the capacity of NMCP in support of alternatives to reintroduction of DDT

	Option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities/ projects/ issues
0	1	2	3	4	5
1.	<b>Strengthen the capacity of NMCP in support of alternatives to reintroduction of DDT</b>				
1.1	<b>Widen and strengthen the present NIBP programme</b>	2009	DOSH, NEA	75 percent of communities use insecticide impregnated bed nets national	Sensitization, distribute impregnated nets throughout the country
1.2	<b>Develop and implement guidance for appropriate use of available insecticides at community level</b>	2009	DOSH, NEA, NARI, APMU, TANGO	Guideline developed and pesticide users and dealers trained nationwide	Guideline development, training workshops
1.3	<b>Promote research on non-pyrethroid alternatives to existing insecticides</b>	2009	DOSH, NEA, NARI, APMU	Suitable alternatives identified	Screening of plant materials for insecticidal properties

#### 3.3.4. Action Plan: PCBs and Equipment Containing PCBs

##### Management options

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national

priorities and objectives for POPs management, the following management options were identified:

1. Implement the necessary provisions with regard to PCBs import (ban) and export (only for the purpose of ESMW) as well as on PCBs Management, Handling and Phasing out into the Hazardous Chemicals Regulations 1999;
2. Elaborate and put in place Regulation under the Waste Bill (yet to be passed) on Disposal of PCBs and PCBs containing waste;
3. To review NAWEC's mandate with the view of covering management of transformers and other PCBs containing equipment outside its purview;
4. Establish and put in place NAWEC guidelines for equipment management and handling;
5. Elaborate and put in place NAWEC guidelines for PCBs equipment phase out, transportation, storage, and disposal;
6. Establish or upgrade existing laboratories for PCBs testing;
7. Develop and implement adequate training modules for all PCB regulators and users;
8. Develop and implement awareness raising programmes on PCBs for the general public;
9. To develop and implement standards for maximum limits of PCBs in different media;

**Note: Management options 1 and 2 will be implemented in the AP on Legal and Institutional Strengthening, and management option 8 will be implemented under the AP on Awareness Raising and Information Dissemination.**

The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.

#### **Implementation strategy**

**3. To review NAWEC's mandate with the view of covering management of transformers and other PCBs containing equipment outside its purview**



NAWEC currently holds the mandate to manage transformers, and therefore indirectly the bulk of PCBs, in The Gambia. However, there might be other equipment owned by the industrial sector. Extending the mandate would enable NAWEC to holistically address Gambia's PCB issues, since NAWEC's transformers and capacitors may be the main source but not the only source of PCBs in the country. NAWEC would also be able to plan training and sensitization programs for target groups.

A very close collaboration of NAWEC and the NEA is envisaged, especially in the areas of training, sensitization and monitoring. An MOU can be signed to this effect.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	of / projects/ issues
0	1	2	3	4	5
3.	To review NAWEC's mandate with the view of covering management of transformers and other PCBs containing equipment outside it's purview				
3.1	Review NAWEC's policy in controlling PCBs	March to June 2009	NAWEC / NEA	Policy reviewed	
3.2	Mandate NAWEC to manage PCBs outside it's purview	July 2009	NAWEC	NAWEC mandated	
3.3	Sign an MOU with NEA for training, sensitisation and monitoring	July 2009	NAWEC / NEA	MOU signed and implemented	

#### 4. Establish and put in place NAWEC guidelines for equipment management and handling

These guidelines should prevent unsustainable handling with transformers, thus contribute to both prevention of cross-contamination, as well as of health and environment hazards.

Part of the guidelines will cover the issue of on-going monitoring, testing, labelling and recording of all transformers and capacitors so as to have an up-to date database. Such a database is essential for preparation of a phase out plan.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	of / projects/ issues
0	1	2	3	4	5
4.	<b>Establish and put in place NAWEC guidelines for equipment management and handling</b>				
4.1	Develop manual of procedures for PCB management and handling	July 2009 – Dec 2009	NAWEC	Manual developed	
4.2	Training of NAWEC personnel for execution of manual	Jan 2010 - onwards	NAWEC	NAWEC personnel trained	
4.3	Monitoring of implementation of the manual of procedures	Jan 2010 onward S....	NAWEC / NEA	Monitoring takes place, improvements recommended and made	
4.4	Maintaining and updating of the transformer database	Jan. 2009 ongoing	NAWEC	Up-to-date database	

**5. Elaborate and put in place NAWEC guidelines for PCBs equipment phase out, transportation, storage, and disposal**

To prevent haphazard disposal of decommissioned transformers guidelines will be established. The transformers and capacitors will be gradually phased out according to a phasing out plan. This phasing out plan will be elaborated on the base of the NAWEC database of PCBs equipment according to the UNEP Guidelines.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	of / projects/ issues
0	1	2	3	4	5
5.	<b>Elaborate and put in place NAWEC guidelines for PCBs equipment phase out, transportation, storage, and disposal</b>				
5.1	Develop plan for PCB phasing out, transportation, storage and	July 2009 –	NAWEC / NEA	Plan developed	

	disposal	Dec 2009			
5.2	Identify proper storage sites & provide facilities	Jan 2010 – Dec 2010	NAWEC	Proper sites and facilities available	
5.3	Implement phase out plan	Dec 2010 - 2024	NAWEC / NEA	Stockholm Convention commitment met	
5.4	Training on phasing out activities	Dec 2010 onwards		Responsible staff trained	
5.5	Training on appropriate transportation, storage and disposal (incl. health & safety)				

#### 6. Establish or upgrade existing laboratories for PCBs testing

To decide on the most appropriate (and cost-effective) disposal option for PCBs contaminated transformer oils information on the exact PCBs concentration is necessary.

The most likely areas for PCBs presence, apart from equipment are the soils and agricultural products grown on polluted soil. Water contamination might be not so critical considering the very low water solubility of the PCBs.

There are currently no existing laboratories to test PCBs neither in the transformer oils nor in the environmental compartments. The NEA pesticide laboratory at Abuko is doted with potentials to test PCBs if reinforced with the appropriate equipment. The water quality laboratory of the Department of Water Resources and the Soils Laboratory of the National Agricultural Research Institute are other potential laboratories for PCB testing.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5
6.	Establish or upgrade existing laboratories for PCBs testing				

6.1	Upgrade NEA lab for PCB testing	July 09 – July 2010	NEA	NEA Lab capable of testing PCB	
6.2	Training on PCB analysis	Sept 07	NEA	lab technicians trained	

### 7. Develop and implement adequate training modules for all PCB regulators and users

NAWEC is the custodian of transformers, and therefore of the bulk of the PCBs in The Gambia. They are also the main manipulators of PCB and PCB containing equipment. NAWEC staff should be in a position to offer advice and training pertaining to the dangers of PCB.

The NEA is the administrator of the laws dealing with pollution and hazardous chemicals and waste control. By virtue of its mandate, the NEA has a supervisory role over NAWEC. The NEA therefore needs to be in a position to offer advice and training on PCB regulation and control.

Specific training modules need to be devised for the various categories of the actors ranging from managers to technicians and monitoring agents. The training should include risk management and risk reduction strategies for PCBs, and both local and international training should be envisaged.

	Option Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5
7.	<b>Develop and implement adequate training modules for all PCB regulators and users</b>				
7.1	Develop training modules for all PCB regulators (monitoring etc.)	July 2009 – Dec 2009	NEA / NAWEC	Training modules for all PCB regulators developed	
7.2	Develop training modules for all PCB users	July 2009 – Dec 2009	NEA / NAWEC	Training modules for all PCB regulators developed	
7.	Implement the identified training	Jan	NEA /	Regulators and	

3	modules	2009 - ongoing .....	NAWEC	users trained	
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**9. To develop and implement standards for maximum limits of PCBs in different media**

The Gambia has almost no capacity to develop national standards for PCBs in various media. Therefore the existing WHO standards will be adopted along with the existing WHO documents for their application and monitoring.

	Option Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator success	Related activities of / projects/ issues
0	1	2	3	4	5
9.	<b>To develop and implement standards for maximum limits of PCBs in different media</b>				
9.1	Reproduce and disseminate WHO standards to relevant stakeholders	March 2009	NEA	WHO standards available to relevant stakeholders	
9.2	Monitor different media at strategic sites	Dec 2009....	NEA / NAWEC	Monitoring occurs & recommendations for improvement implemented	

3.3.5. Action Plan: Unintentionally Produced POPs by-products

**Management options**

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention as well as other relevant international treaties and national policies, pursuant to the national priorities and objectives for POPs management, the following

management options were identified:

1. Enact the Waste Management Bill 2003;
2. Strengthen the capacity of NEA Inspectorate to enforce effective pollution prevention and control;
3. Strengthen capacity of institutions for waste management (waste collection, transportation and storage equipment, and sanitary landfill facilities);
4. Training of local authorities (NEA and DOSH) in sound municipal waste management;
5. Awareness raising on proper waste management practices to general public;
6. Regular updating of emission inventory.

Note: Management options 1 and 2 will be implemented in the AP on Legal and Institutional Strengthening, and management option 5 will be implemented under the AP on Awareness Raising and Information Dissemination.

The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.

#### Implementation strategy

#### 2. Strengthen the capacity of NEA Inspectorate to enforce effective pollution prevention and control

Various sources of pollution contribute to the emission of PCDD/PCDF (along with other hazardous pollutants such as particulate matter, CO, NO<sub>2</sub>, SO<sub>2</sub>, HCL, HF, VOC, PAH etc.) in the environment. Therefore to minimise this emissions there must be an effective pollution prevention and control. Currently there is limited capacity at the NEA to carry out effective pollution prevention and control nation wide. The inspectorate does not have adequate capacity in terms of personnel, training and equipment.

Management Activities	option /	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities of / projects/
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					issues
0	1	2	3	4	5
2.	<b>Strengthen the capacity of NEA Inspectorate to enforce effective pollution prevention and control</b>				
2.1	Train inspectors to at B.Sc. level in pollution control	2009 - 2013	NEA	Number of inspectors trained	
2.2	Provide equipment for monitoring and enforcement	2009-2010	NEA	Adequate equipment provided	
2.3	Provide laboratory equipment for testing for various pollutant in environmental media	2009-2010	NEA	Well equipped laboratory acquired	

**3. Strengthen capacity of institutions for waste management (waste collection, transportation and storage equipment, and sanitary landfill facilities)**

The single largest source of PCDD/PCDF discharges to air is landfill / dumpsite fires and open burning of domestic and other wastes. Reduction or elimination of PCDD/PCDF discharges to air from these sources can be minimized or eliminated by improvement of waste management practices, in particular the provision of a sanitary landfill facility and an adequate collection and storage capacity.

Therefore it is necessary to put in place an effective waste management system especially in the GBA and Brikama to:

- Provide adequate storage, collection and transportation facilities to the local authorities to enable them provide reliable and efficient services;
- Provide a well-managed sanitary landfill/dumpsite for final disposal of solid waste.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
0	1	2	3	4	5

3.	<b>Strengthen capacity of institutions for waste management (waste collection, transportation and storage equipment, and sanitary landfill facilities)</b>					
3.1	Provide collection, transportation and storage equipment	2009 - 2010	NEA, local Authorities, Government	Adequate collection transportation and storage equipment acquired	PACAB-GBA / Brikama waste management study 2002	
3.2	Provide Sanitary Landfill / dumpsite	2009	NEA, DOSH Authorities, Government	At least one landfill per local Authorities,	PACAB-GBA / Brikama waste management study 2002	

**4. Training of local authorities, NEA and DOSH in sound waste management**

Currently there is lack of trained personnel in waste management in the local Authorities. The so call managers of the cleansing services units of the local authorities have virtually no training in waste management but are in charge of all waste management issues. Most of the supervisors of the collection and disposal process have no training in Public or environmental Health or waste management. At the NEA and DOSH, there is a need for professional training in waste management to facilitate the execution of their mandate as waste regulators.

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Related activities / projects/ issues
0	1	2	3	4	5
4.	<b>Training of local authorities (NEA and DOSH) in sound municipal waste management</b>				
4.1	Stakeholders workshops on Waste Management	2009	NEA	Number of participants/nu	



				number of workshops held	
4.2	Training on waste management for waste managers and waste regulators at the local authorities, NEA and Health	2009 - 2011	NEA, DOSH, Local Government Authorities	NEA, DOSH and Local Authorities have adequate trained Officers in waste management	
4.3	Training on waste management for policy makers, decision makers	2009	Local Authorities, National assembly, cabinet	Numbers of people trained	

## 6 Regular updating of emission inventory

During the first inventory exercise (as of 2000) certain major categories of emission sources were not present in the Gambia. It is important to monitor any change to the present source categories through the Environmental Management Discharge Permit Regulations, so that they can be included during the update. The inventory should be updated every five years.

	Option Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Related activities / projects/ issues
<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<b>6.</b>	<b>Regular updating of emission inventory</b>				
6.1	Monitoring of source categories that are currently not present in the Gambia	2009 - 2010	NEA	Number of source new categories in the Gambia	
6.2	Update emission inventory	2010	NEA, local Authorities, DOSH	New inventory capturing all source categories	

### 3.3.6. Strategy for Information Exchange and Reporting

Parties are required to facilitate or undertake the exchange of information detailed in paragraph 1 of Article 9. This information shall be exchanged directly or through the Convention Secretariat. In addition Parties are also required to designate a national Focal Point for the exchange of such information.

Parties are also required, pursuant to Article 15, to report to the Conference of the Parties on the measures they have taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention. Such reporting shall be at periodic intervals and in a format decided by the Conference of the Parties at its first meeting<sup>4</sup>.

The national Focal Point designated under Article 9 of Convention, has the primary responsibility for the submission of the national report to the Secretariat of the Convention. Other departments and national institutions that are responsible for implementing aspects of the Convention, will be responsible to provide to the national Focal Point the relevant information required in order for the Party to comply with its reporting obligation.

Following strategy (Table 9) for information exchange and reporting should facilitate this process:

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## Reporting obligations under the Stockholm Convention and the strategy of information exchange and reporting in The Gambia

### Reporting obligations:

The Gambia shall endeavour to report in detail all activities or strategies put in place in the effective implementation of the Convention.

The country shall through the Stockholm Convention Focal Point provide statistical data ( or a reasonable estimate of such data) on quantities of each of the chemicals listed in Annex A and Annex B to the Secretariat of the Convention.

The country shall also provide to the secretariat, a list of the states from which it has imported such substances.

Such reporting shall be at periodic intervals and in a format as decided by the conference of parties at its first meeting.

### Information exchange

The Focal Point shall coordinate I.E.C. programs to promote and facilitate:

Awareness among policy and decision makers with regard to persistent organic pollutants.

Provision to the public of all available information on POPs, taking into account the fact that information on health and safety of humans and the environment shall not be regarded as confidential. And that exchange of other information pursuant to the convention shall protect any confidential information as mutually agreed.

The Development and Implementation of public awareness programs on health and environmental effects and alternatives to POPs, especially for women, children and the least educated.

Convention Obligation	Description of Requirement	Periodicity	Responsible Institutions
Article 5, subparagraph (a) Measures to reduce or eliminate releases from unintentional production	Requires each Party to develop an action plan, or, where appropriate, a regional or subregional action plan, and subsequently to implement it as part of its national implementation plan specified in article 7, designed to identify, characterize and address the release of the chemicals listed in Annex C of the Convention.	Within two years of the date in which the Convention enters into force for that Party	NEA, COUNCILS NAWEC
Article 5, subparagraph (a) (v): Measures to reduce or eliminate releases from unintentional production	A review to be undertaken of those strategies pursuant to the development of an action plan to identify, characterize and address the release of the unintentionally produced persistent organic pollutants listed in Annex C, and of their success.	Every five years	NEA, Councils NAWEC
Article 7: Implementation plans	Requires each Party to develop and endeavour to implement an implementation plan and transmit it to the Conference of the Parties, and requires each Party to review and update its plan on a periodic basis and in a manner to be specified in a decision of the Conference of the Parties.	Transmission to the Conference of the Parties within two years of the date on which the Convention enters into force for that Party.	NEA, APMU, NARI, DOSH, TANGO, NAWEC, GCCI
Article 15: Reporting	Each Party shall report to the Conference of the Parties on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention. Each Party shall provide to the Secretariat: (a) Statistical data on its total quantities of production, import and export of each of the chemicals listed in Annex A and Annex B or a reasonable estimate of such data; and (b) To the extent practicable, a list of the States from which it has imported each such substance and the States to which it has exported each such substance.	To be decided by the Conference of the Parties.	NEA
Annex A, Part II Subparagraph (g)	Requires each Party to provide a report every five years on progress in eliminating polychlorinated biphenyls and submit it to the Conference of the Parties pursuant to Article 15	Every 5 years	NEA



### 3.3.7. Action Plan: Public Awareness, Information Dissemination and Training

#### Options

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention and national policies, pursuant to the national priorities and objectives for POPs management, the following options for awareness raising, information dissemination and training were identified:

1. Strengthen the capacity (both technical and human) of NEA and other stakeholder institutions to implement a POPs information system;
2. Develop and put in place a strategy for POPs information/reporting;
3. Design and implement a POPs monitoring programme in selected matrices;
4. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;
5. Include provisions for waste recording and reporting into the Waste Management Bill 2003;
6. Intensify / develop and put in place effective sensitisation programme as follows:
  - Awareness raising on effects of POPs on human health and environment;
  - Awareness raising programme on PCBs for the general public;
  - Awareness raising on proper waste management practices to general public;
7. Develop and put in place a system for reporting of pesticide / chemical poisoning cases;
8. Regular updating of emission inventory;
9. POPs information needs assessment;
10. Message development;
11. Development of an effective communication strategy and its implementation;

12. Training of farmers and other end-users on chemicals and pesticides – methods of application, handling and other safety measures (including residual management and disposals);
13. Training and sensitization of the private sector actors in the chemical business.

**Note: Option 2 is subject of a separate chapter. Option 4 will be implemented under AP on Pesticides. Option 5 will be implemented in the AP on Legal and Institutional Strengthening. Target group of the sensitization programme (option 6) will be the general public. Sensitization and training of the authorities, experts, managers and workers (options 12 and 13) will be implemented under the subject specific action plans. Option will 7 be implemented under the AP on Pesticides and option 8 under the AP on Unintentional By-products. The proposed options for realising the objectives are described in more detail in the following text. For each option an explanatory text describes the rationale behind selecting the particular option, its implementation strategy and the assumed implementation costs.**



### Implementation strategy

#### 1. Strengthen the capacity (both technical and human) of NEA and other stakeholder institutions to implement a POPs information system

The every-day work of NEA and other stakeholder institutions is seriously hampered by very weak technical infrastructure of the information technologies used (network, internet connections etc.).

Effective IT is a prerequisite of any information system; therefore the first step in its strengthening must be establishment of an appropriate electronic framework to support it.

0	1	2	3	4	5
Management Activities	option	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Note
1	<b>Strengthen the capacity (both technical and human) of NEA and other stakeholder institutions to implement a POPs information system</b>				
1.1	Strengthening of the IT hardware at NEA	2009-2010	NEA	computers and peripheral accessories provided	
1.2	Training staff of NEA and stakeholder institutions on database management.	2009	NEA, NCC	number of personnel trained	
1.5	Use of the information system for information acquisition, dissemination and exchange	2009-onwards	NEA	number of institutions or individuals benefiting from the system	

#### 3. Design and implement a POPs monitoring programme in selected matrices

Monitoring of POPs content in various matrices (e. g. environmental compartments, agricultural products, etc.) and trends over the time is essential to perform risk assessment, as well as evaluate effectiveness of adopted strategies and measures for POPs prevention and control.

The Gambia as a least developing country has only very limited resources for POPs monitoring, being particularly demanding in terms of laboratory facilities and consumables, as well as highly

skilled personnel.

However, at least a minimal POPs monitoring programme should be designed and put in place, to cover the most pressing issues such as PCBs content in the transformer oils and POPs pesticide residues in food (both imported and exported).

0	1	2	3	4	5
Management Activities	option /	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Note
<b>3 Design and implement a POPs monitoring programme in selected media</b>					
3.1	Identification of priority areas to be monitored	2009	NEA, DOSH	Priority areas identified	
3.2	Identification of locations and matrices to be monitored	2009	NEA, DOSH, APMU	Locations identified and matrices developed for monitoring	
3.3	Identification of resource requirements	2009	TANGO, NEA, DOSH, NAWEC	resource requirements identified	
3.4	Development of a monitoring system	2009	NEA, DOSH, APMU	Monitoring system developed	
3.5	Regular monitoring of identified locations	2009	NEA, DOSH, TANGO, APMU	Identified locations regularly monitored	

#### 6. Develop and put in place effective sensitisation programme

Awareness of the POPs issue is critical for all players: for policy makers- in order to develop the right policies and legal framework for their prevention and control; for the local and regional authorities- to implement and enforce the legal documents; for experts-to search for right solutions; for managers- to put in place appropriate management procedures; for concerned workers-to handle POPs in safe manner; and last not least for the general public- to promote correct behaviour patterns and prevent unsafe handling and habits.

A sensitisation programme will be developed and put in place to cover all important POPs issues (environment & health effects, prevention of releases, safe handling, proper waste management, possible PCBs contamination of waste-oils,

etc.) and targeted to various population groups (e.g. farmers, journalists, teachers, users, general public etc).

It will be based on the “training of trainers approach” and implemented by various means through all available media (radio, TV, newspapers, pamphlets, leaflets).

To approach the broadest public (e.g. in the villages) effectively, also traditional communicators such as drama groups, kangelengs, songs, theatre and local communicators will be used.

0	1	2	3	4	5
Management Activities	option	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / success	Note
6	<b>Develop and put in place effective sensitisation programme</b>				
6.1	Develop an POPs sensitisation strategy	2009	NEA, DOSH, NGOs	A strategy document	
6.2	Prepare training plans for the various areas	2009	NEA, DOSE	Training plans	A working document
6.3	Training of trainers in the various areas	2009on going	NEA, DOSE	100 farmers; 50 extension workers; 20 media personnel	Annually
6.4	Implement the POPs sensitisation strategy in the particular areas	2009on going	NEA, DOSH, NGOs	Public sensitised	
6.5	Develop and deliver supplementary material for schools	2009-2011	NEA	Teaching material developed and delivered	

### POPs information needs assessment

Based on the analysis of the country baseline situation, considering the provisions of the Stockholm Convention and national policies, pursuant to the national priorities and objectives for POPs management, the following options for awareness raising, information dissemination and training were identified:

14. Strengthen the capacity (both technical and human) of NEA and

other stakeholder institutions to implement a POPs information system;

15. Develop and put in place a strategy for POPs information/reporting;
16. Design and implement a POPs monitoring programme in selected matrices;
17. Strengthen the capacity (both human and technical) of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;
18. Include provisions for waste recording and reporting into the Waste Management Bill 2003;
19. Intensify / develop and put in place effective sensitisation programme as follows:
  - Awareness raising on effects of POPs on human health and environment;
  - Awareness raising programme on PCBs for the general public;
  - Awareness raising on proper waste management practices to general public;
20. Develop and put in place a system for reporting of pesticide / chemical poisoning cases;
21. Regular updating of emission inventory;
22. POPs information needs assessment;
23. Message development;
24. Development of an effective communication strategy and its implementation;
25. Training of farmers and other end-users on chemicals and pesticides – methods of application, handling and other safety measures (including residue management and disposals);

### Training and sensitization of the private sector dealing in chemicals

	Management Activities	option /	Timeframe	Responsible / supporting Institution(s)	Requested output indicator of success	Note
0	1		2	3	4	5
9	POPs information needs assessment					

9.1	Baseline survey on the level of awareness, access to information (type of information), management skills and knowledge levels.	2009	NEA, and Local media Consultants	Baseline data obtained	
9.2	Prepare, develop and implement information management system including Monitoring and Evaluation Strategy.	2009	NEA, and Local Consultant	Monitoring and Evaluation strategy developed for a Information Management system.	

### 10. Message development

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / of success	Note
0	1	2	3	4	5
10.	<b>Message development</b>				
10.1	Message development workshop to involve a representation of all beneficiaries and stakeholders	2009	Stakeholders Participation	Message development workshop convened	
10.2	Select the appropriate medium/media that can better disseminate the same message	2009	Participants at the workshop	Medium/media selected	
10.3	Pre-testing of all the messages	2009	NEA and local Consultant	Messages pretested	

### 11. Development of an effective communication strategy and its implementation

	Management option / Activities	Timeframe	Responsible / supporting Institution(s)	Requested output indicator / of	Note
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				success	
0	1	2	3	4	5
<b>11</b>	<b>Development of an effective communication strategy and its implementation</b>				
11.1	Develop a media strategy that selects the most appropriate channel(s) of communication and use them singly or in combination to achieve effective communication.	2009	NEA and Local Consultants		
11.2	Special campaigns on POPs issues for the general public.	2009	NEA, Media Houses, and Drama Groups		
11.3	Activity- Popular theatre by local drama groups	2009	Drama Groups		

## Resource mobilisation

### 3.4. Proposals and Priorities for Capacity Building

Current capacity and capability for POPs management available in The Gambia needs to be strengthened to achieve the objectives of the NIP. Priority needs for capacity building to support compliance with Convention provisions and achieving of NIP objectives, are highlighted below for the particular priority areas.

**Institutional and regulatory framework:**

- Training for information system;
- Equipments for information system;
- ETC

**POPs pesticides**

**DDT: Research into alternatives**

**Enforcement of existing Hazardous chemicals and pesticides Regulations**

**Strengthening of the Pesticides formulation analysis**

**Training of Laboratory Technicians**

## PCBs and equipment containing PCBs

- GC equipment with accessories for PCB testing at NEA lab

- Training of lab technicians

- Training of trainers on general PCB management (monitoring, phasing out, etc)

- Resources for disposal (export) of PCB contaminated material

- Proper stores for PCB and PCB contaminated materials

- Testing kits for potential contaminated media

- ETC

## Unintentionally produced by-products

- Training of local government authorities, NEA and DOSH personnel on waste management;

- Strengthening of existing laboratories;

- Provision of waste management equipment.

## Resource Requirements

This section will summarise the projected costs of measures included in the NIP. Incremental costs for measures will be identified and potential sources of finance for both incremental costs and baseline costs will be noted. In accordance with Article 13 of the Convention alternate sources of funding will be considered. Determine needed human, financial, infrastructure and capacity resources. The detailed consolidated costing of all possible activities should be prepared in order to determine the needs of the country for external financing. The cost analysis has to include the investment, operational and maintenance costs, which together will constitute the total costs. As some funding agencies will only cover specific portions of a project, it may additionally be of value to separate the total cost into the following categories:

- Incremental and non-incremental costs (costs related to environment protection) (cost of the investment not related to environment protection measures)

- Foreign and local costs, arrived at by identifying how much of the total costs are local (can be financed from national government or private sector budget) and how much needs to be supplied from external sources.

The following tables provide a summary of the timeframe, resource assessment and proposed sources of funding of the NIP-Action Plans.

With regard to the timing the following is considered:

Short-term activities: to be implemented within 3 years;

Medium-term activities to be implemented in the framework of 3-6 years;

Long term activities to be implemented in the framework over 6 years.

With regard to assessment of cost necessary for implementation the following is considered:

Low costs mostly human costs (predominantly from governmental offices) operation costs to run the offices; no capital costs.

Medium costs human costs (partly governmental officers, partly consultants/experts); operation costs to run the offices / laboratories and purchase in-country services; capital costs up to 0,5 mil USD.

High costs human costs (governmental officers, consultants/experts, managers, workers); operation costs to run facilities; to purchase services overseas; capital costs over 0,5 mil USD.



With regard to sources of financing the following is considered:

State budget usual budget of the governmental institutions as well as additional budget earmarked for a particular purpose.

Private sector any input from the concerned private sector.

Expatriate donors funding from international donors (e.g. GEF, World Bank, EU)  
or  
bi-lateral funding (e.g. JICA).

## Summary of the timeframe, resource assessment and proposed sources of funding of the NIP-Action Plans

Action plans	Timeframe			Assessed costs			Sources of financing		
	Short	Medium	Long	Low	Medium	High	State	Private	External
<b>AP: Institutional and Regulatory Strengthening Measures</b>									
Include provisions for control of POPs production and use into NEMA 1994;									
Elaborate PCBs regulation to control import, export, management, handling and phasing out									
Elaborate and put in place regulation on Disposal of PCBs / PCBs waste;									
Include provisions to control import / export of POPs into HCHR 1999;									
Include provisions for disposal of POPs in the Waste Management Bill.									
<b>AP: POPs pesticides</b>									
Develop strategies for the control and prevention of illegal entry of POP pesticides in The Gambia;									
Establish functional poison control centres in all the major health centres;									
Strengthen the capacity of stakeholder laboratories for POPs residue analysis;									
Identify and develop alternatives to DDT for vector control ;									

Action plans	Timeframe			Assessed costs			Sources of financing		
	Short	Medium	Long	Low	Medium	High	State	Private	External
Awareness raising on effects of POPs on human health and environment;									
Human capacity building in stakeholder institutions;									
Training of farmers and other end-users on safe handling and use of pesticides									

AP: DDT									
Strengthen the capacity of NMCP in support of alternatives to reintroduction of DDT;									
Widen and strengthen the present NIBP programme (including sensitization of the public);									
Develop and implement guidance for appropriate use of available insecticides at community level;									
Promote research on non-pyrethroid alternatives to existing insecticides.									
AP: PCBs									
*Elaborate PCBs regulation to control import, export, management, handling and									

Action plans	Timeframe			Assessed costs			Sources of financing		
	Short	Medium	Long	Low	Medium	High	State	Private	External
phasing out									
*Elaborate and put in place regulation on Disposal of PCBs / PCBs waste;									
To review NAWEC's mandate to cover management of transformers outside it's purview									
Establish and put in place NAWEC guidelines for equipment management and handling									
Elaborate and put in place NAWEC guidelines for PCBs equipment phase out, transportation, storage, and disposal									
Establish or upgrade existing laboratories for PCBs testing									
Develop and implement adequate training modules for all PCB regulators and users									
*Develop and implement awareness raising programmes on PCBs for the general public									
To develop and implement standards for maximum limits of PCBs in different media									

NOTE: Management options marked with \* will be implemented under an another action plan

Action plans	Timeframe			Assessed costs			Sources of financing		
	Short	Medium	Long	Low	Medium	High	State	Private	External

<b>AP: Unintentionally produced POPs</b>									
*Enact the Waste Management Bill 2003;									
Strengthen the capacity of NEA Inspectorate to enforce effective pollution prevention and control;									
Strengthen capacity of institutions for waste management ;									
Training of local authorities (NEA and DOSH) in sound municipal waste management;									
*Awareness raising on proper waste management practices to general public;									
Regular updating of emission inventory.									
<b>AP: Awareness raising and information dissemination</b>									
Strengthen the capacity of NEA and other stakeholder institutions to implement a POPs information system;									
Develop and put in place a strategy for POPs reporting;									

Action plans	Timeframe			Assessed costs			Sources of financing		
	Short	Medium	Long	Low	Medium	High	State	Private	External
Design and implement a POPs monitoring programme in selected matrices;		■			■		■		
*Strengthen the capacity of stakeholder laboratories (NEA, DOSH, NARI and APMU) for POPs residue analysis;		■			■		■		
*Include provisions for waste recording and reporting into the Waste Management Bill 2003;	■			■			■		
Develop and put in place effective sensitisation programme	■			■			■		
*Develop and put in place a system for reporting of pesticide / chemical poisoning cases;	■				■		■		
*Regular updating of emission inventory;		■		■			■		
POPs information needs assessment;	■			■			■		
Message development;	■			■			■		
Development and implementation of communication strategy;	■			■			■		
*Training of end-users on safe use of chemicals and pesticides	■			■			■	■	
*Training of the private sector actors in the chemical business.	■			■			■	■	



## ANNEXES

### A.1 REFERENCES

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## Annex 1. COSTING TABLES

### 1.1 STRATEGIES FOR THE CONTROL AND PREVENTION OF ENTRY OF POP PESTICIDES IN THE GAMBIA BY 2012

	Activities	Period: 2006												Monitoring indicators	Responsible agencies
	UPDATE AND STRENGTHEN ENFORCEMENT OF REGULATION													Updated national regulatory frame work in place	PCU/NCC (NEA)

	BILATERAL CONSULTATION WITH ENFORCEMENT AUTHORITY IN NEIGHBOURING SENEGAL														Bilateral programme of action developed	PCU/NCC
	Training of enforcement personnel (Training)														5 short term trainings in year one & 3 BSc between 2 <sup>nd</sup> – 4 <sup>th</sup> year of project implementation	PCU/NCC
	SENSITISATION OF COMMUNITY ELDERS AND OPINION LEADERS														2 radio & 2 TV phone in programmes conducted. Ten villages covered countrywide.	Resource persons identified by PCU/NCC
	Establishment of Pesticide monitoring COMMITTEES AT DISTRICT/ WARD LEVELS														Five committees per year for 5 years	Task team established by PCU/NCC

TOTAL = 213350

### 1.2 To Revitalize and Update the Poison Record/Control Centres

ACTIVITIES	Period: 2007										Monitoring indicators	Responsible agencies	Budget	
ESTABLISHMENT OF POISON RECORD AND CONTROL CENTRES IN MAJOR HEALTH CENTRES												Five centres establish in year one	PCU/DOSH	13
Identification and training of health personal for the centres												Number of Staff trained	PCU/DOSH	30

	PROCUREMENT AND INSTALLATION OF EQUIPMENT FOR THE CENTRES									NUMBER OF ITEMS PROCURE D AND INSTALLE D	PCU/DOS H	95
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**Total =16100**

**1.3 TO STRENGTHEN ANALYTICAL CAPACITY OF EXISTING LABORATORIES  
BY 2015**

**Planned Activities**

	ACTIVITIES	Period: 2009 - 2015										Monitoring indicators	Responsible agencies	Budget	
	PROCUREMENT OF EQUIPMENT & SUPPLIES FOR THE LABORATORIES												Number of items procured	PCU/NCC	30
	Training of laboratory staff												Number of personnel trained	PCU/NCC	35

**Total = 301300**

**1.4 TO IDENTIFY AND DEVELOP ALTERNATIVES TO DDT FOR VECTOR AND CROP PEST CONTROL**

	ACTIVITIES	Period: 2009 - 2011										Monitoring indicators	Responsible agencies	
	PESTICIDE EFFICACY STUDIES												NUMBER OF STUDIES CONDUCTED AND REPORTED	PCU/NARFI & DOSH

	Development of integrated management strategies																	Number of management options developed	PCU/NAR I & DOS
	IPM TRAINING																	Number of trainings and trainees	PCU and Stakeholders
	Restricted Use of DDT in accordance with WHO & Stockholm Convention																		PCU and stakeholders

**Total = 34300**

**1.5 TO SENSITISE POLICY MAKERS AND GENERAL PUBLIC ON EFFECTS OF POPS ON THE ENVIRONMENT**

	ACTIVITIES	<b>Period: 2009 - 2010</b>											<b>Monitoring indicators</b>	<b>6Responsible agencies</b>

	Sensitisation workshop for policy & decision makers on effects of POPs									NUMBER OF PEOPLE TRAINED AND THEIR PARTICIPATION IN PROJECT ACTIVITIES	PCU/NCC
	Sensitisation of general public through radio and television									Number of programmes and public participation	PCU/NCC
	Sensitisation of village heads and community leaders									Number of V/heads & leaders reached & resulting programmes	PCU/NCC

**Total = 7350**

## A. 2 Implementation Strategy Objectives and Activities:

### 2.1 TO DEVELOP STRATEGIES FOR THE CONTROL OF PREVENTION ENTRY OF POP PESTICIDES IN THE GAMBIA BY 2010

Activity One: Update and strengthen enforcement of regulations inline with international conventions					
Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/Materials	Special Resources	Total Resource Cost
A -Identification & Hiring of Consultant for review of existing regulatory & institutional framework		Hall for NCC meeting	Writing material & Advertisement	Per diem for NCC	Lump sum US\$500
B- Development of the TOR		Done with item A	NEA/NCC		

C- Review & updating of existing national legislation & institutional framework	1 Consultant Counterpart		Production & multiplication of the document	Transport and fuel	Lump sum US\$1450
D- I d e n t i f i c a t i o n & h i r i n g o f h a l l				Hiring of hall	US\$250
E- S u b m i s s i o n o f d r a f t r e p o r t a t a				Per diem & food for participants	Lump sum US\$1000



v a l i d a t i o n w o r k s h o p					
F- Submission of final document to relevant authority for enactment				Communication, telephone & email	US\$350

**Total = 3550**

**Objective One Continues:**

1.2 Activity Two: Bilateral consultation with enforcement authority in neighbour Senegal				
Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	
A- Gambian team visits Senegal to re-estab		Telephone & fax facilities		

lish conta ct of Sene galo /Gam bian Pesti cide Com mitte e				
B- Memorandum of understanding between the two countries revisited and updated		Communication, telephone & email		
C- Proposal on Bilateral program of action on cross-border monitoring and surveillance of illegal pesticide trade				
D- Prop osals ubmit ted to poten tial dono rs for fundi ng				Comm & ema

Total = 3800



**2.3 Activity Three: Enhance capacity of enforcement personnel (Training)**

Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	Sp
<p style="text-align: center;">A- T r a i n i n g n e e d s a s s e s s m e n t c o n s u l t a n t i d e n t i f i e d, h i r e d &amp; T O R d e v e l o p e d</p>	<p style="text-align: center;">1 Consultant 1 Counterpart</p>	<p style="text-align: center;">Hall for NCC meeting</p>	<p style="text-align: center;">Writing material &amp; Advertisement</p>	

Total = 61450

1.4 Activity Four: Sensitisation of community elders and opinion leaders about POPs

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification of resource persons		Hall for NCC meeting	Writing material & Advertisement	
B- Development of communication messages			Printing & development	
C- Review & validation of messages		Hall for NCC meeting		
D- Selection of target villages & communities			Done with item A	
E- Countrywide Trekking for message delivery				
F- Radio and TV phone in programmes	Resource Persons		TV & Radio time slots	

Total = 9700

2. Activity Five: Establishment of ten Pesticide monitoring committees at district/ divisional levels

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Task team establish at NCC	NCC Meeting			
B- Radio & TV programmes to sensitise public on the need for such committees	NCC Task team			
C- Team treks countrywide to sensitise and advice on formation of such committees	NCC task team		Transportation, Fuel	
D- Form	NCC task team/1 respective/chief,	hall	Food & transportation	

**Total = 7000**

3.1 Activity One: Establishment of poison record and control centres in major health centres

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>
<b>A- TO CONTACT INTERNATIONAL COMMUNITY FOR TECHNICAL ASSISTANCE TO ESTABLISH POISON CONTROL CENTRES</b>	PCU/NCC		Communication, telephone, e-mail etc
B- Sensitise health authority / personnel on need for such centres C- Identified centres recognised & establish as poison centres	NCC/PCU	Meeting hall	Communication, telephone, e-mail etc
C- Identification of 5 major centres	NCC/PCU/DOSH		Communication
D- Identified centres recognised & established as poison centres	NCC/PCU/DOSH		

**3. OBJECTIVE TWO: TO REVITALIZE AND UPDATE AT LEAST 5 POISON RECORD/CONTROL CENTRES**

Total = 1380

1.2 Activity Two: Identification and training of personal for the poison control centres

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identify key personnel to man 5 centres	PCU/DOSH		Communications	
B- Identification & hiring of resource persons to train these personnel	PCU & DOSH	Hall		
C-Development of pesticide poisoning training manuals	3 Resource Persons			
D- Identification & hiring of training site	PCU & DOSH			
E- Training of key personnel on pesticide poisoning			3 Resource Persons	

Total = 3050

1.1 Activity Three: Procurement and Installation of equipment for the poison control centres

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Procurement of 5 computers and accessories for the centres	PCU		Communication cost 5 computers & peripheries	



B- Installation and commissioning of equipment	PCU/DOSH		Radio & TV times	
C- Bimonthly reporting of cases	DOSH P. Centre staff			
D- Quarterly monitoring of poison control centres	PCU/DOSH		Communication cost	

Total = 1380

### OBJECTIVE THREE

TO STRENGTHEN ANALYTICAL CAPACITY OF OUR ALREADY EXISTING LABORATORIES BY 2015

<b>Activity One: Update capacity of labs (existing labs)</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A-Review of mandates of different laboratories & assigning POPs management responsibilities	NCC/PCU	Meeting hall	Communication cost	
B- Identification & hiring of consultant for gap analysis	1 consultant, 1 counter- part (NCC/PCU)	Meeting Hall		

C- evelopment of TOR	NCC/PCU	Meeting hall	Done same time with item B.	
D- Reviewing status of labs & identifying equipment gaps	2 Consultants			
E- Procurement of quotations & invoices for the different equipment	2 consultants		Communication cost	
F- Purchase of equipment	PCU/NCC			
G- Distribution & commissioning	PCU			
H- Provide training on any new equipment	Supplier & staff of labs concern			

Total = 301400

**Total 350**

1.2 Activity Two: Capacity (Manpower) development of personnel

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Communication cost</b>	
A- Identification of staff to be trained on new equipment	PCU & labs concern			
B- Hands on training of staff in the different labs			Costed under activity one above	

**OBJECTIVE FOUR**

**To identify and develop alternatives to DDT for vector and crop pest control**

**ACTIVITY ONE: PESTICIDE EFFICACY STUDIES TO DETERMINE ALTERNATIVES TO DDT CONTROL**

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification, sourcing & procurement of pesticides to be used in study	PCU & Researchers concern		Communication cost	
B- Identification of collaborator	PCU & Researchers concern			

s				
C- Design & layout of study	Researchers & Call.	Field & lab studies	Field materials	
D- Implementation of study	Researchers & Call.		Fuel for trekking & allowances	
E- Submission of progress & final reports	Researchers		Communication & writing cost	

Total = 16500

1.3 Activity Two: Development of integrated management strategies

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment /Service Material</b>
<b>A- Design of Various IPM &amp; IVC options</b>	Research ers & Call.	Farmer field schools	Pesticide & field inputs
B- Sourcing & procurement of study inputs	Research ers		
C- Testing of the different options	Research ers & Call.	Farmer field Schools	

**Total = 5000**

**Objective Four:**

Total 2500

1.5 Activity Four: Pesticide training of DDT in accordance with WHO guidelines				
Tasks to be undertaken	1.6 Human Resources	Facilities	Equipment/Services/Materials	
A- Consultation with WHO	DOSH & WHO		Communication cost	
B- Formulating a DDT vector control programme inline with WHO/ POPs convention guidelines	DOSH & WHO	Meeting hall	Communication cost & consultations meetings with	
A- Identification of participants	PCU & Research		Computer facilities	
C- Monitoring of programme to keep it inline with WHO & Stockholm	PCU/WHO task team		Meetings to set up task team; materials	
B- Development of training materials	3 Resource Persons		Communications	
D- Progress and monitoring reports	PCU		Communication cost	
C- Identification & hiring of hall	PCU & Resource Persons	Meeting Hall		
D- Training of participants	Resource Persons & 25 Participants			Perfor & h for per

**Objective Five**

**TO SENSITISE POLICY MAKERS AND GENERAL PUBLIC ON EFFECTS OF POPs  
ON THE ENVIRONMENT**

ACTIVITY ONE: SENSITISATION WORKSHOP				
<b>Tasks to be under taken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
<b>A- Identification &amp; hiring of resource persons</b>	NCC/PCU	Hall		
B- Identification & invitation of participants	PCU/NCC		Communication cost	
C- Identification & hiring of hall	PCU	Hall	Done with item A	
D- Developments of messages	3 Resource persons			
E- Training of participants	3 Resource persons & 25 participants			



**Objective Five:**

1.7 Activity two: Radio and television programmes				
<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
A- Establishment of a task team	NCC/PC U	Hal l	Commun ication cost	
B- Conduct radio & TV phone in programmes	Task team	TV & Ra dio	TV & Radio time slots	

1.8 Activity Three: Community sensitisation

Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	
A- Task team conduct countrywide treks	Task team			
B- Conduct one day meetings at divisional headquarters with divisional authorities	Task team & driver (s)			

**Objective Five:**

## Implementation Strategy Objectives and Activities:

### 1.9 Objective One:

#### TO DEVELOP STRATEGIES FOR THE CONTROL OF PREVENTION ENTRY OF POP PESTICIDES IN THE GAMBIA BY 2010

1.10 Activity One: Update and strengthen enforcement of regulations inline with international conv				
<b>Tasks to be under taken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	<b>Speci Reso</b>
A -Identification & Hiring of Consultant for review of existing regulatory & institutional framework		Hall for NCC meeting	Writing material & Advertisement	Per di NCC
B- Development of the TOR		Done with item A	NEA/NCC	
C- Review & updating of existing national legislation & institutional framework	1 Consultant 1 Counterpart		Production & multiplication of the document	Trans fuel
D- Identification				Hiring

at io n & hi ri n g of h al l				
E- S u b m i s s i o n of dr af t re p or t at a v al id at io n w or k s h				Per di for pa

o p				
F- Submission of final document to relevant authority for enactment				Comm teleph email

**Objective One Continues:**

1.11 Activity Two: Bilateral consultation with enforcement authority in neighbour Senegal				
<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- G a m b i a n t e a m v i s i t s S e n e g a l t o		Telephone & fax facilities		

re - e st a bl is h c o n t a c t o f S e n e g a l o /G a m b i a n P e s t i c i d e C o m m i t t e e				
B- Memorandum of		Communication, telephone & email		

<p>understanding between the two countries revisited and updated</p>				
<p>C- Proposal on Bilateral program of action on cross-border monitoring and surveillance of illegal pesticide trade</p>				
<p>D- P r o p o s a l s u b m i t t e d t o p o t e n t i a l d o n o r s</p>				

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**Activity Three: Enhance capacity of enforcement personnel (Training)**

Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials
<p style="text-align: center;">A- T r a i n i n g n e e d s a s s e s s m e n t c o n s u l t a n t i d e n t i f i e d, h i r e d &amp; T O R d e v e l o p e d</p>	<p style="text-align: center;">1 Consultant 1 Counterpart</p>	<p style="text-align: center;">Hall for NCC meeting</p>	<p style="text-align: center;">Writing material &amp; Advertisement</p>

Objective One

1.12 Activity Four: Sensitisation of community elders and opinion leaders about POPs

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification of resource persons		Hall for NCC meeting	Writing material & Advertisement	
B- Development of communication messages			Printing & development	
C- Review & validation of messages		Hall for NCC meeting		
D- Selection of target villages & communities			Done with item A	
E- Countrywide Trekking for message delivery				
F- Radio and TV phone in programmes	Resource Persons		TV & Radio time slots	

**Objective One:**

1.13 Activity Five: Establishment of ten Pesticide monitoring committees at district/ divisional level

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Task team establish at NCC	NCC Meeting			
B- Radio & TV programmes to sensitise public on the need for such committees	NCC Task team			
C- Team treks countrywide to sensitise and advice on formation of such committee	NCC task team		Transportation, Fuel	

**Objective One:**

OBJECTIVE TWO: TO REVITALIZE AND UPDATE AT LEAST 5 POISON  
RECORD/CONTROL CENTRES

1.14 Activity One: Establishment of poison record and control centres in major health centres

Tasks to be under taken	Human Resources	Facilities	Equipment/Services/ Materials
<p><b>A- To CONTACT INTERNATIONAL COMMUNITY FOR TECHNICAL ASSISTANCE TO ESTABLISH POISON CONTROL CENTRES</b></p>	<p>PCU/NCC</p>		<p>Communication, telephone, e-mail etc</p>
<p>B- Sensitise health authority / personnel on need for such centres C- Identified centres recognised &amp; establish as poison centres</p>	<p>NCC/PCU</p>	<p>Meeting hall</p>	<p>Communication, telephone, e-mail etc</p>
<p>C- Identification of 5 major centres</p>	<p>NCC/PCU/DOSH</p>		<p>Communication</p>
<p>D- Identified centres recognised &amp; established as poison</p>	<p>NCC/PCU/DOSH</p>	<p>198</p>	

**Objective Two:**

**1.14.1.1 Activity Two: Identification and training of personal for the poison control centres**

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identify key personnel to man 5 centres	PCU/DOSH		Communications	
B- Identification & hiring of resource persons to train these personnel	PCU & DOSH	Hall		
C-Development of pesticide poisoning training manuals	3 Resource Persons			
D- Identification & hiring of training site	PCU & DOSH			
E- Training of key personnel on pesticide poisoning			3 Resource Persons	

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**Objective Two:**

<b>1.14.1.2 Activity Three: Procurement and Installation of equipment for the poison control centres</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Procurement of 5 computers and accessories for the centres	PCU		Communication cost 5 computers & peripheries	
B- Installation and commissioning of equipment	PCU/DOSH		Radio & TV times	
C- Bimonthly reporting of cases	DOSH P. Centre staff			
D- Quarterly monitoring of poison control centres	PCU/DOSH		Communication cost	



## OBJECTIVE THREE

### TO STRENGTHEN ANALYTICAL CAPACITY OF OUR ALREADY EXISTING LABORATORIES BY 2015

<b>1.14.1.3 Activity One: Update capacity of labs (existing labs)</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Review of mandates of different laboratories & assigning POPs management responsibilities	NCC/PCU	Meeting hall	Communication cost	
B- Identification & hiring of consultant for gap analysis	1 consultant , 1 counterpart (NCC/PCU)	Meeting Hall		
C- Development of TOR	NCC/PCU	Meeting hall	Done same time with item B.	
D- Reviewing	2 Consultan			

status of labs & identifying equipment gaps	ts			
E- Procurement of quotations & invoices for the different equipment	2 consultants		Communication cost	
F- Purchase of equipment	PCU/NCC			
G- Distribution & commissioning	PCU			
H- Provide training on any new equipment	Supplier & staff of labs concern			

**Objective Three:**

1.15 Activity Two: Capacity (Manpower) development of personnel				
<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
A- Identification of staff to be trained on new equipment	PCU & labs concern		Communication cost	
B-Hands on training of staff in the different labs			Costed under activity one above	

**OBJECTIVE FOUR**

**To identified and develop alternatives to DDT for vector and crop pest control**

ACTIVITY ONE: PESTICIDE EFFICACY STUDIES TO DETERMINE ALTERNATIVES TO DD  
PEST CONTROL

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification, sourcing & procurement of pesticides to be used in study	PCU & Researchers concern		Communication cost	Pesticide materials
B- Identification of collaborators	PCU & Researchers concern			
C- Design & layout of study	Researchers & Call.	Field & lab studies	Field materials	
D Implementation of study	Researchers & Call.		Fuel for trekking & allowances	
E- Submission of progress & final reports	Researchers		Communication & writing cost	

**Objective Four:**

1.18 Activity Four: Developing of DDT rat management with WHO guidelines					
Tasks to be undertaken	Human Resources	Facilities	Facilities	Equipment/Service Equipment/Service s/ Materials	Sp Sp Re Re
<b>A- Design of Various IPM &amp; IVC Control options</b>	Researchers & Call. DOSH & WROU		Farmer field schools	Pesticides & field inputs	Co
<b>B- Formulating a DDT vector control</b>	Researchers & Call. DOSH & WROU	Meeting hall		and writing materials	
<b>B- Design of the different options of programmatic training materials</b>	Researchers & Call. DOSH & WROU		Farmer field Schools	& consultations meetings with relevant stakeholders	Tr & t all
<b>C- Identification &amp; hiring of hall</b>	PCU & Resource Persons	Meeting Hall			
<b>C- Monitoring of programme to keep it inline with WHO &amp; Stockholm</b>	PCU/WHO Resource Persons & task team			Meetings to set up task team; communication cost	Tr Pe for & h for per
Convention guidelines					
<b>D- Progress and monitoring reports</b>	PCU			Communication cost	

**Objective Four:**

TO SENSITISE POLICY MAKERS AND GENERAL PUBLIC ON EFFECTS OF POPs  
ON THE ENVIRONMENT

ACTIVITY ONE: SENSITISATION WORKSHOP				
Tasks to be under taken	Human Resources	Facilities	Equipment/Services/ Materials	
A- Identification & hiring of resource persons	NCC/PCU	Hall		
B- Identification & invitation of participants	PCU/NCC		Communication cost	
C- Identification & hiring of hall	PCU	Hall	Done with item A	
D- Developments of messages	3 Resource persons			
E- Training of participants	3 Resource persons & 25 participants			

**Objective Five:**

1.20 Activity two: Radio and television programmes

<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>
A- Establishment of a task team	NCC/PC U	Hal l	Communi cation cost
B- Conduct radio & TV phone in programmes	Task team	TV & Ra dio	TV & Radio time slots

**Objective Five:**

1.21 Activity Three: Community sensitisation

<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
<b>A- Task team conduct countrywide treks</b>	Task team			
B- Conduct one day meetings at divisional headquarters with divisional authorities	Task team & driver (s)			



1.22 4.2 Gantt Charts on Implementation Strategy Objectives and Activities:

1.23 Objective One:

TO DEVELOP STRATEGIES FOR THE CONTROL OF PREVENTION ENTRY OF POP PESTICIDES IN THE GAMBIA BY 2010

1.24 Activity One: Update and strengthen enforcement of regulations inline with international conventions				
Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	S
A -Identification & Hiring of Consultant for review of existing regulatory & institutional framework		Hall for NCC meeting	Writing material & Advertisement	F
B- Development of the TOR		Done with item A	NEA/NCC	N
C- Review & updating of existing national legislation & institutional framework	1 Consultant 1 Counterpart		Production & multiplication of the document	T
D- Identification & hiring of hall				f
E- Submission of draft report at a				F

validation workshop				
F- Submission of final document to relevant authority for enactment				C te e

**Objective One Continues:**

1.25 Activity Two: Bilateral consultation with enforcement authority in neighbour Senegal

Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials
A-G a m b i a n t e a m v i s i t s S e n e g a l t o		Telephone & fax facilities	

re - e st a bl is h c o nt a ct of S e n e g al o /G a m bi a n P e st ic id e C o m m itt e e				
B- Memorandum of		Communication, telephone & email		

<p>understanding between the two countries revisited and updated</p>				
<p>C- Proposal on Bilateral program of action on cross-border monitoring and surveillance of illegal pesticide trade</p>				
<p><b>D- Proposal submitted to potential donors for funding</b></p>				



**Activity Three: Enhance capacity of enforcement personnel (Training)**

1.26 Tasks to be undertaken	Human Resources	<b>Facilities</b>	<b>Equipment/Service Materials</b>
<b>A- Training needs assessment consultant identified, hired &amp; TOR developed</b>	1 Consultant 1 Counterpart	Hall for NCC meeting	Writing material & Advertisement
B- Assessment of stakeholder training needs	Consultants		Communication, / email
C- Institutions & individuals identified for the different training needs (short and long term)			
<b>D- Potential candidates identified</b>			Done with item C
<b>E- Training of candidates</b>	Institutions/Resource persons		Communication, telephone & email

Objective One

Activity Four: Sensitisation of community elders and opinion leaders about POPs

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification of resource persons		Hall for NCC meeting	Writing material & Advertisement	
B- Development of communication messages			Printing & development	
C- Review & validation of messages		Hall for NCC meeting		
D- Selection of target villages & communities			Done with item A	
E- Countrywide Trekking for message delivery				
F- Radio and TV phone in programmes	Resource Persons		TV & Radio time slots	

**Objective One:**

1.27 Activity Five: Establishment of ten Pesticide monitoring committees at district/ divisional level

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Task team establish at NCC	NCC Meeting	215		
B- Radio & TV programmes to	NCC			

**Objective One:**

OBJECTIVE TWO: TO REVITALIZE AND UPDATE AT LEAST 5 POISON  
RECORD/CONTROL CENTRES



1.28 Activity One: Establishment of poison record and control centres in major health centres

Tasks to be under taken	Human Resources	Facilities	Equipment/Services/ Materials
<p><b>A- To CONTACT INTERNATIONAL COMMUNITY FOR TECHNICAL ASSISTANCE TO ESTABLISH POISON CONTROL CENTRES</b></p>	<p>PCU/NCC</p>		<p>Communication, telephone, e-mail etc</p>
<p>B- Sensitise health authority / personnel on need for such centres C- Identified centres recognised &amp; establish as poison centres</p>	<p>NCC/PCU</p>	<p>Meeting hall</p>	<p>Communication, telephone, e-mail etc</p>
<p>C- Identification of 5 major centres</p>	<p>NCC/PCU/DOSH</p>		<p>Communication</p>
<p>D- Identified centres recognised &amp; established as poison</p>	<p>NCC/PCU/DOSH</p>	<p>217</p>	

**Objective Two:**

**1.28.1.1 Activity Two: Identification and training of personal for the poison control centres**

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>
A- Identify key personnel to man 5 centres	PCU/DOSH		Communications
B- Identification & hiring of resource persons to train these personnel	PCU & DOSH	Hall	
C-Development of pesticide poisoning training manuals	3 Resource Persons		
D- Identification & hiring of training site	PCU & DOSH		
E- Training of key personnel on pesticide poisoning			3 Resource Persons

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**Objective Two:**

<b>1.28.1.2 Activity Three: Procurement and Installation of equipment for the poison control centres</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Procurement of 5 computers and accessories for the centres	PCU		Communication cost 5 computers & peripheries	
B- Installation and commissioning of equipment	PCU/DOSH		Radio & TV times	
C- Bimonthly reporting of cases	DOSH P. Centre staff			
D- Quarterly monitoring of poison control centres	PCU/DOSH		Communication cost	

## OBJECTIVE THREE

### TO STRENGTHEN ANALYTICAL CAPACITY OF OUR ALREADY EXISTING LABORATORIES BY 2015

<b>1.28.1.3 Activity One: Update capacity of labs (existing labs)</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Review of mandates of different laboratories & assigning POPs management responsibilities	NCC/PCU	Meeting hall	Communication cost	
B- Identification & hiring of consultant for gap analysis	1 consultant , 1 counterpart (NCC/PCU)	Meeting Hall		
C- Development of TOR	NCC/PCU	Meeting hall	Done same time with item B.	
D- Reviewing	2 Consultan			

status of labs & identifying equipment gaps	ts			
E- Procurement of quotations & invoices for the different equipment	2 consultants		Communication cost	
F- Purchase of equipment	PCU/NCC			
G- Distribution & commissioning	PCU			
H- Provide training on any new equipment	Supplier & staff of labs concern			

**Objective Three:**

1.29 Activity Two: Capacity (Manpower) development of personnel				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification of staff to be trained on new equipment	PCU & labs concern		Communication cost	
B-Hands on training of staff in the different labs			Costed under activity one above	

**OBJECTIVE FOUR**

**To identified and develop alternatives to DDT for vector and crop pest control**

**ACTIVITY ONE: PESTICIDE EFFICACY STUDIES TO DETERMINE ALTERNATIVES TO DDT CONTROL**

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>
<b>A- Identification, sourcing &amp; procurement of pesticides to be used in study</b>	PCU & Researchers concern		Communication cost
B- Identification of collaborators	PCU & Researchers concern		
C- Design & layout of study	Researchers & Call.	Field & lab studies	Field materials
D- Implementation of study	Researchers & Call.		Fuel for trekking & allowances

E- Submission of progress & final reports	Researchers		Communication & writing cost	



**Objective Four:**

1.30 Activity Two: Development of integrated management strategies				
<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
<b>A- Design of Various IPM &amp; IVC options</b>	Research hers & Call.	Far mer field sc ho ols	Pesticide s & field inputs	
B- Sourcing & procurement of study inputs	Research hers			
C- Testing of the different options	Research hers & Call.	Far mer field Sc ho ols		





1.32 Activity Four: Restricted use of DDT in accordance with WHO guidelines

<b>Tasks to be undertaken</b>	1.33 Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>
A- Consultation with WHO	DOSH & WHO		Commun ication cost
B- Formulating a DDT vector control programme inline with WHO/ POPs convention guidelines	DOSH & WHO	Me eti ng hall	Commun ication cost & consultat ions meetings with relevant stakehol ders
C- Monitoring of programme to keep it inline with WHO & Stockholm Convention guidelines	PCU/WH O task team		Meetings to set up task team; communi cation cost
D- Progress and monitoring reports	PCU		Commun ication cost

**Objective Four:**

**Objective Five**

TO SENSITISE POLICY MAKERS AND GENERAL PUBLIC ON EFFECTS OF POPs  
ON THE ENVIRONMENT

ACTIVITY ONE: SENSITISATION WORKSHOP				
Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	
A- Identification & hiring of resource persons	NCC/PCU	Hall		
B- Identification & invitation of participants	PCU/NCC		Communication cost	
C- Identification & hiring of hall	PCU	Hall	Done with item A	
D-	3 Resource			

Developments of messages	persons			
E- Training of participants	3 Resource persons & 25 participants			

**Objective Five:**

1.34 Activity two: Radio and television programmes				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Establishment of a task team	NCC/PCU	Hall	Communication cost	
B- Conduct radio & TV phone in programmes	Task team	TV & Ra	TV & Radio time	

		dio	slots	

**Objective Five:**

1.35 Activity Three: Community sensitisation				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
<b>A- Task team conduct countrywide treks</b>	Task team			
B- Conduct one day meetings at divisional headquarters with divisional authorities	Task team & driver (s)			





1.36 4.2 Gantt Charts on Implementation Strategy Objectives and Activities:

1.37 Objective One:

TO DEVELOP STRATEGIES FOR THE CONTROL OF PREVENTION ENTRY OF POP PESTICIDES IN THE GAMBIA BY 2010

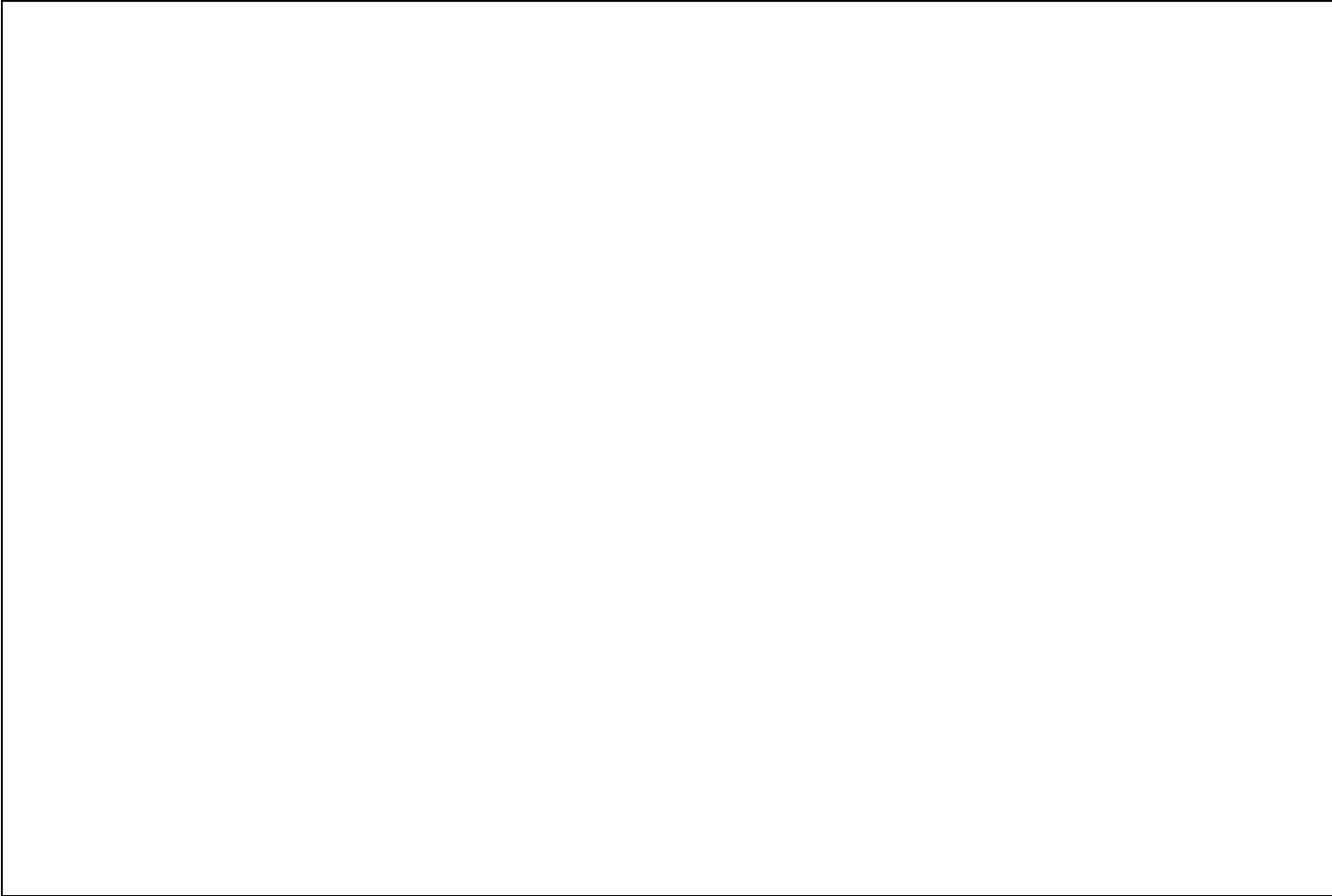
1.38 Activity One: Update and strengthen enforcement of regulations inline with international con

**Tasks to be undertaken**

A -Identification & Hiring of Consultant for review of existing regulatory & institutional framework

B- Development of the TOR

C- Review & updating of existing national legislation & institutional framework



1.39 4.2 Gantt Charts on Implementation Strategy Objectives and Activities

1.40 Objective One:

TO DEVELOP STRATEGIES FOR THE CONTROL OF PREVENTION ENTRY OF POP PESTICIDES

1.41 Activity One: Update and strengthen enforcement of regulations inline with international con

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipm Material</b>
A -Identification & Hiring of Consultant for review of existing regulatory & institutional framework		Hall for NCC meeting	Writing Advertis
B- Development of the TOR		Done with item A	NEA/N
C- Review & updating of existing national legislation & institutional framework	1 Consulta nt 1 Counter part		Produc multipli docume
D- Identification & hiring of hall			
E- Submission of draft report at a validation workshop			
F- Submission of final document to relevant authority for enactment			

**Objective One Continues:**

1.42 Activity Two: Bilateral consultation with enforcement authority in neighbour Senegal

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>E M</b>
A-Gambian team visits Senegal to re-establish contact of Senegalo /Gambian Pesticide Committee		Telephone & fax facilities	
B- Memorandum of understanding between the two countries revisited and updated		Communication, telephone & email	
C- Proposal on Bilateral program of action on cross-border monitoring and surveillance of illegal pesticide trade			
D- Proposal submitted to potential donors for funding			

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Objective One

**Activity Three: Enhance capacity of enforcement personnel (Training)**

1.46 Tasks to be undertaken	Human Resources	<b>Facilities</b>	
A- Training needs assessment consultant identified, hired & TOR developed	1 Consultant 1 Counterpart	Hall for NCC meeting	
B- Assessment of stakeholder training needs	Consultants		
C- Institutions & individuals identified for the different training needs (short and long term)			
D- Potential candidates identified			
E- Training of candidates	Institutions/Resource persons		

1.47 Activity Four: Sensitisation of community elders and opinion leaders about POPs

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/Materials</b>	
A- Identification of resource persons		Hall for NCC meeting	Writing material & Advertisement	
B- Development of communication messages		239	Printing & development	
C- Review & validation of		Hall for NCC		

E- Submission of draft report at a validation workshop

F- Submission of final document to relevant authority for enactment



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**Objective One Continues:**

1.75 Activity Two: Bilateral consultation with enforcement authority in neighbour Senegal

<b>Tasks to be under taken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A-G a m b i a n t e a m v i s i t s S e n e g a l		Telephone & fax facilities		

<p>g al to re - e st a bl is h c o nt a ct of S e n e g al o /G a m bi a n P e st ic id e C o m m itt e</p>				
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e				
B- Memorandum of understanding between the two countries revisited and updated		Communication, telephone & email		
C- Proposal on Bilateral program of action on cross-border monitoring and surveillance of illegal pesticide trade				
D- Proposal submitted to potential				

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1.79 Tasks to be undertaken

1.80 A- 4.2 Gantt Charts on Implementation Strategy Objectives and Activities:

<b>Activity Three: Enhance capacity of enforcement personnel (Training)</b>			
Tasks to be undertaken	Human Resources	Facilities	
A- Training needs assessment consultant identified, hired & TOR developed	1 Consultant 1 Counterpart	Hall for NCC meeting	
B- Assessment of stakeholder training needs	Consultants		
C- Institutions & individuals identified for the different training needs (short and long term)			
D- Potential candidates identified			
E- Training of candidates	Institutions/Resource persons		

1.81 Objective One:

## Objective One

1.112 Activity Four: Sensitisation of community elders and opinion leaders about POPs

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification of resource persons		Hall for NCC meeting	Writing material & Advertisement	
B- Development of communication messages			Printing & development	
C- Review & validation of messages		Hall for NCC meeting		
D- Selection of target villages & communities			Done with item A	
E- Countrywide Trekking for message delivery				
F- Radio and TV phone in programmes	Resource Persons		TV & Radio time slots	

**Objective One:**

1.113 Activity Five: Establishment of ten Pesticide monitoring committees at district/ divisional level

<b>Tasks to be undertaken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Task team establish at NCC	NCC Meeting	248		
B- Radio & TV programmes to	NCC			



**Objective One:**

OBJECTIVE TWO: TO REVITALIZE AND UPDATE AT LEAST 5 POISON  
RECORD/CONTROL CENTRES

1.114 Activity One: Establishment of poison record and control centres in major health centres

Tasks to be under taken	Human Resources	Facilities	Equipment/Services/ Materials
<p><b>A- To CONTACT INTERNATIONAL COMMUNITY FOR TECHNICAL ASSISTANCE TO ESTABLISH POISON CONTROL CENTRES</b></p>	<p>PCU/NCC</p>		<p>Communication, telephone, e-mail etc</p>
<p>B- Sensitise health authority / personnel on need for such centres C- Identified centres recognised &amp; establish as poison centres</p>	<p>NCC/PCU</p>	<p>Meeting hall</p>	<p>Communication, telephone, e-mail etc</p>
<p>C- Identification of 5 major centres</p>	<p>NCC/PCU/DOSH</p>		<p>Communication</p>
<p>D- Identified centres recognised &amp; established as poison</p>	<p>NCC/PCU/DOSH</p>	<p>250</p>	

**Objective Two:**

**1.114.1.1 Activity Two: Identification and training of personal for the poison control centres**

<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>
A- Identify key personnel to man 5 centres	PCU/DOSH		Communications
B- Identification & hiring of resource persons to train these personnel	PCU & DOSH	Hall	
C-Development of pesticide poisoning training manuals	3 Resource Persons		
D- Identification & hiring of training site	PCU & DOSH		
E- Training of key personnel on pesticide poisoning			3 Resource Persons

**Objective Two:**

<b>1.114.1.2 Activity Three: Procurement and Installation of equipment for the poison control centres</b>				
<b>Tasks to be undertaken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Procurement of 5 computers and accessories for the centres	PCU		Communication cost 5 computers & peripheries	
B- Installation and commissioning of equipment	PCU/DOSH		Radio & TV times	
C- Bimonthly reporting of cases	DOSH P. Centre staff			
D- Quarterly monitoring of poison control centres	PCU/DOSH		Communication cost	

## OBJECTIVE THREE

### TO STRENGTHEN ANALYTICAL CAPACITY OF OUR ALREADY EXISTING LABORATORIES BY 2015

<b>1.114.1.3 Activity One: Update capacity of labs (existing labs)</b>				
<b>Tasks to be under taken</b>	<b>Human Resources</b>	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Review of mandates of different laboratories & assigning POPs management responsibilities	NCC/PCU	Meeting hall	Communication cost	
B- Identification & hiring of consultant for gap analysis	1 consultant , 1 counterpart (NCC/PCU)	Meeting Hall		
C- Development of TOR	NCC/PCU	Meeting hall	Done same time with item B.	
D- Reviewing status of labs & identifying equipment gaps	2 Consultants			

E- Procurement of quotations & invoices for the different equipment	2 consultants		Communication cost	
F- Purchase of equipment	PCU/NCC			
G- Distribution & commissioning	PCU			
H- Provide training on any new equipment	Supplier & staff of labs concern			

**Objective Three:**

1.115 Activity Two: Capacity (Manpower) development of personnel

<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>
A- Identification of staff to be trained on new equipment	PCU & labs concern		Commun ication cost
B-Hands on training of staff in the different labs			Costed under activity one above

## OBJECTIVE FOUR

**To identified and develop alternatives to DDT for vector and crop pest control**

ACTIVITY ONE: PESTICIDE EFFICACY STUDIES TO DETERMINE ALTERNATIVES TO DDT CONTROL				
<b>Tasks to be under taken</b>	Human Resources	<b>Facilities</b>	<b>Equipment/Services/ Materials</b>	
A- Identification, sourcing & procurement of pesticides to be used in study	PCU & Researchers concern		Communication cost	
B- Identification of collaborators	PCU & Researchers concern			
C- Design & layout of study	Researchers & Call.	Field & lab studies	Field materials	
D- Implementation of study	Researchers & Call.		Fuel for trekking & allowances	



E- Submission of progress & final reports	Researchers		Communication & writing cost	

**Objective Four:**

1.116 Activity Two: Development of integrated management strategies				
<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
<b>A- Design of Various IPM &amp; IVC options</b>	Research hers & Call.	Far me r fiel d sc ho ols	Pesticide s & field inputs	
B- Sourcing & procurement of study inputs	Research hers			
C- Testing of the different options	Research hers & Call.	Far me r fiel d Sc ho ols		

**Objective Four:**

1.117 Activity Three: IPM training

Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials
A- Identification of participants	PCU & Researchers		Computer facilities and writing materials
B- Development of training materials	3 Resource Persons		Communications
C- Identification & hiring of hall	PCU & Resource Persons	Meeting Hall	
D- Training of participants	Resource Persons & 25 Participants		
	259		

1.118 Activity Four: Restricted use of DDT in accordance with WHO guidelines

<b>Tasks to be undertaken</b>	1.119 Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>
A- Consultation with WHO	DOSH & WHO		Commun ication cost
B- Formulating a DDT vector control programme inline with WHO/ POPs convention guidelines	DOSH & WHO	Me eti ng hall	Commun ication cost & consultat ions meetings with relevant stakehol ders
C- Monitoring of programme to keep it inline with WHO & Stockholm Convention guidelines	PCU/WH O task team		Meetings to set up task team; communi cation cost
D- Progress and monitoring reports	PCU		Commun ication cost

**Objective Four:**

**Objective Five**

TO SENSITISE POLICY MAKERS AND GENERAL PUBLIC ON EFFECTS OF POPs  
ON THE ENVIRONMENT

ACTIVITY ONE: SENSITISATION WORKSHOP				
Tasks to be undertaken	Human Resources	Facilities	Equipment/Services/ Materials	
A- Identification & hiring of resource persons	NCC/PCU	Hall		
B- Identification & invitation of participants	PCU/NCC		Communication cost	
C- Identification & hiring of hall	PCU	Hall	Done with item A	
D- Developments of messages	3 Resource persons			
E- Training of participants	3 Resource persons & 25 participants			

**Objective Five:**

1.120 Activity two: Radio and television programmes				
<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
A- Establishment of a task team	NCC/PC U	Hal l	Commun ication cost	
B- Conduct radio & TV phone in programmes	Task team	TV & Ra dio	TV & Radio time slots	


**Objective Five:**

1.121 Activity Three: Community sensitisation

<b>Tasks to be undertaken</b>	Human Resources	<b>Fa cili tie s</b>	<b>Equipm ent/Serv ices/ Material s</b>	
<b>A- Task team conduct countrywide treks</b>	Task team			
B- Conduct one day meetings at divisional headquarters with divisional authorities	Task team & driver (s)			



*Table1: Cost in Dollars and time-scale for implementing strategies of objective 1*

	<i>Description of activity</i>	
	<b>Establishment of a POPs section at NEA</b>	
	<b>Purchase of 3 double cabin pickup</b>	
	<b>Purchase of 2 computers with processor &gt;= pentium4; internet and LAN compatible Windows XP &amp; DOS, OS. Two printers LaserJet.</b>	
	<b>Installation of computers &amp; purchase of software for database</b>	
	<b>Training of 2 NEA laboratory personnel for chemical formulation and chemical residue test for DDT, PCBs, HCBs, Dioxins and Furans in solid, liquid, gas, air and vapour.</b>	
	<b>Purchase of one HPLC and GC with accessories and construction of new laboratory building<sup>1</sup>.</b>	
	<b>Purchase of reagents</b>	
	<b>Training of POPs section staff</b>	
	<b>Development of codes for different chemical list types at NEA POPs section, and training on coding. Alternative we may have:</b>	

	<b>Training of relevant custom staff to identify and code chemical products</b>	
	<b>Training of hospital and health centre staff on how to record abnormalities from chemicals</b>	
	<b>Internet user cost for 5 years for 10 accounts</b>	
	<b>Purchase of waste disposal motor vehicles and/or high temperature incinerators and heavy duty weighing scale for waste in 8 local government areas (LGA).</b>	

1:

Purchase of one HPLC and GC with accessories and construction of new laboratory building. This corresponds to expenditure item no 1.6. The present NEA laboratory is not well equipped to perform chemical formulation and chemical residue tests for PCBs, HCBs, Dioxins and Furans. These tests are possible only with upgrading of the current GC with necessary accessories. Tests for dioxins and furans require separate laboratory and new accessories. Hence the estimated actual cost of expenditure item 1.6 is US\$300,000. This exclude the cost of inputs for carrying out the tests in the Gambia. The estimated cost of sending 500 samples of dioxins (100 each year) to foreign laboratories is US\$550,000. Hence, the opportunity cost of expenditure item no.1.6 is this amount US\$550,000.

***Objective 2: To strengthen the capacities of institutions which are component parts of the POPs information systems in order to facilitate a quick and timely exchange of useful POPs related information among units of the system so that each can achieve its desired goals in relation to POPs.***

## **Strategies**

Training of staff of institutions, which are directly involved in providing POPs related data or the management of chemicals.

Provision of equipment and tools.

Provision of raw materials, such as reagents and reference standards for POPs chemicals.

Provision of special e-mail account in each institution which is part of the information system. The account should be used exclusively by the unit providing required information for the NEA POPs section.

Strengthen and enhance or create new POPs related database of departments which are parts of POPs information system.

**Objectives 3:** To prepare an exhaustive sampling or population frame of POPs media which will be used for the purpose of sampling and as a base for estimating population parameters in all follow-up surveys relating to POPs and their alternatives.

In fact the need for the content of objective 3 is implied in a paragraph of Article 10, of the POPs convention, which reads:

'and that each party shall give sympathetic consideration to developing mechanisms, such as pollutant release and transfer registers, for the collection and dissemination of information on estimates of the annual quantities of the intentional and unintentional POPs.'

**Strategies:**

A nation-wide enumeration or listing of all the following POPs media:

A nation-wide listing of establishments, institutions and enterprises that deal in chemicals in one or more of the following ways: direct use, direct contact, distribute, control, advisory and legal. Listing will be done at EA level. Both

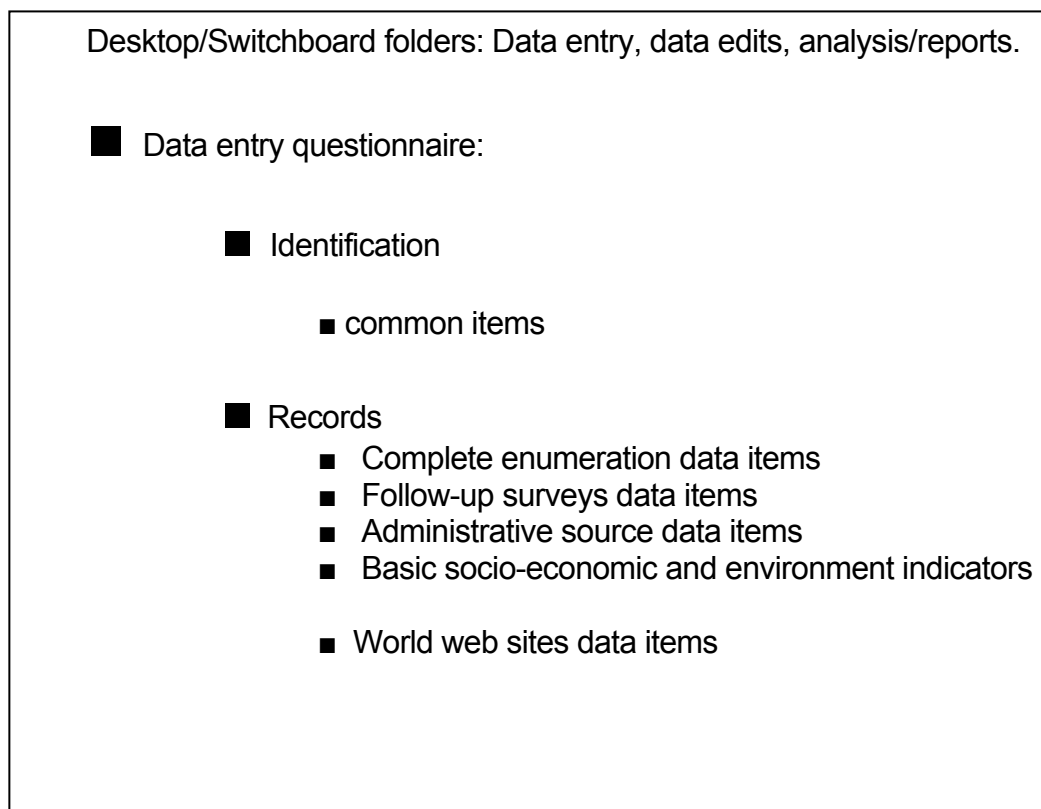
formal and informal establishment will be covered; and

A nation-wide listing of hospitals, health centres, chemical stores, dump sites (authorised and unauthorised), incinerators, etc.

To create a database for the institutions dealing in chemicals, and contaminated environmental sites. The database shall exist in a recommended software and will be used for sampling units in any relevant POPs follow-up survey, estimating population parameters, computing sampling fraction and entering survey data for samples selected from the database. The database may be updated every 3 years.

Integrate horizontally the database with a census household data set to be obtained from the census at EA level. An alternative to this is the computation and imputation of appropriate inflation factors on the database for the purpose of estimation.

**Fig 1: Structure of POPs Database at NEA.**



The common items should be available in all the records defined.

**7.6**

**Data gaps leading to objective 3:**

Data collection efforts of the second phase have revealed that an exhaustive register of establishments formal and informal, that deal in chemicals is absent.

## 7.7 Minimum required variable for the census

The census should collect the following minimum information for each organisation: Name of organization; Address (Local government area, District, Enumeration Area, street name, compound number/name of compound, stall number/shop number, telephone number, etc); level and nature of involvement in dealing with chemicals, such as direct use, direct contact, distribution, advisory, regulatory, etc; type of activity; type of output; name of chemical; classification of chemicals according to lists of banned or approve chemicals of UNEP, SCC, The Gambia's list of banned chemicals, etc; use of chemicals, number of workers occupationally exposed by gender; quantity of chemicals handled; use type, etc.

Objective 3 implies that we can trace each institution dealing in POPs to a given EA. Other population or sampling frames that are discussed in details in subsequent chapters are population frames for LUMOS, that is weekly markets, population frame for hospitals and major health centres, waste dump sites, incinerators, etc.

Activity/expenditure item		1.121.1.1.1.1
	<i>Description of activity</i>	
	<b>Consultancy to design appropriate multi-sectoral questionnaire for the POPs Info. System and, create appropriate database at the NEA POPs section following the recommended structure of database. The database shall include variables for the sampling or population frame of all institutions and units that manage, store or release POPs (intentional as well as unintentional) and hazardous chemicals. To integrate the main database with the database for the follow-up surveys. Assist selected institutions to build their database. Produce reports using the database.</b>	<b>15000</b>

	<b>Strengthen the existing database at NEA's inspectorate/build new database at this unit and training of staff on database management.</b>	<b>28000</b>
	<b>Strengthen or build a new database at CSD, NAWEC, NEA laboratory, Malaria Control Programme, Pest Management Unit, Department of Agricultural Services, Public Health Unit(DMHS), Environment Unit(DMHS), Epidemiology &amp; Statistics unit (DMHS) and NARI. Exactly (10 institutions excluding the POPs section.</b>	<b>10300</b>
	<b>Installation of computers &amp; special e-mail accounts for the (POPs Info. Sys.). Distribution of computers to beneficiary institutions {CSD, 1 trade, 1 transport}; {NAWEC 1}; {NEA laboratory, 1} {Malaria Control Programme 1}; {Pest Management Unit 1}; {Department of Agricultural Services 1}; {Public Health Unit(DMHS) 1}; {Environment Unit(DMHS) 1}; {Epidemiology unit DOSH 1} and {NARI 1}. Exactly (11 computers, each with at least pentium4 processor and internet compatibility, having Windows XP and DOS, OS). 11 LaserJet printers.</b>	<b>55000</b>
	<b>Training of relevant staff of relevant institutions on managing the POPs Info. Sys.</b>	<b>10000</b>
	<b>Conduct of complete enumeration of POPs media throughout the country: Cost item: Consultant, temporary supervisors, temporary enumerators, fuel cost, stationery, EA maps, training, temporary coders and verifiers, temporary data entry clerks, other logistics,</b>	<b>370000</b>
	<b>Purchase of laboratory reagents and reference standard chemicals, refrigerator for storage.</b>	<b>10000</b>
	<b>First round of follow-up surveys for chemical formulation and residue analysis of selected samples and survey of health facilities. Produce reports using database.</b>	<b>100000</b>
	<b>Tables and analysis for YEAR2 report on POPs and</b>	<b>2000</b>
	<b>Purchase of test kits, other accessories and more computers for NAWEC</b>	<b>19400</b>

	<b>More computers for epidemiology unit to facilitate their work.</b>	<b>14700</b>
	<b>Design and development of NEAWebsite and accompanying supports</b>	<b>30000</b>
		<b>664400</b>

### 7.8 Potential output of objective 3

The production of these tables depends on the type of variables that will be successfully collected. They only represent a guideline as to the type of tables that would be useful for taken decisions on the management of POPs and their alternatives.

- Table x1: Institutions dealing in chemicals by level of involvement.
- Table x2: Institutions dealing in chemicals by number and gender of those occupationally exposed.
- Table x3: Institutions dealing in chemicals by precautionary methods.
- Table x4: Institutions dealing in chemicals by product.
- Table x5: Institutions dealing in chemicals by local list type – banned and approved.
- Table x6: Institutions dealing in chemicals by regional list type – banned and approved.
- Table x7: Institutions dealing in chemicals by international list type – banned and approved.
- Table x8: A directory of importers and exporters of chemicals.
- Table x9: A directory of establishment using and/or manufacturing chemicals.
- Table x10: A directory of hospital and primary health centres with inpatients during listing.
- Table x11: A directory of weekly LUMO markets.
- Table x12: A directory of waste dump sites approved and unapproved.
- Table x13: Institution by number of workers occupationally exposed by POPs types.
- Table x13b: A directory of all local chemical stores in the country.

## 8 EXPECTED POPs RELATED INFORMATION FROM OTHER DATABASE

### 8.1 Agric Pest Management Unit

- Table x14: Chemicals distributed by the Agric Pest Management Unit by Quantity and trade names.
- Table x15: Chemicals distributed by the Agric Pest Management Unit by quantity of active ingredient.
- Table x16: Chemicals distributed by the Agric Pest Management Unit by quantity and cost.
- Table x17: Chemicals distributed by the Agric Pest Management Unit by intended specific uses.
- Table x18: Chemicals distributed by the Agric Pest Management Unit by type of precautionary measures.
- Table x19: Chemicals distributed by the Agric Pest Management Unit by available, safer and cheaper substitutes.

### 8.2 NAWEC Database

- Table x20: Quantity of NAWEC transformers by settlement and district.
- Table x21: Litres of PCBs in transformers by settlement and district.
- Table x22: Quantity of transformers and Litres of PCBs abandoned by settlement and district.
- Table x23: Quantity of transformers and Litres of PCBs imported by NAWEC.
- Table x24: Quantity of PCB-free transformers or substitutes of PCB transformers imported by NAWEC.

The above tables may be suitable for capacitors too.

### 8.3 Malaria Control Programme

- Table x25: Type and quantity/volume of insecticides distributed by the



programme.

- Table x26: Type and quantity/volume of insecticides by active ingredient.
- Table x27: Number of bed nets distributed by the programme by division.
- Table x28: Percentage of bed nets dipped by type of pesticide, and division
- Table x29: Other insecticide-treated materials distributed by type of insecticide and division.

#### **8.4 Public Health Unit (DMHS)**

- Table x30: Weight/volume of waste disposed by the unit by disposal method and division.
- Table x31: Type and quantity/volume of insecticides distributed by the unit.
- Table x32: Type and quantity/volume of insecticides by active ingredient.
- Table x32b: Type and quantity of insecticides not distributed or used.

#### **8.5 NEA Laboratory**

- Table x33: Proportion of solid samples containing POPs, by POP type, by division and unit of measure for POP.
- Table x34: Proportion of liquid samples containing POPs, by POP type, by division and unit of measure for POP.
- Table x35: Proportion of air samples containing POPs, by POP type, by division and unit of measure for POP
- Table x36: Estimates of pesticides containing POPs by POP type, by product type.
- Table x37: Proportion of solid, liquid and air samples containing residue of POPs, by POP type and mean quantity of POP in a given unit of measure.
- Table x38: Estimates of product containing POP residue by product type.

#### **8.6 NARI**

- Table x39: Alternative to POPs tested and recommended by type and uses.

- Table x40: Cost of alternatives to POPs recommended.
- Table x41: Active ingredients in alternatives to POPs recommended.
- Table x42: Safety methods of application of alternatives.

## **8.7 NEA INSPECTORATE**

- Table x43: Time series on volume/weight of imported solid pesticides by trade names.
- Table x44: Time series on volume/weight of imported solid pesticides by mean percent of active ingredients.
- Table x45: Time series on volume/weight of imported liquid pesticides by trade names.
- Table x46: Time series on volume/weight of imported liquid pesticides by mean percent of active ingredients.

## 8.8 FOLLOW-UP SURVEYS

A given round of a follow-up survey shall consist of the following:

- Chemical formulation analysis of selected or randomly selected chemicals legally imported, chemicals illegally traded in selected weekly markets, solid waste in selected sites, liquid waste in selected sites, sample of air from burning waste, chemicals used in small and large scale manufacturing activities, etc. Samples have to be tested to identify DDT, PCBs, HCBs, Dioxins and Furans in the chemical formulation of the samples.
- Chemical residue analysis of selected imported food items, imported chicken feed, selected locally produce food, samples of water, soil and air at selected sites; samples of breast milk, samples of blood of exposed population. Samples have to be tested to determine the level of concentration of DDT, PCBs, HCBs, Dioxins and Furans in the samples.
- Survey of hospitals and health centres.

Some of the potential output of the follow-up surveys is:

Table x47: Proportion of DDT in selected imported and locally produced food items.

Table x48: Proportion of Dioxins in selected imported and locally produced food items.

Table x49: Proportion of Furans in selected imported and locally produced food items.

Table x50: Proportion of PCB in selected imported items.

Table x51: National estimates of the quantity of DDT, Dioxins, Furans, PCBs and HCBs by selected items.

Table x52: Mean concentration of DDT in selected imported and locally produced food.

Table x53: Mean concentration of DDT, Furans, and Dioxins in selected imported and locally produced food.

Table x54: Mean concentration of DDT, Furans, Dioxins in selected sample of blood, breast milk.

Table x55: Mean concentration of DDT, Furans, Dioxins in selected sample of air, soil, waste sites, etc.

Table x56: Outpatients by disorder type.

## 9 AWARENESS CREATION

**OBJECTIVE 4: TO RAISE THE LEVEL OF AWARENESS OF POLICY MAKERS, DECISION TAKERS, IMPLEMENTING AGENTS, IMPORTERS, EXPORTERS, USERS (INCLUDING FARMERS) AND MANUFACTURERS, ETC, CONCERNING THE SOUND MANAGEMENT OF POPS AND THEIR ALTERNATIVES SO AS TO REDUCE OR ELIMINATE THE RISKS OF DISEASE, DEATH AND ACCIDENT FROM THE USE OF CHEMICALS.**

### *STRATEGIES*

In collaboration with the programme officer of the Technical Services Network of the NEA and the POPs focal point, the Environmental Education and Communications program of the NEA will be responsible for implementing the Strategy for Raising Awareness on the management of POPs and their alternatives.

***DEVELOP A COMPREHENSIVE STRATEGY FOR A SOUND MANAGEMENT OF POPS AND THEIR ALTERNATIVES FOR ALL CATEGORIES OF MANAGERS, USERS AND APPLICATORS. EXISTING AWARENESS RAISING ACTIVITIES OF STAKEHOLDERS SHOULD BE REVIEWED AND STREAMLINED***

To suit activities designed to phase out and control all forms of POPs.

In implementing the Strategy the EE&C programme shall develop links between the with institutional channels of communication, e.g., Agricultural Communication Unit of DOSA to sensitize farmers on management of POPs, their alternatives and other hazardous chemicals; radio stations and TV station; non-formal education and other channels of communication.

***THE STRATEGY SHOULD BE SO DESIGNED SO THAT ONE CAN USE IT TO DRAFT QUESTIONS TO EVALUATE THE LEVEL OF AWARENESS OF DIFFERENT CATEGORIES OF MANAGERS, USERS AND APPLICATORS.***

***THE STRATEGY SHOULD TAKE INTO ACCOUNT RESULTS OF THE LISTING OF POPs MEDIA, THE FIRST ROUND OF FOLLOW-UP SURVEYS AND THE UPDATED POPs SECTION DATABASE.***

***TO INCREASE THE LEVEL OF AWARENESS OF POLICY MAKERS AND DECISION TAKERS AND IMPLEMENTING AGENTS SO THAT AT LEAST 50 PERCENT OF THEM CAN SCORE OVER 70 PERCENT ON CAREFULLY SELECTED STANDARD QUESTIONS RELATING TO TYPE OF, EFFECTS OF, SAFE USE OF, SOURCES OF, PURPOSES OF AND ALTERNATIVES TO INTENTIONAL AND UNINTENTIONAL POPs AND THEIR ALTERNATIVES.***

***TO RAISE THE LEVEL OF AWARENESS OF IMPORTERS, EXPORTERS, USERS INCLUDING FARMERS AND MANUFACTURERS SO THAT AT LEAST 50 PERCENT OF THEM CAN SCORE OVER 50 PERCENT ON SELECTED STANDARD QUESTIONS RELATING TO TYPE OF, EFFECTS OF, SAFE USE OF, SOURCES OF, PURPOSES OF AND ALTERNATIVES TO INTENTIONAL AND UNINTENTIONAL POPs AND ITS ALTERNATIVES.***

The strategy shall exploit to the fullest extent the following channels of communication:

- Electronic media (Radio, Television, video tape);
- Print media (newspapers, newsletter, manuals, brochures, leaflets, magazines, posters, books, documentary);
- Workshops, seminars, meetings, training, symposia, phone in programs/panel discussion;
- Competitions: essay, quiz, sports, award scheme, drawings;
- Focus group meetings;
  - Extension services, schools, study visits; and
- Traditional media (songs, local communicators, popular theatre, drama, religious leaders, politicians, opinion leaders, etc);

The POPs section of the NEA will be responsible for soliciting the required information in accordance with the approved formats. The various consultants from the media houses working with the EE&C shall use the reports of the POPs section guided by the Strategy to disseminate information for awareness creation through their respective mass media.

The POPs section of the NEA shall solicit information from the following administrative and sample survey data sources: Custom offices, NANA, NARI, Municipal/area councils, NEA Program areas, Laboratories, Water Resources, NAWEC, DOSA, DHTs, Extension workers, NGOs, Other actors, Malaria unit, Planning & Environment unit of DOSH, CSD, Households (in EAs), farm, informal trades, farmers, Institutions, Markets (LUMOS), Schools, Manufacturers/importers, Community leaders, Women/youth groups, and the General public at large

Table 3: Cost in Dollars and time-scale for implementing strategies of objective 3 and 4

Activity/expenditure item		YEAR2
	<i>Description of activity</i>	<b>2</b>
	<b>Develop appropriate Strategy of Awareness raising on the management POPs and its alternatives. A consultant will be hired for this and he or she shall make use of the results of Listing of POPs media exercise, the first round of follow-up surveys and the updated database of the POPs section, i.e. A complete set of reports from the complete database. These activities should take place during the last quarter of YEAR2.</b>	<b>14,000</b>
	<b>Awareness creation according to recommendation in the Strategy of Awareness raising. Dissemination of information through the channel of communications. First quarter of YEAR3.</b>	<b>200000</b>
	<b>Baseline survey on level of awareness and participation in managing POPs and its alternatives. YEAR3</b>	<b>12,000</b>

	<b>Training of relevant staff of relevant institutions on managing the POPs Info. Sys. YEAR3</b>	<b>10,000</b>
	<b>Purchase of laboratory reagents and reference standard chemicals. YEAR3</b>	<b>5000</b>
	<b>Second round of follow-up surveys for chemical formulation and residue analysis of selected samples and survey of health facilities. YEAR3</b>	<b>150000</b>
	<b>Tables and analysis for YEAR3 report on POPs and its alternatives</b>	<b>700</b>
		<b>355738</b>

## 9.1 Baseline Survey on Level of Awareness

By the third year of the implementation of the NIP, many capacities would have been built, a lot of training would also have taken place, and sensitization would have just begun. At this stage of the NIP, it is useful to have a benchmark data of the current state of affairs with regard to awareness levels in POPs management. The benchmark will help measure future impacts of the implementation process, in particular, the extent to which targets have been met.

A consultant working closely with officials of the Inter-Sectoral Network Services, particularly, EE&C officials shall design and implement the baseline survey.

The sponsor of the project should ensure that appropriate sampling techniques are used to determine sample size, select sample and compute estimates. The largest among the target groups of the baseline survey, households, should have a sample size of at least 2000 households.

The variables of the survey, while attempting to include all aspects of the management of POPs and its alternatives (including IPM and IVM), should strictly incorporate standard questions and issues addressed by the Strategy on POPs Awareness.

In classifying selected variables it is useful to consider pressure/stress, state and impact indicators. This classification will ensure that the baseline report contributes

its own quota to the State of the Environment report.

<i>Table 4: Cost in Dollars and time-scale for implementing strategies of objective 3 and 4</i>	
<b>Activity/expenditure item</b>	<b>YEAR4</b>
<i>Description of activity</i>	<b>4</b>
<b>Awareness creation according to recommendation in the Strategy of Awareness raising. Dissemination of information through the channel of communications.</b> <b>Sensitization of different categories of stakeholders through the channels of communication</b>	<b>200000</b>
<b>Training of relevant staff of relevant institutions on managing the POPs Info. Sys. YEAR4</b>	<b>10,000</b>
<b>Purchase of laboratory reagents. YEAR4</b>	<b>2500</b>
<b>Third round of follow-up surveys for chemical formulation and residue analysis of selected samples and survey of health facilities. YEAR4</b>	<b>160000</b>
<b>Tables and analysis for YEAR4 report on POPs and its alternatives</b>	<b>1000</b>
	<b>363514</b>

Table 5: Cost in Dollars and time-scale for implementing strategies of objective 3 and 4

Activity/expenditure item		Y E A R 5
	<i>Description of activity</i>	<b>5</b>
	<b>Awareness creation according to recommendation in the Strategy of Awareness raising. Dissemination of information through the channel of communications. Sensitization of different categories of stakeholders through the channels of communication</b>	<b>150000</b>
	<b>Training of relevant staff of relevant institutions on managing the POPs Info. Sys. YEAR5</b>	<b>10,000</b>
	<b>Purchase of laboratory reagents and reference standards. YEAR5</b>	<b>2500</b>
	<b>Third round of follow-up surveys for chemical formulation and residue analysis of selected samples and survey of health facilities. YEAR5</b>	<b>160000</b>
	<b>Tables and analysis for YEAR5 report on POPs and its alternatives</b>	<b>700</b>
		<b>313215</b>

Table 6: Cost in Dollars and time-scale for implementing strategies of objective 3 and 4

Activity/expenditure item	YEAR6
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	<i>Description of activity</i>	
	<b>Sensitization of different categories of stakeholders through the channels of communication</b>	<b>100000</b>
	<b>Training of relevant staff of relevant institutions on managing the POPs Info. Sys. YEAR6</b>	<b>10,000</b>
	<b>Purchase of laboratory reagents, reference standards and refrigerators. YEAR6</b>	<b>10000</b>
	<b>Third round of follow-up surveys for chemical formulation and residue analysis of selected samples and survey of health facilities. YEAR6</b>	<b>200000</b>
	<b>Tables and analysis for YEAR6 report on POPs and its alternatives</b>	<b>1000</b>
	<b>Impact assessment of the activities of Awareness raising in the management of POPs and its alternatives. YEAR6-YEAR7.</b>	<b>17000</b>
		<b>328010</b>

**ANNEX- ACTION PLAN TABLE ON PCBs**

<b>Objective</b>	<b>Output</b>	<b>Activities</b>	
Provision of adequate storage facility for PCB oil and PCB contaminated equipment	Storage facility with 4 modified shipping containers for PCB oil and PCB contaminated equipment and materials.	<ul style="list-style-type: none"> <li>i. Identification of proper storage facility site location.</li> <li>ii. Acquiring and modifying suitable Shipping containers for PCB storage purposes</li> <li>iii. Prepare storage facility to required</li> </ul>	<ul style="list-style-type: none"> <li>i. Estab stand facilit</li> <li>ii. PCB per q is an level</li> <li>iii. Meth</li> </ul>

		standards for PCB Storage  iv. Transport all de-commissioned PCB equipment and PCB contaminated materials storage to site.	hand porti and tami men of th
De-contamination and reduce risk of all identified contaminated sites	Identify and make safe all PCB contaminated sites	i. Sampling & testing of all sites suspected to be contaminated  ii. Identify & seal contaminated site Location  iii. De-contaminated by scooping or asking for external assistance  iv. Collect and store all PCB contaminated solids, debris, spill clean-up of soil and material.	i. Testin tamin PCB

To put in place an adequate legislation and institutional framework that binds all PCB users in the Gambia; esp. NAWEC the main user and the public at large.	A strategy for the control waste and PCB contaminated materials	i. Enactment of legislations that deal with chemicals management holistically  ii. Broaden the HCPCMA to address issues of Concern for the both Rotterdam and Stockholm conventions.  iii. Create standards & norm for PCB handling and storages.	i. Attitud chang handl by us
Create PCB awareness for all stake holders, and users and the public	I. Stakeholder Awareness of PCB hazards, existing legislations, standards, and norms pertaining	I. Training workshops for stake holders on PCB effects on health and the environments	i. Enact regula and n risk re

	to PCBs		
	ii. Awareness creation among PCB users to reduce occupational risks	ii. Training of people whose occupation expose them to PCB hazards	ii. Attitudinal changes at occupational level
	iii. Public awareness creation of hazards of PCB esp. in the Open System	iii. Information dissemination to the public via news media, drama, symposia w/shops, etc., on PCB	iii. Attitudinal changes in the general public

### SUMMARY OF TABLES ON COSTING

DESCRIPTION	TOTAL
1. Strategies for the control and prevention of entry of POP Pesticides in the Gambia by 2010	82,850
2. To revitalize and update the Poison record/Control Centres	13,950
3. to strengthen analytical capacity of Existing laboratories by 2010	301,300
4. Identify and develop alternatives to DDT for vectors and crop pest control	34,300
5. To sensitize policy makers and general public on effects of POPs on the Environment	7,350
6. Implementation strategy objectives and activities * To development strategies for the control of POP pesticides in the Gambia by 2010	3,900
7. Bilateral consultation with enforcement authority in neighbor Senegal	3,800
8. Enhance capacity of enforcement personnel (training)	61,000
9. Sensitization of community elders and opinion leaders about POPs	7,500
10. Establishment of ten pesticide monitoring committee at district/divisional levels	7,000
11. To revitalize and update at least 5 poison record/control centres	1,350
12. Identification and training of personal for the poison control centres	3,050
13. Procurement and installation of equipment for the poison control centres	9,550
14. Update capacity of labs (existing labs)	301,650
15. Restricted use of DDT in accordance with WHO guidelines	3,700
16. To sensitize policy makers and general public on effects of POPs on the environment. * Sensitization workshop	3,350
17. Radio and television programmes	2,800
18. Community sensitization	1,200
19. To develop strategies for the control and prevention entry of POPs pesticides in the Gambia by 2010 * Update and strengthen enforcement of regulations inline with international conventions	3,550
<b>Grand total</b>	<b>USD853</b>

