

Minamata Initial Assessment Report
National Environment Agency
Republic of The Gambia
November, 2017

Table of Contents

Foreword by Government Official	2
Executive Summary	2
Introduction	15
Chapter I: National Background Information	17
Chapter II: Mercury Inventory and Identification of Emissions and Releases	21
Chapter III: Policy, Regulatory and Institutional Framework Assessment	51
Chapter IV: Identification of Populations at Risks and Gender Dimensions	77
Chapter V: Awareness/Understanding of Workers and the Public; and Existing Training and Education Opportunities of Target Groups and Professionals	79
ANNEX I: Stakeholder Engagement process	1
ANNEX II: UNEP TOOLKIT Calculation Spreadsheet	3
Useful Resources	3

Foreword by Government Official

During the past few decades, the Government of the Gambia has significantly strengthened its effort to protect the environment from the harmful interventions of humans. Many lessons have been learned and systems are in the process of being strengthened, to ensure impact to the environment is reduced.

The Hazardous Chemicals and Pesticides Management Control Act (HCPMCA), administered by the National Environment Agency and enacted in 1994, is the national legal framework for addressing the control and management of chemicals

in the Gambia. This regulatory framework replaced the 1983 Pesticides Management Act and made provisions for the establishment of a Hazardous Chemicals and Pesticide Management Board (HCPMB), a regulatory body responsible for the registration, licensing, and management of all hazardous chemicals and pesticides. It also makes provisions for enforcement.

The Gambia is not a significant user of chemicals in general and mercury in particular. This, by no means, should implicate that the Country is not taking efforts to reduce the impact of chemicals. The Gambia is part of the major chemical conventions, Basel, Rotterdam, Stockholm and Bamako Conventions. The Government of The Gambia is among the first fifty countries to ratify the Minamata Convention on mercury. The Government of the Gambia in November 7th, 2016 ratified the Convention. Prior to being a party to the Minamata Convention, The Government of The Gambia has made tremendous efforts to protect human health and the environment from the risk of chemicals through the existing Chemical Legislations. As such the Government of The Gambia has made tremendous efforts to implement the conventions in order to meet the national obligations stipulated in the respective conventions.

The Gambia has undertaken the Mercury Initial Assessment to foresee the extent of mercury problem in the Country, to assess the compatibility of national legislative frameworks to implement the obligations under the Minamata Convention. The Government is continuing its efforts to address issues related to mercury by creating awareness to the community across the country. All efforts will be made to reach out communities at the grassroots level. This assessment will guide policy makers and technical experts in taking further actions to reduce the release of mercury to the environment.

Executive Summary

The Republic of The Gambia signed the Minamata Convention on Mercury on October 10, 2013 and in November 2016, the Convention was ratified. As a first step in preparing the country for meeting future obligations under the Minamata Convention and take early action towards reducing releases of Mercury and safeguarding its population and environment, the government of The Gambia through the National Environment Agency (NEA) indicated interest in the conduct of a detailed inventory of Mercury releases in the country.

Due to the anticipated challenges in obtaining accurate data, the Level 1 inventory was conducted, to be further developed with a Level 2 inventory. The inventory of Level 1 was conducted by forming task teams with team members drawn from different government and non-government institutions, including the industry and tertiary training institutes. Each task team was working on a particular source categories according to the Toolkit reference report and spreadsheet. The inventory was undertaken during the first quarter of 2017 and the objective was to identify the main sources of Mercury releases in the country. The results of the level 1 inventory are presented in this report, and the results shall be useful in the subsequent development and adoption of a National Action Plan for Mercury management in The Gambia.

This mercury release inventory was conducted by making use of the UNEP (April 2015) "*Toolkit for Identification and Quantification of Mercury Releases- Level 1*" version 1.3. Where available, 2014 input data was used, however when such data was not available the most recently available data was used instead.

In this inventory, default input factors were used for the estimation of mercury releases from general waste treatment. The default factors were based on literature data of mercury contents in waste and wastewater, and these data were only available from developed countries. The calculations made indicate that the default input factors for general waste may over-estimate the mercury releases from these sources (see the section on waste data in this report). This may be of priority in follow-up work, as feasible.

Detailed presentation of mercury inputs and releases for all mercury release source types present in the country are shown in the following report sections.

1. Summary of Results of the Mercury Inventory

The main conclusions of the inventory are that in the Republic of The Gambia, the following source groups contribute the most Mercury in terms of inputs:

Use and disposal of other products (2081.4 kg Hg/y)
Waste incineration and open waste burning (959.7 kg Hg/y)
Informal dumping of general waste (638.7 kg Hg/y)

In terms of percentage of total releases in the country, the inventory indicates that ***the use and disposal of other products (65%)*** contributes to the highest Mercury release.

An aggregated presentation of the results for main groups of mercury release sources is presented in Figures 1-1 to 1-7 and Table 1-1:

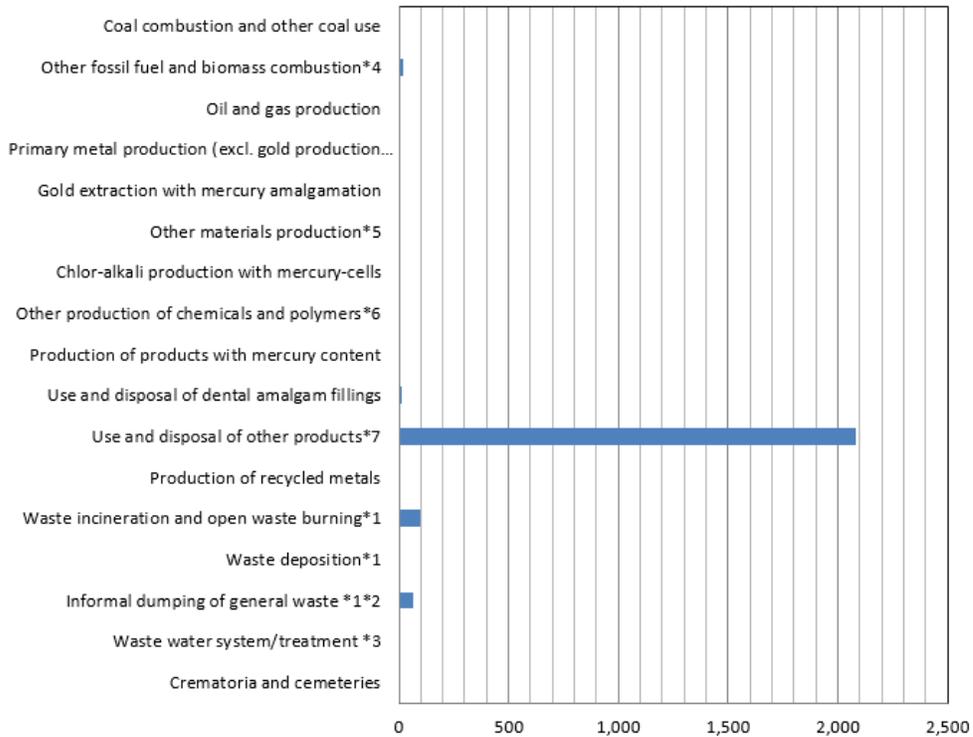


Figure 1-1: Estimated mercury inputs (Kg of Mercury per year)

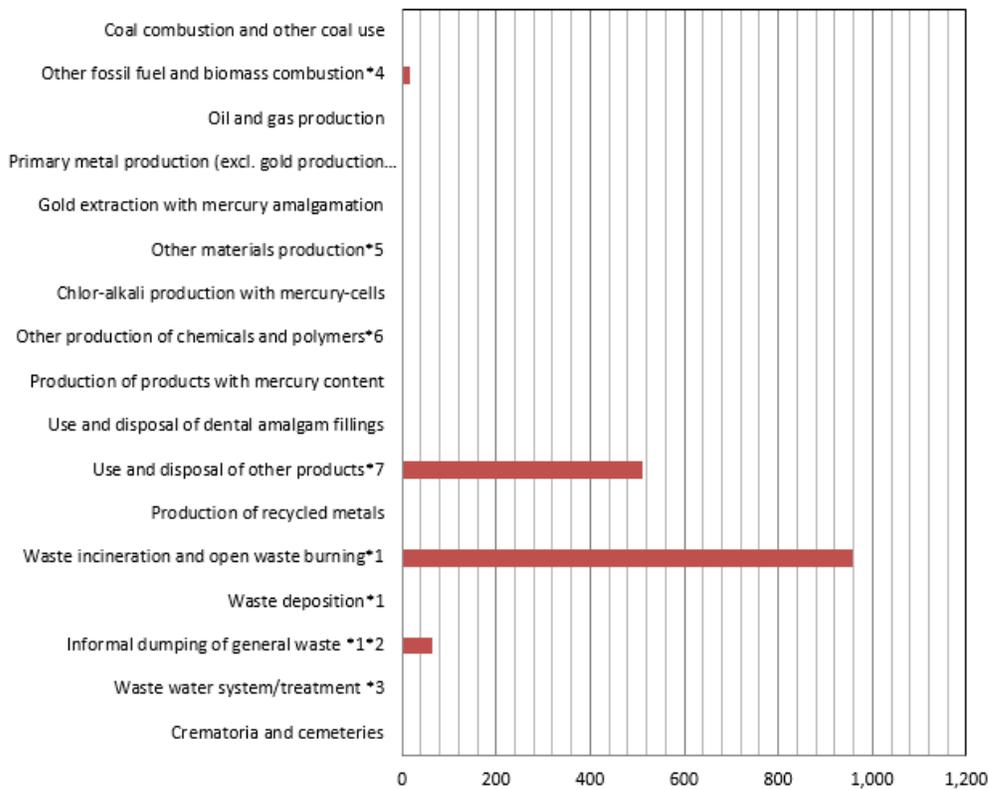


Figure 1-2: Estimated mercury releases to air (Kg Hg/y)

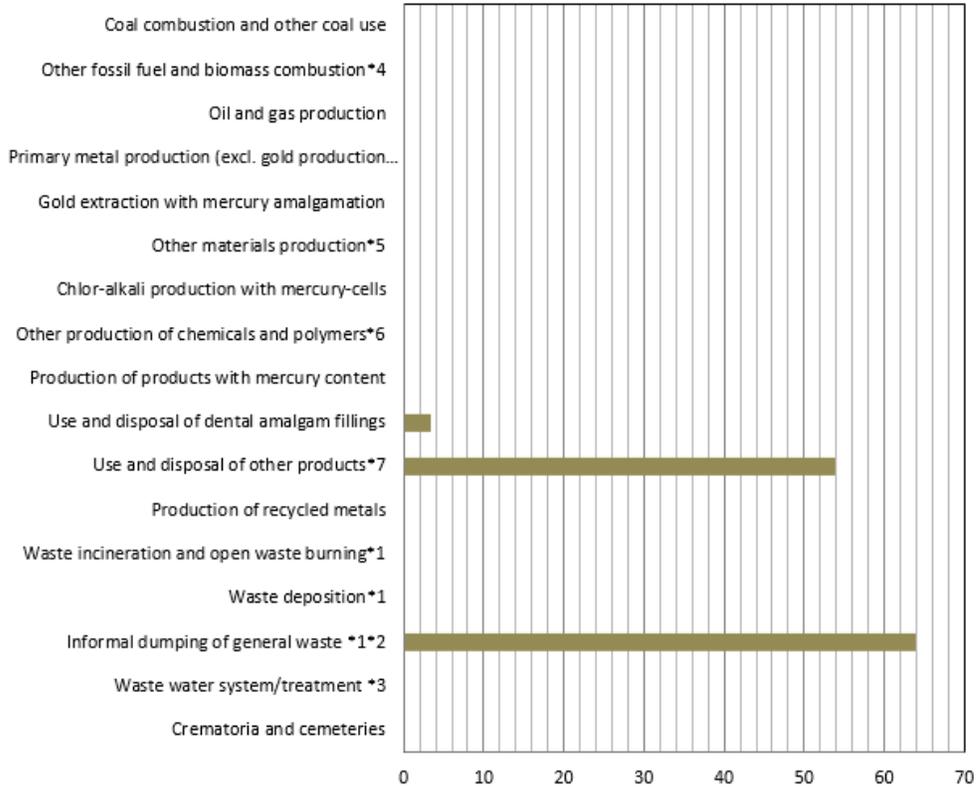


Figure 1-3: Estimated mercury releases to water (Kg Hg/y)

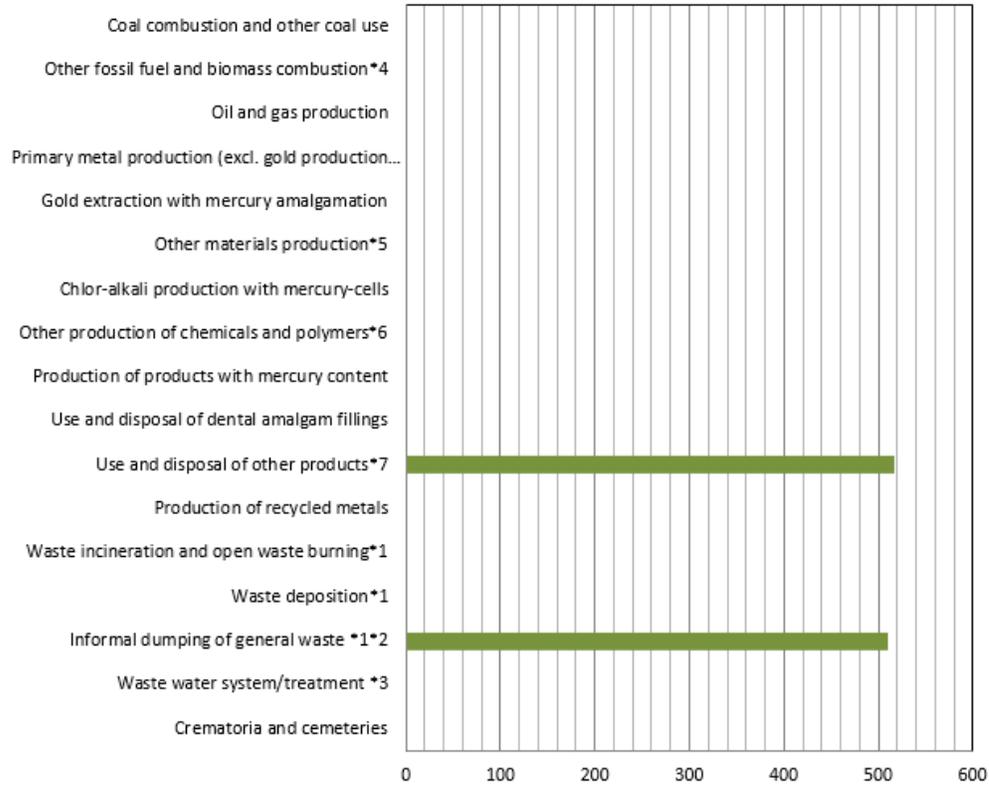


Figure 1-4: Estimated mercury releases to land (Kg Hg/y)

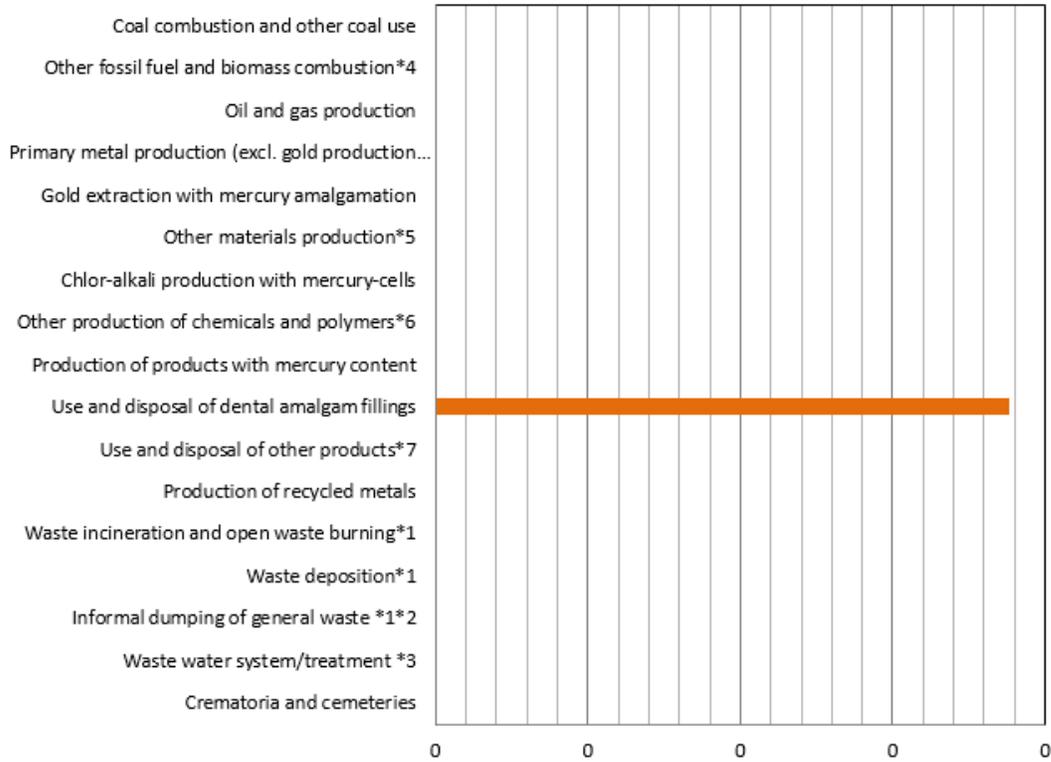


Figure 1-5: Estimated mercury outputs to by-products and impurities (Kg Hg/y)

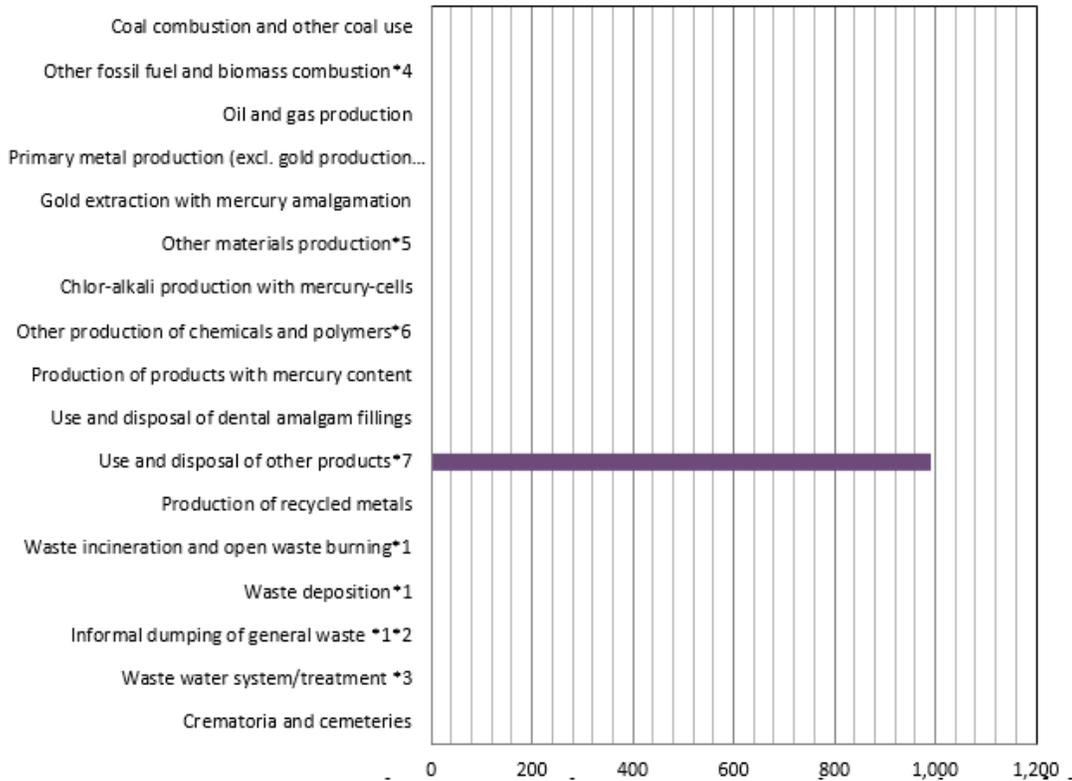


Figure 1-6: Estimated mercury releases to general waste (Kg Hg/y)

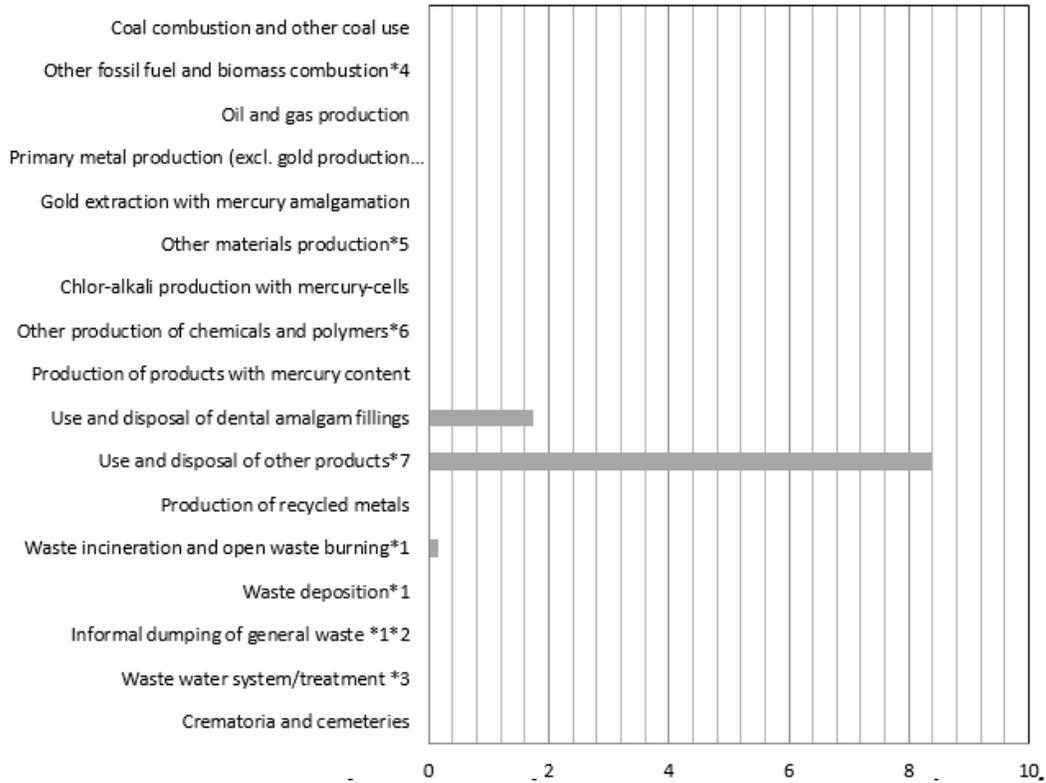


Figure 1-7: Estimated mercury releases, sector specific waste (Kg Hg/y)

Table 1-1: Summary of mercury inventory results

Source category	Estimated Hg input, Kg Hg/y	Estimated Hg releases, standard estimates, Kg Hg/y							Percent of total releases *3*4
		Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal	Total releases *3*4*5	
Coal combustion and other coal use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other fossil fuel and biomass combustion	16.7	16.7	0.0	0.0	0.0	0.0	0.0	17	1%
Oil and gas production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Primary metal production (excl. gold	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%

production by amalgamation)									
Gold extraction with mercury amalgamation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Other materials production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Chlor-alkali production with mercury-cells	-	-	-	-	-	-	-	0	0%
Other production of chemicals and polymers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Production of products with mercury content*1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Application, use and disposal of dental amalgam fillings	10.4	0.2	3.5	0.5	0.4	1.8	1.8	8	0%
Use and disposal of other products	2,081.4	510.0	53.9	516.9	0.0	992.2	8.4	2,081	65%
Production of recycled metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Waste incineration and open waste burning*2	959.7	959.5	0.0	0.0	0.0	0.0	0.2	960	30%
Waste deposition*2	-	-	-	-	-	-	-	0	0%
Informal dumping of general waste *2*3	638.7	63.9	63.9	510.9	-	-	-	128	4%

Waste water system/treatment *4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Crematoria and cemeteries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
TOTALS (rounded) *1*2*3*4*5	2,270	1,550	120	520	0	990	10	3,190	100%

According to the results, the following source groups contribute to the major mercury inputs:

- Use and disposal of other products.
- Waste incineration and open waste burning.
- Informal dumping of general waste.

The individual mercury release sub-category contributing with the highest mercury inputs and releases to the atmosphere are the ***use and disposal of other products***. Such products include batteries, fluorescent bulbs, and other items.

The origin of mercury in waste and waste water produced in the country is mercury in products and materials. Waste fractions and waste water do therefore not represent original mercury inputs to society (except imported waste). Waste and waste water may however represent substantial flows of mercury through society.

The following were found to be the major flows of mercury with waste:

- Use and disposal of other products.
- Informal dumping of general waste.

Major findings of the policy, regulatory and institutional assessments

Various government ministries, agencies, and other institutions are directly involved in governing the usage and management of chemicals at one stage or another. This includes, inter alia, the NEA, which is operating under the Office of the President and Ministry of Environment, Climate Change and Natural Resources; Department of Agricultural Services (DAS); Department of Livestock Services (DLS); Ministry of Trade, Industry and Employment; National Agricultural Research Institute (NARI); Food Safety and Quality Authority (FSQA); Department of Health Services; Attorney General's Chambers; Gambia Chamber of Commerce; and Gambia Revenue Authority-Customs and Excise Department.

The private sector and other nongovernmental organizations (NGOs) also play an important role in chemicals management in the Gambia. There are also several organizations such as the University of The Gambia, Gambia College, private research institutes, laboratories, libraries, and quasi-governmental institutions that have access to relevant scientific/ technical information and/or are conducting related research on chemicals management. In addition, some NGOs, including community-based organizations that are members of the Association of Non-

Governmental Organizations (TANGO), also have interest in the sound management of chemicals.

A number of inter-ministerial commissions and coordinating mechanisms exist in the Gambia addressing chemicals management. These exist in the form of Boards, Working Groups, and Councils. These include the following:

National Environment Management Council

Hazardous Chemicals and Pesticides Control and Management Board (HCPCMB)

MEA Coordinating Committee

Medicines Board

National Agricultural Research Board

Combined Joint Industrial Council

Water Resources Commission

Memberships of these are largely drawn from relevant governmental departments, private sector, and NGOs. For example, chemicals used in agricultural production and public health are managed by the NEA; Ministry of Health and Social Welfare; Ministry of Agriculture; Ministry of Trade, Industry and Employment; The Gambia Chamber of Commerce; Ministry of Finance and Economic Affairs (particularly the Customs and Excise Department); private sector; research institutions; and the NGOs.

Voluntary initiatives by industries or research-oriented studies by NGOs are limited in the country. However, such organizations are involved in community-based activities, and they could be used as channels for the education of the public on the dangers of chemical misuse and overuse.

The Hazardous Chemicals and Pesticides Management Control Act (HCPMCA), administered by the NEA and enacted in 1994, is the national legal framework for addressing the control and management of chemicals in the Gambia. This regulatory framework replaced the 1983 Pesticides Management Act and made provisions for the establishment of a Hazardous Chemicals and Pesticide Management Board (HCPMB), a regulatory body responsible for the registration, licensing, and management of all hazardous chemicals and pesticides. It also makes provisions for enforcement.

The National Environment Management Act, to a certain extent, addresses environmental pollution including pollution from chemicals. This was achieved through the establishment of Environmental Quality Standard Regulations 1999; Industrial Registration and Discharge Permit Regulations; Environmental Impact Assessment Regulations; and Waste Management Regulations. Other legal instruments that directly or indirectly address chemicals management are the: Medicine Act; Water Resources Act; Public Health Act; Local Government Act; Petroleum Act; Fisheries Act; Plant Importation Act; and Prevention of Damage by Pests Act.

Other regulatory mechanisms that have been implemented in the Gambia include: Montreal Protocol Regulations; Hazardous Chemicals and Pesticides (Prior Informed Consent Procedure) Regulations; Hazardous Chemical and Pesticides (POPs) Regulations; Pesticides Registration and Licensing Regulations; CILLS Common Registration into the Laws of the Gambia; and Globally Harmonized System of the Classification and Labeling of Chemicals Regulations.

Incentive mechanisms have also been put in place for government officers assisting the NEA and other types of incentives such as tax reduction are also practiced by the Customs Department. The Prior Informed Consent (PIC) Procedure is another tool, which aids in decision-making concerning chemical importation. Most PIC chemicals are on the list of banned chemicals in the Gambia and alternatives to these chemicals have been identified.

While there is little or no overlap between the HCPMCA and the other above-mentioned Acts, the enforcement of the HCPMCA faces many challenges. Some of the major setbacks are:

- Inadequate and under-qualified personnel

- Low levels of awareness of the populace

- Difficulty to control the entry of chemicals through the border; the border's porosity is due to the unusual geographical position of the Gambia

- Unscrupulous persons posing as NEA inspectors with the intention of collecting registration or licensing fees from dealers

- Inability of the NEA to enforce its laws; there is an urgent need for the NEA to enforce the environmental impact assessment regulations and its mitigating measures, and the implementation of environmental audits and industrial registration and discharge permitting system

Enforcement of pesticide regulations is more effective. Notable achievements include:

- Effective monitoring is carried out by the inspectors

- Substantial amounts of banned pesticides have been confiscated

- Detection of the presence of banned and illegal chemicals in some pesticide samples through analysis

- Over 1,000 applications for licensing to import, sell, warehouse or commercially apply pesticides/chemicals have been received since 1995

- Twenty pesticides/chemicals have been banned and 25 severely restricted

- About 130 pesticides/chemicals have been registered by the HCPCMB

- A database of pesticides imported from 1997 to date is available

The Gambia is Party to a number of chemicals and waste related international agreements, including the following:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Rotterdam Convention on the Prior Informed Consent (PIC) Procedure
Stockholm Convention on Persistent Organic Pollutants
Minamata Convention on Mercury
Strategic Approach to International Chemicals Management
Vienna Convention for the Protection of the Ozone Layer
Montreal Protocol on Substances that Deplete the Ozone Layer and its Amendment
Bamako Convention on the Ban of the Import into Africa and the Control of
Transboundary Movement and Management of Hazardous Wastes within Africa
Convention on the Prohibition of the Development, Production, Stockpiling and Use
of Chemical Weapons and on their Destruction
Common Regulation for the Registration of Pesticides in CILSS Member States
United Nations Framework Convention on Climate Change

The Gambia also adheres to the following frameworks:

UN Recommendations on the Transport of Dangerous Goods - Model Regulations
Nature, Purpose and Significance of the Recommendations
International Code of Conduct on the Distribution and Use of Pesticides
International Health Regulations (2005)

The Gambia has undertaken several steps towards meeting its commitments to various international agreements including the preparation of the Stockholm Convention National Implementation Plan (NIP), which was submitted to the Convention's Secretariat in 2009. The Gambia is currently updating of the NIP, with the financial support of GEF and UNEP as the implementing agency. The Gambia is also part of regional projects for implementation of the Stockholm Convention, and national projects for ratification and early implementation of the Minamata Convention. An MEA Unit and MEA Coordinating Committee have been established at the NEA to support coordination, information sharing, and reporting for the chemicals and waste related international agreements.

Summary of the measures that have been prioritized in order to implement the Convention

Priority 1: Improve on the Policy and Regulatory Framework Governing the Management of Chemicals in The Gambia

In The Gambia, pollution control is regulated under the National Environment Management Act (NEMA), 1994 and other regulations; however specific regulations on mercury does not exist. The Hazardous Chemicals and Pesticides Control and Management Act (HCPCMA) does not also capture specific mercury issues. A new Waste Bill is being finalized by the National Environment Agency with the intention to incorporate E-waste and mercury containing waste. No regulatory limit currently exists for exposure to mercury. Considering mercury emissions from mercury products in the waste stream are one of the most potential sources of Mercury emissions to air and ground water, it is imperative to:

Mainstream sound management of chemicals including Hg in national policies, plans and programmes

Harmonization of existing legislation dealing with hazardous chemicals including mercury

Enhance coordination among government institutions to avoid duplication of efforts

Policy shift from mercury containing medical devices and other equipment to non-mercury containing equipment:

Amendment of the HCPCMA to encompass sustainable management of mercury

Listing of mercury under the list of banned or restricted chemicals

Domestication of the Minamata Convention on Mercury

Priority 2: Undertake Continuous Awareness Raising Among Priority Groups and Built Capacity through Training and Sensitization

Currently there is little awareness on mercury issues among risk groups, the population at large or even government agencies and institutions having responsibilities pertaining to mercury and mercury containing products. Although some limited awareness raising activities have been provided recently through workshops and distributing fliers, additional awareness on the issues surrounding mercury in particular for risk groups and decision makers, is important.

Therefore, capacity building in the form of training on the adoption of alternatives to the use of mercury, or the proper management, storage, transport and disposal/treatment of mercury and mercury containing products and wastes is highly recommended. This may include creating awareness programs on mercury and its effects on the environment and human health by establishing a platform to discuss the issues of mercury among stakeholders.

The communication plan shall include both media sensitization platforms, outreach activities and consultations with stakeholders.

Priority 3: Restrict the Importation and Use of Mercury and Mercury Containing Products

Under Article 4 (Mercury-added products), each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A after the phase-out date specified for products to be phased out by 2020.

In The Gambia, the potential source of mercury pollution include mercury containing products such as mercury oxide batteries, fluorescent lamps, Cosmetics and some medical equipment, and dental amalgam.

The Gambia have not yet taken steps or actions on reducing the use of certain products containing mercury, and no actions have been taken to reduce the use of other types of mercury containing products and replacing them with mercury-free or lower mercury content alternatives.

Regarding the phase-down of dental amalgam, the NEA is envisaging to eliminate the use of mercury in dental amalgam within a given time schedule after

consultation with the Ministry of Health and Social Welfare, the Dental Council, the Dental Association, and other stakeholders.

Priority 4: Improve Monitoring and Reporting Capacity on Mercury Levels in Food, Soil, Water and Air

The NEA have established a pesticide formulation laboratory; however, that laboratory and a number of other laboratories in The Gambia do not have the capacity/equipment to analyze mercury levels in soil, water and biological samples (e.g. fish).

The Minamata Convention requires Parties to control and reduce releases of mercury to air (Article 8), to land and water (Article 9) and identify and protected populations at risk (article 16). In order to do so the capacity of the country needs to be improved in order to be able to measure and monitor levels of mercury in environmental media and populations at risk on a regular basis.

Therefore, it is important to build capacity to monitor and manage mercury and mercury products through:

Analytical and monitoring of Hg and Hg compounds at all levels

Upgrade existing laboratories with appropriate equipment to analyze products with mercury.

Develop a monitoring system on Hg through:

Assessment of atmospheric Hg, mercury in water bodies and mercury in the soil.

Development of a data base on all mercury assessments.

Priority 5: Improve Waste Management Practices for Mercury and Mercury Containing Wastes

When products containing Mercury break or need to be disposed of, such wastes are being discarded along with regular municipal waste, or as an interim measure are kept on the premises of Health Care Facilities or industries. No special measures are taken to protect the environment or people/communities coming in close contact with such wastes.

In Article 11 (Mercury Waste), each Party shall take appropriate measures so that mercury waste is:

Managed in an environmentally sound manner, taking into account the guidelines developed under the Basel Convention and in accordance with requirements of the COP

Only recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under this Convention or for environmentally sound disposal pursuant to paragraph 3 (a);

For Parties to the Basel Convention, hazardous waste shall not be transported across international boundaries except for the purpose of environmentally sound disposal in conformity with this Article and with that Convention.

In The Gambia, there are no specific guidelines on the management, storage, disposal or treatment of Mercury containing wastes, which could result in inadequate disposal and long-term storage of Mercury and Mercury containing wastes.

A new Waste Bill is underway by the NEA, and this Bill is expected to incorporate/reflect the waste management of Mercury and Mercury containing wastes.

The Hazardous chemicals and Pesticides Management Act is also under review, and shall address specific mercury issues.

Introduction

With financial support from The GEF through Ground Works as the Executing Agency, the National Environment Agency (NEA) on behalf of the Government of The Gambia implemented the project 'Development of Minamata Convention on Mercury Initial Assessment in Africa'.

The objective of the project is to provide scientific evidence for the ratification and early implementation of the Minamata Convention through the use of scientific and technical knowledge and tools by national stakeholders in participating countries.

The project aims to support the government in its efforts to assess capacity for the Sound Management of Chemicals, identify needs, and ultimately integrate identified priorities into national development plans and policy.

As part of the project components (Component 3), an assessment of Mercury releases was conducted to identify its sources and emissions in the country. Findings from this assessment will inform the Government of The Gambia in their decision to implement the already ratified Minamata Convention on Mercury, and also to start discussions on the management options for Mercury releases. Although The Gambia does not practice ASGM, the Mercury release inventory will lead to the development of an Action Plan for Mercury management in The Gambia.

This mercury release inventory was made with the use of the UNEP "Toolkit level1, Version 1.3 April 2015, for the identification and quantification of mercury releases" made available by the Chemicals Branch of the United Nations Environment Programme (UNEP Chemicals). The Toolkit is based on mass balances for each mercury release source type. Inventory Level 1 works with pre-determined factors used in the calculation of mercury inputs to society and releases, the so-called default input factors and default output distribution factors. These factors were

derived from data on mercury inputs and releases from the relevant mercury source types from available literature and other relevant data sources. Where available, data for the year 2014 was used in the inventory. However, for some data types, data from this year have not been available. The year for all data given is noted with the data in question in the relevant sections of this report.

The level 1 inventory, led by the NEA in collaboration with its stakeholders was started in February 2017 and ended in April 2017. To support the assessment and to provide data, information and insight into various aspects pertaining to potential Mercury releases, a National Coordinating Committee (NCC) was set up to oversee the whole affairs of the project implementation. In addition, four different task teams were formed to do the data collection and information gathering through both field exercise and desk review. Each task team comprised of 6 representatives of various government and non-government institutions who has a stake in chemicals management.

Mercury is a naturally occurring element and is found throughout the world. There are thus many natural sources of mercury, creating background environmental levels that have been present since long before humans appeared. Mercury is contained in many minerals, including cinnabar, an ore mined to produce mercury. Much of the present day demand for mercury is met by supply from mercury recovered from industrial sources and stockpiles rather than from mercury mining. Mercury is also present as an impurity in many other economically valuable minerals, in particular the non-ferrous metals, and in fossil fuels, coal in particular.

Human activity, especially mining and the burning of coal, has increased the mobilization of mercury into the environment, raising the amounts in the atmosphere, soils, fresh waters, and oceans. The majority of these human emissions and releases of mercury have occurred since 1800, associated with the industrial revolution based on coal burning, base-metal ore smelting, and gold rushes in various parts of the world. To some extent the same drivers of mercury emissions and releases are continuing with fossil-fuel-based energy generation powering industrial and economic growth in Asia and South America, which in turn helps drive high demand for metals including gold, spurring artisanal and small-scale gold mining (ASGM) around the world (Global Mercury Assessment, 2013).

In The Gambia, mercury is mainly used in certain consumer products including medical equipment, electrical appliances, dental amalgam, and others. The major source of mercury emission to the environment is the use and disposal of mercury added products, waste incineration and open waste burning, and informal dumping of general waste.

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 of groundwater from hazardous waste (clinical waste and industrial waste) dumped indiscriminately and air pollution from waste dumpsites. Outside these areas, the problem is mainly pesticides and other agrochemicals and heavy metals from

batteries. The low level of awareness of potential risks associated with the use of chemicals among users and the general public, inadequate data on specific chemical poisoning, and the unavailability of data related to groundwater and air pollution due to these hazardous chemicals makes it difficult to address such concerns. The lack of resources, both human and financial is another contributing factor. Lack of a residue laboratory and inadequate capacity at existing laboratories contributes to lack of information on chemical pollution in air, soil and water. Some opportunities exist, however, to collaborate with Locutox in Senegal for analysis of pesticide residues to generate a baseline data. Another concern is the country's porous borders, which enable easy entry and exit by persons engaged in sales of unregistered and unlabeled products. In addition, the situation of some of the major weekly local markets along national boundaries hinders efforts to control the management of chemicals.

Chapter I: National Background Information

Geography and population

The Republic of The Gambia in Western Africa occupies an area of 11,365 sq km. A small sub-tropical country between latitudes 13°28'W and 16°36'W, it is bordered to the north, south and east by Senegal and has an 80km coast on the Atlantic Ocean to the west. The country's borders roughly correspond with the path of the River Gambia. The capital city is Banjul. The Gambia has a sub-tropical climate with two variations of distinct dry and rainy seasons. The dry season commonly known as 'Harmattan' usually starts mid-October and ends around mid-June every year with an average temperature of 32°C / 89.6°F. The rainy season usually starts around the mid- June and ends around the mid-October with August being the wettest month of the year, temperatures can reach up to 41°C/105.8°C. The Gambia has a total area: 11,365 km² (4388 sq. miles) and out of this approximately 1,300 km² is of water bodies with an 80-km coastline with an exclusive fishing zone of 200 nautical miles with continental shelf. The agricultural land is 6,550 km² and the arable land is 588,000 hectares of which 334,000 hectares are under cultivation and a forest area of 4750 km² i.e. 47.5% of land area. The total population of the Gambia according to the 2015 Nation Census was estimated at 1,882,450 inhabitants with average annual growth rate of 3.3%.

1.1.2 Political, legal and economic profile

The Gambia's GDP growth rate has been volatile during the past decade and determined by exogenous shocks such as late and uneven distribution of rainfall, the inability of services sector, especially tourism to provide countercyclical remedy to agricultural shocks. The recent 2016 Ebola outbreak in neighboring countries, the 2016 political impasse as well as several years of weak domestic policies have further contributed to the pendulous nature of the Gambia's GDP rates. During this period, The Gambia's highest GDP growth rate of 6.5 % was experienced in 2010,

while the lowest rate of – 4.3% occurred in 2011 due to poor rainfall across the country. Compared to the Sub Saharan average GDP growth rate of 4.1%, Gambia's average GDP growth rate of about 3.5% has also not been as desired with the 2016 GDP growth of 2.2% still below what prevails in SSA. However, growth for 2017 is expected to pick up marginally to 3 percent with this recovery mainly predicated on the assumption of a normal agricultural season, following the bad 2016/17 harvest, and a gradual recovery in trade. Tourism is also forecast to recover, but is unlikely to make up for the losses in experienced in early 2017 because of the political turmoil (IMF 2017).

1.1.3 Profiles of economic sectors

With a population of about 1.9 million, a large proportion of the people are employed in the agricultural sector, both for commercial and subsistence production. There is a relatively small industrial sector and a large services sector dominated by the government. The agricultural sector mainly comprises crop and livestock production and fisheries. The industrial sector is classified into formal and non-formal manufacturing, building and construction, and tourism. The formal manufacturing sector is dominated by the food industry, which includes beverage facilities, fish processing plants, abattoir, sweets and milk processing plants. There are facilities for sand and gravel mining and timber to serve the building industry. Foam manufacturing and plastic production plants also exist.

Agriculture, services including tourism, manufacturing, and industry sectors, are the major drivers of growth in the Gambia although agriculture is the principal driver as evidenced by the direct correlation between growth, rainfall patterns and agriculture value added (World Bank 2015). Agriculture is by far the most important sector for the Gambian economy and poverty reduction. It is the main driver of GDP growth, employs nearly half (46.4 %) of the working population and 80.7 % of the rural working population. The sector typically contributes up to 31 % of national GDP although this has declined to 20% of GDP in 2016 (IHS 2016). Furthermore, the poor are most likely to rely on agriculture for livelihood as 72% of the poor and 91% of the poor work as farmers. Agriculture, specifically groundnuts is the main source of foreign exchange for the Gambia-accounting for 30% while simultaneously meeting 50% of the national food requirements (CCA 2015). In addition, agro-industries constitute a significant component of Gambia's industries – which is another growth driver that contributes 15% to GDP.

Agriculture in The Gambia is mainly small-holder based and characterized by subsistence farming of food crops and the semi intensive cultivation of selected cash crops. The low performance of agriculture is due to a range of factors, including: an unfavorable macro-fiscal stance in recent years; a weak policy and institutional framework; insufficient budgets (capital and recurrent); difficult access to modern inputs and to finance; ineffective research and advisory services or lack thereof; rainfall variability and climate shocks; lack of transport and market infrastructures; limited irrigation; high post-harvest losses due to poor handling, inappropriate

storage, as well as poor adherence to SPS & TBT standards of the export markets. Livestock and poultry production is increasing thus cementing its significance in the zero-hunger agenda. However, this increase coupled with uncontrolled grazing pose challenges to the environment.

The Gambia has some of the richest fish resources in the world along the Atlantic Ocean. However, industrial fishing for local processing has nearly collapsed, and exports have plummeted due to increased illegal fishing, poor surveillance of the fisheries resources in the high seas, unsustainable number of commercial fishing licenses, declining landed catches, high cost of energy needed for processing, and stringent sanitary and phytosanitary requirements in the EU market. The fisheries sector faces additional challenges, including: high attrition rate of trained and skilled workers, limited access to funding for the provision of adequate raw materials to sustainability, a relatively small output making it difficult for the sector to make a mark on any market, while energy costs associated with the sector are very high and unpredictable. Despite this current setback, the sector has great potential and is an area where The Gambia has comparative advantage.

The tourism industry is a major contributor to the national economy contributing 12% - 16% of Gross Domestic Product (GDP), supporting over 35,000 direct and 40,000 indirect jobs, and generating US\$ 85 million in foreign exchange earnings (Tourism, Culture, and Hospitality Strategy Plan, 2015-2020). It has attracted US\$ 45 million in foreign investment over the last 5 years while also providing the necessary air cargo opportunities to support the development of some of The Gambia's other sub sectors such as shellfish, horticulture and other international business activities. Tourism has a catalytic role in accelerating growth and employment opportunities (along the value chain) to improve the welfare of the population.

Trade has always been an important economic activity in The Gambia creating job opportunities, generating income, and contributing to poverty reduction. For decades, The Gambia had served as a regional entrepôt, with imported goods being transported to the hinterland using the river Gambia. Supported by relatively low import taxes, a well-functioning port and customs services and limited administrative barriers, The Gambia's position as a trading centre was reinforced. Gambia still serves as the port to many countries within the sub region (such as Mali, Guinea Bissau, Guinea Conakry and Southern Senegal) although this has since declined as The Gambia has lost competitiveness due to a number of trade related policy decisions. Imports dominate trading, accounting for 39% of GDP in 2014 (CCA, 2015). Of this, 33% comprise of food and agricultural products while 43% constitutes fuel and manufacturing inputs.

The Gambia's transport system falls under three modes; (i) road transport system (consisting of a primary network, inter-urban trunk roads; gravel surfaced secondary roads; urban roads confined mainly to Greater Banjul area; and gravel/earth surface rural feeder roads); (ii) Air Transport System provided by

Banjul International Airport at Yundum, and (iii) Maritime and River Transport consisting of the Banjul Port and the River transport. Transport is critical for the efficient functioning of the national economy as it provides vital and essential links between areas of production and markets and also facilitates access to social and economic facilities. For the private sector, the transport infrastructure is critical for competitiveness and is equally an opportunity for participation through public-private –partnerships (PPPs). In essence, growth in other sectors will impose corresponding quality and quantity demands on the transport sector and to this end, The Gambia prioritizes suitability, cost effectiveness, environmental sustainability, and appropriate institutional mechanisms for effective inter-modal coordination and communication between the user, operator, regulator and the Government. In addition, the country's spatial geography of being divided into two by the River Gambia continues to be an important factor in any transport development discourse as this geography imposes not only the imperative to connect its two Banks for national integration, but also to use its transport system for the integration of Senegal which is also divided into two parts by the River Gambia.

Energy is a critical element in the development and functioning of The Gambia's economy. As an essential input to households, agricultural production, ICT, transportation, industry, commerce and the knowledge industry, the country's reliance on energy will also continue to grow as the population increases and standards of living improve. The Gambia has a dual energy system where traditional and modern energy systems co-exist. The main source of energy in The Gambia is fuel wood, followed by petroleum products and a small growing fraction of renewable energy (solar and wind). LPG is also an important source of energy although its use is higher among the affluent segment of urban households. The biggest consumers of energy in The Gambia are households and the transport sector, with a steady and consistent increase during the past decade in the consumption of petroleum products. Approximately 44% of the electricity produced is consumed by residential consumers. The small-scale industries including hotels and larger industries use approximately 39% while commercial entities use about 8%. The remaining 9% is consumed by Government and NAWEC (NAWEC, 2011). Electricity supply in The Gambia is insufficient, and is among the most expensive in Sub Saharan Africa. It is unreliable and costly due to the high cost of fossil fuel, the high cost of installing the transmission infrastructure, and 24% average electricity loss during transmission and distribution (NAWEC 2016). Renewable energy represents an area of tremendous opportunity for The Gambia.

The manufacturing subsector contributes 5.5% (2014) to GDP (that has stagnated since 1995). Manufacturing activities in The Gambia are dominated by light manufacturing consisting of clothing and textiles, food and beverages, metals and metallic works, wood and leather processing, and chemicals primarily used in the production of soaps and plastics, fish processing, etc. Small scale light manufacturing such as wood crafts, clothing and textile, chemicals, food, rice milling, fruit juice production, traditional medicine, electronic assembly, etc. constitute the

manufacturing sector in The Gambia. The level of industrialization of The Gambian economy is low, as indicated by its Manufacturing Value Added (MVA) per capita, which has almost stagnated at about US\$16 since 1995 (UNIDO, 2010) - lower than the average for developing countries. One of the critical challenges affecting the industrialization process is the lack of technological innovation as well as an outdated industrial policy.

The Gambia's production of chemicals is minimal if not negligible. However, the country imports a large quantity of chemicals ranging from agricultural and industrial to consumer chemicals. Petroleum products are imported and used on a large scale, followed by other consumer chemicals and then agrochemicals. The country depends very heavily on chemicals to enhance agricultural productivity. Chemicals are equally heavily used in the public health sector to control arthropod vectors of human diseases, and in the development of industries.

Chapter II: Mercury Inventory and Identification of Emissions and Releases

2.1 Emissions and Releases

2.1.1 Mercury release source types present

Table 2-1 shows which mercury release sources were identified as present or absent in the country. Only source types positively identified as present are included in the quantitative assessment.

It should be noted however, that the presumably minor mercury release source types shown in Table 2-2 were not included in the detailed source identification and quantification work. However, some of the categories are present in the country but in limited data availability.

Table 2-1: Identification of mercury release sources in the country; sources present (Y), absent (N), and possible but not positively identified (?).

Source category	Source present?
	Y/N/?
Energy consumption	
Coal combustion in large power plants	N
Other coal uses	N
Combustion/use of petroleum coke and heavy oil	Y
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	Y
Use of raw or pre-cleaned natural gas	N
Use of pipeline gas (consumer quality)	N
Biomass fired power and heat production	Y

Charcoal combustion	Y
Fuel production	
Oil extraction	N
Oil refining	N
Extraction and processing of natural gas	N
Primary metal production	
Mercury (primary) extraction and initial processing	N
Production of zinc from concentrates	N
Production of copper from concentrates	N
Production of lead from concentrates	N
Gold extraction by methods other than mercury amalgamation	N
Alumina production from bauxite (aluminium production)	N
Primary ferrous metal production (pig iron production)	N
Gold extraction with mercury amalgamation - without use of retort	N
Gold extraction with mercury amalgamation - with use of retorts	N
Other materials production	
Cement production	N
Pulp and paper production	N
Production of chemicals	
Chlor-alkali production with mercury-cells	N
VCM production with mercury catalyst	N
Acetaldehyde production with mercury catalyst	N
Production of products with mercury content	
Hg thermometers (medical, air, lab, industrial etc.)	N
Electrical switches and relays with mercury	N
Light sources with mercury (fluorescent, compact, others: see guideline)	N
Batteries with mercury	N
Manometers and gauges with mercury	N
Biocides and pesticides with mercury	N
Paints with mercury	N
Skin lightening creams and soaps with mercury chemicals	N
Use and disposal of products with mercury content	
Dental amalgam fillings ("silver" fillings)	Y
Thermometers	Y
Electrical switches and relays with mercury	Y
Light sources with mercury	Y
Batteries with mercury	Y
Polyurethane (PU, PUR) produced with mercury catalyst	N
Paints with mercury preservatives	?

Skin lightening creams and soaps with mercury chemicals	Y
Medical blood pressure gauges (mercury sphygmomanometers)	Y
Other manometers and gauges with mercury	Y
Laboratory chemicals	Y
Other laboratory and medical equipment with mercury	Y
Production of recycled of metals	
Production of recycled mercury ("secondary production")	Y
Production of recycled ferrous metals (iron and steel)	Y
Waste incineration	
Incineration of municipal/general waste	N
Incineration of hazardous waste	N
Incineration and open burning of medical waste	Y
Sewage sludge incineration	N
Open fire waste burning (on landfills and informally)	Y
Waste deposition/landfilling and waste water treatment	
Controlled landfills/deposits	N
Informal dumping of general waste *1	Y
Waste water system/treatment	Y
Crematoria and cemeteries	
Crematoria	N
Cemeteries	Y

Table 2-2: Miscellaneous potential mercury sources not included in the quantitative inventory; with preliminary indication of possible presence in the country.

Source category	Source present? Y/N/?
Combustion of oil shale	N
Combustion of peat	N
Geothermal power production	N
Production of other recycled metals	Y
Production of lime	Y
Production of light weight aggregates (burnt clay nuts for building purposes)	Y
Production of other chemicals (than chlorine and sodium hydroxide) in Chlor-alkali facilities with mercury-cell technology	N
Polyurethane production with mercury catalysts	N
Seed dressing with mercury chemicals	N
Infra red detection semiconductors	N

Bougie tubes and Cantor tubes (medical)	?
Educational uses	Y
Gyroscopes with mercury	N
Vacuum pumps with mercury	?
Mercury used in religious rituals (amulets and other uses)	?
Mercury used in traditional medicines (ayurvedic and others) and homeopathic medicine	?
Use of mercury as a refrigerant in certain cooling systems	N
Light houses (levelling bearings in marine navigation lights)	?
Mercury in large bearings of rotating mechanic parts in for example older waste water treatment plants	N
Tanning	?
Pigments	?
Products for browning and etching steel	N
Certain colour photograph paper types	?
Recoil softeners in rifles	?
Explosives (mercury-fulminate a.o.)	?
Fireworks	?
Executive toys	?

2.1.2 Summary of mercury inputs to society

Mercury inputs to society should be understood here as the mercury amounts made available for potential releases through economic activity in the country. This includes mercury intentionally used in products such as thermometers, blood pressure gauges, fluorescent light bulbs, etc. It also includes mercury mobilized via extraction and use of raw materials, which contain mercury in trace concentrations.

Table 2-3: Summary of mercury inputs to society

Source category	Source present ?	Activity rate	Unit	Estimated Hg input, Kg Hg/y
	Y/N/?			Standard estimate
Energy consumption				
Coal combustion in large power plants	N	0	Coal combusted, t/y	-
Other coal uses	N	0	Coal used, t/y	-
Combustion/use of petroleum coke and heavy oil	Y	37,531	Oil product combusted, t/y	2
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	Y	113,650	Oil product combusted, t/y	1

Use of raw or pre-cleaned natural gas	N	0	Gas used, Nm ³ /y	-
Use of pipeline gas (consumer quality)	N	0	Gas used, Nm ³ /y	-
Biomass fired power and heat production	Y	198,000	Biomass combusted, t/y	6
Charcoal combustion	Y	67,000	Charcoal combusted, t/y	8
Fuel production				
Oil extraction	N	0	Crude oil produced, t/y	-
Oil refining	N	0	Crude oil refined, t/y	-
Extraction and processing of natural gas	N	0	Gas produced, Nm ³ /y	-
Primary metal production				
Mercury (primary) extraction and initial processing	N	0	Mercury produced, t/y	-
Production of zinc from concentrates	N	0	Concentrate used, t/y	-
Production of copper from concentrates	N	0	Concentrate used, t/y	-
Production of lead from concentrates	N	0	Concentrate used, t/y	-
Gold extraction by methods other than mercury amalgamation	N	0	Gold ore used, t/y	-
Alumina production from bauxite (aluminium production)	N	0	Bauxite processed, t/y	-
Primary ferrous metal production (pig iron production)	N	0	Pig iron produced, t/y	-
Gold extraction with mercury amalgamation - without use of retort	N	0	Gold produced, kg/y	-
Gold extraction with mercury amalgamation - with use of retorts	N	0	Gold produced, kg/y	-
Other materials production				
Cement production	N	0	Cement produced, t/y	-
Pulp and paper production	N	0	Biomass used for production, t/y	-

Production of chemicals				
Chlor-alkali production with mercury-cells	N	0	Cl ₂ produced, t/y	-
VCM production with mercury catalyst	N	0	VCM produced, t/y	-
Acetaldehyde production with mercury catalyst	N	0	Acetaldehyde produced, t/y	-
Production of products with mercury content				
Hg thermometers (medical, air, lab, industrial etc.)	N	0	Mercury used for production, kg/y	-
Electrical switches and relays with mercury	N	0	Mercury used for production, kg/y	-
Light sources with mercury (fluorescent, compact, others: see guideline)	N	0	Mercury used for production, kg/y	-
Batteries with mercury	N	0	Mercury used for production, kg/y	-
Manometers and gauges with mercury	N	0	Mercury used for production, kg/y	-
Biocides and pesticides with mercury	N	0	Mercury used for production, kg/y	-
Paints with mercury	N	0	Mercury used for production, kg/y	-
Skin lightening creams and soaps with mercury chemicals	N	0	Mercury used for production, kg/y	-
Use and disposal of products with mercury content				
Dental amalgam fillings ("silver" fillings)	Y	1,436,000	Number of inhabitants	10
Thermometers	Y	150,000	Items sold/y	150
Electrical switches and relays with mercury	Y	1,436,000	Number of inhabitants	69

Light sources with mercury	Y	6,785	Items sold/y	0
Batteries with mercury	Y	600	t batteries sold/y	1,835
Polyurethane (PU, PUR) produced with mercury catalyst	?	1,436,000	Number of inhabitants	?
Paints with mercury preservatives	?	0	Paint sold, t/y	?
Skin lightening creams and soaps with mercury chemicals	Y	0	Cream or soap sold, t/y	0
Medical blood pressure gauges (mercury sphygmomanometers)	Y	0	Items sold/y	0
Other manometers and gauges with mercury	Y	1,436,000	Number of inhabitants	2
Laboratory chemicals	Y	1,436,000	Number of inhabitants	5
Other laboratory and medical equipment with mercury	Y	1,436,000	Number of inhabitants	20
Production of recycled of metals				
Production of recycled mercury ("secondary production")	Y	0	Mercury produced, kg/y	0
Production of recycled ferrous metals (iron and steel)	Y	0	Number of vehicles recycled/y	0
Waste incineration				
Incineration of municipal/general waste	N	0	Waste incinerated, t/y	-
Incineration of hazardous waste	N	0	Waste incinerated, t/y	-
Incineration and open burning of medical waste	Y	72	Waste incinerated, t/y	2
Sewage sludge incineration	N	0	Waste incinerated, t/y	-

Open fire waste burning (on landfills and informally)	Y	191,593	Waste burned, t/y	958
Waste deposition/landfilling and waste water treatment				
Controlled landfills/deposits	N	0	Waste landfilled, t/y	-
Informal dumping of general waste *1	Y	127,731	Waste dumped, t/y	639
Waste water system/treatment	Y	3,895	Waste water, m3/y	0
Crematoria and cemeteries				
Crematoria	N	0	Corpses cremated/y	-
Cemeteries	Y	0	Corpses buried/y	0
TOTAL of quantified inputs*1*2*3				2,270

Note that the following source sub-categories made the largest contributions to mercury inputs to society:

Batteries with mercury (1,835 kg Hg/y)

Open fire waste burning (on landfills and informally) (958 kg Hg/y)

Informal dumping of general waste (639 kg Hg/y)

2.1.3. Summary of mercury releases

In the Table 4-1 below, a summary of mercury releases from all source categories present is given. The key mercury releases here are releases to air (the atmosphere), to water (marine and freshwater bodies, including via waste water systems), to land, to general waste, and to sectors specific waste treatment. An additional output pathway is “by-products and impurities” which designate mercury flows back into the market with by-products and products where mercury does not play an intentional role. See Table 4-2 below for a more detailed description and definition of the output pathways.

Table 2-4: Summary of mercury releases

Source category	Estimated Hg releases, standard estimates, Kg Hg/y					
	Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal
Energy consumption						
Coal combustion in large power plants	-	-	-	-	-	-

Other coal uses	-	-	-	-	-	-
Combustion/use of petroleum coke and heavy oil	2.1	0.0	0.0	0.0	0.0	0.0
Combustion/use of diesel, gasoil, petroleum, kerosene, LPG and other light to medium distillates	0.6	0.0	0.0	0.0	0.0	0.0
Use of raw or pre-cleaned natural gas	-	-	-	-	-	-
Use of pipeline gas (consumer quality)	-	-	-	-	-	-
Biomass fired power and heat production	5.9	0.0	0.0	0.0	0.0	0.0
Charcoal combustion	8.0	0.0	0.0	0.0	0.0	0.0
Fuel production						
Oil extraction	-	-	-	-	-	-
Oil refining	-	-	-	-	-	-
Extraction and processing of natural gas	-	-	-	-	-	-
Primary metal production						
Mercury (primary) extraction and initial processing	-	-	-	-	-	-
Production of zinc from concentrates	-	-	-	-	-	-
Production of copper from concentrates	-	-	-	-	-	-
Production of lead from concentrates	-	-	-	-	-	-
Gold extraction by methods other than mercury amalgamation	-	-	-	-	-	-
Alumina production from bauxite (aluminium production)	-	-	-	-	-	-
Primary ferrous metal production (pig iron production)	-	-	-	-	-	-
Gold extraction with mercury amalgamation - without use of retort	-	-	-	-	-	-
Gold extraction with mercury amalgamation - with use of retorts	-	-	-	-	-	-
Other materials production						

Cement production	-	-	-	-	-	-
Pulp and paper production	-	-	-	-	-	-
Production of chemicals						
Chlor-alkali production with mercury-cells	-	-	-	-	-	-
VCM production with mercury catalyst	-	-	-	-	-	-
Acetaldehyde production with mercury catalyst	-	-	-	-	-	-
Production of products with mercury content						
Hg thermometers (medical, air, lab, industrial etc.)	-	-	-	-	-	-
Electrical switches and relays with mercury	-	-	-	-	-	-
Light sources with mercury (fluorescent, compact, others: see guideline)	-	-	-	-	-	-
Batteries with mercury	-	-	-	-	-	-
Manometers and gauges with mercury	-	-	-	-	-	-
Biocides and pesticides with mercury	-	-	-	-	-	-
Paints with mercury	-	-	-	-	-	-
Skin lightening creams and soaps with mercury chemicals	-	-	-	-	-	-
Use and disposal of products with mercury content						
Dental amalgam fillings ("silver" fillings)	0.2	3.5	0.5	0.4	1.8	1.8
Thermometers	30.0	45.0	30.0	0.0	45.0	0.0
Electrical switches and relays with mercury	20.7	0.0	27.6	0.0	20.7	0.0
Light sources with mercury	0.0	0.0	0.0	0.0	0.0	0.0
Batteries with mercury	458.8	0.0	458.8	0.0	917.6	0.0
Polyurethane (PU, PUR) produced with mercury catalyst	?	?	?	?	?	?
Paints with mercury preservatives	?	?	?	?	?	?

Skin lightening creams and soaps with mercury chemicals	0.0	0.0	0.0	0.0	0.0	0.0
Medical blood pressure gauges (mercury sphygmomanometers)	0.0	0.0	0.0	0.0	0.0	0.0
Other manometers and gauges with mercury	0.5	0.7	0.5	0.0	0.7	0.0
Laboratory chemicals	0.0	1.6	0.0	0.0	1.6	1.7
Other laboratory and medical equipment with mercury	0.0	6.5	0.0	0.0	6.5	6.7
Production of recycled of metals						
Production of recycled mercury ("secondary production")	0.0	0.0	0.0	-	0.0	0.0
Production of recycled ferrous metals (iron and steel)	0.0	0.0	0.0	0.0	0.0	0.0
Waste incineration						
Incineration of municipal/general waste	-	-	-	-	-	-
Incineration of hazardous waste	-	-	-	-	-	-
Incineration and open burning of medical waste	1.6	0.0	0.0	0.0	0.0	0.2
Sewage sludge incineration	-	-	-	-	-	-
Open fire waste burning (on landfills and informally)	958.0	0.0	0.0	0.0	0.0	0.0
Waste deposition/landfilling and waste water treatment						
Controlled landfills/deposits	-	-	-	-	-	-
Informal dumping of general waste *1	63.9	63.9	510.9	-	-	-
Waste water system/treatment *2	0.0	0.0	0.0	0.0	0.0	0.0
Crematoria and cemeteries						
Crematoria	-	-	-	-	-	-
Cemeteries	0.0	0.0	0.0	-	0.0	0.0
TOTAL of quantified releases*1*2	1,550.0	120.0	520.0	0.0	990.0	10.0

Notes to table above:

**1: The estimated quantities include mercury in products which has also been accounted for under each product category. To avoid double counting, the release to land from informal dumping of general waste has been subtracted automatically in the TOTALS.*

**2: The estimated release to water includes mercury amounts which have also been accounted for under each source category. To avoid double counting, input to, and release to water from, waste water system/treatment have been subtracted automatically in the TOTALS.*

Note that the following source sub-categories made the largest contributions to mercury releases to the atmosphere:

Batteries with mercury (458.8 kg Hg/y)

Open fire waste burning (on landfills and informally) (958.0 kg Hg/y)

Informal dumping of general waste (63.9 kg Hg/y)

Also, the following source sub-categories made the largest contributions to mercury releases to land:

Batteries with mercury (458.8 kg Hg/y)

Informal dumping of general waste (510.9 kg Hg/y)

Batteries with mercury made the largest contribution of mercury release to general waste (917.6 kg Hg/y).

Table 2-5: Description of the types of results

This table provides general descriptions and definitions of the output pathways.

Calculation result type	Description
Estimated Hg input, Kg Hg/y	The standard estimate of the amount of mercury entering this source category with input materials, for example calculated mercury amount in coal used annually in the country for combustion in large power plants.
Air	Mercury emissions to the atmosphere from point sources and diffuse sources from which mercury may be spread locally or over long distances with air masses; for example from: Point sources such as coal fired power plants, metal smelter, waste incineration; Diffuse sources such as small-scale gold mining, informal burning of waste with fluorescent lamps, batteries, thermometers.

Calculation result type	Description
Water	<p>Mercury releases to aquatic environments and to waste water systems; point sources and diffuse sources from which mercury will be spread to marine environments (oceans), and freshwaters (rivers, lakes, etc.). for example releases from:</p> <p>Wet flue gas cleaning systems on coal fired power plants;</p> <p>Industry, households, etc. to aquatic environments;</p> <p>Surface run-off and leachate from mercury contaminated soil and waste dumps</p>
Land	<p>Mercury releases to the terrestrial environment: General soil and ground water. For example releases from:</p> <p>Solid residues from flue gas cleaning on coal fired power plants used for gravel road construction.</p> <p>Uncollected waste products dumped or buried informally</p> <p>Local un-confined releases from industry such as on site hazardous waste storage/burial</p> <p>Spreading of sewage sludge with mercury content on agricultural land (sludge used as fertilizer)</p> <p>Application on land, seeds or seedlings of pesticides with mercury compounds</p>
By-products and impurities	<p>By-products that contain mercury, which are sent back into the market and cannot be directly allocated to environmental releases, for example:</p> <p>Gypsum wallboard produced from solid residues from flue gas cleaning on coal fired power plants.</p> <p>Sulphuric acid produced from desulphurization of flue gas (flue gas cleaning) in non-ferrous metal plants with mercury trace concentrations</p> <p>Chlorine and sodium hydroxide produced with mercury-based chlor-alkali technology; with mercury trace concentrations</p> <p>Metal mercury or calomel as by-product from non-ferrous metal mining (high mercury concentrations)</p>

Calculation result type	Description
General waste	General waste: Also called municipal waste in some countries. Typically household and institution waste where the waste undergoes a general treatment, such as incineration, landfilling or informal dumping. The mercury sources to waste are consumer products with intentional mercury content (batteries, thermometers, fluorescent tubes, etc.) as well as high volume waste like printed paper, plastic, etc., with small trace concentrations of mercury.

2.1.4 Major data gaps

Obtaining data was a big challenge as most institutions do not update their database as necessary. The most challenges were encountered by identifying and obtaining the data and information necessary to complete Step 6 of the inventory (Hg products and substances). It would therefore be advisable that Step 6 of the inventory (which focuses on data collection and inventory of the consumption of mercury contained in products, as metal mercury and as mercury containing substances) be further improved. Preferably such research would be undertaken as part of a level 2 inventory. Such an assessment should also work closely with various local equipment suppliers/distributors so that data collection captures the use of such products in the public, private and domestic sector.

Furthermore, the HS codes for various products were not sufficient to provide a final conclusion on the number of Mercury containing items. For example, the total number of imported light sources did not distinguish those that contain mercury from the other types. The same applied to batteries, cosmetics and soaps. In terms of waste treatment and recycling, there are lot of unregulated waste disposal sites that were not accounted for during the inventory. This is as a result of the low waste collection rate by the municipal councils that causes wide spread backyard dumping and open burning.

2.1.5 Main priorities for further assessment

Considering the “Use and disposal of other products” as the most significant input category of Mercury in The Gambia and is significantly influencing and impacting the outcomes of the Mercury assessment, it is therefore important that the data presented in Step 6 “Mercury in products and substances” of the level 1 inventory accurately reflects the current situation. Either this data could be specifically improved for Step 6, or additional emphasis could be placed on this category during a level 2 inventory. Particular focus to be put on thermometers and sphygmomanometers in health care facilities.

For mercury containing batteries and light sources, not only was the import data unclear or even absent for certain Mercury containing products (e.g. batteries and compact fluorescent lamps), import data groups products and items by HS code.

These HS codes do not distinguish between Mercury containing batteries, neither do HS codes distinguish between CFLs and fluorescent tubes (which have a different Mercury content). In addition based on brands the Mercury content in energy efficient lamps can also dramatically vary. Therefore, import data was compared and cross checked with information and data obtained through other sources (e.g. importers/distributors), in order to obtain a more accurate data, but that was also difficult due to unavailability of information.

Another area which needs further data collection is the production of recycled ferrous metals. The Gambia is not an industrialized country; however, the importation of large numbers of used cars and other obsolete equipment from abroad poses a serious threat to their waste management. The Gambia Technical Training Institute (GTTI) recycles metals and produced metal iron bars to be used for construction. However, the amount of recycled ferrous metals is currently unknown (which is expressed in the toolkit as number of vehicles recycled/year). For waste handling and recycling, the Level 1 inventory looked predominantly at the main growth centres where it was easy to give a rough estimate of the quantity of waste handled. These areas include the Kanifing Municipality and Banjul City Council. This inventory should represent a rough total estimate across the country. During a level 2 inventory, it would be important to look more into waste collection and disposal in all administrative regions of the country.

Although import records do not provide any information on the quantities of dental amalgam that are imported on a yearly basis, the Gambia Dental Association confirmed that dental clinics still use dental Hg amalgam. Currently, there is no dental amalgam phase-out plan in place, and no specific waste management practices for Mercury containing waste streams are put in place. In the future, it will be important to determine the amount of dental amalgam being imported on a yearly basis and to obtain a sense of the use of alternative filling versus amalgam fillings. Furthermore early action could be promoted towards the phase-out of the use of dental amalgam while improving waste management practices of amalgam containing waste to minimize releases to the environment.

An area of key importance that needs detailed inventory, and lacks sufficient information, is the issue of mercury in cosmetics and paints (metallic paints might contain Mercury while imported road paint certainly does). There are wide varieties of these products being imported into the country, and it is not clear which brands contain mercury. Therefore, it is important to conduct specific analyses on these products.

The jewellery sector of the Gambia is more of artisanal and small scale which makes it difficult to obtain reliable data. However, the sector should be assessed in more detail with respect to current use of Mercury.

Another areas of further research could be electrical switches. As the Gambia only imports these products, information in this area could potentially be a problem. There are no hazardous waste disposal facilities in The Gambia that could treat Mercury waste or Mercury containing waste products. As a result most of the Mercury containing waste either ends up in the locally managed dumpsites or kept in stores awaiting the identification of final disposal/treatment methods. In addition it is known that certain facilities keep stockpiles of Mercury containing products as

waste, but an in-depth inventory on the quantities of Mercury containing wastes kept in facilities (Laboratories, Schools, industries, etc.) should be carried out. As part of a future level 2 inventory this aspect should be taken into consideration. Artisanal and Small Scale Gold Mining (ASGM) is one of the major source of mercury emission and release in Africa. There is no activity of gold mining in the Gambia; however, the activity is carried out upstream in Kedogou (Senegal), the effect of which could be transported downstream along the River Gambia. It is understood that methylmercury, the most toxic and bio-accumulative form of mercury, which presents the greatest health risk to humans and wildlife, is mainly formed in aquatic environments through natural microbial processes. It is therefore important to analyse mercury contents along the river Gambia especially in the Upper River Region which is closer to the Kedogou region in Senegal; and also if possible in fish caught along the river Gambia.

2.2 Summary of mercury releases, stockpiles, and supply and trade.

The Gambia like many other least developed countries, the details of domestic trade inside individual countries are not very well known. A few countries have systems to collect and centralize information on domestic commercial transactions of mercury. Mercury transactions between countries are tracked through tariff codes by Customs authorities and are reported to centralized databases such as the UN Statistics Division's (UNSD) Comtrade database (UNEP, 2006).

Mercury trade data are relatively less transparent. It is difficult to determine how much country-to-country trade in elemental mercury may not have been reported. For the 163 countries and protectorates that have reported mercury imports or exports during at least one year since 1995, the Comtrade database appears reasonably comprehensive for many countries, and not very complete for a number of others, based on indications of experts working with artisanal and small-scale miners, and separate estimates of regional mercury consumption.

2.3 Data and inventory on energy consumption and fuel production

2.3.1. Coal Combustion in Large Power Plants

The Gambia relies almost entirely on imported liquid fuels for power generation. This includes both light and heavy fuels used in power plants across the country. For the purpose of clarity there is no coal combustion in large power plants in the Gambia.

2.3.2 Other Coal Uses

There are no other coal uses in the Gambia. This was confirmed after visits to the Energy sector institutions.

2.3.3 Combustion/Use of Petroleum Coke and Heavy Oil

Considering that there are no refineries present in the Gambia, it was assumed that no petroleum coke is being used for power generation. However, at Sunny Enterprise in Mandinary (a Chinese Company), petroleum coke, produced as a result of re-refining of used oil, is being used to fire their boilers. There was no data available on the amount of petroleum coke they use. For the data obtained, data was extracted from CIA World fact book 2016 using the (2014 est.) of 37,531t/y as an input for the toolkit. As the CIA data contains the consumption of all the petroleum products in the country and to avoid double counting, 113,650t was subtracted from 151,181t to get the consumption of pet coke only.

2.3.4 Combustion/Use of Diesel, Gasoil, Petroleum and Kerosene

The Gambia imports all of its petroleum requirements which are mainly refined products like gasoline, diesel, heavy fuel Oil, Kerosene/Jet A-1 and liquefied petroleum gas. Petroleum product imports are mainly used for electricity power generation and in the transport sector. The assumption was made that LPG is part of this category. It is used mainly for cooking and water heating.

Data for this category has been extracted from the Ministry of Petroleum report 2016. The consumption figures for 2016 (combining Gasoil-65,042t; Petrol-24,423t; Jet A1-21,743t; and LPG-2,451t) add up to 113,650 tonnes, which has been used as an input for the toolkit.

2.3.5 Use of Raw or Pre-cleaned Natural Gas

Currently, there is no use of raw or pre-cleaned natural gas as the Gambia doesn't produce natural gas and no pipeline transporting natural gas exists between Gambia and any other country. However, the Gambia has petroleum offshore sites that are considered to have prospect for oil (2006 and 2010 2D and 3D Seismic Survey Report, Ministry of Petroleum).

2.3.6 Use of Pipeline Gas (Consumer Quality)

In the Gambia the distribution of gas (LPG) for domestic consumption is done in 3, 6 and 12-kg metallic bottles, no pipeline gas is available. However, LPG's are counted in the source-category 5.1.3.

2.3.7 Biomass Fired Power and Heat Production

There is no power plant that uses biomass. Biomass is mainly used in household cooking/heating. The main source of energy in The Gambia is fuel wood (78.11%) followed by petroleum products (18.49%) and a small growing fraction of renewable energy (solar and wind 0.04%). LPG (0.43%) is also an important source

of energy although its use is higher among the affluent segment of urban households.

Data as input to the toolkit have been extracted from FAO Forest Products 2010-2014, using the 2014 consumption figure of 740,000m³ which corresponds to 518,000 tonnes of wood. As 320,000t of wood were used for charcoal production, it leaves only 198,000t for firewood usage. Therefore, this figure (198,000t) was used as an input for the toolkit.

2.3.8 Charcoal Combustion

The production of charcoal is banned in the Gambia since 1981. However, despite the ban there is an amount of production that is taking place within the country in addition to the illegal importation from neighboring countries. According to Kinteh (2005), the demand for charcoal has increased for the period 2002-2006. The reason being charcoal is much preferred to fuel wood by the people because it is being considered to be more modern for a high class people in the urban and growth centers of the country.

Data as input to the toolkit have been extracted from FAO Forestry Products 2010-2014, page 142, table "wood charcoal" consumption using the 2014 consumption figure 67,000 tonnes/year, which was used as an input for the toolkit.

2.3.9 Fuel Production

There is no fuel production facility in The Gambia.

2.3.10 Oil Extraction

No oil extraction process takes place in The Gambia. However, it is important to note that the Gambia has petroleum offshore sites (Block A1, A2, A3, A4, A5 & A6) that are considered to have prospect for future oil extraction as four of these blocks are already licensed (2006 and 2010 2D and 3D Seismic Survey Report, Ministry of Petroleum).

2.3.11 Extraction and Processing of Natural Gas

No extraction and processing of natural gas takes place in The Gambia.

2.4 Data and inventory on domestic production of metals and raw materials

In The Gambia there is no domestic production of metals and raw materials. No primary metal production or other materials production taking place, which might directly or indirectly lead to releases of Mercury.

In The Gambia, Cement manufacturing is not taking place; it's only distributed and repackages into smaller 50kg bags. Some companies like Gacem Gambia Ltd, Jah Oil Company Ltd. and Gambia Manufacturing Plant at Brikama are taking part in this process.

With respect to pulp and paper production, only paper recycling is done. The only remaining data gap is related to the jewelry sector. It has been known that the Jewelry sector in The Gambia they are not using elemental Mercury to recuperate waste gold, in particular artisanal jewelers.

2.5 Data and inventory on domestic production and processing with intentional mercury use

2.5.1 Production of Chemicals

In summary there is no domestic production of chemicals, which involves the use of a Mercury catalyst or Mercury cells.

Regarding the production of Polyvinyl Chloride (PVC), Vinyl Chloride Monomer (VCM), the “building stone” for PVC, was imported as pellets for manufacture of PVC pipes. Sankung Sillah and Sons Gambia Company Ltd. was the company that takes part in production of PVC and VCM in the country which is no more operational in term of PVC pipes production.

2.5.2 Production of Products with Mercury Content

In The Gambia it is very unlikely that production of products with Mercury content (such as thermometers with Mercury, light sources with Mercury, Manometers/gauges with Mercury, biocides & pesticides with Mercury, batteries with Mercury, paints with Mercury or skin lightening creams and soaps with Mercury) is taken place.

From the data Collected at Gambia Revenue Authority (GRA) information was obtained on Mercury added products imports for which permits were issued during 2010 and 2013 (See Attached copies).

2.6 Data and inventory on waste handling and recycling

Solid waste management has been devolved to the local government authorities through the 2002 Local Government Act. In general, Municipal Cleansing Services provide for the collection, disposal and treatment of municipal waste.

Note: Information pertaining to municipal waste collection and disposal was relatively easily to come by for the Greater Banjul Area (Banjul City Council, Kanifing Municipal Council and West Coast Region). However, such information was not readily available for the other Area Councils (Kerewan, Mansakonko,

Janjangbureh and Basse). Therefore, during a level 2 inventory, or a future refinement of the level 1 inventory, the aspect of waste collection and disposal for the above four area councils, should be more closely looked at.

2.6.1 Production of Recycled Mercury (“Secondary Production”)

There is no known activity of production of recycled mercury in The Gambia; however, according to some unconfirmed information, the production of recycled Mercury is taking place mostly for traditional purposes such as traditional medicine and local jewelry sector. There is no available data on the quantity used. Until data/information has been obtained in this respect, this value has been left blank. It is not clear where the mercury is obtained from. This practice of recycling mercury is not widely practiced and very few people in the local community knows about mercury.

2.6.2 Production of Recycled Ferrous Metals (Iron and Steel)

There has been none primary ferrous metal production (pig iron production), however only secondary metal production from recycled materials (spare part productions for Telecommunication and mechanical) which is taking place at Gambia Technical Training Institute (GTTI). The GTTI foundry was acquired in 1999 as a grant from the Government of Turkey in order to provide both training to students and render services to support the local industry. The foundry recycles metals and produced metal iron bars to be used for construction. However, the amount of recycled ferrous metals is currently unknown (which is expressed in the toolkit as number of vehicles recycled/year). Until data/information has been obtained in this respect, this value has been left blank.

2.6.3 Incineration of Municipal/General Waste

No incinerator for municipal/general waste is available in The Gambia.

2.6.4 Incineration of Hazardous Waste

No incinerator for Hazardous waste is available in The Gambia.

2.6.5 Incineration and open Burning of Medical Waste

In the health facilities, only needles and syringes are being incinerated. No proper records were found to be in place as to the amount being incinerated. However, based on the assumption that an average weight of a safety box is 1kg, the following calculations were made for all the incinerators visited, summed up and inputted into the excel sheet.

Incinerator 1	120 boxes per day	120 x 1 kg x 365 days	4,380 kg	4.38 tons
Incinerator 2	60 boxes per day	60 x 1kg x 365 days	2,190 kg	2.19 tons
Incinerator 3	60 boxes per day	60 x 1kg x 365 days	2,190 kg	2.19 tons
Incinerator 4	75 Boxes per day	75 x 1 kg x 365 days	27,375 kg	27.4 tons
Incinerator 5	40 boxes per day	40 x 1 kg x 365 days	14,600 kg	14.6 tons
Incinerator 6	400 boxes per week	400 x 1kg x 52	20,800 kg	20.8 tons

These calculations combined lead to the conclusion that each year a total of 71,535 kg (71.535 tonnes) of needles and syringes is generated (for public and private healthcare facilities combined). This calculation assumes that perfect waste segregation practices have been put in place and are being followed at hospital/clinic level – which is the best-case scenario. However, healthcare waste is often not perfectly segregated into infectious, hazardous and non-hazardous waste streams.

It is expected that the number of incinerators will increase in the next few years because of an already approved World Bank Project at the National Nutrition Agency (NaNA) that is building incinerators in all major health centers in the country. With that project, it is expected to have more accurate data in terms of the amount of medical waste being incinerated.

2.6.6 Sewerage Sludge Incineration

In the Gambia, the incineration of sewerage sludge is not available.

2.6.7 Open Fire Waste burning (on landfills and informally)

According to a research report by Wiedinmyer et al., “Global emissions of traces of gases, particulate matter, and hazardous air pollutants from open burning of domestic waste^z”, the residential waste burned and the waste burned at the dump site was 153601 tons and 37992 tons respectively.

^z Global Emissions of Trace Gases, Particulate Matter, and Hazardous Air Pollutants from Open Burning of Domestic Waste
Christine Wiedinmyer, Robert J. Yokelson, and Brian K. Gullett
Environmental Science & Technology 2014 48 (16), 9523-9530, available at <http://pubs.acs.org/action/showCitFormats?href=http%3A%2F%2Fpubs.acs.org%2Fdoi%2Ffull%2F10.1021%2Fes502250z&doi=10.1021%2Fes502250z>, accessed 26 May 2017.

In the Gambia there is no segregation of waste done either at the point generation or at deposal sites and the main deposal method currently done is open tipping and it's a crude and burning which can serve as medium for the contamination of our water, spread of diarrheal diseases like cholera, polio etc, possible mercury emissions and also acid rains.

The composition of waste is Solid or semisolid, non-soluble material (including gases and liquids in containers) such as agricultural refuse, demolition waste, industrial waste, municipal garbage of which 60 percent is sand. The main reduction of waste during the process of collection to disposal is through Scavenging by the municipal laborers and also children. These figures are been combined and fed into the toolkit.

2.6.8 Controlled Landfills/Deposits

No controlled landfills/deposits

2.6.9 Informal Dumping of General Waste

According to a research report by Wiedinmyer et al., "*Global emissions of traces of gases, particulate matter, and hazardous air pollutants from open burning of domestic waste*"², the informal dumping of general waste was 127732 tons. This figure is been fed into the toolkit.

Wastes from consumer products containing mercury can end up in dumpsites. Mercury is still used in a wide range of products, including batteries, paints, switches, electrical and electronic devices, thermometers, blood-pressure gauges, fluorescent and energy-saving lamps, pesticides, fungicides, medicines, and cosmetics. Once used, many of the products and the mercury they contain enter waste streams. While mercury in dumpsites may slowly become re-mobilized to the environment, waste that is burnt can be a major source of atmospheric mercury, especially from uncontrolled burning in dumpsites.

2.6.10 Waste Water System/Treatment

Gambega Limited (a Coca Cola bottling company) is the only company in the Gambia with a waste water treatment facility. According to the information obtained, the company treated around 3,895 m³/year. This is the figure that has been used in the toolkit.

2.6.11 Test of waste default factor

² Ibid.

In this inventory, default input factors were used for the estimation of mercury releases from general waste treatment and wastewater treatment. The default factors are based on literature data of mercury contents in waste and wastewater, and these data were only available from developed countries. The following test of the results was performed to qualify the results for these sources.

The test made for general waste compares the calculated inputs to all four general waste sub-categories with the sum of general waste outputs from intentional mercury uses in products plus processes as follows, using data from the Inventory Level 1 spreadsheet:

In the IL1 spreadsheet, the test was done as follows: Tab "Level 1-total summary":

$(E60+E64+E66+E67) > 2*(J25+J26+\sum(J31 \text{ to } J55)).$

$(0+958+0+639) > 2*(0+0+994).$

$1597 > 1988$

The calculations made indicate that the default input factors for general waste does not necessarily over-estimate the mercury releases from these sub-categories.

Furthermore, the calculation shows that there are significant mercury flows from consumption of mercury-added products (mainly batteries) to general waste.

2.7 Data and inventory on general consumption of mercury in products, as metal mercury and as mercury containing substances

Mercury is a component of a wide range of products from thermometers to miniature batteries. Researchers have shown that between 65-75% of mercury used in products is used in batteries, measuring and control devices, and electronic device and this is a similar situation to the Gambia as we depend heavily in the importation of goods particularly those from China.

The Gambia suffers the same fate as most countries in the sub region as skin lightening is common practice in the Gambia. Mercury is a common ingredient found in skin lightening soaps and creams.

Due to the toxicity of mercury, manufacturers have come of different names to mimic and fake consumers in labelling on the packaging of the active ingredients on products. Common names to check out on are as follows; mercury, Hg, mercury iodide, hydrargyrium oxydum rubrum (mercury oxide), amide chloride of mercury, quicksilver, cinnabaris (mercury sulfide), ammoniated mercury. Thus most companies do not even put in their levels at all.

2.7.1 Mercury application and use in the health facilities

Health Care Facilities were proposed to be the highest consumers or users of mercury products prior to the inventory. Mercury's ability to dense and maintain its volume in response to change in pressure makes it a useful device to measure blood pressure. Mercury is a major component of a wide range of equipment utilize in hospitals and health care facilities. The applications range from small size thermometers to Mercury Sphygmomanometers.

Hospitals and health care facilities in the Gambia had been visited to verify the presences and use of any mercury containing device or equipment both in use and not in use.

Other applications of mercury in the health fraternity have also being looked into; Hg feeding tubes, esophageal dilators, mercury spectral tubes but none were encountered during the inventory. The table below shows some of the hospitals in possession of Hg instruments and their status.

Table II-1: List of Hospitals Visited and Mercury Items

No	Health Facility	item	Quantity	Remarks
1	Soma District Hospital	Hg Sphygmomanometer	2	Not In Use
2	Bansang Health Center	Hg Thermometer	10	In use
		Hg Sphygmomanometer	8	1 in Use
3	AFPRC General Hospital	Hg Thermometer	12	Not In Use
		Hg Sphygmomanometer	1	Not In Use

2.7.2 Mercury use in Beauty and Cosmetics

Beauty and Cosmetic products are popular products that ladies prioritize so much among the list of item they purchase in a daily bases. Mercury is believed to be the active ingredient in skin lightening products particularly those coming in Africa. Mercury in cosmetics are known to exist in two forms, inorganic mercury e.g. ammoniated mercury which is used in skin lightening soaps and creams, organic mercury like thiomersal (ethyl mercury) and phenyl mercuric salt are used as cosmetic preservatives in eye makeup cleansing products.

Through random interview with ladies that utilize skin lightening products, a list of product reportedly containing mercury were given to them for identification which most of them are known to exist in the country. The table below shows the list of beauty products containing mercury. However, due to the lack of clear information, the concentration of mercury in these products is not reported. This would require the use of specific instruments to conduct analyze the mercury content in skin lightening creams, soaps and other cosmetics especially those that are found in The Gambia.

Table II-2: List of cosmetic products (cream and soap) containing mercury, and their presence in The Gambia

No	Commercial Name	Category	Status in The Gambia: YES for present; Others not confirmed
----	-----------------	----------	---

1	Stillman	Cream	not confirmed
2	Arche	Cream	not confirmed
3	Fair & Lovely	Cream	YES
4	Pohli Syria	Cream	not confirmed
5	Diana	Cream	YES
6	Jiaoli	Cream	not confirmed
7	Pimplex Medicated	Cream	not confirmed
8	New Shirley Medicated	Cream	not confirmed
9	Dermaline	Cream	not confirmed
10	Miss Key	Cream	not confirmed
11	Crema Santa	Cream	not confirmed
12	Manning Crema De Belleza	Cream	not confirmed
13	Bioactive	Cream	not confirmed
14	Jin Sheng Mei	Cream	not confirmed
15	Ginseng	Cream	not confirmed
16	Orrefor	Cream	not confirmed
17	Pally	Cream	not confirmed
18	Bivong	Cream	not confirmed
19	Butae	Cream	not confirmed
20	Silvana	Cream	YES
21	Ly-Na	Cream	not confirmed
22	Alfa	Cream	not confirmed
23	Yin Fong	Cream	not confirmed
24	Ideal	Cream	YES
25	Melanex	Cream	not confirmed
26	Cing Cing	Cream	not confirmed
27	Daifu	Cream	not confirmed
28	Minerva	Cream	not confirmed
29	Fasco	Cream	not confirmed
30	Mui lee Hiang	Cream	not confirmed
31	Natural 99	Cream	YES
32	Rose Super White	Cream	not confirmed
33	Emel Skin Care	Cream	not confirmed
34	Movate	Soap	not confirmed
35	Mekako	Soap	YES
36	Jaribu	Soap	YES
37	Tura	Soap	YES
38	Acura	Soap	not confirmed
39	Rico	Soap	not confirmed
40	Fair Lady	Soap	YES
41	Elegance	Soap	not confirmed

42	Miki	Soap	not confirmed
43	Jambo	Soap	not confirmed

2.7.3 Mercury use in Academia, Research, Engine Control and Laboratories

Mercury is a rare chemical substance within the academic field particularly in the Secondary and Tertiary learning institutions. The inventory revealed that only very minimal types of mercury reagents are present in schools. Mercury reagents that were assessed are elemental mercury, laboratory reagents (e.g. mercury oxide, mercury chloride, mercury sulfate, mercury nitrate, and mercury iodide), mercury laboratory thermometers, mercury barometers and mercury switches. Elemental mercury and other mercury containing reagents are used during qualitative analysis. Elemental mercury specifically used to demonstrate the concept of density. Although teachers stress out that the use of it in the school is quite minimal compared to other inorganic and organic reagents e.g. acids, bases and alcohols.

Most of the laboratory Mercury Thermometers are contained in a silver bulbs which is a minute quantity (1.5g and 3g). Recently alcohol type thermometer are in the increase as alternatives to mercury ones.

Table II-3: List of schools visited showing the quantity of mercury products and their status in The Gambia

No	School	Item Description	Quantity	Remarks
1	Gambia Senior Secondary School	Elemental Mercury	100mg	Not in Use
2	Berending Senior Secondary School	Hg Thermometers	4	In use
3	Farafenni senior Secondary School	Hg Thermometers	6	In use
4	Armitage Senior Secondary School	Liquid Hg	120g	in store
		Hg Thermometers	7	In use
5	Essau Senior Secondary School	Mercury oxide	75g	In store
		Mercury chloride	Unknown	in store
		Hg Thermometers	7	In use
6	Brikamaba Senior Secondary School	Hg Thermometers	6	In use

The Gambia has Eight (8) Meteorology Stations located at different sites within the country. The Central station is located at the Airport in Yundum which has the only

Mercury Barometer and the remaining station housed the mercury thermometers only.

Table II-4: List of Meteorological stations in The Gambia with the quantity of mercury products and their status

No	Meteorology Station	Items	Quantity	Remarks
1	Central Station YUNDUM	Hg Thermometer	10	In use
		Hg Barometer	5	4 in Use
2	Banjul	Hg Thermometer	8	In use
3	Kerewan	Hg Thermometer	8	In use
4	Sibanour	Hg Thermometer	7	In use
5	Jenoi	Hg Thermometer	8	In use
6	Kaur	Hg Thermometer	8	In use
7	George Town	Hg Thermometer	9	In use
8	Basse	Hg Thermometer	8	In use
9	Fatoto	Hg Thermometer	8	In use

Research institutions like the National Agriculture Research Institute (NARI), University of The Gambia, Plant Protection Services and National Environment Agency have been utilizing mercury and mercury added products in research works at a very small scale as reagents and in thermometers for analysis.

Table II-5: Institutions visited with the quantity of mercury products and their status

No	Laboratories	Items	Quantity	Remarks
1	National Environment Agency	Hg Thermometer	1	In store
2	Plant Protection Services	Hg Thermometer	2	Not in Use
3	Radville Farms	Hg Thermometer	0	only Laser
4	National Agriculture Research Institute	Hg Thermometer	15	In Use
		Mercury Iodide	30g	In Use
		mercuric sulphate	100g	In store
		Kjeldahl Catalyst	300 Tablets	0.1Hg/tablet in Store
5	University of The Gambia/ Gambia College	Hg Thermometer	6	In Use
		Mercury Chloride		In store

The Gambia as many other nations depends heavily on heavy and light hydrocarbon fuel to power generators for electricity. The National Water and Electricity Company (NAWEC) are the main suppliers of electricity to communities in the country with few sub contracted companies. Main Stations across the country were visited and they all equipped with main the same type of engine that run on heavy fuel. They are built with alcohol type engine control thermometers and sensors within the engine

to detect and read engine temperature. None were actually found to contain a mercury type engine control thermometer.

2.7.4 Mercury use in Dental Amalgams

The Gambia like many other nations has been using mercury amalgams as dental fillings to repair damage tooth. Dental amalgam is the most commonly used dental filling material and it's a mixture of mercury and a metal alloy. The normal composition is 45-55% mercury, approximately 30% silver and other metals such as copper, tin and zinc. Mercury contained in dental amalgam is the greatest source of mercury vapor and therefore poses serious risk on human health (WHO mercury exposure report, 2008).

The number of dental clinics has increased in the recent years in the Gambia and this has led to establishment of National Dental Association; The Gambia. The Gambia dental association was able to provide the list of dental clinics operating in the country and it has shown in their records that they all use similar materials in their filling activities. Checklist has been administered to most of the dental clinics and proves of mercury amalgams have been shown but the import records of the total import cannot be established. An average main dental station uses an approximately 25 dental amalgam capsules per month according to Smile dental clinic reports. Due to the poor waste management system in the country, pulled teeth containing amalgam are discarded as general waste while other are suspended in water bottles.

2.7.5 Mercury in Electronics and Electrical Equipment

As The Gambia struggles to meet the electricity needs of it citizenry, the increased utilization of energy efficient products without considering the hazards associated with those products regarding their waste is a concern. The National Bureau of Statistic data on the import of mercury products showed an incredible rise in the importation of electrical and electronic devices as shown in the table below. Thus, the importation and utility of fluorescent bulbs have particularly increased from 2010 to 2015.

Button cell batteries are known to contain approximately 0 to 25mg of mercury which is an integral component of small gadgets like watches, calculators, toys and small lightening devices. Mercury oxide batteries are also widely imported and utilize in the country and are mostly imported from china and Dubai. Mercuric Oxide batteries contain mercury as the electrode and are useful in applications that require a high energy density and a flat voltage curve. In the past, mercuric oxide button-cell batteries were used in hearing aids, watches, calculators, electronic cameras, and other personal electronic items requiring a small battery. According to the UNcomtrade data 2014, The Gambia imports on average 4993279kg of mercuric oxide batteries and exports on average 355111.20kg to mainly Bissau, Mali and Senegal. The difference (import minus export) which equals to 4638167.8kg is

consumed in the Gambia. Based on the total weight of 0.002kg of mercury per battery, 4657.771563kg of mercury was converted in tonnes (about 5 tonnes), which was used as an input factor in the toolkit.

2.8 Data and inventory on crematoria and cemeteries

2.8.1 Crematoria

Crematoria has never been performed in The Gambia due to religious and traditional reasons.

2.8.2 Cemeteries

There is no adequate data available on the number of deaths in the country. Mortality data are mostly recorded at health facilities and are strictly confidential. Traditional means of death records and lack of post mortem per death by communities due to religious influence renders such data insufficient.

2.9 Stocks of mercury and/or mercury compounds, and storage conditions

There is no significant stocks of mercury in The Gambia. The available stocks include the old medical equipment containing mercury including glass Hg thermometers, Hg barometers, Hg Sphygmomanometer, and some small quantities of elemental mercury and Hg Compounds kept in laboratories.

2.10 Supply and trade of mercury and mercury containing compounds, including sources, recycling activities and quantities [not included in the UNEP Toolkit although most information/data can be extracted from the categories included in the Calculation Spreadsheet]

2.11 Contaminated sites

Mercury contaminated sites have not yet been identified in The Gambia. The main concern relating to mercury contaminated sites is the open disposal and burning of mercury containing mercury. These include dental amalgam waste, broken medical equipment (thermometers, barometers, etc.), empty containers of skin lightening creams, broken electrical equipment (fluorescent tubes, switches and relays, etc.), and others. Therefore, it is highly suspected that the dumpsites where these wastes are dumped and burnt could be contaminated with mercury.

It is important to note that, the areas surrounding these dumpsites because of their high fertility, some city farmers often cultivate the areas. The potential threat therefore, is that

the crops mainly corn and some other vegetables could be heavily contaminated mercury because of its high affinity for absorption. In addition, due to the close proximity of the Mile II dumpsite to the wetlands, there is high potential of mercury compounds being washed into the waters in the wetlands area. These areas are also often utilized by fisher men and women to harvest fish oysters. All of these poses serious risk to the population

that finally consume the harvests. Therefore, it is recommended to conduct analyses on the soils and water bodies around the dumpsites, and also to analyse the crops and sea food harvested in the said areas. These sites include mainly the Bakoteh dumpsite in the Kanifing Municipality and the Mile II dumpsite in the Banjul City Council. Furthermore, as a result of the ASGM activity carried out upstream in the Kedogou Region in Senegal, it is suspected that the River Gambia could be polluted with mercury by the downstream flow. It is also recommended to conduct analyses on the waters and sea food close to the said region. The agreed upon strategies for the identification or confirmation of the suspected contaminated sites include: Strengthen existing laboratories to analyze mercury samples. Build capacity of staff on mercury sampling and analyses. Use of appropriate assessment tool that would be used to test samples across the country. Develop/adopt standard guidelines on site sampling and analyses.

2.12 Impacts of mercury in human health and the environment

Mercury is a toxic, persistent pollutant that bioaccumulates and biomagnifies through food webs. People are exposed to methylmercury mainly through their diet, especially through the consumption of freshwater and marine fish and consumption of other animals that consume fish (such as marine mammals). People may be exposed to elemental or inorganic mercury through inhalation of ambient air during occupational activities, and from dental amalgams. Occupational exposures can occur where mercury or mercury compounds are produced, used in processes, or incorporated in products.

Occupational exposures have been reported from (among others) chlor-alkali plants, mercury mines, mercury-based small-scale gold and silver mining, refineries, thermometer and sphygmomanometer factories, dental clinics with poor mercury handling practices, and production of mercury-based chemicals. Exposures to elemental mercury or inorganic mercury forms can also occur due to use of some skin-lightening creams and soaps, the presence of mercury in some traditional medicines, use of mercury in cultural practices, and due to various accidental mercury spills in homes, schools or other locations. Minor exposures to other forms of organic mercury may result from the use of thimerosal (ethylmercury thiosalicylate) as a preservative in some vaccines and other pharmaceuticals (WHO Mercury Exposure, 2008).

All humans are exposed to some low levels of mercury. The factors that determine the occurrence and severity of adverse health effects include: the chemical form of mercury; the dose; the age or developmental stage of the person exposed (the fetus is considered to be the most susceptible); the duration of exposure; and, the route of exposure (inhalation, ingestion, and dermal contact). Dietary patterns can increase exposure to a fish-eating population when fish and seafood are contaminated with mercury.

The primary targets for toxicity of mercury and mercury compounds are the nervous system, the kidneys, and the cardiovascular system. It is generally accepted

that developing organ systems (such as the fetal nervous system) are the most sensitive to toxic effects of mercury. Fetal brain mercury levels appear to be significantly higher than in maternal blood and the developing central nervous system of the fetus is currently regarded as the main system of concern as it demonstrates the greatest sensitivity. Other systems that may be affected include the respiratory, gastrointestinal, hematologic, immune, and reproductive systems. Effects on the nervous system (especially the developing nervous system) appear to be the most sensitive toxicological endpoint observed following exposure to elemental mercury and methylmercury, while damage to the kidneys is the key endpoint in exposure to inorganic mercury compounds.

Chapter III: Policy, Regulatory and Institutional Framework Assessment

<p>Article 3 - Mercury supply sources and trade</p>
<p>Description of Article:</p>
<p>3.1) Not allow new primary mercury mining- Applicable 3.2) Phase out existing primary mercury mining within 15 years -Not applicable- 3.3) Prevent the import and use of mercury from primary mercury mining for artisanal and small-scale gold mining (ASGM)-Applicable- 3.4) In accordance with Article 3.5(b), restrict the import and use of excess mercury from decommissioning chlor-alkali plants, and require environmentally sound disposal- Applicable- 3.5) Obtain information on stocks of mercury or mercury compounds exceeding 50 metric tons (MT), and mercury supply generating stocks exceeding 10 MT/yr- Applicable- 3.6) Not allow the export of mercury unless the importing country provides written consent the mercury is for an allowed use or environmentally sound storage, and all other conditions of Article 3.6 are met-Applicable- 3.7 Not allow the import of mercury without government consent, ensuring both the mercury source and proposed use are allowed under the Convention (and applicable domestic law)-Applicable-</p>
<p>Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</p>
<p>In the National Environment Management Act (NEMA), 1994, the Schedule (environmental impact assessment part 'A') section 7, specifies by using broad terms such as precious metal, metalliferous ores and others that any mineral can be mined in The Gambia if approved by an EIA. This section indirectly creates the power to mine any mineral and this does not necessarily exclude metallic mercury. However, the EIA can disapprove of any project which is harmful to the environment and human health. There is no provision in the NEMA that categorically prohibit the prospecting and development of a mercury mine in The Gambia.</p> <p>Section 2 under subsection 1 to 2, the Minerals Act of 1963 empowers the Director of Geological Department and the Executive Director of NEA to block the</p>

issue of license, on grounds of causing damage to health and the environment, to any type of mining that has started or yet to be started. Mining includes all types of mining and mercury mining cannot be excluded.

The Mines and Quarries Act, 2005 has the following provisions:

Section 97. The Secretary of State may, by regulations, declare any mineral, in its refined or unrefined state or in both states, to be a restricted mineral; and

Section 98. (1) Unless specifically authorised to do so by a mineral right, a person shall not deal in or possess a restricted mineral except with, and in accordance with a special licence.

Mercury can also be declared as restricted mineral. We have seen that NEMA 1994, The Minerals Act of 1963 and Mines and Quarries Act, 2005 can be used to implement Article 3.1

The Mercury study that preceded the signing of the Minamata Convention by The Gambia does not mention any incidence of mercury mining in the Gambia. It is for this reason the provision of the Convention, that is, Article 3.2 on phasing out of existing primary mercury mining is not applicable to the Gambia.

The Pesticides and Hazardous Chemical Act 1994 Regulations, PART VII, Section 25 (1) provides that: An application for an authorization to import, manufacture or use an unregistered pesticide in accordance with Section 13 of the Act shall be made in writing to the Board and shall disclose the following: (A list of information that indicates whether or not the pesticide is harmful or prohibited). Hence, the importation of hazardous chemicals is subject to control of the custom officers in collaboration with NEA officials and prohibited products which are imported are always forfeited

The Gambia re-export a variety of goods to countries in the sub-region one cannot rule out the possibility of importers in the Gambia importing and exporting organic and inorganic mercury to countries in the sub-region.

The Pesticides and Hazardous Chemical Act 1994 Regulations. PART V of PART B section 17, and PART IV in section 13 and Section 14 provide for controlling imports and exports of pesticides.

Section 3 (2) and section 20 (1) have provisions on import, export, manufacture, distribution, storage, and disposal of chemicals and pesticides in The Gambia and are relevant to Article 3 on sources and trade on primary mercury from mining.

The 1997 Constitution of the Gambia. This constitution is the supreme Law of The Gambia and any other law found to be inconsistent with any provision of this Constitution shall, to the extent of the inconsistency, be void. Chapter 215 (4d) of the Constitution provides that the State shall pursue a policy of protecting the

environment; Chapter 220 (1j) provides for citizens to cooperate with appropriate agency to protect and preserve the environment; Chapter 216 (4) provides that the State shall endeavour to facilitate equal access to clean and safe water, adequate health and medical services, habitable shelter, sufficient food and security to all persons.

Mercury compounds is among the list of banned chemicals in The Gambia. The Ban was contained in an Order from the NEA that shows a list of banned chemicals and mercury compounds was among them. See NEA website. Mercury was banned under the prior informed consent (PIC) operated by FAO. However, In 2014, about 2 tons of mercury was imported into the country.

The Pesticides and Hazardous Chemical Act 1994 Regulation, the NEMA and Mining Acts empowers the NEA and the Department of Geology to take actions that are relevant to implementing Articles 3.1, and 3.3 to 3.6. which are described above.

Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions *(only in relation to binding provisions):*

Ban on the importation and use of mercury compounds was an administrative Order there is a need to make it a law which would be passed by the National Assembly. None of the Acts cited above mentioned mercury by name, mercury was implied in the general terms, such as minerals or chemicals used in the Acts. Hence, in future it may be difficult for administrative personnel with no knowledge about mercury to implement its management requirements.

The 1997 constitution of The Gambia does not give any further guidance on the management of the environment in general and chemicals.

The constitution does not address specific line of authorities that would be required by the Convention.

Relevant national stakeholders/institutions

Role with respect to the above listed provisions:

The National Environment Agency formulates, implement and enforce policies and legislations on chemicals, The Department of Geology formulates, implement and enforce policies and legislations on mining, The Department of Trade formulates, implement and enforce policies and legislations on imports and exports of chemicals in collaboration with NEA.

The NEA through the Minamata project collected useful statistics on use of mercury in the country.

Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:

Staff of the institutions mentioned above should be trained on mercury management through a sustained training programmes.

The constitution of The Gambia is not easily amended like other Laws some provisions require three-quarters votes of all members or even a referendum for amendments to take effect. It cannot be amended to regulate specific environment management issues because it may conflict with other laws as it has a provision that declares its supremacy over other laws.

The general public is not aware about the harmful effect of mercury, legislation on mercury and the various management options, such as the use of alternatives to mercury.

What can be done

Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable. In a new regulation for mercury and other harmful chemicals and substances one may make reference to the relevant provisions of the Constitution and Other Acts. It is in this regulation which should be passed by parliament and assented to by the president that a legal ban on mercury, its compound and its products are expected.

Article 4 - Mercury-added products

Description of Article:

4.1 Not allow the manufacture, import, and export of products listed in Part I of Annex A. Some of these mercury-added products are batteries, lamps, switches and relays, cosmetics, pesticides, barometers, thermometers and other non-electronic measuring devices; cosmetics and pesticides by 2020;

4.2 Phase down the use of dental amalgam through two or more measures listed in Part II of Annex A

4.3 Take measures to prevent the incorporation of products listed in Part I of Annex A

4.4 Discourage the manufacture and distribution of new mercury product types.

Policy and regulatory measures in place that enable the country to comply with the above listed provisions:

A section of NEMA which is relevant to this Article is sections 36. (2) which provides that The NEA shall identify and classify materials, processes and waste that are dangerous to human or animal health and the environment. The NEA website: www.nea.gm, under the tab button named Program Areas, contains the following extract:

"PESTICIDES AND OTHER CHEMICALS BANNED IN THE GAMBIA (By the Hazardous Chemicals and Pesticides Control and Management Board of NEA). It is illegal in The Gambia to import, manufacture, formulate, offer, hold on stock, sell, use or advertise the following banned chemicals:" See Annex 2. Mercury compounds is among the list.

Also section 37 of NEMA provides that The Council, that is, NEMC shall make regulations controlling, prohibiting or restricting the manufacture or use of substances that deplete the ozone layer identified in accordance with the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer. Part A Section 10, of NEMA list a number of processing and manufacturing industries that must pass the test of EIA before commencement. Some of these industries are potential sources of mercury and mercury compounds.

The Gambia Solid Waste Management Strategy, 1997, The strategy mentions about mercury in batteries. Section 12.8 (ii) recommends that a legislation should be enacted to control the import of certain types of batteries. The principal hazards associated with certain batteries are due to the presence of heavy metals such as mercury and cadmium.

Section 25, sub-section-(1) of the Pesticides and Hazardous Chemical Act 1994 Regulations, PART VII provides that an application for an authorization to import, manufacture or use an unregistered pesticide shall be made in writing to the Board and shall disclose particulars that gives information about the level of compliance with environmental standards. Nothing was mentioned about chemicals in particular mercury in its various forms,

Section 22, sub-section (1) of The Pesticides and Hazardous Chemical Act, 1994 empowers the Chemical board to restrict the use and handling of a pesticide or to ban

a pesticide if pesticide causes or is likely to cause adverse effects to human health, animals, plants or the environment,

Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions (only in relation to binding provisions):

Ban on the importation and use of mercury compounds was an administrative Order there is a need to make it a law which would be passed by the National Assembly and assented to by the president. .

None of the Acts cited above mentioned mercury by name, mercury was implied in the general terms, such as materials, substances, pesticides or chemicals used in the Acts. Hence, in future it may be difficult for administrative personnel with no knowledge about mercury to implement its management requirements. The Ban on mercury compounds didn't defined mercury compounds so that one may not know whether it includes mercury and products containing mercury.

<p>According to the Convention, by 2020 the products listed in Annex A, part I (mercury-added products) cannot be imported, exported or manufactured, and NEMA and other legislations do not adequately address these products in terms of what they are.</p>
<p>Relevant national stakeholders/institutions</p> <p>Role with respect to the above listed provisions:</p> <p>The National Environment Agency formulates, implement and enforce policies and legislations on chemicals , The Department of Trade formulates, implement and enforce policies and legislations on import, export and manufacturing of all types of goods and services collaboration with NEA in areas pertaining to the health of the environment and the living things on it. The Customs Department of The Gambia Revenue Agency plays a very important role in enforcing Article 4 at the customs corridors of The Gambia.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p> <p>Staff of the institutions mentioned above should be trained on mercury management through a sustained training programmes. Putting in place sustained capacity in key laboratories to detect mercury, mercury compounds and product containing mercury is crucial to the implementation of article 4.</p>
<p>What can be done</p> <p>Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.</p> <p>In a new regulation for mercury and other harmful chemicals and substances one may make reference to the relevant provisions of the Constitution and Other Acts. The NEA should secure funds to prepare and regularly updates list of mercury, mercury compounds and products containg mercury and list of alternatives to the banned and the phasing out substances.</p>

<p>Article 5 - Manufacturing Processes</p>
<p>Description of Article:</p>
<p>5.1 Not allow the use of mercury or mercury compounds in the manufacturing Processes listed in Part I of Annex B (Batteries, switches, fluorescent lamps, and others).</p> <p>5.2 Restrict (as specified in the Annex) the use of mercury in the processes listed in Part II of Annex A. (Dental amalgam).</p> <p>5.3 Not allow new facilities from using mercury in the processes listed in Annex B (Chlor-alkali and others),</p> <p>5.4 For facilities with processes listed in Annex B, identify and obtain information on mercury or mercury compound use;</p> <p>5.5 Discourage new uses of mercury in industrial processes</p>

Policy and regulatory measures in place that enable the country to comply with the above listed provisions:

Section 10, in PART IV of the Pesticides and Hazardous Chemical Act 1994 Regulations, list a number of processing and manufacturing industries such as Mineral processing, reduction of ores and minerals, Smelting and refining of ores and minerals, foundries, Cement works and lime processing, oil refineries and petro-chemical works, Pulp and paper mills and others that should go through EIA before approval or disapproval to kick off.!

The Gambia Environment Action Plan (GEAP) put in place a data collection mechanism that provided information for the state of the environment reports-one in 1997 and the last in 2008. The MIA project also provides an opportunity to collect information on storage of mercury.

A number of projects or programmes such as the African Emergency Locust Project (AELP) and The National Malaria Control Programme in collaboration with the Regional Health Management Teams have identified and rehabilitated existing structures for the storage of DDT and other pesticides.

The report on the Identification of Sources and Supply of Mercury in The Gambia, 2015, does not mentioned about any manufacturing process that uses mercury or its Compound in the Gambia. However, it is important that the practice of using mercury or its compound in manufacturing processes is preempted by relevant provisions of the regulations.

Section 20 (1) of The Hazardous Chemicals and Pesticides Control and Management Act, states that no person shall be issued with a license for manufacture, the manufacture, import, export, use storage, etc, or sale of a chemical or pesticide unless the chemicals or chemical or pesticide has been registered or pesticides pesticide has been registered, or provisionally cleared. This can be applied to prevent new facilities from using mercury in any manufacturing process.

The Pesticides and Hazardous Chemical Act, 1994 regulations 22. (1) A person manufacturing or formulating or desiring to manufacture or formulate a pesticide in The Gambia shall apply to the Board for a license to manufacture or formulate a pesticide.

Section 38, sub-section (1) PART VIII POLLUTION CONTROL, NEMA, 1993, states that: No person shall discharge any dangerous material, or substance, oil or mixture containing oil into any waters or any other segment of the environment

<p>except in accordance with regulations prescribed by the Council. This provision is to some extent useful for controlling the use of mercury in manufacturing processes.</p>
<p>Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions <i>(only in relation to binding provisions):</i></p>
<p>The list of manufacturing industries that require EIA approval before starting production, in the Pesticides and Hazardous Act 1994 Regulations, does not mentioned manufacture of batteries, dental amalgam, and others mentioned by Article 5 of the Minamata Convention.</p> <p><i>None of the Acts cited above mentioned mercury by name, mercury was implied in the general terms, such pesticides or chemicals used in the Acts.</i></p>
<p>Relevant national stakeholders/institutions</p> <p>Role with respect to the above listed provisions:</p> <p>The Department of Trade formulates, implement and enforce policies and legislations on manufacturing industries in The Gambia in collaboration with the NEA.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p> <p>Staff of the institutions mentioned above should be trained in order to strengthen their skills to identify manufacturing processes that would use mercury or mercury compounds.</p>
<p>What can be done</p> <p>Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.</p> <p>In a new regulation for mercury and other harmful chemicals and substances the list of manufacturing processes that could use mercury or mercury compounds should be exhaustive.</p>

<p>Article 6 on exemptions available to a Party upon request</p>
<p>Description of Article:</p> <p>6.1 Any state or regional economic integration organization may register for one or more exemptions from the phase-out dates listed in Annex A and Annex B.</p> <p>6.2 An exemption can be registered either for a category listed in Annex A or B or for a sub-category identified by any state or regional economic integration organization.</p>

<p>6.3 Each party that has one or more exemptions shall be identified in a register.</p> <p>6.4 (c) The register shall include the expiration date of each exemption.</p> <p>6.5 Set expiry date of an exemptions at five years.</p> <p>6.6 An exemption can be extended for five years by the Conference of Party if requested by a party and provided that acceptable reasons and management measures are forwarded by the party.</p>
<p>Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</p>
<p>The Pesticides and Hazardous Chemical Act, 1994 regulations PART IV – RENEWAL OF REGISTRATION OF PESTICIDES</p> <p>20.-(1) A person desiring to renew the registrations of a pesticide shall make an application to the Board in the form attached to these Regulations as Schedule 4 and shall include:</p> <p>(d) whether the pesticide has been banned or severely restricted in any country or whether such an existing ban or severe restriction has been removed or modified</p>
<p>Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention’s provisions (only in relation to binding provisions):</p>
<p>This provision of the Chemical Act 1994 is applicable in implementing Article 6 of the Convention if the meaning of pesticide is extended to cover mercury, its compounds and its products.</p>
<p>Relevant national stakeholders/institutions</p> <p>Role with respect to the above listed provisions:</p> <p>The National Environment Agency is responsible for registering pesticides used, manufactured, imported or exported from The Gambia. The NEA will collaborate with The Department of Customs and The Department Trade in respect of the import and export of chemicals and pesticides.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p> <p>Staff of the institutions mentioned above should be trained on the exemptions in terms of expiry date and quantity allowed for the various mercury products and substances identified by the Convention.</p>
<p>What can be done</p> <p>Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.</p>

<p>Article 7 on artisanal and small-scale gold mining</p>
--

Description of Article:
<p>7.1 Take measures to reduce, and where feasible, eliminate mercury and mercury</p> <p>7.2 Establish coordinating mechanism and delineate agency roles for development/implementation</p> <p>7.3 Define and formalize or regulate ASGM consistent with the Convention Eliminate whole ore amalgamation, open burning of amalgam or processed amalgam, burning of amalgam in residential areas, and cyanide leaching of mercury-laden sediment, ore or tailings</p> <p>7.4 Set mercury use reduction goals or targets consistent with the timely elimination of the worst practices and other use reduction efforts</p> <p>7.5 Reduce mercury emissions, releases, and exposures associated with ASGM, and prevent mercury exposures of vulnerable populations (particularly women of child-bearing age and children).</p> <p>7.6 Prevent the diversion of mercury and mercury compounds from other sectors to ASGM, and manage mercury trade consistent with the NAP</p> <p>7.7 Implement a public health strategy to address mercury exposures to ASGM miners and communities</p>
Comments
<p>These provisions of this Article 7 are not applicable in the Gambia. Gold mining is so far insignificant in The Gambia. However, the Government over the past decades has shown keen interest in prospecting for various mineral resources including Gold.</p>

Article 8 – Air Emissions
Description of Article:
<p>8.1 Require best available techniques/best environmental practices (BAT/BEP) or associated emission limit values (ELVs) for new (as defined in Article 8.2(c)) sources listed in Annex D (coal-fired power plants, coal-fired industrial boilers, non-ferrous metal smelting and roasting processes, waste incineration, and cement production)</p> <p>8.2 Require one or more measures identified in Article 8.5 to control/reduce mercury emissions from existing sources listed in Annex D, which shall be operational at the source within 10 years</p>
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:
<p>At present the Gambia does not use coal power plant, however metal smelting and waste incineration are practiced in the Gambia. Cement is packaged in the Gambia but not manufactured, in future manufacturing may take place in the Gambia.</p> <p>Through the EIA programme of the NEA measures can be put in place to control/reduce emissions.</p>

Component 3 of the Mercury Initial Assessment (MIA) is expected to provide a quantified inventory of sources of mercury. At the end of the project reporting about status of mercury in The Gambia may be done through the state of the environment report by relevant stakeholders. This can happen only when the stakeholder is empowered to collect the required information. The NEA, the Department of Water Resources and The Department of Health Services are the likely candidates.

The thrust for this work is enshrined under section 49 sub-section (1) and sub-section (4) of NEMA, 1994 which state that: The Agency shall gather, analyse, manage and disseminate environmental information; and The Agency shall, at such intervals as it deems fit, publish a state of the environment report which shall highlight the achievements of the Agency in the protection of the environment and the future challenges, problems, prospects and the strategies for addressing them; respectively. This provision of NEMA, 1994 is relevant to Article 8.5 (a) of the Convention which states that a quantified goal for controlling and, where feasible, reducing emissions from relevant sources should be included in any of the national plan of a party.

NEMA Section 28 (2) provides for the establishment of minimum standards for the quality of air, water, soil and waste. Also section 38. (1) of NEMA provides that no person shall discharge any dangerous material, or substance, oil or mixture containing oil into any waters or any other segment of the environment except in accordance with regulations prescribed by the Council.

A relevant provision of NEMA is in section 39 (2): a person who pollutes or permits any other person to pollute the environment in excess of any standards and guidelines established under this Act commits an offence.

NEMA, 1994 Section 29 (1) encourages relevant authorities of the Government, eg, NEA, to use tax incentives, user fee and disincentive to encourage good environmental behaviour. This of course can be interpreted to mean best available techniques/best environmental practice (BAT/BEP).

Environmental Quality Standard Regulations, 1999, The Regulations set out in schedule I thereof environmental quality standards which are to apply in respect of ambient air, saline waters, surface fresh waters and groundwater. **Mercury standards are established therein.**

Section 2 establishes the environmental quality standard board of which the principal public health officer is a member.

Section 5. (1) The environmental quality standards set out in schedule I shall apply in respect of ambient air, saline waters, surface fresh waters and groundwater.

Section 6. (1) The Agency shall monitor the standards set out in schedule I in accordance with the parameters and techniques set out in schedule II.

Section 6 (4) Notwithstanding sub-regulation (3), a summary of the results of ambient environmental monitoring shall be provided in the National State of the Environment Report.

Mercury and cyanide standards for Surface Fresh Waters and Groundwater are fixed by the regulation as follows: mercury 0.001mg/l and 0.05mg/l for cyanide.

Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions *(only in relation to binding provisions):*

The NEMA, 1994 and the Environmental Quality Standard Regulations, 1999 didn't specify details of best available techniques or best environmental practice and alternative techniques for reducing mercury emissions from the identified and available sources in The Gambia, eg incineration of clinical waste, smelting of non-ferrous metal, etc.

The air quality standards of the 1999 Environmental Quality Standard Regulations has nothing on mercury.

A large number of products containing mercury have no standards for level of concentration of mercury in the product and mercury emissions to air

Relevant national stakeholders/institutions

Role with respect to the above listed provisions:

In Section 10 (j), of NEMA 1994 the NEA shall perform the following functions: carry out environmental audits and monitoring of the environment among other functions.

The national strategies for Environmental Quality Monitoring and Enforcement (EQME)

and Solid Waste Management (SWM) were developed under the guidance of the Environmental Quality Working Group.

In collaboration with the Department of Water Resources, the Gambia Police Force

and the Department of Health Services, the NEA commenced implementation of the

EQME strategy. The team focused on ambient air quality, vehicle emissions, water quality and solid waste management. The institutions were provided with training and

equipment for the implementation of the strategy.

The National Environment Agency formulates, implement and enforce policies and legislations on the management chemicals in collaboration with the Department of Public health.

Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:

<p>Staff of the institutions mentioned above should be trained on mercury management through a sustained training programmes.</p> <p>Inadequate Knowledge about best available techniques and practices to prevent and control mercury emissions and releases from major sources may limit the effectiveness of current and new provisions to manage mercury.</p> <p>Many of the requirements of the Articles of the Conventions are indirectly or broadly provided for in this Act, this may pose challenges in identifying the most appropriate authority to implement a given provision of the Convention.</p> <p>Similarly the absence of well equipped laboratories would pose limits to the enforcement of the requirements for implementing Article 8.</p>
<p>What can be done</p> <p>The use of experts in the management of mercury and other chemicals to work with a legal expert when making legislation for management of mercury and other chemicals.</p> <p>The expert would help in the preparation of best available techniques and practices.</p> <p>Build capacities of laboratories in terms of equipment, reagents and personnel training in the NEA, The Department of Public Health and other relevant laboratories</p> <p>Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.</p>

<p>Article 9 – Releases to Land and Water</p>
<p>Description of Article:</p> <p>9.1 Require reporting or otherwise obtain information as needed to identify significant sources of mercury/mercury compound releases to land or water, and to maintain an inventory of releases from the sources identified</p> <p>9.2 Take one or more measures specified in Article 9.5 to control/reduce mercury and mercury compound releases to land and water from significant sources it identifies</p>
<p>Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</p> <p>Section 32 of NEMA provides for the preparation of an inventory of biological diversity instead;</p> <p>Section 49 (1) empowers the NEA to gather, analyse, manage and disseminate environmental information. Sub-Section (2) to Sub-Section 5 and Section 10</p>

contain provisions for the coordination, management, collection, undertaking of studies, reporting, dissemination and exchange of environmental information.

Section 10 sub-section (h) of the NEMA, 1994 seeks to promote public awareness of environmental issues through gathering, analyzing and disseminating information about the environment and publishing periodic reports on the state of the environment;

Section 28, sub-section (1) of NEMA 1994 states that The Agency shall establish criteria and measurement of environmental quality in general and in particular, of (a) air quality; (b) water quality; and (g) soil quality;

the Environmental Quality Standard Regulations, 1999 was born out of the powers conferred by the above section 28 of NEMA, 1994

Section 5 (1) of the Environmental Quality Standard Regulations, 1999 specifies that:

The environmental quality standards set out in schedule I shall apply in respect of ambient air, saline waters, surface fresh waters and groundwater.

Section 5(2) of the same 1999 Quality Standard Regulations states that: The Agency shall ensure that the standards set out in Schedule I are maintained and shall take appropriate measures to ensure same.

Section 6(1) of the 1999 Quality Standard Regulations specifies that: The Agency shall monitor the standards set out in schedule I (which gives air and water quality standards) in accordance with the parameters and techniques set out in schedule II (for monitoring water and air quality).

Section 6(2) of the 1999 Quality Standard Regulations states: In monitoring the standards the Agency shall make use of an appropriate laboratory or other institution having the required analytical capability.

Schedule I established the following standards for mercury: surface water standard (0.001mg/l) for ground water standard (0.001mg/l)

The air quality standard has nothing on mercury and there is no land quality standard.

Section 38, sub-section (1) PART VIII POLLUTION CONTROL, NEMA, 1994, states that: No person shall discharge any dangerous material, or substance, oil or mixture containing oil into any waters or any other segment of the environment except in accordance with regulations prescribed by the Council.

Since a number of artisanal gold mines are operated in neighboring countries within the basin and around the sources of The river Gambia it is believed that the surface and ground waters of the Gambia are highly vulnerable to mercury contamination from these mines. Few Gambians or foreign nationals with relatives in The Gambia might have received license to do gold mining in some of these neighboring countries hence the likelihood of them being involved in some form of trade in mercury cannot be ruled out completely. Therefore measures should be taken to identify nationals who are expose to mercury by trade or direct participation in SGM in neighboring countries and to find out what measures are taken by neighboring countries that would eventually reduce contamination of the Gambia river with mercury

The legal powers exist to establish a coordinating mechanism and this has been done.

Legal powers also exist to delineate the role of the NEA for the development and implementation of National Action Plan (NAP) which would have a component on international collaboration in managing the use of mercury amalgam in countries where releases can reach the Gambia in shorter time.

Section 1.6 of the National Health Policy (2012-2020) mentioned that surveillances take place at major health centre this may compliment efforts to identify nationals at risk of exposure to mercury.

Section 36 (1) of the NEMA empowers NEMC to prescribe measures for the management and improvement of the working environment. This would be useful in future when the Gambia starts mining gold or in providing awareness to Gambians who may be engaged in gold mining in neighboring countries in complying with the obligation of the Convention under Article 7 which regulates the exposure of women of child bearing age, children and others to burning of mercury in ASGM. Presently the population may be exposed to mercury in cosmetics and burning of waste containing mercury compounds and the use of dental amalgamation.

Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions (only in relation to binding provisions):

The regulations mentioned above did not clearly specify options for best available techniques. There is no strategy that set limit values to control and reduce releases from identified sources of mercury releases.

The air quality standards of the 1999 Environmental Quality Standard Regulations has nothing on mercury and there is no land quality standard.

Relevant national stakeholders/institutions

Role with respect to the above listed provisions:

<p>The National Environment Agency formulates, implement and enforce policies and legislations on the management of chemicals and land, The agency collaborates with Department of Geology, the Department Agriculture, The Department of Forestry for the purpose of managing the land.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p>
<p>Staff of the institutions mentioned above should be trained on mercury management through a sustained training programmes.</p>
<p>What can be done Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable. In a new regulation and/or strategy for the management of mercury and other harmful chemicals and substances, mercury standards for land, and detailed best available techniques and alternatives for management of mercury releases on land should be specified.</p>

<p>Article 10 -Interim mercury Storage</p>
<p>Description of Article:</p>
<p>10.1 Take measures to ensure interim mercury storage is conducted in an environmentally sound manner, taking into account guidelines to be developed by the Conference of the Parties (COP)</p>
<p>Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</p>
<p>Section 38 (6) and (7) of NEMA provide that:</p> <p>(6) (6) The Agency may dispose of the production or storage facility, vessel or motor vehicle seize in accordance with sub-section (5) to meet the cost of clean-up and restoration measures where the owner, after a passage of a reasonable time, fails to take the necessary measures.</p> <p>(7) The Agency shall not be liable to a suit for anything done by it in good faith under</p> <p>The African Emergency Locust Project (AELP) was to develop pesticide stores in eight sites. The National Malaria Control Programme in collaboration with the Regional Health Management Teams were running storage facilities for DDT. The foregoing implies that there were strategies and plans that catered for the upkeep of storage facilities.</p>
<p>Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions (only in relation to binding provisions):</p>
<p>The absence of strategies, plans and legislations that give detailed guidelines on the</p>

Upkeep and maintenance of storage facilities for excess mercury and mercury compounds that would exceed 10 tonnes
Relevant national stakeholders/institutions
Role with respect to the above listed provisions:
The National Environment Agency has powers to control storage facilities that has the potential to pollute the environment. The Agency can use its inter-stakeholder forums to reach relevant stakeholders in this regard in both the private and public sector.
Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:
Staff of the NEA and relevant stakeholders (eg department of public health, department of agriculture, NGOs dealing in chemicals, etc) should be trained on the construction and upkeep of temporary storage facility for mercury.
What can be done
Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable. In a new regulation for mercury and other harmful chemicals and substances, detailed guidelines for managing temporary storage facility for mercury should be specified.

Article 11 – Mercury Waste Management
Description of Article:
11.2 Take measures to manage mercury wastes in an environmentally sound manner, taking into account guidelines developed under the Basel Convention and in accordance with COP requirements to be developed.
11.3 Take measures to restrict mercury derived from the treatment or re-use of mercury waste to allowed uses under the Convention or environmentally sound disposal.
11.4 Require transport across international boundaries in accordance with the Basel Convention, or if the Basel Convention does not apply, consistent with international rules, standards, and guidelines.
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:
Environmental Protection (Prevention of Dumping) Act, 1988
The Act makes provision for the prevention of the dumping of industrial wastes and for the protection of the environment. This Act defines <u>dumping</u> as "any disposal of wastes into land within The Gambia or into any waters under the jurisdiction of The Gambia".

Unless otherwise issued with a permit under Regulations made under the Act, a person is prohibited from dumping or attempting to dump onto land in the Gambia or any waters within the jurisdiction of the Gambia waste produced from a source outside the Gambia.

The Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal came into force in 1992.

The Gambia joined the Basel Convention and the national focal point is the National Environment Agency. This was as a result of concern to ensure that hazardous waste movements across borders are effectively controlled to ensure protection of human health and the environment.

The solid waste management strategy, 1997, mentioned about management of waste battery that contained mercury.

Monitoring and Enforcement of Importing and Dumping Policy: It was agreed that The Gambia ratifies the Basel and Bamako Conventions and enacts the relevant legislation. Enforcement of the prevention of import of materials prohibited by these conventions should be by the National Environment Agency.

Section 4 (1) (c) of NEMA is related to Article 16 and the ACT prohibits the treatment keeping or disposing of controlled waste in a manner likely to cause pollution of the environment or harm to human health.

However Section 28(1) provides that The Agency shall establish criteria and measurement of environmental quality in general and in particular, of effluent and solid waste among others. Section 28 (2) also empowers The Agency to establish the minimum standards for environmental quality in general and in particular for solid waste disposal among others

The Gambia Solid Waste Management Strategy, 1997 Lack of resources is blamed for failure to collect all waste produced but, without this basic information, it is not possible to know how efficiently the available resources are being used, nor to make a case for provision of more.

Solid waste management strategy, 1997, covered the management of waste battery that contained mercury.

Section 10 of the Solid waste management strategy states:

'It is agreed that legislation places responsibility on producers of clinical waste to ensure that it is taken to an appropriate disposal facility. It is agreed that a consignment note system is operated, and in addition, producers would be required to keep records of all wastes produced, the disposal method and transport arrangements'.

Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions *(only in relation to binding provisions):*

Because of the gaps in The Waste Act, 1999 in the management of chemicals in general, a waste management Bill, 2007 was to be enacted which would take into

account the Basel and Bamako conventions and other international standards in the management of mercury waste.

Relevant national stakeholders/institutions

Role with respect to the above listed provisions:

In Greater Banjul and the Western Region the Banjul City Council, Kanifing Municipal Authority and Brikama Area Council are responsible for collection and disposal of waste. Monitoring waste management activities in these areas is carried out by the Public Health Department although the National Environment Act places responsibility for this with the National Environment Agency.

In the other Regions, waste collection and disposal are the responsibility of the Area Councils and the Public Health Department. There appears to be some form of confusion and inconsistency in the distribution of responsibilities between the two but, in general, it appears that the former provides financial and material resources while the latter provides management and technical supervision. The workforce appears to be provided partly by the Area Councils and partly by the Public Health Department. Monitoring is supposed to be carried out by the Public Health Department but, as they are managing the work, no independent monitoring was being undertaken

Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:

Staff of the institutions mentioned above should be trained on the management of mercury waste through a sustained training programmes.

The NEMA provides the legal framework for environmental planning, management and decision-making, like the constitution its supremacy over other laws as far as the management of the environment is concerned is provided for in Section 64 as follows: Where the provisions of this Act are inconsistent with the provisions of any existing Act the provisions of this Act shall prevail. This is a potential source of conflict with other legislations which must be resolved by amendments or the drafting of new legislation on the management of mercury and other chemicals. A waste legislation study has pinpointed some conflicts or overlaps of mandates of some authorities in different ministries to manage certain aspect of waste. There is therefore the need to review all relevant legislations and regulations to identify and resolve all the conflicts in a new legislation on management of mercury and other substances. The rule of constitutional law may allow a latter law to prevail over an earlier but a waste of time and resources and negative environmental impacts may occur before this rule apply. Other challenges are the effective and regular enforcement of environmental impact assessment regulations, mitigation measures, the implementation of

environmental audits, and the implementation of an industrial registration and discharge permitting system.

What can be done

A new legislation for the management of mercury and its compound should be enacted through bottom-up approach in order to integrate the needs, interests, concerns, local perceptions, knowledge and skills

There is a need for a new legislation regulating the management of mercury and other chemicals or gases. The legislation should be drafted in such a way as to avoid conflict of authorities and to make way for accommodating new developments and required amendments in the management of chemical substances and gases.

There are various pieces of legislation that touch on waste management in the Gambia, hence, to resolve conflicting mandates and the lack of action there is a need to draft a single comprehensive waste management legislation for The Gambia that incorporates in details provisions on measures to manage waste from mercury, mercury compounds and products containing mercury.

Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.

Article 12 on contaminated sites

Description of Article:

12.1 Develop strategies for identifying and assessing mercury/mercury compound contaminated site

12.2 If risk reduction activities are taken at contaminated sites, they are taken in an environmentally sound manner, incorporating risk assessment where appropriate

Policy and regulatory measures in place that enable the country to comply with the above listed provisions:

Section 20 (3) of the NEMA provides that The Action Plan shall relate to all matters affecting the environment and shall identify key environmental issues and strategies for preventing, controlling or mitigating any deleterious effects on the environment, and shall include the conservation of a sustainable use of natural resources.

Section 6(1) of the 1999 Quality Standard Regulations specifies that: The Agency shall monitor the standards set out in schedule I in accordance with the parameters and techniques set out in schedule II.

Section 31(1) of NEMA 1994 provides for the NEA to establish procedures for sound management of the environment.

Environmental Quality Standard Regulations, 1999 Section 6 (2) In monitoring the standards in accordance with subsection (1) the Agency shall make use of an

appropriate laboratory or other institution having the required analytical capability.
Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions <i>(only in relation to binding provisions)</i> :
The national strategies for Environmental Quality Monitoring and Enforcement (EQME) and Solid Waste Management (SWM) were developed under the guidance of the Environmental Quality Working Group formed by the NEA. The Strategies did not specify adequate measures for identifying mercury contaminated site.
Relevant national stakeholders/institutions
Role with respect to the above listed provisions:
The National Environment Agency in collaboration with the Department of Geology, the Department of Health Services the Department of Lands and the Municipal Councils and Area Councils all have a stake in the management of contaminated lands.
Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:
Staff of the institutions mentioned above should be trained on identification and management of mercury contaminated.
Funds are needed to build capacity and carry out required enforcements
What can be done
Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable. In a new legislation/strategy for mercury and other harmful chemicals and substances one may make provisions for measures to manage contaminated sites.

Article 13- Financial resources
Description of Article:
Access domestic resources as may be needed to implement Convention obligations;
Access financial resources available under the Convention financial mechanism and other resources available from multilateral, regional, and bilateral funding sources
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:
The NEA finance and administration unit in collaboration with international donors and the Ministry of Finance would seek funding for implementing the activities of the Minamata Convention.

<p>Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions <i>(only in relation to binding provisions):</i></p>
<p>Relevant national stakeholders/institutions</p> <p>Role with respect to the above listed provisions:</p> <p>The National Environment Agency in collaboration with the Ministry of Finance is responsible for managing the finances (domestic and international finances) of the NEA.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p> <p>Untimely arrival of funds sometimes caused delays in implementation</p>
<p>What can be done</p> <p>Encourage donors to find a solution to the administrative bottlenecks sometimes causing delays in receiving funding on time.</p>

Article 14, on capacity building, technical assistance and technology transfer

The Gambia has been benefitting from capacity building, technical assistance and technology transfer through multilateral and bilateral arrangements initiated through the following international conventions: Stockholm Convention on Persistent Organic Pollutants; the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that deplete the Ozone Layer; The United Nations Convention to Combat Desertification (UNCCD) ; United Nations Framework Convention on Climate Change (UNFCCC), The Basel convention and the Bamako initiative. The Minamata Convention on Mercury is not an exception it will no doubt follow the best examples of capacity building and technology transfer learned from these conventions.

Section 23 (3) (c) of the NEMA calls for a description of the technology and processes that will be used in an environmental impact statement of an environmental impact study.

The Gambia Solid Waste Management Strategy, 1997, the strategy suggested a wide range of technologies that can be used for managing waste. It was however silent on the best available techniques for managing mercury, mercury compounds and products-containing mercury.

Article 15, Implementation and Compliance Committee

Since the function of the committee, which will be elected by the conference of party is facilitative in nature, the Gambia is expected to benefit a lot because of its needs in capacity building, technical assistance and technology transfer.

Section 10 of the NEMA empowers The Agency to implement the policies of the Council on the environment and to liaise with the various ministries, departments, and agencies of Government on all issues relating to the environment and ensure that environmental concerns are integrated into all spheres of national planning and project implementation; on issues of compliance section 59 (3) a person shall be personally liable for any offence under this Act whether committed by him on his own account or as an agent or servant of another person. These provisions and others provide a window for collaboration with the Implementation and Compliance Committee established by Article 15 of the Minamata Convention.

<p>Article 16 -Public Health</p>
<p>Description of Article:</p>
<p>(a) Promote the development and implementation of strategies and programmes to identify and protect populations at risk, particularly vulnerable populations, and which may include adopting science-based health guidelines relating to the exposure to mercury and mercury compounds, setting targets for mercury exposure reduction, where appropriate, and public education, with the participation of public health and other involved sectors;</p> <p>(b) Promote the development and implementation of science-based educational and preventive programmes on occupational exposure to mercury and mercury compounds;</p> <p>(c) Promote appropriate health-care services for prevention, treatment and care for populations affected by the exposure to mercury or mercury compounds; and</p> <p>(d) Establish and strengthen, as appropriate, the institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to the exposure to mercury and mercury compounds.</p>
<p>Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</p>
<p>Section 1.6 of the National Health Policy (2012-2020) mentioned that surveillances take place at major health Centre this offers an opportunity for the health system to diversify efforts to identify nationals at risk of exposure to mercury and the population vulnerable to infection from mercury. There is the National Health Policy (2012-2020), The Draft Public Health Act 2008 and The Occupational Health and Safety Policy (2007). Their contents lack the powers to enable the country to comply with the above listed provisions.</p>
<p>Gaps: Outstanding regulatory or policy aspects that would need to be addressed/developed to ensure compliance with the Convention's provisions (only in relation to binding provisions):</p>

<p>The health policies and regulations cited above did not specifically grant powers to implement the above provisions for management of mercury, mercury compounds and products containing mercury.</p>
<p>Relevant national stakeholders/institutions</p> <p>Role with respect to the above listed provisions:</p> <p>The National Environment Agency in collaboration with the Department of Health Services, private hospitals and laboratories and NGOs active in the health sector and The Gambia Police Force would be responsible for implementing the above provisions.</p>
<p>Challenges: Remaining Capacity Gaps at National Level that need to be addressed before provisions can be met:</p> <p>Staff of the institutions mentioned above should be trained on mercury management through a sustained training programmes.</p> <p>Challenges: Obtaining the equipment and infrastructure for a wide range of technologies that can be used for managing waste is a challenge; identifying and integrating technologies specific to the management of mercury and its compounds; sustaining awareness about ASGM until the Gambia has Gold or other heavy metal mines; one major challenge facing the government is the need to identify alternative and healthy cosmetics for those who used them and to sensitize them about the availability of the alternatives and the need to quit the habit of bleaching. Resolving conflicts in mandates for managing wastes in a number of legislations.</p> <p>Many of the requirements of the Articles of the Conventions are indirectly or broadly provided for in the legislations and policy named above, this may pose challenges for the rational management of mercury and its compounds as it may results in lack of action and initiative from different authorities because of uncertainties as to where the authority lies. Inadequate Knowledge about best available techniques and practices to prevent and control mercury emissions and releases from major sources may limit the effectiveness of current and new provisions to manage mercury.</p>
<p>What can be done</p> <p>Revised the 2009 GEAP so that its strategies address most of the provisions of the Minamata Convention.</p> <p>Prepare and implement training programmes for relevant stakeholders and staff of relevant institutions. The training should be continual and sustainable.</p> <p>In a new regulation for mercury and other harmful chemicals and substances one may make reference to the relevant provisions of the Constitution and Other Acts.</p>

Article 17, Information exchange

All steps, actions, activities and strategies adopted and taken by The Gambia shall be shared through reporting to the COPs and the state of the environment report. The

Gambia through the NEA and other stakeholders will find avenues for updating herself with best practices in managing the phase-out process of elemental mercury and its other forms.

Section 10 of the NEMA provides that The Agency shall perform the following functions: (h) promote public awareness of environmental issues through gathering, analyzing and disseminating information about the environment and publishing periodic reports on the state of the environment; this would lend support to the requirements of Article 17 for Information exchange.

Article 18, Public information, awareness and education

The NEA and other stakeholders such as the Department of Health Services had put in place structures for public information, public awareness and public education. The NEA has been running the Environmental Education and Communication EE&C Programme since the implementation of the 1997 Gambia Environmental Action Plan (GEAP). In its present day form the EE&C is supported by a GIS unit.

Section 10 of NEMA, which calls for the promotion of public awareness of environmental issues through collecting and disseminating information of the environment is applicable to Article 18 of the Convention on Public information, awareness and education.

The Gambia Solid Waste Management Strategy, 1997, Sub section 9.1.1, states - It is also agreed that emphasis should be laid on education and awareness creation to make consumers, suppliers and people aware of the issues, and the communities should be encouraged to participate in such ventures. In addition, it is agreed that a category on waste reduction initiatives be included in the annual Environment Award Scheme.

Article 19, Research, development and monitoring

The Gambia through Coordination from NEA and international cooperation shall continue to develop and improve the processes of preparing inventories of the use, consumption and anthropogenic emissions of mercury and its compounds to air and releases to water and land, monitoring of the level of mercury and its compound in human blood thereby identifying the population at risk and modeling the outcome of these researches. The NEA shall coordinate the activities of the department of health, department of water resources and any other relevant stakeholder (e.g. The University of The Gambia) to be identified by NEA for the purpose of research and monitoring for implementing the provisions of the Minamata Convention.

Section 49 (1) of NEMA provides that The Agency shall gather, analyze, manage and disseminate environmental information.

Section 20 (1) provides that waste collection authorities shall carry out an investigation with a view to deciding what arrangements are appropriate for dealing with the waste by separating, baling or otherwise packaging it for the purpose of recycling it;

Article 20, Implementation plans

The NEA will liaise with national stakeholders and with selected regional plans during the process of developing an implementation plan for executing the provisions of the Convention on Mercury. The plan will be developed soon after the initial assessment and it will be transmitted to the Secretariat as soon as it has been developed.

Section 20 of NEMA has a number of provisions on Action Plan which shall be the key instrument for national environmental planning. Sub-section 2 provides that the Action Plan shall be revised at least once every ten years and at such other times as may be necessary to take into account new developments and emergent needs.

The Environmental Legislation Working Group

A revision of the National Environmental Management Act was completed in 1994. A comprehensive review of all existing laws by the Environmental Legislation Working Group in March 1996 led to the preparation of a compendium of environmentally-related laws in The Gambia. A sensitization workshop was held for lawyers on key environmental issues in The Gambia in 1996. The Environmental Legislation Action Plan, which was adopted at a national workshop in April 1996, set priorities for the drafting of legislation in EIA, Waste and Water Resources Management. The working group reviewed and adopted the Forestry Legislation, the Minerals Act, the legislation for Pesticides and Hazardous Chemicals, and Ozone Depleting Substances. It also reviewed and adopted the regulations establishing the Environmental Quality Standards Board, Environmental Quality Standards, Environmental Monitoring, and Industrial Registration and Discharge Permitting System.

Other environment related laws and regulations

National Water Resources Council Act.

Local Government Act, 2002.

Public Health Act, 1990.

Ports Act (1972).

The Factories Act, 1941.

Physical Planning and Development Control Act, 1990.

Development Control Regulations, 1995.

National Water and Electricity Corporation (NAWEC).

The Draft Public Health Act (2008).

The Occupational Health and Safety Policy (2007).

The Gambia Utilities Act (1972).
The National Water Policy.
The Anti-Littering Regulation (2008).
The Waste Management Bill (2007).

Chapter IV: Identification of Populations at Risks and Gender Dimensions

4.1 Preliminary review of potential populations at risk and potential health risks

Article 16 of the Convention encourages parties to promote the development and implementations of strategies to protect populations at risk.

Generally, according to the WHO mercury exposure report 2008, there are two susceptible subpopulations, namely, those who are more sensitive to the effects of mercury and those who are exposed to higher levels of mercury. The fetus, the newborn and children are especially susceptible to mercury exposure because of the sensitivity of the developing nervous system. In addition to *in utero* exposures, neonates can be further exposed by consuming contaminated breastmilk. Thus, new mothers, pregnant women, and women who might become pregnant should be particularly aware of the potential danger of methylmercury. Individuals with diseases of the liver, kidney, nervous system, and lung are also at higher risk of suffering from the toxic effects of mercury.

The other subpopulation that may be at greater risk to mercury toxicity are those exposed to higher levels of methylmercury due to fish and seafood consumption (such as recreational anglers and subsistence fishers, as well as those who regularly eat large amounts of fish and other seafood). Besides fish and shellfish, exposure can also be significant in populations consuming meat (muscle and organs) from marine mammals (such as seals and whales).

The Gambia is an agrarian country with many women and children exposed to the dangers of chemical pollution. Exposure to chemical pollution is mainly due to improper disposal of obsolete chemicals including pesticides and empty chemical containers. This is compounded by inadequate enforcement of the regulations to address issues that are chemical related. The presence of different chemicals such as mercury in some consumer goods and their effects on human health and the environment is a concern to public health particularly on women and children.

Uncontrolled burning of unsorted waste including plastics, batteries, empty containers of different products, broken light bulbs and electrical appliances, etc. in open dumpsites poses serious risk to residents around the dumpsites. Medical and pharmaceutical waste are commonly disposed of and destroyed by either low technology incineration or open burning at sites located within residential areas.

The health and environmental impact on communities living around dumping sites are of course tremendous. Direct exposures to all chemicals are common at workplaces in the public as well as in the private sector.

Most public and private constant workplace and environmental health hazards resulting from industry related activities. In addition to the above are the following specific issues:

- Low skilled private contractors are engaged in the importation and supply of pesticides and other industrial chemicals;
- Sale and advertising of chemicals to public is done by untrained local business men and women;
- High level of smuggling on borders with Senegal resulting in minimal control and difficulty in assembling an accurate chemical database;
- Lack of environmentally sound disposal skills;
- Inadequate regulations for effective management of chemicals;
- Misuse of certain chemicals in controlling ectoparasites like headlice, marine life and the ripening of fruits;
- Absence of stringent control mechanism of chemicals movement.

Individuals with dental amalgams generally have greater exposure to elemental mercury than those who do not. Other populations with potential for higher than average exposure are workers with high occupational exposure, and individuals who use various consumer products that contain mercury (such as some skin lightening creams and soaps), traditional ethnic medicines containing mercury, or use mercury for cultural and religious purposes.

4.2 Assessment of potential gender dimensions related to the management of mercury.

Women of child-bearing age are at high risk of heavy exposure to mercury and mercury compounds in various products especially in cosmetics. In addition, women and children do most of the household chores and therefore highly exposed to household waste that are contaminated with mercury. Some of these waste include empty containers of cosmetics, used batteries, broken light bulbs and others. Bleaching liquids for cleansing services at household and commercial levels are also potential sources to which women of child bearing age may be exposed. An increasing number of women are engaged in informal trades and weekly local markets within and across the borders of the Gambia.

Another source of exposure of women is the use of dental amalgam that has mercury compound for dental filling. Women form the majority at the dentistry to repair broken tooth. And it was reported by the Gambia Dental Association that dental amalgam containing mercury is the main form of treatment.

Article 16 of the Convention encourages parties to promote the development and implementations of strategies to protect populations at risk. At the moment, there is no programme yet on the development and implementations of such strategies.

Chapter V: Awareness/Understanding of Workers and the Public; and Existing Training and Education Opportunities of Target Groups and Professionals

Some awareness raising on chemicals management has been undertaken, but this needs to be intensified. Several government institutions have established environmental education programmes within their respective units and carry out various awareness creation activities. These include: NEA; Agricultural Communication Unit; Forestry Department: Ministry of Agriculture; Department of Parks and Wildlife Management; and Ministry of Education: Department of Non-formal Education. NGOs are also actively involved in the sensitization of communities especially on environmental matters. In addition to increasing awareness raising at the community/village level, industries in the Gambia need to be more aware of the hazards, risks, and best practices related to chemicals management.

Information management on chemicals in the Gambia is still in its primary stage. Existing information sources include: Ministry of Health Social Welfare and Women's Affairs; NEA: Ministry of Agriculture; Ministry of Trade; and Pesticide Dealers; as well as international sources online. However, it would be beneficial to establish a national information exchange system that, inter alia, provides a mechanism for interaction between scientists, decision-makers, and other stakeholders; establishes and reinforces networks both with international and national partners; and provides important chemicals related data.

Chapter VI: Implementation Plan & Priorities for Action

Article 20 of the Convention Text states that *“each Party may, following an initial assessment, develop and execute an implementation plan, taking into account its domestic circumstances, for meeting the obligations under this Convention.”*

The Gambia have expressed interest in starting the preparation of an implementation plan as part of their Minamata Initial Assessment (MIA) project. This section briefly describes how The Gambia will implement the action plan.

The Minamata Convention text also states *“Any such plan should be transmitted to the Secretariat as soon as it has been developed. Each Party may review and update its implementation plan, taking into account its domestic circumstances and referring to guidance from the Conference of the Parties and other relevant guidance. Parties should, in undertaking work in support of the above, consult national stakeholders to facilitate the development, implementation, review and updating of their implementation plans.”*

6.1 Strategic Objectives

Below are the strategic objectives that will drive the activities for goal attainment:

Strategic Objective 1 (SO1): Enhance the capacity of stakeholders who are already involved in the mercury management process ;

Strategic Objective 2(SO2) - Strengthen Legal and Regulatory Instruments Pertaining to Mercury and Mercury-containing Wastes (including Mercury-contaminated Materials/Sites) ;

Strategic Objective 3 (SO3)- Minimize if not prevent the supply, import and export of mercury, mercury-containing products and mercury-containing waste;

Strategic Objective 4 (SO4) – Strengthen public participation and IEC on mercury and mercury-containing wastes;

Strategic Objective 5 (SO5) – Establish a national inventory and database of mercury and mercury containing wastes (including mercury-contaminated sites) and Conduct continual studies on mercury and mercury wastes reduction measures ;

Strategic Objective 6 (SO6) – Minimize if not prevent the use of mercury in products and processes;

Strategic Objective 7 (SO7) – Establish effective controls for mercury removal from waste streams (air, water, sludge, soil); Develop and implement EOL management of mercury and mercury-containing wastes; and

Strategic Objective 8 (SO8) – Establish health and safety program for handling mercury and mercury-containing wastes in workplaces.

Strategic Objective 9 (SO9) – Ensure effective incineration of medical by replacing the old inefficient ovens with incinerators fitted with emission control devices.

6.2 Implementation Plan

The National Environment Agency will be the lead Agency in the implementation of the Action Plan. It will use its inter-sectoral service network program to bring about the coordination required for implementation.

6.2.1 Mechanisms

The Action Plan will be implemented over a five year period (2017-2021). As the lead executing agency, the NEA will fulfill its mandated function of coordination and supervision of the process of managing mercury and mercury compounds.

The Environment Impact Assessment programme unit shall serve as secretariat of the Mercury project and shall serve as the liaison between the Minamata Convention secretariat and the Gambia mercury project which is seated at the NEA.

6.2.2 Monitoring and Evaluation

The NEA will undertake monitoring and evaluation of the implementation process in order to track progress made in phasing out mercury by conducting a baseline survey on awareness level about the sound management of mercury and mercury compounds, a series of impact studies and preparation of the updates of the mercury inventory.

The Monitoring will be undertaken on an annual basis to investigate the status of releases and emission of mercury each year.

6.2.3 Financing Plan

The success of the implementation of the Action Plan will largely depend on the flow of funds for the Minamata project. It is expected that The Government of the Gambia and development partners will commit themselves to financing the implementation of the Action plan.

The NEA has a Finance and Administration unit whose responsibilities are to ensure that funds provided for the implementation of the plan will be used in accordance with the current financial instructions and guidelines provided by the government of the Gambia.

The secured funds will be audited both internally and externally to ensure compliance to the financial regulations governing fund management.

The plan quantifies the financial resources required for its implementation. The financing will cover the seven strategic areas as defined above.

Table VI-1: Total cost of National Action Plan 2017-2020 in US\$1000

Strategic Objective	Code	Costs
Strategic Objective 1 (SO1): Enhance the capacity of stakeholders who are already involved in the mercury management process	SO1	427
Strategic Objective2 (SO2) - Strengthen Legal and Regulatory Instruments Pertaining to Mercury and Mercury-containing Wastes (including Mercury-contaminated Materials/Sites)	SO2	103
Strategic Objective 3 (SO3)- Minimize if not prevent the supply, import and export of mercury, mercury-containing products and mercury-containing waste	SO3	97
Strategic Objective 4 (SO4) – Strengthen public participation and IEC on mercury and mercury-containing wastes	SO4	103

Strategic Objective 5 (S05) – Establish a national inventory and database of mercury and mercury containing wastes (including mercury-contaminated sites) and Conduct continual studies on mercury and mercury wastes reduction measures	S05	54
Strategic Objective 6 (S06) – Minimize if not prevent the use of mercury in products and processes	S06	15
Strategic Objective 7 (S07) – Establish effective controls for mercury removal from waste streams (air, water, sludge, soil); Develop and implement EOL management of mercury and mercury-containing wastes	S07	90
Strategic Objective 8 (S08) – Establish health and safety program for handling mercury and mercury-containing wastes in workplaces	S08	101
Strategic Objective 9 (S09) – Ensure effective incineration of medical by replacing the old inefficient ovens with incinerators fitted with emission control devices.	S09	105
Total		1095

Table VI-2: Planned activities and costs 2017-2020

Table 2: Planned activities and costs 2017-2020								
Tasks	Specific activity	Activity code	Implementing agency	2017 -2020 in US\$1000				Total cost
				17	18	19	20	
1	2	3	4	5	6	7	8	9
Strategic Objective 1 (SO1): Enhance the capacity of stakeholders who are already involved in the mercury management process	ARTICLE 14							
	Support a study tour of 3 NEA staff associated with management of mercury; 2 legal personnel that would be involved in the legal aspect of the mercury management process; 2 local consultant that would be involved in the planning, monitoring and evaluation processes and 2 custom officials that would be involved in import and export control of mercury and its compounds	SO1.1	NEA; NRA; AG Chambers					60
	Support a study tour of 2 NEA laboratory personnel; 1 water resources laboratory personnel; 1 national hospital laboratory personnel and 1 National Food Safety lab personnel for training on mercury test on air, water, land, blood, hair, food, and waste using Cold Vapour Atomic Absorption Spectrometry or other cost effective techniques	SO1.2	NEA; Water resources; Department of Health; Food Safety					35
	2 international consultants that would work with the above beneficiaries after their training to independently or jointly prepare all required guidelines for the management of mercury and mercury compounds in products and waste.	SO1.3	NEA					22
	Purchase of laboratory equipment and reagents/costs for collection and transporting samples overseas for lab test	SO1.4	NEA					100

	Purchase of 2 laptops and 2 desktop computers and licensed SPSS software and other software for the proposed database	SO1.5	NEA					5
	Construction of temporary storage facilities, purchase of protective gears	SO1.6	NEA					200
	Development of Terms of References (TOR) to procure the services of consultants and stakeholders	SO1.7	NEA, Capacitated stakeholders					5
		SO1						427
Strategic Objective2 (SO2) - Strengthen Legal and Regulatory Instruments Pertaining to Mercury and Mercury-containing Wastes (including Mercury-contaminated Materials/Sites)	ARTICLE 3 ARTICLE 7 ARTICLE 8 ARTICLE 9 and Others							
Formulate, develop, enforce and implement a new legislation entitled Chemical Management Act, 2017	Review all relevant legislation that address issues which are similar at least to some extent to the requirements of the Minamata Convention (see Draft Report on the Assessment of The National Infrastructure and Capacity to Manage Mercury (including legislation). Embody the results of the review in the new Act	SO2.1	NEA; AG Chambers					5
Develop and implement soil standards and cleanup guidelines	Review the Technical guidelines for the environmentally sound management of wastes consisting of elemental mercury and wastes containing or contaminated with mercury, UNEP 2011; the Basel Convention and the Bamako Initiative. Embody the results of the review in the new Act	SO2.2	NEA; Municipalities; Area councils					5
	Prepare final Chemical Management Act, 2017 by establishing linkages, synergies, complementarities and novelties among all the legal provisions domestic and international and	SO2.3	NEA; AG Chambers					10

	incorporate the results in the new Act; accord supremacy over other Acts in respect of the management of mercury and mercury compounds and waste containing mercury; The Act should have provisions to devote separate chapters to the management of different chemicals when the need arises to amend the Act for new chemicals.							
	The Mining section of the Act should prohibit future mercury mines; the industrial Act should prevent the use of mercury in any manufacturing process	SO2.4	NEA; AG Chambers					3
	Inform the public about the new Act	SO2.5	NEA; AG Chambers					5
	Work with other government agencies in identifying current products, assessing product life cycle for appropriate timing of gradual phase-out / banning.	SO2.6	NEA, GCCI, Consumers protection, lead local consultant					5
	Identify industry sectors/subsectors that are using mercury or have products/supplies containing mercury and develop scheme for gradual phase-out / banning	SO2.7	Same					20
	Prepare/draft guide ordinance for domestic sources of mercury and mercury containing wastes	SO2.8	Same					5
	Adopt and implement city/municipal/provincial ordinance on domestic sources of mercury and mercury-containing wastes	SO2.9	Same & municipalities, area councils					10
	Conduct study for the development of standards and guidelines	SO2.10	NEA & capacitated stakeholders					25
	Coordinate with various agencies	SO2.11	Same					5

	Inform the public about the standards and guidelines	S02.12	same					5
		S02						103
Strategic Objective 3 (S03)- Minimize if not prevent the supply, import and export of mercury, mercury-containing products and mercury-containing waste	ARTICLE 3							
Monitor the sources and establish the uses of mercury and mercury compounds and products containing mercury which are imported	Design, introduce and enforce new control forms for importing and exporting mercury, mercury compounds and products containing mercury	S03.1	NEA, NRA					3
Prepare a list of mercury-containing products for importers and exporters Prepare a list of mercury-free products	Work with medical centers, pharmacies to prepare list of dental amalgam, list of alternatives which are mercury free or have less mercury content. Determine the life cycle of available mercury dental amalgam and prepare and implement a phase down guideline.	S03.2	NEA, Department of Health					10
	Work with private and public laboratories to find out whether they use COD vials that contain mercuric thiocyanate or mercuric sulfate , and if so, search for alternative methods for chemical oxygen demand (COD) analysis;	S03.3	NEA, Water Resources; DoH					5
	Discourage the manufacture and distribution of new mercury product types	S03.4	NEA; MoT					5
	Exemptions available to a Party upon request regulated	S03.5	NEA					1
Monitor progress made in controlling trade in mercury		S03.6	NEA, GBOS, NRA					
Develop mechanisms whereby manufacturers/distributors will	Work with the manufacturers/distributors of non-mercury-containing health care instruments	S03.7	NEA, MoT, GCCI					10

make the following available in The Gambia market:- Products that have less mercury content- Products that have longer life- Products that are made of sturdy material to prevent unintended releases (breakdown, spill, or leak	to have a better competitive price for the benefits of the general consumers							
	Work out a phase out plan with the Department of health and implement it in all health care facilities and institutions nationwide, private and public.	SO3.8	NEA, DoH					5
	Work with suppliers of vaccines to find alternative for thimerosal (sodium ethylmercuric thiosalicylate) as preservative	SO3.9	NEA, DoH					5
	Work with the lighting products importers and distributors for the ongoing development of lamps that contain less mercury or have longer product life and have these products available in the market	SO3.10	NEA, capacitated stakeholders, MoT					3
	Establish product standards for other mercury-containing products, which include disclosure of mercury content	SO3.11	Same & standards Bureau					10
	Strengthen the control over entry of mercury-containing products to prevent illegal entry of mercury-containing products. Carry out sporadic checks on illicit cross border trade to track down mercury	SO3.12	NRA, NEA					15
	Prepare the required Environmental Technology Evaluation / Environmental Technology Verification (ETE/ETV) studies	SO3.13	NEA, consultant					15
	Check/review substitute materials, products, or processes if these have the appropriate ETE/ETV before introducing in the Philippine market	SO3.14	NEA, consultant					10
		SO3						97

Strategic Objective 4 (SO4) – Strengthen public participation and IEC on mercury and mercury-containing wastes	ARTICLE 18							
Develop and implement program to increase awareness and understanding of the health and environmental risks of mercury and mercury-containing wastes	Conduct a nationwide survey on awareness level about the management of mercury, mercury compounds, products and waste-containing mercury and mercury compounds	SO4.1	Local consultant, NEA					25
	Create database for the mercury awareness survey	SO4.2	Same					3
	Set-up databank/library on mercury as source of information for continuous public dissemination at NEA documentation centre	SO4.3	NEA					3
	Produce and disseminate IEC materials based on documented testimonials and popularized technical reports and risk studies	SO4.4	NEA, DoE					3
	Conduct series of seminars and lectures to various organizations both formal and non-formal organizations	SO4.5	NEA, DoE					5
Sensitize the public about the mercury products and alternatives and conduct a baseline survey on awareness about mercury	Initiate media coverage through:* Writing and placement of regular news releases* Conduct of regular press conference* Radio-television guestings by government officials* Use of existing radio and television government programs* Tapping of public affairs programs	SO4.6	NEA, GRTS					10
Create and implement educational programs at all levels	Coordinate with the Ministries of Education to integrate awareness on mercury and its health and environmental impacts	SO4.7	NEA, MoE					2
	Conduct National Orientation seminar and training of potential trainers among teachers and student leaders from different schools nationwide	SO4.8	NEA, MoE					5
	Require schools to have as one of its Outreach Program, the conduct of orientation seminars of the environmental and health effects of mercury	SO4.9	NEA, MoE					2

	and mercury-containing wastes in their respective communities							
Build and sustain network information exchange and communication	Conduct a survey of partner stakeholders to establish common interest and preferred communication mechanisms	S04.10	NEA					5
	Maintain regular coordinative meetings, including reporting on updates and the activities with partners (government agencies, NGOs, private sectors) and other stakeholders	S04.11	NEA					5
	Participate in local, national, and international forums on mercury and mercury-containing wastes management	S04.12	NEA					35
		S04						103
Strategic Objective 5 (S05) – Establish a national inventory and database of mercury and mercury containing wastes (including mercury-contaminated sites) and Conduct continual studies on mercury and mercury wastes reduction measures	ARTICLE 19							
Set-up system/network for the national database on mercury and mercury-containing wastes	Procure services for the development and establishment of the national database on stand alone or networked computers. Conduct studies on national input and output factors; collect activity data for level 2 inventory	S05.1	NEA, capacitated SH					35
Using the results of the initial inventory, expand further by requiring all establishments governed by existing regulations to submit in detail the types and quantities of mercury and mercury-containing materials/products that they use and/or generate; and the existing waste management practice	Develop survey/inventory form for mercury and mercury-containing wastes. Collate and input into the database	S05.2	NEA, capacitated SH					1

Gather/collect sampling and analysis data of mercury from existing and abandoned sites	Identify sites that use or have used mercury in their process, conduct sampling and analysis, and submit results to NEA for consolidation in the database	S05.3	NEA, capacitated SH						3
Promote the development of research into new reduction technologies	Conduct studies on the available and emerging technologies, processes, and products that can or can potentially reduce mercury and mercury-containing wastes - Seek for technology transfer	S05.4	NEA, Consultant, capacited SH						5
	Include in the short- and long-term science and technology plans and programs the support for alternative solutions to processes/products that use mercury	S05.5	NEA, UTG, NARI						5
Promote incentives to encourage adoption of emerging technologies for reduction of mercury releases	Include in the Investment Promotion Strategy of the Ministry of Trade the alternative process, technology for mercury-containing product	S05.6	NEA, GIEPA						5
		S05							54
Strategic Objective 6 (S06) – Minimize if not prevent the use of mercury in products and processes	Article 4, Article 5								
Establish a management program where source reduction (using alternative materials or alternative process not requiring mercury), waste minimization (efficient use of mercury in the process), and/or emission reduction/treatment are the critical components	Work with private laboratories to search for alternative methods for chemical oxygen demand (COD) analysis; instead of using COD vials that contain mercuric thiocyanate or mercuric sulfate	S06.1	NEA and Selected laboratories						10
	Work with the manufacturers/distributors of non-mercury-containing health care instruments to have a better competitive price for the general consumers benefits	S06.2	NEA, GCCI, MOT						5
		S06							15
Strategic Objective 7 (S07) – Establish effective controls for mercury removal from waste streams (air, water, sludge, soil); Develop and implement EOL	ARTICLE 11 ARTICLE 12								

management of mercury and mercury-containing wastes								
	Prepare a detailed guideline on mercury waste management	S07.1	NEA, consultant					10
Strictly enforce the guideline for mercury wastes management as stipulated in the new Chemical Control Act and the Hazardous Chemical Act, The Waste management Bill. Wastes Management Guideline (and their amended versions)	Conduct regular inspection to all Department of Health -owned hospitals and selected private hospitals and clinics to ensure that they follow the waste management guideline,.	S07.2	NEA, DOH					10
Encourage the treatment of wastes from combustion and industrial processes and pollution-control operations to recover, stabilize, or retire mercury in the waste where there is a risk of mercury being released to the environment through any subsequent waste storage, transfer, or disposal operation	Include in the review/assessment of the permitting process the assessment of the controls implemented to reduce/control emissions of mercury	S07.3	NEA, local consultant					2
Develop pollution prevention policies and programs aimed at reducing the amount of mercury entering wastewater treatment facilities	Establish protocols for identifying, analyzing, and reducing these sources of mercury to wastewater treatment facilities Encourage the development of appropriate management techniques to reduce the release of mercury from bio solids or effluents from waste water treatment facilities	S07.4	NEA, consultant					10
	Ensure that these requirements are integrated into the EIA process as part of the environmental mitigation plan of the proponent	S07.5	NEA's EIA unit					3

Strict evaluation and monitoring of Treatment, Storage and Disposals for mercury and mercury-containing wastes	Use of standardized inspection protocols and checklists Conduct regular inspection	S07.6	NEA's Inspectorate					10
Prepare and implement short and long term EOL storage/disposal plans for the phased-out mercury-containing products considering the life cycle of these products	Conduct feasibility study on the appropriate EOL management options: 1) long-term storage; 2) interim storage and off country disposal; 3) combination of interim storage with initial mercury recovery for internal consumption; 4) combination of interim storage with initial mercury recovery, and off country disposal	S07.7	NEA					25
Develop short- and long-term strategy for sites contaminated with mercury	Implement the best management options per type of products for mercury-containing wastes	S07.8	NEA and SH					10
	Implement immediate site control to prevent exposure while looking at long-term site remediation or rehabilitation	S07.9	NEA, SH					10
		S07						90
Strategic Objective 8 (S08) – Establish health and safety program for handling mercury and mercury-containing wastes in workplaces	ARTICLE 16							
Promote employee awareness on the Health and Safety Programs for handling mercury and mercury-containing wastes in the workplace	Develop a standard Health and Safety Program training manual for handling mercury and mercury-containing wastes in the workplace	S08.1	NEA, capacitated SH					3
	Develop training programs to effectively implement mercury waste processing and ensure safety against mercury exposure when processing mercury wastes	S08.2	NEA, capacitated SH					12
	Strengthen implementation of personal protective equipment requirements	S08.3	NEA, capacitated SH					10

Establish an Emergency Response Program on dealing with accidental release of mercury in the workplace area	Develop guidelines in responding to mercury spills/releases in the workplace and in the environment	S08.4	NEA, capacitated SH					6
	Enforce the requirements on developing emergency preparedness and response programs and conducting drills to all establishments	S08.5	NEA, SH					10
	Conduct series of seminars and lectures to various organizations both formal and non-formal organizations	S08.6	NEA, DOE, DOH					20
	Train health personnel so that they can diagnose and address mercury exposures to ASGM miners and communities	S08.7	NEA, DOE, DOH					20
	Sustainability training	S08						20
		S08						101
Strategic Objective 9 (S09) – Ensure effective incineration of medical by replacing the old inefficient ovens with incinerators fitted with emission control devices.	Set a criteria which covers at least 75% of the emissions from incineration of medical waste, i.e. include the largest incinerators (Article 8.2 (b))	S09.1	NEA, Ministry of Health, Municipal Councils					25
	Set a quantified goal for controlling and, where feasible reducing emissions from incineration of medical waste. (Article 8.5(a))	S09.2	NEA, DOH, Municipal Councils					20
	Aim for reasonable progress over time, i.e. utilizing air pollutant controls in the biggest incinerators (Article 8.6)	S09.3	NEA, DOH, Municipal Councils					30
	Maintain an inventory of emissions from that source (Article 8.7)	S09.4	NEA, DOH, Municipal Councils					30

Table VI-3: Planned activities, Baseline data 2017 and Targets 2017-2020

Table 3: Planned activities, Baseline data 2017 and Targets 2017-2020

Tasks	Specific activity	Activity code	Baseline data 2017	Targets 2017-2020
1	2	3		
Strategic Objective 1 (SO1): Enhance the capacity of stakeholders who are already involved in the mercury management process	ARTICLE 14			
	Support a study tour of 3 NEA staff associated with management of mercury; 2 legal personnel that would be involved in the legal aspect of the mercury management process; 2 local consultant that would be involved in the planning, monitoring and evaluation processes and 2 custom officials that would be involved in import and export control of mercury and its compounds	SO1.1	0	9 persons trained in the third quarter of 2017
	Support a study tour of 2 NEA laboratory personnel; 1 water resources laboratory personnel; 1 national hospital laboratory personnel and 1 National Food Safety lab personnel for training on mercury test on air, water, land, blood, hair, food, and waste using Cold Vapor Atomic Absorption Spectrometry or other cost effective techniques	SO1.2	0	5 persons trained in the third quarter of 2017
	2 international consultants that would work with the above beneficiaries after their training to independently or jointly prepare all required guidelines for the management of mercury and mercury compounds in products and waste.	SO1.3	0	1 international consult by Sept/Oct 2017
	Purchase of laboratory equipment and reagents/costs for collection and transporting samples overseas for lab test	SO1.4	0	November/December 2017

	Purchase of 2 laptops and 2 desktop computers and licensed SPSS software and other software for the proposed database	S01.5	0	November/December 2017
	Construction of temporary storage facilities, purchase of protective gears	S01.6	0	January 2018
	Development of Terms of References (TOR) to procure the services of consultants and stakeholders	S01.7		February 2018
		S01		
Strategic Objective2 (S02) - Strengthen Legal and Regulatory Instruments Pertaining to Mercury and Mercury-containing Wastes (including Mercury-contaminated Materials/Sites)	ARTICLE 3 ARTICLE 7 ARTICLE 8 ARTICLE 9 and Others			
Formulate, develop, enforce and implement a new legislation entitled Chemical Management Act, 2017	Review all relevant legislation that address issues which are similar at least to some extent to the requirements of the Minamata Convention (see Draft Report on the Assessment of The National Infrastructure and Capacity to Manage Mercury (including legislation). Embody the results of the review in the new Act	S02.1		
	Review the Technical guidelines for the environmentally sound management of wastes consisting of elemental mercury and wastes containing or contaminated with mercury, UNEP 2011; the Basel Convention and the Bamako Initiative. Embody the results of the review in the new Act	S02.2		
	Prepare final Chemical Management Act, 2017 by establishing linkages, synergies, complementarities and novelties among all the legal provisions domestic and international and incorporate the results in the new Act; accord supremacy over other Acts in respect of the	S02.3		

	management of mercury and mercury compounds and waste containing mercury; The Act should have provisions to devote separate chapters to the management of different chemicals when the need arises to amend the Act for new chemicals.			
	The Mining section of the Act should prohibit future mercury mines; the industrial Act should prevent the use of mercury in any manufacturing process	S02.4		
	Inform the public about the new Act	S02.5		
	Work with other government agencies in identifying current products, assessing product life cycle for appropriate timing of gradual phase-out / banning.	S02.6		
	Identify industry sectors/subsectors that are using mercury or have products/supplies containing mercury and develop scheme for gradual phase-out / banning	S02.7		
	Prepare/draft guide ordinance for domestic sources of mercury and mercury containing wastes	S02.8		
	Adopt and implement city/municipal/provincial ordinance on domestic sources of mercury and mercury-containing wastes	S02.9		
Develop and implement soil standards and cleanup guidelines	Conduct study for the development of standards and guidelines	S02.10		
	Coordinate with various agencies	S02.11		
	Inform the public about the standards and guidelines	S02.12		
		S02		
Strategic Objective 3 (S03)- Minimize if not prevent the supply, import and export of mercury,	ARTICLE 3			

mercury-containing products and mercury-containing waste				
Monitor the sources and establish the uses of mercury and mercury compounds and products containing mercury which are imported	Design, introduce and enforce new control forms for importing and exporting mercury, mercury compounds and products containing mercury	S03.1		
Prepare a list of mercury-containing products for importers and exporters Prepare a list of mercury-free products	Work with medical centres, pharmacies to prepare list of dental amalgam, list of alternatives which are mercury free or have less mercury content. Determine the life cycle of available mercury dental amalgam and prepare and implement a phase down guideline.	S03.2		
	Work with private and public laboratories to find out whether they use COD vials that contain mercuric thiocyanate or mercuric sulfate , and if so, search for alternative methods for chemical oxygen demand (COD) analysis;	S03.3		
	Discourage the manufacture and distribution of new mercury product types	S03.4		
	Exemptions available to a Party upon request regulated	S03.5		
Monitor progress made in controlling trade in mercury		S03.6		
Develop mechanisms whereby manufacturers/distributors will make the following available in The Gambia market:- Products that have less mercury content- Products that have longer life- Products that are made of sturdy material to prevent unintended releases (breakdown, spill, or leak	Work with the manufacturers/distributors of non-mercury-containing health care instruments to have a better competitive price for the benefits of the general consumers	S03.7		

	Work out a phase out plan with the Department of health and implement it in all health care facilities and institutions nationwide, private and public.	S03.8		
	Work with suppliers of vaccines to find alternative for thimerosal (sodium ethylmercuric thiosalicylate) as preservative	S03.9		
	Work with the lighting products importers and distributors for the ongoing development of lamps that contain less mercury or have longer product life and have these products available in the market	S03.10		
	Establish product standards for other mercury-containing products, which include disclosure of mercury content	S03.11		
	Strengthen the control over entry of mercury-containing products to prevent illegal entry of mercury-containing products. Carry out sporadic checks on illicit cross border trade to track down mercury	S03.12		
	Prepare the required Environmental Technology Evaluation / Environmental Technology Verification (ETE/ETV) studies	S03.13		
	Check/review substitute materials, products, or processes if these have the appropriate ETE/ETV before introducing in the Philippine market	S03.14		
		S03		
Strategic Objective 4 (S04) – Strengthen public participation and IEC on mercury and mercury-containing wastes	ARTICLE 18			

Develop and implement program to increase awareness and understanding of the health and environmental risks of mercury and mercury-containing wastes	Conduct a nationwide survey on awareness level about the management of mercury, mercury compounds, products and waste-containing mercury and mercury compounds	S04.1		
	Create database for the mercury awareness survey	S04.2		
	Set-up databank/library on mercury as source of information for continuous public dissemination at NEA documentation centre	S04.3		
	Produce and disseminate IEC materials based on documented testimonials and popularized technical reports and risk studies	S04.4		
	Conduct series of seminars and lectures to various organizations both formal and non-formal organizations	S04.5		
Sensitize the public about the mercury products and alternatives and conduct a baseline survey on awareness about mercury	Initiate media coverage through:* Writing and placement of regular news releases* Conduct of regular press conference* Radio-television guesting by government officials* Use of existing radio and television government programs* Tapping of public affairs programs	S04.6		
Create and implement educational programs at all levels	Coordinate with the Ministries of Education to integrate awareness on mercury and its health and environmental impacts	S04.7		
	Conduct National Orientation seminar and training of potential trainers among teachers and student leaders from different schools nationwide	S04.8		
	Require schools to have as one of its Outreach Program, the conduct of orientation seminars of the environmental and health effects of mercury and mercury-containing wastes in their respective communities	S04.9		

Build and sustain network information exchange and communication	Conduct a survey of partner stakeholders to establish common interest and preferred communication mechanisms	S04.10		
	Maintain regular coordinative meetings, including reporting on updates and the activities with partners (government agencies, NGOs, private sectors) and other stakeholders	S04.11		
	Participate in local, national, and international forums on mercury and mercury-containing wastes management	S04.12		
		S04		
Strategic Objective 5 (S05) - Establish a national inventory and database of mercury and mercury containing wastes (including mercury-contaminated sites) and Conduct continual studies on mercury and mercury wastes reduction measures	ARTICLE 19			
Set-up system/network for the national database on mercury and mercury-containing wastes	Procure services for the development and establishment of the national database on stand alone or networked computers. Conduct studies on national input and output factors; collect activity data for level 2 inventory	S05.1		
Using the results of the initial inventory, expand further by requiring all establishments governed by existing regulations to submit in detail the types and quantities of mercury and mercury-containing materials/products that they use and/or generate; and the existing waste management practice	Develop survey/inventory form for mercury and mercury-containing wastes. Collate and input into the database	S05.2		

Gather/collect sampling and analysis data of mercury from existing and abandoned sites	Identify sites that use or have used mercury in their process, conduct sampling and analysis, and submit results to NEA for consolidation in the database	S05.3		
Promote the development of research into new reduction technologies	Conduct studies on the available and emerging technologies, processes, and products that can or can potentially reduce mercury and mercury-containing wastes - Seek for technology transfer	S05.4		
	Include in the short- and long-term science and technology plans and programs the support for alternative solutions to processes/products that use mercury	S05.5		
Promote incentives to encourage adoption of emerging technologies for reduction of mercury releases	Include in the Investment Promotion Strategy of the Ministry of Trade the alternative process, technology for mercury-containing product	S05.6		
		S05		
Strategic Objective 6 (S06) – Minimize if not prevent the use of mercury in products and processes	Article 4, Article 5			
Establish a management program where source reduction (using alternative materials or alternative process not requiring mercury), waste minimization (efficient use of mercury in the process), and/or emission reduction/treatment are the critical components	Work with private laboratories to search for alternative methods for chemical oxygen demand (COD) analysis; instead of using COD vials that contain mercuric thiocyanate or mercuric sulfate	S06.1		
	Work with the manufacturers/distributors of non-mercury-containing health care instruments to have a better competitive price for the general consumers benefits	S06.2		
		S06		

Strategic Objective 7 (S07) – Establish effective controls for mercury removal from waste streams (air, water, sludge, soil); Develop and implement EOL management of mercury and mercury-containing wastes	ARTICLE 11 ARTICLE 12			
	Prepare a detailed guideline on mercury waste management	S07.1		
Strictly enforce the guideline for mercury wastes management as stipulated in the new Chemical Control Act and the Hazardous Chemical Act, The Waste management Bill. Wastes Management Guideline (and their amended versions)	Conduct regular inspection to all Department of Health -owned hospitals and selected private hospitals and clinics to ensure that they follow the waste management guideline,.	S07.2		
Encourage the treatment of wastes from combustion and industrial processes and pollution-control operations to recover, stabilize, or retire mercury in the waste where there is a risk of mercury being released to the environment through any subsequent waste storage, transfer, or disposal operation	Include in the review/assessment of the permitting process the assessment of the controls implemented to reduce/control emissions of mercury	S07.3		
Develop pollution prevention policies and programs aimed at reducing the amount of mercury entering wastewater treatment facilities	Establish protocols for identifying, analyzing, and reducing these sources of mercury to wastewater treatment facilities Encourage the development of appropriate management techniques to reduce the release of mercury from biosolids or effluents from wastewater treatment facilities	S07.4		

	Ensure that these requirements are integrated into the EIA process as part of the environmental mitigation plan of the proponent	S07.5		
Strict evaluation and monitoring of Treatment, Storage and Disposals for mercury and mercury-containing wastes	Use of standardized inspection protocols and checklists Conduct regular inspection	S07.6		
Prepare and implement short and long term EOL storage/disposal plans for the phased-out mercury-containing products considering the life cycle of these products	Conduct feasibility study on the appropriate EOL management options: 1) long-term storage; 2) interim storage and off country disposal; 3) combination of interim storage with initial mercury recovery for internal consumption; 4) combination of interim storage with initial mercury recovery, and off country disposal	S07.7		
Develop short- and long-term strategy for sites contaminated with mercury	Implement the best management options per type of products for mercury-containing wastes	S07.8		
	Implement immediate site control to prevent exposure while looking at long-term site remediation or rehabilitation	S07.9		
		S07		
Strategic Objective 8 (S08) – Establish health and safety program for handling mercury and mercury-containing wastes in workplaces	ARTICLE 16			
Promote employee awareness on the Health and Safety Programs for handling mercury and mercury-containing wastes in the workplace	Develop a standard Health and Safety Program training manual for handling mercury and mercury-containing wastes in the workplace	S08.1		
	Develop training programs to effectively implement mercury waste processing and	S08.2		

	ensure safety against mercury exposure when processing mercury wastes			
	Strengthen implementation of personal protective equipment requirements	S08.3		
Establish an Emergency Response Program on dealing with accidental release of mercury in the workplace area	Develop guidelines in responding to mercury spills/releases in the workplace and in the environment	S08.4		
	Enforce the requirements on developing emergency preparedness and response programs and conducting drills to all establishments	S08.5		
	Conduct series of seminars and lectures to various organizations both formal and non-formal organizations	S08.6		
	Train health personnel so that they can diagnose and address mercury exposures to ASGM miners and communities	S08.7		
	Sustainability training	S08		
Strategic Objective 9 (S09) - Ensure effective incineration of medical by replacing the old inefficient ovens with incinerators fitted with emission control devices.	ARTICLE 8	S09		
	Set a criteria which covers at least 75% of the emissions from incineration of medical waste, i.e. include the largest incinerators. Article 8.2 (b)			
	Set a quantified goal for controlling and, where feasible reducing emissions from incineration of medical waste. Article 8.5(a)			
	Aim for reasonable progress over time, i.e. utilizing air pollutant controls in the biggest incinerators Article 8.6			
	Maintain an inventory of emissions from that source. Article 8.7			

ANNEX I: Stakeholder Engagement process

CONTACT LIST (all institutions and persons interviewed and engaged with during the preparation of the MIA Report, Mercury Inventory and other aspects of the MIA project).

No.	Institution	Name	
National Coordinating Committee			
1.	Ministry of Environment, Climate Change and Natural Resources	Haddijatou Njie	
2.	Office of the President	Adama Ngum Njie	
2.	Ministry of Petroleum & Energy	Sadibu Badgie	
	Ministry of Justice	Lamin Ak Touray	
3.	Ministry of Trade & Industry	Fabba Jammeh	
4.	Ministry of Agriculture	Sariyang MK Jobarteh	
5.	Geological Department	Alieu Jawo	
6.	University of The Gambia	Jerro Saidikhan	
7.	Gambia Manufacturers Association	Mafugi Jatta	
8.	Gambia Dental Association	Mariama Gaye	
9.	Ministry of Health & Social Welfare	Dr. Modou Waggeh	
10.	Gambia Pharmaceutical Association	Mariama Gaye	
11.	Gambia Bureau of Statistic	Lamin Dibba	
14.	Food Safety and Quality Authority	Lalia Jawara	
15.	Gambia Association of Non-Government Organizations	Kebba K Barrow	
Task Team 1: Energy			
1.	National Environment Agency	Bafoday Sanyang	
2.	Ministry of Energy And Petroleum	Sulayman Camara	
3.	National Water and Electricity Co.	Momodou Njie	
4.	Gambia National Petroleum Co.	Kolly Suwai	

6.	Geological Department	Adolf Secka	
Task Team 2: Production Of Metals/Materials And Industrial Mercury Use			
1.	National Environment Agency	Borry Mansa Demba	
2.	Gambia Technical Training Institute	Bubacarr Cham	
3.	Gambia Bureau of Statistics	Lamin Dibba	
4.	Gambia Revenue Authority	Ebrima Sallah	
5.	Ministry of Trade and Industry	Fabba Jammeh	
Task Team 3: Waste Treatment and Recycling			
1.	National Environment Agency	Mariatou Dumbuya	
2.	Stay Green Foundation (NGO)	Baboucarr Mbye	
3.	Kanifing Municipal Council	Edrissa Njie	
4.	Ministry of Environment, Climate Change and Natural Resources	Yankuba Kanteh	
5.	National Disaster Management Agency	Lamin Tamba	
Task Team 4: Mercury In Products			
1.	National Environment Agency	Lamin Jaiteh	
2.	Food Safety and Quality Authority	Lalia Jawara	
3.	National Agriculture Research Inst.	Ebrima AA Jallow	
4.	University of The Gambia	Lamin B Dibba	
5.	Ministry of Agriculture	Saja Conateh	
6.	Medical and Dental Association	Mariama Gaye	

ANNEX II: UNEP TOOLKIT Calculation Spreadsheet

Submitted as a separate excel file

Useful Resources

Minamata Convention Website:

<http://www.mercuryconvention.org/>

Minamata Convention Text

<http://www.mercuryconvention.org/Convention/tabid/3426/Default.aspx>

Materials developed by the interim secretariat of the Minamata Convention

<http://www.mercuryconvention.org/AwarenessRaising/Resources/tabid/3873/Default.aspx>

Becoming a Party to the Minamata Convention on Mercury (FACT SHEET)

Minamata Convention on Mercury at a glance (FACT SHEET)

Overview of the negotiations process (PPT)

Overview of the Minamata Convention on Mercury (PPT)

Provision of the Convention on financial and technical support (PPT)

Practical steps of the ratification, acceptance, approval or accession processes and notifications under the Minamata Convention (PPT)

Toolkit for Identification and Quantification of Mercury Releases (UNEP)

<http://www.unep.org/chemicalsandwaste/Metals/MercuryPublications/GuidanceTrainingMaterialToolkits/MercuryToolkit/tabid/4566/language/en-US/Default.aspx>

MercuryLearn Platform (UNITAR/UNEP)

<http://mercurylearn.unitar.org/>

List of Country Mercury Release Inventories (UNEP)

<http://www.unep.org/chemicalsandwaste/hazardoussubstances/Mercury/Informationmaterials/ReleaseInventories/tabid/79332/Default.aspx>

Checklist of legal authorities to implement Minamata Convention on Mercury [Natural Resources Defense Council - NRDC]

http://docs.nrdc.org/international/files/int_15101301a.pdf

Minamata Convention on Mercury - Ratification and Implementation Manual [Zero Mercury Working Group, Natural Resources Defense Council, Ban Toxics]

[http://www.zeromercury.org/phocadownload/Developments at UNEP level/minamata manual eng january%202015%20final.pdf](http://www.zeromercury.org/phocadownload/Developments%20at%20UNEP%20level/minamatamanual_eng_january%202015%20final.pdf)

Guidance for identifying populations at risk from mercury exposure

(WHO/UNEP) <http://www.who.int/foodsafety/publications/risk-mercury-exposure/en/>

Developing a National Action Plan to Reduce, and Where Feasible, Eliminate Mercury Use in Artisanal and Small Scale Gold Mining (UNEP, 2015)

<HTTP://WWW.UNEP.ORG/CHEMICALSANDWASTE/NATIONALACTIONPLAN/TABID/53985/DEFAULT.ASPX>

Chemicals Management: The why and how of mainstreaming gender (UNDP, 2007) http://www.undp.org/content/undp/en/home/librarypage/environment-energy/chemicals_management/chemicals-management-the-why-and-how-of-mainstreaming-gender.html

Draft guidance on identification of individual stocks of mercury or mercury compounds exceeding 50 metric tons, as well as sources of mercury supply generating stocks exceeding 10 metric tons per year

http://www.mercuryconvention.org/Portals/11/documents/meetings/inc7/English/7_4_e_stock.pdf

Satya P. Mohapatra and Anne Mitchell, MERCURY TRADE IN AGLOBALIZINGWORLD; In: Trade Policy in Globalizing World