Minamata Initial Assessment National Report for Lesotho

2018



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2018

Foreword

Mercury poisoning became evident in Minamata Bay, Japan as early as 1900s. As an outcome of industrial production which released its effluent into the sea and contaminated the fish used as staple food for neighbouring communities thereby causing diseases.

It was only in 2013, Kumamoto, Japan, when countries adopted the legally binding instrument on mercury. In 2014, Lesotho deposited its instrument of accession to the Convention and became a Party. The decision to join other countries in an effort to minimise the harmful effects of mercury on human health and the environment was based on scientific data indicating how widely mercury is used in everyday life, how easily it is released and emitted into the environment and how urgently it was necessary to take regulatory measures to minimise the harmful effects.

Although, mercury is released into the environment through natural phenomena, the bulk of environmental mercury now comes from human activities. The Minamata Initial Assessment (MIA) process undertaken in Lesotho, revealed that the major source of mercury is mercury added products. In order to manage and control this source and other sources identified as stock, releases and emissions, a legal gap analysis, populations at risk and needs analysis were also undertaken in the MIA process. This was done in order to better understand the mercury situation in the country so as to make informed decisions for its management and control. The MIA process also helped to build national capacity around issues related to mercury as numerous stakeholders were involved in the process.

However, three main issues were realised during this process. Firstly, few people were aware that mercury could be found in anything from mascara and dental amalgam to small-scale artisanal gold mining and burning coal for heating homes. Secondly, few nations have preparedness to deal with the deadly element that could seep into air, land, water and the food chain. Thirdly, although bringing mercury under control could create many opportunities for sustainable development, too many such opportunities were currently being missed, along with potential means of addressing other global problems such as climate change and socioeconomic challenges.

The development of the MIA report is a practical demonstration of Lesotho's commitment towards effective implementation of the Minamata Convention on Mercury for the protection of human health and the environment from the anthropogenic releases and emissions of mercury and mercury compounds. This report should therefore be viewed as a "living" document, which will be updated as more information becomes available. More importantly, this document will serve as a benchmark for all stakeholders to cooperate towards achieving the objective of the Convention.



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Acknowledgements

The Government of Lesotho, through the Ministry of Tourism, Environment and Culture (MTEC), received funding from the Global Environment Facility (GEF) for an enabling activity for the Minamata Convention on Mercury called the Minamata Initial Assessment (MIA). This was meant to prepare itself for an early implementation of the Convention. The funding for this project was received through the UN Environment as the Implementing Agency and the Africa Institute as the Executing Agency.

The guidance and support of these two agencies throughout the project is highly appreciated. In the country, this project was overseen by the Chemicals Management Committee (CHEMAC) which acted as the project steering committee. The commitment, dedication and hard-work of this multi-stakeholder committee deserves credit for the successful completion of the project.

This report therefore is a culmination of the efforts that came from many individuals and organizations. They include line ministries, parastatals, consultants and civil society organizations. Their commitment to the course and perseverance throughout the hardships is thanked. A team-work is never easy. It is an accommodative process that requires tolerance, understanding, inclusivity and respect for all. This was well demonstrated in this assignment and in the end the final product that all parties can be proud of has been achieved.

From the onset, it is acknowledged that this report is the first step in a long journey that the country has consciously embarked on. A journey to protect its people from Mercury in whatever form it comes. While conclusion of this assignment represents a significant milestone, it challenges the country to face the trials and tribulations of this journey that lie ahead with similar vigour and veracity. A people united shall never fail.

List of Acronyms

ASGM	Artisanal Gold Mining
BOS	Bureau of Statistics
CDR	Crude Death Rate
CHAL	Christian Health Association of Lesotho
CHEMAC	Chemicals Management Committee
CIEN	Chemicals Information Exchange Network
CMA	Common Monetary Area
COWMAN	Committee on Waste Management
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNDI	Gross National Disposable Income
GNI	Gross National Income
HDI	Human Development Index
INC	Intergovernmental Negotiating Committee
IEC	Information, Education and Communication
LHWP	Lesotho Highlands Water Project
LNDC	Lesotho National Development Corporation
LPG	Liquified Petroleum Gas
LRA	Lesotho Revenue Authority
LTMPC	Lesotho Traditional Medical Practitioners Council
LTV	Lesotho Television
MEAs	Multilateral Environmental Agreements
MASL	Meters Above Sea Level
MIA	Minamata Initial Assessment
MMB	Maluti Mountain Brewery
MTEC	Ministry of Tourism, Environment and Culture
NGOs	Non-Governmental Organizations
NICR	National Identity Civil Registration
NUL	National University of Lesotho
PRTRs	Pollutant Release and Transfer Registers

SACU	Southern African Customs Union
SADC	Southern African Development Community
TRC	Transformation Resource Centre
UNEP	United Nations Development Programme
UN	United Nations
WASCO	Water and Sewage Company

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Executive Summary

As countries prepare themselves for the implementation of the Minamata Convention on Mercury after conclusion of the negotiations, it became abundantly apparent that in some countries the information on the extent and effects of Mercury was insufficient. The GEF provided the funding for some of these countries that did not have sufficient information but had signalled their interest to become parties to the Convention by signing or ratifying the Convention through an enabling activity that is termed the Minamata Initial Assessment (MIA). The purpose of the MIA process is to help recipient countries to develop baseline data that they will use to understand the national situation and therefore justify their ratification based on such and further assist with priorities towards early implementation of the Minamata Convention. It is an inclusive and participatory process that brings together all relevant stakeholders in a country that must play a role in the implementation of the Minamata Convention.

Lesotho has ratified the Minamata Convention and is keen to begin its implementation. The MIA process is therefore an essential leg that helps the country to fully understand its national situation and establish priorities that will bear fruits for its environment and its people. Lesotho has a long history with Mercury. It is commonly found in informal traditional medicinal markets without traceability of sources. There are many speculations about its sources including one that the informal markets obtain it from school laboratories.

Many people in Lesotho especially rural people and those with low level education have cultural beliefs that make them highly vulnerable to effects of Mercury. Some wear it around their necks in a necklace form in small vials. Others carry it on themselves in concealed or hidden form. The essence of all this close proximation with Mercury in this group of people is that it has mythical powers. Some believe it makes them strong, others belief it makes them fearful, others belief it makes them fearless while others believe that by having it on themselves, they somehow become invincible and their opponents whether in court, argument or debate stand no chance against them. Because of its nature, it is a subject of intrigue and mythology.

Of all these, the most vulnerable group is the pregnant women who ingest traces of elemental Mercury in the belief that it will mythically ease their delivery process. While there is paucity of data on the magnitude of this practice among the pregnant women because it is shrouded in mystique and secrecy, there is a general concern that it is a common practice, especially in the rural areas. Its impact on the population is not known.

Lesotho does not have an ASGM industry within its borders yet there are thousands of Basotho men who work in an illegal ASGM industry in the South Africa mining industry. ASGM in the context of Lesotho therefore is a male dominated enterprise that involves illegal migration, violence and organized crime. Because the actors in this enterprise are in an illegal enterprise they are not protected in either Lesotho or South Africa. In fact, because of the organized crime nature of this enterprise, it is littered with illegal firearms, violence and gruesome murders in some cases mass murders. The governments in both countries consider it an unwelcome menace. There are no measurable efforts that are geared towards regularising it or curbing it.

The other sources of Mercury in the country are relatively small. Coal used domestically in households during winter months represents an exposure especially in the rural areas where open coal fires are done in the houses with no chimneys for the smoke. Mercury added skin lightening creams are also available and many women use them. They are sourced from South Africa indicating a need for a collaborative cross-border control in the implementation phase of the Minamata Convention.

The country has an arsenal of laws that can be used to address some aspects of the Mercury releases, emissions and exposure. It is however apparent that a new framework law is essential on chemicals to cover Mercury and other priority chemicals. The current laws including the framework environment law that was promulgated in 2001 and amended in 2008 are insufficient in this area.

Because of the many superstitions associated with Mercury in the country, the government and non-governmental organizations need more aggressive public campaign methods. The billboards, newsletters, brochures and TV are good tools, but they tend to target literate and urban populations. Some strong efforts must be made to reach out to the low level or totally illiterate rural populations many of whom are in the centre on these superstitious beliefs. Civil society organizations must come on board to help the government. Women groups including planned parenthood and faith-based associations must reach out to women of childbearing age across all divides.

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Chapter 1: Introduction

1.1 Background

Although Mercury has been studied and continues to be studied considerably in other parts of the world, especially in the developed countries, there is paucity of data in developing countries and in Africa in particular. This is so even though African countries have Mercury circulating in them as well just like all other countries around the world. The impacts remain undocumented and the extent of exposure is unknown. It is therefore encouraging to notice that African countries have played a vital role in ensuring that the Minamata Convention on Mercury comes into force as it presents an opportunity for them to work within the framework of multilateralism towards tackling the Mercury challenges that they are facing. Without this opportunity, this problem was festering unattended outside the lens of public policy and academic discourse in these countries.

The Minamata Initial Assessment (MIA) process arises out of the global undertaking by the international community to develop a legally binding instrument to control and manage Mercury and all its uses because of its adverse impacts on human health and the environment. The UNEP Governing Council, at its 22nd session in February 2003, decided that there is sufficient evidence of significant global adverse impacts from Mercury to warrant international action.

After that decision of the UNEP Governing Council, a global intergovernmental negotiating committee (INC)process (Fig. 1) was put into place in 2009 and in January 2013 at INC 5, the governments participating in the INC process agreed to the text of the globally binding instrument on Mercury. This was named the Minamata Convention on Mercury. It is named after the city of Minamata in Japan which was devastated by industrial Mercury pollution that led to ecosystem poisoning and loss of human life.

The UNEP Governing Council decided that national, regional and global actions should be initiated as soon as possible to reduce the risks to humans and environment from the release and emissions of Mercury to the environment and has urged all countries to adopt goals and take actions, as appropriate, to identify populations at risk and to reduce human-generated emissions and releases of Mercury.



Fig. 1: The intergovernmental negotiation (INC) process of the Minamata Convention

Mercury is a naturally occurring element that is found in the air, water and soil. It exists in several forms: elemental or metallic Mercury, inorganic Mercury compounds, and organic Mercury compounds. Mercury is rarely found in nature as the pure, liquid metal, but rather within compounds and inorganic salts. It volatilizes readily. Mercury vapours are colourless and odourless. The higher the temperature, the more vapours will be released from liquid metallic Mercury.

It has traditionally been used to make products like thermometers, switches, and some light bulbs. It is also used in some cultural and religious activities. It is a common addition in the dental amalgams and continues to be used openly in artisanal good mining especially in the developing countries. Many African countries are blessed with gold and in almost all of them artisanal gold mining is a key livelihood activity.

While Lesotho does not have gold mining taking place within its territory, scores of Basotho men are some of the most active in the illegal artisanal gold mining activities in the neighbouring South Africa. As such Lesotho suffers the impacts of Mercury use in the artisanal sector as well. Because this activity in considered illegal in South Africa and Lesotho, it remains outside the purview of governments in both countries and the impacts continue unabated.

Mercury is found in many rocks including coal. When coal is burned, Mercury is released into the environment. Burning wastes, breaking Mercury products, and spilling Mercury, as well as the improper treatment and disposal of products or wastes containing Mercury, can also release it into the environment. Open burning of mixed waste is a very common phenomenon in Lesotho being practiced by households as well as the municipalities or town councils.

Mercury exposure at high levels can harm the brain, heart, kidneys, lungs, and immune system of people of all ages. It has been demonstrated that high levels of methylmercury for example in the bloodstream of unborn babies and young children may harm the developing nervous system, making the child less able to think and learn. Mercury also causes increased cancer risk of the liver and of the oesophagus. Respiratory toxicity may also cause pulmonary edema, congestion, coughing, interstitial pneumonitis and respiratory failure. Mercury may also affect reproduction by causing increased spontaneous abortions, congenital anomalies, and reduced fertility among women. These conditions are observed within the population in Lesotho although there are no comprehensive studies that have been conducted to link them directly to Mercury or any other specific cause for that matter.

In 2005 the UNEP Governing Council requested the Executive Director of UNEP to urge governments, intergovernmental organizations, non-governmental organizations and the private sector to develop and implement partnerships in a clear, transparent, and accountable manner as one approach to reducing the risks to human health and the environment from the releases and emissions of Mercury and its compounds.

Building on this decision UNEP invited governments, particularly in developing countries and countries with economies in transition, to identify, in consultation with stakeholders, priority partnership areas as soon as possible and to work with governments and relevant stakeholders to compile and report needs identified to execute the partnerships and assist in the mobilization of resources in support of the partnerships.

To this end, a global assessment report (2002) under the tutelage of UNEP was prepared on Mercury and Mercury compounds with the objective of promoting environmentally sound management of Mercury and its compounds as well as contributing to an obvious awareness gap that was evident about this substance.

The Minamata Initial Assessment process is an enabling activity which is financed by the Global Environment Facility (GEF). While GEF has a long history of supporting initiatives that reduce the contamination by Mercury dating as far back as the 1990s, its involvement in the Minamata Convention has been specifically included in Article 13 of the Convention as one of the predictable financial mechanisms that should be made available to developing countries and countries with

economies in transition in particular towards the early ratification and implementation of the Minamata Convention.

In June 2013, the 44th GEF Council approved an allocation of $10 million towards assisting prospective parties to Minamata Convention in the developing countries and countries with economies in transition in their Minamata pre-ratification initiatives. Furthermore, the Conference of Plenipotentiaries on the Minamata Convention on Mercury in 2013 invited the GEF Council to support developing countries and countries with economies in transition that are signatories to the Convention in undertaking activities, particularly enabling activities, to facilitate early implementation and ratification of the Convention.

In May 2014, the GEF instrument was amended to include the Minamata Convention. As a result, from July 2014 to June 2018, GEF has allocated $141 million towards Mercury projects around the world. This allocation has enabled many countries to undertake their MIA processes to facilitate their ratification of the Minamata Convention. This was probably one of the most significant contributors to the successful coming into force of the Minamata Convention upon attaining the required 50th ratification in 2017 as many countries were able to do their initial assessments to assist them in the decision-making process.

1.2 The MIA Process

The current project of the Minamata initial assessment being undertaken by Lesotho through UN Environment and the Africa Institute is part of this support that was made available by GEF to support either signatories to the Minamata Convention or countries that have already completed their ratification process or countries that have signalled their intention to become parties to the convention. As a GEF enabling activity the Minamata initial assessment process has the same structure across countries.

The purpose of the MIA projects is to help recipient countries to develop baseline data that they could use to understand the national situation and therefore justify their ratification based on such and further assist with priorities towards early implementation of the Minamata Convention. The project also recognises that Mercury affects multi-sectoral stakeholders who need to coordinate their efforts if any meaningful gains must be made at the national level. It is found in trade, health, science, culture, social use, domestic emissions, food, waste management, water and many areas that affect ordinary day to day activities in all countries.

It therefore requires industry, government, municipalities, civil society organizations, schools, academia, hospitals, doctors, sociocultural leaders, media, ordinary people and many other actors to work together. It is for this reason that the bedrock of the MIA process is component 1 which organizes coordination. A country may take opportunity provided by the MIA process to further synchronise its chemicals conventions coordination since there is always an overlap and synergy in these conventions.

Component 2 of the project requires a country to evaluate its institutional setup and the legal foundation for effective implementation of the Minamata Convention. The key issue here is for a country to align its institutional setup such that the obligations of the convention will be implemented seamlessly and without difficulties. It is against this backdrop that this evaluation must also include evaluation of the legal requirements that will assist in that endeavour.

Component 3 requires a country to document its Mercury sources and the magnitude of the releases and emissions emanating thereof. This is important as it speaks to the extent of exposure

that the country is experiencing. To standardize the Mercury inventory process across the world, UNEP contracted a Danish consulting company called COWI to develop a spreadsheet based toolkit that must be used to calculate Mercury from the various sources based on the quantities of the materials in question. This toolkit is an indirect but most cost-effective method available for calculation of Mercury emissions and releases from various substrates and processes. It is a simplified method that bridges the scientific gap and hurdle that most countries are facing especially developing countries.

This toolkit has 2 levels: Level 1 is the most basic with calculations depending on in-built formulas without user influence. Level 2 is advanced and requires detailed inputs for the toolkit to calculate the Mercury emissions and releases in a more accurate manner. This allows the user to provide specific conditions that may be characteristic of the national or sub-regional scenario so that the Mercury emissions and releases are more accurate. This requires considerable baseline information that most developing countries, especially African countries may not always have. Nonetheless, to reflect better the Mercury situation even in these countries it remains advisable to attempt Level 2 inventories using whatever scientific data may be available regardless of its inadequacy.

Lesotho had completed Level 1 inventory through a funding that was provided by the Interim Minamata Secretariat and executed by the Africa Institute in 2015 (Lesotho Government, 2015). For MIA therefore, the emphasis was on Level 2 to improve the quality of the national situation report using locally available scientific information.

Component 4 analyses the needs of a country so that it could implement the Minamata Convention. This component also outlines the already existent opportunities that a country may capitalise on as it moves into the implementation of the Minamata Convention. The logic in this is that while countries may need assistance to address the challenges that they face to reduce or eliminate the Mercury threat, they invariably have endogenous options that they already possess that could assist them to achieve this goal.

These opportunities may be institutional, financial, technical, good-will and otherwise in nature and the countries must then systematically harness them so that they could expedite the implementation of the Minamata Convention for the benefit of their populations and the environment. The purpose of implementing the Minamata Convention is not merely to become complaint with the obligations of the convention as a Party but primarily to protect the people and the environment in each of the Parties.

Component 5 synthesizes all the information so that a consolidated report is produced. This component further requires each participating country to launch and educational and outreach campaign so that people are sensitised to the dangers and possible exposure to Mercury. Knowledge is power. When people know then they are more likely to take necessary precautionary measures to reduce their exposure and therefore minimize harm on themselves.

The effects of Mercury on humans are big and debilitating and, in some cases, leading to loss of life. It is therefore an unavoidable obligation on the part of the government and civil society organizations to transfer all essential information to the populations at risk using all methods necessary. Failure to do so may be a human rights issue.

Component 6 requires a country to exchange all the information that it has within its territory and with the target groups and with all other agencies that may have a stake in this matter. It also requires countries to share their results with others so that their situation may be well understood, and a regional scenario may be revealed. Under this component countries will also share lessons learned through the MIA process especially those that are within the same region.

1.3 Context and Purpose of the MIA

The purpose of this task is to prepare a consolidated national report for the MIA project in Lesotho. As indicated, the MIA project in divided into 6 components each with a specific deliverable. The current exercise is part of Component 5 of the project which synthesises all the previous Components and develops a national MIA report that summarises the information that is currently presented in sectorized components. By nature, therefore this Component draws on the other components without re-inventing the wheel. Thus, its strength lies in the strength of its components.

This sectorised approach to the MIA process is meant to provide a systematic and step-wise approach to the Mercury situation in the country so that all key elements in the Mercury value-chain are properly understood at the national level. The primary purpose of the MIA process is to assist countries to effectively implement the Minamata convention based on well documented and understood national conditions. Since Mercury by nature touches many stakeholders in all the countries, it became important during the implementation of the MIA project to organize all key stakeholders into a functional entity that will assist the country as it moves into the implementation phase of the Minamata convention. This national coordination mechanism that has been beefed up through the project is not meant to be tied to the project lifespan but rather to continue to guide the country as it moves into the implementation phase.

Chapter 2: The National Background

2.1 Geography

Lesotho is a small mountainous country of about 30,355 square kilometres that is entirely encircled by South Africa. It is divided into four ecological regions based on altitudinal limits. These are 1) the lowlands which form a narrow strip of land ranging from 8 to 64 km in width along the western border and rises in altitude to a maximum of about 1, 830 meters above sea level, 2) the foothills which lie between 1, 8030 and 2, 290 meters above sea level, [m.a.s.l.]. The third ecological region or zone is the mountains which cover more than 66% of the country ranging from 2, 290 m.a.s.l. and above, and the fourth is the Senqu River Valley which is a floodplain of the Senqu River as it cuts through the southwestern mountains on its course to the Atlantic Ocean (Guillarmod, 1971; Staples and Hudson, 1938).

This fourth region is similar to the lowlands in most characteristics including altitude except the alluvial deposits within the valley floor which have been left by the Senqu River. The Senqu River is one of the major rivers in southern Africa cutting through four countries. It originates in Lesotho, cuts through South Africa, Botswana and joins the Atlantic Ocean in Namibia. It is therefore one of the major sources of water in these countries.

With two thirds of the country as the mountains many with very steep slopes, Lesotho is a highly mountainous country. The highest peak in the southern part of Africa is Thabana Ntlenyana (3, 482 m.a.s.l.) and is situated in the north-eastern district of Mokhotlong in Lesotho. The entire mountain region is rugged underlain by the basaltic bedrock. It preserves the extrusive igneous rocks which are believed to correspond with rocks found in Ferrar Ingneous province in Australia and Antartica (White, 1997; Duncan *et al*., 1997).

It is thus therefore believed that the Lesotho region held a central position in the former Gondwana supercontinent which resulted in the high altitude of the region before breakup of the Gondwana supercontinent. The other factors that are believed to have contributed to this elevation of the country are the Epierogenic uplift of the African continent after breakup of the Gondwana and the asymmetrical separation of the proto-Indian Ocean (Partridge and Maud, 1987; Duncan *et al*., 1997).

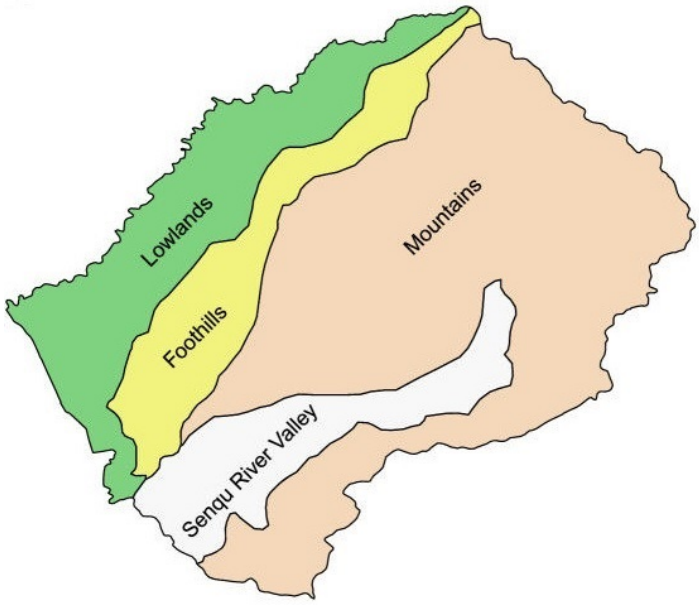

Fig. 2: Ecological map of Lesotho

Precipitation in Lesotho occurs primarily in summer months (October – March) although snow is common in June and July, especially in the mountains. The Senqu River Valley receives the lowest rainfall (500 – 600 mm) because of its position in the rain shadow of the mountains. The annual average rainfall of the country is 750 mm. Droughts are common and they seem to be increasing in regularity. Temperatures vary considerably between the seasons with winters cold and dry becoming much more severe in the mountains. Freezing temperatures occur between May and August and snow may lie for several days or even weeks at higher elevations.

Over 80% of the land is above 1,800 m.a.s.l in altitude and only 9% of the total area is suitable for arable cultivation. Arable area has been declining due to urbanization and villagization (Lesotho Government, 1999). Lesotho has few natural resource endowments. It has an abundance of water and natural beauty with many rivers and streams originating from the mountains. Because of this abundance of water, it is implementing a large project that transfers large quantities of water to the industrial hub of its more industrialized neighbour, South Africa. This project is known as the Lesotho Highlands Water Project (LHWP). It is a binational project between Lesotho and South Africa which aims to build a series of large dams that will transfer water to South Africa. At the moment, two dams are complete and water transfer to South Africa has been occurring for several years. This scheme provides Lesotho with a significant income and the project is hailed as a flagship of the country. There are growing talks about similar water schemes with other drier countries in the region such as Botswana and Namibia.

Lesotho also has a bourgeoning diamonds mining sector that has repeatedly unearthed record holding diamonds. These include Lesotho brown (601 carats), Letseng legacy (493 carats), Leseli-la-Letseng (478 carats) and Letseng star (550 carats). The latest of these diamonds were found in January 2018 at the Letseng mine. Other new mines have recently been opened and this sector seems to hold positive promise for the country.

2.2 Population

Lesotho is a small country with a small population of 2.0 million (BOS, 2018). Over 60% of the population live in the four districts that comprise the western corridor where the bulk of the limited arable land is located and which has the best access to physical infrastructure, utilities and service delivery facilities. By ecological zones or regions, 47% of Basotho live in the Lowlands, 23% in the Foothills, 21% in the mountains and 11% in the Senqu River Valley. Around 34% of this population live in urban areas implicitly indicating the rural nature of the country (BOS, 2018).

The national average population density is 66 per square kilometre, ranging from 21 in Mokhotlong to 133 in Berea. Expressed in terms of arable land, population density rises to 580 people per square kilometre in Maseru with a low of 187 in Mafeteng (Fig. 3). The average national population density per arable land is 347 per square kilometre (BOS, 2018). With so many people per kilometre, it is no wonder Lesotho depends largely on food imports from its more agriculturally developed neighbour, South Africa. The mountains are basically more suitable for animal husbandry with goats and sheep as the most predominant livestock. Because of this, Lesotho exports significant quantities of wool and mohair to the world markets.

Lesotho is undergoing a rapid demographic transition. Whereas the population grew rapidly in the first thirty years of independence (1966 to the 1990s), the population remained virtually the same from 1996 to 2006. It is now growing at 0.68% and it is projected to grow by only 0.13% each year towards 2030. The steady increase in the country's population was driven by previous high fertility rates and rapid mortality decline.

The recent slowing in population growth has been driven by three main factors. These are the declining total fertility rate of 5.4 children per woman in 1976 to 3.5 children per woman in 2006. The latest estimate from 2009 suggests that the total fertility rate has further reduced to 3.01 children per woman and is projected to decline further to 2.8 children per woman by 2025. Secondly, the Crude Death Rate (CDR) doubled from 13 per 1000 people in 1996 to 27 deaths in 2006 and has now come down to 12 deaths per 1000 in 2016.



Fig. 3: Administrative districts of Lesotho

These trends have resulted in a significant decline in life expectancy at birth, from 51.0 years in 1976 to 59.0 in 1996 but fell to only 41.2 in 2006. The life expectancy has now increased again to 56 in 2016. The elderly population is increasing with 6.1% of the population at 65 and above, which shows an increasing need for social services and safety nets for this increasing vulnerable group (BOS, 2018).

Another factor is the net migration out of the country especially to the more industrialised neighbour, South Africa, in search of opportunities. In the past Lesotho relied on a conscripted migrant labour system to the South African mines and factories, and all the conscripts were sending remittances back to the country. They also remained *de jure* inhabitants of the country although they were *de facto* South African residents. The current trend since opportunities in the mines declined, is outward migration that leads to permanent residence and citizenship in South Africa. The geographic position of Lesotho as an enclave in the mid-central part of South Africa and close family ties between almost all Basotho and South Africans is highly facilitative of this outward migration.

2.3 The Economy

Lesotho's economic development is framed by its central location in southern Africa. Lesotho is a member of the Southern African Customs Union (SACU), the Common Monetary Area (CMA) and the Southern African Development Community (SADC). SACU and CMA are key influencers on the trade, exchange rate and monetary policies of all member countries. South Africa remains Lesotho's main trading partner, supplying about 80% of imported goods and many services, as well as buying approximately one-quarter of Lesotho's exports.

Gross Domestic Product (GDP) has grown at a real annual average rate of 4.0% between 1982/83 and 2010/11. Unfortunately, this has not resulted in a decrease in poverty because many of the gains in GDP have been offset by falling remittances. The fall in the number of mine workers from approximately 120,000 in the 1980s to less than 50,000 today has resulted in a much smaller proportion of households receiving income from abroad. Consequently, the real annual growth rate of Gross National Income (GNI) from 1982/83 to 2010/11 is only 0.9% per annum while Gross National Disposable Income (GNDI), which includes net transfers from the SACU revenue pool, has only grown by 1.2% per annum in recent years.

Income is increasingly generated domestically. Whereas in 1982/83, most of domestic consumption was derived from productive activity abroad, Lesotho is now much more independent. The share of GDP as a proportion of total income has more than doubled from 30% to 64%. Although GDP has been positive in every year since 1982/83, periods of acceleration have been followed by years of slow growth (2% or less). GNI has been much more volatile, with several years of negative growth.

The strongest driver of GDP growth has been the secondary sector the majority of which coming from manufacturing. Between 1982/83 and 2010/11, the primary sector has increased by 1.8%, the secondary sector by 7.8% and the tertiary sector by 3.8%. Agriculture remains important to most households, with over half having some agricultural land and keeping some livestock, and one-third of rural females and two-thirds of rural males engaging in some agricultural work. However, Agriculture's contribution to GDP has been declining. In 1982/83, the primary sector, at that time which was almost exclusively coming from agriculture contributed 24.5% of GDP.

Agricultural growth in recent years averaged only 0.4% per annum. Most crop output is not marketed because grain and cereals are mostly produced for home consumption, in other words, this is predominantly subsistence agriculture. Agricultural work does not generate much income;

two-thirds of all labour do not receive any wages as they are self-employed or work for a family member. Agricultural land continues to decline further making this sector highly questionable as the safety net against poverty in the long run. There is net migration from the mountains to the lowlands districts where better opportunities exist. Unfortunately, this is where the arable land is found, and this land is now increasingly being converted into settlements.

Manufacturing has increased more than 6-fold. Textiles have been the main growth driver over the last thirty years, but other manufacturing has remained high even during the recent global economic crisis. Growth in manufacturing has also been the main engine of job creation. In the past few years, decreases in exports to the United States have been partially offset by increases in exports to South Africa.

Growth in the tertiary sector has been in line with the overall GDP growth. Public administration has grown by 3.6%. High rates of growth have been generated by some sub-sectors, notably posts and telecommunications (11.5%), especially since the take-off of the boom in mobile phones, and financial intermediation (10.9%). Hotels and restaurants generated only 1.7%. The decline in remittances has meant that private consumption has only grown in line with population growth since 1982/83.

The per capita consumption has declined but there have been increases over the past decade. On the other hand, higher SACU revenues in the past have allowed public consumption to expand rapidly, unfortunately they have been declining rapidly in recent years. Over the last thirty years, the main drivers of investment have been major infrastructure projects, foreign direct investment and public-sector projects. Overall, investment remained very low throughout the 1980s at less than 40% of GDP and less than 10% of GNDI. It rose to around 25% of GNDI with the implementation of the Lesotho Highlands Water Project in the 1990s but it has subsequently fallen back to around 15%.

Regarding mining, it is the diamond mining that is dominating the sector. In 1999, the contribution of the minerals sector to GDP was 0.1% which was relatively insignificant. In 2011, the sector's contribution to GDP rose to an estimated 4.5%. Its Human Development Index (HDI) has improved marginally from 0.422 in 1980 to 0.461 in 2012. In recognition of the growing economic importance of the minerals industry, the government recently re-organized its Ministry of Natural Resources under which the Department of Mining previously operated and created a fully-fledged Ministry of Mining. Following the reorganization and in pursuance of the national strategic development plan, the government decided to develop a Mining and Minerals Policy to provide a strategic direction for the development of the country's mineral resources.

2.4 Poverty

Although Lesotho has a per capita income of around $1,000 (BOS, 2018), the national poverty line recorded an average national poverty head count of 54% with 58% in rural areas and 40% in urban areas. The World Bank's international $1 a day poverty line figure produced a significantly lower average national head count of 37% with41% in the rural areas and 25% in urban areas. It is estimated that 27.5% of the population and 21.4% of households are at risk of multi-dimensional poverty.

Larger households with many children, headed by older and less educated people were worse-off while households headed by migrant labour males, majority of whom working in South Africa, are better-off. Households receiving remittance income from abroad have amongst the highest incomes and best outcomes in the rural economy. One of the challenges is that the poorest

households grow less of their own food than do higher income households. Perhaps this speaks to the inability to secure the inputs necessary to grow the food. It is this group of people that is highly vulnerable and is responsible for the continued reliance of the country on food aid from other countries. Government needs targeted interventions that will facilitate subsistence agriculture in this group as dependence on international food aid is not a sustainable policy option.

2.5 Unemployment

The 2008 Labour Force Survey indicated that Lesotho had a working-age population of 1,237,000. Of these, 608,000 people were employed and 192,000 were unemployed, giving an unemployment rate of 24%. Another caveat is that of those employed only 38% are believed to have formal wage employment, while the rest are informally employed principally in activities such as subsistence agriculture and often only in seasonal jobs or as informal employees in formal enterprises. This high level of underemployment and low labour productivity suggests ample flexibility in the labour market.

2.6 Inequality

Household Income and Expenditure Surveys indicate that the national Gini coefficient has fallen from 0.57 in 1994/95 to 0.53 in 2002/03 and that there has been a significant reduction in head-count poverty from 66.6% to 56.6%. This still suggests significant inequality, and income distribution is heavily skewed with the richest 20% securing 60% of income while the poorest 20% receive only 2.8%. Inequality is high in both urban and rural areas, having been a structural feature of Lesotho for decades. Even though the top wealth quintile resides predominantly in the lowland areas with half of the poorest quintile living in the mountains, the rural-urban divide can explain only 4% of overall inequality, with the remaining 96% being attributable to intra-urban and intra-rural inequality.

2.7 Gender

According to the Gender Inequality Index (HDR 2010, using 2008 data), Lesotho performs relatively well with an index score of 0.685 and a rank of 102. However, women have long been disadvantaged by cultural traditions, even though they play a vital role in the economy. Simply put, women continue to be regarded as minors whose existence within the families is tightly knitted onto the male figures in those families. Major decisions within the families remain the prerogative of the males with women primarily playing a support role.

The gender roles assigned to men and women are significantly defined structurally and culturally in ways which create, reinforce, and perpetuate relationships of male dominance and female subordination. Through the process of socialization within the family, in educational institutions and other social spheres, boys and girls are conditioned to behave in certain ways and to play different roles in society. They are encouraged to conform to established cultural norms and values and these continue to be passed on from generation to generation.

Efforts are being made nevertheless to reverse this trend and empower women. Given the slow rate of progress it is abundantly clear that this will take a very long time unless markedly radical policy options are explored. There must be a strong political will to create a more balanced society

and to achieve that the government must champion a radical transformational process that will tear down the cultural barriers that have existed for many generations.

Chapter 3: National Inventory of Mercury

3.11 Mercury Releases and Emissions in Lesotho

The inventory for Lesotho was developed using 2015 data because no latest could be found. This was meant to be the Level 2 inventory report, yet the challenges were many and, in many instances, it was not possible to get the necessary data to perform the full Level 2 work. In such circumstances Level 1 work was performed. The study used the UNEP toolkit for identification and quantification of Mercury releases which was provided by the UN Environment Chemicals Branch.

As a start, a three-day training workshop of all relevant stakeholders in the country was convened to train them on the use of the Toolkit. This training was facilitated by the Africa Institute. Since Lesotho had completed Level 1 inventory in 2015 and many of the stakeholders had taken part in that study, the purpose of the training workshop was to familiarise and enskill the participants on the requirements of the Level 2 process.

After this training was completed the participants discussed the project implementation model that the country will follow and resolved to form multi-stakeholder teams of data collectors that went around the country collecting information. This decision was informed by the experience that the country had gained when it was undertaking the Level 1 inventory. Part of it was that by forming the multi-stakeholder teams, the participants were cultivating broader ownership of the inventory process by the key stakeholder institutions and therefore facilitating better access to the data that the same key institutions might possess.

The following key stakeholders were represented in the working teams:

- Ministry of Environment
- Ministry of Health
- Ministry of Trade and Industry
- Ministry of Education
- Ministry of Local Government
- Ministry of Science and Technology
- Ministry of Agriculture
- Consumer Protection Association
- Civil Society Organizations
- National University of Lesotho

After data collection was completed, a smaller data synthesis working team was composed. This synthesis working team also had broader representation from the stakeholders. For facilitation and support, the Africa Institute also joined this working team and worked with them to analyse and synthesise the data. The working team produced a draft synthesis report that outlined the sources of releases and emissions of Mercury in Lesotho. That report has been incorporated into this national MIA report.

3.12 Mercury Release Source Types present in the Country

Table 1 presents sources that were identified as present or absent in the country. Only source types positively identified as present are included in the quantitative assessment in subsequent sections of the report. As the table shows many potential sources of Mercury are not present in Lesotho.

Table 1: Identification of Mercury Release Sources in the Country

Cat. no.	Source category	Source presence (Y/N/?)
5.1	**Main category - Extraction and use of fuels/energy sources**	
5.1.1	Coal combustion in large power plants	**N**
5.1.2	Other coal combustion	**Y**
5.1.3	Extraction, refining and use of mineral oil	**Y**
5.1.4	Extraction, refining and use of natural gas	**N**
5.1.5	Extraction and use of other fossil fuels	**N**
5.1.6	Biomass fired power and heat production	**Y**
5.1.7	Geothermal power production	**N**
5.2	**Main category - Primary (virgin) metal production**	
5.2.1	Primary extraction and processing of Mercury	**N**
5.2.2	Gold and silver extraction with the Mercury-amalgamation process	**N**
5.2.3	Zinc extraction and initial processing	**N**
5.2.4	Copper extraction and initial processing	**N**
5.2.5	Lead extraction and initial processing	**N**
5.2.6	Gold extraction and initial processing by other processes than Mercury amalgamation	**N**
5.2.7	Aluminium extraction and initial processing	**N**
5.2.8	Extraction and processing of other non-ferrous metals	**N**
5.2.9	Primary ferrous metal production	**N**
5.3	**Main category - Production of other minerals and materials with Mercury impurities**	
5.3.1	Cement production	**N**
5.3.2	Pulp and paper production	**N**
5.3.3	Lime production and light weight aggregate kilns	**N**
5.3.4	Others minerals and materials	**N**

5.4	**Main category – Intentional use of Mercury as an auxiliary material in industrial processes**	
5.4.1	Chlor-alkali production with Mercury-technology	**N**
5.4.2	VCM (vinyl-chloride-monomer) production with Mercury-dichloride ($HgCl_2$) as catalyst	**N**
5.4.3	Acetaldehyde production with Mercury-sulphate ($HgSO_4$) as catalyst	**N**
5.4.4	Other production of chemicals and polymers with Mercury compounds as catalysts	**N**
5.5	**Main category - Consumer products with intentional use of Mercury**	
5.5.1	Thermometers with Mercury	**Y**
5.5.2	Electrical and electronic switches, contacts and relays with Mercury	**Y**
5.5.3	Light sources with Mercury	**Y**
5.5.4	Batteries containing Mercury	**Y**
5.5.5	Polyurethane with Mercury catalysts	**Y**
5.5.6	Biocides and pesticides	**N**
5.5.7	Paints	**N**
5.5.8	Pharmaceuticals for human and veterinary uses	**N**
5.5.8	Cosmetics and related products	**?**
5.6	**Main category - Other intentional products/process uses**	
5.6.1	Dental Mercury-amalgam fillings	**Y**
5.6.2	Manometers and gauges	**Y**
5.6.3	Laboratory chemicals and equipment	**Y**
5.6.4	Mercury metal use in religious rituals and folklore medicine	**Y**
5.6.5	Miscellaneous product uses, Mercury metal uses and other sources	**N**
5.7	**Main category - Production of recycled metals**	
5.7.1	Production of recycled Mercury ("secondary production)	**N**
5.7.2	Production of recycled ferrous metals (iron and steel)	**N**
5.7.3	Production of other recycled metals	**N**
5.8	**Main category – Waste incineration**	
5.8.1	Incineration of municipal/general waste	**N**
5.8.2	Incineration of hazardous waste	**N**
5.8.3	Incineration of medical waste	**Y**
5.8.4	Sewage sludge incineration	**N**
5.8.5	Informal waste burning	**Y**
5.9	**Main category - Waste deposition/landfilling and waste water treatment**	
5.9.1	Controlled landfills/deposits	**Y**

5.9.2	Diffuse deposition under some control	**Y**
5.9.3	Informal local deposition of industrial production waste	**N**
5.9.4	Informal dumping of general waste	**Y**
5.9.5	Waste water system/treatment	**Y**
5.10	**Main category - Cremation and cemeteries**	
5.10.1	Crematoria	**N**
5.10.2	Cemeteries	**Y**
	Main category - Potential hot spots	
	Closed/abandoned chlor-alkali production sites	**N**
	Other sites of former chemical production where Mercury compounds are/were produced (pesticides, biocides, pigments etc.), or Mercury or compounds were used as catalysts (VCM/PVC etc.)	**N**
	Closed production sites for manufacturing of thermometers, switches, batteries and other products	**Y**
	Closed pulp and paper manufacturing sites (with internal chlor-alkali production or former use of Mercury-based slimicides)	**N**
	Tailings/residue deposits from Mercury mining	**N**
	Tailings/residue deposits from artisanal and large scale gold mining	**N**
	Tailings/residue deposits from other non-ferrous metal extraction	**N**
	Sites of relevant accidents	**Y**
	Dredging of sediments	**N**
	Sites of discarded district heating controls (and other fluid controls) using Mercury pressure valves	**N**
	Sites of previous recycling of Mercury ("secondary" Mercury production)	**N**

Y = present, N = absent (N) and ? = possibly present but not positively identified

According to the Convention, source types may be from Mercury or Mercury compounds, naturally occurring trace quantities present in products such as non-Mercury metals, ores or mineral products, or from Mercury added products. As shown in Table 1 above, most sources of Mercury are imported Mercury added products. There is very little supply of Mercury to Lesotho for laboratory research. It has also been noted that Mercury is illegally imported and used in religious rituals and folklore medicine.

Mercury inputs to society should be understood 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 mobilised via extraction and use of raw materials which contain Mercury in trace concentrations.

For waste categories, the "inputs" are calculated to show the distribution of Mercury in waste through the different waste treatment activities and calculate releases from these activities, though waste is not an original source of input Mercury into society.

Table 2 presents the calculated releases and emissions of Mercury into the 3 substrate media, namely air, water and land by source category.

Table 2: Sources and Quantities of Mercury Releases and Emissions in Lesotho

Source category	Calculated Hg output, Kg/y						
	Air	Water	Land	General waste	Sector specific treatment /disposal	Total releases by source category	Percent of total releases
5.1: Extraction and use of fuels/energy sources	61.1	0.0	NA	0.1	NA	61	3%
5.2: Primary (virgin) metal production	NA	NA	NA	NA	NA	NA	NA
5.3: Production of other minerals and materials with Mercury impurities	NA	NA	NA	NA	NA	NA	NA
5.4: Intentional use of Mercury in industrial processes	NA	NA	NA	NA	NA	NA	NA
5.5: Consumer products with intentional use of Mercury (whole life cycle)	251.8	30.4	257.3	506.2	NA	1046	51%
5.6: Other intentional product/process use	1.0	15.7	0.1	15.5	15.9	48	2%
5.7: Production of recycled metals	NA	NA	NA	NA	NA	NA	NA
5.8: Waste incineration and burning	45	NA	NA	NA	NA	45	2%
5.9: Waste deposition/landfilling and waste water treatment	379.8	401.2	3024.7	13.9	9.2	3829	38%
5.10: Crematoria and cemeteries	NA	NA	71.1	NA	NA	71	3%
SUM OF QUANTIFIED RELEASES	739	424	329	536	25	2052	100%

NA = Not Applicable

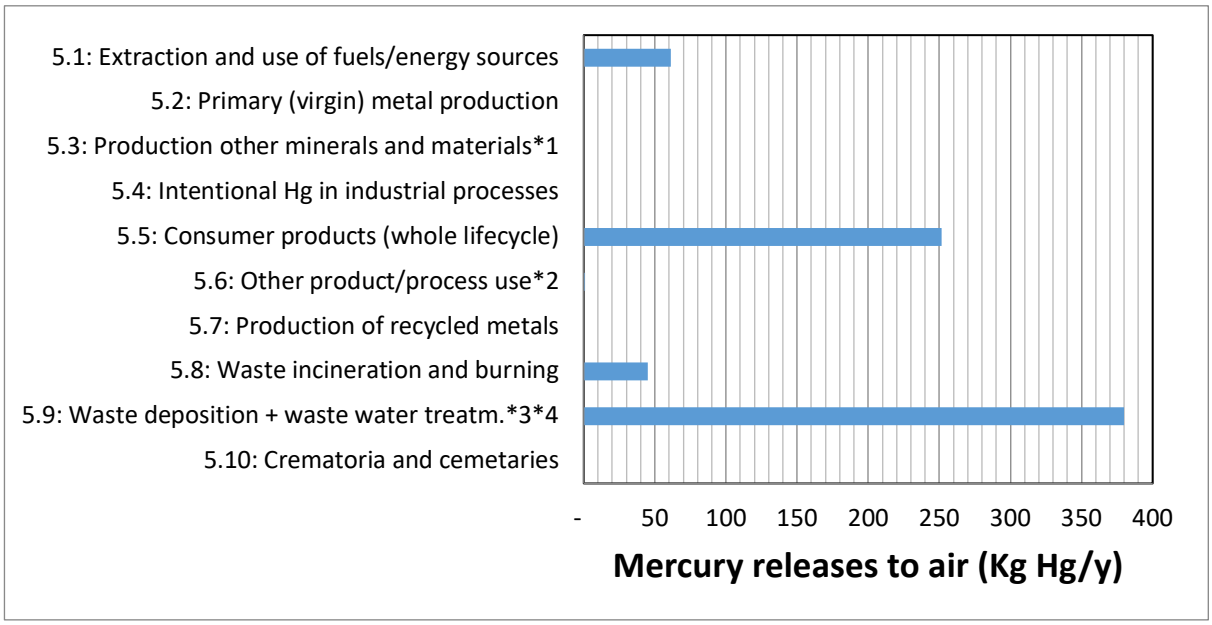

Fig. 4: Releases of Mercury to the Air in Lesotho

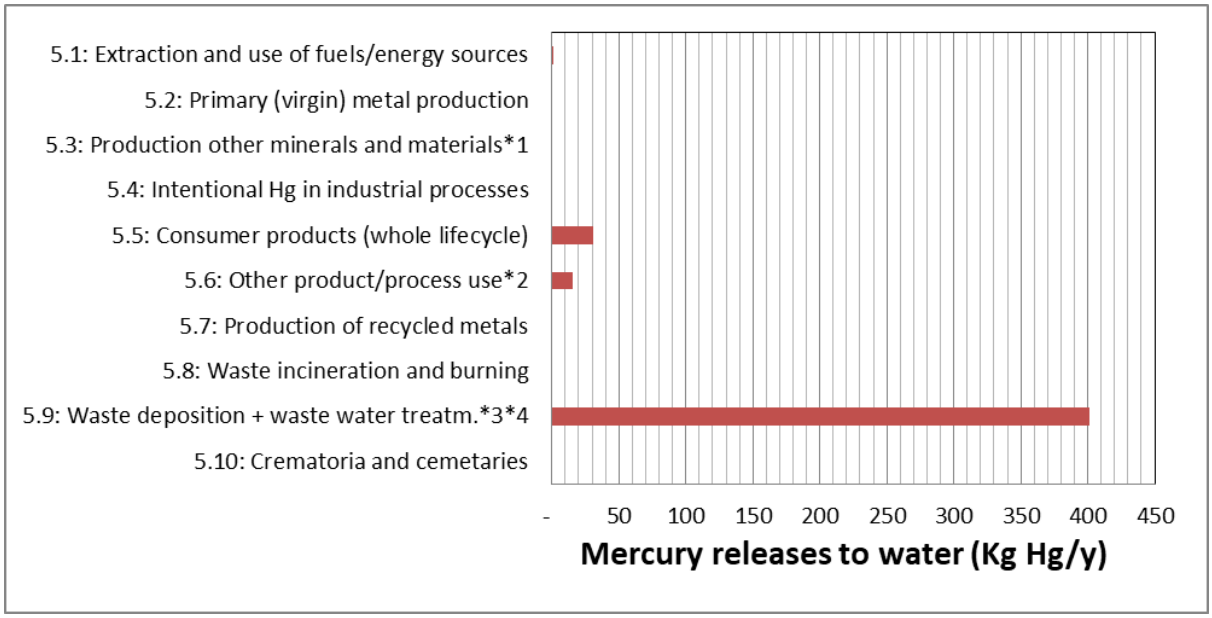

Fig. 5: Releases of Mercury to the Water in Lesotho

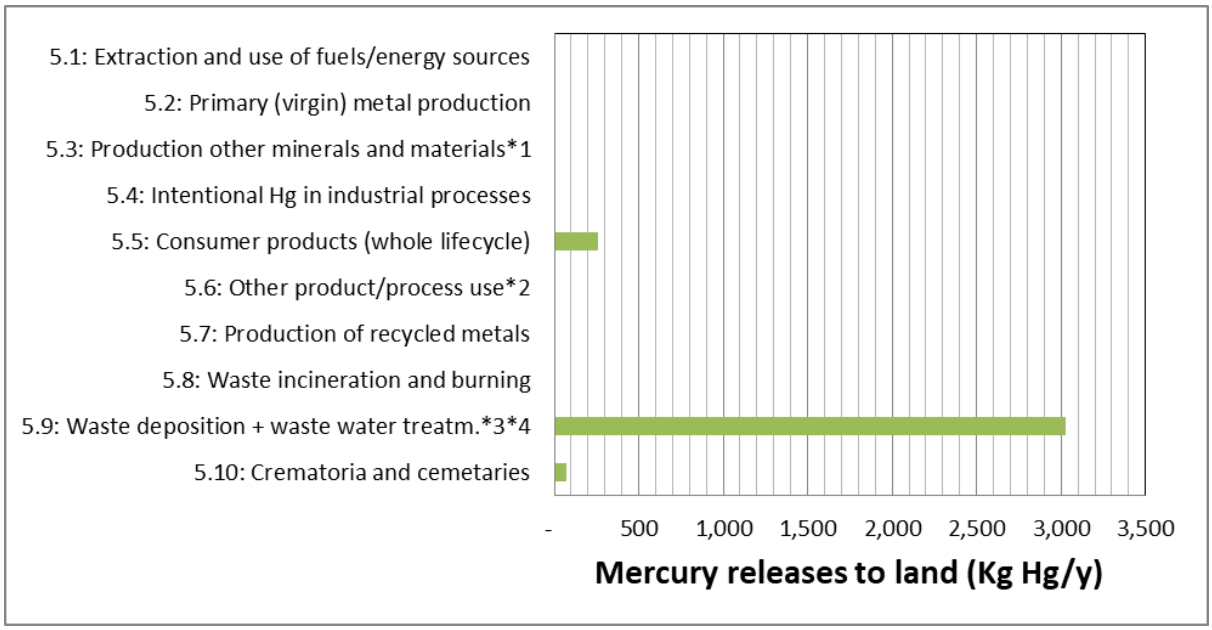

Fig. 6: Releases of Mercury to the Land in Lesotho

The individual Mercury release sub-categories contributing with the highest input to the atmosphere is waste deposition/landfilling and waste water treatment. The second highest emissions of Mercury into the air comes from the consumer products with intentional use of Mercury (whole life cycle). For water, the major source is the waste water some of which arising from waste management and the second largest coming once again from the consumer products and materials. Waste fractions and waste water do therefore not necessarily represent original Mercury inputs to society given the fact that Lesotho does not import waste. In fact, on the contrary, Lesotho exports its waste to its only one neighbour, South Africa.

In this inventory, default input factors were used for the estimation of Mercury releases from general waste treatment and wastewater treatment. The default factors were based on literature 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 and wastewater do almost likely over-estimate the Mercury releases from these sources. Follow-up is therefore necessary to get a lot more accurate scenario based on local conditions as this was not achieved in this study.

Table 3: Summary of Mercury Inputs to Society.

Category no.	Source category	Estimated Hg input, Kg Hg/y by life cycle phase (as relevant)	
		Use phase	**Dispo phase**
5.1	**Main category - Extraction and use of fuels/energy sources**		
5.1.2	Other coal combustion	**2.3**	
5.1.3	Extraction, refining and use of mineral oil	**0.0303**	
5.1.6	Biomass fired power and heat production	**58.8**	
5.5	**Main category - Consumer products with intentional use of Mercury**		
5.5.1	Thermometers with Mercury	**94**	
5.5.2	Electrical and electronic switches, contacts and relays with Mercury	**104**	
5.5.3	Light sources with Mercury	**8**	
5.5.4	Batteries containing Mercury	**817**	
5.5.5	Polyurethane with Mercury catalyst	**22.339**	
5.5.8	Cosmetics and related products	**?**	**?**
5.6	**Main category:** Other intentional products/process uses		
5.6.1	Dental Mercury-amalgam fillings	**7.74**	
5.6.2	Manometers and gauges	**3.72**	
5.6.3	Laboratory chemicals and equipment	**37.24**	
5.6.4	Mercury metal use in religious rituals and folklore medicine	**0.27**	
5.8	**Main category:** Waste incineration		

5.8.3	Incineration of medical waste	**7**
5.8.5	Informal waste burning	**38**
5.9	**Main category:** Waste deposition/ landfilling and waste water treatment	
5.9.1	Controlled landfills/deposits	**169**
5.9.2	Diffuse deposition under some control	**0**
5.9.4	Informal dumping of general waste	**3,781**
5.9.5	Waste water system/treatment	**46**
5.10	**Main category:** Cremation and cemeteries	
5.10.2	Cemeteries	**71.12**

The key Mercury releases here are releases to air (the atmosphere), to water, to land, to general waste, and to sectors specific waste. An additional output pathway is "by-products and impurities" which designate Mercury flows back into the market with by-products and products. It is worth noting that informal dumping of general waste made the largest input followed by Batteries with Mercury. This issue of informal dumping of waste is caused by lack of facilities in the country. Although there are efforts by the municipalities to collect waste, they generally fall short of the waste generated by both industries and the households. The collections are also unreliable with many drop-off points turning into dumpsites in some instances.

There is also a common tendency by the inhabitants to dump their waste in gullies or *dongas* that are found around the settlement sites. Lesotho is a country that is heavily scarred by gullies especially in the lowlands because of very high soil erosion caused by the duplex nature of the soils. The residents then take advantage of these gullies by using them as easy access places to simply dump their waste. During the rains, these areas become sources of leachate and downstream contamination.

Table 4: Summary of the Mercury Releases and Emissions

C	Sub-C	Source category	Exists (Y/N/?	Calculated Hg output, Kg/y					
				Air	**Water**	**Land**	**By-prod. +impur.**	**General waste**	**Sector spec. treatm./dispos.**
5.1		**Source category: Extraction and use of fuels/energy sources**							
	5.1.2	Other coal use	Y	2.3	0	0	0	0	0
	5.1.3	Extraction, refining and use of mineral oil	Y	0.03	0	0	0	0	0
	5.1.6	Biomass fired power and heat production	Y	58.8	0	0	0	0	0
5.5		**Source category: Consumer products with intentional use of Mercury**							
	5.5.1	Thermometers with Mercury	Y	9.4	28.2	0	0	56.4	0
	5.5.2	Electrical and electronic switches, contacts and relays with Mercury	Y	31.27	0	41.7	0	31.27	0
	5.5.3	Light sources with Mercury	Y	2.32	0	2.32	0	3.1	0
	5.5.4	Batteries with Mercury	Y	204.35	0	204.35	0	408.7	0
	5.5.5	Polyurethane with Mercury catalysts	Y	4.47	2.23	8.94	0	6.7	0
	5.5.8	Cosmetics and related products with Mercury	?	0	0	0	0	0	0
5.6		**Source category: Other intentional product/process use**							
	5.6.1	Dental Mercury-amalgam fillings (b	Y	0.15	1.08	0	0	0.93	0
	5.6.2	Manometers and gauges with Mercury	Y	0.77	2.32	0	0	2.32	2.32
	5.6.3	Laboratory chemicals and equipment with Mercury	Y	0	12.29	0	0	12.29	12.66
	5.6.4	Mercury metal use in religious rituals and folklore medicine	Y	0.11	0.05	0.11	0	0	0
5.8		**Source category: Waste incineration**							
	5.8.3	Incineration of medical waste	Y	7	0	0	0	0	0
	5.8.5	Informal waste burning	Y	38	0	0	0	0	0

5.9		**Source category: Waste deposition/landfilling and waste water treatment**							
	5.9.1	Controlled landfills/deposits	Y	1.69	0.02	0	0	0	0
	5.9.2	Diffuse disposal under some control	Y	-	-	-	-	-	-
	5.9.4	Informal dumping of general waste	Y	378.09	378.09	3024.69	-	-	-
	5.9.5	Waste water system/treatment	Y	0	23.12	0	0	13.87	9.25
5.10		**Source category: Crematoria and cemeteries**							
	5.10.2	Cemeteries	Y	0	0	71.12	-	0	0
SUM of Quantified Releases:				**738.75**	**447.4**	**3353.23**	**0**	**535.58**	**24.23**

Table 5: Description of the Types of Results for Mercury Releases and Emissions.

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 the amount of 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 as small scale gold mining, informally burned waste with fluorescent lamps, batteries, thermometers.
Water	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: • Wet flue cleaning systems from coal fired power plants; • Industry, households, etc. to aquatic environments; • Surface run-off and leachate from Mercury contaminated soil and waste dumps
Land	Mercury releases to soil, the terrestrial environment: General soil and ground water. For example releases from: • Solid residues from flue gas cleaning on coal fired power plants used for gravel road construction; • Uncollected waste products dumped or buried informally • Local un-confined releases from industry such as on site hazardous waste storage/burial • Spreading of sewage sludge with Mercury content on agricultural land (sludge used as fertilizer) • Application on land, seeds or seedlings of pesticides with Mercury compounds

Calculation result type	Description
By-products and impurities	By-products that contain Mercury, which are sent back into the market and cannot be directly allocated to environmental releases, for example: • Gypsum wallboard produced from solid residues from flue gas cleaning on coal fired power plants. • Sulphuric acid produced from desulphurization of flue gas (flue gas cleaning) in non-ferrous metal plants with Mercury trace concentrations • Chlorine and sodium hydroxide produced with Mercury-based chlor-alkali technology; with Mercury trace concentrations • Metal Mercury or calomel as by-product from non-ferrous metal mining (high Mercury concentrations)
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 or burning. 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.
Sector specific waste treatment /disposal	Waste from industry and consumers which is collected and treated in separate systems, and in some cases recycled; for example. • Confined deposition of solid residues from flue gas cleaning on coal fired power plants on dedicated sites. • Hazardous industrial waste with high Mercury content which is deposited in dedicated, safe sites • Hazardous consumer waste with Mercury content, mainly separately collected and safely treated batteries, thermometers, Mercury switches, lost teeth with amalgam fillings etc. • Confined deposition of tailings and high-volume rock/waste from extraction of non-ferrous metals The country-specific waste treatment/disposal method is described for each sub-category in the detailed report sections below.

3.13 Challenges

During the inventory exercise, several challenges were encountered when collecting data to feed into the toolkit. These challenges resulted into the following major gaps:

- Some uncertainty was encountered in distinguishing between anthracite, bituminous and sub-bituminous sub-categories particularly where there was no labelling or source.

- There are emissions that are unaccounted for due to cross-border movement of vehicles and refuelling because data presented is based on sale of fuel in the country. This does not cater for vehicles refuelled outside the country yet operating within the country and vice versa.

- The data on biomass consumption by rural population was unaccounted for. The only available data was on imported biomass.

- Data on thermometers with Mercury from medical institutions run by Christian Health Association of Lesotho (CHAL) and private hospitals and clinics was unavailable due to unsystematic record keeping of their stocks.

- There was no data on cosmetics with Mercury because importation of such cosmetics is illegal however there is evidence of sale and use of such cosmetics. Likewise, the sale and use of Mercury is prohibited by law and this contributed to Mercury suppliers and users' reluctance to disclose information.

- There is no quantification of solid waste in general hence there is no recent data on waste quantities.

- There are no flow meters installed in wastewater treatment facilities to measure the actual volume of the influent.

- There is fragmentation in documentation of deceased people.

3.14 Recommendations

- It is therefore deemed worthwhile that in future orientation and exposure by relevant bodies such as Department of Mines to different types of coal available in the market. This will help future data collection exercise to eliminate the uncertainty experienced in the present exercise.

- It is necessary to improve natural resource economics data capturing by the Department of Forestry and the Bureau of Statistics, such that biomass consumption data throughout the country, imported and locally harvested biomass is well articulated.

- The Department of Environment in collaboration with Environmental Health Division of the Ministry of Health need to conduct awareness and education campaigns as well as assist

in the development of systematic record keeping of Mercury containing thermometers by medical institutions.

- The Department of Environment in collaboration with Environmental Health Division of the Ministry of Health to strengthen awareness and education campaigns on the adverse effects of exposure to Mercury.

- The Ministry of Local Government through the relevant departments should set up a proper data collection mechanism for solid waste management.

- Water and Sewerage Company (WASCO) should ensure that all its wastewater treatment facilities are equipped with flow meters.

- Collection and recording of data on deaths needs to be harmonised and strengthened by the relevant institutions.

3.2 Extraction and use of fuels/energy sources

3.21 Other Coal Uses

For this source sub-category, Lesotho imports a total of 14,895.25t of coal. From this 2,100t is washed anthracite and 7,610.15t is not washed. The total is also inclusive of 2,580.72t of bituminous coal and 2,604.38t sub-bituminous coal (BOS, 2015). Coal in Lesotho is used for both industrial boilers especially in the textile industry as well as for domestic heating and cooking.

Lesotho relies on imported coal from the South Africa, with 70% of the total coal coming from Mpumalanga Province while 30% is from Gauteng Province. Working teams of the data collectors were engaged to collect data at the district level nationwide. This data was then verified against information within the Department of Energy of the Government of Lesotho.

Table 6: Other Coal Uses

Other coal uses (Washed)	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y		2,100		2,100
Input factor for phase	g Hg/t		0.15		0.15
Calculated input to phase	Kg Hg/y		0.3		0.3
Output distribution factors for phase:					
- Air	Kg Hg/y		1		1
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-
Calculated outputs/releases to:					
- Air	Kg Hg/y		0.3		0.3
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-

Other coal uses (Combustion)	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y		12,795.25		12,795.25
Input factor for phase	g Hg/t		0.15		0.15

Calculated input to phase	Kg Hg/y	2	2
Output distribution factors for phase:			
- Air	Kg Hg/y	1	1
- Water		-	-
- Land		-	-
- Products		-	-
- General waste treatment		-	-
- Sector specific waste treatment		-	-
Calculated outputs/releases to:			
- Air	Kg Hg/y	2	2
- Water		-	-
- Land		-	-
- Products		-	-
- General waste treatment		-	-
- Sector specific waste treatment		-	-

3.22 Mineral Oils – Extraction, Refining and Use

According to the Department of Energy, the use of gasoline, diesel, light fuel oil, kerosene, LPG and other light to medium distillates amounts to 16,645.02t for the year 2015, all imported from the South Africa. The data was given in litres of petrol and diesel. There was also data in kilograms of liquefied petroleum gas (LPG). These units were converted to tonnes using the respective oils' densities. The assumption was that transport sector used a large percentage of petrol and some diesel, residential mainly used LPG while other use was mainly for industrial which used a large percentage of diesel, some LPG and very little petrol.

The calculations were as follows:

- Tonnes of Petrol: 88.04
- Tonnes of Diesel: 112.98
- Tonnes of LPG: 16444

Total: 16,645.02

- Transport: 83.04 Petrol + 32.98 Diesel = 116.02t, equivalent to 0.70% of 16,645.02t
- Residential: 10,444t LPG, equivalent to 62.75% of 16,645.02t
- Other use: 5t Petrol + 80t Diesel + 6,000t LPG, equivalent to 36.56% of 16,645.02

There are emissions unaccounted for due to cross-border movement of vehicles and refuelling because data presented is based on sale of fuel in the country. This does not cater for vehicles refuelled outside the country yet operating within the country and vice versa. This may account for a significant figure given the high degree of cross-border traffic between Lesotho and South Africa and the fact that there are many people from Lesotho who permanently reside in South Africa, yet they work in Lesotho and therefore commute daily.

Table 7: Mineral oils – Extraction, Refining and Use

Mineral Oils – Extraction, Refining and Use	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y		16,645.02		16,645.02
Input factor for phase	Mg Hg/t		2		2
Calculated input to phase	Kg Hg/y		0.03		0.03
Output distribution factors for phase:					
- Air	Kg Hg/y		1		1
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-
Calculated outputs/releases to:					
- Air	Kg Hg/y		0.03		0.03
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-

3.23 Biomass Fired Power and Heat Production

According to the 2015 Energy Report by the Lesotho Bureau of Statistics, 5,380.43t of biomass is used annually. The data presented may be an underestimation given the fact that biomass consumption by rural population is high and yet goes unaccounted for since imported biomass is the only one recorded. There is a need for an improvement in natural resource economics data capturing such that biomass consumption data is well articulated.

Table 8: Biomass Fired Power and Heat Production

Biomass	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y		1,960,000		1,960,000
Input factor for phase	g Hg/t		0.03		0.03
Calculated input to phase	Kg Hg/y		58.8		58.8
Output distribution factors for phase:					
- Air	Kg Hg/y		1		1
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-
Calculated outputs/releases to:					
- Air	Kg Hg/y		58.8		58.8
- Water			-		-
- Land			-		-
- Products			-		-
- General waste treatment			-		-
- Sector specific waste treatment			-		-

3.3 Consumer products with intentional use of Mercury

3.31 Thermometers with Mercury

Lesotho imported from the South Africa a total of 8,148 thermometers with Mercury. They comprised 3,637 medical thermometers, 4381 other glass thermometers, 129 ambient air thermometers and 1 industrial and special thermometer. This is inclusive of thermometers used by the Lesotho Meteorological Services, the Ministry of Health and the Maluti Mountain Brewery (MMB), the single major brewery in the country.

It was not possible to access data on thermometers used in medical institutions run by Christian Health Association of Lesotho (CHAL) and private hospitals and clinics. There is a need for embarking on awareness and education programmes for the above-mentioned institutions so that in the future their information can also be incorporated. It is therefore obvious that the data presented in this report on this matter is a gross under representation because of this factor. CHAL has many hospitals and clinics around the country and there are many private clinics also run by individual medical doctors.

3.32 Electrical switches and relays with Mercury

For this source sub-category, the calculations were based on electrification rate and population size. Electrification was mainly in the urban areas for many years. Recently, the government has embarked on an aggressive electrification campaign that is including rural areas nationwide.

3.33 Light sources with Mercury

A total of 344,589 light sources were recorded as imported in 2012 (2012 Import and Export Data, BOS). Available data from the Bureau of Statistics is for the year 2012. This data under-represents this source category because of the rapid electrification process that has been undertaken since 2012.

3.34 Batteries with Mercury

It has been estimated that there are 131.07t of batteries with Mercury that were imported into the country in 2012 (2012 Import and Export Data, BOS).

- Mercury oxide (all sizes); also called Mercury-zinc cells = 75,9871 cells; (2.6g/weight of battery, converted to kilograms', then to tonnes, then multiplied by the number of cells) is equivalent to 1.97t
- Zinc-air button cells = 20,9179; (1.9g/weight of battery, converted to kilograms', then to tonnes, then multiplied by the number of cells) is equivalent to 0.39t

- Alkaline button cells = 13,133,214; (2.4g/weight of battery, converted to kilograms', then to tonnes, then multiplied by the number of cells) is equivalent to 31.52t
- Silver oxide button cells = 49,127; (2.3g/weight of battery, converted to kilograms', then to tonnes, then multiplied by the number of cells) is equivalent to 0.11t
- Alkaline, other than button cell shapes = 3,807,438; the weight is between 11g and 40g. Therefore, the average weight of 25.5g was converted to kilograms', then to tonnes, then multiplied by the number of cells, resulting in 97.08t.

3.35 Cosmetics and related products with Mercury

For this source sub-category, no data could be found. Cosmetics with Mercury are however present in the country and sold illegally along with other skin lightening creams. Cosmetics with Mercury are smuggled into the country because of the high demand out of ignorance on the impacts of Mercury on human health and the environment. It is important to intensify awareness and education campaigns on the adverse effects of exposure to Mercury in cosmetics.

3.36 Dental Mercury Amalgam Fillings

There are 32 dentists that serve the entire population of Lesotho, resulting in 0.0168 dentists per 1000 people. This is according to the Ministry of Health, Dental Department. Many of these dentists still use dental amalgams that contain Mercury.

3.37 Manometers and Gauges with Mercury

There are 47 medical blood pressure gauges that were found to be imported and in use. The toolkit has provided for other manometers and gauges using the electrification rate and the population.

3.38 Laboratory Chemicals and Equipment with Mercury

A total of 80L of liquid Mercury have been recorded from the health and education sectors. About 4L of mercurochrome was found in some hospitals. Equipment with Mercury such as thermometers, pressure gauges, manometers and barometers have also been identified in hospitals, schools and weather stations. Nevertheless, the toolkit has calculated Mercury releases from these sources using the population and electrification rate. These chemicals and equipment with Mercury are not produced in Lesotho but imported from elsewhere. There was a challenge in establishing quantities of chemicals and equipment with Mercury in the health sector hence the reason for opting to use the electrification to population ratio.

Approximately 2000 items are suspected to be used for this source sub-category per year. Mercury used is imported from South Africa. Using the data provided by selected pharmacies which was extrapolated for the entire country, it was estimated that 2L could be procured per each of the 10 districts. This translates to using 20 000ml/year. This is then sold in 10ml vials to the public, therefore giving 2000 items per year as the activity rate.

The input factor was calculated by multiplying the quantity per item (10ml vial) with the density of Mercury, with units converted to litres. That is:

0.01L * 13.52g/L = 0.1352g

To calculate the input factor, the same formula used in other sub-categories was used where the activity rate was multiplied by the input factor and converting to kilograms, giving:

2000 * 0.1352 / 1000 = 0.2704 kg

The output distribution factors were based on the following uses of Mercury in rituals and folklore medicine:

- Some expectant women ingest Mercury with the belief that it will reduce labour complications during child birth.
- Some men wear Mercury vials around their neck with the belief that they will be protected from evil spirits, and also as a charm.

Output distribution factors for Mercury used for rituals and folklore medicine, for land, air and water is 0.4, 0.4 and 0.2 respectively. This distribution pattern is due to the following:

- Land- Some Mercury ingested bioaccumulates in human tissue which gets released into land when the people are buried, and some gets released into land through excretion

- Air- Mercury in the vials worn by men ends up in air through evaporation

- Water- The small percentage of the population (expectant women) ingests Mercury which is later excreted and eventually finds its way to water and the land.

The sale and use of Mercury is prohibited by law and this contributed to Mercury suppliers and users reluctance' to disclose information in this regard. Based on the cultural mythology surrounding the use of Mercury in traditional beliefs it is taboo to even communicate the reasons behind its use.

Table 9: Thermometers with Mercury

Thermometers with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Items/year		8,148		8,148
Input factor for phase	g Hg/item		1-103		1-103
Calculated input to phase	Kg Hg/y		94		94
Output distribution factors for phase:					
- Air	Kg Hg/y		0.1		0.1
- Water	Kg Hg/y		0.3		0.3
- Land			-		-
- Products			-		-
- General waste treatment	Kg Hg/y		0.6		0.6
- Sector specific waste treatment	Kg Hg/y		-		-
Calculated outputs/releases to:					
- Air	Kg Hg/y		9.4		9.4
- Water	Kg Hg/y		28.2		28.2
- Land			-		-
- Products			-		-
- General waste treatment	Kg Hg/y		56.4		56.4
- Sector specific waste treatment	Kg Hg/y				-

Table 10: Electrical Switches and Relays with Mercury

Electrical switches and relays with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Inhabitants		1,909,321		1,909,321
Input factor for phase	gHg/(y*inhabitant)		0.14		0.14
Calculated input to phase	Kg Hg/y		104		104
Output distribution factors for phase:					
- Air			0.3		0.3
- Water					
- Land			0.4		0.4
- Products					
- General waste treatment			0.3		0.3
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y		31.27		31.27
- Water					
- Land	Kg Hg/y		41.7		41.7
- Products					
- General waste treatment	Kg Hg/y		31.27		31.27
- Sector specific waste treatment					

Table 11: Light Sources with Mercury

Light sources with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Items/y		344,589		344,589
Input factor for phase	mg Hg/item		10-30		10-30
Calculated input to phase	Kg Hg/y		8		8
Output distribution factors for phase:					
- Air	Kg Hg/y		0.3		0.3
- Water					
- Land	Kg Hg/y		0.3		0.3
- Products					
- General waste treatment	Kg Hg/y		0.4		0.4
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y		2.32		2.32
- Water					
- Land	Kg Hg/y		2.32		2.32
- Products					
- General waste treatment	Kg Hg/y		3.1		3.1
- Sector specific waste treatment					

Table 12: Batteries with Mercury

Batteries with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y		131.07		131.07
Input factor for phase	Kg Hg/t		0.25 - 320		0.25 - 320
Calculated input to phase	Kg Hg/y		817		817
Output distribution factors for phase:					
- Air	Kg Hg/y		0.25		0.25
- Water					
- Land	Kg Hg/y		0.25		0.25
- Products					
- General waste treatment	Kg Hg/y		0.5		0.5
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y		204.35		204.35
- Water					
- Land	Kg Hg/y		204.35		204.35
- Products					
- General waste treatment	Kg Hg/y		408.70		408.70
- Sector specific waste treatment					

Table 13: Polyurethane with Mercury Catalysts

Polyurethane with Mercury catalyst	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Inhabitants		1,909,321		1,909,321
Input factor for phase	gHg/(y*inhabitant)		0.03		0.03
Calculated input to phase	Kg Hg/y		22.33		22.33
Output distribution factors for phase:					
- Air			0.2		0.2
- Water			0.1		0.1
- Land			0.4		0.4
- Products					
- General waste treatment			0.3		0.3
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y		4.47		4.47
- Water	Kg Hg/y		2.23		2.23
- Land	Kg Hg/y		8.94		8.94
- Products					
- General waste treatment	Kg Hg/y		6.7		6.7
- Sector specific waste treatment					

Table 14: Dental Mercury Amalgam Fillings

Dental Mercury amalgam filling	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Inhabitants		1,909,321		1,909,321
Input factor for phase	gHg/(y*inhabitants)		0.2		0.2
Calculated input to phase	Kg Hg/y		7.74		7.74
Output distribution factors for phase:					
- Air	Kg Hg/y		0.02		0.02
- Water	Kg Hg/y		0.14		0.14
- Land					
- Products					
- General waste treatment	Kg Hg/y		0.12		0.12
- Sector specific waste treatment	Kg Hg/y		0.12		0.12
Calculated outputs/releases to:					
- Air	Kg Hg/y		0.15		0.15
- Water	Kg Hg/y		1.08		1.08
- Land			-		-
- Products			-		-
- General waste treatment	Kg Hg/y		0.93		0.93
- Sector specific waste treatment	Kg Hg/y		0.93		0.93

Table 15: Manometers and Gauges with Mercury

Manometers and Gauges with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Items/y		47		47
Input factor for phase	g Hg/item		80		80
Calculated input to phase	Kg Hg/y		4		4
Output distribution factors for phase:					
- Air	Kg Hg/y		0.1		0.1
- Water	Kg Hg/y		0.3		0.3
- Land					
- Products					
- General waste treatment	Kg Hg/y		0.6		0.6
- Sector specific waste treatment	Kg Hg/y				
Calculated outputs/releases to:					
- Air	Kg Hg/y		0.77		0.77
- Water	Kg Hg/y		2.32		2.32
- Land					
- Products					
- General waste treatment	Kg Hg/y		2.32		2.32
- Sector specific waste treatment	Kg Hg/y		2.32		2.32

Table 16: Laboratory Chemicals and Equipment with Mercury

Laboratory chemicals and equipment with Mercury	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Inhabitants		1,909,321		1,909,321
Input factor for phase	g Hg/y*inhabitants		0.01-0.04		0.01-0.04
Calculated input to phase	Kg Hg/y		37.23		37.23
Output distribution factors for phase:					
- Air					
- Water	Kg Hg/y		0.33		0.33
- Land					
- Products					
- General waste treatment	Kg Hg/y		0.33		0.33
- Sector specific waste treatment	Kg Hg/y		0.34		0.34
Calculated outputs/releases to:					
- Air					
- Water	Kg Hg/y		12.29		12.29
- Land					
- Products					
- General waste treatment			12.29		12.29
- Sector specific waste treatment	Kg Hg/y		12.66		12.66

Table 17: Mercury Metal Use in Religious Rituals and Folklore Medicine

Mercury metal use in religious rituals and folklore medicine	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Items		2000		2000
Input factor for phase	g Hg/item		0.1352		0.1352
Calculated input to phase	Kg Hg/y		0.27		0.27
Output distribution factors for phase:					
- Air			0.4		0.4
- Water			0.2		0.2
- Land			0.4		0.4
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y		0.11		0.11
- Water	Kg Hg/y		0.05		0.05
- Land	Kg Hg/y		0.11		0.11
- Products					
- General waste treatment					
- Sector specific waste treatment					

3.4 Waste incineration and burning

3.41 Incineration of Medical Waste

The 2012 Lesotho Health Care Waste Management Plan recorded 157t of incinerated medical waste per year from all hospitals in the country. This was inclusive of 67.8t from Queen Elizabeth II Hospital. Currently this hospital is not operating at full capacity and has been replaced by a new hospital; Queen 'Mamohato Memorial Hospital. The assumption made is that Queen Elizabeth II has reduced its operational capacity by 75%, and Queen 'Mamohato Memorial is double the size of Queen Elizabeth II.

Therefore, to arrive at the present tonnage of medical waste incinerated, the following calculations were made:

- 157t – 67.8t = 89.2t (all hospitals – Queen Elizabeth II)
- 89.2t + 16.9t = 106.1t (+ 25% Queen Elizabeth II capacity)
- 106.1t + 135.6t = 241.7t (+ Queen 'Mamohato Memorial)

Since most of the health care facilities have refurbished their outpatient department and incinerators since 2012, and other factors such as population increase, incineration of medical waste is assumed to have increased by 13.7% to 280t. Extrapolations were made on 2012 data because a systematic way of recording this data has only been established recently and the only available data was for three months.

3.42 Informal waste burning

The 2012 Solid Waste, Water and Sanitation report of the Lesotho (Bureau of Statistics) stated waste generation of 802,389t per year. Using other data provided in Integrated Solid Waste Management Study of 2006, it was established that about 1% of waste is burned under controlled measures, the rest is indiscriminately done by the public. Waste management is given low priority. There is no weighing of waste at official dumpsites hence there is no recent data on waste quantities even to establish the fraction that ends up being burned accurately. To overcome this challenge, it is important for the responsible institution to collect data on waste generation to make accurate assumptions of waste burned.

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 which came from the 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 4 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 2 spreadsheet:

In the (unaltered) IL2 spreadsheet the test was done as follows; tab "Level 2-Summary":

$$(E59+E63+E65+E68) > 2*(J23 + \sum(J36 \text{ to } J53)).$$

$$(0+38+244) > 2*(0+0+0+0+0+28+0+3+409+0+0+0+0+5+0+0+0)$$

$$262 < 890$$

The test made for wastewater compares the calculated inputs to wastewater treatment with the sum of outputs to water from intentional Mercury uses in products plus processes as follows, using data from the Inventory level 2 spreadsheet:

In the IL2 spreadsheet the test was done as follows; tab "Level 2-Summary":

E69 > 2*(G23 + ∑(G36 to G53)).

46 > 2 * (0+0+0+0+28+0+0+0+0+0+0+0+4+0+0+0)

46<64

The calculations made indicate that the default input factors for general waste and wastewater treatment does not necessarily over-estimate the Mercury releases from these sub-categories and therefore is usable.

Table 18: Incineration of Medical Waste

Incineration of medical waste	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y			280	280
Input factor for phase	g Hg/t waste incinerated			24	24
Calculated input to phase	Kg Hg/y			7	7
Output distribution factors for phase:					
- Air	Kg Hg/y			1	1
- Water					
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y			7	7
- Water					
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					

Table 19: Informal Waste Burning

Informal waste burning	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y			7557.66	7557.66
Input factor for phase	g Hg/t			5	5
Calculated input to phase	Kg Hg/y			38	38
Output distribution factors for phase:					
- Air	Kg Hg/y			1	1
- Water					
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y			38	38
- Water					
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					

3.5 Waste disposal, deposition/landfilling

3.51 Controlled landfills/deposits

There are 33,780.58t of waste disposed-off at controlled or semi-controlled dumpsites. This is 4.2% of waste generated. This has been calculated from the 2012 data presented in the Solid Waste, Water and Sanitation report of the Lesotho. Waste management is given low priority. There is no weighing of waste at official dumpsites hence there is no recent data on waste quantities. To overcome this challenge, it is important for the responsible institution to collect data on waste generation, collection and weighing prior to disposal.

3.52 Informal dumping of general waste

There are 44,854t of waste categorised under informal dumping of general waste. This accounts for 5.6% of waste generated. This has been calculated from the 2012 data presented in the Solid Waste, Water and Sanitation report of Lesotho. To overcome this challenge, it is important for the responsible institution to collect data on waste generation to make accurate assumptions of informal dumping of general waste.

Table 20: Controlled Landfills/Deposits

Controlled landfills/deposits	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y			33,780.58	33,780.58
Input factor for phase	g Hg/t			5	5
Calculated input to phase	Kg Hg/y			169	169
Output distribution factors for phase:					
- Air	Kg Hg/y			0.01	0.01
- Water	Kg Hg/y			0.0001	0.0001
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y			1.69	1.69
- Water	Kg Hg/y			0.02	0.02
- Land					
- Products					
- General waste treatment					
- Sector specific waste treatment					

Table 21: Informal Dumping of General Waste

Informal dumping of general waste	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	t/y			7,561,714	7,561,714
Input factor for phase	g Hg/t			5	5
Calculated input to phase	Kg Hg/y			3,781	3,781
Output distribution factors for phase:					
- Air	Kg Hg/y			0.1	0.1
- Water	Kg Hg/y			0.1	0.1
- Land	Kg Hg/y			0.8	0.8
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air	Kg Hg/y			378.09	378.09
- Water	Kg Hg/y			378.09	378.09
- Land	Kg Hg/y			3,024.69	3,024.69
- Products					
- General waste treatment					
- Sector specific waste treatment					

3.53 Waste water system/treatment

There are 8,809,064m^3 of waste water treated by the Water and Sewerage Company of Lesotho (WASCO). Maseru district alone accounts for 95% of the total. There are no flow meters installed in the treatment facilities to measure the actual volume of the effluent. As a result, the amount of waste reflected in this report is based on the volumetric capacity of the treatment facilities and not on the actual flows. The flow meters are to be installed in treatment facilities by the responsible institution to measure the volume of effluent.

Table 22: Waste Water System/ Treatment

Waste water system/treatment	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	m^3/y			8,809,064	8,809,064
Input factor for phase	mg Hg/ m^3			5.25	5.25
Calculated input to phase	Kg Hg/y			46	46
Output distribution factors for phase:					
- Air	Kg Hg/y			0.5	0.5
- Water					
- Land					
- Products					
- General waste treatment	Kg Hg/y			0.3	0.3
- Sector specific waste treatment	Kg Hg/y			0.2	0.2
Calculated outputs/releases to:					
- Air	Kg Hg/y				
- Water				23.12	23.12
- Land					
- Products					
- General waste treatment	Kg Hg/y			13.87	13.87
- Sector specific waste treatment	Kg Hg/y			9.25	9.25

3.6 Crematoria and cemeteries

3.61 Crematoria/Cremation

Mercury Inventory Level 1 had indicated that there were 12 corpses cremated annually. This data assumed that 1 person was cremated per month. The assumption was based on the relative size of the Indian community in the country and a small number of other people who prefer cremation. Cremation in Lesotho is not popular with most of the population preferring burial instead. Further work during this Level 2 inventory ultimately indicated that, there is no cremation taking place anywhere in Lesotho and there are no cremation facilities. All people who wish to be cremated are taken to the neighbouring country, South Africa in the city of Bloemfontein where they are cremated.

3.62 Cemeteries

The mortality rate in Lesotho has varied considerably as indicated earlier. In the 1990s it was very high some of it attributed to the scourge of HIV/AIDs. With the countrywide coverage of antiretroviral drugs this mortality rate has now come down to about 12 per 1000 inhabitants in recent years. Using the 2012 mortality rate of 15 per 1000 inhabitants, provided by the Lesotho Demographic survey, the number of deaths per 1,909,321 inhabitants is 28,449, which is assumed to be equivalent to the number of corpses buried.

For this source sub-category, the survey opted to use mortality rate because there is fragmentation in documentation of deceased people. The National Identity Civil Registration (NICR) office captures data on births and deaths. These are only reported deaths and as such, omit unreported deaths. Deaths may be reported at the office of the Chief but may not be reported at NICR if the family does not require a death certificate which is a common practice in the rural areas.

Table 23: Cemeteries

Cemeteries	Unit	Production	Use	Disposal	Sum of releases to pathway from assessed part of life-cycle
Activity rate	Corpses buried/y			28,449	28,449
Input factor for phase	g Hg/corpse			2.5	2.5
Calculated input to phase	Kg Hg/y			71.12	71.12
Output distribution factors for phase:					
- Air					
- Water					
- Land	Kg Hg/y			1	1
- Products					
- General waste treatment					
- Sector specific waste treatment					
Calculated outputs/releases to:					
- Air					
- Water					
- Land	Kg Hg/y			71.12	71.12
- Products					
- General waste treatment					
- Sector specific waste treatment					

Chapter 4: Contaminated sites

Mercury contaminated sites were identified in this work. They tend to be the dumpsites that are dotted around the country especially in major cities and towns. The source of the Mercury is the Mercury added products. This is because most Mercury added products (batteries, electrical switches, compact florescent lamps, etc) end up in dumpsites due to lack of segregation of municipal waste in the country. These are suspected to be contaminated however concentration levels have not been determined.

Maseru and Maputsoe are the largest cities and are the main industrial areas generating the highest waste volumes. It is in these two areas where sizable dumpsites are located. In the former area there is some form of waste management in place whereas in the latter, there are almost no control measures in place. This is an area of concern which warrants some form of mitigation measures to be applied. This latter area is also situated near a school and many factories and is frequently on fire with large plumes of smoke bellowing across the city. Many people especially the students in the school nearby and the thousands of textile factory workers that are frequently enveloped by the smoke from this dumpsite are vulnerable groups of concern.

Chapter 5: Policy, regulatory and institutional framework assessment

In terms of policy and regulatory arrangement, Lesotho needs to first domesticate an international treaty so that it can be effective in the country. Without domestication such a treaty fails to become self-executing and therefore affects implementation. Since Lesotho has ratified the Minamata Convention, it is therefore imperative to domesticate it so that it may be effectively implemented in the country. Lesotho has found it necessary to become a Party to several multilateral environmental agreements such as the Minamata Convention on Mercury on the basis of several legal foundations that it possesses. It is also a Party to other chemical and waste conventions such as the Basel, Rotterdam and Stockholm Conventions.

In the preamble of the Minamata Convention on Mercury, Parties acknowledge that the Convention and other related international conventions or agreements in the field of the environment and trade are mutually supportive. Parties to the Convention recognise the roles of relevant multilateral environmental agreements, especially the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the Rotterdam Convention on the Prior Informed Consent (PIC) for certain Hazardous Chemicals and Pesticides in International Trade and the Stockholm Convention on persistent organic pollutants for protection of human health and the environment. They achieve their collective aim by focussing on implementation at national, regional and global levels. They provide a coherent policy guidance, enhance efficiency in the provision of support to Parties, reduce administrative burden and maximize the effective and efficient use of resources at all levels.

These Conventions are related as they share the common objective of protecting human health and the environment from hazardous chemicals and wastes, and help facilitate the delivery of assistance to countries to manage chemicals and wastes at different stages of their life-cycle. Lesotho has a long history of implementing these other 3 conventions and established administrative structures that include broad participation of many stakeholders representing a broad cross-section of the society. The implementation of the Minamata Convention will thus benefit from this existing work and is therefore likely to move faster than with other older conventions.

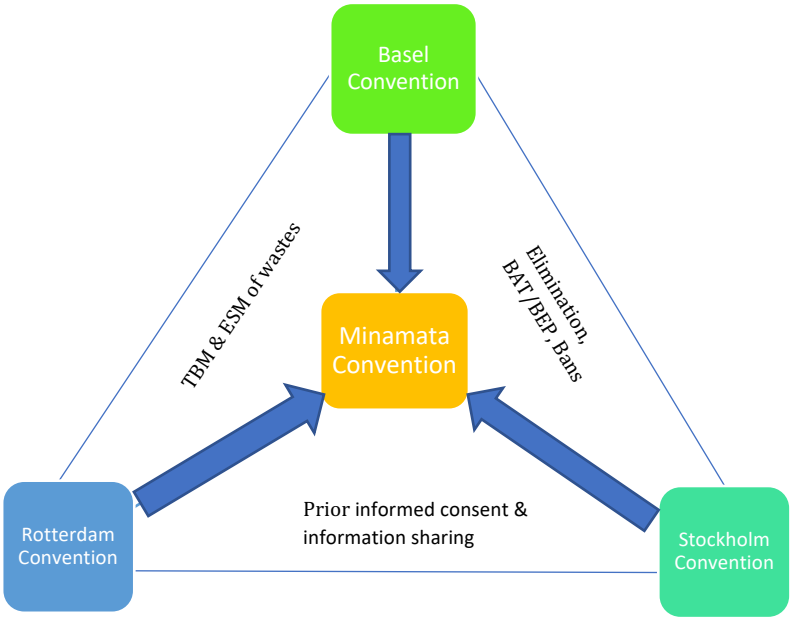

Fig 7: A schematic illustration of the synergy between the Minamata Convention and the other Chemicals Convention that Lesotho is a Party to.

5.1 Constitution of Lesotho 1993.

The Constitution of Lesotho is the supreme law of the country. Although it does not specifically spell out the issue of sound management of chemicals or management of Mercury *per se*, Section 36, prescribes the mandate for the country to address the issue of sound and safe environment for the health and well-being of its citizens.

It reads as follows:

> *"Lesotho shall adopt policies designed to protect and enhance the natural and cultural environment of the country for the benefit of both present and future generations and shall endeavour to assure all citizens a sound and safe environment for their health and well-being."*

This clause confers upon the government, a mandate to promulgate laws and policies that aim to protect the environment and human health of the nation. From this mandate the government is therefore able to join like-minded countries in multilateral environmental agreements in order to solve common problems. This includes the Minamata Convention.

After joining a convention, the government is then mandated by Section 94 of the Environment Act 2008 *"to initiate and prepare legislative proposals for consideration by the relevant Ministry for purposes of implementing those international or regional conventions or agreements and identify appropriate measures necessary for the implementation of conventions or agreements."* This is the section that therefore requires the government to domesticate a convention so that it be implemented in the country. This Act also requires the Director of Environment to keep a register of all international conventions or agreements that Lesotho is a Party to.

5.2 National Environment Policy 1996

Section 27 of the Constitution of Lesotho provides that *"Lesotho shall adopt policies aimed at ensuring the highest attainable standard and mental health for its citizens including policies intended to among others, improve environmental and industrial hygiene."* In pursuance of this goal, in 1996 Lesotho developed the National Environment Policy and amended it in 1998. The purpose of this policy was to create an enabling environment for developing legislative interventions meant to address the obligations as stated in the Constitution.

With respect to chemicals, the National Environment Policy calls for the following:

- designing and setting up of a national regulatory framework to control transboundary movements of chemicals:
- establishment of mechanism to regulate and control the importation of or generation of toxic and hazardous chemicals;
- capacitation of the private and public sectors in addressing the risks caused by chemicals to human health and environment; and
- empowerment of women to play a key role in natural resource use and management activities.

The National Environment Policy also deals with the issue of domestication of multilateral environmental agreements. It indicates that to *"ensure effective implementation of international Multilateral Environmental Agreements (MEAs) to which Lesotho is a party or will accede to in the future, national laws consistent with those agreements will be promulgated and implemented."* The Policy further stresses that Lesotho will continue to participate actively internationally or regionally in the development and codification of the MEAs, instruments and guidelines, and facilitate their adaption and inclusion in national laws and procedures. It is therefore obvious that the mandate to domesticate all multilateral agreements that Lesotho becomes a Party to originates from the Constitution and is further cascaded into the over-arching national environment policy.

5.3 Lesotho Vision 2020

The national Vision 2020 provides a long-term perspective within which national, short to medium term plans were formulated. It provides a dream for the nation for a good environment that will be underlain by a good environmental management premised on good national policies, laws and multilateral environmental agreements that Lesotho is a Party to.

5.4 National Strategic Development Plan (NSDP) 2012/13 – 2016/17

This serves as an implementation strategy for the national Vision 2020. The plan has been extended by another year. Some of the ambitions of this plan include considerations of the new challenges that the country is facing such as climate change. The plan talks about waste and sanitation services as well as promotion of environmental health. There is a further commitment to improve coordination and enforcement of laws, information and data for environmental planning and increased public knowledge and protection of the environment.

5.5 Environment Act 2008

The Environment Act is the framework law on environment in Lesotho. It has provisions dealing with issues related to toxic and hazardous chemicals, wastes and Mercury management. This Act identifies the Department of Environment as the principal authority responsible for supervision and management of toxic and hazardous chemicals, wastes and Mercury management. The Act seems focussed on the government without a clear articulation of how other stakeholders such as private pharmacies, dental clinics and traditional healers, research and training institutions and the Non-Governmental Organisations (NGOs) may play a part in chemicals and waste management.

This is a broad framework environmental law that seeks to cover environmental issues in the broadest sense. For example, although it addresses chemicals management it is silent on the issue of the globally harmonised system of labelling and classifications of chemicals (GHS). This limitation has been recognised and there is an attempt by the government now to develop a new framework law that is focussed on chemicals management.

5.6 Labour Code Order 1992

This law deals with all places of employment or apprenticeship excluding public service and the mining sector. It serves to provide occupational safety. It is supported by the Chemicals Safety Regulations 2003 that have been developed under it. The Chemicals Safety Regulations 2003 provide for banned chemicals under Schedule IV. Unfortunately, the Mercury and Mercury compounds are not included in the list but may be added as the need arises.

Regulation 16 of the Labour Code (Chemicals Safety 2003) has a provision for training and information dissemination to workers. It provides that *"an employer shall take appropriate measures to ensure that workers in the place of work receive sufficient and appropriate training on a continuous basis in light of all available information, in particular in the form of appropriate information and instruction concerning (i) potential risks to health and safety due to chemical they handle, including additional risks due to other factors that may promote such risks, (ii) precautions and technical measures to be observed to prevent exposure to chemicals substances and the precautions."* This provides an opportunity for Mercury management at the workplace as well.

5.7 Mines and Mineral Act 2005

This Act covers all mining activities in Lesotho. Section 58 refers to environmental obligation such as an obligation to prevent and to promptly treat pollution and contamination of the environment. The Act defines "mineral" as any substance in liquid, gaseous or solid form occurring naturally and formed by or subject to geological processes. Mercury can therefore be said to be a mineral under this definition. The Act is undergoing a review. This review presents an opportunity for the department of environment to suggest for inclusion issues of Mercury as well to address any future use in Mercury given on-going mineral exploration.

5.8 Public Health Order 1970 and Health Care Waste Management Policy 2010

This Order establishes the Ministry of Health which is charged with the health issues in the country. Included in its scope of work are matters related to environmental health. This Order is very old and needs to be reviewed to address emerging issues of the current time.

The country has also developed the Health Care Waste Management Policy which deals with how healthcare waste must be treated in the country. This policy recognises the role that environmental conventions must play in the management of the healthcare waste especially for transboundary movement. The policy also recognises that there may be vulnerable groups when matters of healthcare waste are considered

5.9 Hazardous (Health Care) Waste Management Regulations 2012

These Regulations are developed under Section 113 of the Environment Act 2008. They provide for environmentally sound management of medical or healthcare waste. These Regulations facilitate the implementation of the Healthcare Waste Management Policy 2010.

5.10 Import and Export Control Act 1984

The Act controls export and import of goods into Lesotho. "Goods" are defined as including wares, articles, merchandise, animals, currency, matter or things. Lesotho does not manufacture the chemicals that are circulating in it including Mercury. Lesotho relies almost entirely on importing such substances for its use. This fact renders this law one of the most important arms or tools which can be used to control the importation of Mercury into the country. Unfortunately, it is very old and needs to be reviewed and updated to respond to the current needs.

5.11 Import Restrictions Regulations 1988 as amended in 2009

Through these Regulations, certain goods of a specified class or kind, or goods other than goods of specified class or kind which appear in Schedule 2 are prohibited from being imported into Lesotho unless the importer is issued with a permit by the Commissioner of Trade. The Regulations are a faster vehicle than the Act, through which a ban or prohibition of importing Mercury substances and Mercury compounds that are not needed in the country can be achieved.

5.12 Local Government Act 1997 As Amended

The purpose of the Act is to establish local authorities for purpose of local government. The local authorities are charged with powers to make among others, public health by- laws, by-laws on supervision of licences for vendors and by-laws on regulation or prohibition of sale of any article in any specified place. There is a proliferation of traditional concoctions that are being developed and sold in the country by unlicensed people, some with big claims in terms of what they claim

they can cure without any scientific proof. It seems the country is ill-prepared to address this problem. It has no policy and no laws to even start.

This new phenomenon of people who simply make claims and put their concoctions on the market for public consumption remains a big risk to the healthcare system of the country. This behaviour is not even consistent with the way in which traditional healers worked in the past. It is simply a commodified approach to healthcare with no emphasis on the patient *per se* but rather on the volumes of concoctions sold. Anything could be in these concoctions and Mercury is a likely additive given the cultural myth that it has some mysterious powers. Any solution to this problem must include local authorities as they are much closer to the people.

5.13 Water Act 2008

The Act provides for the management, protection, conservation, development and sustainable utilisation of water resources. In relation to chemicals, it covers pollution control. This Act may provide an opportunity to manage Mercury in watercourses and to manage waste water for Mercury contamination. This may include effluent from the factories and from the sewage treatment plants.

5.14 Overview of the legislative tools available in the country for Minamata implementation

Table 24 below presents an overview of the legislative tools that Lesotho has for chemicals management and measures that need to be taken to ensure that they also cover Mercury in their scope. It is clear from this overview that most of the legislative tools that the country has have gaps that need to be filled to ensure that the Minamata Convention is properly implemented in the country. As a starting point, international conventions are not self-executing in Lesotho. They need to be domesticated so that they may have a legal force in the country. While for many years the country has relied on the Environment Act 2008 as amended, the limitations are many and a new framework law for chemicals has been developed (Toxic and Hazardous Chemicals Control and Management Bill 2015). The process has taken a very long time and needs to be concluded soon.

Table 24: Legislative measures in place applicable to Minamata Implementation

<table>
<tr><td colspan="2">Article 3 -</td></tr>
<tr><td colspan="2">Description of Article: Mercury supply sources and trade</td></tr>
<tr><td>Succinct summary of provisions relevant to the country in question (source NRDC Checklist)</td><td>• Not allow new primary Mercury mining
• Obtain information on stocks of Mercury or Mercury compounds exceeding 50 metric tons (MT), and Mercury supply generating stocks exceeding 10 MT/yr.
• Not allow the export of Mercury unless the importing country provides written consent
• 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)</td></tr>
<tr><td colspan="2">Policy and regulatory measures in place that enable the country to comply with the above listed provisions:</td></tr>
<tr><td>Title and reference/number of relevant Policy and Regulatory Measure, as well as date:

Amendment to Toxic and Hazardous Chemicals Control and Management Bill 2015 (The Bill is currently under development, and is not yet approved as law)</td><td>• Not allow new primary Mercury mining: Section 75 on prohibition of mercury mining

S75 (1) prohibits conducting of mining activities involving mining of Mercury or any mining process in which Mercury amalgamation is used

S.75 (2) imposes a penalty of a fine which does not exceed M10 000 000.00 or imprisonment for a period of 20 years or to both fine and imprisonment on a person who is found guilty of contravening the provisions of S.75 (1).

• Not allow the export of Mercury unless the importing country provides written consent: Section 73 is on export of Mercury or Mercury compounds.

S73(1) prohibits the export of Mercury or Mercury compounds from Lesotho unless
- (a) a person has obtained a permit from the Director
- (b) such mercury is for the use allowed in the receiving state under the Convention
- (c) a person has submitted to the Director a written consent for the import of mercury or mercury compounds of the receiving State
- (d) mercury or mercury compound is intended for environmentally sound interim storage in the receiving State.</td></tr>
</table>

	S 73(2) provides that an application for exporting of mercury or mercury compounds shall be submitted to the director in writing in a prescribed form and accompanied by a prescribed fee. If an importer is not a party to the Convention, the exporter shall submit to the Director - (a) a written consent from the receiving State - (b)proof that the receiving State has in place measures to ensure the protection of human health and the environment - (c) proof that the receiving State has in place measures for interim storage of such mercury and mercury compounds and the measures to be undertaken in an environmentally sound manner are in accordance with the guidelines prescribed by the Director - (d) proof that both the receiving and exporting States have taken appropriate measures to ensure that mercury or mercury compound is managed in an environmentally sound manner and in accordance with the guidelines prescribed by the Director. • **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):** **Section 72** is on importation of Mercury. It prohibits under **S.72 (1**) prohibits importation of mercury or mercury compounds into Lesotho. **S. 72 (2)** exempts importation of Mercury or Mercury compounds intended for laboratory scale research or as reference standard. **S.72 (3**) provides that a person who wishes to import mercury or mercury compounds for purposes of S72 (2) shall submit an application in writing to the Director in a prescribed form and accompanied by a prescribed fee. **S.72 (5)** imposes a penalty of a fine which does not exceed M1 000 000.00 or imprisonment for a term not exceeding 10 years or to both such fine and imprisonment for contravention of this section.
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):	
• There is no legislation prohibiting new primary Mercury mining, no legislation prohibiting export of Mercury unless the importing country provides written consent, no legislation prohibiting importation of Mercury without government consent, ensuring both the Mercury source and proposed use are allowed under the Convention and applicable domestic law. There is no legislation as the Toxic and Hazardous Chemicals Control and Management Bill 2015 and the proposed Amendment which incorporates provisions on (i) prohibition of primary Mercury mining, (ii) export of Mercury or Mercury compounds and (iii) importation of Mercury or Mercury compounds has not yet been enacted into a binding law (Act) and is still in a draft form. Once it is enacted and comes into force these aspects will be covered.	

• It is therefore necessary to expedite the enactment of this Bill into law/an Act of Parliament.	
Article 4	
Description of Article:	Mercury-added products
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Not allow the manufacture, import, and export of products listed in Part I of Annex A not otherwise excluded following the phase out date listed in the Annex • Phase down the use of dental amalgam through two or more measures listed in Part II of Annex A • Take measures to prevent the incorporation of products listed in Part I of Annex A (i.e. switches and relays, batteries) into larger, assembled products • 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:	
Toxic and Hazardous Chemicals Control and Management Bill 2015. (The Bill is currently under development, and is not yet approved as law)	• **Not allow the manufacture, import, and export of products listed in Part I of Annex A not otherwise excluded following the phase out date listed in the Annex: Section 74** is on Mercury added products. **S.74 (1)** prohibits manufacturing, handling, use, import or export of mercury added products listed in the Second Schedule to this Act, after the dates shown in the Schedule. The section exempts, under **S.74 (2),** (a) products essential for civil protection and military uses, (b) products for research, calibration of instruments, for use as reference standard, and (c) where no feasible mercury-free alternative for replacement is available, switches and relays, cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) or electronic displays and measuring devices, and (d) vaccines containing thiomersal as preservatives**.** **S.74 (3)** imposes a penalty of a fine which does not exceed M1 000 000.00 or imprisonment for a term not exceeding 10 years or both fine and imprisonment for contravention of this section. • **Take measures to prevent the incorporation of products listed in Part I of Annex A (i.e. switches and relays, batteries) into larger, assembled products**: **Section 74** above is relevant for the purpose of this aspect as well.
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):	
There is no legislation in place which: • Prohibits the manufacture, import, and export of products listed in Part I of Annex A of the Convention, that are not otherwise allowed as per Annex A of the Convention, • Phases down the use of dental amalgam through two or more measures listed in Part II of Annex A, and • Discourages the manufacture and distribution of new mercury product types which are without demonstrated environmental or health benefits,	

• The Toxic and Hazardous Chemicals Control and Management Bill 2015 and the proposed Amendment which incorporates a provision on Mercury added product has not yet been enacted into a binding law (Act) and is still in a draft form. • It is therefore necessary to expedite the enactment of this Bill into law/an Act of Parliament.	
Article 5	
Description of Article: Manufacturing processes in which mercury or mercury compounds are used	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Restrict (as specified in the Annex) the use of mercury in the processes listed in Part II of Annex B. • Not allow new facilities from using mercury in the processes listed in Annex B, except facilities using mercury catalysts to produce polyurethane • For facilities with processes listed in Annex B, identify and obtain information on mercury or mercury compound use; • Control mercury emissions to air, and releases to land and water. • Discourage new uses of mercury in industrial processes.
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Amendment to Toxic and Hazardous Chemicals Control and Management Bill 2015 (The Bill is currently under development, and is not yet approved as law)	Lesotho does not have plants using Mercury in the processes listed below, but it will take action to prohibit any likely mercury use in any industrial processes. • **Restrict (as specified in the Annex) the use of mercury in the processes listed in Part II of Annex** **Section 76** deals with manufacturing processes. **S. 76 (1)** prohibits use of mercury or mercury compounds in the manufacturing process specified in the Third Schedule to the Act after the dates shown in the Schedule. **S.76 (2)** imposes a penalty of a fine not exceeding M10 000 000. 00 or to imprisonment for a period of 20 years or both.
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):	
Not allowing new facilities from using mercury in the processes listed in Annex B, except facilities using mercury catalysts to produce polyurethane; For facilities with processes listed in Annex B, identifying and obtaining information on mercury or mercury compound use and controlling of mercury emissions to air and releases to land and water from such facilities; and Discouraging new uses of mercury in industrial processes: There is no legislation in place which controls these activities.	

• Expedite the enactment of the Toxic and Hazardous Chemicals Control and Management Bill 2015 together with proposed amendments incorporating a provision that deals with manufacturing processes, into law/an Act of Parliament. • Incorporate a new section under the Toxic and Hazardous Chemicals Control and Management Bill 2015, which prohibits use of Mercury in new facilities. Include also a new section which exempts facilities that use mercury catalysts to produce polyurethane from this prohibition, or • Amend First Schedule Part A of the Environment Ac No.10 of 2008 where it deals with Types of projects or activities for which EIA is required, by adding under Paragraph 9 entitled "processing and manufacturing industries", a new section "s", which will read as follows: manufacturing processes using mercury or mercury compounds other than manufacturing processes for Chlor-alkali production and acetaldehyde production in which mercury or mercury compound are used as a catalyst. (This will inform Ministry of Trade and Industry, in which case a traders' license will not be issued for such an activity without an EIA certificate from the Director of Environment).	
Article 6	
Description of the Article: Exemptions available to a party upon request	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	Register for one or more exemptions from the phase out dates listed in Annex A
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date:	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure:
	Register for exemptions for MAPs under Part 1 Annex A
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):	
• There are no outstanding aspects because Lesotho has submitted an application registering for exemptions for MAPS that are listed under Part I Annex A.	
Article 8	

Description of the Article: Emissions	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	(Select from the below as appropriate to national situation) • 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 • Require monitoring/reporting and otherwise establish a mercury emissions inventory for sources listed in Annex D
Policy and regulatory measures in place that enable the country to comply with the above listed provisions	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date: • **Environment Act No.10 of 2008**	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure: • **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:** • Section 29 of the Environment Act deals with Air quality standards by empowering the Director in consultation with relevant Line Ministry to make the following: (a) Establish criteria for the measurement of air quality (b) establish (i) ambient air quality standards; (ii) occupational air quality standards; (iii) emission standards for various sources; (vi) criteria and guidelines for air pollution control for both mobile and stationery sources and (v) any other air quality standards, which may be prescribed from time to time (c) take measures to reduce existing sources of air pollution by requiring the redesign of plants or the installation of new technology or both in order to meet the requirements of standards established under this section (d) make guidelines to minimize emissions of greenhouse gases and identify suitable technologies to minimize air pollution (e) consider the rate of emission concentration and nature of pollutants emitted (f) consider the best practicable technology available in controlling pollutants during the emission process (g) determine the analytical technology available in controlling pollutants during the emission process (h) order or carry out investigations of actual or suspected air pollution including pollution produced by aircraft, motor vehicles, factories and power generating stations; (i) order an industry or any other source of air pollution to file returns and provide any information as it may require; and (j) do any other thing, which may be necessary for the monitoring and controlling of air pollution. • **Section 29 (2**) prohibits any emission which causes air pollution in contravention of emissions standards, established under this Act. And • **Section 29 (3)** imposes a penalty of a fine which is not less than M5,000 or to imprisonment for a period of not less than 2-years or to both fine and imprisonment for contravention of S.29(2)

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):	
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: There are no air quality standards. • Addressing this short coming will require an implementation of Section 29 of the Environment Act outlined above, by among others, developing the required air quality standards in which case emissions limit values can be stipulated in such a manner as will control and reduce Mercury emissions from relevant sources and a guidance document that will be adopted by the Minamata Convention COP.	
Require monitoring/reporting and otherwise establish a mercury emissions inventory for sources listed in Annex D: There is no provision in the law or in the proposed Bill for monitoring /reporting and otherwise establishing a mercury inventory for sources listed in Annex D of the Convention. • Addressing this short coming will require incorporating a section in the Toxic and Hazardous Chemicals Control and Management Bill 2015, that provides for monitoring/reporting and establishment of an inventory for mercury emissions in Lesotho.	
Article 9	
Description of the Article: Releases	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• 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. • 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.
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date: • Environment Act No. 10 of 2008	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure: **Taking 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:** **Section 28** of the Environment Act deals with issues of water quality standards as follows: **Section 28. (1)** The Director shall, in consultation with the relevant Line Ministry (a) establish criteria and procedures for the measurement of water quality (b) establish minimum water quality standards for all the waters of Lesotho and for the following different uses (i) drinking water; (ii) water for industrial purposes; (iii) water for agricultural purposes; (iv) water for

	recreational purposes; (v) water for fisheries; (vi) water for wildlife; and (vii) any other water uses which may be prescribed (c) determine conditions for the discharge of effluents into the aquatic environment (d) make guidelines for the preservation of fishing areas, aquatic areas, and other areas where water may need special protection (e) identify areas of research and initiate or commission research on the effects of water pollution on the environment, human beings and fauna and flora (f) order or carry out investigations of actual or suspected water pollution including the collection of data (g) document the analytical methods by which water quality and pollution control standards can be determined (h) collect maintain and interpret data from industries and local authorities on the pre-treatment nature and levels of effluents (i) prescribe measures for the treatment of effluent before discharging it into the sewerage systems (j) establish standards for the discharge of effluent into waters of Lesotho (k) recommend the undertaking by a plant operator, of Works necessary for the treatment of effluent before it is discharged into the waters; and (l) perform anything or act necessary for the monitoring and control of water pollution. (2) The Director may, in consultation with the relevant Line Ministry, prescribe different quality standards to apply in different areas of Lesotho with respect to different segments of the environment and the Director may, from time to time, vary such standards. **Section 28 (3)** imposes a penalty of a fine of not less than M5, 000 or to imprisonment for a term of not less than 2 years or to both fine and imprisonment.
Water quality standards 2014 (developed but not yet formally adopted by the Government of Lesotho.	
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):	

Taking 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: Water quality standards which were developed in 2014 have not been adopted by the Government of Lesotho and are therefore not being implemented.	
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:	
• There is no provision on reporting or obtaining information as needed to identify significant sources of Mercury/ Mercury compounds releases to land or water and to maintain an inventory of releases from the sources identified. • This could be redressed by incorporating a section in the Toxic and Hazardous Chemicals Control and Management Bill 2015, that provides for monitoring/reporting and establishment of an inventory for waste facilities in Lesotho which are the sources for releases.	
Article 10	
Description of the Article: Environmentally sound interim storage of mercury, other than waste mercury	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	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)
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date: **None**	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure: **None**
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):	
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):	
• Amend the Environment Act to provide for the development and adoption of guidelines on the interim storage of Mercury and Mercury compounds intended for allowed use, or	

• Include a provision on the issue of development/ adoption of guidelines on the interim storage of Mercury and Mercury compounds in the Toxic and Hazardous Chemicals Control and Management Bill 2015.	
Article 11	
Description of the Article: Mercury Waste	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Use a definition of mercury waste consistent with 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. • 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 • 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:	
• Title and reference/number of relevant Policy and Regulatory Measure, as well as date: Hazardous (Healthcare Waste Regulations Legal Notice 37 of 2012)	**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:** Hazardous (Health Care) Management Regulations 2012 provides for environmentally sound management of health care waste which is defined as health care general waste and health care risk waste. Health care risk waste is defined as waste that is hazardous or which is capable of producing disease, injury or pollution and includes infectious, pathological, sharp, pharmaceutical and genotoxic waste, which are also defined in the Regulations. Health care general waste is defined as the non- hazardous component of health care waste.
Draft Hazardous and Non-Hazardous Waste Management Bill 2005	• Require transboundary movement in accordance with the Basel Convention, or if the Basel Convention does not apply, consistent with international rules, standards, and guidelines: deals with Transboundary movement of waste under Part IX. **Section 26 (1)** prohibits importation of hazardous waste into Lesotho. **Section 26 (2)** provides that subject to Subsection (1) the provisions of Basel Convention set out in the Schedule to this Act shall be applied to regulate any transboundary movement of waste. **Section 26 (3)** prohibits exportation of hazardous waste unless the exporter is in possession of an insurance policy or guarantee approved by the Director, covering risks likely to arise from exportation of wastes**.**

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):
• **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** • **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** • **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:**
• There is no legislation except the one regulating healthcare waste namely, the Hazardous (Health Care) Waste Management Regulations 2012. However, these Regulations also do not regulate transboundary movement of the healthcare waste. • Draft Hazardous and Non- Hazardous Waste Management Bill 2005 quoted above is an old Bill which has not been further developed into law/Act. No steps have been taken to present it into the national legislation making process so that it could ultimately be enacted into law. These gaps can be addressed by: • Developing Mercury Waste Regulations under Section 113 of the Environment Act 2008 to come up with a provision for holistically addressing the issue of Mercury wastes as stipulated in Article 11 • Reviving and finalising the development of Draft Hazardous and Non-Hazardous Waste Management Bill 2005 to ensure that issues of Mercury wastes as provided for under Article 11 are holistically incorporated.
Article 12
Description of the Article: Contaminated sites
Succinct summary of provisions relevant to the country in question (source NRDC Checklist) — • Develop strategies for identifying and assessing mercury/mercury compound contaminated sites • 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:

Title and reference/number of relevant Policy and Regulatory Measure, as well as date: **None**	**None**
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):	
• **Develop strategies for identifying and assessing mercury/mercury compound contaminated sites:** • **If risk reduction activities are taken at contaminated sites, they are taken in an environmentally sound manner:** • **incorporating risk assessment where appropriate: For all three of these outstanding aspects**: • There are no Standards or criteria for establishing such Standards.	
• The gap can be addressed by including a provision in the Toxic and Hazardous Chemicals Control and Management Bill 2015 for development of standards for identification of Mercury contaminated sites and for undertaking of risk reduction activities at contaminated sites.	
Article 13	
Description of the Article: Financial resources and mechanisms	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• 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:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date:	• 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

• National Strategic Development Plan 2012/13 -2016/17	
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):	
• Mercury issues are not included in the National Strategic Development Plan. • The gaps related to funding will be addressed if the issues of Mercury could be included in the ministry's Strategic Plan and ultimately in the National Strategic Development Plan • Toxic and Hazardous Chemicals Control and Management Bill 2015 should provide for charging of fees for several activities such as registration, licensing, inspections and training etc. so as to raise necessary finances.	
Article 16	
Description of the Article: Health aspects	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Promote the development and implementation of strategies to identify and protect populations at risk, such as developing fish consumption guidelines • Promote occupational exposure educational and prevention programs • Promote prevention, treatment, and care services for affected populations
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date**:** • **Labour Code (Chemicals Safety) Regulations Legal Notice 75 of 2003**	• **Promote occupational exposure educational and prevention programs:** • **Regulation 16** on training and information of workers provides that an employer shall take appropriate measures to ensure that workers in the place of work receive sufficient and appropriate training on a continuous basis in light of all available information, in particular in the form of appropriate information and instruction concerning (i) potential risks to health and safety due to chemical they handle, including additional risks due to other factors that may promote such risks, (ii) precautions and technical measures to be observed to prevent exposure to chemicals substances and the precautions • **Section 15** of the Hazardous (Health Care) Waste Management Regulations provides that a person in charge of a health care facility, treatment plant or transporter shall provide training to an employee who handles health care risk waste.

• **Hazardous (Health Care) Waste Management Regulations Legal Notice 37 of 2012** • **Public Health Order 1970**	• **Section 3** of Public Health Order 1970, the functions of the Ministry of Health include promotion of personal health and environmental health.
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):	
• **Promote the development and implementation of strategies to identify and protect populations at risk, such as developing fish consumption guidelines** • **Promote occupational exposure educational and prevention programs** • **Promote prevention, treatment, and care services for affected populations:**	
• There is no legislation enabling formulation of strategies to identify and protect populations at risk, promoting occupational exposure, educational and prevention programmes in line with Article 16 paragraph 2 which enables promotion, prevention, treatment and care services for affected populations. • All of the three aspects could be addressed by incorporation of enabling provisions in the Toxic and Hazardous Chemicals Control and Management Bill 2015. • Although it is noted above that Labour Code (Chemicals Safety) Regulations have a provision on training and information of workers, it is noted that in terms of Section 30 of the Public Service Act 2005 the Labour Code does not apply to workers in the Civil Service hence it will still be necessary to provide for this aspect under the Toxic and Hazardous Chemicals Control and Management Bill 2015.	
Article 17	
Description of the Article: Information exchange	
Succinct summary of provisions relevant to the	Share information on the health and safety of humans and the environment as non-confidential, in accordance with Article 17.5

country in question (source NRDC Checklist)	
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date: Environment Act No.10 of 2008	**Share information on the health and safety of humans and the environment as non-confidential:** Section 95 provides for freedom of access to environmental information by applying to the Director to furnish such information. However, the proprietary information is exempted.
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):	
• Regarding the issue on access to information on health and safety of humans and of treating such information as confidential: It is noted that the Environment Act covers only environmental education and does not stipulate health and safety information. • Toxic and Hazardous Chemicals Control and Management Bill 2015 should have a provision on access to information on health and safety of humans and that such information should **not** be treated as confidential; • Designate a National Focal Point for exchange of information	
Article 18	
Description of the Article: Public information, awareness, and education	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Collect and disseminate information on annual quantities of mercury and mercury compounds emitted, released, or disposed; and other information specified. • Education, training and public awareness related to the effects of exposure to mercury and mercury compounds on human health and the environment, in collaboration with relevant intergovernmental and NGOs and vulnerable populations, as appropriate
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	

Title and reference/number of relevant Policy and Regulatory Measure, as well as date • Environment Act No. 10 of 2008	**Collect and disseminate information on annual quantities of Mercury and Mercury compounds emitted, released, or disposed; and other information specified:** **Section 96** of the Environment Act provides that the Director shall collect, analyse and disseminate environmental information**.**
• Environment Act No. 10 of 2008	**Education, training and public awareness related to the effects of exposure to Mercury and Mercury compounds on human health and the environment, in collaboration with relevant intergovernmental and NGOs and vulnerable populations, as appropriate:** **Section 97** of the Environment Act provides that Director shall in consultation with relevant Line Ministries take appropriate measures for integration of education on the environment in all levels of education**.**
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):	
Collect and disseminate information on annual quantities of Mercury and Mercury compounds emitted, released, or disposed; and other information specified: Provision in the Environment Act Section 96 does not mention Mercury or Mercury compounds. Therefore, the Environment Act should be amended in Section 96 to incorporate issues of Mercury and mercury compounds.	
• **Education, training and public awareness related to the effects of exposure to mercury and mercury compounds on human health and the environment, in collaboration with relevant intergovernmental and NGOs and vulnerable populations, as appropriate:** • **Section 97** of the Environment Act on integration of education on the environment at all levels of education does not mention mercury issues education. Therefore Section 97 should be amended to incorporate issues of mercury and mercury compounds.	
Article 19	
Description of the Article: Research, development and monitoring	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	To cooperate with other countries to develop and improve on key areas of research that can support effective implementation of the Convention.

	These research areas include, among others, inventories of mercury use and consumption; the levels of mercury in people, aquatic food sources, and wildlife; and information on mercury commerce and trade.
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date**: None**	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure: **None**
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):	
To cooperate with other countries to develop and improve on key areas of research that can support effective implementation of the Convention:	
• There is no provision at all on cooperation as far as possible with other countries on research. • There is no provision designating the National Focal Point as the structure with a mandate to fulfil this requirement in the Toxic and Hazardous Chemicals Control and Management Bill 2015.	
Article 21.	
Description of the Article: Reporting	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	Report to the COP on progress in implementing Convention obligations under Article 21
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and	

Regulatory Measure, as well as date	
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):	
• There is no section/provision on reporting mechanism in the Toxic and Hazardous Chemicals Control and Management Bill 2015	
Article 25	
Description of the Article: Settlements of disputes	
Succinct summary of provisions relevant to the country in question (source NRDC Checklist)	• Participate in one of the dispute resolution processes specified if needed, under Article 25 of the Convention In the course of implementing the Convention, countries may find themselves in a disagreement over the interpretation or application of the Convention. To manage disputes among countries, the Convention lays down the following rules: • Countries shall seek to settle any dispute between them concerning the interpretation or application of the Convention through negotiation or other peaceful means of their own choice. (Article 25.1) • 2. A country or a regional economic integration organization may declare at the time it ratifies the Convention, or at any time thereafter, in a written instrument submitted to the Depositary that, with regard to any dispute concerning the interpretation or application of the Convention, it recognizes one or both of the following means of dispute settlement as compulsory in relation to any country accepting the same obligation: a. Arbitration in accordance with the procedure set out in Part I of Annex E and b. Submission of the dispute to the International Court of Justice. (Article 25.2)
Policy and regulatory measures in place that enable the country to comply with the above listed provisions:	
Title and reference/number of relevant Policy and Regulatory Measure, as well as date: **None**	Explanation on what aspects of the above provisions are being addressed by policy/regulatory measure: **None**
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):	
• No legislation is required, however the ministry must ensure that a written declaration is send, if it has not yet been sent to the Depository, with respect to the choice of dispute settlement mechanism it recognizes.	

Chapter 6: Stakeholders Analysis

5.1 The Stakeholders in the country

There are many stakeholders in the country for environmental issues and Mercury is no exception. For coordination of these stakeholders, the Department of Environment uses two committees. These are the Chemicals Management Committee (CHEMAC) and the Committee on Waste Management (COWMAN). These are committees made up of the various stakeholders that play a role one way or another in the chemicals management in the country. The challenge with these committees is that they are not statutory but advisory in nature. Nevertheless, they have been functional for many years and many stakeholders tend to participate in them actively.

Some of the stakeholders are as follows:

Ministry of Health: This ministry manages health impact of chemicals on the general public through many departments including the Department of Environmental Health. The Ministry of Health is responsible for public education and raising awareness on all health-related issues. It further regulates appointment of the Lesotho Traditional Medical Practitioners Council (LTMPC). Traditional healers in Lesotho are known to prescribe the use of Mercury to their patients. It is the prerogative of the Ministry of Health to raise awareness among these traditional healers as they work in the same sector.

Ministry of Trade and Industry: This ministry is responsible for setting up a conducive environment for the manufacturing sector in the country (and this could be extended to manufacturing of chemicals and their by-products) through Lesotho National Development Corporation (LNDC). It is also responsible for regulating imports and exports of chemicals substances; issuing of trading licences, manufacturing, import and export licences and issuing permits. When they issue permits they work together with the Department of Environment which provides what is called environmental clearance. The environmental clearance is meant to imply that the department of environment has considered the application for either export or import and established that it is not going to have adverse environmental impacts.

Ministry of Law and Constitutional Affairs and Human Rights: This ministry is responsible for legislative drafting; legal advice to government and its several ministries and departments; and representation of government and its ministries and departments in civil and criminal litigation.

Ministry of Energy and Meteorology: This ministry is responsible for Controlling trade of petroleum fuels through the Department of Energy, for atmospheric and weather observations, development of data bank and archiving system to create a national climate record. The agency charged with executing these functions is the Lesotho Meteorological Services and uses Mercury-containing instruments in its weather stations for climate and weather monitoring.

Ministry of Employment and Labour: This ministry is responsible for the welfare, health and occupational safety of workers. It is the ministry responsible for the safety of the workplace environment.

Ministry of Local Government: This ministry is responsible for land use, waste management and pollution control though Local Authorities. It has councils in all the districts of the country.

Ministry of Agriculture and Food Security: This ministry is responsible for regulation of pesticides and importation of agro-chemicals that are used for pest control and veterinary services. It is also responsible for importation of fertilizers and chemicals used for seed dressing.

Ministry of Water: This ministry is responsible for monitoring and protection of water resources against pollution. It that pursuance, it oversees water quality and quantity in Lesotho. This ministry is also responsible for waste water management through a subsidiary organisation called the Water and Sewage Company (WASCO).

Ministry of Mining: This ministry is responsible for the regulation of ownership and acquisition of mineral rights, prospecting licenses and mining leases as well as ensuring that mining operations follow environmentally sound mining practices.

Ministry of Education and Training: This ministry is responsible for procurement, storing and distribution of chemicals used in schools. This includes elemental Mercury and devices containing Mercury such as thermometers.

Lesotho Revenue Authority works hand in hand with other Ministries to check on importation of goods and confiscate banned goods.

Ministry of Development Planning: This ministry is responsible for national policies and strategies including environmental related policy recommendations. It achieves this through planning units that are embedded in all line ministries

Ministry of Finance: This ministry is responsible for budget allocation. Budget allocation of all ministries including the Ministry of Environment for all their activities comes from this ministry.

Ministry of Police: This ministry deals with law enforcement. As a law enforcement agency of the Government, the Ministry needs to be sensitized about issues of Mercury management especially the laws that govern the issues. The police also play a meaningful role regarding awareness campaigns on criminal issues which members of the public should avoid.

The Private sector: This includes the private pharmacies, dental practitioners and manufacturers, importers and sellers of Mercury.

Trade Unions/Workers Unions: These take up issues of workplace safety that may be of concern to their members.

Medical and Dental Association of Lesotho: This is the umbrella body for all medical doctors and dentists in the country. It is an association that represents their interests and provides a collective bargaining power.

Lesotho Medical, Dental and Pharmacy Council: This is a statutory body that regulates all the medical doctors, dentists and pharmacists in the country.

Lesotho Traditional Medicine Practitioners' Association: This association is responsible for coordinating issues of traditional healers (some traditional healers are known to prescribe Mercury to their patients.

Lesotho Nursing Council: This is the umbrella body that oversees all matters related to the nurses in the country. Some nurses have established their own clinics and may use chemicals that include Mercury.

5.2 Capacity constraints

Although there is a coordination mechanism for environmental issues and chemicals and waste management in the country, the following institutional and capacity gaps have been identified in regarding management of Mercury as required by the Minamata Convention:

5.21 Facilities

- Article 3: There are no facilities to monitor imports for Mercury and Mercury compounds.
- Article 4: There are no facilities to monitor imports for Mercury added products (MAPs).
- Article 5: There are no facilities to test for Mercury in existing manufacturing processes within the country.
- Article 8: There are no emissions monitoring instruments and appropriate analytical laboratories for analyzing emissions. The existing laboratories are privately owned and do not have Mercury as they priority per se.
- Article 9: Analytical laboratories are generally not well equipped and need to be upgraded. In some instances where water analysis is required water samples are taken to South Africa for analysis. The few laboratories available in Lesotho, are operating without any accreditation, more so because they are not commercial.
- Article 10: There is a lack of sound storage facilities for Mercury and Mercury compounds intended for a use allowed to a Party under the Convention.
- Article 11: There are no hazardous waste disposal facilities and again organizations and departments whose focus is waste management, do not have equipment for analyzing the presence of Mercury/ Mercury compounds in such waste.
- Article 12: There are facilities to test suspected contaminated sites.
- Article 16: There is a good number of selected healthcare facilities (clinics and hospitals) that were upgraded through a recently implemented project funded by the Millennium Challenge Account, however more clinics need to be upgraded for treatment and monitoring of health risks related to chemicals exposure.
- Article 17: There is no database for Mercury and Mercury compounds which are imported into and/or stockpiled in the country.

5.22 Other capacity requirements

- Most of the stakeholders in the country do not have the necessary skills for Mercury management to fulfill their obligations in terms of the Convention. They therefore need training to fulfill their obligations as required under all relevant Articles.
- The public institutions are understaffed. There has not been any measurable improvement in this aspect from the situation that prevailed in 2010 when the National Profile of Chemicals Management Infrastructure was compiled. It was noted then that many departments in the public service are understaffed.
- There is a need for the department of environment to have environmental inspectors. These inspectors will have a much broader mandate including activities related to the Minamata Convention. The current structure of using district environmental officers tends to relegate itself to mere bureaucratic office operations with no enforcement component that inspectorate would bring.
- Article 12: There is no chemical emergency response plan that would enable swift and appropriate action in case of chemical emergencies.
- Article 13: There is lack of financial resources in terms of, but not limited to purchasing equipment, training and relevant personnel in line with handling Mercury and Mercury waste.
- Although there is an outreach division within the department of environment, there is not comprehensive educational and awareness raising programmes on issues of Mercury generally.
- Article 16: Mercury related diseases are not included in the Integrated Disease Surveillance and Response Plan and this poses a challenge in case of occurrence or incidences of such diseases with respect to prompt response or treatment.

Chapter 7: Vulnerable Populations and Gender Dimensions of the Risk

In terms of Mercury vulnerability, the two main groups that are in the forefront in Lesotho are 1) pregnant women and 2) men who work in the illegal ASGM sector in South Africa. Other groups may also experience the effects of exposure to Mercury such as people who use skin lightening products that contain Mercury, those who use Mercury for cultural rituals and those who scavenge on the dumpsites in the country that may be contaminated with Mercury because of the way those sites are being managed. However, if any meaningful impact must be made in Lesotho, the focus must be on these two most vulnerable groups as they face the greatest risk.

The first group and the group of biggest concern is the pregnant women who ingest Mercury. The cultural story about the pregnant women in Lesotho especially rural and low literacy level pregnant women is that they deliberately source and ingest elemental Mercury because of a cultural belief that it helps to ease delivery. Although this issue is regularly raised no systematic study or studies has/have ever been done by either the Ministry of Health or the Department of Environment to document and understand the extent and depth of this problem. It is a practice that is known to occur but because there is no data that informs how severe or non-severe it is there are no interventions that are being done to address it.

Given the fact that it is generally accepted that there are some pregnant women who engage in this practice, some government intervention is overdue. The developing foetuses are most susceptible to effects of Mercury with catastrophic implications on their brain development and general nervous system growth. By ingesting the Mercury, these women affect their unborn babies as the Mercury may pass through the placenta to the foetus. This cultural practice causes self-poisoning of the mother and poisoning of the foetus as well.

This myth may be addressed by including targeted pre-natal sessions on Mercury and its effects. The focus of the sessions must be on the health effects of Mercury on pregnant women and their unborn babies so that people may begin to take informed decisions. This myth must be debunked, and women must be made to understand the health implications that they put themselves and their unborn babies in when they engage in this practice. As this is shrouded in mythology and cultural taboos, the Ministry of Health must find creative ways of breaking these barriers so that they may win over the women who believe in this practice. Ignoring that this practice happens and therefore taking no steps to address it is not an option for the country.

Regarding ASGM, Lesotho does not have an ASGM sector within its territory. Yet because of historical reasons, most able-bodied men in Lesotho have always been engaged in the South African mining industry. At some point in Lesotho's history most of the unskilled men between the ages of 18 – 60 were at some time in the lives working in the gold mining industry of South Africa. In other words, Lesotho had become captive labour reserve for the South African mining industry. After apartheid was removed in South Africa, the numbers of labourers employed by the South African mining industry have steadily declined. The aggressive recruitment infrastructure that had been established by the mines in the country has completely disappeared and many able-bodied men with mining experience and mining dependence have been rendered jobless.

On the other side in South Africa, there are many gold mines that have been decommissioned because the proprietors felt that they were no longer economically viable. These retrenched men from Lesotho and the other neighbouring countries that have been providing labour to this industry have encroached in and are mining illegally in these abandoned mines. The working conditions are bad, and the practices are evolving towards organized crime. Because their activities are not recognized in South Africa, they represent a vulnerable group that operates

outside formal industry standards with no support from either the government of Lesotho nor the government of South Africa. When they get sick, these illegal miners return home to Lesotho for their healthcare.

Unlike in other countries where ASGM activities are undertaken by whole families including women and children, in the case of Lesotho this is exclusively done by men. It is a violet enterprise with hordes of criminal gangs and illegal firearms. Every year many young men lose their lives in this enterprise yet there is no coordinated policy response from either the government of Lesotho or the government of South Africa.

Table 25: The Vulnerable Populations in Lesotho

Source Group	Vulnerable or Populations at risk
1. Use and disposal of the other products	(a) Women who use Mercury added products especially skin lightening cosmetics. (b) Traditional healers since some of them prepare medicinal concoctions that include addition of Mercury in unsafe conditions. (c) People with dental amalgam fillings.
2. Informal dumping of general waste and waste water system/treatment	(a) People engaged in the waste sector such as waste scavengers. (b) People who live near dumpsites or downstream dumpsites as they may be exposed to emissions as burning is a common practice in dumpsites or exposed to releases of lecheate.
3. Coal combustion and other coal use	(a) Industry workers from industries that use coal for industrial boilers without scrubbers to mitigate emissions (b) Residents who use coal especially coal burned openly within homesteads in the rural areas without emissions stacks and therefore people directly inhaling the smoke in a confined environment.
4. Others	(a) People engaged in cultural beliefs surrounding the use of Mercury (b) People who prepare and sell traditional concoctions some having Mercury added. (d) Children from contaminated products (e) Unborn babies from pregnant women who ingest Mercury. (f) Pregnant women who ingest Mercury. (g) Basotho Men who work in the illegal ASGM sector in South Africa.

Chapter 8: Awareness Raising and Understanding of the Issues by the Relevant Stakeholders

Public awareness is the most important aspect of a successful implementation of the Minamata Convention in Lesotho. This is because the most significant challenge that the country is facing regarding Mercury has to do with lack of awareness.

It seems Basotho tend to think of Mercury as a benign substance that they can use in any manner that they may wish including deliberately eating it in elemental form. In schools when Mercury containing devices break, the Mercury released becomes a subject of intrigue, fun and playfulness instead of a pollutant that is harmful. Not even teachers including science teachers are aware of the potential risks and are therefore are able to teach their students about the dangers of Mercury.

Given the fact that the entire population needs awareness, the task of awareness raising must be taken on by all major institutions in the country. From the highest echelons of government, to local government structures including community councils, civil society organizations and faith-based organizations. The ministries of environment and health must develop a joint risk communication strategy for Mercury.

8.1 Decision makers

The ability of awareness raising programmes to reach, and influence decision makers is critical as it is the starting point for the implementation of the Minamata Convention requirements. This is also crucial as decision makers ensure availability of resources. Decision makers to be targeted include political leaders (members of Parliament, specifically the portfolio committee on Natural Resources, Tourism and Land Cluster, District Administrators, community councillors, Personal Secretaries, Directors and Heads of Departments.

8.2 Non-governmental Organisations (NGOs)

Non-governmental organisations can be instrumental in influencing decision making and raising awareness at grassroots level. NGOs can influence decision makers through advocacy and lobbying hence they should be one of the main stakeholders involved in advocating for implementation of Article 18 of the Minamata Convention. The government through the Department of Environment shall therefore take steps to identify relevant NGOs and include them in the implementation of the Minamata Convention.

8.3 Academia

Schools and tertiary institutions provide an opportunity for several people to be reached and to instil knowledge to many generations. The Mercury issues related to health and the environment can be included formally and informally in school programmes to raise awareness among both teachers/lectures, students, other staff and board members. The use of existing Enviro-Clubs in some schools will be crucial as it will encourage student-to-student learning.

8.4 Users of Mercury and Mercury added products

Specific programmes should be tailored for known users of Mercury and Mercury added products. User groups and those exposed include:

Table 26: Users of Mercury and Mercury added products in Lesotho

User Group	Exposure to Mercury
Health practitioners (dental and pharmaceuticals, nurses and doctors)	Health practitioners use Mercury in dental amalgam fillings and in other medical equipment such as thermometers and sphygmomanometers, etc.
Traditional healers and herbalists	Mercury is used by traditional healers in the treatment of their patients in folklore medicine.
Initiation school instructors and students	Mercury is used by initiation school instructors to perform some rituals especially in the initiation of males.
Laboratory technicians	Laboratory technicians use Mercury containing instruments in laboratories such as thermometers and manometers for different purposes.
Livestock herders	Livestock herders (commonly male) use Mercury as a charm and for ritual power over others as they believe that it makes a person to have a certain heavy aura.
Waste handlers/scavengers	Waste handlers are exposed to Mercury from waste medical equipment and electronic waste that they handle such as fluorescent bulbs, batteries, thermometers that contain mercury. There are also many devices that are discarded with the general waste that contain Mercury.

Pregnant women	Some pregnant women believe in a myth that ingesting Mercury will ease labour pains and expedite delivery.
Construction workers	Construction workers may be exposed to Mercury during the installation of fluorescent bulbs during construction of buildings and handling Mercury containing waste during demolition.
Factory workers	Some factory workers can be exposed to Mercury in factories which use coal. There was also a high risk of exposure for workers who were working for bulbs and lights manufacturing factory. The factory was closed but many people worked in it for a long time. Stringent measures will have to be implemented should a similar factory start operations in Lesotho.
General public in particular rural communities	Mercury is mainly used in rural communities for superstitious purposes such as easing labour for pregnant women or as a charm. Use of Mercury containing substances and products such as coal and fluorescent bulbs can also expose members of the public to Mercury.
People involved in artisanal mining;	Mercury is used in artisanal gold mining. Although there are no artisanal gold mines in Lesotho, there are many Basotho migrant workers who engage in artisanal gold mining in South Africa.

8.5 Options for Awareness Raising

8.51 Print Media

Print media such as posters, flyers, newspapers and billboards can be used as part of the IEC materials for dissemination of information on Minamata Convention and MIAs. Posters and flyers can be targeted at among others, schools (including tertiary institutions), government departments and factories. Billboards have a potential of having a significant impact when it comes to awareness as they are placed in visible areas where people see them every day. Messages communicated through posters and billboards must be clear, succinct and designed attractively to catch attention of target groups.

8.52 Television and Radio Programmes

An opportunity exists in the television and radio broadcast as the Ministry of Environment already has slots on the public broadcasters such as Lesotho Television (LTV) and Radio Lesotho. These slots should be scheduled to times when most people are able to watch TV or listen to the radio. For instance, TV programmes can be scheduled for evening hours when most people have knocked off from work. An informative drama on TV is one of the programmes which can catch a large audience as it can be educational and entertaining as well.

8.53 Social Media

Advancements in technology have made information dissemination to numerous people easy through use of social media and instant messaging applications. Social media such as Facebook and Twitter and instant messaging such as WhatsApp should therefore be used to reach youth and middle-aged groups of the population as they are the ones who are more knowledgeable on the use of technology.

8.54 Formal Education

Inclusion of relevant information on Mercury in school curriculum from as early as primary schools. This will initially require collaboration between the Ministry of Education and Training and Department of Environment. Development of content to be included in the curriculum should take into consideration the level of understanding of targeted pupils.

8.55 Community outreach

Traditional ways of reaching the communities such as public gatherings can also be instrumental in raising awareness on Mercury issues. These will be used for reaching the public, in particular rural communities. Literacy levels of target communities should be put into consideration to ensure effectiveness of awareness raising.

8.56 Seminars and workshops

Seminars and workshops can serve as platforms to educate groups or individuals with common ground. For instance, they can be aimed at laboratory technicians, traditional healers and initiation school teachers, dentists and other main users of Mercury. Health and environmental impacts of Mercury as well as potential alternatives to Mercury can be discussed in such platforms.

8.57 Access and availability of information

Exiting information centres such as libraries should be used as access points for Mercury Initial Assessments reports. Below is a list of information centres or media that people already have access to:

- Libraries including national library, Transformation Resource Centre (TRC), tertiary institutions and schools library;
- Radio stations;
- Television;
- Information displays at Government Departments and other Corporates;
- Notice boards at Chiefs' offices and or local community council offices;
- Government websites.

It terms of availability, necessary information on Mercury and the Minamata Convention should be available and target groups should be made aware of available information and where it can be accessed. Notice boards, websites and newsletters can be used to notify target groups of where to access detailed information.

8.58 Record-keeping and Archiving

It is important that there be proper record keeping of programmes for the purposes of future use and monitoring and evaluation as well as accountability. Records to be kept shall include:

- Outreach and awareness programmes implemented:
- Dates on which programmes were implemented;
- IEC materials developed and disseminated;
- Target groups reached;
- Number of attendees at meetings, workshops and public gatherings;
- Minutes of meetings held;
- Resources employed – both financial and human resources;
- Feedback obtained;
- Monitoring reports for implemented programmes;
- Evaluation reports for implemented programmes.

8.59 Potential barriers

There may be potential barriers in the awareness campaigns and information dissemination that may have to be overcome. It is important to understand them so that appropriate strategies may be employed bearing in mind the sensitivities that each may require.

Table 27: Dissemination of Information Barriers and how they could be Addressed

Provisions of Article 18	Potential Barriers	Recommended solutions
1.Each Party shall, within its capabilities, promote and facilitate: (a) Provision to the public of available information on various topics as outlined in the Convention. (b) Education, training and public awareness related to the effects of exposure to mercury and mercury compounds on human health and the environment in collaboration with relevant intergovernmental and non-governmental organizations and vulnerable populations, as appropriate.	• **Low Literacy levels** This may hinder part of the public from understanding some of the content outlined in the convention. • **Cultural beliefs which hinder behavioural change** There are existing cultural beliefs among population groups (women and other vulnerable groups) which may hinder behavioural change in relation to use of Mercury. • **Poor collaboration between government departments and NGOs and vulnerable groups;** • **Limited financial resources** Resources can limit both in government in developing the IEC materials as well as the target user in terms of obtaining them if there is an associated cost. • **Lack of interest in reading**	• Use of local language as much as possible in particular in rural areas; Use of visual aids to ensure better and quicker understanding • Continuous awareness raising on the risks of Mercury exposure; • Identification and awareness raising on alternatives for Mercury and Mercury added products; • Strengthen collaboration between government and NGOs and vulnerable groups. • Sufficient budget should be allocated for information dissemination activities. Mainstreaming; • IEC materials should be availed for free at information centres. • Use of billboards as they capture attention; • MOET should encourage culture or of reading in students from a young age.
2. Each Party shall use existing mechanisms or give consideration to the development of mechanisms,	• There are no existing mechanisms in relation to sharing of	• The government should work towards developing

such as pollutant release and transfer registers (PRTRs) where applicable, for the collection and dissemination of information on estimates of its annual quantities of mercury and mercury compounds that are emitted, released or disposed of through human activities.	information on pollution; • The process of developing mechanisms such as PRTRs for sharing of information on pollutant release may be costly.	mechanisms such as pollutant release and transfer registers. In addition, an initiative to establish Lesotho Chemical Information Exchange Network (CIEN) should be pursued to completion; • Polluters should also be capacitated in providing relevant information for PRTRs; • Development of PRTRs and Lesotho CIEN should be incorporated into the government budget.

Chapter 9: Priorities for Action

The primary purpose of the Minamata Convention is to protect human health and the environment from the impacts of Mercury and Mercury compounds in whatever form they may come. Mercury occurs naturally and is also found in many areas of human habitation. It is found in food, rituals, spirituality, healthcare, science, commerce, industry, lighting products, relays, beauty products and many facets that touch human life. Whether a society is industrialized, middle income or living a primitive life, Mercury tends to somehow exist in all of them.

Because of this a Mercury implementation plan must be broad and all-inclusive. It needs to transcend various divides of society and needs a strong commitment at the political, institutional and personal levels.

9.1 Political will

The government has moved in the right direction by ratifying the Minamata Convention. More commitment and political will shall be required going forward. The government is responsible for both financial and human resource mobilisation and policy development. It is crucial to get decision makers buy-in and commitment from the onset.

9.2 Resources

Resources will be needed if the country implement the Minamata Convention effectively. In addition to accessing finances from the international community, the government must allocate sufficient resources to the line ministries so that programmes meant to address Minamata issues may be implemented. Part of the work will include awareness raising. Minamata Convention and other MEAs must be mainstreamed into the government programming.

9.3 Capacity building

Relevant personnel within implementing government departments and NGOs and other relevant stakeholders will have to be capacitated to ensure effective implementation. Capacity needs assessment will be the starting point for capacity development. Personnel shall be trained in among others, effective communication strategies for different target groups and development of appropriate IEC materials.

9.4 Monitoring and Evaluation

It is important that the monitoring and evaluation must include all actions taken as a matter of priority for Mercury management in the country. As well the awareness raising strategies must be monitored and evaluated to determine the effectiveness of the awareness raising and education programmes. The frequency of monitoring shall depend on the type of action or programme, but it is recommended that there be bi-annual and annual monitoring of all. Programme evaluation can be done at the end of each programme to measure its success and draw lessons for future projects.

9.5 Priorities for Action for Minamata Convention Implementation

9.51 High-level priority 1: Pregnant women and ingestion of Mercury in the country

The implementation plan and priority setting for Minamata implementation must take as the first priority the local context within which Mercury exists. In the case of Lesotho first priority must be to address the Mercury problem with the pregnant women. This problem has been left unattended for far too long. It needs a multi-stakeholder and multi-prong approach. In the first place the government must come to a conclusion that this practice by pregnant women of ingesting elemental Mercury in quantities and frequencies that are unknown is a health emergency that needs emergency approach and not business as usual.

The first thing is to understand how prevalent and pervasive this problem may be among the women and secondly to implement a comprehensive public campaign programme that will reach each and every woman and each and every girl in the country first to create awareness but secondly to discourage those who already engage in the practice and to ensure that those who do not engage in it never start. This must involve the government championed by the ministries of health and environment. The Ministry of Education must include this in the curriculum and ensure that all schools from primary to tertiary are taught about this problem. In order to ensure that even girls that are out of school are reached and all women are reached, churches, other faith-based organizations, parenthood associations, initiation schools, other civil society organizations including women groups e.g. *stokvels*, political parties, cultural and sporting events must also teach about this problem.

9.52 High-level priority 2: Men involved in illegal ASGM industry in the neighbouring South Africa

The fact that there are thousands of men who work illegally in the ASGM sector in South Africa must be a source of concern to the Lesotho government. Many of these men are involved in this activity because there are no opportunities in their own country, Lesotho. Because they have mining experience and have been working in some of the mines that are now abandoned by the proprietors

they encroach into those mines at incredible personal risk including potential exposure to Mercury and possible poisoning since almost all their activities are conducted underground in the mine shafts.

As these men are considered outlaws in Lesotho and South Africa, their work seems to be increasingly evolving into a violent enterprise that leads to gangs, fights, murders and in some cases mass murders. This is because they are fending for themselves with no form of government support in either Lesotho or South Africa. They are simply on their own. The government of Lesotho can no-longer turn a blind eye to this problem. It is a problem that is affecting many households especially poor rural households whose livelihoods have always depended on mining and, also seems to evolve into a foreign affairs relations menace with the neighbour.

As this problem affects both Lesotho and South Africa, it is important that it must be included in the bilateral programmes that the two countries have in managing their relations. Their cooperation may go a long way towards curbing violent crimes, especially violet crimes that involve illegal firearms that are fuelled by this illegal enterprise.

9.6 Other priorities

Priority 1: Amend the Toxic and Hazardous Chemicals Control and Management Bill 2015 to cover aspects of Mercury as identified in this report that are missing

The government of Lesotho is in the process of developing a framework law on toxic and hazardous chemicals control and management. This assessment has identified that there are already gaps in this bill regarding several aspects that would enhance Mercury management and control. The opportunity still exists to cover all the identified gaps in this law before it is sent to Parliament.

Priority 2: Promulgate the Toxic and Hazardous Chemicals Control and Management Bill 2015 into law

It has now taken more than 4 years to complete the process of promulgating this law. The government must expedite this process so that the Minamata Convention on Mercury and other chemicals convention may be domesticated and legally enforceable in the country.

Priority 3: Establish a national working committee between the Ministries of Environment and Health to address the issue of pregnant women

The fact that there are reports that pregnant women especially rural pregnant women in the country deliberately ingest elemental Mercury in the belief that it will help them during childbirth must be

treated as a matter of urgency. As a starting point the two ministries concerned must establish a national working committee that must assess the magnitude of this problem urgently. Since the Ministry of Environment is the official national contact point and houses the national focal point, it must work jointly with the Ministry of health to tackle this problem. The said national working committee must be given no more than one year to complete and propose measures that the country must take to address this problem. The proposed national working committee may be expanded to include other stakeholders who may be deemed essential in the rapid assessment process.

Priority 4: Establish a national working committee between the ministries of Environment and Labour to address the issue of ASGM

As indicated Lesotho's ASGM is transboundary in nature with many Basotho men working illegally in the dis-used South African gold mines. And because they work in an illegal enterprise they are not covered by the Ministry of Labour in the country like their counterparts who are legally working in the same industry in South Africa. Many of these men are former mine workers who have experience in mining who have been retrenched over the years.

With unemployment so high in Lesotho these men have decided to undertake this treacherous enterprise at a very high personal risk to themselves. Given the fact that there are scores of these men, but the numbers remain unknown, the Ministry of Environment and Labour must establish a national working committee that will first establish the extent of this practice, establish the statistics of men involved and remedial measures that need to be taken to ensure that they are not left to fend for themselves in an enterprise that is increasingly becoming dangerous.

Priority 5: Develop and implement a comprehensive national awareness campaign

The biggest challenge that the country is facing with respect to Mercury is lack of awareness. Basotho have a long association with Mercury and because of its nature have developed many beliefs around it. The fact that it is hazardous is not known. It is commonly sold in traditional medicinal markets which are found throughout the country especially in the urban areas. Although the country has a country-wide network of hospitals and clinics, the belief in traditional medicine is still strong. This belief seems to transcend income and educational divides and is as common in the rural areas as in the urban areas. This calls for a comprehensive national awareness campaign that must reach all corners of the country. The campaign must be stratified in such a manner that all stakeholders will be reached.

Priority 6: Phase-out the importation and sale of Mercury added products in the country

Mercury added products especially cosmetics are commonly found in retail shops in the country. They are imported from South Africa. They must be prohibited from crossing at the border. Lesotho and South Africa must work jointly to address this problem.

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