UNITED REPUBLIC OF TANZANIA

VICE PRESIDENT'S OFFICE

NATIONAL STRATEGY FOR SOUND MANAGEMENT OF CHEMICALS AND HAZARDOUS WASTE 2020 — 2025

November, 2019

PREFACE

Tanzania like other developing countries is encountering a multiplicity of challenges regarding chemicals and hazardous wastes management amid low level of awareness of harmful effects of chemicals among a greater part of the population. Further to this, agricultural and industrial workers are at great risk from exposure of hazardous pesticides and industrial chemicals. The country faces several challenges in sound management of chemicals and waste including inadequate capacity to monitor chemicals of concern in the environment. Additionally, the oil and gas sector, which is rising, and it uses a variety of different chemicals which necessitate the requirements for enhancing capacity to deal with chemicals and hazardous waste in this sector.

Tanzania is Party to Multilateral Environmental Agreements related to chemicals and hazardous wastes management namely: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Stockholm Convention on Persistent Organic Pollutants; the Rotterdam Convention on the Prior Informed consent procedure for Certain Hazardous Chemicals and Pesticides in International Trade; and Minamata Convention on Mercury. Subsequently, the country was qualified for financial assistance from UN Environment through the Special Programme on Chemicals and Waste to implement a project on “Strengthening Institutional Capacity for Sound Management of Chemicals and Waste in the United Republic of Tanzania". The project seeks to enhance national institutional capacity to develop, monitor and enforce policy and regulatory framework for the sound management of chemicals and hazardous wastes throughout their lifecycle. The strategy gives a comprehensive national framework to enhance the coordination, governance and sustainability of strategic interventions at the individual, local and national levels to promote sound management of chemicals and hazardous waste in an integrated manner.

The strategy also identified institutions and their roles in achieving sound management of chemicals and hazardous wastes. The identified roles include: Enhancement of risk management related to chemical exposure based on the life-cycle approach; Strengthening education, public awareness and knowledge management on chemicals and hazardous waste; Enhancing institutional, policy and legal framework for sound management of chemicals and hazardous waste; Enhancing the monitoring of Sound Management of Chemicals and Hazardous Waste Strategy; and Enhancement of technical cooperation and effectiveness in promoting sound management of chemicals and hazardous waste. Effectively, execution of these roles by respective institutions will minimize the impacts to human health and the environment caused by inappropriate management of chemicals and hazardous waste.

Mindful on the need and importance for pre-emptive approach and encouraging multi-stakeholder response to address challenges presented by chemicals and hazardous waste, the Government is determined to and shall make every effort to mobilize resources and ensure effective engagement of all stakeholders. In this context, the Government welcomes the support of local and international stakeholders in our desire to achieve sound management of chemicals and hazardous waste.

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ACKNOWLEDGEMENT

The Government of the United Republic of Tanzania acknowledges with appreciation the UN Environment through the Special Programme on Chemicals and Waste for providing technical and financial support to this Strategy under the auspices of the project on "Strengthening Institutional Capacity for Sound Management of Chemicals and Waste in the United Republic of Tanzania" which supports developing countries in efforts towards sound management of chemicals and hazardous waste.

The successful drafting and compilation of the Strategy is a reflection of contribution and inputs by many individuals and institutions that deserve a vote of thanks.

I therefore wish to express our gratitude to the national team of experts which was involved in developing the National Strategy for Sound Management of Chemicals and Hazardous Waste. The team was drawn from President's Office – Regional Administration and Local government (PO-RALG); Vice President's Office – Division of Environment (VPO - DoE); Ministry of Minerals; Ministry of Agriculture; Government Chemist Laboratory Authority (GCLA); National Environment Management Council (NEMC); Tropical Pesticides Research Institute (TPRI); Tanzania Bureau of Standards (TBS); Tanzania Medical and Medical Devices Authority (TMDA); Occupational Safety and Health Authority (OSHA); and AGENDA for Environment and Responsible Development (NGO).

I am thankful to Ambassador Joseph E. Sokoine, Deputy Permanent Secretary, Vice President's Office; Mr. Faraja Ngerageza, Acting Director of Environment, Vice President's Office; and Ms. Kemilembe Mutasa, Acting Assistant Director of Environment, Vice President's Office, for coordinating and overseeing development of this Strategy.

Last but not least, we are thankful to all stakeholders, who cooperated and in one way or the other, contributed to this very important process of developing the National Strategy for Sound Management of Chemicals and Hazardous Waste.

Eng. Joseph K. Malongo
Permanent Secretary

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LIST OF ABBREVIATIONS

AMGC	African Minerals and Geo-sciences Centre
APP	Acute Pesticide Poisoning
ARU	Ardhi University
ASGM	Artisanal and Small Scale Gold Mining
AGC	Attorney General Chamber
ATMIS	Integrated Agriculture Management Information System
BATs	Best Available Technologies
BEPs	Best Environmental Practices
BSP	The Bali Strategic Plan for Technology Support and Capacity Building
CiP	Chemicals in Products
COSTECH	Tanzania Commission for Science and Technology
CMS	Container Management Scheme
CPCT	Cleaner Production Centre of Tanzania
CSOs	Civil Society Organizations
DEG	Diethylene Glycol
EDCs	Endocrine Disrupting Chemicals
EEE	Electrical and Electronic Equipment
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EPPPs	Environmentally Persistent Pharmaceutical Pollutants
ERS	Emergency Rescue Service
EWURA	Energy and Water Utilities Regulatory Authority
FAO	Food and Agriculture Organization
FFF	Film-Forming Foams
GCLA	Government Chemist Laboratory Authority
GDP	Gross Domestic Product
GePG	Government electronic Payment Gateway
GHSCLC	Globally Harmonized System of Classification and Labeling of Chemicals
GST	Geological Survey of Tanzania
HHPs	Highly Hazardous Pesticides
HICs	High Income Countries
HSLEEP	Hazardous Substances in the Life Cycle of Electronics and Electronic Products
ICT	Information and Communication Technology

IFCS	Intergovernmental Forum on Chemical Safety
IPM	Integrated Pest Management
LDHE	Libreville Declaration on Health and Environment
LGAs	Local Government Authorities
LITA	Livestock Training Agency
LMICs	Low and Middle Income Countries
LTPP	Tanzania Long Term Perspective Plan
MATI	Ministry of Agriculture Training Institutes
MEA	Multilateral Environmental Agreements
MRP	Minjingu Rock Phosphate
MSD	Medical Stores Department
MT	Metric Tons
NBS	National Bureau of Statistics
NEMC	National Environment Management Council
NEP	National Environmental Policy
NGOs	Non-Government Organizations
NIMR	National Institute for Medical Research
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
OSHA	Occupational Safety and Health Authority
PCBs	Polychlorinated Biphenyls
PERC	Pesticides and Empty Containers Recovery and Collection
PeWaMIC	Pesticides and Waste Management Information Centres
PFCs	Perfluorinated chemicals
PFOS	Perfluorooctane Sulfonate
POPs	Persistent Organic Pollutants
PPP	Public Private Partnership
PSC	Project Steering Committee
PURA	Petroleum Upstream Regulatory Authority
SAICM	Strategic Approach to International Chemicals Management
SDGs	Sustainable Development Goals
SIDP	Sustainable Industrial Development Policy
SUA	Sokoine University of Agriculture
TAEC	Tanzania Atomic Energy Commission
TANESCO	Tanzania Electric Supply Company Limited
TARI	Tanzania Agricultural Research Institute
TBS	Tanzania Bureau of Standards
TCF	Trillion Standard Cubic Feet
TDV	Tanzania Development Vision

TFDA	Tanzania Food and Drugs Authority
TFRA	Tanzania Fertilizer Regulatory Authority
TIRDO	Tanzania Industrial Research and Development Organization
TMDA	Tanzania Medicines and Medical Devices Authority
TPRI	Tropical Pesticides Research Institute
TPF	Tanzania Police Force
TRA	Tanzania Revenue Authority
TV	Television
TVLA	Tanzania Veterinary Laboratory Authority
UDSM	University of Dar es Salaam
UNGHSCLC	United Nations Globally Harmonized System of Classification and Labeling of Chemicals
WHO	World Health Organization
WSPs	Waste Stabilization Ponds

EXECUTIVE SUMMARY

The National Strategy for sound Management of Chemicals and Hazardous Waste provides a national framework for enhancing sound management of chemicals and hazardous waste in the context of chemicals management, environmental management, public health and sustainable development. The development of this strategy was motivated by several persisting challenges in relation to achieving sound management of chemicals and hazardous waste in the country. Some of the challenges include: Low level of awareness of adverse effects of chemicals among the majority of the population that works under substandard occupational health conditions; The great risk of acute poisoning and chronic illnesses facing agricultural and industrial workers who are often part of the informal labour market whom frequently exposed to toxic substances and human health effect of the local community that resulted from the improper handling of chemicals.

The development of this strategy involved extensive stakeholder consultation process. Some of those processes include; Inception workshop, Multi-sectoral Technical Working Group, National Stakeholders Validation Workshop and Endorsement of the Strategy. Also, review of legal and regulatory framework forms a part of the development of this Strategy. Some of the legal and regulatory framework reviewed include; The Industrial and Consumer Chemicals (Management and Control) Act No 3 of 2003, The Environmental Management Act No. 20 of 2004, The Mining Act, No.14 of 2010 as amended, The Occupational Health and Safety Act, No. 5 of 2003, The Tropical Pesticides Research Institute Act No 18 of 1979, The Plant Protection Act, No. 13 of 1997, The Merchant Shipping Act No. 21 of 2003, Tanzania Food, Drugs and Cosmetics Act No. 1 of 2003, The Urban Planning Act No. 8 of 2007, The Water Supply and Sanitation Act No. 5 of 2019, The Public Health Act No. 1 of 2009, The Standards Act No. 2 of 2009, The Atomic Energy Act No. 7 of 2003 and The Explosives Act No. 56 of 1963.

Additionally, the Strategy establishes the milestones that will enable the country to achieve sound management of chemicals and hazardous waste. The milestones include: enhancing risk management related to chemical exposure based on the life-cycle approach; strengthening education, public awareness and knowledge management on chemicals and hazardous waste; enhancing institutional, policy and legal framework for sound management of chemicals and hazardous waste; enhancing technical cooperation and effectiveness in promoting sound management of chemicals and hazardous waste; Improvement in the prevention of, preparedness for and response to chemical and industrial accidents; developing and implementing mechanisms to detect, prevent and sanction illegal trafficking of chemicals and hazardous waste; and enhancing implementation of the cleaner production concept in accordance with best available techniques and best environmental practices; providing agricultural producers, pesticides and agro-product dealers, agricultural, health professionals, and consumers with an environmentally safe, sustainable, and convenient way to get rid of obsolete pesticides and empty pesticide containers; developing user friendly guidelines for the management of obsolete pesticides and empty pesticide containers; establish Industrial chemicals, Pesticides and Hazardous Waste Management

Information Centre in all regions; and establish Pesticides and Empty Containers Recovery and Collection (PERC) Group, Sub-groups, and centres.

The duration for implementing the Strategy is five years. Further, the total cost for its implementation throughout the period amounts to USD 23,810,000. Major implementing institutions include, but not limited to Ministries responsible for Health, Agriculture, Environment, Water Resources, Industry; Government Chemist Laboratory Authority; Tropical Pesticides Research Institute, National Environment Management Council; Occupational Safety and Health Authority, National Institute for Medical Research, Tanzania Bureau of Standards; National Bureau of Statistics; Tanzania Medicine and Medical Devices Authority; Tanzania Atomic Energy Commission; and Cleaner Production Centre of Tanzania.

Monitoring of the Strategy will involve continuous and systematic data collection, analysis and reporting. This will provide information to the Ministry responsible for environment and stakeholders on ongoing interventions, for the purpose of assessing the extent of progress and achievements made over the objectives and the use of allocated funds. Further, performance evaluation will consist of two evaluations which will be conducted after every two years and final evaluation to assess progress towards attainment of the strategic objectives.

1.0 INTRODUCTION

1.1 Background

Chemicals are part of our modern society and are used daily to make our lives more comfortable and productive. They provide many benefits and contribute substantially to socio-economic developments, as they are used or produced in almost every sector, including health, energy, transport, agriculture, construction, textiles and consumer products. Further to this, chemicals contribute significantly to the well-being of society, they also pose a threat to human health, the environment and sustainable development if they are not managed in a sound manner.

In view of the diversity and potential consequences of their adverse impacts, combined with the limited national capacity to manage those impacts, the sound management of chemicals and hazardous wastes is a cross-cutting challenge which requires a holistic approach.

Further, population growth coupled with the increasing demand and use of chemicals presents an alarming threat due to potential hazardous effects to human health and the environment which might be caused by the inappropriate handling of chemicals and hazardous waste.

Global efforts for the sound management of chemicals has resulted in adoption of several Multilateral Environmental Agreements (MEAs). These have been developed to promote sound management of chemicals and hazardous waste with a view to protect human health and the environment from their adverse effects. These include, among others, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed consent procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; Minamata Convention on Mercury; and The Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in 1987. In the same context, the country has put in place policy and legal framework to regulate the manufacturing, importation, distribution (including classification and labeling and safety data sheets), usage, transportation and storage of various types of chemicals. However, sound management of chemicals remains a challenge in the country at all governance levels.

Generally, the country is facing many challenges in promoting sound management of chemicals and hazardous waste including inadequate institutional and regulatory capacity; low public awareness on the risks associated with chemicals and hazardous waste in their life cycle **(Figure 1)**; inadequate national infrastructure; and inadequate sectoral coordination.

It is against this background that this Strategy has been developed to provide a national framework to enhance the coordination, governance and sustainability of strategic interventions at the individual, local and national levels so as to promote sound management of chemicals and hazardous waste in an integrated manner.

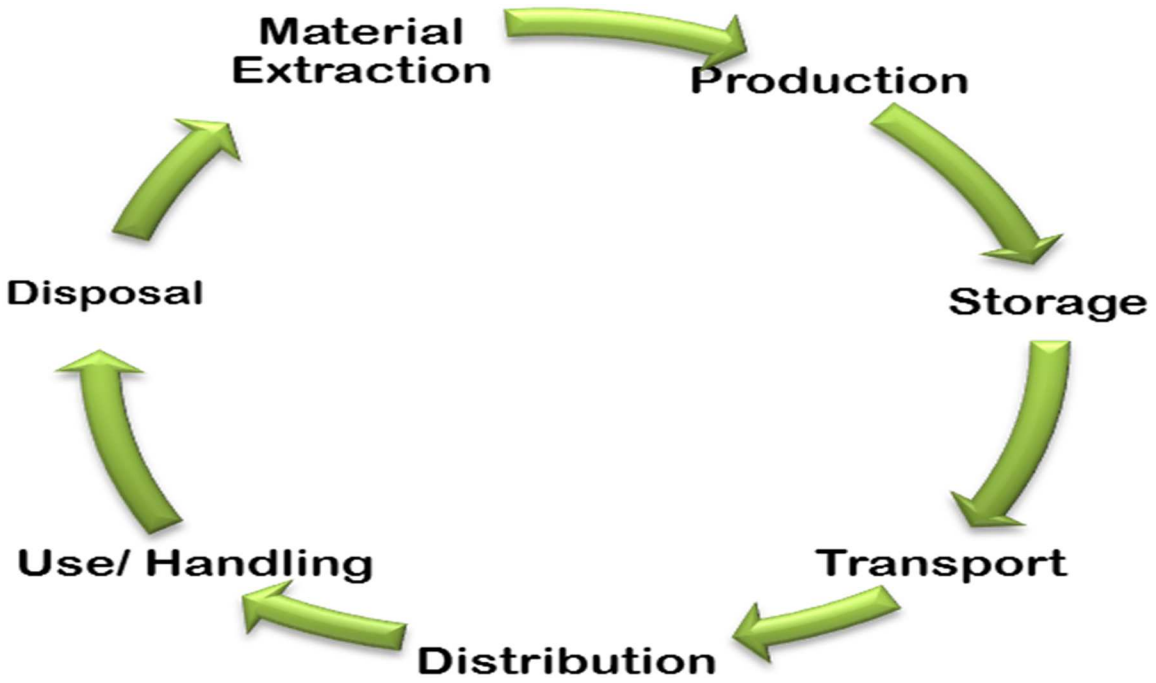

Figure 1: Key elements of the life cycle approach for sound management of chemicals

1.2 Justification for the Strategy

Chemicals are widely used in various sectors including health, energy, transport, agriculture, construction, manufacturing, mining, consumer products and other sectors. The production of chemicals for local use or export in the country is minimal leading to most of the local chemical needs being met through importation. It is notable that more than 90% of the chemicals used in Tanzania are imported into the country as raw materials, intermediaries and finished products.

It is recognized that the inappropriate use of these chemicals has adverse effects on human health and the environment. However, these associated risks can be reduced through adequate control and management of chemicals throughout their life cycle. While chemicals have significant contribution to the national economy, link has been established between poverty and increased risks of exposure to hazardous chemicals and wastes. It is predominantly the poor that routinely face unacceptably high risks because of their occupations, living conditions and inadequate knowledge about the detrimental impacts of such exposures.

Management of risks which may be posed by chemicals should therefore be addressed in a coherent way. It is necessary to address the socio-economic advantages of chemicals as well as the risks they pose to human health and the environment in an attempt to achieve sustainable development. Although there have been substantial efforts to address challenges associated with sound management of chemicals and hazardous waste over the years, yet national coordination and capacity building towards common goal in sound management of chemicals has been generally inadequate and therefore there is an urgent need for strengthening the needed national capacity.

This National Strategy is meant to serve as a national framework to enhance holistic approach and actions towards achieving sound management of chemicals and hazardous waste. Further, its implementation will contribute in achieving relevant sustainable development goals, particularly those related to poverty alleviation, environment, health and gender.

1.3 Purpose of the Strategy

The purpose of the Strategy is to provide a national framework for enhancing sound management of chemicals and hazardous waste in the context of sustainable development.

1.4 Linkage of the Strategy with International and National Frameworks

The development of the Strategy has taken into account the principles, approaches, guidelines and recommendations contained in relevant international instruments and mechanisms on chemicals and hazardous waste management including the following:

a) *Agenda 21 (1992)* which raised the subject of environmentally sound management of chemicals as a key element for achieving socially and economically sustainable development at a global level, regional and national levels;

b) *Intergovernmental Forum on Chemical Safety (IFCS) (1994)* which is an overarching mechanism for cooperation among governments, intergovernmental and non-governmental organizations for the promotion of chemical risk assessment and the environmentally sound management of chemicals;

c) *The Johannesburg Plan of Implementation (2002)* which set the aim “to achieve, by 2020, the use and production of chemicals in ways that lead to the minimization of significant adverse effects on human health and the environment. In addition, the Summit endorsed the development of “a strategic approach to international chemicals management";

d) *The Globally Harmonized System of Classification and Labeling of Chemicals* (2002). This document describes the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS), it relates to the sound management of chemicals;

e) *The Bali Strategic Plan for Technology Support and Capacity Building (BSP) (2005)* which is an inter-governmentally agreed framework for strengthening the capacity of governments in developing countries and countries with economies in transition to coherently address their needs, priorities and obligations including to facilitate compliance with and enforcement of obligations under multilateral environmental agreements;

f) *Strategic Approach to International Chemicals Management (SAICM) (2006)* a policy framework to guide efforts to achieve the goal set out in the Johannesburg Plan of Implementation that, by 2020, chemicals would be produced and used in ways that minimize significant adverse effects on human health and the environment;

g) *The Libreville Declaration on Health and Environment (2008)* which aims to address more effectively the issue of environmental impacts on health, through integration of these links in policies, strategies, regulations and national development plans; and

h) *Sustainable Development Goals (SDGs)* reflects on sound management of chemicals and hazardous wastes in a number of the Goals and targets, including those on health, water, cities and human settlements, oceans and sustainable consumption and production. The sound management of chemicals and hazardous wastes is also an important, albeit less prominent, factor in areas such as education, gender equality and climate change.

Further, the development of the Strategy has considered several national development frameworks, plans and strategies of relevance to chemicals and hazardous waste management including the following:

a) *Tanzania Development Vision 2025* is the national development blueprint covering a span period of about 25 years from 1999 to 2025. It aims to transform the country from a least developing to a middle income and semi-industrialized country by 2025. It envisions transforming the economy from a predominantly agricultural one to a diversified and semi-industrialized economy with a substantial industrial sector comparable to typical middle-income countries;

b) *Tanzania Long Term Perspective Plan (LTPP)* is an important vehicle for implementing the Tanzania Development Vision 2025 and thus serves as a revised implementation framework for the remaining 10 years of TDV 2025. It provides, among others, a more focused guidance to the growth and development process to transform Tanzania into a middle-income country; a strategic anchor for other supporting strategies, such as macroeconomic stability, good governance, industrial development, human resource and technological development.

c) *The Second Five Year Development Plan (2016/17 - 2020/21)* entitled *Nurturing Industrialization for Economic Transformation and Human Development* has a dual focus on growth and transformation and poverty reduction. There are four priority areas for action: (i) fostering economic growth and industrialization; (ii) fostering human development and social transformation; (iii) improving the environment for business and enterprise development; and (iv) strengthening implementation effectiveness. The priority sectors include automotive; petrol, gas and chemicals; pharmaceuticals; building and construction; agriculture and agro-processing (cotton to clothing, textiles and garments, leather); coal; and iron and steel. The Plan also supports value addition and beneficiation in metal and minerals industries, and looks to improve agricultural productivity and deepen agricultural value chains.

1.5 Guiding Principles

There are general principles which are reflected in the Constitution of the United Republic of Tanzania and related national strategies, policies and legislation that are of relevance to the sound management of chemicals and hazardous waste, including the following:

a) The Environment is the common heritage of present and future generations;

b) Right to clean and healthy environment; including the right for access by any citizen to the various public elements or segments of the environment for recreational, educational, health, spiritual and cultural purposes;

c) Stake and duty to safeguard and enhance the environment and to inform the relevant authority of any activity and phenomenon that may affect the environment significantly;

d) Adverse effects to health and environment shall be prevented and minimized through long term integrated planning and coordination, integration and cooperation of efforts, which consider the entire environment as a whole entity;

e) The precautionary principle which requires that where there is risk of serious irreversible adverse effects occurring, a lack of scientific certainty shall not prevent or impair the taking of precautionary measures to protect the environment;

f) The polluter pays principle, which requires that any person causing adverse effect on the environment shall be required to pay in full social and environmental costs of avoiding, mitigating, and or remedying those adverse effects;

g) Right to the involvement of the people in the development of plans and processes for the management of the environment;

h) Right to environmental information; which enables citizens to make informed personal choices and encourages improved performance by industry and government;

i) The generation of waste shall be minimized wherever practicable, and that for proper management of waste, it shall, in order of priority, be reused, recycled, recovered and disposed of safely in a manner that avoids creating adverse effects;

j) Non-renewable natural resources shall be used prudently, taking into account the consequences for the present and future generations; and

k) Renewable natural resources and ecosystems shall be used in a manner that is sustainable and does not prejudice their viability and integrity.

1.6 Development of the Strategy

The Strategy was developed involving extensive stakeholder consultation process. The key steps in developing the Strategy include the following:

i) Inception workshop

The inception workshop for the project on "Strengthening Institutional Capacity for Sound Management of Chemicals and Waste in the United Republic of Tanzania" was organized in October, 2017. The development of this Strategy was part of the activities to be implemented under the project. The objectives of the inception workshop were to: introduce the project objectives, anticipated results and activities; and discuss project work plan, project activities and clarify roles and responsibilities. The workshop gathered 44 participants from Government Ministries, Departments and Agencies; Academia; Civil Society and the media whereby some recommendations were made with regard to the content of the draft Strategy.

ii) Multi-sectoral Technical Working Group

The Multi-sectoral Technical Group was established by the Vice President's Office, comprising of 15 members drawn from relevant Government Ministries and Agencies, Academia and Non-Government Organization to undertake the situational analysis on management of chemicals and hazardous waste in the country and develop the Strategy.

iii) National Stakeholders Validation Workshop

A National Stakeholders Workshop was organized to review and validate draft Strategy. In addition, the workshop served as a platform for sensitizing the stakeholders regarding sound management of chemicals and hazardous waste.

iv) Endorsement of the Strategy

The Project Steering Committee (PSC) consisted of 16 Senior Officials from relevant government Departments and Agencies, NGOs and private sector was chaired by the Permanent Secretary, Vice President's Office. The main function of the PSC was to advise and guide the formulation and implementation of the Strategy. The PSC considered the Final Draft of the Strategy and endorsed it in its meeting held in November, 2019.

2.0 SITUATIONAL ANALYSIS ON CHEMICALS AND HAZARDOUS WASTE MANAGEMENT

2.1 Country Profile

Tanzania is located in East Africa lying just below the equator, Latitude 1º S and 12ºS and Longitude 29ºE and 41ºE **(Figure 2)**. The country comprises of Mainland Tanzania and the islands of Zanzibar and Pemba, covering a total area of 947,300 km^2, making it the 31st largest country in the world. As of 2019, the total population is estimated to be 55.89 million with women comprising 51.1 percent of the total population as compared to 48.9 percent for men. (National Population Projections: 2013 – 2035 Report, NBS, 2018).

Figure 2: The Map of Tanzania showing Regional and International boundaries

The real Gross Domestic Product (GDP) for the year 2018 amounted to TZS 129.4 trillion compared to TZS 118.7 trillion in 2017. The per capita income in 2018 is equivalent to USD 1,090 against USD 1,044 in 2017, an increase of 4.4 percent.

The active labour force[1] which constitutes population aged 15 or above is equivalent to 44.9% of the total population. Out of the total working age population, 79.8 percent is economically active and 20.2 percent is economically inactive. Agriculture sector remains the leading employer, whereby 63.0% of people are engaged. Unemployment rate stands at 9.7 percent.

The major contributing economic sectors to the national GDP in 2018 were services sector (including fundamental social services, tourism, defense, information and communication, and finance) (37.0%); agricultural activities (28.2%); and manufacturing and construction activities (26.8%).

2.2 National Chemicals Management Profile

The National Chemical Management Profile (2002) reports on production, import, export, transport, storage, use and disposal of chemicals in Tanzania. It further highlights strengths, gaps and identifies priority areas which could have the greatest immediate impact on chemicals risk reduction in the country. In addition, the profile establishes measures to be undertaken in addressing sound management of chemicals and hazardous waste includes phase out of lead in paint, mercury, persistent organic pollutants, controlled substances such as ozone depleting substances and introduction of alternatives to toxic chemicals.

2.2.1 Policy, Legal and Institutional Framework

The regulatory framework on national chemicals management profile includes number of institutional, policy and legal regime.

a) Institutional Framework

The national framework on management of chemicals and waste include but not limited to several ministries mandated with key role in the management of chemicals that include Ministry responsible for Regional Administration and Local Governments; Environment, Health, Agriculture, Finance and Planning; Industries and Trade; Foreign Affairs; Justice and Constitutional Affairs; Labour, Employment and Youth Development; Energy; Minerals; Water; Works, Transport and Communication, livestock and fisheries; and Education, Science and Technology.

[1] *Labour Force indicators are based on projections for 2018 using information from the 2001, 2006, 2014 Integrated Labour Force Survey and the Formal Sector Employment and Earnings surveys*

b) Policy Framework on Management of Chemicals and Hazardous Waste

Tanzania has several policies that address matters of sound management of chemicals and waste but non that is stand-alone policy for management of chemicals and waste. Issues of sound management of chemicals and waste are dealt with in sector specific policies implicitly.

i). The National Environmental Policy, 1997

The National Environmental Policy of Tanzania Mainland (1997) (under review) provides overall guidance to sectoral policies on environmental management aspects in order to achieve sustainable development. The policy puts more emphasis on strengthening of environmentally sound use, monitoring, registration and management of agrochemicals in order to control agricultural run-offs of these chemical to minimize pollution of both surface and ground water. The policy further emphasizes the need of putting in place regulations that control the use of mercury in mining activities.

ii). Zanzibar Environmental Policy, 2013

The overall objective of Zanzibar Environmental Policy (2013) is to pave the way for the protection, conservation, restoration and management of Zanzibar's environmental resources, such that their capacity to sustain development and maintain the rich environmental endowment for the present and future generations is not impaired. The Policy advocates the need for strengthening environmental governance and intra and inter-sectoral coordination for effective environmental practices and law enforcement. Further to this, the policies advocate issues of environmentally sound management of chemicals.

iii). National Health Policy, 2007 and Zanzibar Health Policy, 2011

The main objectives of this policy is to improve the health and well-being of all Tanzanians, with a focus on those most at risk, and encourage the health system to be more responsive to the needs of the people and, thus increase the life expectancy. Therefore the National Health Policy recognizes the need to strengthen disposal and safe destruction system of medical waste including chemicals.

The main objective of the Zanzibar Health Policy (2011) is to improve health services and social welfare of the people of Zanzibar. It aims to address a number of challenges including inappropriate handling of chemicals along their lifecycle; lack of formal management scheme for e-waste; inadequate management of healthcare waste; inadequate coverage of toilet facilities; environmental pollution; and inadequate provision of social services to the increasing population.

iv). National Agriculture Policy, 2013 and Zanzibar Agricultural Sector Policy, 2000

The National Agriculture Policy (2013) aims, among others, to ensure agricultural practices that sustain the environment are promoted; and ensure production of quality products in order to improve competitiveness of agricultural products in the markets enhanced. The policy recognize that the critical weakness in agriculture is low productivity of land which is mainly caused by

among other things low use of improved farm inputs such as quality seeds, fertilizers and chemicals and pesticides. However, The Policy calls for sustainable agricultural practices such as Integrated Pest Management (IPM) and organic farming to ensure environmental protection.

The overall goal of the Zanzibar Agricultural Sector Policy (2000) is to promote sustainable development of the agricultural sector for economic, social and environmental benefits. The Policy recognizes that environmental degradation is an issue of major concern in agricultural development attributed to lack of public awareness on the preservation and conservation of environment and natural resources. Other attributed factors include the rate of population growth and density; and use of dangerous agro-chemicals and pesticides in agricultural activities.

v). National Energy Policy, 2015

The overall policy in the energy sector aims to ensure adequate and sustained energy supplies for continued economic growth and development. The energy policy places emphasis on development and efficient utilization of indigenous energy resources and self-reliance in energy science and technologies. The National Energy policy adopts the National Environmental Policy, 1997 as its framework for environmental management. The policy promotes environmental management best practices including “Polluter-Pays-Principle’’.

The policy further, sets out a range of policy statements regarding environment, health and safety including: promoting environmental impact assessment as a requirement for all energy programmes and projects; promoting energy efficiency and conservation as a means towards cleaner production and pollution control; promoting development of alternative energy sources including renewable energies and wood fuel end-use efficient technologies to protect woodlands; promoting disaster prevention, response plans, and introducing standards for exploration, production, conversion, transportation, distribution, storage and fuel end-use.

vi). National Minerals Policy, 2009

Mineral Policy aims at ensuring that artisanal and small scale mining activities are carried out on the basis of environmentally sound practices. The policy highlights the need for gold extraction activities safe and environmentally friend in order to maximize socio-economic benefits to the country. The mineral policy has the objective to promote safety and maintain hygiene conditions and protect the environment in mining areas.

The Mineral Policy emphasizes on strengthening the integration of the mineral sector with other sectors of the economy; improving economic environment for investment; improving the environment; strengthening capacity for administration of the mineral sector; developing small scale miners; promoting and facilitating value addition to minerals; and strengthening environmental management.

However, the policy is designed to address several challenges, including ensuring environmental protection and management. In view of this challenge, the policy aims at minimizing or eliminating the adverse social and environmental impacts of mining development including management of chemicals and waste.

vii). National Fisheries Policy, 2015

The overall objective of the National Fisheries Policy is to develop a robust, competitive and efficient fisheries sector that contributes to food security and nutrition, growth of the national economy and improvement of the wellbeing of fisheries stakeholders while conserving the environment. One of the policy objectives is to promote fisheries and aquaculture practices that sustain the environment.

Fisheries production depends on environmental resources such as land, water, air and other resources. The sustainable utilization of these resources is important for the growth and sustainability of the sector. However, appropriate fishing and aquaculture practices including best use of chemicals, conserve the environment and therefore reduce negative impacts on aquatic ecosystem.

viii).National Water Policy, 2002

The objective of the water policy among others is to have in place a water management system, which protect the environment, ecological systems and biodiversity. The objectives include ensuring quantity and quality water for both surface and groundwater resources based on scientific information available considering both the temporal and spatial water requirements. This ensures maintaining health and viability of riverine and estuary ecosystems and associated flora and fauna; and use of environmentally friendly raw materials with less-toxic elements and adapt cleaner production technologies.

The policy further, provides a specific policy statement which puts emphasis on creation of public awareness in the importance of protecting water resources from pollution including that resulting from inappropriate use of agrochemicals.

ix). National Transport Policy, 2003

The policy among other objectives is to develop safe, reliable, effective, efficient and fully integrated transport infrastructure. The policy emphasizes the need to facilitate sustainable development by ensuring that all aspects of environment protection and management are given sufficient emphasis on the design and development stages of transport infrastructure as well as when providing services. However, these efforts are determined to sound management of chemicals and their waste in the transport sector.

x). National Food Security Policy, 1996

The National Food Security Policy recognizes food availability, accessibility and utilization as three major pillars of food security. While the policy does not explicitly address chemicals and waste, the concern on pests and diseases, which have influence on chemicals and waste indicates that the policy indirectly underscores some issues relevant to chemicals and waste.

xi). The Sustainable Industrial Development Policy, 1996-2020

The Sustainable Industrial Development Policy (SIDP) in particular Section 3.5.3 recognizes sound environmental management as a means of promoting environmentally friendly and ecologically sustainable industrial development in Tanzania. The policy underscore the importance of putting in place motivational mechanism for the purpose of promoting investments which contain anti-pollution programs. Furthermore, the Policy insist on developing the capacity and support initiatives designed to enhance application of cleaner production concept as an important complement to end-of-pipe pollution control. In this regard, the policy promotes the reduction and eventual elimination of discharges/emissions of toxic chemicals including PCBs, PCDDs and PCDF from industrial processes.

c) Legal Framework on Management of Chemicals and Hazardous Waste

i) The Industrial and Consumer Chemicals (Management and Control) Act No 3 of 2003.

The Act provides for the management and control of the production, import, transport, export, storage, dealing and disposal of industrial and consumer chemicals in the country. The Act also provides for the registration, restrictions, prohibition and inspection of chemicals. Further, it has provisions for safe handling, chemical wastes, accidents; management of spills and contaminated sites and decommissioning of plants.

The Act provides for establishment of various technical committees incorporating a variety of stakeholders for coordination of chemicals management policies and programmes, and fostering cooperation between the Technical Committee and other institutions in chemicals management.
The Act has included some provisions for implementation of Multilateral Agreement Ratified by the Government such as the Rotterdam Convention, and for banns or restriction on chemicals known to be hazardous to health and the environment.

The Act provides for the management and control of the production, import, transport, export, storage, dealing and disposal of industrial and consumer chemicals in the country. The Act mandates the Chief Government Chemist as the registrar of chemicals in the country. Further, the Act mandates the Chief Government Chemist to implement ratified international conventions.

The Act provides for restrictions, banning and elimination of chemicals which are highly toxic and hazardous, persistent or biologically accumulative; or subject to action according to multilateral environmental agreements to which Tanzania is a Party. Consequently, in the Act the list of severely restricted/banned/eliminated chemicals in the Eighth Schedule to the Act. Further, the Act requires the Chief Government Chemist to consult and cooperate with other institutions with related mandates.

The Act mandates the Minister responsible Health to appoint Chemical Inspectors who ensure compliance to the provisions of the Act.

ii) The Environmental Management Act No. 20 of 2004

The Act provides for the legal and institutional framework for sustainable management of the environment. It also provides principles for environmental management, impact and risk assessments, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; and basis for implementation of international instruments on environment.

The Act empowers the Minister to disseminate Regulations covering among others compliance with international obligations; and regulation of POPs and other toxic chemicals; including compensation, clean-up and emergency response to spills and accidents, as well as the establishment of national, city, municipal, town and village contingency plans.

The Act also gives the Local Government Authorities mandate to ensure environmental compliance in their areas of jurisdiction from the City, Regional, Municipal, District, Town, Township, hamlet to street levels. Further, it requires designation of Environmental Management Officers at all levels of local government authorities.

In addition, the Act mandates the Minister responsible for Environment to appoint Environmental Inspectors from the National Environment Management Council or designate them from Local Government Authorities, Sector Ministries or other public institutions.

Any person who pollutes the environment contrary to the provisions of the Act, commits an offence and is liable on conviction to a fine of not less than five million shillings but not exceeding ten billion shillings or to imprisonment for a term not exceeding 12 years or to both. Further, the Court may order the person convicted to pay full cost of cleaning up or cleaning up the polluted environment. Furthermore, the Court may direct the polluter to meet the cost of injury or effects of the pollution to any third parties through adequate compensation, restoration or restitution.

iii) The Mining Act No.14 of 2010

The Mining Act of 2010 and its Amendments has the objective of regulating all mining activities including prospecting, mining, processing and dealing in minerals and related matters. In addition, the Act has provisions related to Environmental Impact Assessment and Management, sound use and storage of chemicals, and compliance to environmental standards. Further, it provides for minimization of the risk associated with the use of mercury in gold extraction and reduction of risk associated with chemicals and waste.

iv) The Occupational Health and Safety Act No. 5 of 2003

The Act provides among others; for the safety, health and welfare of persons at work in factories and other places of work; and for the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. The Act also provides for toxic chemicals or substances to be used only where the use of non-toxic chemicals is not reasonable practicable under the condition that appropriate measures should be instituted including periodic medical examinations.

v) The Tropical Pesticides Research Institute Act No. 18 of 1979

The Act, generally establishes the institute to carry out, and promote the carrying out of research and to evaluate and disseminate the findings on the fundamental aspects of pesticides application and behavior in relation to the control of tropical pests by both ground and aerial spraying techniques.

The Act, requires the Institute to supervise and regulate the manufacture, importation, distribution, sale and use of pesticides in the production of crops, fibers, livestock for the protection of public health and safety. The Act further, mandates the Institute to act as the registrar of pesticides and maintain a register of pesticides in the country.

vi) The Plant Protection Act No. 13 of 1997

The Act provides for control the importation and use of plant protection substances; and also to regulate export and import of plant and plant products. The Act stipulates requirements for registration, manufacturing or formulation, importation, sale, use, transportation of plant protection substances also disposal of chemical wastes and their empty containers. The Act also provides for the handling of pesticide in accordance with the FAO code of conduct on the distribution and use of pesticides. Further, the Act requires that pesticides be registered and approved before they can be used in Tanzania.

vii) The Merchant Shipping Act No. 21 of 2003

The Act, among others, provides for the prevention of marine pollution by oil, hazardous waste, noxious liquid, sewage, toxic waste, garbage and other substances.

The Act promotes marine resources conservation against undesirable discharges including chemicals that have potential adverse effects to aquatic life, human health and the environment.

viii) Tanzania Food, Drugs and Cosmetics Act No. 1 of 2003 as amended by Finance Act No. 8 of 2019

The Act provides for the efficient and comprehensive regulation and control of drugs, medical services, cosmetics, herbal and poisons. The Act prohibits manufacturing, sell or distribution of medical devices which do not comply with prescribed requirements. The Act also prohibits the manufacturing, sell, importation, storage or exhibition of cosmetics added chemicals unless they conform to the national, regional and international legal requirements.

ix) The Urban Planning Act No. 8 of 2007

The Act provides for procedures for the preparation, administration and enforcement of land use plans. One of the fundamental principles of land use includes protection of environment of human settlements and of ecosystems from pollution, degradation and destruction in order to attain sustainable development. The Act promotes protection and conservation of human settlements and the environment against environmental pollution through sustainable urban land use planning.

x) The Water Supply and Sanitation Act No. 5 of 2019

The objective of the Act is to promote and ensure the right of every person in the country to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account the fundamental principles of, among others, protection and conservation of water resources and development and promotion of public health and sanitation. Further, the Act prohibits dumping, discharging or causing to be dumped or discharged any unauthorized waste into the sanitation works.

In general, the Act supports environmentally sound management of Chemicals to ensure that they don't affect waterworks and sanitation works.

xi) The Public Health Act No. 1 of 2009

The Act provides for the promotion, conservation and maintenance of public health with a view of ensuring comprehensive functional and sustainable public health services. The Act also prohibits allowing discharges into a sewer or into drain that may cause malfunctioning of the drainage systems.

The Act offers an overall framework for promoting and protecting public health from potential adverse effects of hazardous chemicals and their waste.

xii) The Standards Act No. 2 of 2009 as amended by Finance Act No. 8 of 2019

The Act provides, among others, for the promotion of the standardization of specifications of commodities and services. The Act establishes the Tanzania Bureau of Standards to be the custodian and overseer of observance of standards in Tanzania. In this regard, the Bureau is mandated to approve, register and control the use of standard marks. The Bureau is also mandated to control manufacturing, importation, distribution, selling or exposing for sale pre-packaged food.

xiii) The Atomic Energy Act No. 7 of 2003

The Act applies to all persons or body of persons whose undertakings involve or include generally the use of atomic energy and nuclear technology and in particular the production, processing, handling, use, holding, possessing, storage, transport and disposal of natural and artificial radioactive materials and radiation devices in respect of any other activity which involves a risk or harm arising from radiation.

Generally, the Act establishes the Tanzania Atomic Energy Commission to be responsible for all matters relating to the safe and peaceful use of atomic energy and nuclear technology including radioactive materials and radiation devices, with a view to ensuring the promotion of their

applications and the Protection of workers, patients and the public generally from harm resulting from radiation.

xiv) The Explosives Act No. 56 of 1963

The Act provides for the control of the manufacture, import, export, purchase, sale, possession and use of explosives for the purpose of carrying out blasting operations and other uses. Section 12(1) of the Act requires every person in charge of explosives or engaged in the handling, storage, transport, guarding or use of explosives to take all necessary precautions for the prevention of accident by fire or explosion and for preventing access by unauthorized person.

xv) The Fertilizer Act No. 9 of 2009

The Act provides for control of the manufacturing, importation, exportation, sale, transportation and utilization of agricultural fertilizers. The Act also regulates and controls disposal of fertilizers or fertilizer supplements.

Despite having several policies and legislation in place, the country has been facing some challenges in relation to implementation and enforcement of them. This has necessitated putting in place some strategic interventions to strengthen enforcement which will contribute to sound management of chemicals throughout their lifecycle.

2.2.2 Chemical Production, Import, Export and Consumption

a) Production of chemicals and related products

Tanzania is not a major producer of chemicals. Basic industrial chemicals include petrochemicals, industrial gases, inorganic chemicals, dyes & pigments and alcohol. These chemicals are the building blocks of other products, such as plastics, paints, fertilizers and other synthetic products. Production statistics on some of the industrial chemicals and related products are shown in **Table 1**.

Table 1: Production of selected chemicals and related products in Mainland Tanzania, 2010 - 2014

Commodity	Unit	2010	2011	2012	2013	2014
Industrial and medical gases	m^3 000	1,106	1,239	820	453	539
Pyrethrum extract	Tones	64	70	73	113	112
Pesticides (liquid)	Ltr 000	12	14	14	15	18
Pesticides (powder)	MT 000	580	645	667	698	770
Adhesives and industrial detergents	MT	3,040	2,924	3,016	3,042	3,171
Paints	Ltr 000	28,201	31,355	34,868	36,623	
Battery	million	93	89	68	75	93
Mosquito coils	MT	157	157	165	169	169
Safety matches	Gross 000	2293	2514	2556	3211	2576
Syrups	Ltr 000	4358	4458	4680	3976	5036
Tablets	Mill pieces	3046	2776	2730	1523	613
Capsules	Mill pieces	185	212	57	109	166

Source: URT Economic Survey, 2014 and TPRI Annual report, 2018

Table 2: Production of Fertilizer 2013 - 2017

HS Code	Product	2013	2014	2015	2016	2017
2510000000	Phosphate Rock	-	-	35,000	2,300	10,168
3105510000	NPS	35,000	15,000		3,900	9,066
Total (MT)		**35,000**	**15,000**	**35,000**	**6,200**	**19,234**

Source: Minjingu Mines & Fertilizers Co. Ltd., 2015

b) Importation of chemicals and related products.

It is notable that more than 90% of the chemicals used in Tanzania are imported. Chemicals accounts for about 11% of imported goods in the country. Examples of chemicals used in large quantities in Tanzania which are of concern include sodium cyanide, ammonium nitrate, sulphuric acid, hydrochloric acid, toluene Di-isocyanate, sodium hypochlorite, hydrogen peroxide and Sulphur. **Table 3** indicates quantities of some of the imported chemicals for 2011 – 2015.

Dar es Salaam port is the main gate for chemicals imported into the country for different use. The underlying challenge in the transportation sector results from inefficient performance of the rail, leading to over 90% of chemicals being transported by road with carriages ranging from 10-40 metric tonnes. In this case, therefore, the quantity of chemicals used in these operations and the distance where chemicals are transported raises a concern in case of accidents.

Table 3: Importation of selected basic industrial chemicals in 2018

Chemical	Unit	2018
Nitric acid	MT	99.3
	LTS	70
Calcium Carbonate	MT	5,788
Sulphuric Acid	MT	745.2
	LTS	1,638,977.5
Sodium cyanide	MT	410,531.8
	LTS	35
Toluene	MT	176
Urea	MT	36
Industrial Ethanol	MT	7,329.4
	LTS	954,750
Xylene	MT	710.5
	LTS	275
Sodium Hydroxide	MT	26,146.5
	LTS	101,280
Chloroform	Kg	10
	LTS	540
Hydrogen Peroxide	MT	29,147.8
	LTS	875.85
Sodium Carbonate	MT	967,803.2
	LTS	2
Acetic Acid	MT	2,473.9
	LTS	938
Acetone	MT	466.7
	LTS	767
Ammonium Solution	MT	70.8
	LTS	750
Hydrochloric Acid	MT	4,698.5
Ammonium Chloride	MT	0.6
Ammonium Hydroxide	MT	0.81
Butanol	MT	3.72
Butyl Acetate	MT	458.7
Formic Acid	MT	20.16
Butyl Glycol	MT	927.7
Iodine	Kg	2.3
Disodium Sulphate	MT	2881.7
Potassium Permanganate	Kg	4.5
Hexane	MT	1,147.7
Iso Butanol	MT	584.3

Source: GCLA Annual Report, 2018

Table 4: Importation of Fertilizer 2013 - 2017

HS Code	Fertilizer Name	2013	2014	2015	2016	2017
3102100000	Urea	162,455	104,275	104,918	136,376	151,319
3105300000	DAP	54,390	30,616	56,205	71,677	82,207
3105200000	NPK	74,366	66,051	65,570	59,609	81,842
3102400000	CAN	39,399	21,304	32,592	50,378	51,450
3102210000	Ammonium Sulphate	33,782	27,342	11,811	46,699	39,222
	Others fertilizers	9,265	29,622	12,538	6,617	11,203
Total (MT)		**373,658**	**279,211**	**283,633**	**371,356**	**417,242**

Source: Minjingu Mines & Fertilizers Co. Ltd., 2015

c) Exportation of chemicals and related products

One of the export commodities is the Minjingu Rock Phosphate (MRP) fertilizer. Currently the mineral is being exported to South Africa, Zambia, Kenya, Uganda and Rwanda.

Some of the other exported basic industrial chemicals and related products are presented in **Table 5.**

Table 5: Exportation of Fertilizer 2013 - 2017

HS Code	Fertilizer Name	2013	2014	2015	2016	2017
3102100000	Urea	3,076	5,222	24,558	18,131	30,692
3105300000	DAP	9,756	-	19,682	887	26,019
3105200000	NPK	10,388	113	12,353	21,335	9,939
3105510000	NP compounds	96	270	-	1,149	9,591
2510000000	Phosphate rock	1,553	207	8,896	2,860	7,637
	Others fertilizers	5,634	31	4,279	476	3,632
Total (MT)		**32,516**	**5,843**	**69,767**	**44,837**	**89,527**

Source: Minjingu Mines & Fertilizers Co. Ltd., 2015

d) Consumption of chemicals and related products

Pesticides: A total of 1,182 pesticide products were reported to be registered by 2015, representing a broad variety of active ingredients. Tanzania imported about to 11,028.13 tons of pesticides in the year 2017. When ranked by imported volume, fungicides dominated (51%) followed by Insecticides (24.12%), herbicides (19.98%), Acaricides (4.43%). Pesticides are mostly traded and used in Arusha, Kilimanjaro, Mbeya, Ruvuma, Iringa, Manyara, Morogoro, Tanga, Mwanza, Kagera and Shinyanga mainly to control pests and diseases in farms. Among all regions Arusha is the leading region in pesticide trading. Approximately 300 pesticide retailers are currently registered in Tanzania. Pesticide distribution in Tanzania was accompanied by many unsafe practices that may contribute to the burden from Acute Pesticide Poisoning (APP), not only affecting the distributors but also farmers who buy and use these products. In Tanzania, a recent report shows that the prevalence of occupational acute pesticide poisoning cases reported in health facilities range from 50% to 96% (Lekei *et al*., 2016).

Table 6: Importation of selected common pesticide categories (tons), 2011-2017

Pesticide Category	2011	2012	2013	2014	2015	2016	2017
Insecticides	4,331	4,701	395	6,367	3,036	1,640	2,668
Fungicides	2,086	2,798	3,224	4,157	3,980	3,148	5,668
Herbicides	2,255	3,052	3,541	6,188	7,250	3,064	2,204
Rodenticides	635	836	774	874	6,316	7,650	7,140
TOTAL	**11,318**	**13,399**	**9,947**	**19,600**	**22,597**	**17,518**	**19,697**

Source: TPRI annual report, 2018

Veterinary pest and insect control: Livestock sub-sector consumes veterinary products to manage and control pests and diseases such as East Coast Fever, tsetse flies, rinderpest, anthrax etc. It is a major source of empty containers containing residues of toxic substances which are reused for domestic purposes such as storing milk and water.

Fertilizers: In Tanzania, most of the fertilizers are mainly imported with the exception of Minjingu Rock Phosphate (MRP) which is obtained locally from major deposits of phosphate produced in the Northern part of Tanzania. In 2013, Tanzania imported 373,658 metric tons of fertilizer, an amount that increased to 417,242 tons in 2017.

Natural Gas: As of 30th June 2015 confirmed natural gas reserves amounts to 55.08 Trillion Standard Cubic Feet (TCF). During the period under review 28,346.58MMscf of natural gas was consumed by the gas-based thermal power generation plant which is equivalent to 882.325 million litres of oil equivalent, mainly Jet A-1 and 6,280.428MMscf of natural gas for industries which is equivalent to 149.933 million litres of oil equivalent, mainly Heavy Fuel Oil.

Petroleum products: In 2014/15, the total imported volume of petroleum products for local consumption was 2.99 billion litres Diesel outperformed all other products by registering 54% of

total annual consumption, followed by Petrol (31%), Jet A1 (7%), Fuel Oil (7%) and Kerosene (1%).

e) Industrial Hazardous Waste

In a national inventory of industrial chemical wastes carried out in 2012, it was estimated that industrial hazardous wastes generated in the country was about 8,500 tons per annum, while industrial hazardous chemical waste was estimated to be about 4,400 tons. Some contaminated industrial sites were identified during the inventory including Saza - Mbeya, Mbagala Leather industry and at Sunflag factory-Arusha. Another contaminated site is an abandoned fertilizer plant site in Tanga, a coastal town in northern Tanzania.

2.2.3 Inter-Ministerial Coordinating Mechanism

There are several mechanisms aimed to facilitate coordination and cooperation amongst government, private agencies, and non-state actors in chemicals management. These mechanisms covers a number of aspects including management of pharmaceuticals, pesticides, radioactive materials, petroleum products and industrial and consumer chemicals governed by both regulatory and non-regulatory mechanisms.

Non-regulatory coordinating mechanisms include the Steering Committee coordinated by the Chief Government Chemist, Technical Advisory Committee and the National Coordinating Team on Chemicals Management. In addition, several inter-ministerial commissions mandated with chemicals management include among others the National Radiation Commission and Anti-drug Commission.

The regulatory institution for management of chemicals in the country include among others:

i). Government Chemist Laboratory Authority (GCLA) was established under the Government Chemist Laboratory Authority Act, 2016. The Authority implements the Industrial and Consumer Chemicals (Management and Control) Act Cap 182 by regulating and managing the production, import, export, transportation, use and handling of chemicals. It also carries laboratory analysis of chemicals and chemical waste.

ii). Tanzania Pesticide Research Institute established under the Tropical Pesticide Research Institute Act No 18 of 1979 mandated to conduct research, training and services on management of pests, pesticides and biodiversity for food security; and promotion of human health and facilitation of internal and external trade for sustainable development.

iii). Tanzania Atomic Energy Commission established under the Atomic Energy Act No 7 of 2003 mandated to advise on safety, use and disposal, legal measures to be taken, determination of the extent of and risk from exposure, inspection of premises and dissemination of information to the public regarding side effects of radiation.

iv). The Pharmacy Board established by the Pharmaceutical and Poisons Act assigned to advise on production, import/export, use and legal issues concerning pharmaceuticals and poisons and issues licenses to dealers; and

v). The Petroleum Act of 2015 established Petroleum Upstream Regulatory Authority (PURA) and an advisory Board to regulate exploration and development activities. EWURA Act of 2001 establishes EWURA as regulatory authority to regulate mid and downstream petroleum subsector on issues of processing, importation, distribution and sale and storage of petroleum products and natural gas.

vi). Tanzania Fertilizer Regulatory Authority (TFRA) was established under the Fertilizer Act No. 9 of 2009 and was mandated to enforce laws/policies/regulations governing the manufacturing, importation and use of, and trade in fertilizers or fertilizer supplements e.g. growth generators and regulators and similar products.

2.2.4 Information Management Capacity, Data Access and Use

National data and information on chemicals and hazardous waste are available at various institutions, mainly government offices such as VPO, GCLA, TPRI (ATMIS), NEMC, OSHA, academic and research institutions. These information are quite useful in reducing health and environment effects if well utilized. The wider collaboration among these institutions and its subsequent wide circulation of such information has resulted in improved information sharing and exchange amongst various institutions. The Improvement in Information and Communication Technology in Tanzania has been significant and contributed to several initiatives aimed at sound management of chemicals and waste.

a) Procedures for Collecting and Disseminating National/Local Data

Procedures for collecting and disseminating data related to chemicals and waste management are mainly restricted to chemicals and hazardous waste. Data and information on pesticides are regulated under the TPRI Act No. 18 (1979). The Act provides mandate to the Tropical Pesticides Research Institute to carry out research and disseminate the findings on the fundamental aspect of its application and behavior in relation to the control of tropical pests.

Furthermore, data and information on industrial and consumer chemicals are regulated under the Industrial and Consumer Chemicals Act No. 3 (2003). The Act provides mandate to the Government Chemist Laboratory Authority to collects, analyses, develop and provide data for a specific chemicals.

The National Environment Management Council is mandated by Environment Management Act No. 20 (2004) to undertake and co-ordinate research, investigation and surveys in the field of environment to collect and disseminate information about the findings of such research, investigation or survey.

Despite having coordinated institutional mechanism mandated for collection and disseminating relevant information, data access is inadequate as there is no national depository of such information which make difficulties to trace the information required.

b) National Information Exchange System

Information flow from international organizations to national institutions depends on the type of information, and it is mainly facilitated through courses, seminars, workshops, symposia; bulletin and journals, brochures, scientific reports; International newsletters and health newsletter. There is also a limited exchange of information amongst other institutions.

With these setbacks on information capacity, data access and use in the country, there is a need for capacity building on data management in all concerned institutions, formulate, facilitate and publicize the network for information bank in the country, and share information with relevant institutions.

2.2.5 Technical Infrastructure

Overview of Laboratory Infrastructure

The conducive laboratory infrastructure is one of the essential needed services to manage and control chemicals and hazardous waste. Tanzania has a well-equipped laboratory at GCLA and other institutions. This include also qualified staff such as chemists and lab technologists. GCLA acts as a national toxicological and environmental lab for analysis of all poison cases. The GCLA carries out analytical tests and interprets lab results on occupational, toxicological, food (including pesticide residuals), drugs, and environmental samples. Other lab facilities are available at TMDA; TBS; University of Dar es Salaam and Ardhi University.

Despite the presence of labs and qualified personnel, there are some challenges regarding chemical management. The major challenges of instrumentation are maintenance and calibration of laboratory equipment. These challenges are compounded by the shortage of instrumentation engineers, lack of authentic spares, inadequate funds as well as the use of outdated equipment. Several laboratories take initiatives to use inter laboratory test comparisons as a means of improving the quality of tests. This initiative is voluntary and in some cases involves even laboratories outside the country.

Specific training programme particularly on laboratory instrumentations available in the country is still inadequate. Most of the instrumentation training offered is in-house and through collaboration with other local and foreign institutions.

Despite the challenges identified, the overall technical infrastructure of the country in chemicals management is improving. There are some laboratories with adequate equipment and staff with basic training and would just need a minimum, specialized training to strengthen their understanding and skills in chemicals management.

2.2.6 Expired and Obsolete Chemicals

a). Obsolete Pesticides and Empty Containers

Empty pesticides containers are usually found scattered mostly at the edge of small-scale farms. This indicates that awareness on proper management of pesticide empty containers is not adequately disseminated to farmers.

The situation is, however, different to large scale farmers; who usually keep pesticide empty containers in stores. Initial survey indicates that both small and large scale farmers have not been capacitated regarding management of pesticides empty containers. In most cases, they seek advice and assistance from the Tropical Pesticides Research Institute (TPRI) which is the regulatory organ in the country on the registration, importation, and monitoring of pesticides throughout their entire cycle. Pesticide empty containers will, however, continue to accumulate wherever pesticides are in use, unless the Container Management Scheme (CMS) is established.

Indiscriminate disposal of unwanted (obsolete) pesticides and empty pesticides containers proliferates the problem of environmental and human contamination. As a consequence of current patterns of use and improper management of pesticides, the volume of empty containers generated is increasing, which poses effects to human health and the environment.

b). Expired and Obsolete Industrial Chemicals

Industrial chemicals are of daily use in various production sectors. They are widely used in the country in mining; cement factories; textiles and clothing; and food processing. However, expired and obsolete chemicals which are mainly available in laboratories, schools and industries is still a major challenge that alerts susceptibility to adverse effects to human health and the environment. These chemicals accumulate due to limited technological capacity for their treatment and disposal in the country.

2.2.7 Treatment and Disposal Infrastructure

The average annual generation of industrial and healthcare waste in the country is estimated to be about 8,500 tons and 4,745 tons respectively. However, number of registered treatment and disposal facilities is still limited. Most of the facilities in the country are privately owned. Examples of the existing private facilities include Supply Base Solution Limited specialized in treatment/disposal of oil and gas extraction waste, located in Mtwara Region and Tindwa Medical and Health Services located in Kisarawe District – Coast Region. Other disposal facilities are available in hospitals mainly for health care waste, and in large scale mining sites. However, the capacity of these facilities is not adequate in some aspects with regard to types of waste to be handled.

2.2.8 Chemical Emergency Preparedness, Response and Follow up

Tanzania has various legal frameworks related to chemicals management including the Industrial and Consumer Chemicals (Management and Control) Act Cap 182 and the Environment Management Act Cap 191 being the key legislation. These legislation have provisions on the management of chemicals throughout their lifecycle including Chemical Accidents Prevention and Preparedness, Environmental Impact Assessment, and Safety Management Plans. Moreover, the Safety and Health Act Cap 297 has some provisions regarding workers safety requirements against use and handling of chemicals.

Despite of the existing legal framework, the Government noted the need to strengthen the capacity for implementation. Community Awareness and Emergency Response programme to improve on its community interaction and relations on emergency preparedness and response is highly needed.

However, the country needs action on quick emergence response in the following possible accidents involving spills of hazardous chemical substances:

- Release of hazardous chemicals as a result of spill/leak of noxious industrial substances;
- Release as a result of ruptured or damaged tanks with chemical liquid or gas;
- Accompanied by fire, explosives, property damage and involving environmental pollution and toxic products resulting from combustion;
- Related to disturbed process flows, generation of explosive mixtures, causing fires where noxious or toxic substances are released; and
- As a result of moving or handling of chemical substances at production premises and areas on the mine site. Industrial accidents may occur on the mine site, disturb the process flows and impose threats on employees' health and lives and the environment.

The capacity need and tasks to rescue Emergency Response include:

- Task of the reconnaissance-rescue team: Immediately start observation of the situation, notify all personnel about the evacuation order issued by the Manager along with any other instructions issued.
- Task of the first-aid team: Receive materials and medicines and immediately start to provide first aid to injured persons;
- Task of the Emergency Rescue Service (ERS) team: Immediately start fire suppression, evacuate any personnel from the premises close to fire, rescue people from collapsed buildings.
- The tools and equipment to be used for emergency response include: tools from the fire extinguisher cabinets; other suitable tools and materials in place, including the first-aid kits with the Emergency Rescue Service

2.2.9 Public Awareness, Training and Education

Several initiatives have been undertaken to raise public awareness on sound management of chemicals and waste including training of regulatory authorities in oil and gas sector; Local Government Officials (LGAs); and agriculture extension officers. There are also specific training courses offered on safe use and handling of pesticides, aspects of waste management, and firefighting. In addition, other initiatives include Television (TV) and Radio programmes, news

articles, exhibitions and seminars. Non-Governmental Organizations are also engaged in promoting public awareness and disseminating information to the public on the same.

Despite these initiatives, the level of awareness of adverse effects of chemicals and waste is still low among the majority of the population. Agricultural and industrial workers including women and children are at great risk from exposure of hazardous pesticides and industrial chemicals. For instance, in ASGM women and children often conduct processing activities exposing them to toxic mercury. About 20-30% out of 1.2 million of the ASGM population are women employed in processing activities using mercury. Women and children working in ASGM are vulnerable to mercury exposure.

2.2.10 International linkages

Tanzania is Party to several regional and international chemicals and waste Conventions including Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed consent procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; and Bamako Convention. The country is also a signatory to the Minamata Convention on Mercury.

However, the country faces several challenges on the implementation of MEAs related to chemicals and waste including: inadequate collaboration and networking specifically in data and information sharing; limited financial resources; limited environmentally sound technologies for management of chemicals and waste; and limited coordination amongst institutions; and low level of awareness.

2.2.11 Resources available and needs

There are several technical and human resources in various sectors including agriculture, health, industry, environment, mining, energy, academic institutions, private sector and civil society, transportation and water. However, such expertise requires additional specialized training and continuing education on sound management of chemicals throughout their lifecycle. However, the capacity to manage chemicals and waste is still low due to limited number of such infrastructure.

2.3 Challenges

The situational analysis indicates that sound management of chemicals and waste throughout their lifecycle may be limited by the following factors:

i). Inadequate treatment and disposal facilities of chemical waste and their hazardous waste;
ii). Inadequate institutional and technical capacity in control of chemicals and waste management in the relevant sectors (health, social and economic development, agriculture, etc.);
iii). Inadequate inter-sectoral coordination mechanisms for chemicals management issues;
iv). Insufficient financial resources from national and international mechanisms;
v). Insufficient generation, management and exchange of data and information on chemicals and waste management;

vi). Inadequate engagement and participation of key stakeholders particularly NGOs and the private sector;
vii). Insufficient information exchange programmes between countries in the region on existing Best Available Techniques and Best Environmental Practices related to chemicals, such as alternative methods of final disposal of certain chemicals, emissions estimation, undertaking inventories, etc.;
viii). Non-availability and affordability of alternative technologies and chemical substitutes;
ix). Low synergy among activities and tasks implemented by public institutions under their chemical agenda and activities implemented as tasks under international conventions;
x). Inadequate cost-benefit analysis studies on sound management of chemicals and waste (poisonings, environmental degradation, chemical accidents, etc.); and
xi). Inadequate enforcement of legislation related to chemicals and hazardous waste management.

3.0 EMERGING ISSUES IN MANAGEMENT OF CHEMICALS AND HAZARDOUS WASTE

3.1 Chemicals in products

Chemicals in Products (CiP) include a number of hazardous or toxic substances which are incorporated into a product and pose a risk to human health and the environment. These may include persistent organic pollutants such as brominated flame retardants, (potential) endocrine disruptors such as phthalates, various solvents and colourants, and heavy metals. Often manufacturers of products that include hazardous chemical components do not reveal potential hazardous ingredients, and are thus not able to control the handling and use of these chemicals through the complex supply chain. Workers are unknowingly exposed to these chemicals; consumers are unable to identify which products may be contaminated and to what extent. Four priority product sectors for urgent action are electronics, building products, toys and textiles.

Generally, chemicals safety is accorded inadequate priority and its link to environmental burden is not fully established. Only few studies have been undertaken in the country revealing hazardous chemicals in a number of products such as presence of Diethylene Glycol (DEG) in toothpaste products; and heavy metals in cosmetic products. There is a need to accelerate the adoption and enforcement of regulatory measures to reduce the presence and risks of these chemicals in products.

3.2 Nanotechnology and manufactured nanomaterials

Nanomaterials refer to a set of substances where at least one dimension is less than approximately 100 nanometers. Nanomaterials are of interest because at this scale unique optical, magnetic, electrical, and other properties emerge which allows for the development of light-weight materials with high strength, high conductivity or high chemical reactivity. In Tanzania, nanotechnology is still a very new topic, although globally is now maturing rapidly with more than 300 claimed nanotechnology products already on the market. Nanotechnology has already had a major impact on electronics, coatings, construction, food technology, telecommunication, environmental technologies, medical technologies and drug development, Nano-biocide applications and energy production, water purification and the utilization of solar energy, among others.

Concerns have been raised that the very properties- of nanomaterials that make them so attractive could potentially lead to unforeseen health or environmental hazards. With its limitless potentials, there are many environmental, health and safety related concerns due to extremely ambivalent effects of nanomaterials. It has been revealed that exposure to nanomaterials has been associated with a number of health effects including pulmonary inflammation, genotoxicity, carcinogenicity and circulatory effects. The nanoparticles can enter the human body through the lungs, intestinal tract, and skin. It is therefore important to capitalize the benefits of emerging nanotechnology while minimizing associated potential risks.

3.3 Hazardous Substances in the Life Cycle of Electronics and Electronic Products (HSLEEP)

With the usage of electrical and electronic equipment (EEE) on the rise, the amount of electrical and electronic waste (e-waste) produced is equally growing enormously. E-waste comprise a broad and growing range of electronic devices ranging from large household devices such as refrigerators, air conditioners, cell phones, personal stereos, and consumer electronics to computers which have been discarded by their users. E-waste related health risks may result from direct contact with harmful materials such as lead, cadmium, chromium, brominated flame retardants or polychlorinated biphenyls (PCBs), from inhalation of toxic fumes, as well as from accumulation of chemicals in soil, water and food. In addition to its hazardous components, being processed, e-waste can give rise to a number of toxic by-products likely to affect human health.

Tanzania is facing a rapid increase in accumulation of e-waste generated. it is expected to grow with respect to increasing needs of Information and Communication Technology (ICT). However, quantification of the amount generated is still a challenge. The main obstacle to e-waste management in the country is inadequate capacity to handle, recycle and disposal of the e-waste. Consequently e-waste mixed with other municipal waste, hence accentuating environmental and health risks. Therefore there is a need to promote a new paradigm shift where e-waste is transformed into resources.

3.4 Lead in paints

Lead or lead compounds are added to give paints its color, to allow the paint to reduce corrosion on metal surfaces, or to help the paint dry more quickly. Paint containing lead additives poses risks to health from poisoning and environmental contamination. Lead can be found in decorative paint for interiors and exteriors of homes, schools, public and commercial buildings, as well as on toys, furniture and playgrounds. Lead can have permanent health effects on children, but also causes harm in adults through physical contact, ingestion and inhalation. Childhood lead poisoning, also during pregnancy, can have lifelong health impacts including: learning disabilities, anaemia, and disorders in coordination, visual, spatial and language skills.

A few studies have been undertaken in the country revealing presence of lead in some paint brands, both imported and locally manufactured, for home use above the threshold of 90 parts per million (ppm, dry weight of paint). In addition, most of the labels of the paint cans do not indicate the presence of lead or other potential hazardous ingredients. Tanzania Bureau of Standards (TBS) has developed a National Standard of 90-ppm mandatory total lead limit to control lead in paint. In this regard, there is an urgent need for regulatory means to phase out lead in paints.

3.5 Endocrine disrupting substances

Endocrine Disrupting Chemicals (EDCs) are chemicals that mimic, block, or interfere with hormones in the body's endocrine system. These disruptions have been associated with a diverse array of health issues including causing cancerous tumors, birth defects, and other developmental disorders. Endocrine disruptors are also associated with severe attention deficit disorder, cognitive and brain development problems; deformations of the body; and breast cancer.

In Tanzania, endocrine disruptors are among the group of emerging environmental pollutants with potential to induce oestrogenic effects in the aquatic environment. Few studies have revealed their occurrence in the fresh, ground, wastewaters, and aquatic environment either through direct disposal of expired/unwanted medicines in the toilets, landfills, and household wastes or through body excretions. Poor waste disposal and discharges from hospital, health centres, persistent halogenated compounds from industries and agricultural activities, and other chemical pollutants, such as mercury in soap and cosmetics industries are major sources of chemical related pollution. Despite the presence of endocrine disrupting substances in the environment and associated concerns on the human health and environmental, there is inadequate capacity in the country to control and manage EDCs.

3.6 Environmentally persistent pharmaceutical pollutants

Pharmaceuticals have major benefits for human health and animal welfare. The demand and use of pharmaceuticals are expected to increase rapidly as they are widely used by humans and animals. Many Pharmaceutical chemicals are only slowly degradable or non-degradable. These pharmaceuticals enter the environment through different pathways such as sewage treatment plants; application of organic manure and slurry from treated animals in livestock facilities; or directly in areas where animals are kept and being treated outside. Additional environmental contamination comes from inappropriate disposal of unused pharmaceuticals and from pharmaceutical manufacturing industries.

Environmentally Persistent Pharmaceutical Pollutants (EPPPs) in the environment have been identified as an emerging environmental concern, with more than 600 pharmaceuticals having been detected in the environment worldwide (in water, soil, sludge, and organisms). Due to the nature of the active ingredients in pharmaceuticals, which were designed to develop a response in humans and animals in low concentrations, they often remain unchanged during their consumption and excretion and there is growing concern about pharmaceuticals building up in the environment. In addition to potential ecological risks, human health might also be at risk through long-term consumption of drinking water containing trace levels of pharmaceuticals.

The types of pharmaceutical products raising concern from the perspective of their potential effects include, but are not limited to: antibiotics (for infections); anti-cancer drugs (to treat cancer); antidepressants (to treat depression); anti-parasitics (to treat parasites); non-steroidal anti-inflammatory drugs (NSAIDs) (for reducing inflammation to ease joint pain and stiffness); beta-blockers (for hypertension and heart problems); lipid regulators (to reduce cholesterol); oral contraceptives and hormone replacement therapies and analgesics (to treat pain). Furthermore, there is also concern that antibiotics in the environment may contribute to the increasing problem of antibiotic resistance in the environment.

Several studies have reported the occurrence of antibiotics in water resources, effluent from industries, sludge, manure, soil, plants and organisms across the country. For instance, some studies have revealed that conventional treatment of municipal wastewater by Waste Stabilization Ponds (WSPs) seems to be ineffective in the removal of antibiotics from wastewater. This implies that WSPs could be a source of antibiotics pollution in water bodies. However, monitoring and

controlling the presence of pharmaceuticals in the environment is challenging and currently there is inadequate capacity to address such pollutants.

3.7 Perfluorinated chemicals and the transition to safer alternatives

Perfluorinated chemicals (PFCs) comprise a group of highly persistent, bio accumulative, and toxic chemicals widely used in industrial and consumer applications since the 1950s, most usually used in chromium metal plating, various fire-fighting foams, or for surface treatment of textiles, carpets and papers.

According to the National Implementation Plan for the Stockholm Convention on POPs (2018), stocks amounting to a total of 58,000 litres of Film-Forming Foams (FFF) potentially containing PFOS were found, meant for use in firefighting. Tanzania has over the years, built some capacity in chemicals management, however specific experience in the management of PFCs is inadequate.

3.8 Highly hazardous pesticides

Highly Hazardous Pesticides (HHPs) refers to pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. HHPs often are older generation, off-patent products that are relatively cheaply available. Products that have been taken off the market in High Income Countries (HICs) frequently remain in use in Low and Middle Income Countries (LMICs) due to a number of factors which may include: weak functioning registration systems; perceptions that poor farmers should have access to cheap pesticides; and lack of knowledge about alternatives. Highly hazardous pesticides may have acute and/or chronic toxic effects, and pose particular risk to children. Their widespread use has caused health problems and fatalities in many parts of the country, often as a result of occupational exposure and accidental or intentional poisonings.

Several studies have revealed widespread presence and use of unregistered pesticides in many parts of the country, but more so common in regions and districts bordering neighboring countries. The availability of unregistered pesticides in the market has been attributed to various factors including: few inspectors; inadequate awareness creation campaigns among pesticides users, sellers and farmers; unavailability of list of registered pesticides to key users; illegal importation of pesticides; weak implementation of sanction to pesticides sellers; and existence of porous borders. This situation suggests for the possibility of presence and use of some of the HHPs in the country. In this regard, strengthening regulatory regime to enforce progressive ban of Highly Hazardous Pesticides and their substitution with safer alternatives is vital.

4.0 PROBLEM STATEMENT, OBJECTIVES AND PRIORITY STRATEGIES

4.1 Problem Statement

Tanzania produces certain chemicals for domestic use, most of the chemicals used in industry, agriculture, and households are imported. Importation of both industrial chemicals and pesticides has been increasing however, sound management of the same throughout their lifecycle has not been efficient and hence poses threat to the environment and human health. The Government recognizes the critical need and importance of enhancing institutional capacity on a long-term and sustainable basis for successfully addressing chemicals and hazardous waste management challenges in a broad and systematic perspective. The approach towards this end has been considering different facets so as to ensure that institutional capacity building is multi-sectoral, multi-stakeholder, cost-effective, locally driven, integrated in the planning and implementation of relevant national initiatives, capitalize on existing structures and enhance synergies.

In spite of the significant effort demonstrated by the Government, a number of challenges persists in relation to achieving sound management of chemicals and hazardous waste in the country. The level of awareness of adverse effects of chemicals is still low among the majority of the population that works under substandard occupational health conditions, and are at great risk of acute poisoning and chronic illnesses from exposure to toxic substances, such as agricultural and industrial workers who are often part of the informal labour market, consequently the improper handling of chemicals can effect human health of the local community. The country has limited capacity to monitor key chemicals in the environment, hence develop appropriate control strategies to prevent adverse impacts on human health and the environment. Further, the oil and gas sector is emerging and use a variety of chemicals. There is a need therefore for improved capacity for achieving sound management of chemicals and hazardous waste.

4.2 Objectives of the Strategy

a. Main Objective

The main objective of the strategy is to ensure proper management of chemicals and waste in ways that minimize the exposure to significant adverse effects on human health and environment by 2025.

b. Specific Objectives

The specific objectives of the Strategy are to:

i). Enhance risk management related to chemical exposure based on the life-cycle approach
ii). Strengthen education, public awareness and knowledge management on chemicals and hazardous waste;
iii). Enhance institutional, policy and legal framework for sound management of chemicals and hazardous waste;

iv). Enhance technical cooperation and effectiveness in promoting sound management of chemicals and hazardous waste;

v). Develop and implement mechanisms to detect, prevent and sanction illegal trafficking of chemicals and hazardous waste;

vi). Enhance implementation of cleaner production concept for those exposed to chemicals (i.e. crop growers, industries, chemical dealers Regulatory Authorities) in promoting sound management of chemicals and hazardous waste;

vii). Enhance safe disposal of obsolete chemicals and empty hazardous chemicals containers

viii). Provide training on proper management of obsolete chemicals and empty containers for users and dealers.

ix). Develop user friendly guidelines for the management of obsolete pesticides and empty pesticides containers;

x). Establish and operationalize Industrial chemicals, Pesticides and Waste Management Information Centres in all regions; and

xi). Establish and operationalize Pesticides and Empty Containers Recovery and Collection (PERC) Group, Sub-groups and centres.

4.3 Action Plan

The Action Plan establishes the milestones that will enable the country to achieve sound management of chemicals and hazardous waste, provides the timeframe and indicative cost estimates for implementation and assign responsibilities to government agencies, NGOs and private sector to take place in implementation of activities in line with their policies and legal mandates **(Table 7)**.

Table 7: Priority actions for promoting sound management of chemicals and hazardous waste in Tanzania, 2020 - 2025

Work Area	Activity	Timeframe	Budget (USD)	Source of Funding	Expected Results	Performance Criteria/ Indicator	Lead Institutions
Strategic Objective 1: Enhance risk management related to chemical exposure based on the life-cycle approach							
Assessment of national chemicals management and identify gaps and prioritize actions	1.1 To review and Update National chemicals management Profile and implement action plans for sound management of chemicals.	2020-2022	50,000	▪ Internal ▪ External	Updated national profile developed and disseminated	Existence of an updated national chemicals management profile	GCLA; TPRI; NEMC; TBS; TMDA; TAEC; TVLA; OSHA; Ministries responsible for: Health, Environment, Industry, Local Government Authorities; Agriculture, and Labour; Academia; CSOs
	1.2 Undertake and strengthen capacity building, research and development in nanotechnology	2020-2025	500,000	▪ Internal ▪ External	Capacity building plan developed and implemented	▪ Existence of Capacity building plan; ▪ Amount of funds allocated to research and developmen t in	Academia; COSTECH, TAEC; Ministries responsible for: Science and Technology; Health, Agriculture, Mining, ICT, and Water Resources; GCLA, TPRI, NEMC, TBS, TMDA, OSHA, TVLA; AGC,

						nanotechnology	
	1.3 Undertake regulatory measures to phase-out lead in paints	2020-2025	100,000	▪ Internal ▪ External	Phase-out plan developed and implemented	Periodic Phase-out reports	Ministries responsible for: Industry, Environment, Health, Works; TBS, TRA, NEMC, GCLA; CSOs; Media
Children and chemical safety	1.4 Eliminate child labour that involves hazardous substances.	2020-2025	100,000	▪ Internal ▪ External	Child labour programme developed and implemented	Number of children detached from hazardous work	Ministries responsible for: Labour, Health, Agriculture, Mining, Fisheries, ICT, Local Government Authorities, Transport and Water Resources;
Occupational health and safety	1.5 Enhance enforcement of relevant legislation to protect the health of workers and the public including sectors as agriculture and health.	2020-2025	150,000	▪ Internal ▪ External	Enforcement programme developed and implemented	Reports	GCLA, TPRI, NEMC, TBS, TMDA, TAEC, OSHA, TVLA; AGC, Ministries responsible for Home and Affairs; MC Judiciary; Local Government Authorities

	1.6 Establish integrated training programmes for all public health and safety practitioners and professionals, with an emphasis on identification, assessment and control of occupational chemical risk factors in all workplaces (such as industrial, rural, business and services).	2020-2025	500,000	▪ Internal ▪ External	Training programme developed and implemented	Number of trainees in identification, assessment and control of occupational chemical risk factors at workplaces	Ministries responsible for: Industry, Labour, Health, Agriculture, Mining Minerals, Energy, Environment, Education, Science and Technology, Fisheries, ICT, Transport and Water Resources; OSHA; Academia; CPCT; and CSOs
	1.7 Enhance awareness and understanding of developed and disseminated safety data sheets (popular version)	2020-2022	50,000	▪ Internal ▪ External	Awareness programme developed	Percentage of safety data developed in a popular version, Increased compliance cases for producer and supplies	OSHA; GCLA; NEMC; TBS; TPRI; TMDA; TVLA; and TAEC; CPCT; Ministries responsible for Health
	1.8 Promote the availability and use of personal protective equipment in workplaces.	2020-2025	120,000	▪ Internal	Promotional programs developed and implemented	Proportion of establishments where personal protective equipment are	OSHA; GCLA; NEMC; TBS; TPRI; TMDA; TVLA; and TAEC; CPCT; Ministry responsible for Mining, Energy,

						in use to the total number of establishments required to use personal protective equipment	Agriculture, Industry; Local Government Authorities;
Highly toxic pesticides risk management and reduction	1.9 Promote implementation of the FAO International Code of Conduct on the Distribution and Use of Pesticides.	2020-2025	150,000	▪ Internal ▪ External	National plan developed and implemented	Implementation report in place	Ministries responsible for: Agriculture, Health, Industry, Labour, Fisheries, Transport and Water Resources; GCLA, TPRI, NEMC, TBS, TMDA, TAEC, OSHA, TVLA;
	1.10 Promote Integrated Pest and Integrated vector management.	2020-2025	200,000	▪ Internal ▪ External	Integrated pest and Integrated vector Management practiced	Number of individuals practicing IPM and IVM	Ministries responsible for: Agriculture, Health, Industry, Labour, Fisheries, Livestock, Transport and Water Resources; GCLA, TPRI, NEMC, TBS, TMDA, TAEC, OSHA; TVLA; Local Government Authorities; Academia; CSOs

Reduced health and environmental risks of chemicals	1.11	Modernize and harmonize chemicals (pesticides, veterinary chemicals, industrial and consumer chemicals and pharmaceuticals) registration and control system.	2020-2022	200,000	▪ Internal ▪ External	Registration system upgraded and publicized	Number and type of chemicals; and number of registered applicants	GCLA, TPRI, NEMC, TBS, OSHA, TMDA; TVLA; Ministry responsible for Livestock, Industry, Agriculture, Health, Environment, Mining
	1.12	Conduct regular inspections to ensure chemicals and related products available on the market are used in accordance with approved licenses.	2020-2025	250,000	▪ Internal ▪ External	Enforcement programme developed and implemented	Inspection reports produced	TPRI, GCLA, NEMC, TBS, OSHA, TMDA, TVLA; Pharmacy Council of Tanzania, MC
	1.13	Develop and implement health surveillance programmes to assess impacts of chemicals	2021-2023	300,000	▪ Internal ▪ External	Surveillance programme developed and implemented	Reports	Ministries responsible for: Health, Agriculture, Industry, Labour, Fisheries, Livestock; and Water Resources; Minerals, Energy, GCLA, NIMR, OSHA; TVLA;

							Academia; Local Government Authorities
	1.14 Strengthen poisoning information and control centre and systems for data collection and analysis.	2021-2023	250,000	▪ Internal ▪ External	Data collection and analysis systems strengthened	Existence of effective operational poison center	Ministries responsible for: Health, Agriculture, Industry, Labour, GCLA, NIMR, TVLA; Academia, CSOs, Media
	1.15 Enhance provision of agricultural, livestock and fisheries extension services on integrated pest management practices.	2020-2025	400,000	▪ Internal ▪ External	Extension services plan developed and implemented	Implementation reports	Ministries responsible for: Agriculture, livestock, fisheries, TPRI, TARI, TVLA; TALIRI, MATI, Academia, LITA Local Government Authorities, CSOs.
	1.16 Enhance biological and chemical monitoring of pesticide residues in food, humans and the environment.	2020-2025	300,000	▪ Internal ▪ External	Monitoring programme developed and implemented	Monitoring reports in place	Ministries responsible for: Health, Agriculture, Industry, Labour, Fisheries, livestock and Water Resources; TBS, TPRI, TARI, NIMR, NEMC, TFNC, TVLA
Formulation of prevention and	1.17 Develop and implement integrated	2022-2023	150,000	▪ Internal ▪ External	National plan developed	National plan	Ministries responsible for: Disaster

response measures to mitigate environmental and health impacts of emergencies involving chemicals		national plan for prevention and emergency preparedness and response to chemical and industrial accidents.				and implemented		Management, Transport, Health, Environment, Local Government Authorities, Home Affairs; NEMC, GCLA, TPRI, TVLA;OSHA; CSOs
Capacity-building to support national actions	1.18	Provide training in emergency preparedness and response on chemical and industrial accidents to public and government.	2020-2025	150,000	▪ Internal ▪ External	Training programme developed and implemented	Training report and number of trainees	Ministries responsible for: Disaster Management, Transport, Health, Environment, Local Government Authorities, Home Affairs; NEMC, GCLA, TPRI, TVLA; CPCT
Cleaner production	1.19	Promote use, transfer, and adoption of cleaner production technologies through best available techniques and best environmental	2020-2025	200,000	▪ Internal ▪ External	Cleaner production technologies transferred and adopted	Number of facilities adopting cleaner production technology	Ministries responsible for: Industry, Health, Agriculture; , TIRDO, CPCT, COSTECH, TVLA; Academia, CTI

		practices (BAT/BEP).						
	1.20	Develop sector specific guidelines on cleaner production techniques and practices.	2020-2022	100,000	▪ Internal ▪ External	Guidelines developed and disseminated	Number and type of guidelines	Ministries responsible for: Industry, Environment, Agriculture, Livestock; TIRDO, CPCT, NEMC, TPRI, GCLA, TVLA; Academia; CSOs
	1.21	Provide training on Cleaner Production (CP) methods and techniques used on sound management of chemicals and their wastes	2020-2025	150,000	▪ Internal ▪ External	Training programme developed and implemented	Training report and number of trainees	Ministries responsible for: Industry, Environment, Agriculture, Livestock; TIRDO, CPCT, NEMC, TPRI, GCLA, TVLA; Academia; CSOs
Remediation of contaminated sites	1.22	Identify contaminated sites and hotspots and develop and implement contaminated site remediation plans	2021-2023	1,000,000	▪ Internal ▪ External	Remediation programme developed and implemented	Implementation reports	Ministry responsible for Land, NEMC, GCLA, TPRI, TBS, OSHA, NIMR, COSTECH, TIRDO, TVLA; Academia, Local Government Authorities
Waste management	1.23	Facilitate the identification and disposal of	2020-2025	500,000	▪ Internal ▪ External	Stockpile management programme	Amount of obsolete	NEMC, TANESCO, ZECO, GCLA, TPRI, TBS, OSHA;

		obsolete stocks of pesticides and other chemicals				developed and implemented	stocks disposed	TVLA; Ministry responsible for Environment, Agriculture
	1.24	Promote recycling and sound management of e-waste	2020-2025	200,000	▪ Internal ▪ External	e-waste management programme developed and implemented	Amount of e-waste recycled as proportion of total e-waste collected	Ministries responsible for: Environment; Health, Industry, Labour; Local Government Authorities; NEMC, TCRA, TBS, NIMR, TIRDO, TAEC, CPCT, Private Sector
		Sub-Total		**6,070,000**				
Strategic Objective 2: Strengthen education, public awareness and knowledge management on chemicals and hazardous waste								
Research, monitoring and data	2.1	Conduct inventory on the use patterns of chemicals of concern to support risk assessment characterization and communication	2021-2023	300,000	▪ Internal ▪ External	Data on hazardous chemicals generated and made available on all chemicals in use	Number and type of chemicals	NIMR, GCLA, TPRI, TBS, NEMC, OSHA, TVLA; Academia, Local Government Authorities, Private Sector
	2.2	Promote research and monitoring of endocrine disrupting chemicals (EDCs)	2020-2025	300,000	▪ Internal ▪ External	Research and monitoring reports in place and disseminated	Number and type of EDCs and other chemicals monitored	Ministries responsible for Health, Industry, Environment, Water Resources,

		and other chemicals of concern including PPPs, PFCs, POPs and HHPs						Agriculture, Livestock, Fisheries, GCLA, NIMR; TPRI, TVLA; Local Government Authorities, Academia
Generation and availability of data on hazardous chemicals	2.3	Prepare and disseminate information detailing the inherent hazards of all chemicals and related products available in the market.	2020-2025	250,000	▪ Internal ▪ External	Information on inherent hazards of all chemicals and related products developed and disseminated	Number and type of hazardous chemicals	Ministries responsible for: Health, Industry, Environment, Water Resources, Agriculture, Livestock, Fisheries, GCLA, NIMR; TVLA; Local Government Authorities, Academia, CSOs, Private sector, Media
	2.4	Promote public awareness on nanomaterials and chemicals of concern including PPPs, PFCs, POPs and HHPs	2020-2025	300,000	▪ Internal ▪ External	Awareness programme developed and implemented	Number of participants in awareness programme	Ministries responsible for Industry, Environment, Health, Water Resources, Agriculture, Livestock, Fisheries, GCLA, NIMR; TVLA; COSTECH; Academia; CSOs; Media

Information management and dissemination	2.5	Promote the exchange of technical information among the academic, industrial, governmental and intergovernmental sectors.	2020-2025	50,000	▪ Internal ▪ External	Exchange of information promoted.	Number and type of entities	Ministries responsible for: Education, Science and Technology, Environment, Agriculture, Health, Industry; Academia; private sector; CSOs
	2.6	Enforce labeling requirements on all articles and products containing hazardous ingredients as stipulated in GHS guidelines	2020-2025	300,000	▪ Internal ▪ External	Compliance to the GHS labelling guidelines	Number and type of articles and products labelled under GHS guidelines	TBS, Ministries responsible for Industry, Environment, Health, Agriculture, Information; private sector; OSHA; TVLA; CSOs; Media; GCLA and TPRI
Highly toxic pesticides risk management and reduction	2.7	Strengthen access to and use of information on pesticides, particularly highly toxic pesticides	2020-2025	90,000	▪ Internal ▪ External	Information on pesticides is available to all stakeholders.	Number and type of information	Ministries responsible for Industry, Environment, Health, Agriculture, Information; private sector; OSHA; TVLA; TBS, TPRI, TALIRI, academia, CSOs; Media
	2.8	Promote alternative safer	2020-2025	100,000	▪ Internal ▪ External	Alternative safer pest control	Alternative safer pest control	Ministries responsible for Industry,

		pest control measures				measures promoted and adopted	measures in place	Environment, Health, Agriculture, Information; private sector; OSHA; TVLA; TBS, TPRI, TALIRI, academia, CSOs; Media
Chemical Life cycle	2.9	Enhance Chemical life-cycle management issues in education curricula.	2020-2023	100,000	▪ Internal ▪ External	Life-cycle issues are incorporated in school Curricula.	School curricula	Ministries responsible for Education, Science and Technology, Environment; TIE; Academia; GCLA; TPRI
PRTRs-creation of national and international registers	2.10	Develop a national Pollutant Release and Transfer Registry (PRTR)	2021-2023	300,000	▪ Internal ▪ External	PRTR is established and maintained	PRTR in place	NEMC, GCLA, TPRI, OSHA, TBS, NIMR; TVLA; Academia
Children and chemical safety	2.11	Promote education and training to women and children on chemical safety.	2020-2025	150,000	▪ Internal ▪ External	Key stakeholders are trained on women and children's safety	Training reports and numbers of stakeholders	Ministries responsible for: Education, Science and Technology, Health, Gender, Children, Environment, Industry; NEMC, GCLA, TBS; TVLA; Academia; CSOs; Media

Education, training and public awareness	2.12 Promote sensitization on chemical safety for those exposed to chemicals (including crop growers, industries, chemical dealers and enforcement agents).	2020-2025	100,000	▪ Internal ▪ External	Sensitization programme developed and implemented	Implementation reports and number of trainees	TPRI; GCLA; NIMR; NEMC; TBS; TVLA; Academia; Local Government Authorities; CSOs; Private sector; Media
Waste management Training	2.13 Prepare and disseminate information, education and communication packages on the sound management of chemicals, targeting key stakeholders including waste handlers and recyclers.	2020-2023	200,000	▪ Internal ▪ External	Information packages prepared and disseminated	Number and type of information packages	Local Government Authorities; Ministries responsible for: Health, Environment, Local Government Authorities; NEMC, GCLA, TPRI; TVLA; Academia; CSOs; Media
	2.14 Conduct research on best practices in hazardous waste management.	2021-2023	1,000,000	▪ Internal ▪ External	Best practices are identified, documented and disseminated.	Number and type of best practices	COSTECH; TIRDO; NEMC; GCLA; TPRI; TVLA; Academia; Ministries responsible for:

							Health, Environment, Industry; Local Government Authorities; private sector
Stakeholder participation	2.15 Enhance participation of women in sound management of chemicals and hazardous waste	2020-2025	50,000	▪ Internal ▪ External	Women involved in all levels of waste management	Number of women involved	Ministries responsible for: local government, Gender, Environment, Health, Agriculture; CSOs;
Sub-Total			**3,590,000**				
Strategic Objective 3: Enhance institutional, policy and legal framework for sound management of chemicals and hazardous waste							
Implementation of integrated national programmes for the sound management of chemicals at the national level in a flexible manner	3.1 Strengthen coordination multi-sectoral and multi-stakeholder mechanisms for sound management of chemicals and hazardous waste.	2020-2025	100,000	▪ Internal ▪ External	Multi-sectoral coordination mechanisms strengthened and sustained	Number and type of coordination mechanisms	Ministry responsible for: Environment, Health. Local Government Authorities, Industry; NEMC, GCLA, TPRI, TBS, NMR, TVLA
GHS (Globally Harmonized System)	3.2 Alignment of national legislation with GHS requirements.	2021-2023	100,000	▪ Internal ▪ External	GHS implemented	Number of legislation aligned	Ministries responsible for: Health, Environment, mining, fisheries,

							energy, Agriculture, Labour, Livestock; Industry; GCLA; TPRI; NEMC; AGC; Academia; CSOs; and Media
International agreements	3.3 Facilitate implementation of all relevant international and regional instruments on chemicals and hazardous waste	2020-2025	600,000	▪ Internal ▪ External	Relevant Conventions and Protocols implemented	Reports	Ministries responsible for: Environment, Mining, Health, Agriculture, Livestock; Natural Resources, Labour, Industry, Foreign Affairs, Justice; NEMC; GCLA, TPRI;TBS; TVLA; TMDA
Social and economic considerations	3.4 Enhance efforts to implement corporate social and environmental responsibility.	2020-2025	100,000	▪ Internal	Corporate social and environmental responsibility are implemented	Number and type of partnerships	Ministry responsible for: Health, Mining, Industry, Environment, Local Government Authorities, Agriculture, Livestock, Investment; NEMC, GCLA, TVLA, TIRDO, TMDA, STAMICO, Private sector

	3.5 Promote private-public partnerships in promoting sound management of chemicals and hazardous wastes.	2020-2025	50,000	▪ Internal ▪ External	Partnerships promoted	Number and type of partnerships	Ministries responsible for: Investment, Local Government Authorities, Industry, Justice; AGC, NEMC, GCLA, TBS; CPCT; Academia; private sector; CSOs
	3.6 Promote capacity building of Civil Society Organizations and communities in chemical safety and management.	2020-2025	100,000	▪ Internal ▪ External	Capacity building programme developed and implemented	Number of organizations and communities capacitated	Ministries responsible for: Environment, Civil Society Organizations, Local Government Authorities, Industry; NEMC, GCLA, TBS; CPCT; Academia; private sector
Sub-Total			**1,050,000**				
Strategic Objective 4: Enhance technical cooperation and effectiveness in promoting sound management of chemicals and hazardous waste							
Capacity building to support national actions	4.1 Develop and implement chemicals management tools	2021-2025	500,000	▪ Internal ▪ External	Chemicals management tools developed and implemented	Implementation reports	Ministries responsible for: Environment, Health, Agriculture, Mining, Industry, Labour, Livestock; GCLA, NEMC,

							OSHA, TPRI, NIMR, TVLA
	4.2 Modernize laboratory facilities to enhance biological and chemical monitoring of chemicals of concern in the environment and surveillance of health impacts.	2021-2025	2,500,000	▪ Internal ▪ External	Modern laboratory facilities established	Number of modern laboratories	Ministries responsible for: Health, Agriculture, Environment, Water Resources, Industry; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA, GST, TBS, TAEC, CPCT
	4.3 Conduct training on application of economic instruments and policy analysis to support sound management of chemicals and hazardous waste.	2020-2025	300,000	▪ Internal ▪ External	Training programme developed and implemented	Training reports and number of trainees	Academia; Ministries responsible for: Finance, Health, Agriculture, Environment, Water Resources, Industry; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA
	4.4 Provide training on the application of relevant liability and compensation mechanisms.	2020-2025	100,000	▪ Internal ▪ External	Training is programme developed and implemented	Training reports and number of trainees	Ministries responsible for: Justice, Health, Agriculture, Environment, Water Resources, Industry; AGC, GCLA, NEMC, OSHA,

							TPRI, NIMR, TVLA
Remediation of contaminated sites	4.5	Provide training on remediation techniques of contaminated sites	2020-2025	400,000	▪ Internal ▪ External	Training programme developed and implemented	Training reports and number of trainees	Ministry responsible for: Land, LGAs, Academia; COSTECH; TPRI; TIRDO; TAEC; NEMC
Children and chemical safety	4.6	Strengthen infrastructure for research into the impact of exposure to chemicals on children and women.	2021-2025	500,000	▪ Internal ▪ External	Programme for Infrastructure upgrading developed and implemented	Number of laboratories, institutions and personnel	Academia; COSTECH; TPRI; TIRDO; TAEC; NEMC
Develop monitoring and evaluation plan of the strategy and implement the plan in collaboration with key stakeholders	4.7	Conduct three meetings to evaluate the strategy	2021-2025	15,000	Internal	Evaluation meetings conducted	Meeting report	Ministry responsible for environment and other key stakeholders
	4.8	Conduct mid-term review meeting and prepare report of implementation of the strategy	2023	15,000	Internal	Mid-term review meeting conducted and report prepared	Meeting report	Ministry responsible for environment and other key stakeholders
	4.9	Conduct final evaluation	2025	20,000	Internal	Final evaluation	Meeting report	Ministry responsible for environment and

		meeting of the strategy				meeting conducted		other key stakeholders
		Sub-Total		**4,350,000**				
Strategic Objective 5: Develop and implement mechanisms to detect, prevent and sanction illegal trafficking of chemicals and hazardous waste								
Prevention of illegal traffic of toxic and dangerous goods	5.1	Promote the use of customs risk profiles and material safety sheets in identifying probable cases of illegal traffic.	2020-2023	150,000	▪ Internal ▪ External	Training programme developed and implemented	Training reports and number of trainees	Ministries responsible for: Customs, Health, Agriculture, Mining, Industry, Labour, Livestock, Home Affairs; TPF; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA
	5.2	Conduct comprehensive assessment on the extent and impact of illegal traffic of chemicals in the country	2020-2022	50,000	▪ Internal ▪ External	An assessment of illegal traffic of chemicals conducted	Assessment report	Ministries responsible for: Customs, Health, Agriculture, Mining, Industry, Labour, Livestock, Home Affairs; TPF; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA, TMDA
	5.3	Train and equip customs, environmental, agricultural, standards,	2020-2025	150,000	▪ Internal ▪ External	Training programme developed and implemented	Training reports and number of trainees	Ministries responsible for: Customs, Health, Agriculture, Mining, Industry, Labour,

		chemicals and health inspectors to detect illegal toxic hazardous chemicals.						Livestock, Home Affairs; TPF; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA, TMDA
Waste management	5.4	Strengthen enforcement of regulatory measures for prevention, detection and control of illegal trans-boundary movements of chemicals and hazardous waste.	2020-2025	200,000	▪ Internal ▪ External	▪ Enforcement of relevant legislation enhanced ▪ Programme for enforcement of legislation in place ▪ Equipment procured	Training reports, number of trainees, number and type of equipment for detection	Ministries responsible for: Customs, Health, Agriculture, Mining, Industry, Labour, Livestock, Home Affairs; TPF; GCLA, NEMC, OSHA, TPRI, NIMR, TVLA, TMDA
Sub-Total				**550,000**				
Strategic Objective 6: Enhance safe disposal of hazardous chemicals, obsolete pesticides and pesticide empty containers								
Management of Obsolete and expired chemicals and empty containers	6.1	Provide training on proper management of obsolete and expired industrial chemicals, pesticides, fertilizers and empty containers for users and dealers.	2020-2025	500,000	▪ Internal ▪ External	Training programme developed and implemented	Number of users and dealers trained on proper management of obsolete chemicals and empty containers.	Ministry responsible for: LGAs; Agriculture; Livestock; Fisheries; Health; Environment; Industry; Minerals, GCLA; NEMC; TPRI; NIMR; TVLA; TMDA;

							TBS; OSHA; and TFRA
	6.2 Develop popular version of guidelines for the management of obsolete and expired industrial chemicals, pesticides, fertilizers and empty containers.	2020-2022	200,000	▪ Internal ▪ External	Guidelines developed and disseminated	Guidelines	Ministry responsible for: LGAs; Agriculture; Livestock; Fisheries; Health; Environment; Industry; GCLA; NEMC; TPRI; NIMR; TVLA; TMDA; TBS; and OSHA
	6.3 Establish and operationalize industrial chemicals, pesticides and waste management information centers in all regions.	2020-2022	500,000	▪ Internal ▪ External	Established Chemicals, pesticides and hazardous waste information centres operational	Chemicals, pesticides and hazardous waste information centres	Ministry responsible for: LGAs; Agriculture; Livestock; Fisheries; Health; Environment; Industry; GCLA; NEMC; TPRI; NIMR; TVLA; TMDA; TBS; OSHA;
	6.4 Establish and operationalize Pesticides and Empty Containers Recovery and Collection (PERC) Group, Sub-groups, and centers.	2022-2025	1,000,000	▪ Internal ▪ External	Established PERC	PERC developed	Ministry responsible for: LGAs; Agriculture; Livestock; Fisheries; Health; Environment; Industry; GCLA; NEMC; TPRI; NIMR; TVLA;

							TMDA; TBS; OSHA
	6.5 Establish centralized chemical disposal facilities in the country	2022-2025	6,000,000	▪ Internal ▪ External	Six centralized chemical disposal facilities established	Six centralized chemical disposal facilities	Ministry responsible for: LGAs; Agriculture; Livestock; Fisheries; Health; Environment; Industry; GCLA; NEMC; TPRI; NIMR; TVLA; TMDA; TBS; OSHA
Sub-Total			**8,200,000**				
GRAND TOTAL			**23,810,000**				

4.4 Resource Requirements and Possible Sources of Funding

The implementation of the National Strategy is estimated to cost **USD 23,810,000** during 5 years (2020 - 2025) of its implementation.

4.5 Implementation Arrangement

The implementation of Strategy implies the need for effective coordination and cooperation among relevant organs of the Government and Non-government actors, it is imperative to recognize existing institutions mechanism and consider ways and means of which coordination and cooperation between institutions and distinct bodies aligned.

The Ministry responsible for Environment will serve as the overall coordination in the implementation of the Strategy. The various key stakeholders having roles in implementation of the Strategy are indicated in **Table 7.**

Table 8: Roles of key stakeholders in implementation of the National Strategy for Sound Management of Chemicals and hazardous Waste

Stakeholder	Responsibilities
1. President's Office Regional Administration and Local government	– Enforcement of EMA, 2004 – Collaborates with other stakeholders in Sound management of chemicals and hazardous waste issues.
2. Vice President's Office (VPO)	– The National focal point for the chemicals and hazardous waste related Conventions including Basel, Stockholm, Rotterdam and Minamata Conventions. – Oversee the enforcement of Environment Management Act, 2004 – Prepare environmental regulations, guidelines, strategies and plans – Promote public awareness and education – Develop monitoring and evaluation plan of the strategy and implement the plan in collaboration with key stakeholders
3. Ministry of Minerals (MoM)	– Oversee and enforce Mining Act, 2010 as amended and other related legislation. – Prepare regulations, guidelines, strategies and plans governing mining activities; and safety, occupational health and environmental issues. – Promote reduction, and where feasible, eliminate the use of mercury in ASGM. – Promote public awareness and education on all matters related to the mining industry.

4. Ministry of Health, Community Development, Gender, Elderly and Children (MHCDGEC).	– Oversee and enforce Public Health Act, 2009 and other related legislation. – Prepare and implement public health strategies to prevent and minimize exposure to chemicals. – Prepare guidelines for reducing health risks from chemicals exposure. – Eliminate the use of mercury in medical equipment. – Promote public awareness and education.
5. Ministry of Justice and Constitutional Affairs (MJCA)	– Capacity building on negotiation skills and all matter related to chemicals and hazardous waste related MEAs. – Facilitate amendment of legislation and regulation for effective implementation of MEAs
6. Ministry of Foreign Affairs and East African Cooperation (MFAEAC)	– Facilitate deposit of the instrument of ratification – Represent and participate in Conference of parties meetings and other Multilateral agencies
7. Ministry of Finance and Planning (MFP)	– Allocate financial resources to implement obligations under MEAs. – Allocate financial resources to implement national strategy for sound management of chemicals and hazardous waste – Grant fiscal incentives for programs and technologies for reducing mercury and mercury compound.
8. Ministry of Education, Science, and Technology (MEST)	– Develop strategies, plan and guidelines that ensure integration of chemicals and hazardous waste issues in teaching curricula at all levels – Promote education, outreach and capacity building initiatives related to sound management of chemicals and hazardous waste.
9. Ministry of Industry and Trade (MIT)	– Formulate strategies, plans and guidelines related with promoting sound management of chemicals and hazardous waste.
10. Ministry of Agriculture (MoA)	– Promote training / education and awareness campaign on sound management of pesticides, obsolete pesticides and empty containers – Promote capacity building and awareness campaign on safer use of alternative pesticide. – Setting and reviewing policies, laws, strategies, plans and guidelines for chemical and waste management in agriculture and agricultural related products. – Dissemination and awareness creation on pesticide/ chemical and waste management guideline as well as other related guideline e.g. Climate Smart Agriculture guideline for sustainable agriculture.
11. Prime Minister's Office - Labour, Youth, Employment	– Develop strategies and Plans that ensure occupations and safety risks are reduced.

and Persons With Disability (PMO-LYEPD)	– Promote health and safety education, outreach and capacity building initiatives
12. Government Chemist Laboratory Authority (GCLA)	– National Focal Point for SAICM – Registrar of industrial and consumer chemicals – Enforcement and compliance of industrial and consumer chemicals Act including registration, inspection and monitoring of import, export and use of chemicals including mercury. – Provide technical advice on the management of chemicals – Training and awareness raising on chemicals management. – Coordinator of national poison control centre. – Provide advice on analytical laboratory services.
11. Tropical Pesticide Research Institute (TPRI)	– To register pesticides. – Enforcement and compliance of pesticides uses. – To conduct research on pests and pesticides. – To regulate importation, retailer and exportation of pesticides. – Strengthen institutional and legal framework for sound management of pesticides and its related wastes. – Strengthen law enforcement to combat illegal importation of pesticides. - promote capacity building and awareness campaign on safer use of alternative pesticide.
13. National Environment Management Council (NEMC)	– Enforcement and compliance of EMA, 2004 and its regulations – Ensure environmentally sound management of chemicals and contaminated sites – Training, awareness raising and out each on sound management of chemicals and hazardous waste
14. Occupational Health and Safety Authority (OSHA)	– Monitoring occupational health and safety for workers against risks from exposure to chemicals – Training, awareness raising and out each on sound management of chemicals – Enforcement and compliance of Occupational Health and Safety Act and its regulations.
15. Tanzania Bureau of Standards (TBS)	– Prepare standards for emissions and releases of chemicals from point sources – Enforcement and compliance of Standards Act and its regulations.
16. National Bureau of Statistics (NBS)	– Enforcement and Compliance of Statistics Act, 2015 – Provide official statistics on chemicals and hazardous waste to the Government, business community and the public at large.
17. Tanzania Medical and Medical Devices Authority (TMDA)	– Enforce and Compliance of Tanzania Food, Drugs and Cosmetics Act, 2003 as amended and its regulations.

18. Tanzania Revenue Authority (TRA)	– Enforcement and Compliance of legislations and regulations related to chemicals trading.
19. Academia and research organizations	– Conduct research, publish and disseminate on chemicals and hazardous waste. – Provide training related to sound management of chemicals – Conduct training on negotiation skills related to MEAs
20. Private Sector	– Credit and financial services to promote sound management of chemicals and hazardous waste – Investment in provision of services for supporting environmentally sound management of chemicals and hazardous waste
21. NGOs	– Training, awareness raising and out each on sound management of chemicals and hazardous waste
22. Media	– Awareness raising and outreach on sound management of chemicals.

5.0 MONITORING AND EVALUATION

This Section provides the Monitoring and Evaluation Plans for the period of five year of implementation of the National Strategy for sound Management of Chemicals and Hazardous Waste. This Strategy covers the period from Financial Year 2020/21 to 2024/25.

Regular monitoring and evaluation of the implementation of the Strategy is essential as it will ensure that, the national objectives and international obligations are met. The monitoring and evaluation will be carried out in a participatory manner and on a continuous basis. Sectoral Ministries and Agencies will prepare and present periodic reports on planned activities and present to the Ministry responsible for environment. Measuring progress on implementation plan will be based on the various criteria and performance indicators.

5.1 Monitoring Plan

Monitoring will involve continuous and systematic data collection, analysis and reporting. This will provide information to the Ministry responsible for environment and stakeholders on ongoing interventions, for the purpose of assessing the extent of progress and achievements made over the objectives and the use of allocated funds.

5.2 Performance Evaluation Plan

Performance evaluation will be a periodic assessment to identify the effectiveness and efficiencies of performance of the objective. The evaluation process will consist of two evaluations which will be conducted after every two years and final evaluation. These evaluations will assess progress towards attainment of the strategic objectives. The challenges encountered during the implementation will be identified and measures to address them will be developed accordingly.