

**THE UNITED REPUBLIC OF TANZANIA**



**MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT,  
GENDER, ELDERLY AND CHILDREN**

**THE NATIONAL ENVIRONMENTAL HEALTH,  
HYGIENE AND SANITATION STRATEGY  
(NEHHSS)**

**2020 - 2025**

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(NEHHSS)**

**2020 - 2025**

**Prepared by:  
The Environmental Health, Hygiene and Sanitation Section  
Directorate of Preventive Services**

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## TABLE OF CONTENTS

<b>FOREWORD.....</b>	<b>vii</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>ix</b>
<b>ABBREVIATIONS.....</b>	<b>x</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 ENVIRONMENTAL HEALTH, HYGIENE AND SANITATION.....	1
1.1.1 Components of Environmental Health.....	1
1.1.2 Strategic Context of the NEHHSS.....	3
1.2 THE IMPORTANCE OF ENVIRONMENTAL HEALTH, HYGIENE AND SANITATION.....	3
1.3 SITUATIONAL ANALYSIS.....	5
1.3.1 Epidemiological Indicators.....	5
1.3.2 Physical Environmental Health Indicators.....	5
1.3.3 Capacity within the Environmental Health Service Delivery System.....	14
1.3.4 Institutional and Legal Framework.....	16
1.4 SWOC ANALYSIS.....	17
1.5 RATIONALE FOR THE NATIONAL ENVIRONMENTAL HEALTH, HYGIENE AND SANITATION STRATEGY.....	19
<b>2 POLICY, GUIDELINES, LEGAL AND INSTITUTIONAL FRAMEWORKS.....</b>	<b>20</b>
2.1 POLICY AND REGULATORY FRAMEWORK.....	20
2.1.1 The National Health Policy, 2007.....	20
2.1.2 The National Water Policy, 2002.....	20
2.1.3 The National Environmental Policy, 1997.....	20
2.1.4 The Health Sector Strategic Plan IV 2015 – 2020 (HSSP IV 2015 - 2020).....	21
2.1.5 The Medium-Term Strategic Plan (MTSP).....	21
2.1.6 The National Occupational Health and Safety Policy, 2010.....	21
2.1.7 The Local Government (District Authorities) Act, 1982.....	22
2.1.8 The Local Government (Urban Authorities) Act, 1982.....	22
2.1.9 Occupational Health and Safety Act, 2003.....	22
2.1.10 Industrial and Consumer Chemical (Management and Control) Act, 2003.....	22
2.1.11 Environmental Management Act, 2004.....	22
2.1.12 Environmental Health Practitioners (Registration) Act, 2007.....	23
2.1.13 Public Health Act, 2009.....	23
2.1.14 The Standards Act, 2009.....	23
2.1.15 Water Supply and Sanitation Act, 2019.....	24

2.1.16	International Health Regulations, 2005.....	24
2.2	INTERNATIONAL AGREEMENTS.....	24
2.2.1	Basel Convention.....	24
2.2.2	Stockholm Convention.....	25
2.2.3	Minamata Convention.....	25
<b>3</b>	<b>VISION, MISSION AND GOALS.....</b>	<b>26</b>
3.1	VISION.....	26
3.2	MISSION.....	26
3.3	GOALS, STRATEGIC OBJECTIVES AND ACTIVITIES.....	26
3.3.1	Goal 1.....	26
3.3.2	Goal 2.....	27
3.3.3	Goal 3.....	27
3.3.4	Goal 4.....	28
3.3.5	Goal 5.....	28
<b>4</b>	<b>STRATEGY IMPLEMENTATION FRAMEWORK.....</b>	<b>29</b>
4.1	THEORY OF CHANGE.....	29
4.2	IMPLEMENTATION OF THE STRATEGY.....	29
4.3	ROLES AND RESPONSIBILITIES IN IMPLEMENTING THE STRATEGY AT DIFFERENT LEVELS.....	30
4.3.1	National level.....	30
4.3.2	Regional level.....	33
4.3.3	District level.....	33
4.3.4	Ward level.....	33
4.3.5	Community level.....	34
4.3.6	NGOs and the private sector.....	34
4.4	CAPACITY BUILDING.....	34
4.5	COLLABORATION AND PARTNERSHIP.....	34
4.6	FINANCIAL RESOURCES.....	35
4.7	INDICATIVE IMPLEMENTATION COSTS OF THE STRATEGY.....	35
4.8	SUPERVISORY AND COMPLIANCE MECHANISM.....	35
<b>5</b>	<b>MONITORING AND EVALUATION.....</b>	<b>36</b>
5.1	MONITORING AND EVALUATION INDICATORS.....	37
<b>6</b>	<b>NEHHSS ACTIVITIES AND INDICATIVE BUDGET ESTIMATES.....</b>	<b>41</b>
6.1	INDICATIVE BUDGET FOR 2020– 2025.....	41
<b>7</b>	<b>REFERENCES.....</b>	<b>57</b>
<b>8</b>	<b>APPENDIX 1.....</b>	<b>60</b>

**List of Figures**

Figure 1: Percentage of households that treat drinking water.....6

Figure 2: Reported cases of diarrhoea attending or admitted to healthcare facilities  
from 2014 to 2019.....14

Figure 3: Institutional framework for environmental health management.....17

Figure 4: Theory of change for implementation of the NEHHSS.....29

**List of Tables**

Table 1: Categories of hazardous waste in healthcare facility.....8

Table 2: Ministries, Departments and Agencies roles and responsibilities for implementation of the strategy.....32

Table 3: Environmental health, hygiene and sanitation key result areas and indicators.....37

Table 4: Estimated budget for the NEHHSS 2020 – 2025.....41

## FOREWORD

Since independence in 1961, the Government of Tanzania has emphasized improving the health status of its people by implementing various strategies to control diseases and injuries. Environmental health encompasses all aspects of the living, working and recreational environments that might either destroy or promote the overall health of Tanzanians according to whether it is poorly or well managed. It deals directly with determinants of health, particularly the physical environment, individual characteristics and behaviours, that underlie both communicable and non-communicable diseases - the “double burden of disease”.

The world is currently challenged by both emerging and re-emerging diseases, and the Government of Tanzania is striving to proactively address them all to ensure the wellbeing of its citizens. With recent global development and growing interaction between countries and continents, the risks of importation and exportation of disease and/or vectors harbouring diseases has increased. Some of the key strategic actions described in this document are therefore designed to safeguard the country’s entry points.

Tanzania is experiencing a drastic demographic shift from rural to urban areas. In 1988, the urban population for Mainland Tanzania was 18%. It increased to 23% in 2002, then 29.1% in 2012 and is expected to rise to 37% in 2020. The increase in the urban population compounded with deficient infrastructure for food safety and waste management, unplanned settlements, inadequate supply of safe water, and poor sanitation and hygiene, fuels the spread of food, water and sanitation-related diseases in the country, which account for over 60% of the diseases reported in healthcare facilities.

Environmental health, hygiene and sanitation are multi-sectoral issues. Because of their close link to public health, however, the MoHCDGEC is the lead institution responsible for ensuring that the public is well-informed and educated on environmental health issues and the measures required to protect against threats to public health.

The national agenda of an industrialized economy will not be achieved if health and safety at workplaces and all aspects of environmental health are not given due respect. The NEHHSS 2020 – 2025 spells out how the MoHCDGEC and stakeholders will implement the National Health Policy and its strategies i.e Health Sector Strategic Plans (HSSP) and Medium-Term Strategic Plan (MTSP) in order to achieve the National Development Vision 2025 and the Sustainable Development Goals (SDGs) targets related to environmental health, hygiene and sanitation.

It is my expectation that, the Environmental Health Practitioners, Service Providers and all stakeholders dealing with environmental health, hygiene and sanitation at all levels will use this strategy to ensure all preventive measures for protecting the health of the Tanzanians are implemented at maximum capacity.

A handwritten signature in blue ink, consisting of stylized, overlapping loops and a final horizontal stroke.

**Prof. Mabula D. Mchembe**  
PERMANENT SECRETARY (HEALTH)

## ACKNOWLEDGEMENT

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Finally, the MoHCDGEC expresses its deep gratitude to UNICEF Tanzania for their valuable support in facilitating the preparation of these guidelines and WSSCC who enriched the final draft of this strategy. It is my sincere hope that they will continue to support environmental health, hygiene and sanitation interventions in Tanzania.



**Prof. Abel Makubi**  
CHIEF MEDICAL OFFICER

## ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ASDS	Agricultural Sector Development Strategy
CCHP	Comprehensive Council Health Planning
CEPC	Continuing Education Programme Courses
DHS	Demographic Health Survey
DHIS2	District Health Information System 2
DPS	Director of Preventive Services
DRA	Demand Responsive Approach
EHS	Environmental Health and Sanitation
EHHS	Environmental Health, Hygiene and Sanitation
EHP	Environmental Health Practitioner
EHPRC	Environmental Health Practitioner Registration Council
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
FBOs	Faith Based Organizations
HIV	Human Immunodeficiency Virus
HBS	Household Baseline Survey
HCF	Healthcare Facility
HCWM	Healthcare waste management
HPAP	Health and Pollution Action Plan
IAQ	Indoor air quality
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
ILO	International Labour Organization
IPC	Infection prevention and control
ISO	International Standards Organization
KRA	Key Result Area
LGA	Local Government Authority
LGRP	Local Government Reform Programme
MDAs	Ministries, Departments and Agencies
MoHCDGEC	Ministry of Health Community Development, Gender Elderly and Children
MoW	Ministry of Water
MUHAS	Muhimbili University of Health and Allied Sciences
NBS	National Bureau of Statistics
NDV	National Development Vision
NEHHSS	National Environmental Health, Hygiene and Sanitation Strategy
NEMC	National Environmental Management Council
NEP	National Environmental Policy

NGOs	Non-Governmental Organizations
NIMR	National Institute for Medical Research
NSC	National Sanitation Campaign
NSMIS	National Sanitation Management Information System
NTCP	National Trachoma Control Programme
NTD	Neglected Tropical Diseases
OHS	Occupational Health Services
PCP	Public Community Partnership
PHA	Public Health Act
PHEIC	Public Health Emergency of International Concern
PMO-LYED	Prime Minister's Office, Labour, Youth Employment and People with Disabilities
PoE	Points of entry
POP	Persistent Organic Pollutants
PopCAB	Population Connectivity Across Borders
PORALG	President's Office, Regional Administration and Local Government
PPP	Public Private Partnership
SDGs	Sustainable Development Goals
TB	Tuberculosis
TBS	Tanzania Bureau of Standards
TOHS	Tanzania Occupational Health and Safety
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VPO	Vice President's Office
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WSDP	Water Sector Development Program
WSSCC	Water Supply and Sanitation Collaboration Council
WTOT	Ward Trainers of Trainers



# 1 INTRODUCTION

## 1.1 Environmental Health, Hygiene and Sanitation

Environmental health is a broad concept and may mean different things or issues to different nations. However, for the purpose of this strategy, environmental health refers to all those factors in a human's physical environment, which exercise, or may exercise, deleterious effects on his or her physical development, health or survival.

It is hence the science and practice of preventing human injury and illness and promoting well-being by identifying and evaluating environmental risks and limiting exposure to hazardous physical, chemical, and biological agents in air, water, soil, food, and other environmental media or settings.

Environmental health management encompasses all those measures contributing to the prevention, mitigation and control of environmental factors that can adversely affect human health. Examples include preventing biological and chemical contamination of water, air and food. It also refers to enhancement of those aspects of the environment that can directly or indirectly contribute to disease prevention and control, and the protection and improvement of human health. Hygiene, sanitation, safe drinking water, food safety, air quality, accident prevention, noise control and occupational health and safety all fall within the purview of environmental health management. It also includes the control of insects and other pests, vector borne disease control, chemical management, waste management, infectious disease control and mitigation of the adverse health impacts of climate change.

### 1.1.1 Components of Environmental Health

The main components of environmental health geared to prevention and control of diseases and management of events that pose a risk to public health include:

1. Sanitation and Hygiene
  - \* Household and institutional sanitation
  - \* Liquid waste and faecal sludge management (including sewerage and sewage treatment)
  - \* Hygiene
  - \* Menstrual health and hygiene
2. Health Promotion, Education, Social and Behaviour Change Communication
3. Epidemiological Surveillance of Diseases and Public Health Events
4. Vector and Vermin Control
5. Solid Waste and Human Remains Management
  - \* Integrated solid waste management
  - \* Safe disposal of human remains

6. Food Safety and Hygiene
  - \* Food premises inspection
  - \* Food sampling
  - \* Monitoring food borne diseases
7. Water Quality and Safety Standards
  - \* Drinking water quality and safety
  - \* Environmental water quality and safety
8. Port Health Services
  - \* Surveillance of PHEIC
  - \* Vaccination services
  - \* Risk assessment and management
  - \* Emergence medical services
9. Occupational Health
  - \* Noise pollution
  - \* Ergonomics, health and safety standards
  - \* Provision of occupational health services
10. Pollution Control (air, land, water)
  - \* Environmental chemical exposures and controls
  - \* Air pollution control (including community noise reduction)
  - \* Indoor air quality control
  - \* Soil pollution control
  - \* Water pollution control
11. Toxic and Hazardous Waste Management
  - \* E-waste management
  - \* Health care waste management
  - \* Industrial waste management
12. Human Nutrition
13. Land Use in Rural, Peri-urban and Urban Areas
  - \* Human settlements
  - \* Recreational and open spaces
  - \* Cemeteries
14. Disasters, Emergency Preparedness and Response
15. Public Health Compliance and Enforcement
  - \* Public health inspection
  - \* Enforcement of public health laws
  - \* Environmental health impact assessments
16. Climate Change and Health
17. Environmental Health Information Systems
18. Housing and Housing Standards (e.g. for schools, offices, houses and hotels)

### **1.1.2 Strategic Context of the NEHHSS**

In 2008, Tanzania signed the Libreville Declaration on Health and Environment in Africa, committing the country to implementing a set of actions to strengthen protection of its population from health threats related to the environment. The NEHHSS represents a further step in Tanzania's efforts to improve the health status of its people. Different interventions have been undertaken to combat both communicable and non-communicable diseases, one example being the National Sanitation Campaign (NSC). More than 88% of diarrhoeal disease, including cholera, is attributable to poor sanitation and hygiene, both components of environmental health. In addition to the impact in terms of morbidity and mortality, the economic costs are substantial. According to the Water and Sanitation Program,(1) it is estimated that Tanzania loses USD 206 million annually due to poor sanitation. More generally, diseases resulting from pollution are estimated to have cost Tanzania between USD 384 million and USD 580 million in 2015 due to lost productivity.(2) Food borne and occupational related diseases and disability add to the burden, although data for these factors are not available. The NEHHSS thus aims to improve the health status of the Tanzanian community and improve the economy of the country through increased productivity by addressing issues that create hazards and risk situations leading to disease and disability.

### **1.2 The Importance of Environmental Health, Hygiene and Sanitation**

Environmental Health, Hygiene and Sanitation (EHHS) are important to the economic and social development goals outlined in the Tanzania Development Vision 2025.(3) A poor living environment contributes to the occurrence of disease, loss of labour productivity and in some cases, loss of life. The consequences are apparent among the majority of the population, especially in children and women. Illnesses caused by drinking contaminated water and exposure to polluted air account for more than 60% of hospitalizations and deaths among children and women.(4) The Tanzania Demographic and Health Survey and Malaria Indicator Survey for 2017 showed that 4% of children under five years of age had severe anaemia. Over 30% of Tanzanian children have moderate anaemia attributed mainly to malaria and worm infestations.(5) These are environmentally related conditions that affect the health and lives of millions of Tanzanians at significant cost. They represent a particular threat for HIV/AIDS patients who are vulnerable to opportunistic infections such as diarrhoea and malaria.

Hospital acquired infections (HAIs) are largely due to inadequate environmental health management. A survey done in tertiary hospitals in Tanzania in 2002 revealed that longer hospital stays were related to higher chances of developing HAIs.(6). Also, a study done at Muhimbili National Hospital revealed high contamination in wards with Methicillin-resistant *Staphylococcus aureus* (MRSA)

in which presence of ten or more patients in a room was an important significant correlate for MRSA contamination.(7). The MoHCDGEC have increased efforts to prevent HAIs by providing guidelines for improved water, sanitation and hygiene (WASH) in healthcare facilities as well as infection prevention and control (IPC) measures.

A briefing note released by WHO in 2014 has earmarked that, there is growing public health concern that antimicrobial-resistant bacteria and AMR genes in human waste could potentially enter water sources via untreated or treated wastewater effluent and result in the exposure of human populations that use such water as drinking-water sources, for bathing, washing and other domestic sources, for primary contact recreation and as irrigation water. The potential risks from antimicrobial-resistant organisms in the water environment include (1) infection by antimicrobial-resistant pathogens present in the water (e.g. resistant *Campylobacter* spp., *Shigella* spp., *Salmonella typhi* and other *Salmonella* spp.); (2) colonization and subsequent infection with opportunistic pathogens, such as *E. coli* and enterococci. Although human exposures to antimicrobial-resistant bacterial pathogens from various environmental sources and by various exposure pathways could cause infections resulting in illnesses and deaths, the extent to which human health risks are increased from such exposures is inadequately characterized, poorly documented and therefore of uncertain magnitude. Therefore, there is a need to address this public health problem through a variety of integrated prevention and control measures supported by appropriate guidance for risk assessment and risk management.

Environmental health, hygiene and sanitation have a major role to play in poverty reduction in Tanzania. The diseases caused by unsatisfactory environmental health conditions, such as malaria and diarrhoea, reduce the productivity of households and divert resources that could be invested in fighting poverty. Furthermore, the impact of poor environmental health mostly affects low income households. Recent studies on the state of poverty in Tanzania indicate that water and air related diseases are most prevalent in households without access to quality EHHS services, whether for financial reasons or because the services are simply not available. Genuine efforts to reduce poverty in Tanzania will have to focus on improving the quality and accessibility of EHHS services for all.

There are many dimensions to EHHS, and numerous key players and stakeholders involved. To maximize efficiency and effectiveness it is crucial to have a tool mapping activities and resource allocation.(8) The NEHHSS will be that tool, serving to guide proper implementation of activities to address the priorities set by the Government of Tanzania.

### **1.3 Situational analysis**

This section describes the status of environmental health, hygiene and sanitation in Tanzania.

#### **1.3.1 Epidemiological Indicators**

Morbidity and mortality caused by food and water borne diseases have increased over time. There were more than 30,000 reported cases of cholera, with around 500 reported deaths in the outbreak that occurred between 2015 – 2018.(9) Moreover, airborne diseases have continued to debilitate people's health in Tanzania. In the year 2016, there were 65,902 cases of TB and 401,112 of pneumonia, both of which are related to exposure to contaminated air. Each year, ten to twelve million people contract malaria, a preventable and debilitating disease.(10).

As a member country of the World Health Organization (WHO), Tanzania has made efforts to fulfil SDG 3 by eliminating the neglected tropical diseases (NTDs) identified in the WHO NTD portfolio. Through various interventions including mass drug administration, environmental health programs (such as the National Sanitation Campaign and environmental cleanliness) and mass education, the prevalence of trachoma, filariasis and other NTDs has been reduced significantly.

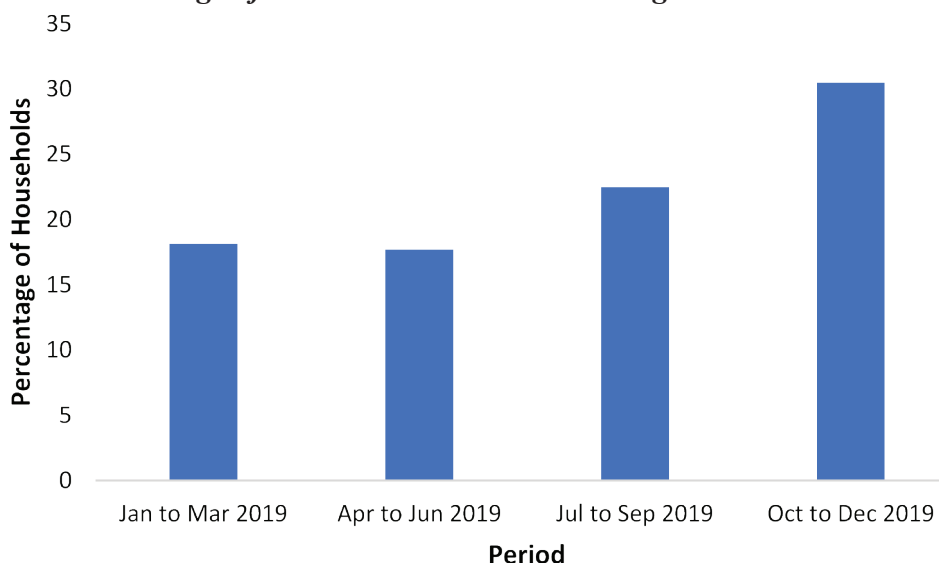
#### **1.3.2 Physical Environmental Health Indicators**

##### **1.3.2.1 Access to Clean and Safe Water**

Tanzania's Water Policy of 2002 makes access to clean and safe water a universal right of all Tanzanians. The MoHCDGEC's 2015-2016 demographic and health survey shows that access to clean and safe water is 49% in rural areas and 86% in urban areas.(5) The majority of Tanzanians, especially in rural areas, draw water from unprotected sources, resulting in exposure to water related disease agents, as evidenced by frequent outbreaks of waterborne diseases such as diarrhoea, dysentery and cholera in many parts of the country. Such outbreaks cause major disruption of people's livelihoods; in Dar es Salaam, at least 20% of the people and their businesses are adversely affected annually due to cholera outbreaks.

Data collected in 2014 by the NSC showed that of 70 primary schools sampled only 53% had access to clean water,(11) revealing the reality that large numbers of pupils were studying in a hazardous environment. Through the NSC, the number of households that treat water for drinking increased from 18% from the first quarter of 2019 to 31% by the last quarter of 2019.(12) It is expected that proper implementation of EHHS interventions will result in a significant reduction of the water related disease burden and associated treatment costs.

**Figure 1: Percentage of households that treat drinking water**



(Source: WASH portal NSMIS 2020)

### **1.3.2.2 Solid and Liquid Waste**

Similar to other developing countries, Tanzania is currently undergoing a demographic shift with the urban population for the Mainland increasing from 23% in 2002 to 29% in 2012. The urban population growth rate is 6% nationally while that of Dar es Salaam City is even higher, reaching 8% with 70% of the City's population living in unplanned areas. Such urbanisation has resulted in unprecedented production of solid waste, which often surpasses the capacity of local authorities. Statistics indicate that on the average, most urban authorities do not collect more than 50% of the solid waste generated.(13)

Improper disposal of solid waste is a major factor contributing to soil and groundwater pollution.(14) Furthermore, it can lead to high emissions of methane gas thereby increasing air pollution and contributing to global warming.

Piped sewerage systems for liquid waste management serve less than 10% of urban households,(13) with the rest resorting to on-site solutions, often without adequate services for the collection, treatment and safe disposal of faecal sludge.

Apart from being eyesores for major urban settlements, uncollected solid and liquid waste are major causes of water contamination and contribute to vector population growth and the spread of infectious diseases.

### 1.3.2.3 Antimicrobial Resistant (AMR)

Antimicrobial resistant (AMR) has been regarded as water, sanitation and hygiene issue by WHO. Human excreta and wastewater are recognized and documented as major sources of antimicrobial agents, their metabolites, antimicrobial-resistant bacteria and their AMR genes because of the widespread and extensive use of antimicrobial agents by human populations. In many countries including, facilities to treat municipal, community and household wastes that may harbour antimicrobial agents, antimicrobial-resistant bacteria and AMR genes are absent or inadequate, including ageing infrastructure such as leaking sewers that are often co-located with municipal water distribution pipes. As a result, these contaminants are released directly into the environment where human exposures are likely and where antimicrobial-resistant bacteria and AMR genes are capable of persisting and spreading.

There is increasing evidence that wastewater treatment plants are hotspots that sustain and further promote the propagation and selection of antimicrobial-resistant bacteria and AMR genes within their systems as well as function as major point sources that release them into the environment, where they disperse. Although wastewater treatment processes can reduce concentrations of pathogens in wastewater, wastewater treatment plant effluents do not show appreciable removal of antimicrobial-resistant bacteria and AMR genes in general.

It has been suggested that other specific hotspots for antimicrobial-resistant bacteria and AMR genes are the waste discharges of pharmaceutical production facilities, hospitals and other health-care facilities. People in hospitals are constantly and extensively being treated with antibiotics and other antimicrobial agents, and their solid, faecal and liquid wastes have been documented as important sources contributing to the release and subsequent spread of antibiotics and other antimicrobial agents, antimicrobial-resistant bacteria and AMR genes in the environment.

Because the presence of antimicrobial-resistant bacteria and their AMR genes in water, wastewater, wastewater-irrigated foods and aquacultural systems is now widely recognized, greater and more harmonized consideration of them as an environmental health hazard is needed. The MoHCDGEC has developed National Action Plan on Antimicrobial Resistant 2017-2022 in which so far a number of activities are ongoing by different actors e.g Agriculture, Livestock and health sectors. As for health sector greater effort are to ensure proper HCWM, provision of WASH in HCF and proper disposal of expiry drugs. There is a need of conducting more assessment and research especially on excreta effluent disposed off into water bodies.

### 1.3.2.4 Hazardous Wastes

#### 1.3.2.4.1 Healthcare waste

Management of hazardous wastes generated by healthcare facilities (HCF), mainly hospitals, is becoming a major health issue in Tanzania. It is estimated that 10 - 25% of healthcare waste (HCW) is hazardous, falling into the categories identified by the WHO and summarized in Table 1.(15)

**Table 1: Categories of hazardous waste in healthcare facility.**

*Adapted from WHO's definition and characterization of healthcare waste.(15)*

<b>Waste category</b>	<b>Description and examples</b>
<i>Infectious waste</i>	Waste suspected to contain pathogens e.g. laboratory cultures; waste from isolation wards; tissues (swabs), materials, or equipment that have been in contact with infected patients; excreta
<i>Pathological waste</i>	Human tissues or fluids e.g. body parts; blood and other body fluids; fetuses
<i>Sharps</i>	Sharp waste e.g. needles; infusion sets; scalpels; knives; blades; broken glass
<i>Pharmaceutical waste</i>	Waste containing pharmaceuticals e.g. pharmaceuticals that are expired or no longer needed; items contaminated by or containing pharmaceuticals (bottles, boxes)
<i>Genotoxic waste</i>	Waste containing substances with genotoxic properties e.g. waste containing cytostatic drugs (often used in cancer therapy); genotoxic chemicals
<i>Chemical waste</i>	Waste containing chemical substances e.g. laboratory reagents; film developer; disinfectants that are expired or no longer needed; solvents
<i>Wastes with high content of: heavy metal</i>	Batteries; broken thermometers; blood-pressure gauges; etc. heavy metals
<i>Pressurized containers</i>	Gas cylinders; gas cartridges; aerosol cans
<i>Radioactive waste</i>	Waste containing radioactive substances e.g. unused liquids from radiotherapy or laboratory research; contaminated glassware, packages, or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources

With national health policy calling for HCF at all administrative levels, the number of HCFs has increased to over 8,900.(16) adding to the generation of HCW requiring proper management plans for safe segregation, storage, transportation, treatment and disposal to minimize health related diseases. The

rapid increase in the spread of HIV/AIDS and hepatitis has exacerbated the threat to public health.(17,18) According to a 2015 WHO report, the coverage of safe disposal of HCW is only 60% in Sub-Saharan African countries; in Tanzania it is estimated at 40%.(16) The MoHCDGEC has developed a strategic plan for healthcare waste management which is in place and being implemented.(16) It is also collaborating with UNDP to develop mechanisms for recycling plastic materials from healthcare services to reduce the total amount of waste from hospitals.

#### **1.3.2.4.2 Toxic and Hazardous Waste**

Human activities produce wastes, many of which are toxic or hazardous. These can accumulate in amounts that may harm the environment and, at sufficiently high concentration, have undesirable effects on plants, animals and people. For example, mining activities are an important source of heavy metals, such as chromium, copper, arsenic, cadmium, mercury, and lead, which may be leached from exposed ores and waste rocks. Factories that process raw materials to finished products produce large amounts of waste products. Industrial operations emit air pollutants like carbon monoxide, oxides of nitrogen, hydrocarbons and lead, and a significant fraction of healthcare waste is categorized as hazardous.

In Tanzania, a number of environmental protection policies and legal frameworks on Toxic and Hazardous Waste Management are in place. They include The Environmental Management Act (2004) which covers waste treatment and disposal, including toxic and hazardous waste, and the Environmental Management (Hazardous Waste Control) Regulations (2009) which list mercury as a waste that needs to be properly handled and managed. The Public Health Act (2009) covers hazardous and health care waste management and the Standards Act No.2 (2009) sets out national standards for maximum tolerance limits. In addition, there are Guidelines for Management of Hazardous Waste (2013) which promote best practices for environmentally sound management. However, sound management is still a challenge. For instance, the Standards Act sets a limit 0.005 mg/l for mercury in municipal and industrial wastewater, but there is no single policy or regulation for mercury waste management. Mercury-containing household wastes are mixed with other municipal solid waste. Although local authorities collect municipal solid waste for disposal at dumpsites, much remains uncollected and is eventually buried, burned or left in open fields.

Lack of data on hazardous waste generation and its effects on human health and the environment is a major stumbling block for proper regulation.

### **1.3.2.5 Latrine Coverage**

The main problem of latrines in relation to environmental health in Tanzania is quality of construction rather than low levels of coverage. Data from National Sanitation Management Information system (NSMIS) indicate that 98.2 % of households had a toilet by the end of 2019.(12) although coverage has remained low in nomadic areas. Only about 63%, however, had an improved toilet.(12) Most latrines in urban and rural areas of Tanzania are poorly constructed, creating additional health risks for users. The problem of quality is evident in the rainy season when the number of households owning a toilet decreases due to destruction caused by heavy rains. Efforts are being made to educate communities on the importance of a durable sanitary facility.

### **1.3.2.6 School Sanitation and Hygiene**

According to the NSC status report of 2019, the proportion of schools having adequate sanitation facilities was 54.4% and only a fraction of these had hand-washing facilities. Most school latrines are temporary and unsanitary with an insufficient number of holes in relation to the number of pupils and teachers. On top of that, most existing toilet facilities are not user- friendly for people with disabilities, or for girls since Menstrual Hygiene Management (MHM) has not been taken into consideration. Various actors in WASH have played a part in improving sanitation in schools, but not all schools have been reached and sometimes those that have still have a high pupil to toilet stance ratio. Tanzania guidelines call for a ratio of 50:1 for boys and 40:1 for girls in primary school. An evaluation study done in 2017 among 84 schools found that the guideline had been met in 43% of the sampled schools.(11) Efforts to improve school facilities are ongoing in collaboration with development partners, stakeholders and relevant ministries.

### **1.3.2.7 Hygiene**

The importance of hygiene in the prevention of diseases cannot be overemphasized. Hygiene entails personal behaviour to maintain cleanliness. According to the NSC, hand washing has remained very low for the majority of regions. The percentage of households with functional hand washing facilities with soap ranges from 3.8% to 53% with an average of 22%. A slight decline of 0.2% from the second to the third quarter was observed in 2019, which might be related to the similar decrease in households with toilets.(19) The slippage occurs during the rainy season.

### **1.3.2.8 Port Health**

Port Health Services are important in the control of diseases of international and local concern as well as implementation of the International Health Regulations

2005.(20) Port Health Officers have the responsibility of controlling the importation and exportation of food, plants, cloths, chemical substances and other goods that may affect public health.

In this globalized world, people and goods are travelling more today than ever before in history, making the world smaller and public health threats bigger. Statistics show that there are 53,000 merchant ships and over 1,200 international airports handling almost 3.7 billion international passengers and 50 million metric tons of cargo travelling all over the world each year. As a result, a disease occurring in one place can rapidly spread to other parts of the world. The coronavirus disease COVID 19 is a prime example; it was first detected in China at the end of 2019 and spread throughout the world in a matter of months. Other recent public health threats with the potential to spread internationally include SARS, influenza, MERS-CoV, Ebola virus, Marburg virus, plague, yellow fever and Zika virus.

Tanzania is vulnerable to the international spread of diseases and other public health events due to its geographical characteristics. It is surrounded by eight countries, the Indian Ocean, Lake Tanganyika, Lake Victoria and Nyasa, and is a destination for international tourists. It has over 49 official points of entry and numerous porous borders.

Public health measures at ports, airports and ground crossings have been implemented in an effort to control the spread of public health events of international concern (PHEIC) in accordance with the International Health Regulations, 2005, the Public Health Act, 2009 and the Port Health Services Operational Guidelines, 2016, which cover inspecting and monitoring travellers, transit agencies, goods and freighting at all points of entry. It is estimated that 4.6 million passengers are screened, 70,000 conveyances inspected, and 16,100 travellers vaccinated against yellow fever at official points of entry annually. Vaccination against Hepatitis B has also been introduced. The Government has also invested in diagnostic equipment including thermo-scanners as indicators of infectious diseases and increased its capacity to provide various vaccines to travellers across the border.

Despite these efforts, there are still challenges that hinder effective control at exit and entry points as required by the IHR 2005. The core capacity assessment and joint external evaluation conducted in 2015 and 2016 indicated weaknesses in core capacity at all times, during emergencies and in coordination and communication. Scores for the various criteria ranged from 37% to 70% compared to a target minimum of 80%. Challenges identified include: inadequate human resource

capacity and development, lack of equipment and infrastructure, lack of effective mechanisms for isolation of suspected cases, and inadequate medical services and transport facilities for highly contagious cases detected at points of entry. The country is determined to address these challenges through its National Action Plan for Health Security 2017-2021 and has made considerable progress. Kilimanjaro International Airport, for example, has met the required core capacity according to international and national standards.

Ongoing challenges include limited capacity to expand the scope of health services at all 49 PoE, cooperation of stakeholders in the control of entering visitors, staff shortages and weak monitoring of health events among migrants passing through informal border crossings.

#### **1.3.2.9 Air Quality**

Like many other countries, Tanzania is struggling to maintain good air quality. Efforts are hampered, however, by industrial emissions, open fires, forest fires, dumpsite fires and vehicle emissions in high traffic areas. Contaminants that have been reported in the ambient air in Tanzania include particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulphur oxides, nitrogen oxides, POPs and methane.(2) Annual deaths resulting from ambient pollution from particulate matter alone were 3.6% of all deaths in the country in 2016, and indoor air pollution attributable to solid fuels accounts for 8.5% of annual deaths.(2) A review of studies done in African countries revealed a significant increase in asthma risk for people whose houses or workplaces are close to highways.(21) Studies elsewhere have shown an increase in respiratory illnesses among children in areas with poor air quality. (22) Tuberculosis, which is linked to poor indoor air quality, ranks fifth among the top ten diseases in the country.

Many health practitioners project increases in health problems associated with poor air quality in urban areas if the increasing volume of motor vehicles and industrial activities is not well managed. While both ambient and indoor air pollution are the major causes of respiratory tract diseases in urban areas, indoor air pollution is the major cause in rural areas because of the greater reliance on firewood for energy (84.4% vs. 17.4% in urban areas).

#### **1.3.2.10 Human Settlements and Dwellings**

The current status of human settlements and shelter in most parts of Tanzania does not support healthy living. In urban areas between 70% and 80% of human settlements and housing lack essential services including solid and liquid waste management and safe and adequate water supply. The situation is exacerbated by increasing urban poverty, overcrowding and unplanned settlements. Most of

houses in urban areas are overcrowded with at least 5.7 persons sharing a room. (23) Housing designs in rural and urban areas are of poor quality with inadequate ventilation and lighting, which are essential factors for the control of air borne diseases.

The problem of noise pollution is particularly an issue in the growing cities of Tanzania, where public places have been established in residential areas. Although there are no official records, anecdotal evidence suggests that noise is increasingly resulting in induced hearing loss among the people in urban settlements. Excessive noise is also a nuisance and can contribute to numerous health effects including headaches, nausea, hypertension and sleep disorders.

#### **1.3.2.11 Occupational Health and Safety**

Occupational hazards in most workplaces expose workers to a high risk of contracting not only occupational health problems, but also diseases related to poor sanitation. Occupational health problems include injuries, permanent disability or even death due to accidents, infectious diseases such as hepatitis, HIV/AIDS and chronic ailments resulting from exposure to poisonous substances such as chemicals, fumes, dusts and radioactive materials. Workers may also suffer from poor workplace ergonomics. The growth of the informal economy activities in areas such as mining, agriculture, trading and welding has increased the risk of working environments. Lack of protective equipment, low awareness of its importance and negligence in its use, compounded by poor enforcement of occupational health laws exacerbate occupational health problems in the country. Inadequate data and risk assessments in workplaces have obscured the magnitude of these problems and resulted in them receiving little attention. The establishment of the Occupational Health and Safety Unit in the MoHCDGEC and OSHA under the Ministry of Labour, Youth, Employment and Persons with Disability has initiated concerted efforts toward improving the working environment and the health of workers.

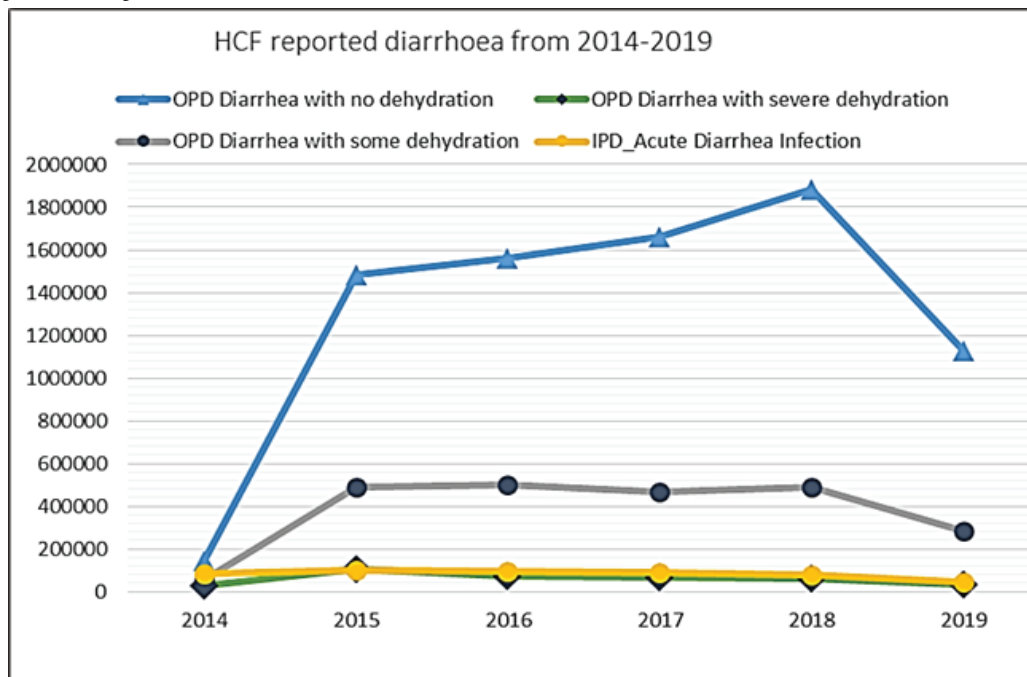
#### **1.3.2.12 Food Safety**

Routine inspection reports of households and food premises in Tanzania have suggested there is a significant gap between what people say they do and what they actually practice regarding food safety. The most common unhygienic practices reported include infrequent and inappropriate hand washing, inadequate cleaning of food contact surfaces, presence of pets in the kitchen and cross-contamination between dirty and clean surfaces and food. Furthermore, there were critical violations related to improper leftover storage and insufficient cooking.

Currently there are no data that show the prevalence of specifically foodborne disease or illness. DHIS2 data from healthcare facilities give the number of

diarrhoea patients who attended or were admitted from 2014 to 2019 (Figure 2), some of which could be the result of food or poor hygienic practice. On the other hand, the country reported 84 cases and 23 deaths from food poisoning, especially due to aflatoxin, between 2016 and 2018. Among other factors, these diseases can be associated with poor handling of foodstuff, consuming unsafe food or inadequate hand hygiene.

**Figure 2: Reported cases of diarrhoea attending or admitted to healthcare facilities from 2014 to 2019**



(Source: DHIS 2)

### 1.3.3 Capacity within the Environmental Health Service Delivery System

One of the critical factors contributing to poor environmental health in Tanzania is the inadequacy of the environmental health workforce, specifically environmental health officers in both rural and urban areas. Enforcement of environmental health laws and application of guidelines depend on the availability of skilled and competent environmental health workers. Their numbers are insufficient in Tanzania with the shortage more pronounced in rural areas. Of the 2200 environmental health workers in the country, only 40% are working in rural areas. The majority of the 10,000 villages nationwide rely on services rendered by ward environmental health officers. These, however, are unable to serve all villages, many of which are widely dispersed and difficult to access because of poor infrastructure and lack of transport facilities. Environmental health assistants and technicians were to be allocated in villages but currently are not being trained or

hired even though the scheme of service is available. In addition, the number of ward environmental health officers is small compared to the number of wards. As a result, they are present in only a few wards with the majority of them being located in urban areas. Increasing access to environmental health services for the majority of rural villages is a major development challenge for Tanzania.

A shortage of environmental health workers is also experienced in other environmental health service areas like ports. None of the 28 port health offices in the country has adequate numbers of staff and office accommodations.

A lack of necessary skills to respond to current environmental health challenges is another capacity problem for the workforce. Most workers possess the traditional skills of a health inspector, but the current challenges require knowledge and skills in environmental epidemiology, risk assessment, environmental auditing, disease forecasting, climate change, chemical management and social sciences necessary for health promotion. Professional training for practitioners is not being offered, although this could reduce the gap in needed skills. Capacity for designing innovative approaches to service delivery is also scarce and the problem is only aggravated by the small number of institutions providing specialised training courses for EHHS services.

With little opportunity for career development, low remuneration and few incentives for environmental health workers, the sector struggles to recruit and retain high quality staff. Coupled with poor accountability systems, this situation has led to dissatisfaction in the workforce, EHP changing to other professions, and, ultimately, poor performance of the whole environmental health delivery system.

Inadequate funding is another critical issue contributing to poor performance. The limited budgets of LGAs make it impossible to ensure the delivery of the needed services. Weaknesses in planning and priority setting at the LGA level add to the problem. Despite the fact that factors in the human environment are major causes of the top ten diseases, many LGAs do not prioritize environmental health interventions in their district development plans. The bulk of activities are carried out either as projects supported by development partners or as special Government campaigns. The benefits are short lived since after the projects and campaigns cease, people slide back to their old habits, as exemplified by a waste management project supported by donors in Morogoro Municipality<sup>1</sup>.

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<sup>1</sup>From discussions in Morogoro with a Ward health committee and CBOs in September, 2019.

Poor planning and inadequate resources have had many negative consequences, including an increasing prevalence of diseases such as cholera, diarrhoea, malaria and worm infestations related to poor environmental management, especially water supply, sanitation and hygiene.

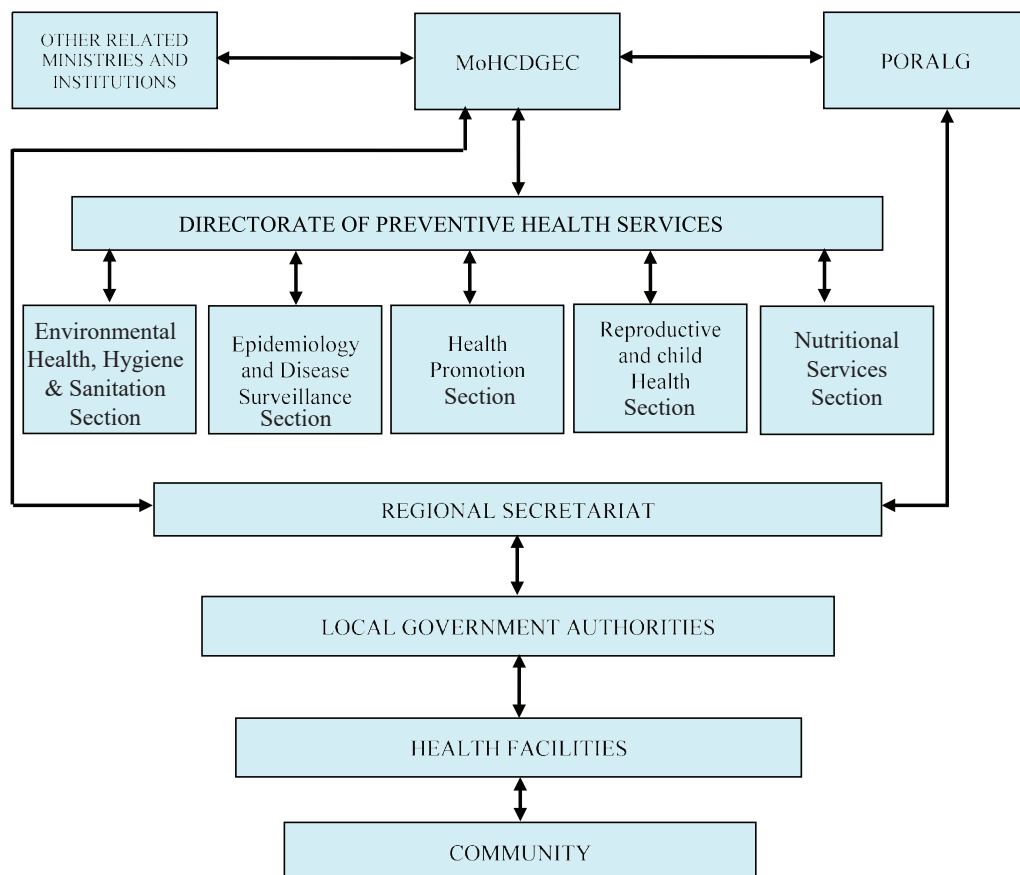
#### **1.3.4 Institutional and Legal Framework**

The current institutional framework does not adequately facilitate coordination and collaboration in planning, implementation and monitoring between the multiple government and non-government institutions with a role in environmental health. The range of EHHS services are delivered through various institutions and actors who are linked vertically and horizontally as shown in Figure 3. At the central level, the Environmental Health Section of the MoHCDGEC relies on inputs from many other ministries, departments and agencies (MDAs), development partners and other non-governmental stakeholders for achieving its objectives. Different MDAs are responsible for ensuring the quality of water, air and land. The MoHCDGEC is the custodian of the National Health Policy, which encompasses environmental health sanitation and hygiene. It also works in collaboration with various other sectors and international organizations involved in EHHS.

Despite the existence of numerous actors in environmental health, there is no clear mechanism for their coordination to ensure they effectively act towards a shared objective of improving environmental health, hygiene and sanitation in Tanzania. The task forces that are currently used to facilitate communication and coordination between the MoHCDGEC, other MDAs and development partners are not effective and are only active when the need arises. A good example is the National task force, which is active only when there is an outbreak to respond to. Due to lack of coordination mechanisms, follow-up on environmental health issues by the Ministry of Health is not effective enough to ensure a streamlined implementation of interventions toward a common goal.

With regard to the legal framework, the laws and regulations governing environmental health, hygiene and sanitation in Tanzania are scattered and their enforcement is fragmented among various institutions (relevant policies and regulations are summarized in Chapter 2). There is also the problem of the inability of enforcement agents to enforce environmental health laws, regulations and standards. Most of the legal instruments relevant to environmental health in Tanzania emphasize policing by Government authorities as the major approach in their enforcement, which does not always give the required results.

**Figure 3: Institutional framework for environmental health management**



## 1.4 SWOC Analysis

The following strengths, weaknesses, opportunities and challenges for Environmental Health, Hygiene and Sanitation in Tanzania were identified in the process of developing this strategy.

### Strengths

- i. Availability of policy and legal framework (Health Policy 2007 and PHA, 2009)
- ii. Presence of strong leadership and coordination from national, regional and district level
- iii. Presence of environmental health practitioners in all councils and most wards
- iv. National and international priorities as reflected in Sustainable Development Goals 3, 6, 8 and 11
- v. Existence of Comprehensive Council Health Planning (CCHP)

- vi. Existence of campaigns like the NSC that create awareness in the population
- vii. Presence of the National Sanitation Management Information System (NSMIS) for data collection and management
- viii. Presence of the Council for Environmental Health Practitioners Registration

### **Weaknesses**

- i. Enforcement of the legal and policy framework is weak
- ii. Inadequate or no budget allocation for environmental health activities
- iii. Environmental health interventions are not prioritized in the planning process (CCHP)
- iv. Inadequate advocacy for environmental health issues targeting political leaders
- v. Inadequate data usage for planning and decision making
- vi. Lack of a clear chain of command and coordination for environmental health
- vii. Inadequate collaboration between district and Environmental Health Officers
- viii. Legal documents are not in user-friendly language

### **Opportunities**

- i. Existing high-level political commitments on environmental health issues
- ii. Presence of national and international partners and stakeholders to support environmental health issues.
- iii. Availability of a training institution for capacity building of environmental workforce
- iv. Increase the number of influential people advocating for environmental health, like religious leaders, traditional leaders and musicians
- v. Media outlets and tools for advocating environmental health are in place
- vi. Private sector involvement in environmental health issues
- vii. Clarification of environmental health policy
- viii. Existence of a mechanism for funding EHS interventions

### **Challenges**

- i. Limited and donor dependent financing mechanism for environmental health
- ii. Change in political and change in priority and political inferences
- iii. Integration of environmental health issues in other sector programmes
- iv. Competing priority for resource allocation between preventive and curative services

- v. Inadequate environmental health practitioner's workforce
- vi. Absence of budget codes for environment health

### **1.5 Rationale for the National Environmental Health, Hygiene and Sanitation Strategy**

The MoHCDGEC recognizes that in the 10 years of implementation of its previous strategy for environmental health, hygiene and sanitation, many changes have occurred, including new priorities that have emerged such as the Sustainable Development Goals. A critical review is timely and necessary to ensure that activities undertaken in the coming years will produce the results that will enable Tanzania to achieve its public health ambitions.

Some of the challenges that have hindered progress include a lack of data and information to inform decision making and planning processes, fragmented interventions that failed to achieve the synergies required for large scale impact, and the absence of a strategic plan to serve as a roadmap for reaching the country's goal of protecting and improving the health of its citizens.

Acknowledging these challenges, the MoHCDGEC has developed this National Environmental Health, Hygiene and Sanitation Strategy (NEHHSS) for 2020 to 2025. Its aim is to promote environmental health interventions that will elevate public health standards in the community. The Strategy will be a tool for guiding and coordinating the actions of all stakeholders.

A clear and realistic NEHHSS for Tanzania will be an important step toward curbing the public and environmental health threats that Tanzanians face every day. With achievable objectives for rural and urban contexts, it is expected to avert major environmental health problems and promote the best utilization of available resources.

Finally, a well-prepared strategic plan provides a framework for annual planning and the monitoring and evaluation that is key to achieving the desired outputs and outcomes. In short, the NEHHSS 2020 - 2025 will serve as the compass for keeping Tanzania on track to protect public health.

## **2 POLICY, GUIDELINES, LEGAL AND INSTITUTIONAL FRAMEWORKS**

### **2.1 Policy and Regulatory framework**

The legislative provisions for addressing EHHS issues in any country establish the basis for legal control of the process with clear definition of the duties and responsibilities of each actor involved in the management of environmental health. This part reviews the current provisions in Tanzania as well as the rules that are applied within the sector. Management of EHHS is guided by policies, regulations, acts and guidelines. Key legal frameworks include the National Health Policy of 2007; the Public Health Act of 2009; the National Environmental Policy of 1997; the Environmental Management Act of 2004, and other related documents.

#### **2.1.1 The National Health Policy, 2007**

The National Health Policy (NHP) recognizes the need for a clean and safe environment, which promotes good health for individuals and families. This policy specifically promotes participation of the private sector in preserving the environment through sound disposal of waste generated from healthcare facilities and research institutions, as well as obsolete drugs and reagents. It also emphasizes the prime importance of observing hygienic disposal of human excreta and personal hygiene. The policy clearly stipulates that: “The government will continue to emphasize on environmental health protection. Environmental health is one of the major important pillars for preventing communicable diseases”.

#### **2.1.2 The National Water Policy, 2002**

The National Water Policy (NAWAPO) of 2002 facilitates the attainment of Tanzania’s Development Vision 2025 through water supply. NAWAPO recognizes that lack of safe water; poor hygiene and sanitation are major causes of sicknesses and deaths in the country. Therefore, the Policy underscores the need to integrate water supply, sanitation and hygiene for improved health impacts of water and sanitation interventions. In this connection, the policy emphasizes that sufficient supply of water and adequate means of sanitation are basic human needs.

#### **2.1.3 The National Environmental Policy, 1997**

The National Environmental Policy (NEP), 1997 identifies six major environmental problems for urgent attention:

- Land degradation
- Lack of accessible good quality water for both urban and rural inhabitants
- Environmental pollution
- Loss of wildlife habitats and biodiversity

- Deterioration of aquatic systems
- Deforestation.

Each of these problems hinders the economic well-being of the country and the health of the people. In dealing with them, the NEP identifies sectoral environmental issues and assigns roles and responsibilities to the various institutions involved from the central government to local government authorities. Sectors such as health, agriculture, livestock, water, transport, energy, mining, human settlements, industry, tourism, wildlife, forestry and fisheries have mainstreamed relevant environmental management objectives formulated by the NEP in their respective policies.

#### **2.1.4 The Health Sector Strategic Plan IV 2015 – 2020 (HSSP IV 2015 - 2020)**

The Health Sector Strategic Plan IV, 2015 – 2020 is a tool to achieve the NHP, 2007 and aims to strengthen the health systems, promote and provide protective measures to households and workplaces. The focus of it is to attain healthy living and quality of life to the population. Issues related to the environmental health, hygiene and sanitation have also been stipulated in the HSSP under intersectoral collaboration for health and encompasses key components of water and sanitation, occupational health, waste management, port health and road safety. Other components of environmental health, hygiene and sanitation are multisectoral issues and are implemented in collaboration with other sectors. Therefore, effective implementation of the NEHHSS will help to achieve the HSSP

#### **2.1.5 The Medium-Term Strategic Plan (MTSP)**

One of the objectives of the MTSP is to prevent and control communicable, non-communicable and neglected tropical diseases so that to improve the wellbeing and quality of life of people. To achieve this, strategies relating to environmental health, hygiene and sanitation have been stipulated and focuses to strengthen all services related to environmental health and sanitation. Among them they include; Prevention and Control of HIV and AIDS Services; Prevention and Management of Communicable Diseases; Environmental Health, Hygiene and Sanitation Services; Health Education and Promotion Services; Occupational health services and School Health Services.

#### **2.1.6 The National Occupational Health and Safety Policy, 2010**

The National Occupational Health and Safety Policy (NOHSP) aims to reduce the number of work-related accidents and diseases in Tanzania. Its development required the adoption and implementation by the government, employers and employees of a culture to prevent occupational hazards. The effective prevention

of work-related accidents and ill-health can have enormous social and economic benefits. These include improvements in productivity and competitiveness and the quality of life of the working population. The effective management of many safety hazards will contribute to improved levels of public health and safety.

#### **2.1.7 The Local Government (District Authorities) Act, 1982**

The Local Government (District Authorities) Act consolidates laws relating to the organisation, functions and duties of local government bodies in districts, townships and villages. It empowers LGAs to perform numerous functions related to environmental health, hygiene and sanitation.

#### **2.1.8 The Local Government (Urban Authorities) Act, 1982**

The Local Government (Urban Authorities) Act consolidates laws relating to the organisation, functions and duties of local government bodies in urban areas. Like the corresponding legislation for District Authorities, it empowers LGAs to perform numerous functions related to environmental health, hygiene and sanitation.

#### **2.1.9 Occupational Health and Safety Act, 2003**

The Occupational Health and Safety Act, 2003 makes provisions for the safety, health and welfare of persons at work in factories and other places of work. It also provides for the protection of persons not at work against hazards to health and safety arising out of or in connection with activities of persons at work.

#### **2.1.10 Industrial and Consumer Chemical (Management and Control) Act, 2003**

This Act provides for the management and control of the production, importation, transportation, exploitation, storage, dealing, and disposal of chemicals and related matters. It covers requirements for all producers and users of chemicals (including medical facilities) and provides for medical surveillance of workers that risk exposure to chemicals.

#### **2.1.11 Environmental Management Act, 2004**

The Environmental Management Act, 2004 constitutes the legal and institutional framework for sustainable management of the environment and natural resources in the country. It is a comprehensive management act that provides for institutional roles and responsibilities with regard to environmental management, environmental impact assessments, strategic environmental assessment, pollution prevention and control, waste management, environmental standards, state of the environment reporting, enforcement and a National Environmental Trust Fund. Some of the key principles embodied in the act are the following. The ‘polluter

pays' principle implies that all producers of waste are legally and financially responsible for the safe and environmentally sound disposal of the waste they produce. The 'precautionary' principle is a key principle governing health and safety protection. It is defined and adopted under the Rio Declaration Principle 15 as: "Where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation." The 'duty of care' principle stipulates that any person producing, handling or managing hazardous substances, or related equipment, is ethically responsible for using the utmost care in that task. The 'proximity' principle recommends that treatment and disposal of hazardous waste takes place at the closest possible location to its source in order to minimize the risks involved in its transport. The 'prior informed consent principle' requires that all parties involved in the production, storage, transport, treatment and final disposal of hazardous and infectious wastes, are to be licensed or registered to produce, receive and handle named categories of waste. In addition, only licensed organizations and sites are allowed to receive and handle the waste.

#### **2.1.12 Environmental Health Practitioners (Registration) Act, 2007.**

This Act makes provision for the control of Environment Health Practitioners (EHP) and prescribes rules relative to their practice. It establishes the Environment Health Practitioners Registration Council for purposes of registration of EHP and the regulation of their conduct. The Council may advise the Minister on issue pertaining to environmental health and may issues a code of conduct for EHP. "Environmental" in this Act means all aspects of human health and disease that are determined by factors in the environment and includes the theory and practice of assessing and controlling factors in the environment that can potentially affect health.

#### **2.1.13 Public Health Act, 2009**

The Public Health Act, 2009 provides for the promotion, preservation and maintenance of public health with a view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public. It includes a wide range of articles relevant to EHHS, from waste management to vector control and food hygiene among others.

#### **2.1.14 The Standards Act, 2009**

The Standards Act, 2009 establishes the Tanzania Bureau of Standards as a body corporate and makes provision with respect to the publication and enforcement of standards in Tanzania. The Bureau shall, among other things, undertake measures for quality control of commodities and services; promote standardization in

industry and trade; assist industries in setting up and enforcing quality assurance and environmental management systems procedures; issue National Standards; and approve the use of standard marks.

### **2.1.15 Water Supply and Sanitation Act, 2019**

The Water Supply and Sanitation Act, 2019.(24) provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services, including the establishment of water supply and sanitation authorities, Rural Water Agency, National Water Fund and community-based water supply organisations as well as the appointment of service providers.

### **2.1.16 International Health Regulations, 2005**

The International Health Regulations (IHR) (2005) is a legal instrument binding all WHO member States. Its purpose and scope are “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade”. The IHR are not limited to specific diseases but apply to new and ever-changing public health risks and are intended to have long-lasting relevance in the international response to the emergence and spread of disease. The IHR also provide the legal basis for important health documents applicable to international travel and transport and sanitary protections for the users of international airports, ports, and ground crossings (19).

## **2.2 International Agreements**

International agreements are formal understandings or commitments between two or more countries. An agreement between two countries is called “bilateral,” while an agreement between several countries is “multilateral.” The countries bound by an international agreement are generally referred to as “States Parties.” Tanzania is a party to most international conventions. Listed below are the most relevant ones that Tanzania has ratified.

### **2.2.1 Basel Convention**

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal is an international treaty to which 187 countries are party, including most African countries. Tanzania ratified it in 1993. As stated on the Convention’s website, “The overarching objective of the Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as “hazardous wastes” based on their origin and/or composition and their characteristics, as well as two types of wastes defined as “other wastes” - household waste and incinerator ash.” (25)

It was established in response to the realization in the 1980s that toxic wastes were being exported for disposal in countries where environmental awareness was much less developed and regulations and enforcement mechanisms were lacking, especially in Africa and other parts of the developing world. Its three principal aims are:

- *“the reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal;*
- *the restriction of transboundary movements of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management; and*
- *a regulatory system applying to cases where transboundary movements are permissible.” (25)*

### **2.2.2 Stockholm Convention**

The Stockholm Convention on Persistent Organic Pollutants (POPs) was adopted on 22 May 2001 and entered into force on 17 May 2004. It has been ratified by over 183 countries, including Tanzania which did so in April 2004 after signing it in 2001. It entered into force in Tanzania in July 2004. The Convention is a global treaty to protect human health and the environment from POPs. POPs are chemicals which remain intact in the environment for long periods, they become widely distributed geographically, accumulate in the fatty tissue of living organisms, and are toxic to humans and wildlife. Extensive contamination of environmental media and living organisms includes many foodstuffs and has resulted in the sustained exposure of many species, including humans, for periods of time that span generations, resulting in both acute and chronic toxic effects.

### **2.2.3 Minamata Convention**

The Minamata Convention on Mercury is an international treaty designed to protect human health and the environment from anthropogenic releases of mercury and mercury compounds. It has been ratified by 123 countries as of 23 July 2020.(26) Tanzania ratified the convention in 2013. Article 4 of the Convention addresses the question of products that contain mercury and requires each state to not allow the manufacture, import or export of certain products by specified phase-out dates. Mercury is a toxic compound that causes mercury poisoning, primarily through inhalation and handling work clothes contaminated with mercury, but also by consuming mercury contaminated fish. Health care facilities generate mercury wastes in various ways such as dental amalgam and mercury thermometers. Article 8 is concerned with controlling and reducing emissions of mercury and mercury compounds to the atmosphere.

### 3 VISION, MISSION AND GOALS

#### 3.1 Vision

The NEHHSS aims to achieve the vision of all Tanzanians living in a healthy environment by 2025.

#### 3.2 Mission

The mission of the Environmental Health and Sanitation Section of the MoHCDGEC is to provide equitable, quality and affordable environmental health, sanitation and hygiene services to all Tanzanians through participatory and sustainable approaches, with special attention to gender.

#### 3.3 Goals, Strategic Objectives and Activities

##### Overall goal

The overall goal of the NEHHSS is to protect and improve health through the prevention, control and mitigation of environmental health risks associated with physical, chemical, biological and behavioural factors by 2025.

It is structured around five specific goals and 24 strategic objectives as follows.

##### 3.3.1 Goal 1

**Strengthen environmental health services to prevent, protect and promote environmental health and contribute to attainment of UHC for all Tanzanians by 2025.**

Environmental health services involve prevention, control and management of chemical, physical, and biological factors that affect the health of the community. These factors may arise from the physical and social environment, including air, water, food, climate change, housing, urban and rural development, land use, transportation, industry and agriculture.

- |                                 |  |
|---------------------------------|--|
| <b>Strategic objective 1.1:</b> | To accelerate universal access to improved sanitation and hygiene services.  |
| <b>Strategic objective 1.2:</b> | To enhance health education and promotion of environmental health determinants.  |
| <b>Strategic objective 1.3:</b> | To strengthen the prevention, control and response capacity on emerging and re-emerging public health events arising from environmental factors. |
| <b>Strategic objective 1.4:</b> | To reduce morbidity caused by diseases transmitted by vectors and vermin.  |
| <b>Strategic objective 1.5:</b> | To ensure compliance with food safety and hygiene regulations from farm to fork.   |
| <b>Strategic objective 1.6:</b> | To enhance advanced knowledge and technology for detection, analysis and timely response to public health threats at points of entry (PoE).      |

- Strategic objective 1.7:** To ensure adherence to water safety standards at the point of use.
- Strategic objective 1.8:** To strengthen and promote protection of the health and safety of the working population in formal and informal sectors.
- Strategic objective 1.9** To enhance waste management options, environmental protection and land use.

### **3.3.2 Goal 2**

#### **Strengthen environmental health planning, research and capacity building.**

A key focus area for the strategy is enhancing proper planning for all environmental health, hygiene and sanitation activities to support efficient and effective utilization of resources. It also aims to develop the research capacity of the workforce with a view to improving environmental services. Other key elements of capacity building are strengthening systems for EHHS management at all levels and ensuring that environmental health staff have up to date knowledge and skills.

- Strategic objective 2.1:** To strengthen planning in EHHS activities at all levels.
- Strategic objective 2.2:** To enhance the capacity of the workforce to be able to address key environmental health issues.
- Strategic objective 2.3:** To strengthen human resource management for EHHS at all levels.
- Strategic objective 2.4:** To enhance the capacity of the workforce and community to adapt to climate change.
- Strategic objective 2.5** To promote research on environmental health and translation of research findings into actions to improve community health.
- Strategic objective 2.6** To promote the use of innovative technology for environmental health interventions.
- Strategic Objective 2.7** To strengthen inspection capacity for environmental health services.

### **3.3.3 Goal 3**

#### **Promote stakeholder's participation in Environmental Health, Hygiene and Sanitation services.**

The community and all other stakeholders need to work in partnership to deal with environmental health issues. In order to achieve this, all partners must be well informed, in particular, the community must be provided with appropriate information and be given the opportunity to participate in policy development and decision-making processes. The key strategy is to engage the community and appropriate stakeholder groups at all levels in these processes.

- Strategic Objective 3.1:** To customize behaviour change communication programs to reduce environment related risk behaviours.
- Strategic Objective 3.2** To promote community participation in environmental health, hygiene and sanitation interventions.
- Strategic Objective 3.3** To enhance inter-sectoral collaboration between ministries, institutions and stakeholders working in areas related to environmental health.
- Strategic Objective 3.4** Promote innovative approaches including Public Community Partnerships (PCP) and Public Private Partnerships (PPP) to increase and improve environmental health service delivery.

#### **3.3.4 Goal 4:**

**Strengthen the legal and institutional framework for environmental health services.**

- Strategic Objective 4.1:** To strengthen enforcement of public health laws.
- Strategic Objective 4.2:** To strengthen the institutional structure for environmental health.

#### **3.3.5 Goal 5:**

**Advocate for availability and accessibility of resources to implement environmental health services.**

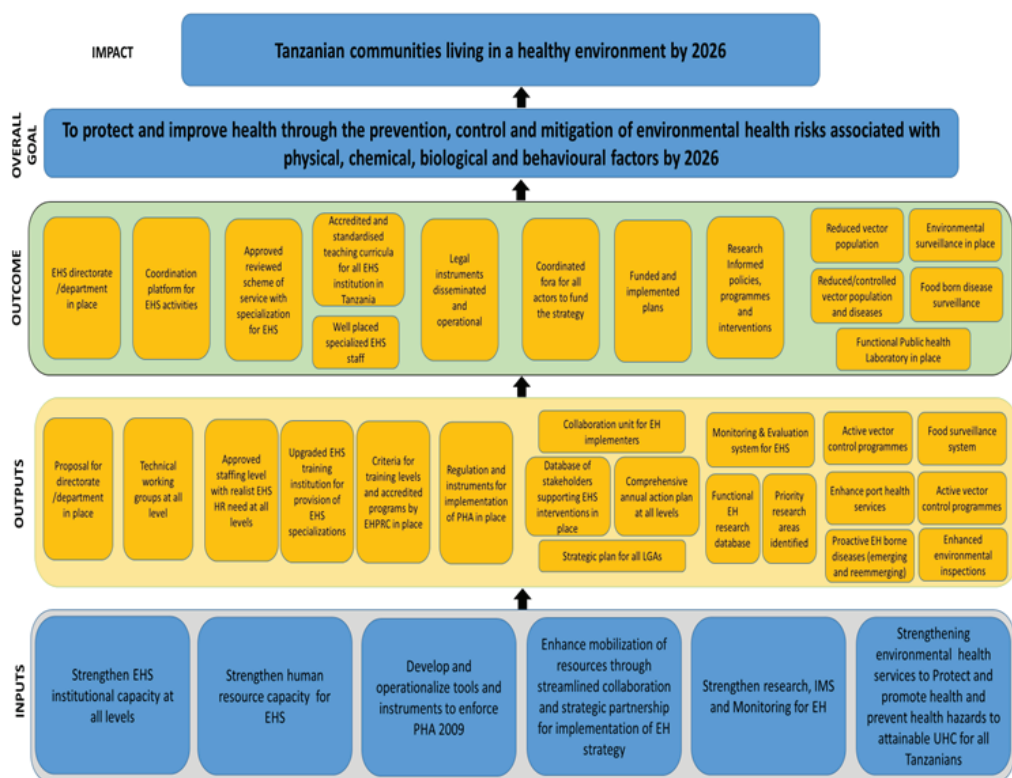
- Strategic Objective 5.1:** To establish environmental health services funding mechanisms.
- Strategic Objective 5.2:** To promote sharing of expertise and resources among stakeholders.

## 4 STRATEGY IMPLEMENTATION FRAMEWORK

### 4.1 Theory of change

The theory of change underlying the NEHHSS is summarized in Figure 4. Implementation of activities in collaboration with all actors to achieve the strategic objectives and goals of the strategy is expected to provide the key inputs to the change process. The resulting outputs and outcomes should lead to improved EH services and reduced outbreaks and illness.

**Figure 4: Theory of change for implementation of the NEHHSS**



### 4.2 Implementation of the Strategy

The National Health, Hygiene and Sanitation Strategy is a six years plan from 2020 through 2025. It will be implemented in line with the Sustainable Development Goals (SDGs), the Public Service Reform Programme, the Local Government Reform Programme, and the National Health Policy of the Government of Tanzania.

Implementation will depend on the actions of many actors within and outside the Government, including:

- The Ministry of Health, Community Development, Gender, Elderly and Children
- The Ministry of Water
- The President's Office, Regional Administration and Local Government
- NGOs, CBOs and FBOs dealing with environmental health, hygiene and sanitation
- Development Partners
- Village Health Committees

The Government of Tanzania, through the MoHCDGEC, will encourage partners and stakeholders to engage in implementing EHHS by providing technical, financial and other forms of support relevant to their needs. In broad terms, the envisaged roles and responsibilities of each category of partners will be as follows:

- Government Ministries will be responsible for policy development and ensuring its implementation.
- Development Partners will be responsible for resource mobilization, technical advice and monitoring.
- Implementing Partners (i.e., Local Government Authorities, NGOs, CBOs, FBOs etc.) will be responsible for the delivery of environmental health services and promoting behaviour change at various levels.
- Research institutions will be responsible for identifying research gaps in EH, undertaking research and enabling the translation of research findings on effective interventions into policy and practice.

### **4.3 Roles and Responsibilities in implementing the Strategy at Different Levels**

#### **4.3.1 National level**

##### **4.3.1.1 MoHCDGEC – Environmental Health and Sanitation**

The MoHCDGEC through the Directorate of Preventive Services, Environmental Health Section will facilitate the process for implementation of the NEHHSS. Specifically, the Environmental Health and Sanitation Section will have the following roles and responsibilities:

- Facilitate the process for the formation of the National Environmental Health Forum.
- Facilitate the functioning of the National Environmental Health Forum including supporting development of its annual and medium-term plans.

- Advocate for the development of programmes for implementation of the strategy.
- Monitor and evaluate the implementation of the strategy.
- Co-ordinate activities of all implementing partners and other stakeholders.
- Mobilize resources and facilitate their allocation.
- Provide technical support to regions, districts and other stakeholders.
- Facilitate capacity building at national, regional and district levels.
- Collect, analyze and use data for planning purposes, to provide feedback to regions and districts, and to contribute to other monitoring systems and reporting frameworks.

#### **4.3.1.2 Other Ministries, Departments and Agencies (MDAs)**

The achievement of intended outcomes of this strategy depends on the actions of various MDAs. While others may have an indirect role, the following MDAs have a direct role in impacting specific outcomes of this strategy:

**Table 2: Ministries, Departments and Agencies roles and responsibilities for implementation of the strategy**

<b>Ministry, Department/Agency</b>	<b>Role</b>
<b>Ministry of Health, Community Development Gender Elderly and Children- Section for Environmental health</b>	Implement the strategy as a leading institution Translation of policy documents and regulations Formulation of regulations from Acts governing EHHS
<b>Vice President's Office Division of Environment- The National Environment Management Council (NEMC)</b>	Participate in environmental protection and climate change related issues in the strategy. Translation of guidelines on Climate change and mitigation measure Education on EIA results from mega developments to community Scrutinizing the EHIA for mega developments
<b>Ministry of Education, Science and Technology</b>	Coordinate in collaboration with MoHCDGEC and have a leading role in School WASH, innovation and training of EHPs at certificate, diploma and degree levels
<b>President's Office, Regional Administration and Local Government</b>	Leading party in implementation of the strategy from regional to ward level Translation of guidelines
<b>Ministry of Livestock and Fisheries</b>	Collaborate with MoHCDGEC in zoonotic disease prevention
<b>Ministry of Water</b>	Collaborate on issues of water safety and implementation of WASH strategic objectives in schools, households and institutions
<b>Ministry of Agriculture, Food Security and Cooperatives</b>	Collaborate with TBS MoHCDGEC on all matters pertaining to food safety
<b>Ministry of Industry and Trade - TBS</b>	Translation of regulation on pollution and developing emission standards for environmental protection and compliance with the stakeholders
<b>Prime Minister's Office, Ministry of Labour, Youth Employment and People with Disabilities - OSHA</b>	Collaborate with MoHCDGEC on issues pertaining to occupational health and safety in workplaces Participate in development of exposure standards
<b>Ministry of Works, Transport and Communications</b>	Ensure building regulation on health aspects are observed

### **4.3.2 Regional level**

The Regional level acts as a link between the National and District levels. Specific roles are:

- Translate policies and guidelines for the implementation of environmental health programmes.
- Supervise, follow-up and evaluate the implementation of environmental health programmes in the districts.
- Provide technical support to districts.
- Identify training needs for human resource development in environmental health and make recommendations to the MoHCDGEC and districts as appropriate.
- Analyze district environmental health related statistics and give feedback and support to districts for their use.
- Carry out operational research in the districts for appropriate environmental health interventions.
- Prepare reports and submit them to relevant authorities.

### **4.3.3 District level**

- Conduct sanitary inspections of water sources and advise communities accordingly.
- Collaborate with other sectors for the implementation of water programmes.
- Develop, implement and evaluate environmental health programmes.
- Scrutinize building plans, issue permits and conduct follow up during construction.
- Train extension workers for installation, operation and maintenance of water and sanitation facilities.
- Supervise proper collection and disposal of solid and liquid waste.
- Carry out epidemiological studies and develop strategies for control of communicable and non-communicable diseases.
- Carry out regular food inspection and take samples for examination.
- Take water samples for physical, chemical and bacteriological testing.

### **4.3.4 Ward level**

- Initiate protection of the environment from pollution.
- Initiate collection and safe disposal of solid and liquid waste and carry out inspection of premises to verify compliance with regulations.
- Respond to complaints of nuisances.
- Initiate and sustain environmental health intervention activities in communities.
- Report and notify District level authorities of occurrences or outbreaks of communicable and non-communicable diseases.

- Develop and disseminate environmental health messages to the communities.
- Initiate legal measures for violations of environmental health regulations.
- Participate in immunization and other health campaigns.
- Carry out inspections of factories, industries and farms for the control of occupational health hazards.
- Participate in relevant ward committee meetings.
- Prepare monthly, quarterly and annual implementation reports.

#### **4.3.5 Community level**

Communities in the LGAs are where this strategy will be implemented and it has been enriched with information collected from Ward health and water committees. It is the responsibility of the communities to work together to improve EHHS as guided by the EHOs. It is their duty to participate and collaborate with stakeholders through their leaders in designing and implementing community level interventions.

#### **4.3.6 NGOs and the private sector**

The private sector, NGOs and FBOs are implementing partners for various aspects of the NEHHSS. The private sector, including industrial actors and others faced with issues pertaining to EHHS, are encouraged to invest in environmental health, sanitation and hygiene undertakings. This strategy emphasizes collaboration between implementers and other players to obtain the best results. Unlike in the past where implementation of EHHS programmes focused on policing, the NEHHSS aims to ensure compliance among private sector operators through coordination and collaboration.

### **4.4 Capacity Building**

The strategy aims to strengthen capacity at all levels. The existing EHHS institutions and workforce from central and local government, NGOs, the private sector and communities will be supported to deliver the desired outcomes.

### **4.5 Collaboration and Partnership**

The achievement of this strategy hinges on the effective participation of multiple stakeholders. Collaboration and partnership between the Government through the MoHCDGEC and other stakeholders will be fostered through existing administrative structures and in line with the Local Government Reform Programme, with District Councils taking a leading role. The key stakeholders and partners responsible for implementing the NEHHSS in collaboration with the MoHCDGEC are the President's Office, Regional Administration and Local Government (PORALG), the Ministry of Water, the Vice president's Office, the

Ministry of Finance, the Tanzania Revenue Authority, the National Environmental Management Council and the Ministry of Education Science and Technology. Others include local and international NGOs, CBOs, FBOs, development partners and communities.

#### **4.6 Financial Resources**

Resources for implementation of NEHHSS at National, Regional, District and Community levels will be mobilised internally and externally through the Government and development partners. They will also be available indirectly from the private sector, NGOs, voluntary agencies and communities.

#### **4.7 Indicative Implementation Costs of the Strategy.**

Based on the activity cost estimates indicated in Table 3, the total implementation cost of the strategy is estimated at TZS 548.7 billion. Annual costs will vary from year to year depending on the activities to be implemented.

#### **4.8 Supervisory and Compliance Mechanism**

The MoHCDGEC and the President's Office, Regional Administration and Local Government will conduct supportive follow-up with all implementing partners of the NEHHSS.

## **5 MONITORING AND EVALUATION**

The Environmental Health Section of the MoHCDGEC will monitor implementation progress in 14 key result areas (KRA) using the indicators listed in Table 3. Monitoring is key to successful implementation of the NEHHSS. It is intended to bring to light programmatic changes that might be needed due to changes in the implementing environment or because the applied approaches have failed to achieve the desired outputs. It will also support resource allocation for annual programmes. Monthly, quarterly, semi-annual and annual reporting will be done through existing government systems.

Formal evaluations of the implementation process will be conducted halfway through the NEHHSS period in 2023 and at the end of the period in 2025. The midterm evaluation will provide an opportunity to make adjustments to the strategy to improve its effectiveness in the remainder of the period. The final evaluation will provide valuable input for preparation of the next strategic period. In addition to assessing the results and impact achieved, both will emphasize learning from implementation experience and identifying gaps that remain to be addressed.

## 5.1 Monitoring and Evaluation indicators

Table 3: Environmental health, hygiene and sanitation key result areas and indicators

Key Result Area	Indicators	Information source	Time
1. Prevention of emerging and re-emerging diseases at PoE	Existence of functional surveillance systems for emerging diseases in PoE	Surveillance reports from MoHCDGEC and Implementation reports from all PoE	Quarterly and Annually
	Incidents of cases identified at PoE		
	Number of workforces trained on disease surveillance at PoE		
2. Water safety, sanitation and hygiene	Percentage of households treating drinking water	NSMIS and survey in a small randomly selected area	Quarterly at LGAs and Annually at Ministry level
	Percentage of households with improved toilets		
	Percentage of household with safely managed sanitation		
	Percentage of household with basic sanitation		
	Percentage of household with limited sanitation		
	Percentage of Household with unimproved sanitation		
	Percent of households with functional hand washing facilities		
	Percentage of HCF with basic sanitation services		
	Percentage of HCF with basic water supply services		
	Percent of institutions (schools and HCF) with appropriate and sufficient sanitary facilities for the number and profile of users (gender, disabilities, age, etc.)		
	Percent of communities that are ODF		
	Prevalence of diarrhoeal diseases among children 5 years and below		
	Number of LGAs actively involved in WASH interventions		

3.	Solid waste management	Percent of generated waste being hauled from the cities per day	NSMIS, Data from each ward and mini survey from randomly selected areas	Quarterly
		Percent of people receiving waste collection services	CCHP document	Annually
		Percent of funds in Health sector allocated for waste management	MoHCDGEC Budget documents	Annually
		Percent of LGAs with an operational and functional sanitary landfill	MoHCDGEC supervision reports	At the stated time of implementation in 2025
4.	Hazardous waste management	Number of Established and hazardous waste management options	MoHCDGEC report on healthcare waste management, LGAs reports on hazardous waste management	Biannual
5.	Air and noise pollution	Number of children with asthma	HCFs data on children attended with URT LRTI and asthma	annually
		Number of educational meetings for indoor air quality conducted	Quarterly and Annual Implementation reports from LGA	Quarterly and Annually
		Percent of population aware of IAQ	Survey from randomly selected people	Annually
		Percent of population aware of means to reduce LAP		
		Percent of people exposed to excessive community noise		
6.	Land use and human settlements	Percent of people with sleep disorders due to noise	Hospital records	Every six months
		Number of permissions granted by Municipal and District Health Officers for construction of buildings in each LGA	Implementation reports from LGAs	Quarterly
		Open spaces available for recreation	Actual inspection during supervision visits	Annually
		Percent of funds allocated for EH services in LGAs	Implementation reports from LGAs	Annually
7.	Planning and financing EH	Number of EH staff trained on planning		
		Code for EH services in CCHP	CCHP books	Annually
		Percent of funds in LGAs allocated for EH activities		Annually
8.	Food safety and hygiene	Number of people suffering from food borne illness	Records from HCFs	Quarterly/Annually

		Presence of up to date regulations on food safety	Regulations at Ministry and /or responsible agency TBS	Annually
		Number of food inspectors trained	Report from MoHCDGEC and LGA training unit	Annually
		Number of zoonotic diseases reported	MoHCDGEC disease surveillance reports	Quarterly, Annually
		Number of food handlers trained	LGA reports and attendance list for trainings	Annually
9.	Climate change and health	Number of personnel in government institutions trained on climate change and health	Surveys on randomly selected people and communities	Annually
		Percent of population with knowledge on climate change mitigation		
		Percent of population practicing climate change mitigation measures		
		Number of trees planted each year		
		Percentage of planted trees that survive	Implementation reports and actual inspection	Annually by LGAs and ministries
10.	Research and capacity building	Number of EH workforce that have received on job training	Implementation reports in LGAs	Annually MoHCDGEC
		Research gaps identified in EH	EH reports and publications from LGAs and research institutions	
		Research grants made for EH issues		
		Number of technical reports generated from available data		
		Presence of a national environmental and occupational health laboratory	MoHCDGEC progress report	Annually
11.	Health promotion and education	Percent of population reached through health promotion and education campaigns	Implementation report and survey on randomly selected people	Annually
		Number of community-oriented interventions		
12.	Public health inspections and law enforcement	Number of workforces trained on law and regulations governing EH	LGA implementation reports	Quarterly
		Number of LGAs with EH regulations and up-to-date by-laws		
		Number of legal notices served		

13.	Coordination of EHHS	Presence of coordinating units for EH activities in all regions and districts	MoHCDGEC report	Annually
14.	Occupational health	Presence of derived or adopted occupational exposure limit values for different agents	Collaboration report from MoHCDGEC OSHA and TBS	Annually
15	Antimicrobial Resistant and WASH	Register for notifiable occupational incidents	Reports from OSHA and MoHCDGEC	Quarterly
		Incidence of occupational diseases and injuries		
		Fatalities from occupational injuries		
		Prevalence of illnesses caused by AMR bacterial pathogens in environment	NIMR, Ifakara Health Institute,	Annually
		Number of death caused by AMR bacterial pathogens in environment	NIMR, Ifakara Health Institute,	Annually
		Number of sources of AMR		Annually

## 6 NEHSS ACTIVITIES AND INDICATIVE BUDGET ESTIMATES

### 6.1 Indicative budget for 2020– 2025

The strategy will be implemented through the costed activities shown in Table 3. Responsible institutions and organs listed may change depending on structural or functional changes made by the government.

**Table 4: Estimated budget for the NEHSS 2020 – 2025**

Overall Goal:	To protect and improve health through the prevention, control and mitigation of environmental health risks associated with physical, chemical, biological and behavioural factors by 2025			
	Strategic Objectives	Targets	Activities	Budget (10 <sup>6</sup> ) Responsible Organ(s)
Goal 1:	Strengthen environmental health services to protect and promote health and contribute to attainment of UHC for all Tanzanians by 2025.			
	1.1. To accelerate universal access to improved sanitation and hygiene services	1.1.1 Open defecation free status achieved by 2025	1.1.1.1 Capacity development to effectively deliver sanitation and hygiene services	47,980 MoHCDGEC, LGAs, PORALG
			1.1.1.2 Develop and enforce regulations, laws bylaws and guidelines for household and institutional WASH	8,655 MoHCDGEC, LGAs, PORALG
			1.1.1.3 Conduct innovative CLTS and sanitation campaigns activities	600 MoHCDGEC, LGAs, PORALG
			1.1.1.4 Design and conduct behaviour change and communication programs for hygiene and sanitation	15,170 MoHCDGEC, LGAs, PORALG
		1.1.1.5 Conduct national-wide hygiene and sanitation events		26,200 MoHCDGEC, PORALG, MoW, LGAs
	1.1.2 WASH infrastructure available, functional and maintained in good state of repair in institutions by 2025		1.1.2.1 Construction and rehabilitation of WASH infrastructure in 2,800 Healthcare facilities	115,862 MoHCDGEC, PORALG, MoW, LGAs

1.2. To enhance health education and promotion of environmental health determinants	1.1.3 WASH in the informal sector enhanced by 2021	1.1.2.2 Construction and rehabilitation of WASH infrastructure in 4,800 schools	194,157	
		1.1.2.3 Construction of WASH facilities on highways and at bus stops	1,440	
		1.1.3.1 Conduct education and behaviour communication change on WASH to leaders and actors in the informal sector	5,000	MoHCDGEC, LGAs, PORALG
	1.2.1 Health education and promotion activities enhanced on priority areas	1.2.1.1 Develop EHHS Information, Education Communication approaches (IEC)	1,200	MoHCDGEC, LGAs, PORALG
		1.2.1.2 Use of reliable communications mechanisms to disseminate EHHS education	500	MoHCDGEC, LGAs, PORALG
	1.2.2 Health education activities integrated and coordinated	1.2.2.1 Coordination for EHHS education and promotion	1,840	
	1.3. To strengthen the prevention, control and response capacity on emerging and re-emerging public health events arising from environmental factors	1.3.1 Surveillance of emerging diseases enhanced in all zones by July 2022	1,400	MoHCDGEC, LGAs, PORALG
		1.3.1.1 Strengthen surveillance system for infectious diseases		
		1.3.1.2 Rollout implementation of third edition IDSR guideline at all	400	MoHCDGEC, LGAs, PORALG
		1.3.1.3 Maintain e-IDSR through monitoring and evaluation	500	MoHCDGEC, LGAs, PORALG
		1.3.1.4 Roll out event-based surveillance at all levels	200	MoHCDGEC, LGAs, PORALG
		1.3.1.5 Develop event-based surveillance	300	MoHCDGEC, LGAs, PORALG
		1.3.1.6 Strengthen EHO workforce on surveillance data analysis storage and use	200	MoHCDGEC, LGAs, PORALG, NBS, research and training institutions
	1.3.2 Detection mechanisms of infectious diseases at all points of entry improved by July 2020	1.3.2.1 Establish national infrastructure for early warning and rapid response to infectious diseases	1,000	MoHCDGEC, MoW, LGAs, PORALG

		1.3.3 Response to emerging and emergency diseases among EH workforce improved by December 2020	1.3.3.1 Assess national capacities, gaps and needs for prevention and control of emerging infectious diseases	100	MoHCDGEC, LGAs, PORALG
			1.3.3.2 Develop tailor made short course for emerging and infectious diseases prevention for EH workforce	30	MoHCDGEC, LGAs, PORALG, training institutions
			1.3.3.3 Conduct practical training and simulations	150	MoHCDGEC, LGAs, PORALG
			1.1.3.4 Strengthen capacity for effective implementation of prevention and control strategy	140	MoHCDGEC, LGAs, PORALG
		1.3.4 Vaccination and immunization programs monitored and implemented	1.3.4.1 Train EHOs on proper handling, storage and maintenance of vaccines at dispensing level	200	MoHCDGEC, LGAs, PORALG
			1.3.4.2 Train EHO on locating children in the community who have not been vaccinated	200	MoHCDGEC, LGAs, PORALG
			1.3.4.3 Educate the community on vaccination and immunization	200	MoHCDGEC, LGAs, PORALG
			1.3.5.1 Conduct research to identify environmental risky to AMR	300	NIMR, IHI
		1.3.5 Control the presence of antibiotics and other antimicrobial agents, their metabolites and antimicrobial- resistant bacteria in human and animal wastes and environmental media	1.3.5.2 Private sector involvement on management of waste water	100	MoHCDGEC, VPO
			1.3.5.3 Improving sanitation infrastructure in health care facilities	2000	MoHCDGEC, PORALG
			1.4.1.1 Implement control measures and mobilize resources to reduce transmission of vector borne diseases	39,196	MoHCDGEC, LGAs, PORALG
	1.4. To reduce morbidity caused by diseases transmitted by vectors and vermin.	1.4.2 Disease vectors controlled in highly stricken regions by December 2024	1.4.2.1 Establish vector control programs and research	1,380	MoHCDGEC, LGAs, PORALG
			1.4.2.2 Develop and conduct surveillance and monitoring systems at ports of entry in line with national and international guidance	1,465	MoHCDGEC, LGAs, PORALG

			1.4.2.3 Strengthen systems for monitoring and evaluation for effective implementation of strategy	1,460	MoHCDGEC, LGAs, PORALG
		1.4.3 Tanzanian community educated and involved in vector control by 2023	1.4.3.1 Increase advocacy through social and behaviour change communication and mobilization on the control of vectors to reduce transmission of vector borne diseases	2,273	MoHCDGEC, LGAs, PORALG
	1.5. To ensure compliance with food safety and hygiene regulations from farm to fork	1.5.1 Monitoring systems for the whole food chain established from farm to fork by December 2022	1.5.1.1 Develop a mechanism to prevent contamination of food from farm to fork	2,000	MoHCDGEC, LGAs, PORALG, TBS
		1.5.2 Food safety surveillance systems are established in all zones by 2023	1.5.2.1 Strengthen food safety surveillance systems from farm to fork at all levels	1,000	MoHCDGEC, LGAs, PORALG, TBS
			1.5.2.2 Establish food borne disease surveillance	400	MoHCDGEC, TBS, LGAs, PORALG
			1.5.2.3 Establish unit for food safety	200	MoHCDGEC TBS
		1.5.3 Professional qualifications of key players in food safety chain at all levels enhanced by 2024	1.5.3.1 Develop a mechanism for building the capacity of key players across food systems (farm to fork)	500	MoHCDGEC, LGAs, PORALG
		1.5.4 Consumer education and awareness creation activities enhanced by 2025	1.5.4.1 Develop and disseminate Information, Education and Communication materials (IEC)	600	MoHCDGEC, TBS, LGAs, PORALG
	1.6. To enhance advanced knowledge and technology for detection, analysis and timely response to public health threats at Points of Entry (PoE)	1.6.1 50% of all PoE in the country attain demonstrated capacity as per International Health Regulations of 2005	1.6.1.1 Train PoE staff and disseminate WHO published guidelines on Vector Surveillance and control, Management of public health events on air transport, Management of public health events onboard ships and Port Health Operational Guidelines of 2016	300	MoHCDGEC, LGAs, PORALG, DP <sub>s</sub>
			1.6.1.2 Construct and equip temporary holding facilities at 12 designated PoE	3,000	MoHCDGEC, LGAs, PORALG
			1.6.1.3 Strengthen coordination, communication and monitoring of Port health services	500	MoHCDGEC, LGAs, PORALG

			1.6.1.4 Strengthen cross border surveillance and population movement and connectivity mapping (PopCAB) for management of public health risks at porous borders	800	MoHCDGEC, LGAs, PORALG
			1.6.1.5 Procure and equip port health offices with data storage devices, furniture and public address systems for implementation of IHR	100	MoHCDGEC, LGAs, PORALG
			1.6.1.6 Procure inspection kits, PPEs, infrared thermal scanners for the assessment of conveyances and ill travellers at designated PoE	4,000	MoHCDGEC, LGAs, PORALG
			1.6.1.7 Procure five ambulances and four boats for transportation of sick travellers suspected to harbour infectious diseases at biggest PoE's, and six vehicles and 20 motorcycles to facilitate Central and zonal supportive supervision	3,000	MoHCDGEC, LGAs, PORALG
			1.6.1.8 Construct incinerators at 26 designated PoE's for the disposal of waste from conveyances	1,500	MoHCDGEC, LGAs, PORALG
			1.6.1.9 Conduct capacity building for PoE staff for implementation of port health services	260	MoHCDGEC, LGAs, PORALG
			1.6.1.10 Support training of 10 degree courses, 5 masters and 3 PHD students on International health and Port Health Issues.	1,200	MoHCDGEC, LGAs, PORALG, DPs and training institution
			1.6.1.11 Develop and test Public Health Emergency Contingency plans at designated PoE's	300	MoHCDGEC, LGAs, PORALG
			1.6.1.12 Develop and Operationalize Vector Control Program at Designated PoE's	550	MoHCDGEC, LGAs, PORALG
		1.7.1. Communities adherence to water standards enhanced	1.7.1.1 Develop measures to minimize contamination of water at the source	100	MoHCDGEC, LGAs, PORALG
			1.7.1.2 Strengthen the capacity for monitoring household (HH) and institutional water safety	300	MoHCDGEC, LGAs, PORALG
		1.7. To ensure adherence to water safety standards at the point of use			

1.8 To strengthen and promote protection of the health and safety of the working population in formal and informal sectors	1.7.1.3 Promote low cost HH water treatment and storage technologies	150	MoHCDGEC, LGAs, PORALG
		70	MoHCDGEC, LGAs, PORALG
	1.7.1.5 Develop and implement water safety plans and guidelines	400	MoHCDGEC, MoW, PO RALG, LGAs DP, stakeholder in EHHS
	1.8.1.1 Develop tailor made course for EHO on occupational hygiene	300	MoHCDGEC, MUHAS, OSHA
	1.8.1.2 Conduct standardized workplace inspection in all workplaces	150	MoHCDGEC, PMO-LYED, OSHA-Tz, TBS, research and educational institutions
	1.8.1.3 Conduct workers OSH education through media and other means	500	MoHCDGEC, PMO-LYED, OSHA-Tz, TBS, research and educational institutions
	1.8.1.4 Develop at least 3 occupational exposure limits (OEL)	1,000	MoHCDGEC, PMO-LYED, OSHA-Tz, TBS, research and educational institutions
	1.8.2.1 Integrate OHS in the primary health care system	300	MoHCDGEC, OSHA, Training institutions
	1.8.2.2 Review the Occupational Health guideline of 2004	500	MoHCDGEC, PMO-LYED, OSHA-Tz, TBS, research and educational institutions
	1.8.2.3 Develop workplace hazards training guidelines for various workers (septic tank emptiers, solid waste pickers, etc.)	200	MoHCDGEC, PMO-LYED, OSHA-Tz, Training institutions
	1.8.2.4 Strengthen the occupational health surveillance system at various levels	300	MoHCDGEC, MoLEDY, OSHA-Tz
	1.8.3.1 Establish coordination for all key players of OSH	100	MoHCDGEC, PMO-LYED, OSHA-Tz, TOHS, research and educational institutions

1.9 To enhance waste management options, environmental protection and land use	1.8.4 Scale up occupational health and safety programmes for health workforce and emergency responders.	1.8.4.1 Develop mechanisms for the protection of the health of health workers and emergency responders	500	MoHCDGEC, PMO-LYED, Training institutions
	1.9.1 Integrated solid waste management enhanced in all councils by December 2023	1.9.1.1. Promote awareness on the 3 R's: reuse, reduce and recycle	300	MoHCDGEC, LGAs, PORALG
		1.9.1.2 Strengthen the capacity of SWM in LGAs	50	MoHCDGEC, LGAs, PORALG
		1.9.1.3 Establish sanitary landfills in all municipalities	200	MoHCDGEC, PORALG, LGAs VPO-NEMC
		1.9.1.4 Establish safely managed waste disposal sites in all councils	20,000	PORALG, LGAs, MoHCDGEC DP and EHHS stakeholders
		1.9.1.5 Establish environmentally friendly solid waste disposal options	1,000	MoHCDGEC, LGAs, PORALG
		1.9.2.1 Procure monitoring devices (SLM and air particulate monitoring devices)	500	MoHCDGEC, OSHA-Tz, NBS TBS, LGAs
		1.9.2.2 Monitor indoor air quality, PM <sub>10</sub> and PM <sub>2.5</sub> in major cities and industrial regions	200	MoHCDGEC, LGAs, PORALG
		1.9.2.3 Promote reliable and sustainable alternative energies	250	MoHCDGEC, LGAs, PORALG
	1.9.3 Indoor air pollution from cooking fuel in rural communities reduced by 2024	1.9.2.4 Develop effective chemical management programs and mechanisms for building the capacity of various key players involved in chemical management	200	MoHCDGEC, LGAs, PORALG
		1.9.2.5 Community sensitization and awareness creation for proper pollution control measures	500	
		1.9.3.1 Conduct mass education and awareness among leaders and community on IAQ	500	MoHCDGEC, LGAs, PORALG
		1.9.3.2 Promote innovative cooking energy sources and designs	250	MoHCDGEC, LGAs, PORALG

		1.9.3.3 Prepare guidelines on indoor air quality control	300	MoHCDGEC, TBS, PORALG
	1.9.4 Proper land use integrated with environmental health aspects implemented in all LGAs and RAs by 2025	1.9.4.1 Integrate EH in land planning	190	MoHCDGEC, LGAs, PORALG
		1.9.4.2 Strengthen capacity and develop guidelines for scrutinizing building plans	400	MoHCDGEC, LGAs, PORALG
		1.9.4.3. Develop a national guidelines checklist to enhance good practices in cemetery management	280	MoHCDGEC, LGAs, PORALG
	1.9.5 Mechanisms for safe management of hazardous wastes established and functional by December 2025	1.9.5.1 Conduct advocacy to raise awareness and commitment among decision makers in hazardous waste management	500	MoHCDGEC, LGAs, PORALG, DP
		1.9.5.2 Create mechanisms for sustainable management of E-waste	200	MoHCDGEC, LGAs, PORALG, VPO
		1.9.5.3 Map sources of hazardous waste	500	MoHCDGEC, LGAs, PORALG, VPO, TBS
		1.9.5.4 Develop monitoring mechanisms for hazardous waste	400	MoHCDGEC, LGAs, PORALG, VPO, TBS, DPs, and EHHS stakeholders
		1.9.5.5 Promote best practices for industrial waste management	300	MoHCDGEC, LGAs, PORALG, DP and stakeholders in EHHS
		1.9.5.6 Educate workforce and community on hazardous waste management options	400	MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders
		1.9.5.7 Develop training packages on hazardous waste management	200	MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders
	1.9.6 Healthcare waste management functional in all HCFs by 2024	1.9.6.1 Design and promote best practices on health care waste management	3,000	MoHCDGEC LGAs PORALG, VPO
		1.9.6.2 Train workforce on healthcare waste management from source to disposal	250	MoHCDGEC, LGAs, PORALG

			1.9.6.3 Conduct operational research on healthcare waste management options	1,000	MoHCDGEC, LGAs, PORALG
			1.9.6.4 Distribute and disseminate national policy guidelines, standards and regulations for HCWM at all levels	400	MoHCDGEC, LGAs, PORALG
			1.9.6.5 Facilitate provision of essential infrastructure equipment supplies treatment and disposal options	1,000	MoHCDGEC, LGAs, PORALG
	<b>Subtotal Goal 1</b>			<b>527,748</b>	

Goal 2:	Strengthen Environmental health planning, research and capacity building						
	2.1. To strengthen planning in EHHS activities at all levels	2.1.1 Planning for preventive services activities featured in national regional and district health plans by June 2022	2.1.1.1 Create sub vote for all EHHS activities at all level	0			
		2.1.2. Resources for EHHS services coordinated and evenly allocated	2.1.1.2 Develop capacity of EHHS workforce on planning	500			MoHCDGEC, LGAs, PORALG
			2.1.1.3 Integrate EH in Council Comprehensive Health Plan (CCHP)	200			MoHCDGEC, LGAs, PORALG
			2.1.2.1 Establish mechanisms to coordinate, monitor and allocate resources	50			MoHCDGEC, LGAs, PORALG
			2.1.2.2 Map all resources for EHHS	184			MoHCDGEC, LGAs, PORALG
	2.2. To enhance the capacity of the workforce to be able to address key environmental health issues	2.2.1. 50% of the EHHS workforce acquire new current knowledge and skills on developments and technology	2.2.1.1 Review EHHS performance	300			MoHCDGEC, LGAs, PORALG
			2.2.1.2 Build capacity of EHHS workforce through continuing education	150			MoHCDGEC, LGAs, PORALG
			2.2.1.3 Support short- and long-term programs for EHHS	0			MoHCDGEC, LGAs, PORALG
			2.2.1.4 Mainstream climate change aspect into EH issues	500			MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders
	2.3 To strengthen human resource management for EHHS at all levels	2.3.1 Deficit of EH workforce in LGAs reduced by 25% by 2025	2.3.1.1 Advocate for EHHS placement in government and private sectors	0			
			2.3.1.2 Review and update assessment of the performance of Environmental Health Services	100			MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders
			2.3.1.3 Review the Environmental Health Sciences scheme of service	100			MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders

2.4. To enhance capacity of workforce and community to adapt to climate change	2.4.1 Public knowledge and action towards climate change adaptation and mitigation promoted and mastered by 2024	2.4.1.1 Develop IEC materials on climate change	500	MoHCDGEC, LGAs, PORALG
		2.4.1.2 Empower community to adapt and develop resilience to climate change	400	LGAs
		2.4.1.3 Conduct CC vulnerability and adaptation assessments in jurisdiction areas	500	LGAs
	2.5. To promote research on environmental health and translation of research findings into actions to improve community health	2.5.1.1 Conduct needs assessment on gaps in research and data usage	100	Research institution MoHCDGEC
		2.5.1.2 Conduct training on research and data use based on the needs	500	MoHCDGEC, research institutions and Stakeholder WHO, UNICEF, WaterAid
	2.5.2 EHS research disseminated for consumption by 2025	2.5.2.1 Strengthen EHS research dissemination platform	100	MoHCDGEC, DP, MDAs and stakeholders, Academic and research institutions
		2.5.2.2 Strengthen EHS research unit	100	MoHCDGEC, DP, MDAs and stakeholders, Academic and research institutions
		2.5.2.3 Establish EHS peer review journal	200	MoHCDGEC, MoET, Academia, Research institutions
	2.5.3 Establish environmental and occupational laboratory at national and zonal levels by 2025	2.5.3.1 Conduct feasibility study	200	MoHCDGEC, PORALG, TBS, VPO
		2.5.3.2 Develop proposal for the laboratory and drawings	400	MoHCDGEC, PORALG, TBS, VPO

2.6 To promote the use of innovative technology for environmental health interventions	2.6.1 Increased number of innovative technologies by 2025	2.5.3.3 Procure land for the establishment	1,000	MoHCDGEC, PORALG, VPO
		2.5.3.4. Conduct EIA	500	MoHCDGEC, PORALG, VPO
		2.6.1.1 Develop inventory of recognized EHS technologies	1,400	MoHCDGEC, LGAs, PORALG
		2.6.1.2 Develop incentive package		MoHCDGEC, LGAs, PORALG, DP's and EHHS stakeholders
	2.6.2 Training modules for continuing education	2.6.1.3 Conduct annual exhibition of EHS technologies	1,000	MoHCDGEC, LGAs, PORALG, DP's
		2.6.1.4 Establish innovation window contest	200	MoHCDGEC, LGAs, PORALG, DP's EHHS stakeholders
		2.6.2.1 Develop Continuing Education Programme Courses (CEPC)	200	MoHCDGEC Teaching institutions
		2.6.2.2 Develop training mechanisms for all EHO		PORALG, EHPRC
	2.7.1 Inspection of all premises conducted effectively by 2023	2.7.1.1 Procure equipment and instruments for measurement of important parameters	1,000	LGAs, PORALG, MoHCDGEC
		2.7.1.2 Develop and operationalize standard procedures for inspection	200	MoHCDGEC, LGAs, PORALG, DP's and EHHS stakeholders
		2.7.1.3 Inventories of premises at all levels	184	PORALG, LGA
		2.7.1.4 Establish reporting mechanisms from ward to regional levels	100	MoHCDGEC, LGAs, PORALG
	<b>Subtotal Goal 2</b>		<b>10,868</b>	

Goal 3:	Promote stakeholder's participation in environmental health, hygiene and sanitation services					
3.1. To customize behaviour change communication programs to reduce environment related risk behaviours  3.2 To promote community participation in environmental health, hygiene and sanitation interventions  3.3 To enhance inter-sectoral collaboration between ministries, institutions and stakeholders working in areas related to environmental health	3.1.1 Tailor made programs for behaviour change designed and implemented in all LGAs	3.1.1.1 Develop models to enhance behaviour change	450	MoHCDGEC, LGAs, PORALG		
			500	MoHCDGEC, LGAs, PORALG		
			200	MoHCDGEC, LGAs, PORALG		
	3.1.2 Community involvement in implementing health changes	3.1.2.1 Empower community in designing public health interventions that suit their environment	1,400	MoHCDGEC, LGAs, PORALG		
			400	MoHCDGEC, LGAs, PORALG, DP		
			200	MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders		
	3.2.1 Community participation in environmental health services increase by 90 percent by 2025	3.2.1.4 Promote community involvement in EHHS national events	200	MoHCDGEC, LGAs, PORALG		
			0	LGAs		
			390	LGAs		
	3.2.1.7 Strengthen/establish TWG for EHHS at all levels	3.2.1.8 Sensitize community standing committees to implement EHHS activities	184	MoHCDGEC, LGAs, PORALG		
1,000			MoHCDGEC, LGAs, PORALG			
300			MoHCDGEC, LGAs, PORALG			
3.3.1 Collaboration between key players in EH developed and strengthened	3.3.2.1 Develop national and international links with sister cities for learning	20	MoHCDGEC , PORALG, LGAs			

	3.4 Promote innovative approaches including Public Community Partnerships (PCP) and Public Private Partnerships (PPP) to increase and improve environmental health services delivery	3.4.1. Innovative approaches from PCP and PPP incorporated in EH service delivery	3.4.1.1 Promote Public Community Partnerships (PCP) for delivery and sustenance of environmental health services through supporting environmental health officers in the development and management of community-based contracts at all levels	60	MoHCDGEC, LGAs, PORALG
			3.4.1.2 Support activities (e.g. dialogue fora) that encourage the government, development partners, private sector, civil society organizations as well as local and International NGOs to work together to improve environmental health	70	MoHCDGEC, LGAs, PORALG
			3.4.1.3 Develop mechanisms for regular communication and coordination among stakeholders	50	MoHCDGEC, PORALG
			Subtotal Goal 3		5,424

Goal 4:	Strengthen the legal and institutional framework for environmental health services				
	4.1 To strengthen enforcement of public health laws	4.1.1 Increased enforcement capacity for public health laws	4.1.1.1 Liaise with DPP for the appointment of EHS as prosecutors	1,400	MoHCDGEC, LGAs, PORALG
			4.1.1.2 Establish national enforcement capacity level in EHHS		MoHCDGEC, LGAs, PORALG, EHPRB
			4.1.1.3 Train EHS staff on legal procedures (tailor made, short and long courses)	200	MoHCDGEC, LGAs, PORALG, EHPRB
			4.1.1.4 Develop regulation and review bylaws to enforce PHA (including fees and charges)	200	MoHCDGEC, LGAs, PORALG, EHPRB
			4.1.1.5 Review PHA penalties (miscellaneous amendments)	50	MoHCDGEC, LGAs, PORALG
			4.1.1.6 Translate legal guiding documents to Kiswahili language	50	MoHCDGEC, LGAs, PORALG, DP and EHHS stakeholders
			4.1.1.7 Disseminate PHA and its related regulations	920	MoHCDGEC, LGAs, PORALG
	4.2 To strengthen the institutional structure for environmental health	4.2.1 EH structure and placement reviewed by 2023	4.2.1.1 Review EHS structure	200	MoHCDGEC, LGAs, PORALG
			4.2.1.2 Develop manning level	200	MoHCDGEC, LGAs, PORALG
			4.2.1.3 Advocate for the EHS structure	200	MoHCDGEC, LGAs, PORALG
Subtotal Goal 4			3,420		

Goal 5	Advocate for availability and accessibility of resources to implement environmental health services					
	5.1 To establish environmental health services funding mechanisms	5.1.1 At least 50% of planned EHS activities funded from own source	5.1.1.1 Develop concept proposal for cost sharing of EHS services and submit to Permanent Secretary Treasury for approval	200	MoHCDGEC, LGAs, PORALG	
			5.1.1.2 Develop cost sharing guidelines for EHHS activities	100	MoHCDGEC, LGAs, PORALG	
			5.1.1.3 Establish budget codes for EHHS at all levels		MoHCDGEC, LGAs, PORALG	
			5.1.1.4 Develop joint planning guidelines	100	MoHCDGEC, LGAs, PORALG	
	5.2: To promote sharing of expertise and resources among stakeholders	5.2.1. Sharing of expertise and resources among stakeholders coordinated and enhanced by 2025	5.2.1.1 Establish forum for EHHS stakeholders	100	MoHCDGEC, PORALG	
			5.2.1.2 Coordinate available resources in EHHS implementing stakeholders	50	MoHCDGEC, PORALG	
			5.2.1.3 Promote sharing of expertise among stakeholders	50	MoHCDGEC, PORALG	
		5.2.2 Strengthen multi-sectoral collaboration in EHS	5.2.2.1 Strengthen inter-ministerial collaboration platforms for resources and information sharing	100	MoHCDGEC, PORALG MoET, MoW, TBS	
			5.2.2.2 Establish and implement strategic partnership coordination mechanisms to bring on board the private sector, communities and key interest groups	500	MoHCDGEC, PORALG, DP, stakeholders in EHHS	
	Subtotal Goal 5		1,200			
	GRAND TOTAL		548,660			

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The National Action Plan on Antimicrobial Resistance: 2017 - 2022

## 8 APPENDIX 1

### Stakeholders who commented on the NEHHSS

Sn	Name	Title	Duty station
1	Fabian Magoma	Public Health Adviser	TPHA
2	Johnson Ndaro	City Health Officer	Mbeya City
3	Regnald Mlay	Acting Municipal Health Officer	Ilala Municipality
4	Fadhili Kilamile	Tropical Disease Control Specialist	MoHCDGEC
5	Theresia Kuiwite	Principal Education Officer	MoEVT
6	Adolf Kiyunge	Principal Health Officer	MoHCDGEC
7	Joshua Lawrence	Water Engineer	MoW
8	Lazaro M. Mwambole	Principal Inspector	TBS
9	Yinza T. Jaka	Health Secretary	MoHCDGEC
10	Carie S. Lyimo	Regional Health Officer	DODOMA
11	Martha Mariki	Principal Environmental Health Officer	PO - RALG
12	Remidius Kakulu	Head, Port Health Service	MoHCDGEC
13	Lilian Mreta	Environmental Health Specialist	MoHCDGEC
14	Clarer Jones	Parasitologist	MoHCDGEC
15	Noah Mwasalujonja	Principal Environmental Health Officer	MoHCDGEC
16	Ramadhani Bofu	Tutor	Mpwapwa
17	Robert Musa	Research Scientist	NIMR
18	Ahmed Ally	Driver	MoHCDGEC
20	Kagirwa Mubarak	Driver	MoHCDGEC
21	Biem Khamis Abeid	Accountant	MoHCDGEC
22	Dr. Ibrahimu Kabole	Country Director	WaterAid
23	Twaha Mubaraka	Technical Advisor	WaterAid
24	Dr. Gloria Sakwari	Consultant	MUHAS
25	Magdalena Shao	Assistant Lecturer	MUHAS
26	Salvatha Silayo	Senior Environmental Health Officer	MoHCDGEC
27	Wilhelmina Malima	National Coordinator	WSSCC/SAWA
28	Rowland Titus	WASH specialist	UNICEF

### Technical team members for incorporation of NEHHSS stakeholders' comments

Sn	Name	Title	Duty station
1	Dr. Khalid Massa	Assistant Director, Environmental Health and Sanitation Services	MoHCDGEC
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3	Honest Anicetus	Head, Environmental Protection	MoHCDGEC
4	Joseph Birago	Head, Occupational Health	MoHCDGEC
5	Anyitike Mwakitalima	Head, Food, Water and Environmental Sanitation	MoHCDGEC
6	Martha Mariki	Principal Environmental Health Officer	PO - RALG
7	Fadhili Kilamile	Tropical Disease Control Specialist	MoHCDGEC
8	Clara Jones	Parasitologist	MoHCDGEC
9	Francis Bujiku	Acting Regional Health Officer	RS – DODOMA
10	Khadija Haruni	Regional Health Officer	RS - Iringa
11	Ezekiel Mbuchi	Municipal Health Officer	Iringa Municipal
12	Yo Miura	WASH officer	UNICEF

### Consultant team

Sn	Name	Title	Duty station
1	Mr Luco Mwelange	Assistant Lecturer	MUHAS
2	Ms Magdalena Shao	Assistant Lecturer	MUHAS
3	Dr. Jane Mlimbila	Lecturer	MUHAS
4	Dr. Gloria Sakwari	Lecturer	MUHAS

