THE UNITED REPUBLIC OF TANZANIA

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

NATIONAL STRATEGIC PLAN FOR HEALTHCARE WASTE MANAGEMENT (2018 – 2022)

JANUARY, 2018

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FOREWORD

Although several isolated attempts have been made to improve the situation in some of the medical institutions, the management of health – care waste (HCW) in Tanzania remains below the minimum international standards, resulting in significant risks to health – care workers, patients, community and the environment. Consequently, the hygienic conditions linked to the handling and disposal of HCW cannot guarantee a satisfactory control of nosocomial infections within the Health care facilities (HCFs).

The backstopping and monitoring capacities of the Central, Regional and District Authorities to support medical institutions remains limited. Furthermore the legal framework is not sufficiently developed and what exists is not properly enforced. As a result, the direct and indirect costs resulting from this situation are difficult to estimate but are certainly significant.

A standardized health- care waste management system must therefore be developed for the country. Additionally, our health – care facilities must be provided with appropriate equipment to implement safer procedures. The differentiation of health – care waste streams within the medical institutions of Tanzania must also be progressively upgraded taking into consideration the Tanzanian context.

The Government has already formulated the National Healthcare Waste Management Policy Guidelines and Standards to more broadly prevent and control infections and improve hygiene in health facilities. It is my belief therefore that this National Strategic Plan for Healthcare Waste (2018 -2022) is of utmost importance in supporting Health Authorities and Healthcare waste Stakeholders to implement adequately the standards for safe management of health – care waste. Among many the National Strategic Plan for Healthcare Waste (2018 -2022) will focus on;

- The standardization of the current health-care waste management practices with the application of on-going management and monitoring procedures which will comprise of:

    i. The establishment of annual health-care waste management plans to progressively lead the medical institutions and the administrative authorities to consider health-care waste management as a routine issue and reinforce progressively their organizational capacities;

    ii. The designation of a Health-Care Waste Management Officer in large health facilities who should be given the responsibility to operate and monitor the health-care waste management system on a daily basis;

    iii. Standardised segregation procedures should be set-up in all Tanzania HCFs by implementing a three bins systems that should be systematically associated with a colour coding and labelling procedure;

    iv. The application of a strict procedure for the most hazardous waste generated in medical institutions such as chemical pre-treatment of the highly infectious waste in a solution of sodium hypochlorite in concentrated form and a centralized disposal of the Cytotoxic and Hazardous Pharmaceutical Waste supervised by the health authority;

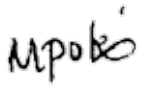
    v. Use of environmentally sound technologies for specific treatment/disposal of healthcare

waste according to the type and the location of the health-care facility where the waste is generated. This includes use of Autoclave machine, Centralized medical waste treatment system and recycling of waste materials;

vi. Priority areas for inclusion in the annual plan and budget allocation at all levels.

- The review of the legal framework and the reinforcement of the existing rules and regulatory documents.
- Implementation of the best practices for the medical staff to ensure sound hygiene and the control of nosocomial infections in a healthcare facility.
- The development of on-going awareness and training programmes as well as the review of the curricula of medical and paramedical staff.
- The involvement of private sector is crucial in the management of the health-care waste at all levels.

Therefore this National Strategic Plan to be implemented over a five-year period (2018-2022) should lead to a progressive upgrade of the current health-care waste management practices to meet the set targets and objectives at all levels of our Health Services delivery. The approximated initial cost of its implementation is TSh 6.6 billion (USD 3.3 million). The National Steering Committee on Health Care Waste Management should steer up the implementation process to ensure better co-ordination and supervision of the Health-Care Waste Management Plans at all levels.



Dr. Mpoki M. Ulisubisya

Permanent Secretary (Health)

ACKNOWLEDGEMENT

The Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC) in collaboration with the United Nations Development Programme (UNDP), the Global Environment Facility (GEF), World Bank and the World Health Organization (WHO) commissioned the development of the National Strategic Plan for the Management of Healthcare Waste. This initiative, the tireless efforts that ensued, and the financial support provided is very much appreciated.

We also very appreciate the tireless efforts made by the Technical team led by Dr. Neema Rusibamayila, the Director for Preventive Health Services, who supervised the review work. Dr. Khalid Massa – the Assistant Director, Environmental Health and Sanitation Services is thanked for his close supervision during the review process. Much appreciation should also go to the Draft Review Team comprised of Honest E. Anicetus - the National Coordinator – Healthcare Waste Management Programme; Noah Mwasalujonja – the Principal Health officer; Hussein Mohamed – Lecturer, School of Public Health and Social Sciences - Department of Environmental and Occupational Health – MUHAS; Deogratias Mkembela – HCWM Project Manager (UNDP) and Dr. Jan Kuhling (a UNDP Consultant).

We also acknowledge the valued inputs throughout the assignment made by the different contributors from various other sectors, namely the Department of Environment – Vice President's Office, PO-RALG – (Regional Secretariat), the National Environment Management Council, Iringa Primary Healthcare Institute, Tanga School of Environmental Health (NEMC), Muhimbili National Hospital (MNH), Muhimbili University of Health and Allied Sciences (MUHAS), National Institute for Medical Research (NIMR), and the Tanzania Public Health Association(TPHA).

We also express our gratitude to all those who took part in the several fora that were organized to bring together the stakeholders so as to discuss the Plan. Their contributions have led to the realization of this National HCWM Strategic Plan that serves the interests of all HCWM stakeholders.

Finally, we sincerely thank all the Experts who contributed in diverse ways to make the development of this National Strategic Plan for Health Care Waste Management for the period 2018 – 2022 a success.

Prof. Muhammad Bakari Kambi

Chief Medical Officer

ACRONYMS

AIDS	:	Acquired Immune Deficiency Syndrome
APHTA	:	Association of Private Hospitals in Tanzania
CEDHA	:	Centre for Educational Development in Health
CSSC	:	Christian Social Services Commission
CHMT	:	Council Health Management Teams
EHSS	:	Environmental Health and Sanitation Services
GNP	:	Gross National Product
HCF	:	Health – Care Facility
HCW	:	Health – Care Waste
HCWM	:	Health – Care Waste Management
HCWMO	:	Health – Care Waste Management Officer
HDPE	:	High Density Polyethylene
HIV	:	Human Immune Deficiency Virus
IDA	:	International Development Association
MCH	:	Maternal and Child Health
MOC	:	Medical Officer in Charge
MOF	:	Ministry of Finance
MOHCDGEC	:	Ministry of Health, Community Development, Gender, Elderly and Children
MSD	:	Medical Stores Department
MUHAS	:	Muhimbili University of Health and Allied Sciences
NEMC	:	National Environmental Management Council
NGO	:	Non-Governmental Organisation
NMC	:	Nurses and Midwives Council
RHO	:	Regional Health Officer
TACAIDS	:	Tanzania Commission for AIDS
TUGHE	:	Tanzania Union of Government and Health Employees
UNEP	:	United Nations Environmental Programme
UNICEF	:	United Nation Children's Fund
WHO	:	World Health Organization
NSCHCWM	:	National Steering Committee on Health – Care Waste Management
NCHHIC	:	National Committee for Hospital Hygiene and Infection
WGRL	:	Working Group on Regulations and Laws
WGP	:	Working Group on Health – Care Waste Management
QIT	:	Quality Improvement Team

INTRODUCTION

1.0. Introduction

Healthcare waste (HCW) means waste generated from healthcare services rendered in healthcare facilities. Generally, HCW is classified into two main categories which are hazardous waste and non-hazardous waste from healthcare facilities, research centres, salons and veterinary centres. The bulk of waste (90%) produced in healthcare facilities is non-hazardous waste, while the remaining 25% (or 10%) is hazardous waste, which is further categorised as infectious waste, pathological waste, sharps, pharmaceutical waste, Geno-toxic waste, chemical waste, heavy metal content waste, pressurised containers, radioactive waste, blood, body fluid waste, and expired/unwanted medicines, drugs and cosmetics. In the HCW stream, hazardous waste is managed separately from the non-hazardous waste because of its potential for severe health risks. Hazardous waste is also of greater importance due to its potential environmental hazards and public health risks with a high possibility of resulting into epidemics.

The handling of HCW continues to be a major challenge in most of healthcare facilities in Tanzania where its management is hampered by technological, economic, social factors and inadequate trained manpower for managing the waste. Poor handling and inappropriate storage, treatment, transportation and disposal methods exacerbate the health hazards and environmental pollution.

Despite the fact that current medical waste management (MWM) practices may vary from one health facility to another it is important to note that healthcare waste requires strict management during generation, collection, storage, treatment, transportation and final disposal to prevent the direct and indirect hazards on workers, patients, community and environment at large. It is the responsibility of the facility's authority to take care of public health issues related to HCW by executing specific approaches including educating patients, and maintaining a clean environment of the health facility. It should be noted that there are a range of technologies available for the treatment and disposal of healthcare waste that authorities may opt to use on-site or off-site.

The negative health and environmental impacts of HCW includes transmission of diseases caused by viruses and other microorganisms, defacing the aesthetics' of the environment, as well as contamination of underground water tables by untreated HCW in landfills. The World Health Organization (WHO) estimates that each year there are about 8 to 16 million new cases of Hepatitis B virus (HBV), 2.3–4.7 million cases of Hepatitis C virus (HCV) and 80,000–160,000 cases of Human Immunodeficiency Virus (HIV) due to unsafe injections disposal and mostly due to very poor waste management systems. *World Health Organization (WHO, 1999).*

Good Health care waste management in HCF depends on a dedicated waste management team, good administration, careful planning, and sound organization, underpinning legislation, adequate financing and full participation by trained workers. To achieve this the HCW should be an integral part of a national health-care system. A holistic approach to health-care waste management should thus include a clear delineation of responsibilities, occupational health and safety programs, waste minimization and segregation, development, adoption of safe and environmentally sound technologies, and capacity building.

The National Health Care Waste Management Strategic plan is intended for use by health service providers and programme officers across the health sector, including those in the private health sector and partners as a guidance in the planning, implementing, and monitoring the activities of HCWM in health facilities in Tanzania. HCW are generated from all levels of healthcare facilities of Tanzania as shown in the table below. It is known that for a long time, water, sanitation and hygiene (WASH) in healthcare facilities has not been given the attention it deserves. As a result the WASH situation in many healthcare facilities is pathetic. This plan takes on-board WASH as one of the important components of infection prevention and control.

Health Care Facilities in Tanzania Mainland by level and type of ownership

The levels are:

1. National Hospital - Muhimbili National Hospital (MNH)
2. National Super-Specialized Hospitals (Jakaya Kikwete Cardiac Institute, Muhimbili Orthopaedic Institute, Ocean Road Cancer Institute, Mirembe Mental Health, Kibong'oto Infectious Diseases, MUHAS Academic Medical Centre)
3. Zonal Referral Hospitals (KCMC, BMC, BMH, CCBRT, Lugalo, Mbeya Refferal Hospital)
4. Regional Referral Hospitals
5. District Hospitals
6. Health Centres
7. Dispensaries

Table 1: Number of Healthcare facilities per Facility categories

Level /Type	Ownership				Total
	Government	FBOs	Parastatal	Private	
National Hospital	1	0	0	0	1
National Super Specialized Hospitals	6	0	0	0	6
Zonal Super Specialized Hospitals	2	2	1	1	6
Referral Hospitals	0	10	0	0	10
Regional Referral Hospitals	25	0	1	0	25
Other Hospitals	3	19	9	29	60
District Hospitals	70	0	0	0	70
Designated District Hospitals	0	36	0	0	36
Health Centers	514	144	18	125	801
Dispensaries	5093	708	295	1062	7413
Total	**5704**	**918**	**324**	**1217**	**8928**

Source:*http://hfrportal.ehealth.go.tz/24/01/2018*

Table 2: Number of Healthcare facilities per region

Region	Dispensary	Health Centres	Clinics	Health Labs	Hospitals	Public	Private
Dodoma	333	38	2	0	9	327	56
Singida	194	20	3	0	9	191	37
Dar es salaam	452	67	115	8	48	166	526
Morogoro	337	48	3	0	13	281	121
Pwani	292	28	2	2	8	268	68
Geita	129	23	1	0	5	120	42
Kagera	263	34	4	0	14	247	68
Mara	231	40	0	4	9	216	73
Mwanza	281	52	17	2	18	287	90
Arusha	291	54	8	46	13	211	200
Kilimanjaro	325	51	2	0	18	246	153
Manyara	164	23	2	7	9	152	54
Tanga	346	39	6	2	10	319	85
Iringa	220	28	6	0	7	186	76
Katavi	67	13	0	8	1	69	20
Mbeya	271	25	16	2	15	239	102
Njombe	226	29	1	0	10	206	60
Rukwa	199	22	0	1	3	190	37
Lindi	205	19	0	0	9	224	9
Mtwara	205	22	0	0	6	196	37
Ruvuma	264	30	4	0	11	243	66
Kigoma	241	31	2	0	6	233	47
Simiyu	190	14	2	0	4	180	31
Shinyanga	182	22	4	0	6	167	47
Tabora	281	24	3	0	9	269	49

Source:*http://hfrportal.ehealth.go.tz/24/01/2018*

CHAPTER ONE: INTRODUCTION

1.1. Background

Health care services inevitably generate waste that may be hazardous to health and environment if not properly managed. Some of the waste, such as blood and sharps carry a higher risk of infection and injury than any other type of waste. Epidemiological studies indicate that a person who has been pricked with a needle that has been used on an infected source patient has risks of 30%, 1.8%, and 0.3% of becoming infected with HBV, HCV and HIV respectively.

The National Health Policy of 2007 recognises the inadequacy of healthcare waste management as one of the challenges in the health sector. Furthermore, efforts have been done by the government and other stakeholders to address the situation. Among such efforts is the development of the first National Health care waste Management Plan for the period of 2009-2014. The then Ministry of Health and Social Welfare developed this plan in collaboration with other stakeholders in 2008. However, since that time, there have been a lot of changes in the health sector that call for a review of the previous plan and development of a second health care waste management plan. Expansion of health care services including private facilities both in the urban and rural areas has resulted into the generation of large amounts of healthcare waste that cannot be well managed with old technologies such as the use of De Monte Forte incinerators. In addition, currently there are biosafety and biosecurity issues requiring more sophisticated technologies to manage the waste from healthcare services in addition to providing appropriate training to healthcare handlers on the health risks associated with HCW.

1.2. Organisation of healthcare services provision

Tanzania has created an extensive network of healthcare facilities that provide 90% of the population with at least one HCF in a radius of 10 kilometres. The healthcare facilities can be categorised as public, private, parastatal and faith based organizations.

Primary Health Services At a District level, basic clinical and public health services are provided through three layers of healthcare services: the Dispensaries, the Health Centres and the District Hospitals. The Dispensary is the smallest curative unit. Usually located at the village level, it provides health services to about 200-300 households. Currently, many dispensaries are equipped to provide maternal and child health services. In addition, it offers health education, treatment of diseases, and immunisation. The dispensary can be located in urban or rural areas.

The Health Centre is normally located at each ward and is expected to provide healthcare services to 50,000 to 80,000 people. The services provided in Health Centres are similar to the ones provided in Dispensaries but with broader services such as inpatient and theatre services.

The District Hospital is the referral health unit at a District level. The district Hospital is a very important level in the provision of health services in the country. Each district, and recently each Council, is supposed to have a hospital. Where necessary, the Government negotiates with religious organizations to designate voluntary hospitals as Designated District/Council Hospitals that then receive subventions from the Government on contractual terms.

Regional Level Facilities: These cater for Secondary Health Services. The Regional Referral Hospital (RRH) is thus the referral facility for the districts and serves a population of about 1 million people. A RRH offers more advanced services compared to those available at a District/ Council level, and includes provision of Specialised services by experts in the various fields.

Zonal Level Facilities: These offer tertiary Health Services, and are referral centers for the respective RRH. Currently these are the Kilimanjaro Christian Medical Centre (KCMC), which caters for the Northern zone, Bugando Medical Centre (BMC) which caters for the Western zone; and Mbeya Referral Hospital (MRH) which serves the Southern Highlands. The Benjamin Mkapa Hospital (BMH) in Dodoma caters for the Central zone.

The Eastern zone is catered for by the National Referral Hospital, the Muhimbili National Hospital (MNH)

National Level Facilities. The epic of health care delivery in the country is the Muhimbili National Hospital (MNH), which is the National Referral Level Facility. Recently, the MUHAS Academic Centre (MAMC) has been inaugurated. There are also National Specialised Hospitals that cater for specific Specialties. These are the Ocean Road Cancer Institute (OCRI), Muhimbili Orthopaedic Institute (MOI), Jakaya Kikwete Cardiac Centre (JKCI), Mirembe Hospital in Dodoma for Mental Health, and Kibong'oto Hospital in Kilimanjaro for TB.

1.3. Rationale

The National Health Policy of 2007 recognises the inadequacy of healthcare waste management as one of the challenges in the health sector. Furthermore, efforts have been done by the government and other stakeholders to address the situation. Among such efforts is the development of the first National Health care waste Management Plan for the period of 2009-2014. The then Ministry of Health and Social Welfare developed this plan in collaboration with other stakeholders in 2008. However, since that time, there have been a lot of changes in the health sector that call for a review of the previous plan and development of a second health care waste management plan. Expansion of health care services including private facilities both in the urban and rural areas has resulted into the generation of large amounts of healthcare waste that cannot be well managed with old technologies such as the use of De Monte Forte incinerators. In addition, currently there are biosafety and biosecurity issues requiring more sophisticated technologies to manage the waste from healthcare services in addition to providing appropriate training to healthcare handlers on the health risks associated with HCW.

It is also true that for a long time, water, sanitation and hygiene (WASH) in healthcare facilities has not been given the attention it deserves. As such the WASH situation in many healthcare facilities is pathetic. This plan takes on-board WASH as one of the important component of infection prevention and control. Furthermore, there have been changes in the health sector that called for a review and development of a second Health Care Waste Management Strategic Plan. Additionally, efforts have been made to ensure that the Plan is in line with the National Health Sector Strategic Plan IV for 2016 – 2020.

Healthcare facilities produce HCW that may lead to various infections such as HIV/AIDS to health workers, community, waste handlers and patients. Healthcare Waste is also associated with causing injuries to handlers and is a significant contributor to the burden of morbidity and motility in the developing world. According to a report of WHO of 2015 in sub-Sahara African Countries the coverage of safe disposal of HCW is 60%. In Tanzania safe management of waste is limited in most healthcare facilities and is estimated at 40%. Furthermore, most of Healthcare facilities have no specific plans for safe management of waste.

Therefore this plan intends to address the promotion of Health facility environmental Health through improved safe collection, transportation, storage, treatment and disposal of healthcare waste.

2.0 CHAPTER TWO: SITUATION ANALYSIS

A proper management of healthcare waste involves having a plan for safely segregation, storage, transportation, treatment and disposal as well as having sufficient trained personnel to carry out health care waste management activities. WHO reveals that in sub- Saharan African countries the coverage of safe disposal of healthcare waste is 60% (WHO, 2015). Currently, it is estimated that 40% of HCFs in Tanzania have safe disposal of healthcare waste. In addition, many HCF fail to segregate waste at the point of generation due to lack of standard storage facilities, poor awareness and also inadequate trucks for waste transportation off-site. Also local methods of waste disposal at the available dumping sites managed by local government authorities do not promote waste separation techniques at source. It is not uncommon in most healthcare facilities to find HCW mixed with municipal waste. Such malpractices need deliberate and coordinated efforts to solve by ensuring that at each level of our healthcare facilities have HCW management plans and a monitoring system.

Current Status of Healthcare Waste Management

Healthcare Waste Management in Tanzania is being unsatisfactorily implemented at all levels of the healthcare facilities. Reports generated during supportive supervision activities in 2014, in 15 regions revealed that most of the regions visited had no HCWM regional coordinators and HCWM plan. Moreover, most (65%) of the regions had their regional HCWM coordinators not oriented to HCWM and that in most (71%) regions reporting mechanisms from lower levels did not exist. In addition, the study found that, in most regions, monitoring and supervision of lower levels involved in HCWM was inadequately practiced.

Currently, monitoring of healthcare waste management is done periodically at all levels to ensure that standards and procedures are adhered to. However, there are challenges, which have been observed during the implementation. To mention a few of them, these are; inadequate knowledge on HCW, lack of standardized monitoring tools, inadequate reporting and feedback mechanism, lack of data management, inadequate coordination mechanism, inadequate funds and lack of communication facilities from national to lower level. These findings were observed despite the fact that most regions had with them the previous National Guidelines on HCWM.

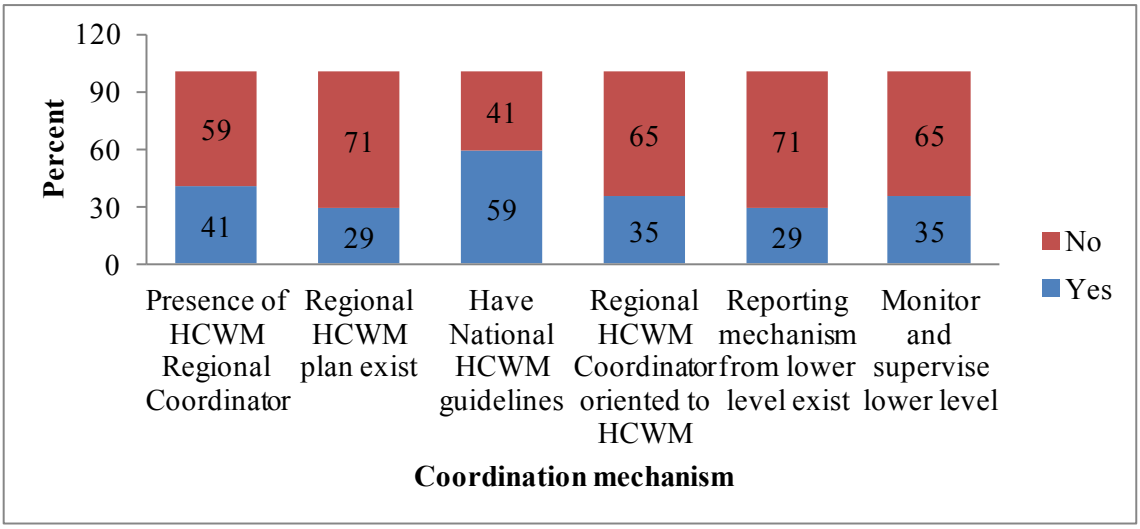


Figure 1: Regional HCWM coordination mechanism - MOHSW report 2014 (Unpublished)

2.1. Availability of standard HCWM equipment

Availability of standard HCWM equipment poses a challenge in many healthcare establishments. Reports show that there is generally inadequate availability of standard health care waste equipment in most of the regions visited. These included waste bins, bin liners, and transportation facilities (Figure 2). This situation poses a great challenge for proper management of waste for improving quality of services in health care facilities in the country.

Despite the fact that a Healthcare waste management plan is a road map to better implementation of HCWM activities the report revealed that 84% of the facilities lacked plans for HCWM. Moreover, in most of the regions (about 70%), waste containers were not labelled as required, suggesting a lack of best practices for HCWM within the facilities. Therefore, this malpractice presents a potential risk for human health and the environment.

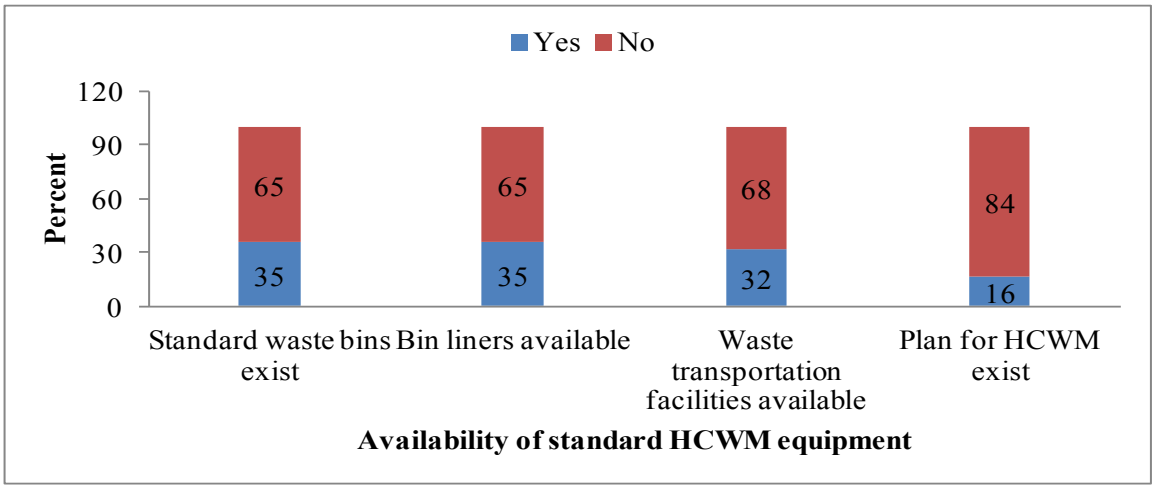


Figure 2: Availability of standard HCWM equipment - MOHSW report 2014 (Unpublished)

2.2. Health facilities with HCWM disposal facilities

Final disposal of HCWM is an important aspect of the waste stream. The report indicated that variations between regions existed in terms of availability of disposal structures. For example, the average number of incinerators in the region was 32.1 (39.1 median) with a range of 1 to 115 incinerators. Moreover, the average number of placenta pits in the regions was 80.2 (58 median) with a range of 13 to 184 placenta pits. Likewise, the average number of burying/burning structures in the regions was 39.3 (37.6 median) with a range of 0 to 110. However, there were no differences in terms of availability of waste storage bay/shed between regions. Moreover, the study found that only 3 (about 18%) of the total regions in the study had waste storage/shed.

2.3. Best Practices for HCWM

Figure 3 provides information on assessment of HCWM best practices in the visited health facilities across the regions. As can be seen most of the health facilities lacked colour coded waste bins. Moreover, only 47% of the regions had a designated officer for HCWM. Among the regions with a designated officer, 90% of the officers lacked job descriptions. Some health facilities also lacked adherence to waste segregation protocol.

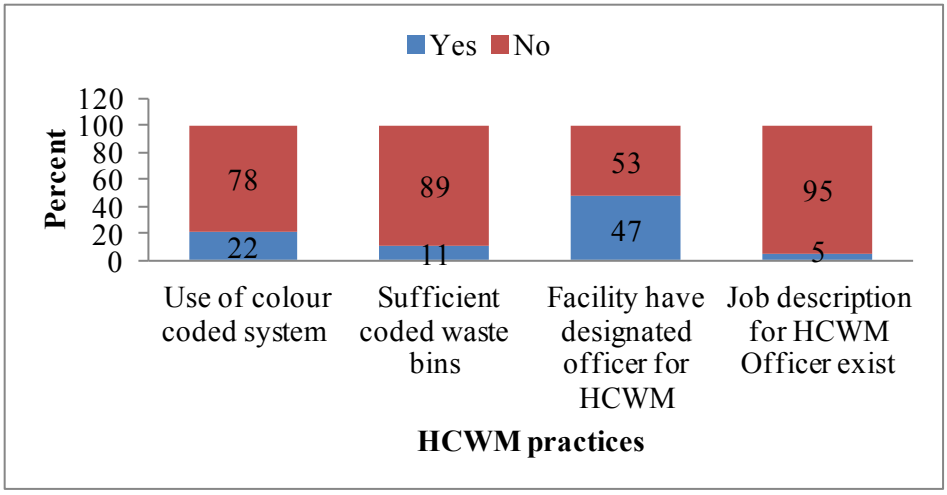


Figure 3: Health care Waste Management Best Practices - MOHSW report 2014 (Unpublished)

2.4. Status of WASH in healthcare facilities

Water supply, hygiene, sanitation (WASH) and vector control are the major issues of concern in many Health Care Facilities in developing countries including Tanzania.

2.5. Water Supply and Hygiene (WASH)

Inadequate supply of potable water for drinking and washing, poor sanitation and low hygiene practices are ingredients that pose as health challenges particularly to patients, staff and relatives using the Healthcare facilities. Several studies conducted in developing counties including Tanzania shows that there are gaps in WASH in healthcare facilities. Findings from 66,101 healthcare facilities in 54 low and middle-income countries reveal that 38% of facilities do not have access to any water source (WHO, 2015). Lack of water supply was found to be one of the challenges, also it was revealed that 19% of HCFs have no sanitation facilities, and 35% lack water and soap for staff and patients to wash their hands and maintain basic hygiene. According to 2014 UN-Water Global Analysis and Assessment of Sanitation and Drinking water in Health care facilities, in Tanzania only 65% of HCFs have been supplied with water. This lack of WASH services compromises the ability to provide basic routine services such as child delivery and hence jeopardizes the ability to prevent and control infections in healthcare facility settings. Moreover, Most HCFs are lacking menstrual hygiene facilities, consequently poses risk of infections to staff, patients and relatives.

2.5.1 Sanitation within the facility

It is a requirement that every health facility should provide toilet facilities accessible for use to all types of users. Many HCFs have inadequate latrines and those few with the latrines do not have provisions for people with disabilities. Latrines in HCFs should also consider accessibility and necessary provisions for people with disabilities. They should also ensure availability of necessary equipment that is supportive for menstrual hygiene. There is limited data about existence, use and adequacy of latrines infrastructure in HCFs in Tanzania. Although, most health facilities have some form of latrines for staff but there is lack of adequate facilities for patients and their relatives. This plan emphasizes that, health plans should consider adequacy of latrines in an acceptable gender ratio, and disabled persons in all health care facilities.

2.6. Air Quality Management and Infection Control in a Health Care Facility

Air quality control in the health facility environment is a significant issue in the protection of health of patients, staff and visitors. Air pollution encompasses a wide variety of factors: temperature, humidity, quantity, presence of chemicals and other contaminants, and the quality of outdoor air brought inside are typical indicators the quantities of which determine the extent and severity of air pollution. These metrics are especially important with regard to the environments within health care facilities. Three key factors that make attention to indoor air quality particularly important in health care settings are:

1. *Patients at risk*: healthcare facilities house many persons with heightened susceptibility to infections, respiratory distress, and other problems associated with air contaminants.

2. *Occupant density*: Because the density of people in health care settings is relatively high, at risk patients are likely to be in close proximity to infectious individuals.

3. *Aging systems*: Many healthcare facilities are aging and their ventilation systems are outdated and are in serious need of maintenance and repair.

2.6.1. Airborne microorganisms

Airborne microorganisms common in the environment can pose a serious health threat to patients, staff and visitors. A patient suffering from an air-borne infectious disease or respiratory disease can spread dangerous microbes to other patients, staff, and visitors. Air pollution, both indoor and outdoor, has the potential to cause public health problems.

2.6.2. Toxic fragrance ingredients

Some cleaning agents, antiseptics and disinfectants contain fragrance ingredients that are derived from petroleum, including a number of highly toxic substances such as toluene, acetone, phthalates and derivatives of benzene. Patients particularly children, the elderly, and people with asthma and other allergies are especially sensitive to indoor air pollutants. Staff members, including nurses and janitorial staff who are subjected to long-term, repeated exposure to fragrances, can experience serious health issues.

Healthcare facilities can minimise toxic fragrance effects to public health by practicing the following Interventions

i. The healthcare facility need to procure and use low-emitting cleaning products

ii. Minimize or eliminate the use of harsh cleaners, solvent-based cleaners or cleaners with strong fragrances. Carefully read labels to determine if cleaning products are fragrance-free.

iii. Minimizing airborne dust also improves indoor air quality and overall cleanliness by preventing dust from settling on floors and other flat surfaces.

iv. Vacuums equipped with high efficiency particulate air (HEPA) filters improve indoor air quality by capturing fine dust rather than dispersing it into the air.

v. Some patients in healthcare facilities have infections that can spread through the air, control of air movement and air cleaning is critically important.

vi. Airborne infectious diseases like TB, patients to be admitted in special infectious isolation rooms that are under negative pressure so that contaminated air will not leak out of the room.

2.6.3. Health impact of air quality control in health facilities

Improving indoor air quality increasingly is a priority for the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC). Enhancing indoor air quality through better cleaning practices and equipment can improve patients' and employees' health, as well as improve the overall experience for visitors in the health facility.

i. Better air quality enhances staff health and productivity. The indoor environment impacts the productivity, morale, health, and welfare, and ultimately retention of a facility's workforce.

ii. Better air quality makes the healthcare facility more accessible to patients with respiratory challenges such as those with asthma, allergies and other health problems related to poor indoor air quality.

i ii. Patients, visitors and staff will experience a safer and healthier environment

2.7. Cleaning and beautification in Health care settings

Routine cleaning is important to ensure a clean and dust-free health care facility environment. There are usually many micro-organisms present in "visible dirt", and routine cleaning helps to eliminate this dirt. Most patient care areas should be cleaned by wet mopping. Dry sweeping is not recommended. However, Management of waste water resulting from cleaning is very important i.e. channelling such water in HCF sewage systems.

Both the inside and surrounding environment of a Health care facility is required to be clean and attractive. Landscaping through planting of trees and gardening is among the beatification efforts. It has been proven that; the al vegetation do have an impact on human health in a subtle but measurable ways as well. Easing anxiety and creating a positive atmosphere for healing, it is argued, can lead to tangible outcomes. Based on this fact, each level of implementation should be strengthened.

2.8. Vector and Vermin control

Cockroaches, flies and maggots, ants, mosquitoes, spiders, mites, midges, and mice are among the typical arthropods and vertebrate pest populations found in health-care facilities. Arthropods recovered from health-care facilities have been shown to carry a wide variety of pathogenic microorganisms. Studies have suggested that the diversity of microorganisms associated with insects reflects the microbial populations present in the indoor health-care environment. Some pathogens encountered in insects from hospitals were either absent from or present to a lesser degree in insects trapped from residential settings. Some of the microbial populations associated with insects in hospitals have demonstrated resistance to antibiotics. Insect habitats are characterized by warmth, moisture, and availability of food. Insects forage in and feed on substrates, including but not limited to food remains from kitchens/cafeteria, foods in vending machines, discharges on dressings either

in use or discarded, other forms of human detritus, medical waste, human waste, and routine solid waste. Cockroaches, in particular, have been known to feed on fixed sputum smears in laboratories. Both cockroaches and ants are frequently found in the laundry, central sterile supply departments, and anywhere in the facility where water or moisture is present (e.g., sink traps, drains and janitor closets). Ants will often find their way into sterile packs of items as they forage in a warm, moist environment. Although insects carry a wide variety of pathogenic microorganisms on their surfaces and in their gut, the direct association of insects with disease transmission (apart from vector transmission) is limited, especially in health-care settings. The presence of insects in itself likely does not contribute substantially to health-care–associated disease transmission in developed countries. However, outbreaks of infection attributed to microorganisms carried by insects may occur because of infestation coupled with breaks in standard infection-control practices.

From a public health and hygiene perspective, arthropod and vertebrate pests should be eradicated from all indoor environments, including health-care facilities. Modern approaches to institutional pest management usually focus on; a) eliminating food sources, indoor habitats, and other conditions that attract pests; b) excluding pests from the indoor environments; and c) applying pesticides as needed. Sealing windows in modern health-care facilities helps to minimize insect intrusion. Fumigation has to be done so as to eradicate pests and vermin infestation. However, consideration of the type of pesticides used for their control has to be managed carefully. Furthermore, chemical waste has to be carefully disposed off based on the Material Safety Data Sheet (MSDS).

3.0 CHAPTER THREE: SWOC ANALYSIS FOR HEALTH CARE WASTE MANAGEMENT (HCWM) IN TANZANIA

Table 3: SWOC Analysis for HCWM in Tanzania

Priority areas	Strengths	Weaknesses	Opportunities	Challenges
Review and disseminate, Policy guidelines, Standards and Regulations on HCWM	• Policy guidelines and Standards for HCWM in place and disseminated • HCWM coordination structures available at all levels of the – MoHCDGEC • Collaboration with other HCWM stakeholders in place (including LGAs, Department of environment in VPO, NEMC, FBOs and private sector) • QIT at Health facility available • Legal and policy framework available	• Implementation of HCWM guidelines, standards, and plan is weak • Enforcement of the Legal and policy framework is weak • National HCWM steering committee not functional	• LGAs are implementing HCWM policy guidelines and standards • Participation of PPP's in HCWM • Empowerment of LGAs through Decentralization by devolution • Development Partners supporting HCWM • EMA Act, 2004, PH Act, 2009, National Health Policy Guidelines, HSSP-IV, National HCWM Regulations, 2017 in place • Advocacy medias for HCWM in place (move to Advocacy)	• Policy guidelines, standards and Regulations on HCWM inadequately utilized • Low awareness and commitment among political leaders on HCWM issues • Inadequate allocation of resources
Improve infrastructure, equipment and supplies and treatment and disposal options for HCWM	• National catalogue for HCWM equipment and disposal options exist • Specification for standard incinerators approved by MoHCDGEC in place • Capacity for construction and maintenance of HCWM treatment and disposal options in place • Tools for building capacity in HCWM available • Procurement system and alternative suppliers for HCWM equipment and supplies in place	• In planning process (CHOP), HCWM interventions inadequately prioritized • Inappropriate use of HCW equipment during waste segregation • Inadequate maintenance of incinerators • Mapping of suppliers/(stakeholders, Recyclers, Re-users) for HCWM equipment for not yet done • Inadequate involvement of stakeholders on HCWM	• Partners supporting HCWM in place • Involvement of PPP's in HCWM • Integration of HCWM into all health programmes and projects • Environmental friendly technologies on HCWM available	• Bureaucratic procurement procedures • High cost of HCWM equipment • Competing priorities for resources • Low demand of HCWM equipment and supplies by the HCFs • Inadequate capacity for quantification and forecasting of HCW equipment and supplies • Inadequate use of efficient technology on HCWM

Priority areas	Strengths	Weaknesses	Opportunities	Challenges
1. Strengthen Institutional Capacity-building and training on HCWM	• Training Materials for on HCWM available • Master TOTs on HCWM available • Customized training manual for HCWM exists. • Ongoing IPC/ HCWM training for healthcare workers • National TOTs on HCWM • Quality Improvement teams in place • HCWM Focal Persons in regions, districts and Healthcare Facilities available	• Workers Attitude towards HCWM practices in HCF is poor • Few trained HCW handlers and Incinerator Operators	• MOHCDGEC has training institutions of various Health cadre • Partners supporting HCWM capacity building • Existence of National Programme for HCWM	• Inadequate financial resources needed • Integration of HCWM to all health programmes • Inadequate EHP in the country • Insufficient HCWM contents in Health Professional curricular on HCWM
2. Conduct advocacy to raise awareness and commitment among decision makers in HCWM	• National Cleanliness Competition on yearly basis exists • Star ratting assessment practiced in all healthcare facilities	• Advocacy package for HCWM political leaders does not exist •	• National Monthly Cleansing day exists • National Sanitation Campaign is implemented in Healthcare Facilities at Regional and Councils levels • Advocacy medias for HCWM in place • Higher level leader recognition and commitment on cleanliness	• Participation of decision makers on HCWM interventions is weak • Support on HCWM resource allocation is inadequate
3. Provision of adequate resources to improve efficiency on HCWM	• Some HCFs have standard HCW bins and bin liners. • National Policy Guidelines and Standards for HCWM in place • Specifications for Standard incinerators approved by MOHCDGEC in place • Availability of basket funds • Availability of Council Blocks Grant • Skilled health care workers in HCWM available • Regional, Council and HFs Focal persons on HCWM available.	• Inadequate trained personnel on HCWM • Inadequate allocation of financial resource for HCWM • Inadequate equipment and supplies • Mechanism for quality control on equipment and supplies	• Partners supporting HCWM • Private sectors involvement • Hospital Management involvement • Mainstreaming of HCWM activities to development partners in their National Health programs • Mainstreaming of HCWM activities in other health programs • Purchase of O/S equipment and supplies from alternative sources	• Competing priorities for resources allocation • Substandard equipment and supplies in the market

Priority areas	Strengths	Weaknesses	Opportunities	Challenges
4. Promote Best Environmental Practices (BEP) on HCWM stream	• Policy guidelines for HCWM in place • Standards for HCWM in place • QIT at HCF available • Availability of relevant legislation on HCWM • HSSP IV 2015-2020 • MKUKUTA IV • Existence of NEMC • Availability of BEP contents in curricula.	• Weak adherence to HCWM guidelines and Standards. • Low attitude of Health services provider towards (BEP) on HCWM • Lack of proper Hospital safety approach	• Integration of HCWM activities in other health care programs • New environmental friendly technologies on HCWM treatment and disposal options available. • Introducing Health promoting hospital initiative program • Government support on HCWM	• Contradiction with Some Traditional cultures on HCWM practices • Lack of Integration of (BEP) activities on HCWM in other sectors. • Lack of appropriate technologies and management of emission control
5. Promotion of Public Private Partnership (PPP) in HCWM	• Involvement of industries in HCWM development.. • Policy guideline on PPP available • The PPP Policy guideline is well coordinated in the Regions and Districts	• Not all industries abide to good manufacturing practice. • Inadequate marketing strategies for PPP in health sector	• Availability of National catalogue for HCWM equipment and disposal options • Availability of new technology on HCWM	• Inadequate knowledge for procurement and users to provide standards and specifications on HCWM equipment • High taxation for HCWM equipment and supplies • Not all industries respond positively • HCWM equipment and supplies are not included in MSD catalogue.
6. Strengthen Monitoring Evaluation and Operational research (OR) on HCWM	• Monitoring plan of HCWM in place • Monitoring tools of HCWM including NS-MIS (Software) available • Ongoing plan on HCWM operation research. • Identified areas for Operation research in HCWM	• NS-MIS on HCWM not yet operationalized • Inadequate data collection using electronic tools on HCW • Supervision on HCWM data quality is weak • Standardise paper based system for data collection • Proper records keeping for HCWM • Inadequate trained staff	• HCWM indicators have been developed • HCWM indicators integrated into HSSP IV 2016-2020 • NS-MIS in place • Existing areas in HCWM require operation research • Government support • Research institutions available	• Inadequate financial resources • Inadequate trained staff on HCWM • Inadequate skills on conducting Operation Research in HCWM

4.0 CHAPTER FOUR: POLICY, REGULATORY AND INSTITUTIONAL FRAMEWORK FOR THE PROVISION OF HEALTHCARE WASTE SERVICES

4.1. Policy, regulatory framework

The legislative provision for improving the management of HCW in any country enables the establishment of a legal control of the process and defines clearly the duties and responsibilities of each actor involved in the management of HCW. This part reviews the current legal provisions for HCWM in Tanzania as well as the current rules that are applied within the healthcare facilities. Management of healthcare waste is guided by policies, regulations, Acts and guidelines. Key legal frameworks include; the National Health Policy, 2007; Public Health Act, 2009; National Environmental Policy, 1997, (NEP), and Environmental Management Act, 2004 (EMA) and other related Acts.

4.1.1. The National Health policy, 2007

Among other things stresses on the importance of healthy workforce for social and economic development. It recognizes the need for clean and safe environment, which promotes good health to individuals and families. Specifically, the policy promotes participation of the private sector in preserving environment through sound disposal of healthcare waste generated from health facilities, research institutions and obsolete drugs and reagents. It also emphasizes on the prime importance of observing hygienic disposal of human excreta and personal hygiene.

4.1.2. Public Health Act, 2009

The Public Health Act (2009) provides for the promotion, maintenance of public health with a view to ensure the provisions of comprehensive, functional and sustainable public health services to the general public and provide for other related matters. Section 92 of the Act states that health care wastes should be sorted and stored in prescribed coded containers, transported in waste trucks designed and registered for that purpose; for final disposal of various types of health care wastes.

4.1.3. National Environmental Policy, 1997

The National Environmental Policy, 1997 identifies six major environmental problems for urgent attention. These are problems of 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, and Deforestation. Each of these problems is a hindrance to the economic well-being of the country and the health of the people. In dealing with these problems, NEP identifies various sectoral environmental issues and assigns roles and responsibilities to various institutions from the central government to local Government. Based on NEP various sectors such as health, agriculture, livestock, water, transport, energy, mining, human settlement, industry, tourism, wildlife, forestry and fisheries have mainstreamed in their respective policies environmental management objectives identified by NEP depending on relevance.

4.1.4 Environmental Management Act, 2004

The Environmental Management Act, 2004 provides for legal and institutional framework

for sustainable management of the environment and natural resources in the country. This 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.

4.1.5. HIV and AIDS (Prevention and Control) Act, 2008

The HIV and AIDS (Prevention and Control) Act, 2008 plays a major role in the prevention against the disease. The Act provide for prevention, treatment, care, support and control of people living with HIV –AIDS through reduction of HCW mismanagement and related risks.

4.1.6. Water Supply and Sanitation Act, 2009

The water supply and Sanitation Act, 2009 promotes clean, safe, adequate and sustainable water supply through provision of guidelines for HCWM, which safeguard the environment by ensuring the adherence to HCWM best practices.

4.1.7. Occupational Health and Safety Act, 2003

The Occupational Health and Safety Act, 2003 was enacted to make provisions for the safety, health and welfare of persons at work in factories and other places of work, to provide for the protection of persons at work against Hazards to health and safety arising out of or in connection with activities of persons at work, and to provide for the connected matters. The workplace in this case includes all health care institutions and facilities.

4.1.8. Industrial and Consumer Chemical (Management and Control) Act, 2003

This is Act provides for the management and control of the production, importation, transportation, exploitation, storage, dealing, and disposal of chemicals and for the matters connected there with. In the course of provision of healthcare service, some chemicals and their products need to be managed safely in order to protect public health and the environment.

4.2. International agreements

4.2.1. Basel Convention

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.

In addition, there are two important Conventions which the country (when creating its policy) will have to take account of, particularly if they are a signatory to that Convention. They are:
The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal. The Basel Convention regulates the trans-boundary movements of hazardous and other wastes applying the 'prior informed consent' procedure (shipments made without consent are illegal). This convention is the most comprehensive global environmental treaty on hazardous and other wastes

4.2.2. Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs). The Stockholm 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.

4.2.3. Minamata Convention

Mercury is a toxic compound that causes mercury poisoning, primarily through inhalation and handling work clothes contaminated with mercury and also by consuming mercury contaminated fish. Health care facilities generate mercury wastes in various ways such as dental amalgam and mercury thermometers. Efforts are underway to eliminate use of mercury and mercury products in hospitals because of the effects it has on public health and the environment. It is estimated that incineration of HCW contributes 13% of the total mercury release in the atmosphere.

The Minamata Convention on Mercury is an international treaty designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. Article 4 of the Convention addresses the question of mercury-added products and requires each state to take appropriate measures to ban the manufacture, import or export of mercury-added products. Article 8 is concerned with Emissions of Mercury where it addresses controlling and reducing emissions of mercury and mercury compounds.

4.3 Institutional Framework

Preamble

The institutional framework for HCWM should involve advocacy on policy documents and Action Plan that would trigger coordination and cooperation for each responsible sector on HCWM. Collaboration of all stakeholders (both public and private including Association of private health care facilities in Tanzania) will improve resource mobilisation for HCWM from point of generation within the HCF through collection and transport to the ultimate destination in a recycling facility, landfill, waste-to-energy recovery or composting site.
The institutional framework has the following levels of service delivery:

4.3.1. National Level

The MoHCDGEC has the leading role on HCWM and overall responsibility of providing health care services and ensure proper HCWM in health sector. It also gives guiding principles to other Ministries, Departments and Agencies (MDAs) implementing HCWM. The MoHCDGEC shall:

- Disseminate the Strategic Plan and the National Action Plan (NAP) for HCWM to all stakeholders and Coordinate a two-way communication from National, Zonal, Regional

and Council levels.

- Integrate HCWM into the agenda of the multi-sectoral team on implementation procedures, including organizing training courses
- Develop and review of legislation, standards, and guidelines on HCWM
- Develop and distribute relevant Information, Education and Communication (IEC) materials on HCWM under the Health Promoting Hospital initiatives
- Conduct continuous on job training on HCWM
- Plan and budget for implementation
- Collect, analyse, and use data on essential waste management practice
- Implement tracking and auditing systems to demonstrate that HCWM has been rendered safe for reprocessing or being destroyed in an environmentally sound manner
- Mobilize financial and human resources to implement the program;
- Conduct supportive supervision, monitoring and evaluation on HCWM including Operational research
- Conduct Environmental Health Impact Assessment (EHIA) being a mandatory ministry
- Identify recommended treatment and disposal methods (BEP) of HCW
- Ensure the involvement of training institutions (teaching institutions including hospitals and Universities) and the inclusion of HCWM in their training curricula.

4.3.2. Regional Level

The Regional Health Management Team which is led by the Regional Medical Officer (RMO) shall:

- Conduct regular meetings to review and monitor the implementation process
- Coordinate a two-way communication from National, Zonal, Regional and Council level on training, communication, and IEC materials
- Interpret National Policy guidelines and disseminate NAP for HCWM to all council
- Inco-operate HCWM activities and budget line in to Regional Health Plan (RHP)
- Distribute the NAP for HCWM to all stakeholders at Regional and Council levels
- Facilitate and support continuous on job training on HCWM
- Collect, analyze, and use data on safe HCWM practice in the region
- Establish focal person (Environmental Health Practitioner) for HCWM at regional referral hospital
- Promote recommended Best Environmental Technology (BET) on HCW treatment and disposal in collaboration with relevant stakeholder
- Conduct supportive supervision, monitoring and evaluation on HCWM

4.3.3. Council/District Level

The Council Health Management Team, which is led by the District Medical Officer (DMO) shall:

- Conduct regular meetings to review and monitor the implementation of HCWM activities at council level
- Implement National policy guideline of HCWM through CHMT
- Conduct and coordinate continuous on job training
- Inco-operate HCWM activities as one of the priority area in to Comprehensive Council Health Plan (CCHP) for budget and implementation

- Promote community engagement and involvement for best practices at community level
- Collect, analyse, and use data on safe HCWM practice at Council level (in the region
- Ensure regular maintenance of HCWM equipment
- Establish focal person (Environmental Health Practitioner) for HCWM at all hospitals (Public, Private and FBOs) in the council

4.3.4 National, Zonal and specialized hospitals

The hospitals and the supportive departments are the main producers of HCW. Each Hospital Management Team shall:

- Designate a well-trained focal person (Environmental Health Officer) for HCWM
- Establish best infrastructure (Adequate water supply, sanitation facility etc)
- Install Best Environmental Technology for HCW treatment and disposal
- Procure standard equipment and transport for HCWM
- Conduct a continuous on job training on safe HCWM practices

4.3.5. Community level

- Health Governing Committees (HGC) shall encourage active community involvement in HCWM activities e.g. planned and documented clean-up campaigns and information.
- Community Health Workers shall raise awareness on HCWM interventions and act as a link between the community and HCF
- Community leaders should disseminate and translate/explain the NAP for HCWM and IEC materials to the community in consultation with the relevant authorities

4.4. Line Ministries, Departments and Agencies (MDAs)

4.4.1. President's Office - Regional Administration and Local Government (PO-RALG)

- Implementation of HCWM guidelines and standards
- Regular supportive supervision to ensure safe management of hazardous waste
- Capacity building on HCWM at all level
- Resource mobilization for health care waste management

4.4.2. Vice President's Office (VPO)

Department of Environment

- Coordinating other sectors in the implementation of acceptable environmental interventions and technologies.
- Offer Certification of Environmental Impact Assessment (EIA)

National Environment Management Council

- Enforcement of the governing laws related to hazardous waste
- Monitoring of environmental pollution
- Conduct Environmental Impact Assessment (EIA) and environmental auditing of Waste disposal systems

4.4.3. Ministry of Water and Irrigation

- Facilitate adequate water supply in Health facilities at all levels
- Regulates water pollution, hazardous waste based on current legislation.

4.4.4. Ministry of Education, Science, Technology and Vocational Training

- Ensure provision of sanitation facilities to all schools and educational Institutions
- Ensure safe disposal of HCW including sanitary protection material in schools and other educational Institutions

4.5 Other Ministries, Departments and Agencies (MDAs)

4.5.1. Ministry of Finance and Planning

- Ensures collaboration with MOHCDGEC in financing HCWM

4.5.2. Public Private Partnership (PPP)

- Shall adhere to a policy guideline, standards and regulations ensuring safe HCWM handling practices.

4.5.3. Ministry of Energy and Minerals

- Regulates all types of wastes produced during mining activities by enforcing them with waste management regulations.
- Facilitate the National Environment Management regulations enforcement

4.5.4. Non-Governmental Organizations (NGOs)

- Shall adhere to HCWM policy guideline, standards and regulations

4.5.5 Community Based Organizations (CBOs)

- Shall adhere to HCWM policy guideline, standards and regulations.

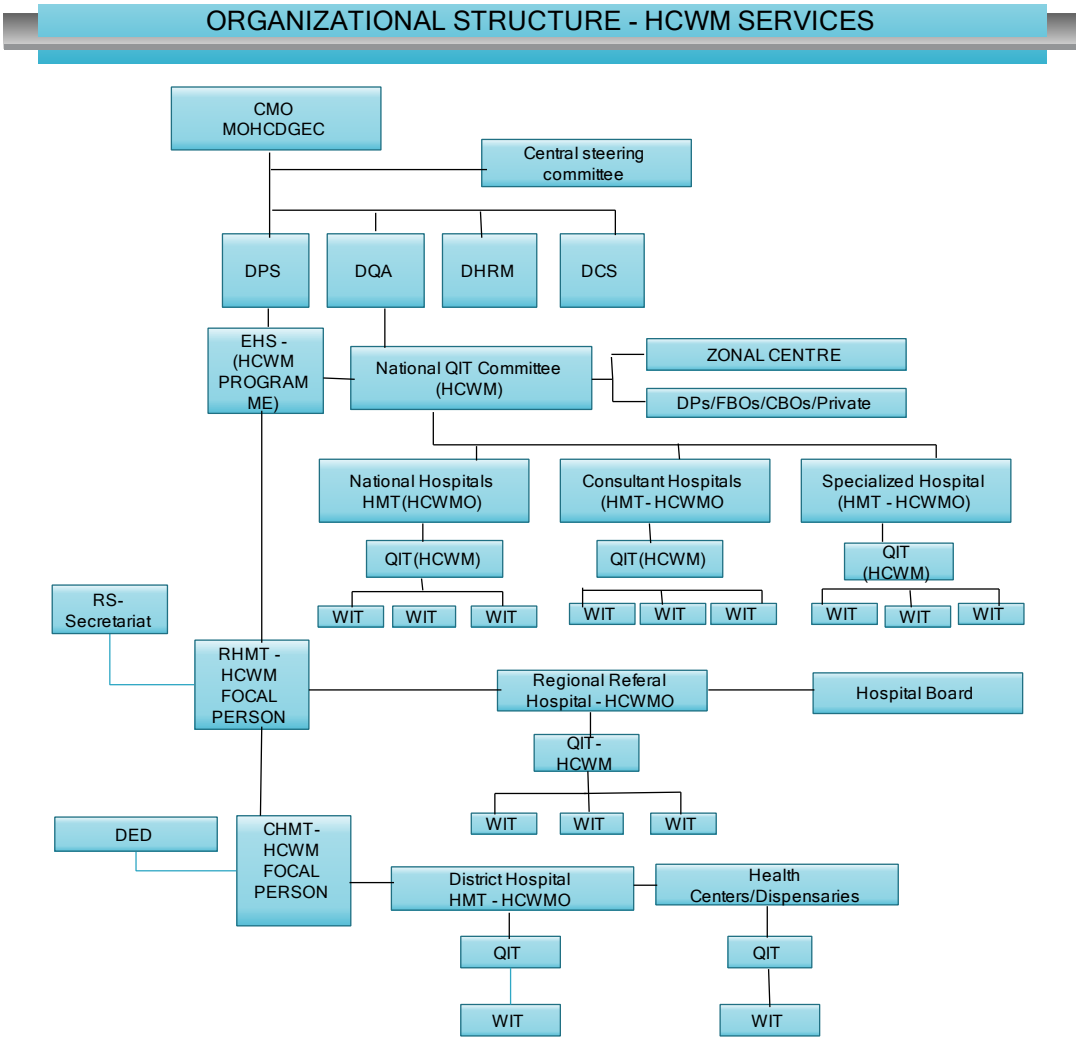
5.0 CHAPTER FIVE: ORGANIZATION OF HEALTHCARE WASTE SYSTEM IN TANZANIA

5.1 Coordination Mechanism

The management of health care waste at all levels will be done in collaboration with a range of stakeholders including Government Ministries, Agencies, Departments, research and training institutions, development partners, NGOs, FBOs, CBOs and communities. Coordination and collaboration amongst stakeholders is important for the realization of HCWM in the country. Stakeholders will be encouraged to provide both technical and financial support for the management of the health care waste. Stakeholders should be involved during each stage of development, planning, implementation, monitoring and dissemination for HCWM.

The proper management of health-care waste depends largely on good administration, coordination and organization, but also requires adequate legislation and financing, as well as active participation and commitment by trained and informed staff. The following figure elaborates more on the linkage and coordination of different departments dealing with healthcare waste management (see figure below).

5.2 Organization Structure For Healthcare Waste Management Services



5.2.1 Resource Mobilization

Adequate financial materials, human resources, equipment and facilities shall be allocated to ensure safe management of health care waste. Sources of funds include government allocation, health insurances, and user fees or cost sharing, consultancies, research, grants and support from partners/stakeholders. Advocacy should be undertaken to solicit support for the implementation of the policy, guidelines as per action plan from all stakeholders. Measures to achieve this include but not limited to the following:

- All relevant reports of health care waste management practices should be made available to all interested stakeholders.
- To draw attention of the development partners and communities to the existing situation in order to obtain the widest possible support including financial commitment and the development of a legal framework
- To disseminate information regarding HCWM to the general public through radio, print medias, journals, booklets, leaflets, production of documentaries and dramas which could be aired on TV and radio stations; and posting of related information on websites.
- To secure the commitment of private health care facilities, the MoHCDGEC should involve them through their respective Boards. The private health institutions in particular should be encouraged to participate in the training programs that the MoHCDGEC will organise for the health institutions under cost sharing arrangements.

5.3. National Standards And Procedures

5.3.1. Guidelines for HCW Minimization, Re use-and Recycling

5.3.2. Minimization concept

For efficient and effective minimization, of Health Care Waste, authorities, health facilities and other stakeholders shall establish and practice strategies for HCW waste avoidance, reduction, re-use and recycling as follows;

- Minimization of HCW shall include source reduction, use of medical procedures that reduce the volume of waste generated.
- Healthcare facilities should put in place mechanisms to restrict the purchase of supplies that produce a lot of HCW.

5.3.3. Recycling

- Healthcare facilities should use separate color coded containers placed at the source of waste generation for recyclable materials.
- Healthcare facilities should practice effective waste segregation at the point of generation to facilitate recycling of recyclable materials.
- All recyclable healthcare waste must be properly treated before taken out of the healthcare facilities
- Companied interested with recycling of medical materials must register for the business by the Environmental Health Registration Board.

5.3.4. Re-use

- Surgical equipment and other items which are designed for reuse and are sensitive to heat shall be sterilized by approved procedures.

- Operating and waste treatment costs should be reviewed periodically to evaluate any fluctuations. Data shall be collected to allow comparisons between HCF and to establish benchmarks.

5.4 Guidelines for Segregation of Healthcare Waste

- HCF shall segregate waste to protect personnel from injury and infection by preventing hazardous waste entering inappropriate waste streams.
- All Standard Operating Procedures (SoP's) of HCW segregation, packaging and labeling shall be displayed in each department;
- Segregation of healthcare waste shall be done at the generation point and is the responsibility of the person/institution that generate it.
- Segregation receptacles must be placed close as possible to waste generator as this will avoid cross contamination.
- Standard color coded receptacles for each category of waste shall be provided by HCF.
- Segregation of healthcare waste shall consist of separating different waste materials based on the type, treatment and disposal or recyclable options;
- The mixing of non-hazardous and hazardous waste is not permitted. If mixing occurs, all waste contained together in, shall be classified and treated as hazardous waste.
- Staff engaged in the segregation of HCW shall wear appropriate personal protective equipment.
- SOPs or posters for healthcare waste segregation should be displayed at the point of healthcare generation.

5.5 Guidelines for collection and onsite-transportation of Healthcare Waste

For efficient and effective collection and transportation of Health Care Waste, authorities or health facilities management shall;

- Provide standard equipment for collection and transportation of healthcare waste.
- Provide appropriate personal protective equipment
- Supervise staff to adhere on use of personal protective equipment.
- All infectious waste shall be collected on daily basis
- Hazardous HCW and non-hazardous HCW shall be collected on separate trolleys.
- The collection/transport route shall be the most direct and shortest one from the collection point to the central storage facility or disposal point, and should avoid where food preparation is done and the heavily populated areas.
- HCW should be transported using color coded/labeled transportation equipment that are not used for any other purpose;
- Collection times should be fixed and reliable
- The collected waste shall not be left even temporarily anywhere other than at the designated central storage facility;
- Health-care waste shall not be transported by hands to avoid the risk of accident or injury
- All bin liners and /or containers of waste must be marked to identify the unit/ward where the waste was generated
- Spare trolleys/wheeled bins shall be available in case of breakdowns and maintenance
- The trolleys/ wheeled bins shall be cleaned and disinfected after every use.
- All waste bag seals should be in place and intact at the end of transportation.

- There should be separate, secured, storage rooms to maintain segregation of:
  - Radioactive waste
  - Waste containing Mercury

5.6 Guidelines for Health Care Waste storage

For efficient and effective storage of Health Care Waste, authorities or health facilities shall:

- Provide a secured and fenced HCW storage bay
- The bay should have an impermeable, hard-standing floor with good drainage system, easy to clean and disinfect in line with standards and procedures for HCWM
- Ensure separate labeled storage compartment for various types of HCW
- Provide a separate compartment for radioactive waste storage
- Infectious waste must be stored not more than 48 hours from the time of generation.
-

5.7 Guidelines for offsite transportation

For efficient and effective off site transportation of Health Care Waste, authorities or health facilities shall comply the following:Before transportation of the waste, dispatch documents should be completed

- All arrangements should be made between consignor, carrier, and consignee
- In case of trans-boundary movement, the consignee should have confirmed with the relevant competent authorities that the waste can be legally transported
- Transport on public roads should only be conducted by licensed companies
- Transport vehicles and drivers must meet legal requirements for the transport of hazardous waste

5.8 Guidelines for HCW treatment

HCW should be treated before disposal. Methods for treatment depend on the waste characteristics, technology, environmental and safety factors. There are five processes for the treatment of hazardous health-care waste that include thermal, chemical, irradiation, biological and mechanical. The choice of treatment system depends on local conditions and involves consideration of:

- Available resources including technical expertise
- Waste characteristics and volume
- Technical requirements for installation, operation and maintenance of the treatment system
- Safety and environmental factors
- Cost considerations

With respect to special waste which include waste containing radioactive materials and mercury shall require special treatment methods and receive special supervision with technical expertise. Radioactive waste materials should be managed under the supervision and recommendation by the Tanzania Atomic Energy Commission. Mercury containing medical devices should be stored and collected centrally for further disposal using internationally acceptable disposal option

5.9 Guidelines on disposal methods

General non-hazardous and hazardous waste that require direct disposal must be known by the healthcare facilities. The Ministry recommend the following disposal option for non-hazardous waste and hazardous waste that require direct disposal.

5.9.1 Non-hazardous waste

- Non – hazardous waste shall be disposed of in public designated disposal sites.
- In case there is no public disposal site the authority shall establish a designated disposal site for non-hazardous that meet public health and environmental requirement.
- Open burning is strictly not allowed for all types of waste
- The designated disposal site should be secured for unauthorised access and fenced.

5.9.2 Hazardous waste disposal options

Hazardous waste must be treated before final disposal. The Ministry recommend the following disposal options for various types of hazardous waste:-

5.9.2.1 Pathological waste disposal:

- Every healthcare facility should have a standard designated placenta pit within the facility premises.
- Other pathological waste must be treated, incinerated or buried.
- In case of human remain must be cremated or buried in public cemetery

5.9.2.2 Disposal of hazardous ash:

Fly ash and bottom ash from incineration is generally considered to be hazardous, because of the possibility of having heavy metal content and containing dioxins and furans.

- Hazardous ashes should be disposed of in sites centralized designed for hazardous wastes,
- In the absence of designated disposal sites, the HCF should construct a standard ash pit within or offsite the facility premises.

5.9.3 Sharp waste disposal

Even after sterilization, sharp waste may still pose physical risks. The HCF should do the following;

- Sterilized sharp waste can be disposed of in safe sharp pits on the health care facility premises or encapsulated by mixing waste with immobilizing material like cement before disposal.
- In case recycling opportunity exist sharp waste should be sterilized and taken for recycling with licenced companies.
- Where high technology for smelting and incineration exist sharp waste can be disposed of by burial method.

5.9.4 Disposal options in emergency situations

- The authority should take appropriate healthcare waste management practices in line with the type of waste generated.

- Appropriate disposal options and procedures must be followed including interim minimal disposal practices.
- Open dumping of boxes/bagged waste should be avoided.
- Pharmaceutical waste and chemical waste should be stored until a safe disposal option has been identified.

5.10 Guidelines for special waste classes

Description of Chemical Wastes Containing Heavy Metals

5.10.1 Mercury Management.

Mercury is a known highly hazardous chemical compound. Organic compounds of mercury, such as methyl mercury, are considered the most toxic forms of the element. Inhalation of elemental mercury vapour is the most common route of exposure. When mercury is spilled or allowed to come into contact with air, it evaporates. These policy guidelines covers all aspects of procurement, use, safe handling, storage, treatment, and environmentally sound disposal of both mercury-containing and mercury free devices. The HCF should;

- Promote the use of alternative mercury free medical devices.
- Reduce the use of other medical devices containing heavy metals.
- Provide procedures for safe clean-up of mercury spills and the safe handling and environmentally sound disposal of broken devices;
- Provide safe interim and long term storage of mercury devices and waste from mercury devices and within the health care facilities;
- Use standard for segregation, collection ,storage transport, labeling, of waste containing heavy metals;
- Use proper personal protective equipment (PPE) when handling waste containing heavy metals.
- Create awareness and training of health care workers for safe handling and disposal of all mercury related wastes.
- Conduct close monitoring and evaluation on the effectiveness of phasing out mercury including safe handling and disposal of all mercury related products in health care facilities.
- Promote use alternative use of non-mercury devices such as Low-mercury or energy efficient lamps, Digital thermostats, and Rechargeable batteries, Lithium or alkaline batteries, Mercury-free switches and batteries.

5.11 Guidelines for Unintended Persistent Organic Pollutants (UPOPs)

Unintended Persistent Organic Pollutants (UPOPs) are chemicals that negatively affect health and the environment when released into the air, water and soil. These are synthetic chemicals which are released as a result of incineration of healthcare waste. POPs are likely to accumulate, persist and bio-concentrate and could, eventually, achieve high-level toxicity. Environmentally sound disposal related waste taking into account relevant provisions of the Basel Convention, the Stockholm Convention on Persistent Organic Pollutants and their respective implementation guidelines should be emphasized. The Authority or Healthcare Facilities should;

- Promote green procurement, use, safe handling, storage, treatment, and environmentally

sound disposal of POPs and UPOPs.

- Promote use of best available techniques and promote non-burn environmental practices
- Promote adequate segregation, labeling, and safe handling of PVC materials.
- Promote Standard and procedures related to reduce, reuse or recycling of PVC material from medical measuring devices.
- Promote the use of proper personal protective equipment (PPE) used when handling waste containing POPs.
- Create awareness and training of health care workers safe handling and disposal of all POPs related wastes.
- Institute monitoring and evaluation mechanisms for safe handling and disposal of all POPs related products in health care facilities.

5.12 Guidelines for chemical waste disinfectants

Chemical disinfectants are often hazardous and toxic and are routinely used in healthcare services to reduce and kill microorganisms on medical equipment and surfaces. Chemical disinfection is most suitable for treating liquid waste such as spills of blood, urine, stools, contaminated linen or hospital sewage. The healthcare facilities should;

- Promote appropriate use of chemical disinfectants for hospital purpose.
- Monitor effectiveness of the disinfectant in line to material safety data sheet.
- Ensure availability and proper use of personal protective equipment (PPE).
- Conduct training and awareness of health care workers on safe handling of chemical disinfectant.
- Use alternative chemical disinfectant which are less toxic and environmental friendly
- Use of best available techniques for disposal of chemical disinfectant.
- Disinfectants as waste whether solid or liquid should be disposed of either by dilution or ion exchange or by immobilization method prior to final disposal.

5.13 Guidelines for Pharmaceutical and cosmetic waste

There are disposal methods of pharmaceutical waste which involve minimal risks to public health and the environment, suitable for countries with limited resources and equipment. The adopted methods contribute to the safe and economical elimination of stockpiles of unusable pharmaceuticals. The authorities should;

- Use the best available environmental option for pharmaceutical destruction such as purpose-built high temperature incineration with adequate flue gas cleaning, encapsulation, immobilization by inertization, dilution method for moderate amount of pharmaceuticals and disposal in a sanitary land fill.
- Use registered and licenced company or environmental Health Practitioner, to supervise the disposal of pharmaceuticals.

5.14 Guidelines for Water, sanitation and Hygiene

Operations and maintenance of sanitation facilities

Sanitation infrastructure and facilities requires careful organization and actions to ensure smooth operations, and provision of maintenance services in case of structural or functional changes. Routine operational and periodic maintenance services are prerequisite for sustaining sanitation facilities in health care settings.

- There should be clear identification and description of staff roles on management of sanitation infrastructure and services. There should be a committee consisting of a manager, supervisors(s), and attendant(s) with assigned the responsibility of maintaining sanitation infrastructure depending on facility level.
- Toilets should be cleaned whenever they are dirty, and at least twice a day with a disinfectant used on all exposed surfaces and a brush to remove visible soiling. Strong disinfectants are unnecessary and should not be used in large quantities (reference: Essential environmental health standards in HCF, 2008).
- There should be weekly and daily cleaning schedule that specify when sanitation facilities should be cleaned and supplied with cleaning and hygiene agents. Cleaning schedule should identify persons or groups responsible for undertaking the cleaning tasks and their supervisors. The schedules should be on display for easy access and be shared with responsible managers.
- Orientation, training, and education of users is an important aspect of operations that must be implemented. Orientation materials, personnel and time should be dedicated to help new comers, regular visitors, and staff members.
- Operation and maintenance plan must be put in place to cover for the running and repairs of sanitation infrastructure and services. This should include regular or incidental repairs and scheduled maintenance activities.
- Monitoring tools for sanitation in healthcare facilities will be developed centrally. It will be the responsibility of each individual facility to obtain tools for monitoring and evaluation exercise, and to make sure that they are being implemented on time.
- Feacal sludge management should be emptied when the septic tank is ¾ full.
- Each HCF should ensure adequate supply of water within the facility

5.15 Guidelines for Waste Water Management

Healthcare facilities inevitably generate waste water during provision of healthcare services. Waste water generated may contain micro-organisms, heavy metals, toxic chemicals and radioactive materials. In this endeavor proper wastewater treatment, is important to minimize health and environmental risks that may emanate as a result of pollution by liquid waste from healthcare facilities. Every healthcare facility should;

- Construct and maintain standard onsite waste water infrastructure within the HCF
- Every healthcare facility must treat its waste water generated from the facility before discharge into public sewer or receiving body.
- Ensure the quality of effluent discharge meet national standards. (BOD, COD, TDS, etc)
- Ensure Planned Preventive and Maintenance of waste water infrastructure.
- Conduct monitoring of waste water infrastructure and quality of effluent discharged
- Waste water cesspit emptiers should meet standards and be licensed

5.16 Guidelines for Landscaping, Gardening and Outdoor Spaces

Outdoor spaces play a critical role in the creation of dignified environments for treatment, as well key role in infection control. Landscape should be considered and integrated into any facility design to produce well-planned exterior environment. Durable and appropriate furnishing can be easily integrated into the landscape approach to create comfortable and low cost outdoor gathering areas that contribute to infection control as well as staff and patient comfort.

For the purpose of these guidelines landscaping on one hand, refers to activities that aim at modifying altering the visible features of land within and around the HCF so that it may become more attractive by adding ornamental features and or planting trees. On the other hand, gardening refers to the act or craft of growing plants, flowers or special shrubs with a purpose of creating a beautiful environment within the HCF landscape. Attractive outdoor environment in healthcare settings is said to have psychological and social positive impacts on both HCWs and their patients as well as patients' relatives.

Outdoor Spaces, Waiting Areas and Paths (Walk ways)

HCFs should provide adequate outdoor space as waiting areas, gathering spaces and parking as one of the simplest and most cost efficient steps to the reduction of airborne disease, avoiding the challenges of properly ventilating indoor spaces and environmental squalor caused by lack of parking area for motor vehicles, bicycles as out of order hospital equipment and furniture

- Landscape should be designed in conjunction with covered waiting areas, taking into account proximity of waiting areas to check-in and diagnostic consultation rooms
- Each HCF should designate special room for storing out of order hospital equipment and furniture
- Play Areas for recovering children or those accompanying sick parents—especially long-term patients should have access to the outdoors, sunshine, and opportunities for play to support improvements in health. Care should be taken to ensure that play areas are safe and comfortable for both children and their caregivers.
- Planting should be used as strategy for providing shade, air purification, dust control, and noise pollution buffering. In each case design strategy should adhere to basic design principles for instance consider of wind direction, sun rise and sun set directions as well as noise barriers,
- HCF management team should consult Agricultural Officer for selection of appropriate planting and flowers for gardening and other purposes. Use of local climate friendly, allergy free and native trees is highly encouraged
- HCFs should allocate and mark a space for parking transport facilities e.g. bicycles, motorcycles and vehicles. The design should consider proper traffic or circulation patters for vessels and pedestrians. Directing traffic patterns e.g. KEEP LEFT or DO NOT HOOT etc should be clearly marked.
- All boundaries of the healthcare facilities should be known and secured by fencing.
- Cleaning of gardens including drainage should be done on daily basis.
- HCFs should be fenced for security, keeping out stray dogs and cats as well as limit tress passers who could otherwise damage the landscaping and ruin efforts made to improve outdoor environment and amenity.

Walk ways

Design of outdoor environment should ensure provision of appropriate walk ways to facilitate ease access and movement for patients and clinicians. Durable and appropriate furnishing can be integrated into the landscape approach to create comfortable and low cost outdoor gathering areas that contribute to infection control as well as staff and patient comfort. Design and construction of walk ways should adhere Ministry's guideline for Design of HCFs infrastructure. The following are General considerations for designing of walk ways;

- Walk ways should be appropriate for each area of a facility and the expected patient load in that area. The recommended path size are 3', 4' and 8' for tertiary, secondary and primary paths respectively.
- Walk way material should be impermeable where adjacent to buildings or beneath covered verandas, and permeable when there is landscape on both sides.
- All paths must be designed with proper grading to be well drained and handicap accessible, and must have handrails where needed.
  HCF management teams should allocate funds for maintenance of land scape and general outdoor environment.

Examples of Photographs showing HFC landscaping and gardening

Wooden seat integrated in the garden

Climate compatible trees and flowers

Climate frindly planting and paved path

Planting for shade and dust control

6.0 CHAPTER SIX: VISION, MISSION, GOALS, STRATEGIC APPROACH AND PRIORITY AREAS

6.1 Vision:

To have health facilities with safe, integrated and efficient health care waste management system, that is gender sensitive, sustainable established across the country.

6.2 Mission:

To provide quality health care waste management services for the prevention and control of diseases through the use of enviroment friendly technologies, strengtherning institution capacity, Operational Research, mobilization of resources, promotion of Public Private Partnership and community engagement at various levels of implementation.

6.2.1. Goal

To contribute to the improvement of human health and environment through improved health care waste management system by 2021.

6.3 Strategic Priorities

Priority Area 1: Policy guidelines, Standards and Regulations

Strategic Objective 1: *Review and disseminate HCWM policies, Regulations, Guidelines and standards by 2021*

The current existing policy guidelines, standards and regulations for HCMW are too old and should require review to comply with the current development and technology changes in line with international requirement such as Basel, Stockholm convention and the new Minamata convention. The reviewed policy guidelines, Standards, and Regulations, will be disseminated to enhance understanding and the use of the documents in the implementation and managing of HCW in the existing structures; thus increase accountability, responsibility and ownership of the activities. It will also assist in the planning of HCWM activities at all levels.

Dissemination of HCWM policies, Regulations, Guidelines and Standards will be done at National level where the focus will be to management teams of the Ministry, Technical working groups as well other stakeholders, both local and international. At regional level the dissemination will focus to Regional Health Management teams and other stakeholders at this level. Likewise at Council level dissemination will be done to Council Health Managements teams and all stakeholders at this level. At primary healthcare level, dissemination at healthcare facility both private and public will focus on board members of the health facilities as well health facility governing committees. In addition, the dissemination will be extended to decision makers at all levels who play a big role in the priority setting and resource allocation for execution of various interventions.

Expected outcomes:

- Adequate copies of HCWM policy guidelines, Regulations, and Standards printed and distributed at all levels
- HCWM policy guidelines, Regulations, and Standards reviewed and disseminated

Priority Area 2: Infrastructure, equipment and supplies, treatment and disposal options

Strategic Objective 1: *Improve infrastructure, equipment and supplies, treatment and disposal options for HCWM by June 2021*

HCWM infrastructure such as waste storage areas, onsite and offsite transport facilities, treatment and disposal options will be improved. Technical considerations for improvement of HCWM infrastructure should meet the national Standards for HCWM both at initial stage of the designs and operation and maintenance. Furthermore, environment friendly technologies such as non- incineration will be introduced at health facility level. Use of affordable Best Available Technologies in health care facilities in rural settings will be introduced and promoted. Partnerships in the investment of HCWM will be strengthened including establishment of centralized treatment and disposal facilities. In this respect, the strategy aim to introduce and scale up centralized HCWM treatment and disposal facilities across the country.

Expected outcomes:

- Number of HCF with improved infrastructure for HCWM increased
- Number of HCF using best technologies for HCW treatment and disposal options increased
- Number of centralized HCW treatment and disposal facilities increased

Strategic Objective 2: *Increase availability and accessibility of equipment and supplies for HCWM by June 2021*

Procurement of equipment and supplies will follow the requirements of the National catalogue, standards and specifications of HCW in the country. Awareness will be done to HCF management teams including procurement officers to adhere to national standards in their annual procurement plans of HCW equipment and supplies.

The supply chain of the HCWM equipment will be strengthened to ensure accessibility and availability of the equipment at all levels through MSD and other suppliers as per Public Procurement Act. Efforts will be made to involve private sectors including industries to design and manufacture HCWM equipment and supplies.

Expected Outcomes:

- Quality equipment and supplies for HCWM procured, available and accessible
- Participation of private sector industries in HCWM increased

Priority area 3: Institutional Capacity

Strategic Objective: *Strengthen institution capacity on HCWM by 2021*

The fundamental purpose of institution strengthening is to build capacity in order to improve and retain skills and knowledge needed for proper HCWM. This include human resources development, both pre-service and in-service personnel that focuses on strengthening understanding, skills and knowledge that will enable them perform effectively. The process of institutional capacity involves conducting training needs assessment to establish strength and weakness so that gaps can be bridged, development of the training curricula and conducting of short courses to health care workers. Furthermore, supportive supervision will be done at all levels to improve performance in HCWM. To improve the appearance of HCFs beautification in-terms of landscaping, gardening and pathways will be strengthened. Institution strengthening will also be done by increasing collaboration and coordination among HCWM stakeholders.

Expected outcomes

- Capacity of institutions at all levels strengthened

Priority area 4: Awareness and commitment among decision makers

Strategic Objective: *Conduct advocacy to raise awareness and commitment among decision makers in HCWM by 2021.*

In order to gain political commitment, system support, social acceptance to HCWM require strategies that targeted to influence policy-makers or decision-makers at the national level and other stakeholders for seeking their support on decision and commitment when they are properly enlightened and respond towards proposed agenda. Thus, communicate HCWM prioritised issues from Health facilities in Tanzania to decision-makers and other potential supporters, including the public, through various interpersonal and media channels will stimulate actions by social institutions, stakeholders and policy-makers to support HCWM across the country. Participatory Advocacy and awareness will foster public policies that are supportive to HCWM at all level of implementation, whereby focus will be in line with public policies which must be viewed in the broader context of the social and economic development process. HCWM will be oriented so as to market HCWM and improved values to get message across for support action in HFs.

Expected outcome:

Awareness, commitment and support among decision makers increased

Priority Area 5: Resources for HCWM

Strategic Objective: *Provide adequate resources for efficiency in HCWM by 2021*

Plan for adequate resources, social marketing and capital investment is of great importance in strengthening efficiency in HCWM practices in health facilities. This will enable HCF to have required standard and sustain HCWM goal by 2021. Efforts will be done to strengthen resource mobilization through sensitization meetings and allocation for HCWM and develop more financial options from different stakeholders. Cost recovery mechanisms will be established to sustain HCWM. HCWM components will be incorporated in the comprehensive plans and budgets of health facilities at all levels. In addition, the current resource fund sources such as recurrent and capital development fund of the Ministry, block grants, basket funding, Council own resources and cost sharing will be utilized for funding HCWM activities. Development partners, community and individual contributions for development of HCWM services at HCF level.

Expected outcomes:

- Adequate resources for HCWM allocated and available
- Sources of resources increased

Priority 6: Best Environmental Practices (BEP)

Strategic Objective*: Promote best practices on HCWM stream by 2021*

Promoting best practices for safe HCWM depends on evidence based research and practical application. Best practices on proper HCWM require demonstration, adequate enforcement and active participation by trained and informed workers. Infection Prevention and Control (IPC) training and application of 5s are the best examples of managing HCW at HCFs that influence implementation of colour coded waste bins according to HCW category. Onsite and offsite treatment and disposal of HCWM have implications on the environment and public health. Every HCF will

strengthen onsite and offsite HCWM as per national guidelines, standards and procedures. All healthcare facilities should be conscious of the possible air pollution that emanate as a result of using unacceptable technology options for HCW treatment and disposal. The Ministry in collaboration with the DoE- Vice President Office and other stakeholders will have the role to strictly promote the use of best practices in all healthcare settings. Advocacy and dissemination strategies should be sought to increase understanding among HCWM implementers. Emphasis will be made on waste Minimization and Recycling of HCW technologies to achieve waste – energy recovery and the related by products.

Expected outcomes:

- Best practices for onsite and offsite treatment and disposal promoted and scaled up
- Unacceptable technologies not in favour of health and environment decreased
- Increased waste recycling initiatives

Priority area 7: Public Private Partnership (PPP)
Strategic objective: *Promote PPP in HCWM by 2021*
Involvement of private sectors will help to improve safe HCWM and increase efficiency. The Private sector will be encouraged to invest in the HCW equipment supply, treatment and disposal technologies and waste transportation. Private companies and individuals involved in the recycling of plastics will be sensitized to seek for other recyclable materials from HCFs for income generation. One of the opportunities for investment include transportation and establishment of the centralized HCW treatment and disposal facilities. Availability of recyclable materials from HCF is another great opportunity for private sectors.

Expected outcome:
Private sector industries participation in HCWM increased

Priority Area 8: Monitoring, Evaluation and operational research
Strategic Objective 1: *Strengthen monitoring and evaluation system for HCWM by 2021*
Monitoring and evaluation in healthcare waste management is a continuous process demanding participation of healthcare workers and managers in each health care facility to ensure proper implementation of planned activities. The monitoring and evaluation on HCWM is part of the overall quality management and improvement system. Development of M&E tool will help to identify problems, their causes and institutionalize practical solutions; and therefore encourages evidence-based decision-making; and also increases the likelihood of replicating good HCWM practices by applying lessons learnt. The monitoring and evaluation shall be undertaken throughout the implementation of HCWM streams. M&E information is needed to assess and guide policy and programme strategy, ensure effective operations, meet internal and external reporting requirements and inform future HCWM programming and improvement initiatives.

External Monitoring
The Ministry of Health Community Development, Gender, Elderly and Children (MoHCDGEC) will be responsible for the development, capacity building, implementation, administration and maintenance of the M&E tools. To support successful implementation and institutionalization of the M&E processes, it is recommended that HCFs should adhere to the developed M&E plan. The M&E tools will be used to collect data and information on how health care facilities are imple-

menting their HCWM programmes and activities in the country. The national HCWM, Monitoring & Evaluation tool will be administered annually across all health care facilities and waste handlers and transporters. The national M&E tool monitors HCWM programme compliance and performance from point of generation to point of ultimate treatment or disposal. In addition, the tool provides information of facility compliance with HCWM policy, guidelines, and occupational health and safety requirements. Monitoring will be conducted in the health facilities on quarterly basis by using the Health Care Facility Checklists.

Internal Monitoring and reporting

The Work Improvement Team (WIT) shall conduct day to day monitoring of HCWM in a health care facility. Data will be analyzed, interpreted and used by health facilities. Reports will be provided on monthly basis. The Quality Improvement Team (QIT) carries out weekly monitoring of HCWM in the health facility. QIT also carries out quarterly evaluation of HCWM in the facility. The districts will submit their quarterly HCWM reports to the regions. HCWM performance data will be routinely compiled and analyzed by the regions. This process will enable the MoHCDGEC and HCWM stakeholders to get key information of facility compliance with HCWM policy, guidelines, and occupational health and safety requirements. Higher levels will provide supervision and feedback to lower levels. At National, Regional and district level and facility levels the management must monitor and evaluate progress of the HCWM action plan implementation annually through establishment of baseline, mid- term and end term reviews.To facilitate this, monitoring and evaluation tools will be developed and used for both internal and external review

Expected outcomes:

- Baseline information on HCWM established
- Monitoring tools at all levels in place
- NS-MIS on HCWM operationalized at all levels

Strategic Objective 2: *Conduct operational research on HCWM by 2021*

Operational research need to be undertaken periodically to identify HCWM operational problems, gaps in knowledge, attitude and practice among the healthcare workers for the generation of evidence needed to improve HCWM. In addition, research will help to identify technological innovations in HCWM. MoHCDGEC in collaboration with HCWM stakeholders such as research and training institutions will strengthen and facilitate more operational researches in the area of HCWM for future improvement initiatives. This will involve communicating priority research areas to research institutions and universities.. Operational research when done during M and E will involve three phases that is, during planning, implementation and follow up.

Expected outcomes:

- Number of operational research done and reported
- New research based innovations on HCWM developed and implemented

7.0 CHAPTER SEVEN: STRATEGIC PLAN IMPLEMENTATION MATRIX

Table 4: Strategic Plan Implementation Matrix

Strategic Objective	Activities	Performance indicators	Responsible	Assumption/risk
Priority Area 1:Policy guidelines, Standards and Regulations				
Review and disseminate HCWM policies, Regulations, Guidelines and standards by 2021	Review HCWM policies, Regulations, Guidelines, and standards	Number of HCWM documents reviewed	MoHCDGEC	Inadequate funds
	Print 7,000 copies each of policies, regulations and standards	Number of printed copies available	MoHCDGEC, LGAs	Inadequate funds
	Disseminate policies, guidelines, standards and regulations in all regions	Number of dissemination session and reports conducted to RHMTs and CHMTs	MoHCDGEC, LGAs	Delayed release of funds
	Conduct 30 advocacy meetings to decision makers on policies, regulations and standards	Number of advocacy meetings conducted and reports	MoHCDGEC, LGAs	Delayed release of funds.
Priority Area 2: Infrastructure, equipment and supplies and treatment and disposal options				
Improve infrastructure, equipment and supplies and treatment and disposal options for HCWM by June 2021	Rehabilitate HCWM storage bays for all regional referral hospitals and district hospitals	Number of HCWM storage bays rehabilitated	MoHCDGEC, LGAs	Delayed release of funds.
	Scale up non- incineration technologies in all regions and districts	Number of non-incineration technologies available	MoHCDGEC, LGAs	Delayed release of funds.
	Introduce centralized HCW treatment options in all regions	Number of regions with centralized HCWM treatment options	MoHCDGEC, LGAs	Delayed release of funds
	Facilitate constructions standard placenta pits at all health facilities	Number of standard placenta pits	MoHCDGEC, LGAs	Delayed release of funds.
	Construct waste water treatment system in all regional referral hospitals	Number of functional waste water treatment systems	MoHCDGEC, LGAs and MOWI	Delayed release of funds
	Construct placenta biogas system in all regional referral hospitals		MoHCDGEC, LGAs and NEMC	Lack of funds
	Promote best affordable environmental technologies for all rural healthcare facilities	Number of best technologies constructed	MoHCDGEC, LGAs	Lack of funds
Increase accessibility of equipment and supplies for HCWM by June 2021	Procure 30 standard trucks for healthcare waste management at all regions	Number of standard trucks	MoHCDGEC, LGAs	Delayed release of funds.

Strategic Objective	Activities	Performance indicators	Responsible	Assumption/risk
	Procure standard colour coded waste bins and bin liners for HCWM in HCFs	Number of standard color coded and bin liners	MoHCDGEC, LGAs	Delayed release of funds.
	Procure at least 1 standard truck for HCWM for each district hospitals	Number of trucks purchased	MoHCDGEC, LGAs	Delayed release of funds.
	Sensitize all National, Zonal, Specialized and councils hospitals to procure essential supplies for HCWM	Number of institutions with essential supplies for HCWM	MoHCDGEC, LGAs	Delayed release of funds.
Priority Area 3: Institution Capacity				
Strengthen the institution capacity on HCWM by 2021	Conduct needs assessment for HCWM in all zones	Report of needs assessment	MoHCDGEC/ LGAs Private sectors	Financial constrains Inadequate trained human resource
	Review HCWM training curricula for pre service personnel	Reviewed curricula	MoHCDGEC/ LGAs Private sectors	Inadequate funds Inadequate trained human resource
	Conduct training on HCWM to in-service personnel	Number of in-service personnel trained	MoHCDGEC/ LGAs Private sectors	Inadequate funds Inadequate trained human resource
	Conduct supportive supervision on HCWM in all regions	Reports	MoHCDGEC/ LGAs Private sectors	Inadequate funds Inadequate expertisepersonnel
	Develop and run short courses in HCWM to healthcare workers	Number of short courses developed Number of short courses conducted	MoHCDGEC/ LGAs	Inadequate funds Inadequate trained human resource
	Conduct training to healthcare workers on infection prevention and control in all districts	Number of healthcare workers trained	MoHCDGEC/ PORALG	Inadequate funds Inadequate training materials
	Enhance collaboration among institutions dealing with HCWM	MoU and meeting reports	MoHCDGEC/ LGAs	Inadequate trained human resource
	Carry out periodic inspections of HCW handling and practices in all HCFs	Number of HCFs inspected Reports	HCFs In-charge LGAs	Inadequate funds Inadequate trained human resource
	Landscaping and beautification of all HCFs by 2021	Number of facilities beautified	HCFs In-charge	Inadequate funds Inadequate trained human resource and expertise

Strategic Objective	Activities	Performance indicators	Responsible	Assumption/risk
Priority Area 4: Awareness and commitment among decision makers				
Conduct advocacy to raise awareness and commitment among decision makers in HCWM by 2021	Identify priority issues to communicate regarding safe HCWM	Number of priority issues on HCWM identified.	MoHCDGEC , LGAs Private sector Media companies	Delayed release of funds. Media companies commitment
	Conduct advocacy to decision makers.	-Number of meetings conducted and reports	MoHCDGEC, LGAs Private sector	Delayed release of funds. Availability of targeted audience
	Develop HCWM communication package/ tools	Communication tools developed Number of interpersonal and media channels identified	MoHCDGEC, LGAs Private sector Media companies	
	Disseminate and distribute IEC materials to public places and HCFs	Number of IEC material disseminated and distributed	MoHCDGEC, LGAs Private sector Potential supporters	Delayed approval and release of funds.
Priority Area 5: Resources for HCWM				
Provide adequate resources for efficiency in HCWM by 2021	Conduct sensitisation meetings to stakeholders in all zones	Number of meetings conducted and reports	MoHCDGE, PORALG Private sector	Competing priorities for resources
	Conduct advocacy meetings for HCWM agenda with stakeholders at all levels ()	Number of meetings conducted and reports	MoHCDGEC/ LGAs Private sector	Inadequate funds Inadequate human resource
	Dissemination of HCWM Plan of Action	Number of meetings and reports	MoHCDGEC Private sector	Inadequate funds
	Fund raising meeting for HCWM interventions	Number of meetings and reports	MoHCDGEC Private sector LGA's	Inadequate funds and Political will
	Conduct social marketing for recyclable materials from HCF	Number of customers involved	MoHCDGEC, PORALG, HCFs Private sector	Inadequate funds Traditional culture

Strategic Objective	Activities	Performance indicators	Responsible	Assumption/risk
Priority Area 6: Best Environmental Practices				
Promote best practices on HCWM stream by 2021	conduct orientation through demonstration of best practices to HCF in all zones	Number of oriented HCF's and reports	MoHCDGEC, PORALG HCFs Private sector	Inadequate funds
	mapping of best practices on HCWM in public and private health facilities	Number of facilities with BEP and reports	MoHCDGEC, PORALG Private sector	Inadequate funds Inadequate trained human resource
	Conduct experience sharing on HCWM among HCF.	Number of forums conducted and reports	MoHCDGEC, PO RALG Private sector	Inadequate funds
	conduct best practice competition on HCWM to health facilities	Number of competition sessions conducted and reports	MoHCDGEC, LGA's	Inadequate funds
	Development of IEC materials	Number of IEC materials	MoHCDGEC	Inadequate funds and trained human resource
	Institute vector control measures in all HCFs	Number of HCFs with vector control measures	MoHCDGEC/ LGAs	Lack of Funds
	Promote Water, sanitation and hygiene measures in all HCFs	Number of HCFs with improved water and sanitation facilities	MoHCDGEC/ LGAs	Lack of funds
	Conduct cleanliness completion among P&P health facilities	Number of champion hospitals	MoHCDGEC/ LGAs	Lack of funds
Priority Area 7: Public Private Partnership				
Promotion of PPP in HCWM by 2021.	Utilize effectively PPP on technical and financial resources to improved HCWM	Number of PPP involved	MoHCDGEC/ LGA's Private sector	Inadequate funds and Political will
	Promote collaboration with the private HCFs and other private health service providers	Number MoU and meeting reports	MoHCDGEC/ LGA's Private sector	Inadequate funds
	Conduct supportive supervision and monitoring.	Supervision and monitoring reports	MoHCDGEC/ LGA's Private sector	Inadequate funds and skilled human resource

Strategic Objective	Activities	Performance indicators	Responsible	Assumption/risk
Priority Area 8: Monitoring, Evaluation and Operational research (OR)				
Conduct operational research on HCWM by 2021	Identify operational problems and develop research agenda on HCWM	Priority research agenda identified	MoHCDGEC/ LGA's Private sector Research Institution	Inadequate funds and skilled human resource
	Promote collaboration with research and training institutions	Number of institutions collaborating	MoHCDGEC/ LGA's Private sector Research Institution	Inadequate funds
	Carry out operational research	Numbers of operational research conducted and reports	MoHCDGEC/ LGA's Private sector Research Institution	Inadequate funds and skilled human resources
Strengthen monitoring and evaluation system for HCWM by 2021	Conduct baseline assessment for HCWM country wide	Baseline assessment reports	MoHCDGEC/ LGAs/Private	Inadequate funds
	Develop HCWM data management registers	Registers in place	MoHCDGEC/ LGA's Private sector	Inadequate funds and skilled human resources
	Conduct training sessions on data management registers to all healthcare workers	Number of sessions and reports	MoHCDGEC/ LGA's Private sector	Inadequate funds and skilled human resources
	Appoint data managers for monitoring of HCWM information system in all HCFs	Data managers appointed	MoHCDGEC/ LGA's	Inadequate human resource
	Operationalize NS-MIS for HCWM parameters	NS–MIS integrated and operationalized	MoHCDGEC/ LGA's	Inadequate funds and skilled human resource
	Integrate HCWM data into the national HMIS	HCWM data integrated	MoHCDGEC/ LGA's	Inadequate funds and skilled human resource

8.0 CHAPTER EIGHT: MONITORING INDICATORS

Table 5: Strategic Plan Monitoring Indicators

Priority 1: Dissemination of healthcare waste management policies, regulations, guidelines and standards.		
Strategic Objectives	**Specific Objectives**	**Indicators**
Policies, Regulations, Guidelines and Standards of HCWM to be disseminated by June/2021.	Print 20,000 policies, regulations and standards by June/2021.	Number of policies, regulations, and standard printed.
	Distribute 20,000 policies, regulations, guidelines and standards to all levels of healthcare facilities by June/2021.	Number of policies, regulations, and standard printed and distributed.
	Orient 27,600 health service providers on policies, regulations and standard by June/2021.	Number of health service providers oriented.
	Conduct 164 advocacy meetings to key political leaders on policies, regulations and standards by June 2021.	Number of advocacy meetings conducted.
Priority Area 2: Improvement of infrastructure, equipment and supplies for HCWM		
Strategic Objectives	**Specific Objectives**	**Indicators**
Infrastructure for HCWM to be improved by June, 2021.	Renovate 1500 Storage bays of healthcare waste at health facilities by June 2021	Number of storage bays improved.
	Rehabilitate 1000 existing storage structures at health facilities June 2021	Number of structures rehabilitated.
	Construct 2500 structures for installation of autoclaves for healthcare waste treatment at health facilities by June 2021.	Number of structures for installation of autoclaves constructed.
	Rehabilitate 1000 existing incinerators for treatment of healthcare wastes at health facilities by June 2021.	Number of incinerators rehabilitated.
	Construct 2000 standard placenta pits at health facilities by June 2021.	Number of placenta pits constructed.
Accessibility and availability of equipment and supplies for HCWM to be improved by June, 2021.	Procure and purchase 138 special/ standard trucks for healthcare waste management by June 2021.	Number of trucks purchased
	Procure and purchase 100,000 colour coded containers and other supplies for healthcare waste management by June 2021.	Number of colour coded containers and other supplies purchased.
	Distribute 100,000 colour code containers and other supplies to health facilities by June 2021.	Number of colour coded containers and other supplies distributed.

Priority 1: Dissemination of healthcare waste management policies, regulations, guidelines and standards.		
Strategic Objectives	**Specific Objectives**	**Indicators**
Priority Area 3: Capacity building and training on HCWM		
Strategic Objectives	**Specific Objectives**	**Indicators**
Capacity building and training strengthened by 2021	To conduct needs assessment for HCWM training in 8 zones	Number of assessment conducted per zone
	To review HCWM contents for pre-service personnel	Module for HCWM available
	To review HCWM contents in-service personnel	Number of Training manual prepared
	To conduct training in HCWM to in-service personnel in seven zones	Number of in-service personnel trained
	Conduct supportive supervision on technical support and mentoring among HCWM implementers in 8 zones	Number of supervision visit on technical support implemented per zone
	To develop and run short course in HCWM	Number of short courses developed
Priority Area 4: Advocacy to solicit political and leadership commitment in HCWM		
Strategic Objectives	**Specific Objectives**	**Indicators**
To conduct advocacy to political leaders to obtain influence on their decisions on HCWM	Conduct a situational analysis on HCWM to indicate magnitude of the problem.	Situational analysis report
	Conduct advocacy to impart knowledge at managerial level on problems associated with improper HCWM (economic, social and environmental problems)	Advocacy report
	Identify various options for solutions with cost implications	Technical and financial report on various options for solutions
	Propose/Suggest the appropriate option basing on enviro-care, economical and sustainability	Technical report on enviro-care, economical and sustainability for HCWM
Priority Area 5: Resources Mobilization for efficiency HCWM		
Strategic Objectives	**Specific Objectives**	**Indicators**
Adequate resources for efficiency HCWM available by 2021	Conduct stakeholders meetings at 7 zones	Number of stakeholders meeting conducted
	Proposal development (desk work)	
	Conduct advocacy meetings for HCWM agenda at national level (DPs, NSSC, TWG, THTWG-HCW; MoHCDGEC, MoEd, MOWI, Media, VPO-Environment, NEMC	Number of advocacy meeting; number of participants/ stakeholders involved;
	Dissemination of HCWM Plan of Action	Number of dissermination meeting conducted
	Fund raising meeting	Report of fund raising reported and presented.
	Social marketing (for recyclable materials from HCF)	Number of stakeholders buy in from selling

Priority 1: Dissemination of healthcare waste management policies, regulations, guidelines and standards.		
Strategic Objectives	**Specific Objectives**	**Indicators**
Priority Area 6: Promotion of best practices in HCWM		
Strategic Objectives	**Specific Objectives**	**Indicators**
Best practices in HCWM practiced by 2021	To conduct orientation of best practices to HCF in 7 zones	Number of orientation made per zones; or Best practice areas identified and utilized
	To assess best practices performance on HCWM to public and private health facilities in 7 zones	Number of identified best practice for public and private HFs per zones
	To conduct best practice competition on HCWM to health facilities	Number HFs participated
	To conduct experience sharing and forums on HCWM performance among HCF in 7 zones	Number of experience meetings and forums conducted per zone
	Development of IEC materials	Number and type of IEC materials developed and distributed per zones
Priority Area7: Strengthening PPP in HCWM		
Strategic objectives	**Specific objectives**	**Indicators**
To encourage PPP in HCWM	Leverage PPP on technical and financial resources alongside improved HCWM.	Technical and financial report
	Promote, oversee and monitor PPP initiatives.	Monitoring report
	Undertake collaboration with the private HCFs and other private health service providers – such as contracting or out-sourcing, leases, concessions, social marketing, franchising mechanism and provision of incentives in HCWM (e.g health commodities, or technical support at no cost).	PPP report
	Encourage private sector to invest in HCWM in rural and under-served areas	PPP report
	Establish supportive supervision and monitoring visits involving public and private care providers with adequate feedback on HCWM.	Supportive supervision and monitoring report

Priority 1: Dissemination of healthcare waste management policies, regulations, guidelines and standards.		
Strategic Objectives	**Specific Objectives**	**Indicators**
Priority Area 8: Strengthening Monitoring, Evaluation and Operation research for HCWM		
Strategic Objectives	**Specific Objectives**	
To conduct baseline, mid -term and end term review of the HCWM Plan	Conduct assessment of the existing situation to ensure proper handling during: - segregation, - storage, - collection, - transportation, - treatment and - disposal procedures of waste are being followed	Checklist and HCWM facility report
	Conduct review of key indicators for HCWM and disseminate findings	Review and dissemination report
	Evaluate the uptake of non-incineration technologies in HCFs	Evaluation report
	Carry-out monitoring of hand hygiene practices using WHO protocol	Monitoring report
	Carry-out monitoring of the availability and use of PPEs	Availability of PPEs, use of PPEs by staff and HCF report
	Carry out studies on incinerator emissions in HCFs.	Study report

Priority 1: Dissemination of healthcare waste management policies, regulations, guidelines and standards.		
Strategic Objectives	**Specific Objectives**	**Indicators**
To build and strengthen capacity for HCWM	Conduct training of healthcare workers on infection transmission and control	Training report and list of participants
	Provide personal protective equipment	PPEs delivery report
	Establish effective occupational health program that includes: - immunization, - Post-exposure prophylactic treatment, and - Medical surveillance	HCF's Occupational health report
	Conduct training on M&E tools to the HCFs (tracking tools, facility audit, IPC checklist)	Training report
	Enhance collaboration between research institutions with other stakeholders	Collaboration report
	HCW incident and accident reporting	PEP report registered
	Identify Land use Plan for offsite HCW disposal	Landfill site available
	Plan for HCFs drainage and waste water management system	Functional drainage and waste water management system available
	Provide safe and adequate water	Availability of safe and adequate water
	Plan for the control of livestock and wildlife in HCF	Availability of fencing/barriers and control report
	Plan for food safety and security	Food safety and security report
	Plan for vector and vermin control	Vector and vermin control report
	Planned landscaping and beautification	HCF landscaped and beautified report
	Review and disseminate M&E plan and tools for HCWM	Dissemination report
	Integrate HCWM indicators into national HMIS	HCWM indicators incorporated in the National HMIS
	Carry out periodic inspections of HCW generation, segregation, collection, treatment and disposal in all functional units	Inspections report on HCW generation
To conduct operational research on HCWM	Identify operational problems and develop research agenda on HCWM	Availability of research agenda items
	Carry out operational research to address the identified problems in HCWM to ensure relevance, quality, timeliness, efficiency and accountability	Operational research report

9.0 CHAPTER NINE: MONITORING, EVALUATION AND OPERATIONAL RESEARCH

9.1 Preamble

Healthcare waste management is a continual task demanding permanent efforts of managers in each health care facility. The monitoring, evaluation and operational research on HCWM is part of the overall quality management and improvement system. To measure the efficiency of the implementation of HCWM plan, the monitoring, evaluation and operational research should be undertaken for generation of evidences and enhance planning and implementation of quality improvement measures. The monitoring, evaluation and operational research aspects categorically focus on HCWM key steps, namely:

- Identification of relevant categories of HCW
- Segregation, colour-coded and packaging/containerization of HCW
- Storage of HCW
- Transportation of HCW
- Waste minimization, re-use and recycling
- Treatment/destruction of HCW
- Final disposal of HCW

9.2 Monitoring and Evaluation (M&E)

Monitoring and evaluation (M&E) system is a critical component of any successful HCWM programme. M&E information is needed to assess and guide policy and programme strategy, ensure effective operations, meet internal and external reporting requirements and inform future HCWM programming and improvement initiatives. M&E tool will help to identify problems, their causes and institutionalize practical solutions; and therefore encourages evidence-based decision-making; and also increases the likelihood of replicating good HCWM practices by applying lessons learnt.

9.3 External Monitoring

The Ministry of Health Community Development, Gender, Elderly and Children (MoHCDGEC) is responsible for the development, capacity building, implementation, administration and maintenance of the M&E tools. To support successful implementation and institutionalization of the M&E processes, it is recommended that HCFs should adhere to the developed M&E plan. The M&E tools will be used to collect data and information on how health care facilities are implementing their HCWM programmes and activities in Tanzania. The national HCWM, Monitoring & Evaluation tool will be administered annually across all health care facilities and biohazard waste handlers and transporters. The national M&E tool monitors HCWM programme compliance and performance from point of generation to point of ultimate treatment or disposal. In addition, the tool provides information of facility compliance with HCWM policy, guidelines, and occupational health and safety requirements. M&E will be conducted in the health facilities on weekly and monthly basis by using the Health Care Facility Checklists.

9.4 Internal Monitoring

The Work Improvement Team (WIT) shall conduct day to day monitoring of HCWM in a health care facility. Data will be analyzed, interpreted and used by health facilities. Reports will be provided on monthly basis. The Quality Improvement Team (QIT) carries out weekly monitoring of HCWM in the health facility. QIT also carries out quarterly evaluation of HCWM in the facility. The districts will submit their quarterly HCWM reports to the regions. HCWM performance data will be routinely compiled and analyzed by the regions and zonal Hospitals and submit reports to MoHCDGEC on quarterly basis. This process will enable the MoHCDGEC and HCWM stakeholders to get key information of facility compliance with HCWM policy, guidelines, and occupational health and safety requirements. Higher levels will provide supervision and feedback to lower levels.

9.5 Operational Research

Operational research need to be undertaken periodically to identify HCWM operational problems, gaps in knowledge, attitude and practice among the healthcare workers for the generation of evidence needed to improve HCWM. In addition, research will help to identify technological innovations in HCWM. MoHCDGEC in collaboration with HCWM stakeholders such as research and training institutions will strengthen and facilitate more operational researches in the area of HCWM for future improvement initiatives. Operational researches should be developed at all levels.

9.6 Priority areas for research

- Efficiency of HCW Management procedures
- Air pollution as linked to HCWM
- Waste water Management
- Chemical waste management
- Occupational health and safety
- Technologies for HCWM
- Health care Waste Associated infection
- WASH in healthcare waste management
- Quality of training

9.7 Monitoring Indicators

Monitoring Indicators are needed at two levels:

a) Broad level national key indicators that would enable a high level evaluation of the state of HCWM in the country; and

b) Process indicators that enable a lower level, more detailed evaluation at district and health care facility levels.

c) Survey indicators and baseline data to address the need to conduct surveys from time to time to determine baseline measurements or trends over time, usually at 3 to 5 year intervals.

A. Broad Level Indicators

At national level the key indicators for HCWM are divided into technical, institutional / organisation, planning and education / training / awareness as follows:

Technical indicators

Technical indicators allow the monitoring of technological aspects of the "cradle to grave" Processes of the HCW system. The monitoring of certain specific indicators is essential for Evaluating the improved HCWM system:

1. Minimisation, segregation, storage and collection:

- % of the total number of HCFs (hospitals and HCs) in the country that has a good system in place for managing HCW
- % of the total number of HCFs (hospitals and HCs) in the country where the correct colour-coded liners and containers for the three-bin system are in place.
- % of the total number of HCFs (hospitals and HCs) in the country where the storage practices are good
- Proportion of the total number of HCFs (hospitals and HCs) in the country that dispose of anatomical waste on-site in placenta pits; on-site in an incinerator and off-site at a district incinerator.
- % of the total number of public and private healthcare laboratories in the country that have a good system in place for managing laboratory wastes
- % of the total number of public and private pharmacies in the country that have a good system in place for managing pharmaceutical wastes

2. Incinerators:

- % of the total number of HCFs (hospitals and HCs) in the country that have access to an incinerator for treatment of their HCRW (both the brick burners and the fuel-fired incinerators)
- % of the total number of existing on-site incinerators in the country that are operate their incinerators effectively

3. Disposal:

- % of the total number of all on-site ash disposal pits at HCFs (hospitals and HCs) in the country that are operate a *good system24* that is *in* accordance with HCWM regulations and standards.
- Proportion of the total number of HCFs (hospitals and HCs) in the country that have on-site disposal of treated HCRW, and those who transport off-site for treatment and/or disposal.

4. Health and Safety measures

- % of the total number of HCF (hospitals and HCs) in the country that has a good health and safety measures in place for handling HCRW.

5. Off-site collection and transport

- % of the total number of monitoring actually carried out to check compliance of the transporter of the external collection and transport operator to the contract specifications

and HCW regulations.

- Institutional/organisational Indicators
- Institutional and organisation indicators are the aspects relating the structures for HCWM including appointment of persons, roles and responsibilities

6. The HCWM Team

- % of the total number of HCFs (hospitals and HCs) in the country that have *good* management structures (QIT) in place for the effective control of HCWM.

7. Monitoring, reporting and statistical analysis for HCWM

- % of the total number of HCFs (hospitals and HCs) in the country that has a good monitoring and reporting system in place for HCWM.
- Number of HCW-related incidents including needle sticks reported in the past year in the country

8. Planning (including financial):

- % of the total number of districts in the country that have approved HCWM plans in place
- % of total number of hospitals in the country that have approved HCWM plans in place
- % of total number of districts in the country that have HCWM as a separate line item in their budget
- % of total number hospitals in the country that have a budget for HCWM
- % of the total number of hospitals in the country that budget effectively28 for HCWM

9. Education/training and awareness:

- % of the total number of districts where adequate training has been conducted and up to Date records of training in HCWM are available
- % of the total number of districts where at least one awareness-raising activity/programme has been conducted throughout the district in the past year

B. Process Level Indicators
Technical Indicators

1. Minimisation, Segregation, Storage and Collection:
At HC Facility level

- % of the total number of waste storage points out of the total number waste storage points per HCF that have the correct colour-coded liners and containers for the three-bin system in place
- % of waste storage points out of the total number waste storage points per HCF where
- HCW is correctly separated into the three-bin system
- % of total number of hospitals in the district with waste storage areas for HCWM
- At District Level
- % of the total number of HCFs (hospitals and HCS) in the district that has a good system in place for HCWM.
- % of the total number of HCFs (hospitals and HCs) in the district where the correct colour-coded liners and containers for the three-bin system are in place.

- Proportion of the total number of HCFs in the district that dispose of anatomical waste on-site in placenta pits; on-site in an incinerator or off-site at district incinerator
- % of the total number of public and private laboratories in the district that have the
- correct containers for storing laboratory wastes
- % of the total number of public and private laboratories in the district that have regular collection of laboratory wastes
- % of the total number of public and private laboratories in the district that have the correct systems in place for dispatching laboratory wastes for proper treatment and disposal
- % of the total number of public and private pharmacies in the district that have the
- correct containers for storing of pharmaceutical wastes
- % of the total number of public and private pharmacies in the district that have regular collection of pharmaceutical wastes
- % of the total number of public and private pharmacies in the district that have the correct systems in place for dispatching pharmaceutical wastes for proper treatment and disposal

2. Treatment and disposal facilities (Waste Autoclave, Incinerators, Placenta pits etc):

- % of total number of existing on-site incinerators in a **district** that are *operating effectively*
- % of total number of all HCFs (Hospitals and HCs) in a **district** that have access to an
- Waste autoclave/incinerator and placenta pits
- Change in the total number of treatment and disposal facilities in the **district** over a baseline number over time (3 year period)

3. Disposal:

- % of total number of on-site ash disposal pits at HCFs (hospitals & HCs) in a district that are operate a good system (that is in accordance with HCWM Policy Guidelines and National HCWM standards and Procedures of 2017.
- Proportion out of the total number of HCFs in the district that practise on-site disposal of treated HCRW, and those that transport HCRW off-site for treatment and disposal

4. Occupational Health and safety measures in place for all staff handling HCRW

- % of total number of HCFs (hospitals or Health Centres) in a district where PPE appropriate for HCW handling (i.e. nitrile gloves, aprons and masks) is provided for all staff cadres
- % of the total number of hospitals in a district where a functioning HCWM Committee exists (either separately or as part of Infection Control and/or Health and Safety Committee/s)
- % of the total number of HCFs in a district where a designated person is allocated responsibility for HCWM in the HCF

5. Monitoring, reporting system and statistical analysis for HCWM

- % of the total number of HCFs (hospitals and HCs) in a district where procedures are in place for the collection of HCW data
- % of the total number of HCFs (hospitals and HCs) in a district where procedures are in place for collating and reporting HCW data
- % of the total number of HCFs (hospitals and HCs) in a district where remedial action was taken on reported adverse incidents, accidents and injuries during the past quarter
- % of total number of HCFs (hospitals and HCs) in a district where an internal physical
- HCWM inspection of the whole facility and standard of operation and compliance is

carried out monthly
- % of the total number of HCFs (hospitals and HCs) in a district where a programme and Procedures are in place for external compliance audits to be conducted regularly
- Number of HCW-related incidents including needle sticks reported in the past year within a district

Planning indicators (including financial)

1. HCWM Plans
- % of the total number of Hospitals in the district that have an approved HCWM Plan
- % of the total number of Hospitals in the district that review their HCWMP annually
- % of the total number of Hospitals in the district that have an approved HCWM vehicle and equipment repairs and maintenance plan

2. HCWM Budgeting
- % of the total number of hospitals in a district where budget is allocated for HCWM consumable items (containers, liners and diesel); repairs and maintenance, and training in HCWM
- % of the total number of hospitals in a district where the budget is effectively managed for HCWM

3. HCWM Procurement of containers and Equipment
- % of the total number of hospitals in a district where procurement of containers and equipment for HCWM is *effectively managed*
- % of the total number of hospitals in a district where procurement of diesel for incinerators is *effectively managed*

Education/training and awareness indicators

1. All Staff at all HC Facilities are trained
- % of the total number of staff per cadre in an HCF that have received training (in-service; CE, refresher) on HCWM over the past year
- Hospital Assistants including Cleaners, Incinerator operator/s (where relevant)
- Ward Attendants
- Nurses and Nursing Assistants
- Laboratory technical staff
- Pharmacists
- Radiologists
- Doctors and Dentists
- Administrative/Procurement staff /Stores Managers
- % of the total number of DHMT staff per cadre in a District that have received training (in-service; CE, refresher) on HCWM over the past year
- Health Inspectors
- Health Assistants
- Public Health Nurses
- Administrative staff

- Health Education staff
- % of the total number of HCFs in a district where an induction training programme on
- HCWM is implemented for newly recruited staff
- % of the total number of incinerator facilities whose incinerator staff have been trained within the past two years.
- Number of HCWM awareness-raising activities/programmes that have been conducted throughout a single district in the past year

C. Survey Indicators and baseline data

1. Change in the of the total number of treatment facilities in the country over the baseline total number over time (3-yearly intervals)
2. Amount of HCRW generated per patient/bed occupied per day

10.0 CHAPTER TEN: MONITORING MATRIX

Table 6: Healthcare Waste Management Indicators

Activity	Responsibility	Indicators
Monitoring of HCW equipment and supplies in HCFs at all levels	MoHCDGEC/PORALG	Standard HCWM equipment and supplies available in all HCFs
HCW incident and accident reporting	HCFs In-charge	PEP Register and Report
Monitoring of waste generation, segregation, collection, transportation, storage, minimization, treatment and final disposal	MoHCDGEC/PORALG	Report on HCWM staff, equipment and supplies
Monitoring of hand hygiene practices	HCFs In-charge	Report on compliance and adherence on hand hygiene practices
Monitoring on the availability and use of PPE	HCFs In-charge	PEP Register and Report

Occupational Health and Safety Indicators

Activity	Responsibility	Indicators
Training of healthcare workers on infection transmission and control	MoHCDGEC/PORALG	Training report and the list of participants
Provision of personal protective equipment	MoHCDGEC/PORALG	PPE Register and Report
Continuous monitoring of workers' health and safety to ensure correct handling during: i. segregation, ii. storage, iii. collection, iv. transportation, v. treatment and vi. disposal procedures of waste are being followed	HCFs In-charge	Checklist and HCWM facility report
Establishment of an effective occupational health program that includes: i. immunization, ii. Post-exposure prophylactic treatment, and iii. Medical surveillance.	MoHCDGEC/PORALG	• List of immunized health workers • PEP register and treatment report • Medical surveillance report

Environmental Indicators

Activity	Responsibility	Indicators
Planned Land use for HCWM	MoHCDGEC/PORALG	Availability of approved plans for HCFs development
Planned drainage and waste water management system	MoHCDGEC/PORALG	Availability of approved plans for drainages and waste water management system
Planned safe and adequate water supply	MoHCDGEC/PORALG	Availability of safe and adequate water supply.
Planned environmental sanitation system	MoHCDGEC/PORALG	Availability of environmental sanitation system
Planned livestock and wildlife habitat management	MoHCDGEC/PORALG	Availability of policies and legislations
Planned food safety and security measures	MoHCDGEC/PORALG	Availability of food safety and security report
Planned vector and vermin control measures	HCFs In-charge (EHPs)	Availability of vector and vermin control System
Planned landscaping and beautification	HCFs In-charge	HCF landscaped and beautified

Monitoring and Evaluation Procedures

Activity	Responsibility	Indicators
Develop and disseminate M&E plan for HCWM	MoHCDGEC/PORALG	HCWM M&E plan developed Number of HCFs adopting the M&E plan
Develop and disseminate HCWM M&E tools	MoHCDGEC/PORALG	Number of HCWM M&E tools developed and disseminated
Training on M&E tools to the HCFs (tracking tools, facility audit, IPC checklist)	MoHCDGEC/PORALG	Number of HCFs where the HCWM M&E tools disseminated.
Integrate HCWM indicators into national HMIS	MoHCDGEC/PORALG	Number of reportable HCWM indicators incorporated to HMIS
Conduct a national baseline on HCWM, midterm review, and end-term review for the strategic plan	MoHCDGEC/PORALG	HCWM baseline report Midterm review report End-term report
Review key indicators for HCWM and disseminate	MoHCDGEC/PORALG	Influence policy and implementation on HCWM
Enhancing collaboration between research institutions with other stakeholders	MoHCDGEC/PORALG	No. of collaborating research institutions and stakeholders, No. of staff trained, No. of forum held to identify priority areas

Activity	Responsibility	Indicators
Performance evaluation on HCWM systems and equipment	MoHCDGEC/PORALG	Number of performance evaluations conducted for waste-treatment technologies
Carry out studies on incinerator emissions	MoHCDGEC/PORALG	Number of treatment equipment emissions measured
Public Private Partnerships in HCWM	MoHCDGEC/PORALG	Number of stakeholder forums held National Government
Evaluate the uptake of non-incineration technologies	MoHCDGEC/PORALG	Feasibility studies conducted for non-incineration technologies

Inspection System for HCW

Activity	Responsibility	Indicators
Scheduling periodic inspections of HCW generation in all functional units	HCFs In-charge	Availability of HCW generation checklist and report
Scheduling periodic inspections of HCW segregation and collection in all functional units	HCFs In-charge	Availability of checklist and report
Scheduling periodic inspections of HCW transportation in all functional units	HCFs In-charge	Availability of HCW segregation and collection checklist and report
Scheduling periodic inspections of HCW treatment and disposal	HCFs In-charge	Availability of HCW treatment and disposal checklist and report

11.0 CHAPTER ELEVEN: STRATEGIC HEALTHCARE WASTE INFORMATION MANAGEMENT

11.1 Documentation and Record Keeping

Each Health facility is required to maintain records of its healthcare waste management. The following information on health care waste shall be documented by each institution to include:

- The particulars of the HCF or commissioned HCWM contractor (name of company, type of license, registration, site of treatment and / or final disposal);
- The date, type, origin and weight of waste generated/ received from other health care facilities (in cases where facilities are shared);
- The means of transportation, type and volume of health care waste transported;
- Treatment and Disposal method in place
- Amount of waste disposed of per day/week/month/Year.
- Signature

NOTE: The NS-MIS data keeping shall be used

11.2 Information Monitoring and Evaluation System

1. Set up an effective data gathering and recording system at each HCF that integrates with the broader HIMS and NS MIS systems

- Set up a data gathering and recording system for identified HCWM indicators in collaboration with national HCWM Focal Person
- Implement the relevant procedures and tools for monitoring at HCF and District levels
- Capacitate CHMTs and QITs unit in conducting HCWM inspections
- Draw up detailed monitoring workplans at Regional, District and HCF levels:
- The first monitoring will be comprehensive, as full as possible to establish the baseline situation.
- Subsequent monitoring will concentrate on gaps and areas that need attention.
- Team'external' monitoring but with full participation by the pilot teams
- Allocate monitoring roles and responsibilities at District and HCF levels
- Plan for the inclusion of indicators into HMIS for testing in pilot
- Consult District HMIS Data Manager
- Align with HMIS system for each facility
- Integrate with HMIS M&E reporting system

2. Adopt monitoring and evaluation systems to ensure compliance of all HCFs with HCWM regulations, standards, guidelines, environmental management systems and quality assurance requirements

- Mandatory monitoring and auditing of HCWM and verify compliance with regulations
- Self-regulatory Environmental Management System for HCFs to mitigate impacts
- Apply procedures for external Audits and quality audits and report back to management
- Apply HCWM procedures for accreditation and star rating of HCFs in Hospital and Health Centre.
- Annual evaluation and environmental management reporting system linked to HMIS reviews Monitoring and evaluation processes embedded in institutional processes/memory

12.0 CHAPTER TWELVE: BUDGET ESTIMATES

Table 7: Budget estimates

Strategic Objective	Activities	Indicative budget Tsh	Source of funds
Priority Area 1:Policy guidelines, Standards and Regulations			
Review and disseminate HCWM policies, Regulations, Guidelines and standards by 2021	Review HCWM policies, Regulations, Guidelines, and standards	300,000,000	MoHCDGEC/WB/ WHO/ CDC
	Print 7,000 copies each of policies, regulations and standards	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Disseminate policies, guidelines, standards and regulations in all regions	200,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct 30 advocacy meetings to decision makers on policies, regulations and standards	300,000,000	MoHCDGEC/WB/ WHO/ CDC
Priority Area 2: Infrastructure, equipment and supplies and treatment and disposal options			
Improve infrastructure, equipment and supplies and treatment and disposal options for HCWM by June 2021	Rehabilitate HCWM storage bays for all regional referral hospitals and district hospitals	450,000,000	MoHCDGEC/WB/ WHO/ CDC
	Scale up non- incineration technologies in all regions and districts	600,000,000	MoHCDGEC/WB/ WHO/ CDC
	Introduce centralized HCW treatment options in all regions	30,000,000	MoHCDGEC/WB/ WHO/ CDC
	Construct standard placenta pits at 30 regional hospitals health facilities	250,000,000	MoHCDGEC/WB/ WHO/ CDC
	Construct waste water treatment system in all regional referral hospitals	300,000,000	MoHCDGEC/WB/ WHO/ CDC
	Construct placenta biogas system in all regional referral hospitals	400,000,000	MoHCDGEC/WB/ WHO/ CDC
	Promote best affordable environmental technologies for all rural healthcare facilities	200,000,000	MoHCDGEC/WB/ WHO/ CDC
Increase accessibility of equipment and supplies for HCWM by June 2021	Procure 30 standard trucks for healthcare waste management at all regions	0	MoHCDGEC/WB/ WHO/ CDC
	Procure standard colour coded waste bins and bin liners for HCWM in HCFs	400,000,000	MoHCDGEC/WB/ WHO/ CDC

Strategic Objective	Activities	Indicative budget Tsh	Source of funds
	Procure at least 1 standard truck for HCWM for each district hospitals	0	MoHCDGEC/WB/ WHO/ CDC
	Sensitize all National, Zonal, Specialized and councils hospitals to procure essential supplies for HCWM	50,000,000	MoHCDGEC/WB/ WHO/ CDC
Priority Area 3: Institution Capacity			
Strengthen the institution capacity on HCWM by 2021	Conduct needs assessment for HCWM in all zones	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Review HCWM training curricula for pre service personnel	100,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct training on HCWM to in-service personnel short course	200,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct supportive supervision on HCWM in all regions	200,000,000	MoHCDGEC/WB/ WHO/ CDC
	Develop and run short courses in HCWM to healthcare workers	100,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct training to healthcare workers on infection prevention and control in all districts	200,000,000	MoHCDGEC/WB/ WHO/ CDC
	Enhance collaboration among institutions dealing with HCWM	10,000,000	MoHCDGEC/WB/ WHO/ CDC
	Carry out periodic inspections of HCW handling and practices in all HCFs	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Promote Landscaping and beautification of all HCFs by 2021	50,000,000	MoHCDGEC/WB/ WHO/ CDC
Priority Area 4: Awareness and commitment among decision makers			
Conduct advocacy to raise awareness and commitment among decision makers in HCWM by 2021	Identify priority issues to communicate regarding safe HCWM	30,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct advocacy to decision makers.	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Develop HCWM communication package/ tools	50,000,000	MoHCDGEC/WB/ WHO/ CDC

Strategic Objective	Activities	Indicative budget Tsh	Source of funds
	Disseminate and distribute IEC materials to public places and HCFs	50,000,000	MoHCDGEC/WB/ WHO/ CDC
Priority Area 5: Resources for HCWM			
Provide adequate resources for efficiency in HCWM by 2021	Conduct sensitisation meetings to stakeholders in all zones	60,000,000	MoHCDGEC/WB/ WHO/ CDC
			MoHCDGEC/WB/ WHO/ CDC
	Conduct advocacy meetings for HCWM agenda with stakeholders at all levels	20,000,000	MoHCDGEC/WB/ WHO/ CDC
	Dissemination of HCWM Plan of Action	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Fund raising meeting for HCWM interventions	0	MoHCDGEC/WB/ WHO/ CDC
	Conduct social marketing for recyclable materials from HCF	0	MoHCDGEC/WB/ WHO/ CDC
Priority Area 6: Best Environmental Practices			
Promote best practices on HCWM stream by 2021	conduct orientation through demonstration of best practices to HCF in all zones	0	MoHCDGEC/WB/ WHO/ CDC
	mapping of best practices on HCWM in public and private health facilities	20,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct experience sharing on HCWM among HCF.	20,000,000	MoHCDGEC/WB/ WHO/ CDC
	conduct best practice competition on HCWM to health facilities	60,000,000	MoHCDGEC/WB/ WHO/ CDC
	Development of IEC materials	30,000,000	MoHCDGEC/WB/ WHO/ CDC
	Institute vector control measures in all HCFs	30,000,000	MoHCDGEC/WB/ WHO/ CDC
	Promote Water, sanitation and hygiene measures in all HCFs	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct cleanliness completion among P&P health facilities	80,000,000	MoHCDGEC/WB/ WHO/ CDC

Strategic Objective	Activities	Indicative budget Tsh	Source of funds
Priority Area 7: Public Private Partnership			
Promotion of PPP in HCWM by 2021.	Utilize effectively PPP on technical and financial resources to improved HCWM	0	MoHCDGEC/WB/ WHO/ CDC
	Promote collaboration with the private HCFs and other private health service providers	0	MoHCDGEC/WB/ WHO/ CDC
	Conduct supportive supervision and monitoring.	100,000,000	MoHCDGEC/WB/ WHO/ CDC
Priority Area 8: Monitoring, Evaluation and Operational research (OR)			
Conduct operational research on HCWM by 2021	Identify operational problems and develop research agenda on HCWM	90,000,000	MoHCDGEC/WB/ WHO/ CDC
	Promote collaboration with research and training institutions	5,000,000	MoHCDGEC/WB/ WHO/ CDC
	Carry out operational research	50,000,000	MoHCDGEC/WB/ WHO/ CDC
Strengthen monitoring and evaluation system for HCWM by 2021	Conduct baseline assessment for HCWM country wide	70,000,000	MoHCDGEC/WB/ WHO/ CDC
	Develop HCWM data management registers	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Conduct training sessions on data management registers to all healthcare workers	60,000,000	MoHCDGEC/WB/ WHO/ CDC
	Appoint data managers for monitoring of HCWM information system in all HCFs	0	MoHCDGEC/WB/ WHO/ CDC
	Operationalize NS-MIS for HCWM parameters	50,000,000	MoHCDGEC/WB/ WHO/ CDC
	Integrate HCWM data into the national HMIS	50,000,000	MoHCDGEC/WB/ WHO/ CDC
GRAND TOTAL		**6,600,000,000**	