THE UNITED REPUBLIC OF TANZANIA

NATIONAL AUDIT OFFICE

PERFROMANCE AUDIT REPORT ON ELECTRONIC WASTE MANAGEMENT

VICE PRESIDENT'S OFFICE, DIVISION OF ENVIRONMENT AND PRESIDENT'S OFFICE-REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT AUTHORITIES

A REPORT OF THE CONTROLLER AND AUDITOR GENERAL

March 2018

THE UNITED REPUBLIC OF TANZANIA

NATIONAL AUDIT OFFICE

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PREFACE

Section 28 of the Public Audit Act No. 11 of 2008, authorizes the Controller and Auditor General to carry out Performance Audit (Value-for-Money Audit) for the purposes of establishing the economy, efficiency and effectiveness of any public expenditure or use of public resources in the MDAs, Local Government Authorities (LGAs) and Public Authorities and other Bodies which involves enquiring, examining, investigating and reporting, as deemed necessary under the circumstances.

I have the honour to submit to His Excellency, the President of the United Republic of Tanzania, Dr. John J.P. Magufuli and through him to the Parliament of Tanzania a Performance Audit Report on Management of Electronic Waste in Tanzania.

This report contains conclusions and recommendations that directly concern the Ministry for State, Vice President's Office (Division of Environment)(VPO-DoE) as well as the President's Office Regional Administration and Local Government (PORALG). These ministries were given the opportunity to scrutinize the factual contents and comments on the draft report. I wish to acknowledge that discussions with the two audited entities (VPO-DoE and PORALG) were very useful and constructive. My office intends to carry out a follow-up at an appropriate time regarding actions taken by the VPO-DoE and PORALG on the recommendations in this report.

In completion of the assignment, the office subjected the report to the critical reviews of the following experts namely Prof. Rubhera Mato and Ms. Anne Magashi who came up with useful inputs in improving this report.

This report has been prepared by Ms. Rebecca S. Mahenge (Team Leader) and Mr. Pendael Ulanga (Team Member) under supervision and guidance of Michael Malabeja (Supervisor), Eng. James Pilly Assistant Auditor General and Ms. Wendy Massoy – Deputy Auditor General. I would like to thank my staff for their inputs in preparing this report. My thanks should also be extended to the audited entities for their fruitful interactions with my office.

Prof. Mussa Juma Assad,
Controller and Auditor General,
Dar es Salaam.
28th March 2018

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ACRONYMS AND ABREVIATION

AECO	East Africa Communication Organization
INTOSAI	International Organization for Supreme Institutions
UNIDO	United Nations International Development Organisation
TCRA	Tanzania Communication Regulatory Authority
PVC	Polyvinyl Chloride
BFR	Brominated Frame Retardants
VPO	Vice President Office
PORALG	President's Office Regional Administration and Local Government
NEMC	National Environmental Management Council
LGAs	Local Government Authorities
RS	Regional Secretariat
VPO-DoE	Vice President Division of Environment
ISSAI	International Standards for Supreme Audit Institutions
NEAP	National Environment Action Plan
UNEP	United Nations Environment Programme
CBOs	Community Based Organisations
PPGs	Personal Protective Gears
MUST	Mbeya University of Science and Technology
NSC	National Sanitation Campaign

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EXECUTIVE SUMMARY

In recent years there has been rapid increase of electronic equipment use in the country. Tanzania Communication Regulatory Authority (TCRA) Statistics of 2013 estimated the country to have 29 million registered mobile phones. In June 2016, about 603,000 fake mobile phones were switched off and most of these phones ended up being e-waste. Also, the Guidelines for Management of Hazardous Waste of June 2013 estimated that e-waste generated in the country was in the range of 18,000–33,000 tonnes of computers each year. The Increase of e-waste have been attributed by the influx of electronic products particularly computers and its peripherals, mobile phones, television sets, and data operation equipment.

The influx caught the public and private sectors unprepared on how to safely dispose them without destroying the environment and threatening people's health. This has eventually left dilapidated and out of use electronic products unsafely attended or disposed of in the landfills and dumpsites being mixed with other municipal waste.

The Ministry of State, Union Affairs and Environment - Vice President Office Division of Environment (VPO-DoE) and President's Office Regional Administration and Local Government (PORALG) were responsible for appropriate disposal of e-waste for maintaining safe environment and human health in the country.

Lack of e-waste management system, increased debates among environmental experts, NGOs, the Parliament and the general public requiring proper way on management of e-waste in the country, this prompted the Controller and Auditor General to carry out a performance audit on how the government manages the electronic waste.

The Audit focused on assessing whether (VPO-DoE) and (PORALG) had financial and human capacity in waste management, strategies and targets, as well as coordination, monitoring and evaluation plans towards minimizing or managing e-waste in the country. Main audited entities were the VPO-DoE and PORALG. Also, data were collected from other government entities. These were NEMC headquarters, four Regional Secretariat Offices, three Municipal Councils and four City councils. Four private waste collectors and one e-waste dealer were also visited for data collection. The audit covered the period of four financial years (2013/2014-2016/2017).

Findings revealed that despite continuous efforts by the Government to improve the state of environment in the country, it has failed to effectively manage the e-waste.

Audit Conclusion

The government's failure to manage e-waste was attributed by to none existence of legal and institutional framework as well as regulations specifically to support e-waste management. Similarly, there were no specific strategies for minimization of e-waste. Consequently, NEMC and LGAs' capacity in dealing with e-waste is not efficient and effective

There was limited e-waste information sharing among various stakeholders because NEMC had not established a formal system for that. Moreover, there was no effective system for monitoring e-waste activities.

Recommendations

The VPO-DoE should ensure that e-waste guiding tools are approved, made available and implemented. Likewise, in both NEMC's and LGAs Offices there should be specific staff to deal with e-waste and given priority for training in e-waste management.

Moreover, VPO and PO-RALG should ensure that, NEMC and LGAs map up the informal e-waste dealers and develop a database for easy management of their operations and easy tracking of e-waste generation, collection, transportation and disposal.

VPO-DoE should ensure that:

- each LGA establishes e-waste disposal centers and take back systems and develop a bylaw which require for proper e-waste disposal.
- NEMC consider adopting EACO-regional e-waste management strategy and develop targets and plans to achieve zero negative impact of e-waste by 2030

As far as Coordination of e-waste issues among stakeholders are concerned:

- PORALG should establish environmental function or appoint environmental officers at the Regional Secretariat level;
- VPO DoE should ensure that NEMC establishes and operates a central information system for sharing information among stakeholders.
- VPO DoE should ensure that NEMC updates the inspection manual to include e-waste issues.
- PORALG should ensure that LGAS have a clause in the environmental by-laws that addresses e-waste management and minimization activities.

CHAPTER ONE:

INTRODUCTION

1.1 Background

Electronic waste is a complex mixture of hazardous and non-hazardous waste, which consists of recoverable items (like Gold and copper) of economic value[1]. The Hazardous Waste Control and Management Regulations of 2009 also categorize electronic waste as a hazardous waste which are harmful to human health and environment if not properly managed or handled.

E-waste continues to grow at an annual rate of about five (5) per cent globally[2]. The report, released by StEP Initiative in 2012, indicated that 50 million tons of e-waste was generated worldwide. This was about 6.8 Kg for every person on the planet. China and USA were found to be the biggest contributors to global e-waste generation. The study further predicted that, the volume of e-Waste was expected to increase by 33% by 2017 and reach 65.4 million tons worldwide per annum.

Lack of a sustainable e-waste management infrastructure in most of Sub-Saharan countries resulted to e-waste being collected and recycled using crude methods. In 2014, Africa was reported to generate 1.9 Mega tons of e-waste. This equalled to generated 1.7 kilograms of e-waste per inhabitant annually[3].This means that most of the generated e-waste was stored in households, treated or dumped to land fill or informal dumpsite. This created a pace for release of harmful toxic chemicals into the environment and human health[4]

E-waste amount is largely unknown in Tanzania. Based on the Cleaner Production Centre of Tanzania (CPCT) 2011, projected amount of e-waste generated from computers alone was about 2,300 tonnes annually, making up about 7-13% of total weight of the EEE[5]. Also, crude estimate indicates that e-waste generated range between 18,000 and 33,000 tonnes annually[6].

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[1]UNEP (2007), E-waste volume II.
[2]UNU, Step Initiative 2015,E-waste Prevention, Take-back System Design and Policy Approaches
[3] UNU, step initiative. Global e-waste monitor
[4] UNU, Step Initiative 2015,E-waste Prevention, Take-back System Design and Policy Approaches
[5] URT-Apostate of environment report, 2014
[6] United Republic of Tanzania. Vice President's Office. Division of Environment. Guidelines for Management of Hazardous Waste. June 2013, p. 12.

Tanzania Communication Regulatory Authority (TCRA) Statistics of 2013 revealed that there were 29 million registered mobile phones and in June 2016, about 603,000 fake mobile phones were switched off[7]. A question can be asked where and how such phones were disposed off. In the fact of the matter is the phones ended up being e-waste products.

Similarly, uncontrolled importation of used and substandard electronic products played a significant role in escalating the volume of e-waste due to their relatively short lifespan and some of them being sub-standard, near-end-of-life or non-functional[8].This was an alarming sign that there was a risk of spreading toxic materials (mercury, lead, sulphur, lead-acid batteries, and cadmium) contained in mismanaged or mishandled mobile phones and other electronic equipment which are out of use.

1.2 Motivation

Electronic equipment (mobile phones, printers, photocopiers laptops, televisions, radios) were being used to large extent in Tanzania. They became electronic waste when found to be unacceptable for human use as per the existing regulations guiding electronic equipment. At this stage they were to be refurbished, recycled, treated or disposed off accordingly.

Similarly, E-waste equipment as contain hazardous (toxic or dangerous) materials calls for not dumping them with other municipal waste. These hazardous substances had negative impacts on human health and environments **(**refer **Appendix 1).** This means that, if e-waste were handled in a good manner they could be less harmful to human health and environment. However, there was no framework guiding how e-waste could be managed.

Moreover, Lack of e-waste management system, increased debates among environmental experts, NGOs, the Parliament and the general public requiring proper way on management of e-waste in the country, this prompted the Controllers and Auditor General to carry out a performance audit to assess whether the responsible ministries and departments effectively manage the e-waste.

[7]http://www.thecitizen.co.tz/News/TCRA-switches-off-600-000-fake-phones/-/1840340/3255138/-/7bqokm/-/index.html
[8] URT-VPO, State of Environment Report, 2014

1.3 Audit design

1.3.1 Main Audit Objective

The main objective of the Audit was to assess whether the Vice President Office Division of Environment (VPO-DoE) and President Office Regional Secretariat and Local Government Authority (PORALG) effectively manage e-waste in the country. In order to address the set audit objective, the audit was guided by four (4) audit questions as follows:

a) Do NEMC and LGAs have adequate capacity to manage e-waste?
b) What strategies, plans and targets do VPO and PORALG have regarding e-waste management?
c) Do relevant agencies and stakeholders effectively coordinate their activities regarding e-waste? and
d) How do VPO and PORALG adequately monitor and evaluate e-waste management activities?

The detailed sub-audit questions are shown in **Appendix 2.**

1.3.2 Audit Scope and Methodology

The main audited entities were Ministry for State, Vice President's Office-Union and environment (VPO-DoE), and The President's Office Regional Administration and Local Government (PO-RALG). VPO was included in the audit because it was responsible for management of environment and the producer of all legal framework guiding e-waste management in the country. PO-RALG was included in the audit because it was responsible for overseeing operation of LGAs which were the sole implementer of legislation developed by VPO regarding e-waste management for safe human health and environment.

Although much of the discussions pertaining to e-waste are covered in the Ministry of health, this audit report does not include views from Ministry for Health Community Development Elders and Children (MoHCDEC). This is because of the distinctive characteristics of health issues in connection to e-waste. Therefore, the management have decided that, because of their distinctive characteristics the new audit solely covering ministry of health in relation to management of e-waste be done in the future.

Data were collected from e-waste management stakeholders including, National Environmental Management Council (NEMC) and Tanzania Communication Regulatory Agency (TCRA). Also, four city councils and three Municipal Councils were visited for data collection. These were;

Tanga, Arusha, Mbeya, Mwanza and Kinondoni, Ilala and Temeke respectively.

The city councils were included in the audit because they generate bulk of e-waste due to their high population and presence of multiple economic activities such as industrial activities and business centres. The three municipal councils were included in the audit because they were among five councils that formed the Dar es Salaam city with high population and most economic activities taking place, and thus huge amount of e-waste generation

The Audit examined the financial and human resources capacity, strategies and targets, coordination, monitoring and evaluations plans put in place by the auditee regarding minimization or managing electronic waste in the country. The audit did not focus on the control mechanisms for imported used electronic products as they contributed to amount of e-waste generation due to limited time and resources.

The audit covered the period of four (4) fiscal years, from 2013/14 to 2016/2017.The period was chosen to portray the things which happened in these LGA, and MDAs.

1.3.3 Methods of data collection and analysis

The following methods were used by the audit team during data collection:

Interviews

Interviews were conducted with VPO, PO-RALG, NEMC, and RS and selected LGAs (Municipal and City Councils) Officials responsible for Environmental Management. The Officials from the said offices were interviewed in order to confirm or clarify information from the documents reviewed. Also, interviews were carried out to get the views and opinions of actors in regard to e-waste management in the country. The list of Officials interviewed is shown in **Appendix 3**

Document Review

Various documents were reviewed regarding to various actors' capacity, strategies, coordination, monitoring and evaluation of e-waste minimization and or Management. The documents were mainly reviewed to identify the goals and targets set, see whether they were implemented as planned and to ascertain whether the implemented targets met the goals and objectives toward minimizing and managing e-waste. The list of documents reviewed together with the purpose of reviewing each document has been shown in **Appendix 4**.

Observations

The audit team visited dump sites and landfills with the purpose of having an auditor's eye insight about the e-waste disposal facilities and thorough comparison between actual condition and requirements.

1.3.4 Data Analysis

Qualitative data were analysed using content analysis descriptive statistical methods. The quantitative data were analysed using excel sheet and analysed data were presented in tables, charts and graphs.

1.4 Assessment Criteria

The audit criteria that were used to measure performance were derived from policies, Acts, Regulations, guidelines, VPO-DoE and PO-RALG strategic and action plans service agreements between the Government, private and international agreement for fiscal years 2013/2014, 2014/2015, 2015/2016, and 2016/2017 on management of hazardous waste. The criteria used for the audit are summarized in the **Appendix 5.**

1.5 Data Validation

The Vice President's Office –Division of Environment (VPO-DoE) and President's Office-Regional Administration and Local Government (PO-RALG) as the main auditee were given an opportunity to read a draft report for factual clearance.

1.6 Audit Standards

The audit was done in accordance with ISSAI and INTOSAI standards. These standards require that; the auditing is planned and performed to obtain sufficient and appropriate evidence to provide a reasonable basis for the findings and conclusions based on the audit objectives. It is believed that, according to the audit objectives, the evidence obtained provide a reasonable basis for the finding and conclusions.

1.7 Content and Structure of the Report

The remaining part of this report is presented as follows:

Chapter two presents the legal and Institutional framework governing e-waste management, describing various actors as well as the process involved in e-waste management; **Chapter Three** presents findings of

the audit; **Chapter Four** provides conclusion of the audit; and **Chapter Five** provides recommendations directed to different actors involved in the management of electronic waste based on the findings.

CHAPTER TWO

LEGAL FRAMEWORK, INSTITUTIONAL ARRANGEMENTS AND PROCESS IN E-WASTE MANAGEMENT

2.1 Introduction

This chapter describes legal framework, institutional arrangements and process in e-waste management. It provides information on the role of Government entities as well as other stakeholders on e-waste management. Details on the system and processes regarding e-waste management are also provided in this chapter.

2.2 Legal framework

Management of e-waste in the country is legally governed by policies, Acts, regulations and guidelines which guide the general environment and hazardous waste in the country. Key legal documents governing (e-waste inclusive) environmental management are explained in subsequent sections below.

The National Environmental Policy of 1997

The policy provides for different initiatives taken by the Government towards environmental management. These initiatives include: environmental policy; legislations, institutional framework, multilateral and regional environmental agreements. Likewise, the policy provides the state of environment in the country based on different social-economic activities which for some reasons affect the environment in the urban and rural areas of the country.

Environmental Management Act, 2004

The Act provides an administration and institutional arrangement for environmental management issues. It also describes roles, responsibilities and the functions of key players in protecting the environment for national interest. It also directs Local Government Authorities to ensure enforcement of the Act, and the powers necessary to minimize hazardous waste and promote environmental public awareness in their areas of jurisdiction. The Act requires each LGA to ensure that standards prescribed for hazardous waste management (e-waste inclusive) are in place and operational always. The act requires LGAs, to provide periodic reports on the state of their environment and to have proper dumping sites for the final disposal of waste.

Hazardous Waste Control and Management Regulations (2009)

The Regulations consider electronic waste as hazardous waste, and thus emphasises for proper handling of all types of hazardous materials which are harmful when in contact with humans or environment. The regulations also require the hazardous waste to be guided by principles of environment. In addition, the regulations place responsibility to the hazardous waste generator for the sound management and disposal of such waste and that shall be liable for damage to the environment and human health arising thereby.

The Environmental Impact Assessment and Audit regulations, 2005

The regulations require all projects related to e-waste recycling, refurbishing, and dismantling be subjected to full Environmental Impact Assessment. Equally, the regulations require companies and e-waste processing plants to conduct an annual compliance audit.

Guidelines on Managing Hazardous Waste (2013)

The guidelines provide guidance for environmentally sound management of hazardous waste (E-waste inclusive) in the country. Specifically, the guidelines elaborate the legal requirements and administrative procedure for handling the transportation, and disposal of hazardous waste as provided in the Environmental Management (Hazardous Waste Control and Management) Regulations, 2009. Furthermore, the guidelines provide responsibility to LGAs to inform relevant authorities in case of spillage, leakage or other accidents during transportation, and how to separate and store hazardous waste.

National Environmental Action Plan (NEAP) 2013-2018

The plan identifies priority areas for actions, expected output, timeframe, key actors, and indicators for tracking progress on e-waste management. Some of the NEAP's priorities[9] for the management of electronic equipment and their waste include;

i) LGAs to implement standards and guidelines for e-waste;
ii) LGAs to conduct an inventory and developing a database of electronic equipment and waste generated by the equipment; and
iii) Compliance with the legislation related to the management of electronic equipment and waste generated by the equipment.

[9]United Republic of Tanzania. Vice President`s Office. National Environmental Action Plan (NEAP) 2013–2018. Implementation Plan for NEAP, pp. 45-46.

2.3 Key Stakeholders' Responsibilities in E-Waste Management

This section describes the roles of key stakeholders in three key steps of e-waste management.

Vice Presidents' Office- Division of Environment (VPO-DoE)

The Audit team found that the VPO-DoE had the following responsibilities.

Developing policies and legislations for handling hazardous waste.
Reviewing the quotation with the view of assessing the capacity of the dealers and providing permit for collection, transporting and storing of e-waste if satisfied by the capacity of the dealers

Grants permits for transporting hazardous waste within or outside the country (trans-boundary) and ensure that hazardous waste management is designed to derive maximum benefit at minimum cost. Equally, **VPO-DoE** monitors the trans-boundary movement of hazardous waste Tanzania mainland.

VPO is responsible for ensuring that Environmental Impact Assessment is carried out before hazardous waste is disposed of into soil, land, air or body of water.

President's Office Regional Administration and Local Government (PORALG)

PORALG is responsible for ensuring harmonized mechanism of dealing with different policies, approaches and methodologies to improve efficiency in managing e- waste. It ensures that LGAs provide permit to e-waste management dealers with appropriate capacity. Similarly, the **PORALG** receives, reviews and scrutinizes the LGAs' progress reports submitted by Regional Secretariat

The National Environment Management Council (NEMC)

NEMC is responsible for enforcing environmental quality standards for the management of hazardous waste. It equally, monitors safety and impacts on human health and environmental hazardous waste and other waste. It also regulates disposal of hazardous waste and sites contaminated with hazardous waste. Not only that but also NEMC conducts inspection to assess the environmental compliance

Local Government Authorities (LGAs)

LGAs are responsible for commissioning electronic waste contractors with responsibility to handle electronic waste over the area specified by a LGA[10].Conducting an inventory and developing a database of electronic equipment and their waste. LGAs provide public awareness and education on hazardous waste management. They also ensure that standards and procedure prescribed for the hazardous waste management are in place and operational at all the time. Likewise, LGAs monitor day to day e-waste activities done by e-waste dealer, and ensuring that persons who handle electronic waste are supplied with protective gears, trained in safe handling and equipped with waste handling equipment

LGAs also ensure that all types of waste are classified depending on whether it is organic, plastics, glass or metals. Furthermore, LGAs receive reviews and scrutinizes operation reports submitted by the e-waste dealers and provide feedback to waste dealers regarding the reports submitted. Moreover, LGAs conduct supervision to the dealers by visiting collection and dumping points on daily or weekly basis and prepares quarterly progress reports and submit to Regional Secretary.

The detailed roles of key and other (TCRA, RS and E-waste dealers) stakeholders for each step of e-waste management process are presented in **Appendix6**.

2.4 Electronic Waste Management Process

E-waste is comprised of the materials which are hazardous in nature. E-waste process can cause pollution to the environment and risk to human health if not properly handled. Thus, it has to be carried out in an environmental friendly way, which is the exact reason e-waste should be given to the authorized e-waste management firms, instead of selling it to random vendors or buyers. The following are steps involved in handling e-waste

Step1: Obtaining the permit to deal with e-waste

The company that wants to deal with e-waste has to; collect information about the type and amount of e-waste along with their location. Thereafter, the Company has to send a quotation to the relevant authority, seeking for permission to do the work.

After the proper analysis and calculation in the time and efforts

[10]Hazardous waste control and management regulation of 2009

needed, the company sends the quotation to VPO or NEMC who either approves or do not approve the quotation. Once the approval is given, the company visit the place to collect e-waste be it residential or commercial buildings to collect e-waste material.

Step 2: Collecting and transporting e-waste materials

After obtaining the permit, the company collects the waste materials, makes use of transportation services and sends them to factory premises or dump on landfills or any identified disposal sites.

Step 3: Sorting and disposing e-waste materials

When the e-waste items arrive at the recycling plants or disposal point, the first step involves is sorting all the items manually. After sorting by hand, the second step is dismantling process and categorizing into core materials and components. The dismantled items are then separated into various categories or parts that can be re-used or continue in the recycling processes. Items that cannot be dismantled are shredded together with the other dismantled parts to pieces less than 2 inches in diameter. This is done in preparation for further categorization of the finer e-waste pieces.

Metals and non-metallic components are separated. Copper, aluminium, and brass are separated from the debris to only leave behind non-metallic materials.

The metals are either sold as raw materials or re-used for fresh manufacture. By use water separation, plastic content is separated from glass. Once separated, all the materials retrieved can then be resold as raw materials for re-use. The products sold include plastic, glass, copper, iron, steel, shredded circuit boards, and valuable metal mix[11].A summary of the process for electronic waste is diagrammatically shown in **Appendix 7**.

[11]http://www.conserve-energy-future.com/e-waste-recycling-process.php

CHAPTER THREE

FINDINGS

3.1 Introduction

This chapter presents findings on how VPO-DoE and PORALG manage e-waste in the country. It describes the capacity of NEMC and LGAs for managing e-waste; strategies adopted by VPO towards minimization and management of e-waste; and coordination of e-waste related issues among key stakeholders and agencies. In addition, monitoring and evaluations of e-waste issues in the country are also explained in this chapter

3.2 NEMC and LGAs' capacity to manage e-waste in the country

3.2.1 Inadequate Legal and Institutional Frameworks for supporting e-Waste management

The regulations of hazardous waste control and management of 2009 require VPO to provide policy direction in matters pertaining to hazardous waste (e-waste inclusive) and develop guidelines for handling of hazardous waste. According to interview with official from VPO and NEMC it was revealed that, e-waste was unique waste stream as it contained both hazardous and valuable materials, and its management provided business opportunities to the community which called for different management ways from other hazardous waste.

A review of legal framework managing hazardous as well as interviews with officials from VPO and NEMC revealed that, Mechanisms to support sustainable growth of e-waste management was still lacking and the existing legal and institutional framework did not fully support effective management of e-waste. Management of e-waste at the time of this report was considered as a sub-set under the hazardous waste control and management regulations.

VPO in collaboration with other stakeholders such as TCRA drafted policy, bill, regulations and guidelines to guide e-waste management. However, these documents had not yet been approved, therefore not operational since 2013.The preparation of these e-waste working instruments was not participatory; for example, Interviews with VPO Officials revealed that, Legal officers at the VPO were not involved in the drafting of the regulations.

The work of drafting the regulations was left to counterpart partner which is TCRA. Therefore, he drafted documents were found not to fully fit the need for e-waste management. In addition, the developed draft policy, regulations and guidelines, were found to overlap with

the existing regulations for the management of the hazardous waste. Such weakness led to the delay for the approval of these e-waste working instrument since 2013.

Similarly, lack of guidelines to manage e-waste in the country resulted into increased risk of several health and environmental problems. Moreover, there was limited provision of comprehensive guidance for effective management of e-waste through appropriate legal, regulatory instruments. This effect was also manifested in the LGAs visited; e-waste items were not reflected in LGAs' environmental by-laws.

The audit team reviewed the environmental by-laws of the visited LGAs (Mbeya, Tanga, Arusha, Mwanza City Councils and Kinondoni, Ilala and Temeke Municipal Councils) to find out if the LGAs addressed issues of e-waste in their by-laws. The audit found that-waste issues were not addressed in the Council by-laws and thus the Councils had no tool for enforcing the management of e-waste. In this regard, the collection, transporting, dismantling, re-uses and disposal of existing e-waste to a large extent were not guided by law.

This implies that e-waste management related issues were not adequately prioritised by LGAs. Interviewed LGAs' officers acknowledged that, e-waste was handled as other general municipal waste. As the result, the hazardous substances contained in e-waste mixed together with municipal waste were dumped in dumpsite or landfill which threatened human health and environment due to leachate produced.

3.2.2 Non- allocation of Funds for e-waste activities

The Tanzania National Five-Year Development Plan 2016/17 – 2020/21 requires global and regional agreements to be mainstreamed into national development planning and implementation frameworks. UNEP developed a framework for e-waste funding model from generation to disposal as well as the model for take back system. The framework was supposed to be adopted by all UNEP member countries. Tanzania as a member country of UNEP was expected to adopt and mainstream e-waste issues in the national environmental plans.

Interviews with officials from NEMC and seven visited LGAs indicated that, funds for e-waste activities were not included in annual budgets. Review of 2013/2014-2016/2017 annual budgets from NEMC and the seven visited LGAs revealed that, for the period under the audit, NEMC and the six LGAs did not allocate funds for e-waste related activities.

Mbeya City Council allocated TZS 2.7 million out of 227.8 million in

2016/2017[12] financial year. The allocated funds were for identifying e-waste dealers (repairs, and dismantlers). Yet, the amount allocated was not approved. According to Mbeya City Council Environmental Officials, this was because e-waste was given low priority in the Council budget. Likewise, the budget approval authorities did not consider the importance of e-waste management in human health.

Lack of universal waste funding model led to four different waste (funding model)[13]used by LGAs. During interviews with seven visited LGAs Officials it was revealed that, each model used was fully responsible for financing waste activities by collected revenues from waste generators. The model included Ward Development Committee, private Contractors; Community based Organizations (CBOs) and LGAs themselves.

Furthermore, the audit team visited private contractors and CBOs dealing with collection and transporting municipal waste (e-waste inclusive) and noted that, each model was responsible for handling waste from collection to disposal. **Table 3.1**below shows each model used by the LGAs for waste (e-waste inclusive).

Table 3.1: Different municipal waste/e-waste management Model used by LGAs

E-waste Management Model[14] (s)	Number of LGAs using the model	LGAs using model
Contractors outsources for collection, transport and disposal	3	Kinondoni, Ilala and Temeke Municipal Councils
LGA itself	1	Tanga City
Combined Contractors and CBOs	1	Arusha City
Combined LGA and Contractor	1	Mwanza City
Combined LGA and Ward Development committee	1	Mbeya City

Source: Auditors analysis

From **Table 3.1,**three out of seven visited LGAs applied one model of outsourcing contractors because LGAs failed to collect, transport and disposal of waste due to lack of resources. Other three management models were used in line with any other model. The difference in management model was due to lack of universal model for waste management which led to LGAs to have its own way of funding.

[12] Mbeya City Council, 2016/2017 budget for department of environment

13 Collection of waste revenue generated from waste generators and financing waste management activities.

[14] Collection, transport, storage and disposal/treatment

Interview with LGAs official acknowledged the management model was only for municipal waste and did not accommodate e-waste management regardless of its unique risk characteristics.

3.2.3 Lack of Competent Human Resource to manage e-waste Management

E-waste is among the emerging environmental issues. Due to its significance, there is a need to have well trained staff to deal with e-waste in the country. Availability of competent personnel handling e-waste minimizes increasing risks of e-waste impacts.

NEMC and LGAs are required to train staff on e-waste management[15]. However, Findings revealed that NEMC as a government agency responsible for management of e-waste in the country have insufficient number of competent staff to deal with e-waste.

For example, NEMC had five staff were allocated to deal with e-waste related assignments. However, out of five, only two had formal training on e-waste, and attended workshops organized by TCRA and other stakeholders on e-waste. The audit failed to establish the actual number of staff required to deal with e-waste. Because staff establishment document is silent regarding required staff to deal with e-waste.

Audit questionnaires were distributed to seven visited LGAs, NEMC headquarter and three NEMC zonal offices. Analysis of responses revealed that, all seven LGAs and four NEMC offices regarded E-waste as a minor problem compared with other types of waste. Similarly, interviewed Environmental officers from seven LGAs as well as NEMCs' Environmental Management Officer acknowledged that, e-waste treated as a minor problem in NEMC and LGAs.

It was emphasised by interviewed officials that, this is because its negative impacts were not visible to the society. Therefore, staff capacity building on e-waste was given low priority. For instance, it was noted from the reviewed training reports of seven visited LGAs that, in total all LGAs had 78 environmental officers who were trained on management of municipal waste, but training did not cover E-waste related issues.

[15] Guideline for management of hazardous waste of 2013

3.2.4. Inadequate Equipment and Personal Protective Gears for Waste Handlers

E-waste handlers need to be equipped for their Safety and Health. This means that they need appropriate and adequate equipment as well as protective gears to handle waste. Personal Protective Gears (PPGs) would protect the waste handlers against health or safety risks at work. Such PPGs include: safety helmets, gloves, eye protections, high visibility clothing, and respiratory protective equipment (mask) etc.[16].Also, NEP of 1997 requires waste handlers to be supported from environmental health hazards.

The Audit team found that, waste handlers in the visited LGAs were not adequately protected as they were found ready for work without having protective gears. For instance, waste handlers in Mbeya City Council were found to have at least three pairs of (safety boots, overall, safety helmets and gloves)for waste handling while in the other three city councils (Arusha, Tanga and Mwanza) the waste handlers had no protective gears as shown in the **Picture3.1** below.

Picture 3.1 Waste handlers seen ready for work

Picture 3.1a: Waste handlers from Mbeya City Council (Iyela Ward) ready for work

Picture 3.1b: Waste handlers from Tanga City Council without protection gears

Interview with 40 waste handlers in Tanga City Council showed that, 12 of them were initially not provided with the safety gears during their first four months at work.28collectors were given substandard gears, therefore could not stay longer before the safety gears got torn. Interview with Officials and review of the 2014/2015 annual budgets of

[16]www.hse.gov.uk/toolbox/ppe.htm (07/11/2017):11h45

Tanga City Council revealed that, funds for PPGs equipment procurement was not allocated, because most of decision makers gave low priority to e-waste handlers PPGs.

Nevertheless, waste handlers employed by private waste operators were adequately protected. For instance, during interviews with directors from two contractors and three CBOs in Ilala MC, Arusha and Mbeya City Councils as well as site visit made to waste handlers employed by private contractors and CBOs in Mbeya and Arusha City Councils showed that, protection of waste handlers was their key priority as far as waste management operations was concerned. This implies that, waste handlers employed by government were inadequately protected unlike those employed by private waste contractors and CBOs.

Lack of protective gears to waste handlers exposed them to environmental hazardous infection as it was the case to one of waste handlers from Tanga City Council as shown the **Picture 3.2** below.

Picture 3.2: Infected Waste Handler's Skin in Tanga City Council

Source: Picture taken by auditors on December 07, 2017.

The above **Picture**3.2 shows how the waste handler's skin was infected by hazardous e-waste because he was not given PPGs during loading waste. Interviews with infected waste handler, it was revealed that, the infection was from waste leachate during loading waste sacks into waste transportation truck.

3.2.5 Procedure for Equipment and Facilities for Handling E-waste not followed

The site visit made to three private waste collectors contractors and three CBOs in four LGAs (Mbeya, Arusha and Mwanza City Council as well as Ilala Municipal Council) witnessed that, municipal waste collectors (mixed with e-waste) were not following the guidelines for hazardous waste of 2013.The guidelines provide for procedure to be followed in waste management activities. The guidelines also require hazardous material to be stored in containers with cool, dry and well-ventilated conditions; not be stored in the open air; permeable surfaces or base material. Also, the guidelines require the materials to be unambiguously and permanently labelled[17].

However, site visits made to waste collectors noted that; Collection, storage and transportation of e-waste often were done without following procedures.

Furthermore, it was noted during site visits in Mbeya City Council that, the government ministries, departments, agencies and institutions did not follow the procedures for handling e-waste. Findings revealed that Mbeya City Council piled up all electronic equipment which was out of use (photocopiers, computers, printers, telephones) together in the store room as shown in the **Picture 3.3** below. This way of storing out-dated electronic equipment was contrary to the laid down procedures for e-waste management.

Picture 3.3Electronic equipment that are out of use at Mbeya City Council stored in a room (Photo taken by auditors)

[17]Guideline for management of hazardous waste of 2013

Furthermore, the audit team observed the equipment (skip containers, waste transportation truck, street waste bins and motorised three tyre motorbikes) used for collecting and transporting the mixed waste (e-waste and municipal waste). The audit team noted that, the required procedures were not followed and the waste transportation trucks were seen partially or not covered while on the way to dumpsites or landfills. **Picture 3.4** below depicts the waste trucks with mixed waste being partly covered and uncovered and being un-labelled.

During interviews with environmental officers from seven LGAs revealed that, the guideline for hazardous waste management was not communicated to six LGAs. For instance, one (Tanga City Council) out of seven LGAs received the guideline from VPO. As the result, LGAs failed to enforce procedure for handling hazardous waste including e-waste because they did not have an enforcement tool.

Picture 3.4a: Partly covered truck, transporting mixed waste in Arusha City Council

Picture 3.4b: Uncovered truck transporting mixed waste in Tanga City Council

Source: Picture taken by auditors

3.2.6 Lack of Designated Facilities for Disposal of E-waste

The audit team visited four dumpsites in Mbeya, Mwanza, Tanga City Councils and Ilala (Pugu Kinyamwezi dumpsite) and one sanitary land fill in Arusha City Council. In all these Cities found that, there was no designated e-waste facility and led LGAs to mix e-waste with other waste. The team observed e-waste being dumped in the councils' dump sites and sanitary land fill together with municipal waste as shown in **Picture 3.5** below

Picture 3.5: Mixed e-waste with other municipal waste at Temeke illegal dumpsite

Source: Picture taken by Auditors.

Furthermore, operators of hazardous waste disposal sites were required to enclose and secure sites from unauthorized persons and install safety signs indicating the nature of operation carried out[18]. Enclosing dumpsites and landfills was important for avoiding and restricting establishment of permanent residential settlement within dump sites buffer zones. Also, it was important for restricting uncontrolled waste scavengers entering the dumpsite for sorting valuable waste materials.

The audit team made Site visits to Arusha City Council's Sanitary landfill and found that, Arusha City Council had well fenced and secured sanitary land fill. However, safety signs were not yet installed. The remaining LGAs (Mbeya, Tanga, Mwanza city Councils and Dar es Salaam City Councils) did not fence and secure their disposal sites.

During interviews with officials in the six visited LGAs (Mbeya, Tanga and Mwanza City Councils as well as Kinondoni, Ilala and Temeke Municipal Councils), it was revealed that, there were no physical problems to human and environment caused by non-fencing the dump sites and thus the officers did not consider fencing dump sites as key priority. However, the audit team made site visits to four unenclosed dumpsites and found permanent residential settlement within dump sites buffer zones and, uncontrolled scavengers entering the dumpsite for sorting valuable waste materials as shown in **Picture 3.6** below.

[18]Guideline for Management of hazardous waste, 2013

Picture3.6a: Scavengers (goats) in Tanga City Council Dumpsite (Picture taken by Auditors)

Picture 3.6 b: Waste Scavengers (People) in Mwanza City Councils dumpsite sorting valuable wastes materials. (Picture taken by Auditors)

Picture 3.6c: Fenced Sanitary Land fill in Arusha City Council with residential settlement outside the fence. Picture taken by Auditors

Picture 3.7d: Unfenced dumpsite in Tanga City Council with settlements close to the dumpsite. Picture taken by Auditors

3.3 E-waste Management Strategies, Plans and Targets

VPO and PORALG were expected to develope-waste reduction strategies, plans and targets. The essence of these strategies was to provide proper system for measuring activities related to e-waste management. It was also crucial to develop and implement plans to support achievement of the set targets[19]. The following sections give details on the performance of VPO and PORALG on planning for e-waste management:

[19]URP, Vice President Office- Division of Environment (2014), State of environment

3.3.1 Unrealistic Strategies for Minimizing or Managing e-waste

Review of the proposed e-waste management policy of 2012 revealed that, VPO and NEMC's strategies on e-waste minimization and management were unrealistic and ambitious. For example, VPO developed an ambitious strategy of establishing2-4 collection and take back centres for e-waste by 2013[20]. It was found that these centers had not yet been established up to the time of this audit. The review of VPO and NEMC annual budgets and plans of (2013/14 to 2016/2017) revealed that, the establishment of collection centres and take back system were not reflected in.

In 2017 NEMC adopted from EACO regional strategy, a goal to reach zero negative impact of e-waste by 2030.However, a review of three visited NEMC's zonal offices annual action plans and budget of four financial years (2013/14 to 2016/2017) revealed that e-waste related activities were not integrated in the budget.

Like VPO officials, interviewed NEMC officials acknowledged putting low commitment and priority in issues regarding to e-waste. This is because the perception of many was that, e-waste related problems were not visible and hence was given low priority in plans and budget for the four financial years. As the result, NEMC failed to determine how to reach the set target of zero negative impact of e-waste in the country by 2030.

In addition, LGAs did not include e-waste reduction activities in their plans/targets. The reviewed annual plans of seven visited councils of 2013/2014 to 2016/2017, indicated that none of the Councils had targets and plans for sanitation and Hygiene (environmental cleanness), but the component related to e-waste minimization or management was left unattended.

Interviewed LGAs Environmental Officials said that, e-waste was not a major problem for LGAs to include in their plans and budget for waste general waste management activities. They insisted that, sanitation and hygiene had immediate impact to the society, therefore, required immediate plans for intervention. This minimized pace for LGAs to include e-waste reduction in their plans. This means that, non-integration of e-waste related activities in NEMC and LGAs' annual plans could lead to unattended e-waste generation.

3.3.2 Lack of E-waste management plans

LGAs were required by the Environmental policy of 1997 to establish e-

[20] E-waste, policy draft of 2012

waste management plans and local environmental policies and regulations so that e-waste as a hazardous waste is controlled[21].

Review of NEMC headquarters' and seven LGAs' annual action plans and inspection checklists of between (2013/14 to 2016/2017) showed that, issues of e-waste management were excluded. Therefore, NEMC and LGAs implemented plans which did not address all key environmental problems existing in the society. This could be one of the reasons for e-waste handlers to continue operating their activities illegally without the fear of not being caught by the government authorities.

3.3.3 Lack of Formal System for Recording of E-waste Generated, Collected and Disposed

Both LGAs and NEMC were required to monitor the hazardous waste as well as to conduct an inventory and develop a database of electronic waste[22]. Review of environmental management files of seven visited LGAs showed that, all seven LGAs had no records of e-waste generated for the whole period under the audit in their respective areas. The only records available were for the municipal solid waste which was recorded at the dumpsite. For instance, review of progress reports of seven visited LGAs indicated that, for four (4) years there were an estimate of 7.5 million tons of municipal wastes generated and 4.3 million tons collected and transported to the dumpsites and sanitary landfills in seven visited LGAs **(Appendix 8).**

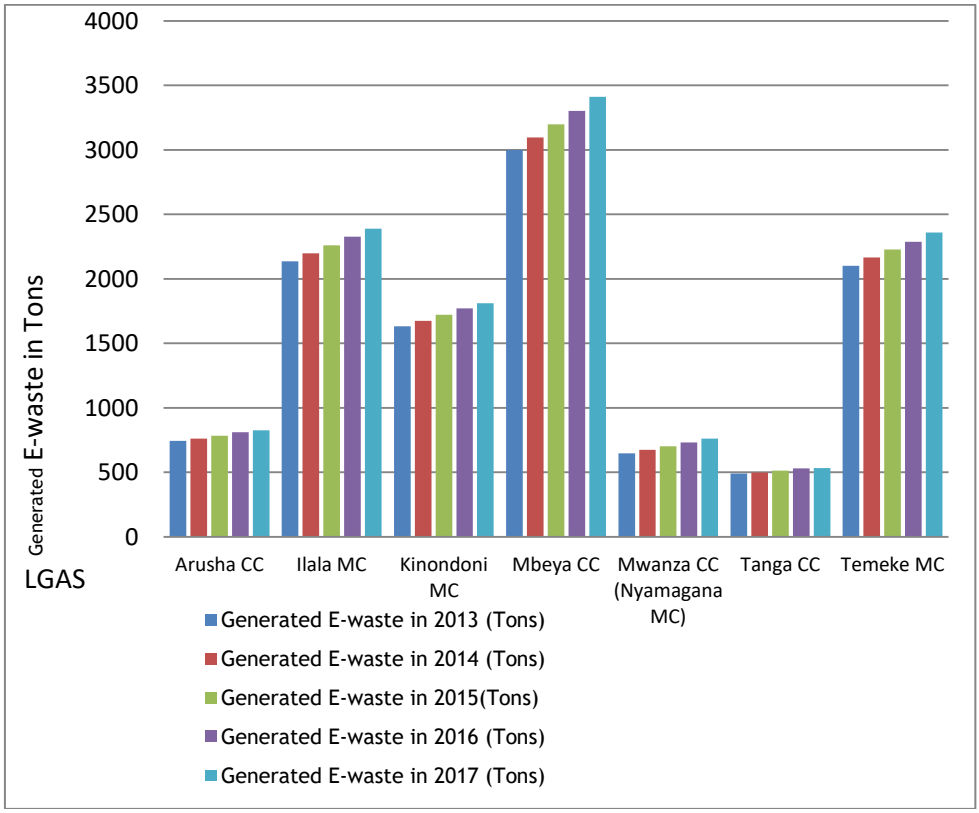
Due to lack of records of e-waste, the estimated quantity of e-waste generated and collected out of the total amount of municipal waste was not known. However, the guideline for management of hazardous waste of June 2013 showed that, a crude estimate provides an indicative amount of e-waste generated in the range of 18-33 thousand tons per annum in the country.

Furthermore, StEP initiative report of 2015 indicated that, in Africa 1.7 kilograms of e-waste per inhabitant was generated annually **(refer appendix 13).** By using the estimated e-waste generated per inhabitant annually, the audit team estimated the generated e-waste from seven visited LGAs in 2013 and 2017as shown in **Figure 3.1** below.

21 Environmental policy of 1997

[22] VPO, Guideline for management of hazardous waste 2013, Hazardous waste control and Management regulation, 2009 and EMA of 2004

Figure 3.1 Estimated E-waste Generated in 2013 and 2017 for Seven LGAs.



Source: StEP Initiative report of 2015 and URT, National Bureau of Statistics, 2016 Tanzania in Figures; June 2017.

From the above **figure 3.1**, there is existence of e-waste generation that increase in each year. For instance, between2013 and 2017 e-waste generation increased in the seven visited LGAs and Mbeya City Council leads in e-waste generation. Also, LGAs (i.e. Kinondoni MC, Ilala MC and Temeke MC) has high increase of e-waste generation by 6 percent. This implies that, the increase of e-waste generation is proportion to the increase in population.

Similarly, the audit team found that LGAs had not conducted e-waste inventory in their areas of jurisdictions. This was because LGAs regarded e-waste as minor problem and was given low priorities. Interviewed officials from VPO, NEMC and LGAs indicated that, low awareness on the impact of e-waste to the environment and the society among the policy and decision makers could also be a cause to e-waste given low priority. As a result, the generated and accumulated e-waste was left unattended in LGAs. Likewise, e-waste generation

increase as population increases. The implication is that, though e-waste status was not known in the country, but there was huge amount generated and unknowingly disposed off.

3.3.4 Inadequate Awareness Creation and Capacity Building to the Public and E-Waste Dealers

The audit team found that there were dumped e-waste containing hazardous substances such as lead, mercury; arsenic, cadmium and selenium. If these substances were not properly handled and disposed off, they could pose threats and risks to human health and the environment. At the same time, effective management of e-waste could allow the recovery of precious metals such as gold, silver, platinum, palladium, copper and tin from disposed components. These precious metals create new business and job opportunities along e-waste management value chain while reducing environmental burden to landfills and dumpsites. Therefore, awareness was required to the public about this issue[23].

NEMC and LGA were required to institute and maintain plan for proactive public awareness raising campaign in environmental and management of hazardous waste[24]. Similarly, VPO and PO-RALG were required to assist local communities become aware of their own situation and support them to become responsible for their own destiny on environmental issues[25].

Review of NEMC headquarters and VPO action plans showed that, VPO awareness campaign conducted focused on environmental conservation and solid waste management but e-waste problems were not covered. Also during interviews with NEMC and VPO Officials it was revealed that, the avenue used to deliver the awareness messages was through major events and national ceremonies such as world environmental day, and peasants' day.

Likewise, the awareness coverage during events focused on highlighting what VPO was doing and not the caution to the public on waste that could harm their health and environment including e-waste. This is because, e-waste issues were not included in the VPO and NEMC plans as issues of priority and importance.

Another mode used by NEMC for awareness campaign was through distribution of brochures. The audit reviewed the planned and released

[23] URT, Mbeya City Council (2016) Environmental Sustainability Action Plan –ESAP. For Electronic Waste (E-waste Management)
[24] Sustainable Industrial Policy of 1996-2020 and Guideline for hazardous management waste, 2013
[25] National Environmental Policy, 1997

budget for promotional materials (brochures, leaflets and fliers) and found that, for three financial years (2014/2015 to 2016/2017, **TZS 53 Million** were disbursed out of the planned budget of **TZS 42** million for the activity. NEMC produced **26800** brochures and distributed **3600(13%)** during the national events of Peasants day held in all NEMC zones and international trade fair held in **(Appendix 9).** The distribution of the brochures was not well planned. This is because NEMC did not have the targeted group to receive the brochures. As the result, the brochure was randomly distributed which made it difficult to assess its effectiveness. This was unwise use of public money (taxpayer's money).

Printed Brochure were not distributed

In 2016/2017 the Government had a campaign for awareness on prohibiting the use of plastic bags. **TZS 46 million** were disbursed for production and distribution of promotional materials. Using these funds NEMC managed to print **23,000** promotional materials including brochures, leaflets and fliers, but before distributing them all, the Government changed its decision and allowed the use of plastic bags. These caused **22,600** promotional materials (brochures inclusive) to remain undistributed. This implies that, there was misuse of public funds for printing materials that were not distributed to the public as planned.

It was revealed during interviews with the NEMC headquarter officials that, national peasant days were used to create public awareness through distribution of brochures. A review of records on NEMC's participation in this event revealed that, for four years, 2013/2014 to 2016/2017 NEMC participated two times, that is (2014/2015 in Dodoma and 2016/2017 in Lindi) and distributed **1700** brochures. In all the brochures, aspects of E-waste or other hazardous waste were missing.

Interviewed NEMC zonal offices officials demonstrated that, awareness was done during the time of inspection in Mining centres and industrial facilities. The targeted group for inspection were the owners of industrial facilities and mining centres and their workers. The audit team noted through interviews and review of inspection reports of NEMC zonal offices that, for years that were under the audit, three NEMC zonal offices conducted inspection to **288** industrial facilities and **677** mining centres **(Appendix 10)**. The interviewed officer acknowledged that the population of the inspected industrial areas and mining centres was not recorded and therefore not known.

A review of 14 inspection reports and seven annual action plans from three NEMC zonal offices did not reflect awareness creation along the inspection activities rather compliance to different environmental

regulations and guidelines. According to interview with NEMC Officials at the Zonal offices, NEMC did not address issues of e-waste because the framework which guided environmental and hazardous waste management did not specifically address e-waste related matters.

3.3.5 Inadequate Awareness Creation and Capacity Building to E-Waste Dealers by LGAs

The audit team interviewed six different people[26] dealing with E-waste in the selected LGAs. The interview revealed that, they all needed to be informed about the side effect of e-waste by LGAs in order to realize the effects of e-waste they are dealing with and how to handle the equipment for minimization of side effects to their human health and environment. Interviewed visited LGAs' Environmental Officers acknowledged that, LGAs responsible for informing electronic equipment craftsmen to realize the effect of e-waste.

Interview with Environmental Officers in each of the seven visited LGAs revealed that, no capacity building was conducted to the dealers of e-waste, municipal waste contractors, scrap metals dealers and electronic equipment craftsmen during the audit period. The audit team further reviewed the training programmes and budgets of seven visited LGAs and noted that, none of them planned and budgeted for such capacity building programmes.

Moreover, from the questionnaires given to seven visited LGAs. Responses from seven LGAs regarding to capacity building to e-waste dealers, revealed that, LGAs failed to build capacity and provide facilities for e-waste dealers. It was revealed further that, Gas had no capacity on e-waste management issues. According to questioners' responses analysis, Environmental Officers from all seven LGAs were not capacitated/trained specifically for e-waste management related issues.

This means that, with limited capacity they had in e-waste management issues, LGAs could not be able to capacitate e-waste dealers in their areas. As the result, e-waste dealers were not aware of effects caused by e-waste to human health and the environment. Thus, e-waste dealers did not know where to dispose their final unusable materials that seem to be of no use anymore. Therefore, they mixed electronic unusable materials with other municipal waste to be disposed in the landfills and dumpsites.

[26]Two electronic equipment craftsmen in Mbeya City Council; three municipal waste collection and transportation contractors in Mwanza, Arusha city Councils and Ilala Municipal Council, One Scrap metal dealer in Arusha city Council and three CBOs dealing with Municipal waste collection and transportation in Mbeya and Arusha City Councils.

Furthermore, the electronic crafts continued to be exposed to toxic materials contained in electronic equipment piled up in their working rooms as seen in **Picture 3.7**below

Picture 3.7: Electronic equipment crafts working in rooms with piled up electronic equipment (Photo taken by auditors)

3.4 Coordination between Stakeholders Regarding E-Waste Management

The Environmental Management Act of 2004; requires NEMC to establish and operate a Central Environmental Information System which may bring together any findings, data and statistics generated by both public and private institutions.

3.4.1 Limited E-Waste Information Sharing

An Analysis of responses from five questioners distributed to VPO, NEMC headquarters and three NEMC Zonal Offices revealed that, VPO have a coordination role of all environmental activities in the country. Therefore, some of the strategies and activities were to be implemented in collaboration with other stakeholders and share the information of the implementation status.

However, the audit found that, sharing of e-waste information among various stakeholders was limited. This was evidenced by the report developed by VPO in 2014 on state of environment, which among other things; the report highlighted the state of e-waste in the country. Although the report was widely published in VPO's website, other institutions such as Regional Secretariats, City and Municipal Councils were not well informed about this report. However, during interviews

with VPO officials, it was confirmed that, up to the time of this audit the report was not shared to other stakeholders.

It was expected[27] VPO had to prepare and issue a report on the state of environment in Tanzania after every two years. According to interview with VPO officials and review of VPO annual budget and plans it was revealed that, there were an estimated amount of **Tsh 625,504,000** for preparation and issuing of state of environment report in 2016.

However, VPO did not prepare and issue the state of environment report which was supposed to be published in 2016. The reason provided by VPO Official for failure to prepare and publish the report was that, the estimated amount was not among the priority of the office as it was expensive to carry out the activity. As a result, the state of environment report has not published since 2016 until the time of this audit report. Hence, the country had no information on the state of environment (including state of e-waste) up to the time of this audit report.

Furthermore, the audit noted that, there was miscommunication on the registration of scrap metal dealers. The audit team reviewed the 2013/14 to 2016/17 scrap metal registration files from three visited NEMC zonal offices[28].The review indicated that, **58** scrap metal dealers were registered in three zonal offices (Southern Highland Zone 12, Northern Zone 4 and Lake Zone 42).

Site visits made by the audit team to scrap metal dealers noted that, the registered scrap metal dealers were also dealing with e-waste (Dismantling) contrary to the conditions in their scrap metal permit. However; interviews with Environmental Officials from seven visited LGAs, all LGAs had no information concerning the presence of these scrap metal dealer. This affects the revenue collection by LGAs and these dealers do not get relevant support from LGAs.

A review was made to NEMC's strategic plan and progress reports to find out if NEMC enforced the part of Environmental Management Act of 2004 of establishing Central Environmental Information System. The system could assist in compiling together any findings, data and statistics generated by both public and private institutions during environmental observation and management.

In 2010 NEMC tried to establish the Tanzania Environmental Information Web Portal (TEIWP) in collaboration with UNEP. The web portal could be used for all public institutions to upload their

[27] EMA, 2004
[28] Southern Highlands Zonal, Northern Zone and Lake Zone

environmental information for the purpose of information sharing.

However, according to interviews with NEMC Officials, before the maturity and operationalization of the portal, UNEP support was ceased and the activity remained unaccomplished. In the 2018/2019 budget NEMC budgeted for revamp of the portal by the assistance of Electronic Government Agency (EGA). However, this information was not verified because NEMC did not provide the audit team with the MoU between NEMC and UNEP, neither MoU between NEMC and EGA as an evidence of the efforts being made.

During interviews with the Regional Secretariat and LGAs Officials it was emphasized that, Lack of an established formal system to facilitate sharing of information resulted for them (RS and LGAs) to remain uninformed concerning e-waste. The officials confirmed that, this led to other stakeholders including government institutions with interest in environmental related issues fail to include e-waste related issues into their annual budgets and plans.

3.4.2 Absence of Environmental Function in Regional Secretariat's Organization Structure

Regional secretariat (RS) offices in the visited RS did not have function for coordinating environmental issues. Interviews with Directors for Economic and Productive Sectors Section from four visited RS offices (Mbeya, Mwanza, Tanga and Arusha) revealed that, environmental issues were handled within above mentioned section and thus there was a need to have an environmental officer(s) within the section. However, in all four RS offices visited, there was no Regional Environmental Officer(s). This was because the environmental function was not included in the Regional Secretariat Organization Structure and therefore no room for appointing Regional Environmental Officers[29].

Absence of environmental coordination office led to environmental plans and reports to be handled by the Regional Health and Social Welfare Section. The audit team reviewed two Regional Health and Social Welfare annual progress reports from Arusha and Mbeya and found that, the focus of the section was on sanitary hygiene and hand washing. E-waste issues were not addressed in the reports. As a result, environmental information lacked proper coordination at RS level and hence low priority given to environment management particularly e-waste management in planning, budgeting and reporting processes.

[29] URT, The Functions and Organization Structure of the Regional Secretariats, June 2011

3.4.3 Duplication of Responsibilities among Stakeholders with Interest in E-Waste Related Issues

According to EMA 2004 and Guideline for Management of Hazardous Waste of 2013, the framework environmental legislation shall be designated to organize various agencies of Government protection to promote coordination and cooperation among them, and fulfil their establishment roles and responsibilities. The implication for this is that, clear stipulated roles and responsibilities amongst key actors minimises duplication of resources and overlapping of activities. Since e-waste activities were not properly regulated in the country there was risk of duplicating of activities, and therefore unwise use of government resources.

Further, the interview revealed for example that, public awareness on environments and waste inspections were done by more than one institution. NEMC officials showed that, duplication of work was among other things, contributed by non-sharing of activity plans for cross-cutting issues.

The audit, established the activities duplicated among government entities as an illustration of the above point. **Table 3.2**below; presents the analysis of roles and responsibilities for six government entities sharing roles. Duplicating roles to government entities mean overspending of resources for the same activity as well as misleading the clients.

Table 3.2 Roles and responsibilities done by more than one stakeholder

SN	Roles shared by more than one stakeholders	Stakeholders sharing roles and responsibilities					
		PO-RALG (RS)	VPO/ NEMC	LGAs	OSHA	Fire Brigade	MoH
1	Public awareness on environment		✓	✓	✓		✓
2	Workplace staff Safety		✓		✓		
3	Fire fighting equipment inspection		✓	✓		✓	
4	Waste inspection	✓	✓	✓	✓		✓

Source: Auditors analysis

Table 3.2 shows that four responsibilities were shared among six government entities. Interview with Fire and Rescue Force, NEMC and OSHA officials revealed that, duplication of responsibilities was partly caused by the institutions establishment acts which sometime stipulate same roles to more than one institution based on institutions core functions. The officials emphasized that this could bring a room of reluctance for each implementing stakeholder on implementation of a certain role or responsibility and the responsibility ended up unaccomplished or uncoordinated.

3.5 Monitoring and Evaluation of E-Waste Management

The Environmental Management Act of 2004 requires NEMC to develop an environmental management plan with mechanisms for monitoring and evaluating the environmental performance and compliance including cost of mitigation measures and the time frame of implementing the measures.

The audit team distributed a total of 13 questionnaires to PORALG, VPO, NEMC head quarter, three visited NEMC zonal offices and seven visited LGAs. An analysis was made to the questionnaires' responses to know the mechanisms used by the Government entities to monitor e-waste activities. The analysis showed that, from all 13 (100%) questionnaires inspections and reporting were indicated as the mechanisms used in monitoring municipal waste (e-waste inclusive) activities.

However; a review of NEMC headquarter, three visited NEMC zonal offices and seven LGAs annual plans and inspection reports revealed that monitoring of e-waste management activities were inadequately done as shown in the subsequent sections.

3.5.1 Limited Inspections on E-Waste Related Activities By NEMC

NEMC was required to conduct surveys on the state and the extent of electronic waste as an emerging environmental challenge to come up with proper mitigation measures[30]. Thus, it was expected that factories of e-waste dealers were to be visited by NEMC for inspection. According to EMA 2004, e-waste registered dealers were to be visited by NEMC for inspection on quarterly basis for inspection.

The audit noted that, there were limited planed inspections conducted by NEMC Headquarters focusing on e-waste. A review of NEMC headquarters inspection report showed that inspections of e-waste

[30]Environmental Management Act of 2004

related activities were done toe-waste dealers who wanted to renew their licenses and those seeking licenses fore-waste collection, transporting and recycling.

Interviewed NEMC Headquarters Officials acknowledged that, such inspections focused on whether applicants had required capacity and facilities to manage e-waste activities in environmentally sound and efficient manner as per the guidelines for management of hazardous waste of 2013. In this regard NEMC headquarters had not conducted inspections to registered e-waste dealers to monitor e-waste dealers' operations. A review of four e-waste dealers registration files from NEMC headquarter and three Zonal offices showed that, three e-waste dealers were registered between 2012 and 2016 **(Appendix 11).**

Reviews of NEMC's zonal offices inspection reports revealed that no inspection was conducted to registered e-waste dealers as well as monitor the dealers operations for the whole period under the audit. Also, through a review of NEMC zonal offices' inspection reports, it was noted that, the visited NEMC zonal offices did not inspect e-waste related activities despite the existence of unregistered e-waste dealers who were formally registered as scrap metal dealers such as; electronic equipment repairs, refurbishes and recyclers.

Interviewed officials from NEMC Zonal offices acknowledged conducting inspections to mining areas and industries but again-waste issues were not touched. For instance, for the period under the audit, NEMC zonal Offices conducted eight inspections to industrial facilities and two to mining centers. The officials insisted that, in all these inspections, e-waste related issues were not addressed.

The audit team noted that there was lack of E-waste issues in NEMC's inspection manual and inspection checklist which contributed to NEMC officials side-line e-waste issues during their inspection visits. As a result, the disposal of e-waste in those inspected areas was done without any control.

Inspection by LGAs

Sector Ministries, Government departments, agencies or institutions were required to undertake monitoring[31].

Questionnaires were distributed to each visited LGA. An analysis of questionnaires responses showed that, in all seven (100%) LGAs, inspections and reporting were the mechanisms used in monitoring activities. However, the audit team found that through the review of

[31]Environmental Impact Assessment and Audit, 2005

LGAs' progress reports it was noted that, the seven visited LGAs did not inspect e-waste activities handled by registered and unregistered e-waste dealers (electronic equipment repairs and dismantlers) nor e-waste generated by Government entities.

The audit reviewed the by-laws from the seven visited LGAs to ascertain relevant clause about e-waste. It was noted that, LGAs environmental by-laws had no any clause on e-waste. Most of sections in the by-laws were on waste water, solid waste and littering. As the result, LGAs lack legal mandate to enforce the management of e-waste in their respective areas. Interviewed LGAs Environmental Officials confirmed that, although the by-laws did not address e-waste activities, inventory and developed data base of e-waste dealers could help LGAs in supervising and evaluating e-waste dealers operations. Unfortunately, none of the visited LGAs developed e-waste dealers' data base. However, according to NEMC and LGAs environmental officials, the number of unregistered e-waste dealers was increasing.

Increasing Number of Unregistered E-waste Dealers

Generally, the willingness of e-waste dealers to be registered was low; few were willing to volunteer to follow the registration process. However, in the last two years the registration condition has been more difficult for start-up business. This is because the Government introduced new registration fee and charges for different waste activities or engagements as shown in table 3.4 below. Similarly, NEMC officials indicated that, this was because the Government decided to only fund NEMCs' development projects and leave other operational charges for NEMC to fund them through its own sources. In addition, the registration fees were not properly categorized to carter for small, medium and large recyclers.

For example, in 2016 the registration fee for e-waste dealers increased from **TZS 600,000 to TZS 10 million**[32]. This increment was more than ten times of the original registration fee. This increment caused the potential e-waste dealers to become reluctant on looking for the official registration and decide for informal option.

Table 3.3 Introduced fees and charges for hazardous wastes

SN	Description	Amount charged (TZS)
1	Application fee	50,000
2	Collection	10,000,000
3	Transportation	5,000,000

[32]Environmental Management (Fee and Charges) (Amendment) Regulations, 2016. (CAP.191)

SN	Description	Amount charged (TZS)
4	Exportation	1,000,000
5	Storage	5,000,000
6	Disposal	5,000,000
7	Battery Dismantling and recycling plant[33]	750,000
8	Environmental compliance monitoring and audit annual charges for EE-waste collection, dismantling and recovery	300,000
9	Environmental compliance monitoring and audit annual charges for e- waste treatment and disposal Incineration plant	1,500,000

Source: Environmental Management (Fee and Charges) (Amendment) Regulations, 2016. (CAP.191)

From **Table 3.3** above, it requires about **Tsh 26 million** to invest in a start-up business for e-waste management from collection to disposal operation. For instance, **Tsh 10 million** is needed just for e-waste collection permit. This would be difficult for a new, small and medium entrepreneur (SME) to start e-waste business due to high registration cost. As the result, the fee encouraged increase of unregistered e-waste dealers. NEMC is advised to lower the cost to welcome more entrepreneurs willing to engage in e-waste business. This could lead to NEMC collect more revenue from more willing registered e-waste dealers.

Moreover, the responsible authorities (NEMC and LGAs) did not manage to map out the extent of unregistered e-waste dealers. Since NEMC had no database of e-waste dealers in the country, it had no capacity to map out extent of the problem in the country. Therefore, it was difficult for NEMC and LGA to apportion their resources to be used in the most affected e-waste areas. Similarly, NEMC could not manage to prioritise their inspection and patrol to high risk areas. In most of visit made, the audit found that the dealers of Scrap metals and E-waste were not complying to their condition of permit as seen in **Picture 3.8** below.

[33] Environmental compliance monitoring and audit annual charges

Picture 3.8: Parts of dismantled computer being recovered and ready for resell in one of scrap metal dealer's workshop in Arusha City Council.

The audit team interviewed one scrap metal dealer and six CBOs, three municipal waste collection and transportation in all visited LGAs it was revealed that, dismantled valuable electronic equipment parts were sold and the remaining fine materials were taken to Landfill or dump sites mixed with other municipal waste.

3.5.2 Reporting system on e-waste related activities by actors

NEMC, LGAs and Licensed companies for handling hazardous waste were supposed to prepare and submit periodic (bi-annual and quarterly) reports to the relevant authorities stating the progress of the activities. The periodic reports were supposed to state the implementation status of environmental regulations enforcement[34].

Following the above requirements, it was expected therefore that, NEMC, LGAs and licensed e-waste dealers to prepare and submit the reports on e-waste management activities accordingly. However, this was not the case as indicated in the following sub-sections.

Weak Reporting by NEMC

NEMC was required to prepare and submit to the sector minister a bi-annual report showing how it has fulfilled its roles and responsibilities[35].

In this regard, NEMC headquarters was required to compile progress reports submitted by zonal offices. Although NEMC Zonal Offices

[34]Environmental Management Policy of 1997, Environmental Management Act of 2004 and Guideline for management of hazardous waste of 2013
[35] Environmental Management Act of 2004

submitted their progress reports to NEMC headquarters, NEMC did not compile them and submit the reports to VPO as required. The analysis of issues reported in seven progress reports prepared by three visited NEMC Zonal Offices showed that, the focus was on environmental compliance and enforcements activities. E-waste related issues were not addressed along the environmental compliance and enforcement activities.

Likewise, the audit found that even e-waste item was missing in the NEMC regular reports. During interviews with NEMC headquarters officials, it was acknowledged that, the progress reports prepared were on general environmental issues. The officials showed that, this was caused by non-integration of e-waste activities in their annual budgets and plans and thus there was no e-waste activity done and be reported.

Weak Reporting by LGAs

According to the reviewed LGAs' progress reports from 2013/2014 to 2016/2017; all seven LGAs were preparing general environmental cleanness reports. The reports were submitted to RS on quarterly basis. Although e-waste was regarded as part of municipal hazardous waste, yet the prepared and submitted reports contained no e-waste management or minimization related item.

Interviewed LGAs' Environmental Officials and review of RS progress reports showed that, progress reports compiled by Regional Secretariat on National and Sanitation Campaign (NSC) had no items of e-waste activities. Through interviews with RS officials, it was noted that, this was partly because there were no established function and appointed officer(s) responsible for coordinating regional environmental issues.

Regional Secretariat Office was responsible for consolidation of the implementation reports of LGAs plans and budgets[36].The compiled reports by RS were to be submitted to PORALG for review and scrutiny before providing feedback on the reviewed reports. The interviewed officials from PORALG acknowledged receiving reports from Regional secretariats that showed implementation status of general environments cleanness and hygiene. However, no report was presented to the audit team.

Seven questionnaires were distributed to seven LGAs. The responses from all seven (100%) LGAs revealed that, none reporting on e-waste by LGAs was due to absence of e-waste inventory as well as non-

[36]URT, PORALG; PMG - Volume II, Job Descriptions for the Regional Administration, 2011/2012, Final Version: June 2012.

identification of e-waste dealers. Since LGAs had no identified e-waste dealer, implies that there was no e-waste information submitted for generated, stored, refurbished, recycled transported and disposed e-waste.

LGAs should submit quarterly reports to the respective regulatory authorities[37]. This means that for seven visited LGAs, could have submitted 112 quarterly reports to their respective RS. The review of quarterly progress reports noted that, there was inadequate submission of quarterly progress reports by LGAs to RS. This was evidenced by the fact that, only five (6%) reports were submitted to RS for the entire period under the audit, i.e. from 2013/2014 to2016/2017.

The reason for inadequate submission of quarterly progress reports according to interviews with RS and LGAs' officials partly due to lack of environmental functions at RS responsible for coordinating and making follow-up of environmental issues from the LGAs. As the result, there were inadequate reported e-waste issues by LGAs to RS.

Weak Reporting by E-waste Licensed Companies

A Company licensed to carry out any activity on handling of e-waste should submit bi-annual reports to the Director of Environment and other relevant authority[38].Similarly, the General Conditions of Permit to collect and store e-waste issued by NEMC require registered e-waste dealer to prepare and submit to NEMC quarterly reports[39].

Review of registered e-waste dealers reports submitted to NEMC indicated that, only one company (Chilambo General Trade Company) out of the three registered e-waste dealers prepared and submitted six bi-annual progress reports to NEMC for the period under the audit.

A review of Chilambo General Trade Company's progress reports further revealed that, 4795.38 tons of e-waste were collected and dismantled. Information reported in the reviewed bi - annual reports contained e-waste related issues **(Refer Appendix 12)**. However, interviews with NEMC officials and responses from four questionnaires responded by NEMC headquarters and three visited zonal offices revealed that, NEMC did not analyse and scrutinize the reports to get an overview of state of e-waste in the country by 100%.

This implies that, though Chilambo General Trading Company provided NEMC with e-waste information, but NEMC did not make effort to establish e-waste database. Therefore, became unaware of the amount

[37]Guidelines For Management Of Hazardous Waste, 2013
[38] The Guideline for management for Management of Hazardous waste of 2013
[39] NEMC, Permit to collect and store electronic waste, permit NO: NEMC/EW/2016/01

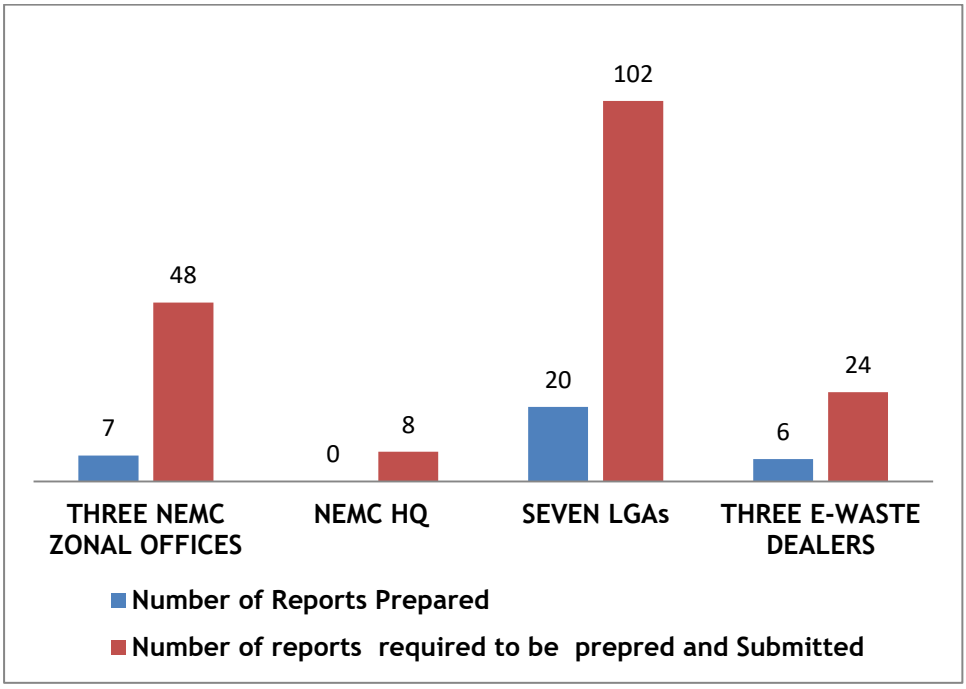
of e-waste generated in the country. Licensed companies' progress reports could help NEMC check whether the operations of registered e-waste dealers were on track towards achieving the set target of zero negative e-waste impact.

Through a review of progress reports from NEMC, LGAs and registered e-waste dealers or licensed persons, the audit team noted that, preparation and submission of reports to relevant authorities were inadequate. This was due to the facts that, NEMC, LGAs and registered e-waste dealers were supposed to prepare and submit a total of 182 reports to relevant authorities (VPO, RAS and NEMC respectively). A review of submitted quarterly and bi-annual reports revealed that, only 33 (23%) reports were prepared and submitted at the time under the audit as shown in the **Figure3.2.**

The audit team distributed a total of 11 questionnaires to NEMC headquarter, three NEMC zonal offices and seven LGAs. Responses from all 11 (100%) questionnaires indicated that, fluctuation of report preparations and submission was due to absence of follow-up from the receiving authority to show the needy. Again, the interviews conducted with NEMC and LGAs officials revealed that, absence of follow-up by the receiving authority led the sending authority to disregard the preparation and submission of the reports. This means that, VPO, PORALG, NEMC,RS and LGAs did not make efforts of seeking or reminding each other to submit the reports regarding implementation.

Consequently, important information regarding e-waste management was not adequately communicated among Government entities. For instance, the volume of e-waste collected by Chilambo General Trade Company (CGTC) and related e-waste activities reported were not communicated to VPO by NEMC.

Figure3.2: Progress Reports Prepared and Submitted to Relevant Authorities



Source: Auditor's Analysis

The above **figure 3.2** indicates the trend of preparation and submission of progress reports to relevant authorities. According to the table, NEMC headquarters did not prepare and submit the bi-annual reports to VPO, whereas one e-waste dealer prepared and submitted six progress reports to NEMC.

Inadequate Report Feedback Giving

Best practice from other sectors shows that, whoever receives the reports from other subject matter stakeholder to give formal (written) feedback accordingly. This means that, whoever receives environmental reports from other government entity had to give a written report feedback to the sender.

A visit made to four Regional Secretariat Offices (RS) noted that, during the period under the audit RS received five quarterly progress reports from LGAs. However, the LGAs did not receive written feedback from RS. Likewise, interviews with NEMC headquarter officials showed that, NEMC headquarter received six bi-annual progress reports from Chilambo General Trade Company (CGTC) about e-waste operations.

NEMC headquarter did not give the formal or written feedback. Interviewed Official from VPO, PORALG, NEMC, RS and LGAs acknowledged that, the feedback was given through phone calls and only when the reports had some issue which needed more clarifications from the sender. This fact has also supported by the responses from 17 questionnaires given to VPO, PORALG, four RS; NEMC headquarter; three NEMC zonal offices and seven LGAs that, feedback given through phone calls could lead to failure in knowing where more improvement was need because phone conversations could be easily forgotten.

3.5.3 Inadequate evaluation of e-waste management performances

VPO was required to establish and strengthen institution responsible for systematic monitoring of state of the environment to cover environmental information gaps[40]. On top of that, NEMC was required to conduct surveys on the state of the environment and in every two years, the director for environment was required to publish a report on the state of the environment and environment management[41].The implication for this is that, for effective achievement of the intended goal evaluation of the program is crucial

It was expected therefore that, NEMC under VPO to conduct survey on state of environment and publish the report in every two years. This means that, through surveillance of environment, VPO and NEMC could conduct e-waste management evaluation to estimate amount of e-waste generated, collected, transported, dismantled, recycled and disposed off and determine appropriate intervention where need be. However, the audit found that, the surveys on the state of environment were not conducted and published periodically as required (**refer section 3.4.1 of this report).**

Interview with TCRA and NEMC headquarters officials showed that, interventions on e-waste were due to demand or pressure from outside communities. For example, Tanzania Communication Regulatory Authority (TCRA) and East African Communication Organisation (EACO) demanded e-waste to be embarked in environmental plans. Also, there was pressure from outside for establishing e-waste National Steering Committee (NSC) and e-waste guiding legislations.

Inadequate information on the state of e-waste

Based on interview with both NEMC and VPO officials, there was no established national database of the state of e-waste in the country. Similarly, Review of final draft of State of environment of 2014 noted

[40] National Environmental Policy, 1997
41 Environmental Management Act of 2004

that, e-waste issues were partially reported in the final draft of State of environment of 2014. E-waste related activities reported in the environmental state report included common categories of e-waste generated by various economic sectors, drivers and pressure for increase of e-waste and results of other studies on e-waste. Nevertheless, the actual state (amount of e-waste generated, collected, transported, dismantled, recycled and disposed) in 2014 was not reported. During interviews it was revealed that Lack of proper reporting system contributed to inadequate evaluation and e-waste management information. However, in response to this, officials from NEMC confirmed that, the council intended to conduct the survey to develop national data base for e-waste[42]

[42]The organization of ICT regulators in East Africa (East African Communication Organization (EACO))

CHAPTER FOUR

CONCLUSION

4.1 Overall Conclusion

This audit concludes that despite continuous efforts to improve the state of environment in the country, the Government has failed to effectively manage the e-waste in the country. Whilst the Government has entered several international agreements concerning hazardous waste management, yet no important instruments and strategies for managing e-waste to minimize its impacts to environment and human health hasn't been developed by VPO and PO-RALG. In addition, NEMC and LGAs as entities that deal with e-waste, have no required capacity to effectively handle the increasing problems related to e-waste in the country. These entities have failed to effectively coordinate and share e-waste related information to other entities. As a result, Tanzania population is exposed to polluted environment, which may lead to increased risk of human health.

4.2 Specific conclusions based on the audit questions are as follows

4.2.1 NEMC and LGAs' capacity in managing e-waste

The capacity of NEMC and LGAs to manage e-waste in the country is low. The staffs dealing with e-waste were not exposed to relevant training about e-waste management. The priority of e-waste management in both NEMC and LGAs was low. Both, NEMC and LGAs had no plans related to capacity building for their staff about E-waste. As a result, that staff were incompetent in managing e-waste in their areas. The effect was further spread to waste collectors and transporters, who also were not well supported by LGAs.

4.2.2 VPO and PORALG Strategies, Plans and Targets toward E-Waste Managements

VPO did not developed strategies for minimization and management of e-waste in the country. This was partly contributed by non-adoption and operationalization of the target of zero negative impact of e-waste by 2030 and establishment of 2-4 e-waste disposal and take-back centres. Also, there was no awareness program on e-waste issues to the public thus, leaving VPO with no clear strategy to work for e-waste management in the country.

4.2.3 Coordination of e-waste related issues among stakeholders

There was no formal and centralized system for sharing e-waste information among the stakeholders with interest in e-waste. NEMC being an organ mandated to develop mechanisms for coordinating and sharing e-waste information across government agencies and other stakeholders did not do so. This led to crucial environmental information to be unknown to other key stakeholders interested in e-waste management.

4.2.4 Monitoring and evaluation of e-waste activities

There was inadequate monitoring and evaluation of e-waste activities. The inspections conducted did not include items of e-waste related activities. Also, the reporting system was inadequately followed by the reporting agencies and e-waste activities are partially reported as the focus is on general municipal waste, sanitation and hygiene.

Moreover, no formal or written feedback for prepared and submitted reports to relevant authority by the sender. The few submitted reports had limited e-waste issues in it. Phone calls feedback was most preferred by the receiving authorities which provided less opportunity for implementers to recognise areas of improvement and integrate them into their plans.

Furthermore, there was no evaluation conducted regarding e-waste activities and e-waste state. This was due to absence of e-waste dealer's data base, consequently missing the e-waste data base. Additionally, absence of formal e-waste coordination system contributes to difficulties in evaluating the state of e-waste and their related activities in the country.

CHAPTER FIVE

RECOMMENDATIONS

5.1 Introduction

This chapter presents recommendations to VPO and PORALG based on the audit findings. The recommendations if implemented, will improve protection of environment and address weakness noted in the areas of NEMC and LGAs' capacity building in managing e-waste, VPO and PORALG Strategies and targets towards e-waste management as well as Coordination of e-waste related issues.

5.2 NEMC and LGAs' capacity in managing e-waste

1. VPO should ensure that, e-waste guiding tools (policy, Bill, Regulation and Guideline) are approved, made available to all interested stakeholders and be implemented.

2. VPO and PORALG should ensure that the proposed UNEP budget framework is adopted to enable appropriate funds allocation for e-waste management stream

3. VPO and PO-RALG should ensure that NEMC and LGAs appoint specific staff to deal with e-waste management are identified and prioritize training staff on e-waste management issues.

4. VPO and PO-RALG should ensure that, NEMC and LGAs map out the informal e-waste dealers (Refurbishes, Recyclers, and Sellers) and have a data base for easy management of their operations to be able to track the generation, collection and disposal of e-waste materials.

5.3 VPO and PORALG Strategies, plans and targets toward e-waste managements

1. VPO should ensure disposal centres and take back system are established in the country

2. VPO should ensure that EACO-regional e-waste management strategy is adopted and develop targets and plans for achieving the zero-negative impact of e-waste

3. VPO should advice NEMC to lower the cost of registrations to welcome more entrepreneurs who are willing to engage in e-waste management business

5.4 Coordination of e-waste related issues among stakeholders

1. PO-RALG should establish environmental functions and appoint environmental officers at the level of Regional Secretariat

2. VPO should ensure that, NEMC assesses the impact of e-waste to both human health and environment and share the information with other stakeholders including the public.

3. VPO should ensure that, NEMC establishes and operates a Central Environmental Information System for sharing information among stakeholders

5.5 Monitoring and evaluation of e-waste activities

1. VPO and PORALG should ensure that, NEMC and LGAs consider developing tools for measuring their performance regarding to e-waste minimization and management

2. VPO should ensure that, NEMC updates the inspection manual and consider including e-waste related issues in the manual

3. PORALG should ensure that, LGAs update their environmental by-laws to address e-waste management and minimization activities

4. VPO and PORALG should ensure reporting system is strengthened and be followed accordingly

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Appendices

Appendix 1: Impact of hazardous substances found e-waste equipment

S/N	Element/substances found in e-waste equipments	Impact of hazardous substances
1	Lead	A neurotoxin that affects kidneys and the reproductive system. It affects mental development in children.
2	Plastics	Dioxins can harm reproductive and immune systems. Burning PVC, a component of plastics, also produces dioxins. BFR can leach into landfills.
3	Chromium	Inhaling hexavalent chromium or chromium 6 can damage liver and kidneys and cause bronchial maladies including asthmatic bronchitis and lung cancer.
4	Mercury	Affects the central nervous system, kidneys and immune system. It impairs foetus growth and harms infants through mother's milk.
5	Beryllium	It is carcinogenic and causes lung diseases.
6	Cadmium	Long-term exposure causes Itai-itai disease, which causes severe pain in the joints and spine. It affects the kidneys and softens bones.
7	Acid	Fumes contain chlorine and sulphur dioxide, which cause respiratory Problems. They are corrosive to the eye and skin.

Source: Auditor's review/analysis

Appendix 2:Audit Questions.

S/N	Audit questions
1.	Do NEMC and LGAs have adequate capacity to manage e-waste?
1.1	Do the existing legal and institutional frameworks support NEMC and LGAs to adequately manage e-waste?
1.2	Do NEMC, VPO and LGAS have an appropriate budget model to allocate funds for e-waste management? (How the VPO, LGAs or NEMC determines the amount of funding that is to be allocated to management of EE-Waste?)
1.3	Do NEMC and LGAs have competent human resource to deal with e-waste management? Are they trained on management of e-waste?
1.4	Do staff dealing with or responsible for e-waste management properly equipped?
1.5	Are the equipment for handling e-waste (collection, storage, transportation, treatment or disposal) meet the required standards?
2.	Do VPO and PORALG have clear strategies, plans and targets regarding

	e-waste management?
2.1	Are there clear strategies direction and targets for the minimization or managing e-waste?
2.2	Has VPO and PORALG developed effective e-waste management plans? Are the plans effectively implemented?
2.3	Do VPO and PO-RALG strategically plan and conduct awareness, capacity building and support about E-waste management to the public?
2.4	Do VPO and PO-RALG conduct an assessment to determine the impact of awareness program implemented?
3.	Do relevant agencies and stakeholders effectively coordinate their activities regarding e-waste?
3.1	Does VPO put in place mechanism for e-waste information sharing?
3.2	Do the agencies and other stakeholders often share e-waste information?
3.3	Are the roles and responsibilities of agencies and other stakeholders regarding e-waste management clearly stipulated?
4.	Do VPO and PORALG adequately monitor and evaluate e-waste management stream?
4.1	To what extent do VPO and PORALG conduct inspections on e-waste management operations?
4.2	Do VPO and PORALG ensure reporting system on e-waste management adequately followed?
4.3	Do the VPO and PORALG evaluate e-waste management performance?

Appendix 3: Officials interviewed and the purpose of interviewing each

S/N	Official Interviewed	Purpose of interviewing
1.	Director of Environment-VPO	• To assess the state of e-waste covered in the published State of environment report of 2014
2.	Deputy Director – Environmental Pollution Management from VPO	• To understand the strategies and directives of the organization on e-waste minimization, and to know the existing plans, budgets and priorities set and the current State of E-waste in the country. • To assess the effectiveness of reporting, monitoring and coordination systems between key actors • To assess the extent of monitoring and evaluation regarding e-waste management
3.	Officials from PO-RALG	• To understand their daily operations regarding e-waste monitoring and evaluations on implementation of hazardous waste legislation in place. • To determine the extent of

S/N	Official Interviewed	Purpose of interviewing
		coordination of e-waste activities between LGAs and PO-ORALG concerning • To understand the extent of monitoring and evaluation regarding e-waste
4.	Director – Enforcement and Compliance from NEMC	• To determine the implementation of plans, budget and priorities set for environment compliances regarding e-waste • To assess the effectiveness of information sharing system for e-waste data base and priorities regarding e-waste
5.	Senior Environmental Officer – E-waste program coordinator from NEMC	• To assess the extent of the implementation of plans, budget and priorities
	Director for Information and Communication Technology	• To determine the status of establishment of the central environmental information system, and the way it operates in gathering e-waste information from different actors
6.	Officials from RS offices	• To determine the kind of e-waste information shared between LGAs and RS. • To determine the extent of e-waste information inclusion in compiled reports at RS offices and the consumer of the report • To assess roles of health Unit, sanitation and hygiene in regard to e-waste activities. • Determine RS plans for intervention regarding e-waste during their inspections in LGAs
7.	Officials from LGAs	• To get information on how municipal manage electronic waste. • To assess LGAs' planning priorities regarding e-waste • To assess budget allocation and disbursement for e-waste • To understand how e-waste is stored

S/N	Official Interviewed	Purpose of interviewing
8.	CBO's, 40 Waste Collector, Director of waste collection companies from Visited LGAs and E-waste Dismantlers	• To determine ways of collecting transporting and disposing electronic waste • To assess the extent to which e-waste handlers are equipped and protected against waste leachates during loading waste into trucks
	Officials from OSHA	• To assess the existence of roles and responsibilities that are overlapping with those of other actors during inspection or enforcement of environmental legislation
	Officials from TCRA	• To get information about EACO and NSC regarding management of E-waste in the country and East African Region • To determine the basis for the proposed the e-waste Policy, Bill regulation and guideline • To assess how the switched off fake phones were disposed off.
	Officials from Fire Rescue Force	• To assess existence of roles and responsibilities that are overlapping with those of other actors during inspection or enforcement of environmental legislation environmental legislation

Appendix 4: Documents Reviewed and Purpose of reviewing

S/N	Description of government entities/Stake holders	Document to be reviewed	Reason
1.	Vice President's Office – Union and Environment and President's Office and Regional Administration and Local Government	i. Annual Budget for Environmental management ii. Environmental Management Plans iii. VPO and PORALG Strategic and annual action plans iv. Annual environmental state reports(Report of Environmental State)	i. To Determine funds allocated and disbursed for e-waste management activities ii. To assess the set priority on budgeting for e-waste, the requested and received for hazardous waste iii. To determine the extent to which e-waste related activities have been prioritized and included in the implementation plans. iv. To assess and determine the state of e-waste in the country
2	National Environmental Management Council (NEMC	i. Environmental Annual Budgets and plans ii. Hazardous waste management Strategic plans iii. Environmental Annual Actions plans iv. Environmental inspection reports and evaluation plans	i. To determine funds allocated and disbursed for e-waste management activities and the extent to which e-waste activities are incorporated into the implementation plans. ii. To assess the strategies, target sand plans in place towards minimization and management of e-waste iii. To determine the extent of e-waste related issues inclusion in the plans iv. To assess whether e-

S/N	Description of government entities/Stake holders	Document to be reviewed	Reason
		v. Environmental Bi-annual reports submitted by e-waste dealers vi. Inspection manual and checklist vii. E-waste dealers registrations records	waste issues were considered during inspections, as well as the kind of awareness given to the public regarding to e-waste v. To determine e-waste issues raised or reported by the e-waste dealers and how NEMC responds to them. vi. To determine the extent of inclusion and the procedures laid for inspection of e-waste issues. vii. To assess the trend of e-waste dealers registrations, and the accompanied conditions for
3	Local Government Authorities (LGAs)	i. Environmental Strategic, Annual budgets and action plans ii. Environmental Monitoring reports iii. Database of trained staff on e-waste management, iv. Data base of trained drivers and waste handler	i. To determine the extent to which e-waste related activities have been prioritized and included in the budgets and implementation plans. ii. To determine e-waste minimization status iii. To assess the capacity of environmental staff in managing e-waste activities. To determine number of trained staff, area of focus and

S/N	Description of government entities/Stake holders	Document to be reviewed	Reason
		v. Local environmental By-laws vi. Annual progress reports	frequency of training. iv. To assess whether the procedures for handling waste are being followed v. To determine the extent to which the local tools provide the mandate for LGAs to control the local e-waste dealers. vi. To determine the extent of state of e-waste in the county and the awareness creation on e-waste done to the public.

Appendix 5: Audit Criteria

Audit Question	Criteria	Source
Does NEMC and LGAs have adequate capacity to manage e-waste in the country?	The VPO and PO-RALG to provide policy direction in matters pertaining to hazardous waste management.	Environmental Management Act ,(hazardous waste control and management Regulations 2009)
	The Director of Environment to develop guidelines for handling of hazardous wastes.	Management (Hazardous waste control and management Regulations 2009)
	VPO to establish and strengthen institution responsible for systematic monitoring of state of the environment to cover environmental information gaps.	National Environmental Policy , 1997
	EMC shall pass Annual Budget of the amount expected to be received	EMA , 2004

Audit Question	Criteria	Source
	and to be disbursed.	
	VPO and PO-RALG to develop financing models for management of e-waste supply chain.	United Nations Environmental Programme (UNEP): Take back system volume III.
	Regional Environmental Management Expert to be appointed by PO-RALG who shall be charged with the responsibility of advising the local regional authorities on matters relating to the implementation and enforcement of this Environmental Management Act,	EMA, 2004
	NEMC and LGAs to train staff on e-waste management.	Guideline for management of hazardous waste 2013
	LGA to training of drivers and waste handlers and manifest be carried in the vehicle	Guideline for management of hazardous waste of 2013
	Trained personnel must be made available on appropriate cadre of professionals on e-waste management.	Environmental National Policy 1997
Do VPO and n PORALG have strategies, plans and targets regarding e-waste management?	VPO and PO-RALG to identify and assess strategic environmental concern and key issues	National Environmental Policy ;1997
	VPO to develop strategies, and undertake strategic environmental risk assessment.	Environmental Management Act; 2004
	LGAs to establish e-waste plan and establish local environmental policies and regulations	National Environmental Policy 1997
	LGAs to determine target on e-waste stream (Generation, storage, collection, transportation and disposal or treatment	United Nations Environmental Programme (UNEP): Takeback system volume III).
	Local Government Authorities and other	EMA, 2004

Audit Question	Criteria	Source
	Regulatory Authorities to control and monitor hazardous waste;	
	LGAs to conduct an inventory and develop a database of electronic equipment and their waste	Guideline for management of hazardous waste of 2013 section 4.2.4; Hazardous Waste Control and Management Regulations of 2009 Par III, sections 9–10. And Environmental Management Act of 2004 sections 114, 115 (1, 2, 4))
	NEMC to develop mechanism for monitoring and evaluating environmental performance that include ;cost for mitigation measures and the time frame of implementing the measures.	EMA 2004
	NEMC and LGA to institute and maintain plan for proactive public awareness raising campaign in environmental and management of hazardous waste.	Sustainable Industrial Development Policy of 1996-2020 Guideline for hazardous management waste, 2013
	VPO shall plan and conduct programmes aimed at raising awareness of the people on sustainable development and environmental management.	EMA 2004
	NEM and LGA to institute and maintain plan for proactive public awareness raising campaign in environmental and management of hazardous waste	Sustainable Industrial Development Policy of 1996-2020 ,Guideline for hazardous management waste, 2013
	VPO and PO-RALG to assist local communities become aware of their own situation and	National Environmental Policy, 1997

Audit Question	Criteria	Source
	support them to become responsible for their own destiny on environmental issues	
	VPO and PO-RALG to establish advisory bodies for monitoring and assessment of effectiveness of action taken (awareness campaign programmes	Source: National Environmental Policy , 1997
Do relevant agencies and stakeholders effectively coordinate their activities regarding e-waste?	NEMC shall establish and operate a Central Environmental Information System which may bring together any findings, data and statistics generated by both public and private Institutions in the course of environmental observation and management. Source *:*	EMA , 2004
	NEMC and other relevant authorities shall establish mechanisms to collect and respond to public comments, concerns and questions related to the environment including public debates and hearings; and as well as environmental information.	EMA , 2004
	LGAs (Generator or owner of hazardous waste) shall submit quarterly reports to the respective regulatory authorities.	Guidelines For Management Of Hazardous Waste, 2013
	A person licensed to carry out any activity on handling of e-waste should submit bi-annual reports to the Director of Environment and other relevant authority.	Guidelines For Management Of Hazardous Waste, 2013
	The Council shall prepare and submit to the Minister a bi-annual report showing how it	EMA 2004

Audit Question	Criteria	Source
	has implemented the provisions of this Act (EMA) and fulfilled its establishment roles and responsibilities	
	Standard report to include; plain language, verbal forms, clear concise title with maximum of three elements, table of content, foreword, introduction, scope, normative reference, terms and definitions, clause and sub clause, notes and examples, tables and figures, annexes and appendices	*International Organization for Standards (ISO)*https://www.iso.org/files/live/sites/isorg/files/archive/pdf/en/how-to-write-standards.pdf
	Stipulated roles and responsibilities for each of various agencies and departments charged with aspect of environmental.	EMA , 2004; Guidelines for Management of Hazardous Waste, 2013
	The framework environmental legislation shall be designed to organise various agencies of Government charged with aspects of environmental protection to promote coordination and cooperation among them.	National Environmental Policy 1997
VPO and PORALG adequately monitor and evaluate e-waste management stream?	NEMC shall conduct surveys on the state of the environment.	EMA ,2004
	Sector Ministries, Government departments, agencies or Institutions to undertake monitoring and submit a report to NEMC.	Environmental Impact Assessment and Audit, 2005
	NEMC to develop environmental management plan with mechanism for monitoring and evaluating the compliance and	Environmental Impact Assessment and Audit Regulation , 2005

Audit Question	Criteria	Source
	environmental performance which shall include the cost of mitigation measures and the time frame of implementing the measures.	
	NEM to gather, analyse information relating to the environment and advise the Minister on existing information gaps.	EMA , 2004

Appendix 6: Responsibilities of stakeholders in e-waste management

Process	Responsible Entity	Activities
Obtaining permit to deal with e-waste	E-waste dealers	Collect e-waste information Analyse and calculate the effort needed Provide the quotation to the client If permit given, collect e-waste materials from residential, industrials, commercial places etc Transport e-waste materials to factory premises, dumpsites or landfills
	VPO	If the quotation was sent to them Review the quotation with the view of assessing the capacity of the dealers Provide the permit if satisfied by the capacity of the dealers Developing policies and legislations for handling of hazardous wastes
	PORALG	Ensuring harmonized mechanism of dealing with different policies, approaches and methodologies so as to improve efficiency in managing e- waste. Ensuring that LGAs provides permit to dealers with appropriate capacity
	LGAs	If the quotation was sent to them Review the quotation with the view of assessing the capacity of the dealers Commissioning electronic waste contractors with responsibility to handle electronic waste over the area specified by the LGA[43] conducting an inventory and developing a database of electronic equipment and

[43]43Hazardous waste control and management regulation of 2009

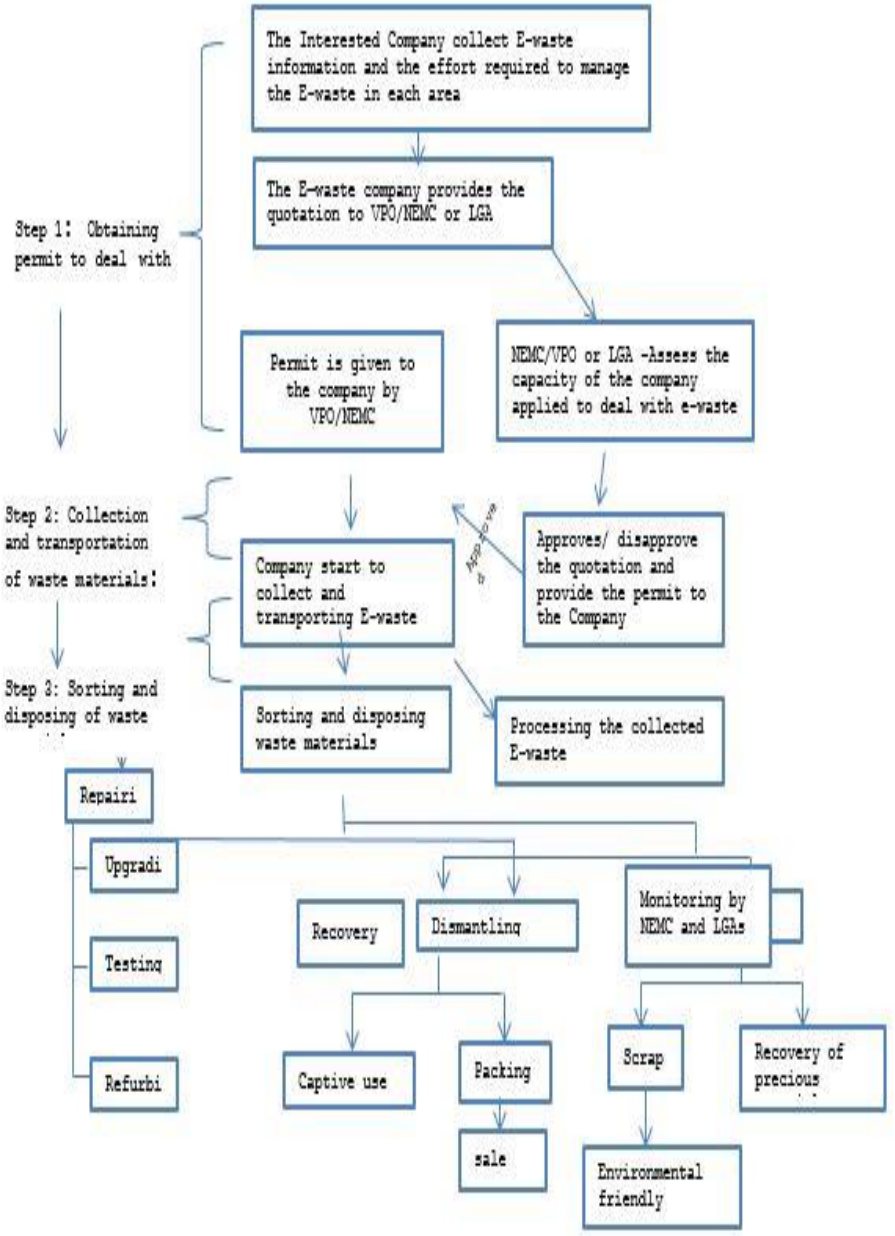
		their waste Provide public awareness and education on hazardous waste management
	TCRA	TCRA assists in different initiatives towards e-waste interventions.
Collection and transportation of e-waste materials	Dealers	Collecting the electrical equipments that are out of use for different purpose Transporting e-waste materials to factories, dumpsites or landfills
	LGAs	Ensuring that standards prescribed for the hazardous waste management are in place and operational at all the time44,45 Monitors day to day e-waste activities done by the e-waste dealer Provide public awareness and education on hazardous waste management Ensure that persons who handle the electronic waste are supplied with protective gears, trained in safe handling and equipped with waste handling equipment Informing VPO or other relevant authorities immediately in case of spillage, leakage, or other accidents during transportation Ensuring that all types of waste are classified depending on whether it is organic waste, plastics, glass or metals; Ensure areas set aside by industries for the collection of waste are clean and protected from flies, animals and scavengers.
	NEMC	Enforcing environmental quality standards for the management of hazardous waste Monitoring safety and impacts on human health and environmental of hazardous waste and other wastes
	Media	Advocacy and awareness to the public about the dangers of e-waste
	VPO	Grant permit for transporting hazardous waste within or throughout Ensure that hazardous waste management is designed to derive maximum benefit at minimum cost Monitor the trans-boundary movement of hazardous waste within and through mainland Tanzania
Sorting and disposing e-waste	Dealers	Repairing the waste materials by upgrading, testing and refurbishing Dismantling the waste by recovering for the

[44]Environmental Management Act of 2004

45 Hazardous waste control and management regulation of 2009

materials		purpose of captive use and packing for sale and residual disposal (scarps and recovery of precious materials)
	LGAs	Monitors day to day e-waste activities done by the e-waste dealers Provide public awareness and education on hazardous waste management
	NEMC	Regulating disposal of hazardous waste and sites contaminated with hazardous waste
	Media	Advocacy and awareness to the public about effects of hazardous waste
	VPO	Make regulations prescribing the best method for the treatment of hazardous liquid wastes from industries. Ensure that Environmental Impact Assessment is carried out before hazardous waste is disposed of into soil, land, air or body of water.
	TCRA	Assists in different initiatives towards e-waste interventions.
Monitoring and evaluation	Dealers	Preparing operation report and submit to LGAs on daily or weekly basis
	RS	To oversee the development of LGAs intervention Receives, reviews and scrutinizes the progress reports submitted by LGAs, and providing report feedback Submits the LGAs' reports to PORALG and when necessary to VPO and NEMC
	LGAs	Receives, reviews and scrutinizes operation reports submitted by the e-waste dealers Provides report feedback to waste dealers regarding to the reports submitted Conducts supervision to the dealers by visiting the collection and dumping points on daily or weekly basis Prepares quarterly reports and submit to RS
	NEMC	Conduct inspection to assess to the environmental compliance
	PORALG	Receives, reviews and scrutinizes the progress reports submitted by RS
	TCRA	TCRA assists in different initiatives towards e-waste interventions.

Appendix 7: Process Description of electronic waste (In Diagram)



Appendix 8 :(a):Estimated waste generated in the visited LGAs (in tons)

Year	Visited LGAs						
	Mbeya CC	Mwz CC	Tanga CC	Arusha CC	Kinodnoni MC	Ilala MC	Temeke MC
2013/14	13,5143	130394	1665046	200,887	739455	420038	501145
2014/15	13,5143	130394	32930	200,887	739490	420038	400222.5
2015/16	13,5143	130394	56055	200,887	739490	420038	288715
2016/17	13,5143	129,948	61979	200,887	369745	420038	47144357.5
Total	540,572	521,130	150,964	803,548	2,588,180	1,680,152	1,334,440
Grand Total	7,534,620						

Source: LGAs' Progress Reports of 2013/2014 -2016/2017

Appendix 8: (b) Estimated waste collected and transported to Dumpsites in the visited LGAs (in tons)

Year	Visited LGAs						
	Mbeya CC	Mwz CC	Tanga CC	Arusha CC	Kinodnoni MC	Ilala MC	Temeke MC
2013/14	98618	85,432	12100	146,800	293863	209,599	439151
2014/15	98618	85,432	13584	146,800	332771	209,599	282199
2015/16	98618	85,432	22151	146,800	410418	209,599	95637
2016/17	98618	95864	33476	146,800	225544	60719	57022
Total	394472	352,160	81311	587,200	1262596	838,396	874009
Grand Total	4,390,144						

Source: LGAs' Progress Reports of 2013/2014 -2016/2017

[46]First Quarter of 2013/13
[47]First Quarter of 2013/13

Appendix 9: NEMC Budget for Printing and Distribution of brochures for three Years

Financial Year	Amount Budgeted to Print Brochures	Actual Amount Released to Print Brochures	Number of Brochures Produced	Number of Brochures Distributed to Public for Awareness Creation
2016/2017	17,800,000.00	46,071,000.00	23,000	400
2015/2016	11,800,000.00	3,300,000.00	1,800	1,500
2014/2015	12,500,000.00	3,800,000.00	2,000	1,700
Total	**42,100,000**	**53,171,000**	**26,800**	**3,600**

Source: NEMC headquarter annual budgets

NB: in 2016/2017 NEMC printed a bulk of promotional materials (brochures, leaflets and fliers which were not distributed because as distribution started the government changed the decision from prohibiting to allowing the use of plastic materials while the materials were already being printed. None of the NEMC zonal Office was provided with the printed materials.

Appendix 10: Number of industrial facilities and Mining centers inspected in three NEMC zonal Offices for four years

NEMC Zonal office	Financial year	No. of industrial areas inspected	No. Mining enters inspected
Arusha	2013/2014	8	2
	2014/2015	8	2
	2015/2016	8	2
	2016/2017	8	2
Total		8[48]	2[49]
Mwanza	2013/2014	47	79
	2014/2015	89	156
	2015/2016	84	210
	2016/2017	35	230
Total		**255**	**675**
Mbeya	2013/2014	25	
	2014/2015	25	
	2015/2016	25	
	2016/2017	25	
Total		**25**	

Source: Interviews with three visited NEMC zonal Offices

[48] Inspection was done to the same facilities in each year
[49] Inspection was done to the same mining centers in each year

Appendix 11: Registered e-waste dealers

S/N	e-waste dealer	Operation Zone	Operation period	Inspection frequency
1.	M/S Chilambo Trade Company	country wide	28th May 2012 to date	None
2	M/S Affordable computers and technology for Tanzania	Northern Zone	15th Sep 2014 to 14th Sep. 2015.	None
3	Victoria Quality services Ltd	Lake Zone	March 2017-mach 2018	None

Source: NEMC's e-waste dealers' registration files

Appendix 12: Bi-annual reports with E- waste related issues reported by Chilambo General Trade Company's) bi annual reports.

Year	Number of bi-annual reports submitted to NEMC	E-waste issues reported.	Volume of e-waste collected (Tons)
2013/14	1		9.3
2014/15	2	1. e-waste collection volume 2. e-waste activities that the company engaged in 3. what has been provided to OK Plast Ltd 4. public Awareness campaigns conducted on e-waste 5. e-waste collection campaigns to public and private companies and institutions	92.78
2015/16	2	1. e-waste collection volume 2. e-waste activities that the company engaged in 3. what has been provided to OK Plast Ltd 4. public e-waste Awareness campaigns conducted 5. e-waste collection campaigns to public and private companies and institutions 6. e-waste equipments	425.67

		collected and the companies that were collected from and 7. agreements made with other companies to collect e-waste	
2016/17	1	1.e-waste collection volume, 2. e-waste equipments collected and the companies that were collected from 3.Public e-waste awareness campaigns conducted, 4.e-waste Collection campaigns conducted and 5.agreements made with other companies to collect e-waste	4267.63

Source: CGTC's bi-annual progress reports of 2013/2014-2016/2017

Appendix 13: Generated e-waste per inhabitant for seven visited LGAs

LGAs	Generated E-waste in 2013 (Tons)	Generated E-waste in 2013 (Tons)	Generated E-waste in 2013 (Tons)	Generated E-waste in 2013 (Tons)	Generated E-waste in 2013 (Tons)	Variance Between 2013 to 2017	(%) Percentage of increase from 2013-2017
Arusha CC	743	761	784	810	825	83	11
Ilala MC	2135	2199	2261	2327	2389	254	12
Kinondoni MC	1633	1675	1722	1771	1812	179	11
Mbeya CC	2999	3096	3198	3303	3410	411	14
Mwanza CC (Nyamagana MC)	**648**	**673**	**703**	**731**	**760**	**112**	**12**
Tanga CC	490	499	513	531	533	44	9
Temeke MC	2101	2166	2229	2287	2359	258	12

Appendix 14: Responses from the Auditee

Reponses from Vice President Office Division of Environment

A: Overall Responses

1. The VPO appreciates the performance audit work done by NAO in the area of E-Waste management in the country.
2. The findings in the Audit Report provide the VPO – DoE with valuable inputs to the areas of its mandate in E-waste management that need to be improved.
3. The VPO-DoE provides for Framework documents such as Policy, Law and Regulations, Guidelines, Strategies and Plans for Sound Management of E-waste in the country, the function that the Office has fulfilled in ensuring that E-waste is addressed in the following:-
    a) The National Environmental Policy 1997 (under review) in which among others issues the E-waste is well articulated in the new policy which has to be completed this year.
    b) The Environment Management (Hazardous Waste Control and Management) Regulations, 2009 which stipulate management of E-waste as part of Hazardous waste (containing Annex I materials);
    c) The Guidelines for Management of Hazardous Waste which provides for procedures for Sound Management of Hazardous waste including e-waste. The Guidelines describe the problem specifically for E-waste on page 12.
    d) The National Environmental Action Plan (NEAP 2013 - 2018) stipulates clearly actions that are required by all stakeholders to address the issue of E-waste Management.
    e) The State of Environment Report 2014 (SoER) also states clearly the problem of E-waste as an emerging environmental issue affecting people's health and the environment.
    f) The draft E-Waste Management Regulations and Guidelines that are in the process of approval are deliberately prepared to respond to the concerns of E-Waste Management in the country.

On top of the above effort the NEP, 1997, the NEAP 2013 – 2018 and the SoER are currently under review and the issue of E-Waste is given more attention. Therefore, the legal and institutional framework for E-waste in the country is in existence and what is the challenge is the enforcement by relevant institutions. The need for a standalone Regulations for E-waste has been addressed as stated in the Audit report which also provides for inputs for more concrete actions for management of the E-waste.

B: Specific Responses

SN	RECOMMENDATIONS	VPO'S COMMENT(S)	ACTION(S) TO BE TAKEN	TIME LINE
NEMC 's Capacity in Managing e-waste				
1.	VPO should ensure that, e-waste guiding tools (policy, Bill, Regulation and Guideline) are approved, made available to all interested stakeholders and be implemented.	We agree with this recommendation. The VPO has already started action	The draft regulations and guidelines are already there under finalization. The policy, NEAP and SoER are in review for more inclusion of E-waste management issues.	2018/2019
2.	VPO should ensure that the proposed UNEP budget framework is adopted so as to enable appropriate funds allocation for e-waste management stream	The recommendation is noted and follow-up will be made to ensure that the proposed UNEP budget framework is adopted so as to enable appropriate funds allocation for e-waste management stream.	Bilateral discussions will be held with UNEP to find a way of accessing funds for the E-waste project	2018/2019
3.	VPO should ensure that, NEMC appoint specific staff to deal with e-waste are identified and prioritize training staff on e-waste management issues.	The recommendation is noted	VPO will request NEMC to appoint specific staff to deal with e-waste issues	2019/2020

4.	VPO should ensure that, NEMC map out the informal e-waste dealers (Refurbishes, Recyclers, and Sellers) and have a data base for easy management of their operations to be able to track the generation, collection and disposal of e-waste materials	The recommendation is noted	VPO will request NEMC to map out the informal e-waste dealers and establish the database.	2018/2019
VPO Strategies, plans and targets toward e-waste managements				
5.	VPO should ensure disposal centres and take back system are established in the country	The responsibilities for establishment of the collection centres and take back system have to be done by the LGAs for easier management. However, because E-waste includes mostly recyclable materials, it is recommended that E-waste dealers establish their own collection centres in compliance to the guidelines and regulations.	VPO will remind LGAs to establish collection centres and require dealers of E-waste to establish collection centres and adhere to the regulations and guidelines	2019/2020

6.	VPO should ensure that EACO-regional E-waste Management strategy is adopted and develop targets and plans for achieving the zero-negative impact of e-waste	The recommendation is noted	The EACO-regional E-waste Management strategy will be mainstreamed in the national plans and strategies	2019/2020
7.	VPO should advice NEMC to lower the cost of registrations to welcome more entrepreneurs who are willing to engage in e-waste business	The recommendation is noted. However, with the new concept of Waste as a business the cost of registration must be viewed as a source of government income due to the profit the companies get in E-Waste recycling	The Fees and Charges Regulations are under review but with a view to enable dealers operate their business smoothly whilst the government gets the income it deserves from the business	2018/2019
Coordination of e-waste related issues among stakeholders.				
8.	VPO should ensure that, NEMC assesses the impact of e-waste to both human health and environment and share the information with other stakeholders	The impact of the mineral/chemical constituents of E-waste to human waste is already known what is needed is to determine whether there are contaminated sites from E-waste that creates hazardous conditions.	VPO will request NEMC to make e waste as a priority issue during the EIA process	2019/2020

9.	VPO should ensure that, NEMC establishes and operates a Central Environmental Information System for sharing information among stakeholders	This recommendation is noted	VPO through World Bank has developed the project. The establishes and operates a Central Environmental Information System for sharing information among stakeholders will be one the activity.	2019/2020
Monitoring and evaluation of e-waste activities				
10.	VPO should ensure that, NEMC consider developing tools for measuring their performance regarding to e-waste minimization and management	This recommendation is noted	VPO will request NEMC to develop the M&E tools for measuring their performance regarding to e-waste minimization and management	2019/2020
11.	VPO should ensure that, NEMC update the inspection manual and consider including e-waste related issues in the manual	This recommendation is noted	VPO will request NEMC to update the inspection manual and consider including e-waste related issues in the manual	2018/2019

12.	VPO and PORALG should ensure reporting system is strengthened and be followed accordingly	This recommendation is noted	Efforts are being taken to strengthen the reporting system and information sharing of environment management. However, environmental management reporting system is prescribed in the EMA 2004 with environmental officers and committees from village to ministerial levels.	

Reponses from President's Office Regional Administration and Local Government (PORALG)s

A: Overall Responses

B: Specific Responses

SN	RECOMMENDATIONS	VPO'S COMMENT(S)	ACTION(S) TO BE TAKEN	TIME LINE

NEMC's Capacity in Managing e-waste				
1.	VPO should ensure that, e-waste guiding tools (policy, Bill, Regulation and Guideline) are approved, made available to all interested stakeholders and be implemented.			
2.	PORALG should ensure that the proposed UNEP budget framework is adopted so as to enable appropriate funds allocation for e-waste management stream			
3.	PORALG should ensure that, LGAs appoint specific staff to deal with e-waste are identified and prioritize training staff on e-waste management issues.			
4.	PORALG should ensure that, LGAs map out the informal e-waste dealers (Refurbishers, Recyclers, and Sellers) and have a data base for easy management of their operations to be able to track the generation, collection and disposal of e-waste materials			
Coordination of e-waste related issues among stakeholders.				

5.	PO-RALG should establish environmental function and appoint environmental officers at the level of Regional Secretariat			
Monitoring and evaluation of e-waste activities				
6.	PORALG should ensure that, LGAs consider developing tools for measuring their performance regarding to e-waste minimization and management			
7.	PORALG should ensure that, LGAs update their environmental by-laws so as to address e-waste management and minimization activities			
8.	PORALG should ensure that reporting system is strengthened and be followed accordingly			