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REGULATION OF E-WASTE IN THE MOBILE PHONE INDUSTRY: KENYA'S LEGAL OPTIONS

STEPHEN W. CHEGE

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DECLARATION

STUDENT'S DECLARATION

I, STEPHEN W. CHEGE do hereby declare that this is my original work and has not submitted and is not currently being submitted for a degree in any other university

Signed.....

STEPHEN W. CHEGE

SUPERVISOR'S APPROVAL

This Thesis is submitted for examination with my approval as University Supervisor:

Signed.....

MR. STEPHEN KIPTINESS

Dated at Nairobi this 20TH day of NOVEMBER 2013

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ABBREVIATIONS AND ACRONYMS

ACA	Anti-Counterfeit Agency
BASEL	The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal
CAMARA	A volunteer based organisation dedicated to educating the community in Africa through computer technology.
CCK	The Communications Commission of Kenya
CFSK	Computers for Schools Kenya
CRT	Cathode Ray Tube
EEE	Electrical and Electronic Equipment
EMCA	The Environmental Management and Co-ordination Act Number 8 of 1999
EU	European Union
GSMA	Global System for Mobile Communications Association
HP	Hewlett Packard
IMEI	International Mobile Equipment Identifier
IPR	Individual Producer Responsibility
LASEPA	Lagos State Environmental Protection Agency
LAWMA	Lagos State Waste Management Authority
MSW	Municipal Solid Waste
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development (OECD)
SIM	Subscriber Identity Module
UNEP	United Nations Environment Programme
WEEE	Waste Electrical and Electronic Equipment

LIST OF STATUTES

Constitution of Kenya, 2010

Environmental Management and Co-ordination Act Number 8 of 1999

Kenya Information & Communication Act, Chapter 411A

CHAPTER ONE: INTRODUCTION

1.1 Background Information

In 2013, the World Trade Organisation reported that international trade in Telecommunications services had a global market worth of over USD 1.5 trillion in revenue and it was estimated that out of this total, Mobile communication services accounted for roughly 40 per cent.[1] In the same year, the International Telecommunications Union (ITU) has reported that at 6.8 billion, there are almost as many mobile-cellular subscriptions as people in the world and that Mobile-cellular penetration rates stand at 96% globally, 128% in developed countries and 89% in developing countries.[2]

This rapid growth in trade in telecommunication services is anchored on the development and distribution, through import and export, of mobile cellular devices. Mobile cellular devices or mobile phones contribute significantly to international trade through the volumes of exports and imports of devices and also through the communications services they facilitate. As mentioned above, trade in telecommunication services is a major global revenue earner and with the advent of mobile money transfer services, this contribution will continue to grow. The ITU notes that Africa is the world's fastest-growing mobile phone market.[3] It estimates that the continent's mobile phone use has increased at an annual rate of 65 per cent, which is twice the global average.[4] Further, the African market is expanding nearly twice as fast as Asia's.[5]

Kenya has not been left behind in this development. Mobile phone usage has seen a significant rise since introduction of these services in Kenya in 1999. Statistics from the Communications Commission of Kenya (CCK) indicate that mobile phone usage has been growing steadily. In 2001, CCK reported that the number of mobile subscribers was 330,000.[6] In March 2013, CCK reported the total number of mobile phone users in Kenya as

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[1] WTO http://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_e.htm

[2] ITU - ICT Facts and Figures (2013), *The World in 2013,* available at http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013.pdf (last accessed 8th March, 2013)

[3] Business Africa (2010), *The Market For Mobile Phones In Africa*, available at: http://www.africa-business.com/features/mobile_phones_africa.html, (last accessed 8th March, 2013)

[4] ibid

[5] ibid

[6] CCK Annual Report of The Board For The Financial Year 2000/2001 at page 6, available at http://www.cck.go.ke/resc/publications/annual_reports/annual_report_2000_2001.pdf (last accessed 19th July 2013)

being 29.8 million.[7] The widespread use of mobile money services and the introduction of internet access through mobile phones continue to push demand for mobile phones in Kenya.

The mobile phones supporting the abovementioned subscriber statistics are invariably imported into Kenya as fully assembled devices and contribute significantly to volumes of imports into Kenya, making the industry significant in international trade in Kenya. To underscore importance of the Kenyan market, major international mobile phone manufacturers such as Nokia, Samsung and Motorola, have set up offices in Kenya to drive their strategic advances in the market.[8] TECNO and LG Electronics, mobile phone manufacturers, have all indicated intention to set up handset assembly plants in Kenya.[9]

Though a majority of the imported handsets are genuine, unscrupulous businessmen have taken advantage of the high demand for handsets to import large quantities of counterfeit mobile phones. A counterfeit mobile phone is an unauthorised copy or imitation of an existing brand, it does not conform to the original manufacturer's design, model, and performance standards, it is not produced by the stated manufacturer or their authorised contractors and usually tends to have incorrect or false markings and documentation even though they can accommodate a Subscriber Identity Module (SIM) from a mobile network operator. In March 2012, CCK estimated that counterfeit handsets in Kenya were approximately three million.[10] The counterfeits are copies of popular brands and models who's International Mobile Equipment Identifier (IMEI), a unique 15 digit number allocated to each individual mobile phone is either serially duplicated or does not conform to the recognised Global System for Mobile Communications Association (GSMA)[11] structure. These phones are also manufactured using sub-standard components and without adherence to recommended communication standards.

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[7] CCK (Jan-March 2013), *Quarterly Sector Statistics Report, January- March, 2013*, p. 8, available at: http://www.cck.go.ke/resc/downloads/Sector_Statistics_Report_for_3rd_Quarter_2012-2013.pdf, (all last accessed 19th August 2013).

[8] *supra,* note 3.

[9] Daily Nation (4th December, 2012), *TECNO to Set up Handset Assembly Plant in Kenya*, available at: www.nation.co.ke/Features/smartcompany/Tecno-to-set-up-handset-assembly-plant/-/1226/1635938/-/sdoyysz/-/index.html, (last accessed 8th March, 2012).

[10] CCK (28th June, 2012), *CCK Launches Consumer Awareness Campaign on Counterfeit Mobile Phones*, available at: http://www.cck.go.ke/news/2012/Counterfeit_Phones.html, (last accessed 19th August 2013).

[11] The GSM Association is a trade group that represents network operators that use GSM technology for their networks. The GSMA also counts a number of manufacturers and suppliers that provide the GSM technology as associate members.

The legislative response to this problem has seen the enactment of the Anti-Counterfeit Act, 2008, which makes it an offense manufacture, produce, sell, hire out, barter or exchange, exhibit, distribute or import any counterfeit item.[12] Persons engaging in such acts are, upon conviction, liable to imprisonment for a term not exceeding fifteen years or to a fine, not less than five times the value of the prevailing retail price of the goods, or both.[13] In addition, the Kenya Information and Communications (Importation, Type Approval and Distribution of Communications Equipment) Regulations 2010 require that all mobile phones to be Type Approved by CCK so as to establish whether they meet the required technical standards.[14] Contravention of the said Regulations attracts a fine not exceeding three hundred thousand shillings or imprisonment for a term not exceeding three years or both.[15] CCK on 30th September, 2012, enforced the above laws, leading to switching off of the counterfeit handsets from mobile networks in Kenya.[16]

In spite of the significant beneficial impact attached to the high uptake in mobile communications and its contribution to trade in Kenya, there is a cost to this rapid growth in usage of mobile devices. The mobile phone industry has the negative effect of also generating large amounts of electronic waste (e-waste). Genuine mobile phone handsets have a limited lifespan estimated at about four years after which they must be disposed creating e-waste.[17] As discussed above, the high number of counterfeit handsets, which last for a relatively shorter time compound this problem as their disposal also contributes to the accumulation of e-waste.[18] CCK's actions to clamp down on counterfeit mobile phones will undoubtedly have resulted in further accumulation of e-waste with the real likelihood that some of the deactivated mobile phones may have been disposed of in garbage sites and landfill sites posing a significant danger to the environment.

Despite the increase in mobile phone e-waste, few measures have been initiated to address this problem. Largely most of the initiatives have been industry based. The leading

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[12] Section 32.
[13] Section 35(1).
[14] Regulation 3.
[15] Regulation 24(2).
[16] CCK (September, 2012), *CCK's Campaign Against Counterfeit Phones*, available at: http://www.cck.go.ke/counterfeit-campaign, (last accessed 8th March, 2013).
[17] The Review (March, 2012), *How Recycling is Giving Old Phones New Life*, Issue No. 3 of 2012, available at: http://www.gemalto.com/companyinfo/digital_stories/review/2012_issue3/index.htm, (last accessed 30th May, 2013).
[18] CCK (28th June, 2012), *CCK Launches Consumer Awareness Campaign on Counterfeit Mobile Phones*, available at: http://www.cck.go.ke/news/2012/Counterfeit_Phones.html, (last accessed 8th March, 2013).

telecommunication company, Safaricom Limited (Safaricom), recently launched a non-profit Waste Electrical and Electronic Equipment centre (WEEE), encouraging members of the public to deposit redundant mobile phones with them[19]. During the CCK counterfeit handset switch-off campaign, several phone manufacturers, among them, Nokia[20] and Samsung[21] partnered with mobile network providers and the Kenyan Anti-Counterfeit Agency to set up collection points across the country where consumers would dispose the counterfeit mobile handsets for recycling.

The Government response to e-waste has been weak. In the National Environmental Management Agency (NEMA)'s Environmental Management and Coordination (Waste Management) Regulations of 2006, aimed at protecting the environment and the public against pollution from waste, little is mentioned about e-waste. The rules made under the Environmental Management and Co-ordination Act Number 8 of 1999 (EMCA) place more emphasis on solid waste management, largely ignoring e-waste. It is only after much pressure from the civil societies and stakeholders in electronic industry that the Government attempted a response to the problem by appointing a taskforce for the development of e-waste regulations in 2011 (hereinafter, "Taskforce"). This had members drawn from Government agencies, NGOs and other private entities, with the mandate to develop a set of e-waste guidelines to be used as a reference for the responsible identification, collection, sorting, recycling and disposing of electrical and electronic waste. The taskforce has since developed the draft Environmental Management and Co-ordination (E-Waste Management) Regulations 2013 (draft E-Waste Management Regulations 2013) that, by the time of this study are still at the stakeholder review stage but which have been made publicly available by NEMA.[22]

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[19] Safaricom Limited records, *Safaricom Launches E-Waste recycling Programme, available at* http://www.safaricom.co.ke/about-us/media-centre/press-releases?layout=edit&id=429 (last accessed 19th August 2013).

[20] CIO East Africa (19th September, 2012), *Nokia Calls on Kenyan Consumers to Recycle Counterfeit Phones*, available at: http://www.cio.co.ke/news/top-stories/nokia-calls-on-kenyan-consumers-to-recycle-counterfeit-phones, (last accessed 11th March, 2013).

[21] Samsung Mobile Kenya (28th September, 2012), *Samsung is set to Replace an Estimated 3 Million Counterfeit Phones, While Helping Mop-up and Recycle E-Waste*, available at: https://www.facebook.com/notes/samsung-mobile-kenya/samsung-is-set-to-replace-an-estimated-3-million-counterfeit-phones-while-helpin/439844166057877, (last accessed 11th March, 2013).

[22] NEMA, *Draft E-Waste Regulations,* available at, http://www.nema.go.ke/index.php?option=com_phocadownload&view=category&id=2:legislationpolicies&Itemid=594 (last accessed 19th August 2013).

1.2 Research Problem

Basing its figures on existing e-waste assessments and related reports, the United Nations Environmental Programme (UNEP) estimates that mobile phones have an estimated lifetime of 4 years, with Kenya producing over 610 metric tons of mobile phone e-waste per year by 2007.[23] Most of this ends up in the landfills and dumping sites such as the one located Dandora, a low income suburb in Nairobi, posing a significant pollution concern to the environment which is hazardous to human health.

Despite the magnitude of the problem, Kenya has been slow in setting up an elaborate framework to address e-waste with more emphasis being placed on solid waste management. NEMA, the body authorised to address environmental pollution in Kenya has been slow to act on this matter. This study also questions whether these draft E-Waste Management Regulations 2013 will be effective in addressing the e-waste problem in Kenya even if they are passed.

Technical solutions for e-waste processing are available, but a legal framework, a collection system, logistics, and other services needs to be implemented before a technical solution can be applied. There is also need to make a comparative examination of how other developing and developed countries have addressed this problem.

In seeking to address the foregoing, this study has had special emphasis on the mobile communications industry in Kenya.

1.3 Problem definition: E-waste is a specific type of Waste

"E-waste" is a popular, informal name for electrical and electronic equipment (EEE) nearing the end of their "useful life."[24] E-waste is used to describe almost all types of EEE that has or could enter the waste stream. Although E-waste is a general term, it can be considered to cover TVs, computers, mobile phones, white goods (e.g. fridges, washing machines, dryers

[23] UNEP (July, 2009), *Recycling From E-Waste To Resources*, p. 69, available at: http://www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf, (last accessed 11th March, 2013).

[24] Advanced Tropical Environment (ATE). November 2012. Identification of the Magnitude of the Electrical and Electronic (E-waste) situation in South Africa: A Strategic Approach to International Chemicals Management (SAICM) E-waste as an Emerging Policy Issue. South Africa Department of Environmental Affairs

etc), home entertainment and stereo systems, toys, toasters, kettles and other EEE household or business item with circuitry or electrical components with power or battery supply.

E-wastes are considered toxic, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density.[25] E-waste contains several persistent, bio-accumulative and toxic substances including heavy metals such as lead, nickel, chromium, mercury, and persistent organic pollutants such polychlorinated biphenyl in capacitors in older models which are still in the market, and brominated flame retardants.[26] The hazardous content of these materials pose a threat to human health and environment. Discarded computers, televisions, stereos, copiers, fax machines, electric lamps, mobile phones, audio equipment and batteries if improperly disposed can leach lead and other substances into soil and groundwater.[27] Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem as discussed later in this Study.

E-waste is distinguished from other form of wastes such as Municipal Waste. Municipal solid waste (MSW) is generated from households, offices, hotels, shops, schools and other institutions. The major components are food waste, paper, plastic, rags, metal and glass, although demolition and construction debris is often included.[28] Industrial Solid Waste which encompasses a wide range of materials of varying environmental toxicity. Typically this range would include paper, packaging materials, waste from food processing, oils, solvents, resins, paints and sludges, glass, ceramics, stones, metals, plastics, rubber, leather, wood, cloth, straw, abrasives, etc. These tend to be unusable parts of raw materials or by-products of industrial production. Agricultural Waste and residues produced as a result of expanding agricultural production which has resulted in increased quantities of livestock waste, agricultural crop residues and agro-industrial by-products. Hazardous Waste; most of which

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[25] Blaser F., Schluep, M,. 2012. Economic Feasibility of e-Waste Treatment in Tanzania

[26] Advanced Tropical Environment (ATE). November 2012. Identification of the Magnitude of the Electrical and Electronic (E-waste) situation in South Africa: A Strategic Approach to International Chemicals Management (SAICM) E-waste as an Emerging Policy Issue. South Africa Department of Environmental Affairs at page 12

[27] Wang F, Huisman J, Meskers CEM, Schluep M, Stevels A, Hagelüken C., 2012. The Best-of-2-Worlds philosophy: Developing local dismantling and global infrastructure network for sustainable e-waste treatment in emerging economies.

[28] The Economic and Social Commission for Asia and the Pacific (ESCAP) Waste Report, 2000. At Chapter 8 page 170. Available at http://www.unescap.org/esd/environment/soe/2000/documents/CH08.PDF (last accessed on 8th November 2013)

is the by-product of a broad spectrum of industrial, agricultural and manufacturing processes, nuclear establishments, hospitals and health-care facilities. High-volume generators of industrial hazardous waste are the chemical, petrochemical, petroleum, metals, wood treatment, pulp and paper, leather, textiles and energy production plants (coal-fired and nuclear power plants and petroleum production plants). Other industries that generate hazardous waste include auto and equipment repair shops, electroplating and metal finishing shops, textile factories, hospital and health-care centres, dry cleaners and pesticide users which produce waste solvents, chlorine bearing waste and pesticide, organophosphate, herbicide, urea and fungicide bearing waste.

This Study focuses on E-waste and the regulatory environment available in Kenya to manage this growing problem.

1.4 Theoretical Framework

This study will rely on the Utilitarianism legal theory to examine the existing legal and regulatory framework around e-waste management in Kenya. Adherents of Utilitarianism as a legal theory believe that law must be made to conform to its most socially useful purpose. Although Utilitarians differ as to the meaning of the word useful, most agree that a law's utility may be defined as its ability to increase happiness, wealth, or justice.

Jeremy Bentham (1748-1832) was the founder of the utilitarian legal theory and political thought that takes "the greatest happiness of the greatest number" as the appropriate standard for both private conduct and institutional design and reform. He was also the leader of a group of Utilitarians known as the Philosophical Radicals, including John Austin (1790-1859), James Mill (1773-1836) and John Stuart Mill (1806-73) who criticised existing political and legal institutions and proposed legislative reforms based on utilitarian principles.[29] Utilitarianism was a direct attack at the Common Law which and its grounding on the Natural Law school of thought which espoused the principles that all laws derive from nature and are self-evident. In this regard Jeremy Bentham is most famously remembered for stating:

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[29] David O. Brink. Contemporary Political Philosophy: Benthamite Utilitarianism, Fall 2005. Available at http://philosophyfaculty.ucsd.edu/faculty/dbrink/courses/167-05/Handout-2%20Benthamite%20Utilitarianism.pdf (last accessed on 27 October 2013).

Natural rights is simple nonsense: natural and imprescriptible rights, rhetorical nonsense,—nonsense upon stilts.[30]

Utilitarianism assessed actions and institutions in terms of their effects on human happiness and advocated actions and the design of institutions so that they promote – in one formulation, maximise human happiness. Utilitarianism was a progressive doctrine historically, because it is universal in scope, insisting that everyone's happiness matters, and because its conception of impartiality is egalitarian, insisting that everyone's happiness matters equally.[31]

A key proposition of Utilitarianism and one from which this study draws its theoretical linkage is the assertion by Bentham and other Utilitarian thinkers that rights should derive from codified laws. This allowed all persons to know what their rights and obligations were as stated in the laws. Law makers (parliament) therefore had the duty to make laws known to citizens to enable them discover their rights and attendant punishment if they failed to obey. It is this law making aspect that this study will focus on together with the Utilitarian view that the role of government is to pass laws that achieve "the greatest happiness of the greatest number".

Drawing from this, this study posits that with regard to management of e-waste in Kenya, it is the role of the government to enact legislation and regulations that provide a conducive framework for the safeguarding of our environment and specifically which ensure that human health, social and economic development, and the environment are not negatively impacted. The study examines whether the government has put in place the necessary measures to attain this and offers recommendations how this may be achieved. In examining this, the study shall evaluate how the existing and proposed regulatory framework address key concepts such as Extended Producer Responsibility, recycling and disposal in e-waste management.

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[30] Jeremy Bentham, Anarchical Fallacies: Being An Examination Of The Declarations Of Rights Issued During The French Revolution (published in English in 1816). Available at http://muse.jhu.edu/login?auth=0&type=summary&url=/journals/human_rights_quarterly/v022/22.1bedau.pdf (last accessed on 27 October 2013)

[31] The Radicals were responsible for significant progressive reforms in British political life that tended to combat a political tradition responsive to class and privilege, including the extension of the franchise, increased opportunities for higher education regardless of class background, and a greater concern with factory and worker health and safety.

1.5 Justification

There has been little development in addressing the e-waste problem in Kenya. The only tangible result so far is the draft E-Waste Management Regulations 2013 awaiting stakeholder input before they are adopted and implemented. This study shall inform the on-going discourse on how to address mobile phone e-waste. It shall also inform policy makers on the various options on how best to deal with mobile phone e-waste. It shall also enlighten law makers on the best practice in developing mobile phone appropriate e-waste regulations. It shall give a comparative perspective on how other developing and developed countries have addressed the mobile phone e-waste problem.

In addition, it shall update the various players and stakeholders in the mobile phone industry, including handset importers, handset manufacturers and even mobile network operators on the contribution they can make in addressing the problem of e-waste.

1.6 Research Objectives

The main objective of this study is to investigate the existing and possible legal opportunities for Kenya to address mobile phone e-waste in Kenya. This objective can be broken down into three specific objectives:

1. To examine the efficacy of the draft E-Waste Management Regulations 2013 in regulation of mobile e-waste.
2. To examine how other developing and developed countries have regulated mobile phone e-waste.
3. To propose amendments to the draft E-Waste Management Regulations 2013 with regard to regulation of mobile phone e-waste.

1.7 Research Questions

This study seeks to answer the following main research question:

What are Kenya's options in developing an effective legal framework for mobile phone e-waste regulation?

This research question can be broken down into four research questions:-

1. Does Kenya currently have a legal framework for management mobile phone e-waste regulation?
2. What are the weaknesses in the draft E-Waste Management Regulations 2013 with regard to addressing e-waste and specifically mobile phone e-waste?

3. How have other developing and developed jurisdictions regulated mobile phone e-waste?
4. What amendments are necessary in the draft E-Waste Management Regulations 2013 to create an effective framework for mobile phone e-waste regulation?

1.8 Hypothesis

The study shall test the following hypothesis:

The current legal and regulatory framework for the management of E-waste in Kenya, including the draft E-Waste Management Regulations 2013 proposed by NEMA is replete with weaknesses and would benefit from significant improvement and in the case of the draft E-Waste Management Regulations 2013 proposed by NEMA, major amendments, before they are published so as to establish an effective framework for mobile phone e-waste regulation in Kenya.

1.9 Literature Review

This study has reviewed the existing literature available in this subject area. There is very little that has been written specifically on mobile phone e-waste. Most of the existing literature deals with e-waste in general. The study reviewed literature under five major themes: the mobile phone e-waste situation in Kenya, effects of the mobile phone e-waste, Kenya's response to the problem, approaches used by other countries, both developing and developed and finally offer recommendations to tackle the e-waste problem.

On the situation of mobile phone e-waste in Kenya, there is agreement in literature that the situation is in serious need of attention. National Environment Management Authority (NEMA)[32] notes that e-waste is an emerging issue in Kenya. It notes that e-waste in Kenya comprises end-of-life appliances including electronics which are destined for re-use, resale, salvage, recycling, or disposal.[33] UNEP identifies contributor of e-waste to be: refrigerators, washing machines, mobile phones, personal computers, printers, toys and TVs.[34]

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[32] NEMA (2010), *State of the Environment (SoE) Report*, available at: http://www.nema.go.ke/index.php?option=com_content&view=article&id=249&Itemid=613, (last accessed 21st May, 2013).

[33] *ibid*, p. 171.

[34] *UNEP (July, 2009), Recycling From E-Waste To Resources, p. 69, available at: http://www.unep.org/PDF/PressReleases/E-Waste_publication_screen_FINALVERSION-sml.pdf, (last accessed 11th March, 2013).*p. 1.

Actual figures regarding the extent and estimation of the existing e-waste vary. Mureithi *et al*,[35] who limit their research to desktop computers, laptops, CRT monitors, printers and flat panel screens,[36] estimate the annual tonnage of e-waste in Kenya at about 2 984.35 tonnes per year.[37] UNEP[38] on the other hand estimates the installed base of electric and electronic equipment in Kenya to be at 58, 110 tonnes per year. This is broken down as follows: 21, 300 tonnes of PCs, 610 tonnes of mobile phones, 22, 600 tonnes of TVs and 13, 600 tonnes of refrigerators.[39] Out of this installed base, it places the quantity of e-waste generated in metric tonnes per year at 11, 400 tonnes from refrigerators, 2, 800 tonnes from TV sets, 2, 500 tonnes from PCs, 500 tonnes from printers and 150 tonnes from mobile phones, making a total of 17 350 tonnes.[40]

NEMA notes that Kenya has seen a rapid expansion in the use of ICT through interventions meant to promote use of mobile telephony.[41] Asiimwe,[42] considering the status of e-waste in East Africa, estimates the percentages of mobile phone usage in 2010 to be 27% in Uganda, 42% in Kenya, 31% in Tanzania, 14% in Rwanda and 6% Burundi.[43] He notes that the demand for this usage is met through importing refurbished and old mobile phone handsets from China and other parts of Asia. The preference for cheap second hand phones is blamed on the culture of likeability of cheap goods by people in East Africa.[44] NEMA in reference to Kenya, thus, blames the high figures of mobile phone e-waste on importation of used mobile phones and other accessories. [45]

There also exists extensive literature on the effects of mobile phone e-waste. NEMA notes that access to telephone services has helped to grow a number of other sectors including agriculture, education, health and business.[46] Specifically, it has also enhance the finance

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[35] Mureithi M, Waema T *et al* (2008), *E- Waste in Kenya: Baseline Assessment*, Proceedings of 19th Waste Management Conference of the IWMSA (WasteCon2008), 6th – 10t October, 2008, Durban, South Africa, available at: http://ewasteguide.info/Mureithi_2008_WasteCon, (last accessed 22nd May, 2013).
[36] *ibid,* p. 503.
[37] *ibid,* p. 504.
[38] *supra*, note 23.
[39] *supra*, note 23, p. 43, Table 13: Stock (installed base) of EEE in metric tons/year.
[40] *supra*, note 23, p. 44, Table 14: Quantity of e-waste generated in metric tons/year.
[41] *supra*, note 24, p. 173.
[42] Edgar Napoleon Asiimwe (2010), *E-waste Management in East African Community*, available at: http://www.spidercenter.org/sites/default/files/master_theses_sponsored/Edgar_Napoleon.pdf, (last accessed 3rd June, 2013).
[43] *ibid*, p. 5, Table 1: ICT use in EAC year 2010 and 2003.
[44] *ibid,* p. 8.
[45] *supra*, note 24, p. 174.
[46] *supra*, note 24, p. 175.

sector where, for instance, Kenyans transfer huge sums of money daily through various mobile phone products offered by the different telecommunication operators.[47]

However, NEMA notes that the mobile phones have negative effect of accumulating e-waste in Kenya. It notes that disposal of e-waste is done informally and there is little regulation in place to safeguard the health of those who dismantle the electronic equipment.[48] A huge quantity of e-waste is handled by the informal *'Jua Kali'*[49] sector. This poses a problem due to its quantity, toxicity, and carcinogenicity. Inappropriate disposal of e-waste leads to significant environmental problems but also to a systematic loss of secondary materials.[50]

UNEP states that mobile phone can contain over 40 elements from the periodic table:

> Base metals like copper (Cu) and tin (Sn), special metals such as cobalt (Co), indium (In) and antimony (Sb), and precious metals including silver (Ag), gold (Au) and palladium (Pd). Metals represent on average 23% of the weight of a phone, the majority being copper, while the remainder is plastic and ceramic material. Looking at one ton of phone handsets (without battery) this would be 3.5 kg Ag, 340 g Au, 140 g Pd as well as 130 kg Cu. For a single unit the precious content is in the order of milligrams only: 250 mg Ag, 24 mg Au, 9 mg Pd while 9 g Cu is present on average. Furthermore, the Li-ion battery of a phone contains about 3.5 g Co.[51]

Kurian[52] states that the cadmium from one mobile phone battery is enough to pollute 600 m^3 of water. Burning of old mobile phones is dangerous for it emits toxic fumes into the air.[53]

Mureithi *et al* note that most Kenyans have a tendency of holding on to old equipment, for over five years, until it is totally not usable.[54] They then dispose it in various ways: bonding, advertising and selling it to public, donation to family and friends, disassembling and using spare parts, disposing in garbage collection points or selling to dealers in metal and plastics.[55] Most of these dealers are technicians who use the obsolete phones to extract spare parts: capacitors, transistors, batteries, network cables, circuit boards, diodes and cables. The

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[47] *supra*, note 24, p. 175.
[48] *ibid,* p. 173.
[49] A term commonly used in Kenya to describe the informal industrial sector.
[50] *supra*, note 24, p. 173.
[51] *supra*, note 23, p. 7.
[52] Kurian Joseph (2007), *Electronic Waste Management In India–Issues And Strategies*, Proceedings Sardinia 2007, Eleventh International Waste Management and Landfill Symposium S. Margherita di Pula, Cagliari, Italy; 1 - 5 October 200, available at: http://www.swlf.ait.ac.th/UpdData/International/NRIs/Electronic%20waste%20management%20in%20India.pdf, (last accessed 3rd June, 2013).
[53] *ibid,* p. 3.
[54] *supra,* note 35, p. 507.
[55] *ibid,* p. 506.

dealers then dump the unusable parts in dumping sites like Dandora, causing great damage to environment and hazard to human beings.[56] Mureithi *et al* end by noting that there is accumulation of a lot of electronic waste in homes, repair shops and offices, without knowledge on how it should be safely disposed of.[57]

Hewlett-Packard (HP)[58] explains that domestic equipment is typically dumped or added to domestic refuse.[59] It is often broken up or burned on the nearest open space so that valuable items, such as gold and copper wire, can be removed. Others are burnt in uncontrolled environments, releasing noxious fumes to the environment. TVs, monitors and other less valuable parts of mobile phones end up in landfills or are fly-tipped.[60] This can allow dangerous chemicals such as lead, cadmium, mercury and other carcinogens to leach, contaminating water supplies and the ground. These cause damage to eco systems and human health.[61]

Ongondo & Williams[62] note that the heavy metals found in electronic equipment, such as lead, can contaminate drinking water by leaching into groundwater from sources such as landfills.[63] They further emphasize that electrical and electronics contain more than 1000 different substances, many of which are highly toxic, such as lead, mercury, arsenic and cadmium, with potentially serious health impacts.[64]

Neira *et al*[65] states that the hazardous substance of most concern contained within cell phones is lead. This heavy metal is a suspected carcinogen which has negative effects on the central nervous system, the immune system, and the kidneys, and has been associated with

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[56] *ibid*, p. 507.
[57] *supra,* note 35, p. 507
[58] Hewlett-Packard (2009), *E-waste Management in South Africa, Kenya and Morocco: Developing a Pathway to Sustainable Systems,* available at: http://h41111.www4.hp.com/globalcitizenship/uk/en/environment/pdfs/E-waste_in_Africa_-_HP_report_2009_final_version.pdf, (last accessed 2nd June, 2013).
[59] *ibid,* p. 3.
[60] *ibid.*
[61] *supra,* note 42, p. 3.
[62] Francis O. Ongondo and Ian D. Williams (2011), *Are WEEE in Control? Rethinking Strategies for Managing Waste Electrical and Electronic Equipment*, Journal Integrated Waste Management – Volume II, available at: www.intechopen.com/download/pdf/18494, (last accessed 2nd June, 2013).
[63] *ibid,* p. 362.
[64] *ibid,* p. 363.
[65] Joaquin Neira *et al* (2006), *End-of-Life Management of Cell Phones in the United States*, Group Project submitted in partial satisfaction of the requirements for the degree of Master's of Environmental Science and Management for the Donald Bren School of Environmental Science and Management, available at: www.bren.ucsb.edu/research/documents/cellphonethesis.pdf, (last accessed 2nd June, 2013).

development abnormalities.[66] They further state that other substances of great concern contained in cell phones are brominated flame retardants which are also known to be persistent, bio-accumulative and toxic. Retardants are associated with cancer and abnormalities in the immune and endocrine system.[67]

The forgoing literature has documented some of the Government's responses to the e-waste problem thus far. NEMA notes that it has authorised 'Computers For Schools Kenya' (CFSK) to establish the first eco-friendly e-waste management centre in the Eastern Africa region at Embakassi, Nairobi at a cost of Kenya Shillings 3.8 million.[68] The centre's e-waste management process entails local recycling and reuse of metal, plastic parts and other functional components, and re-export of components that cannot be safely disposed of locally. The centre's in-house e-waste management protocol is guided by three principles namely: health and safety, environmental friendliness and sustainability.[69] NEMA goes ahead to state that although there are existing environmental laws on waste management in Kenya, there are no specific environmental policies, regulations or guidelines directly targeting e-waste management in the country.[70]

HP notes that in Kenya, the market for recyclers is expanding and becoming more sophisticated.[71] Plastic, ferrous metals and aluminium can all be recycled in Kenya. Copper, printed wiring boards, cathode ray tubes and hazardous fraction cannot, and are currently exported to Europe and Asia.[72] In its study on e-waste in Kenya, only 25% of importers indicated that they had a policy on extended user responsibility. There was a 70% level of awareness of environmental hazards caused by discarded electronic equipment, yet little action was being taken. Only 20% of vendors had an e-waste management policy. Of those who did not, fewer than half planned to introduce one. Further, only about 50% of e-waste workers have medical cover.[73] The report notes that most staff at repair shops wear protective gear but few have thorough training. Hazards included fumes, dust, poor ventilation, cramped conditions, potential eye and back damage, and exposure to electric shock.

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[66] *ibid,* p.14.
[67] *ibid.*
[68] *supra*, note 32, p. 173.
[69] *ibid.*
[70] *ibid,* p. 174.
[71] *supra,* note 42, p. 5.
[72] *supra,* note 42, p. 5.
[73] *ibid.*

HP further notes specific e-waste policy and legislation is virtually non-existent in Kenya. There is often very little infrastructure or training to support a more sustainable waste management system.[74] HP however examines the existing NEMA waste disposal Environmental Management and Coordination (Waste Management) Regulations of 2006. It notes that the regulations require e-waste collectors and final disposers to register with NEMA, and use designated facilities. It also notes that the ministry of Information and Communications has developed a concept paper to address e-waste, potentially through recycling and technology transfer. Further it notes that the Ministry of Local Government is developing a solid waste management policy but there is no mechanism to implement this. In addition, the CCK is hailed for having built an e-waste management mechanism into its licensing conditions. These efforts towards e-waste recycling are noted to offer a significant opportunity for job creation and poverty elevation.[75]

Asiimwe in critiquing Kenya's approach notes that the country lacks a regulatory framework for e-waste management.[76] However, he notes that the Environmental Management and Coordination (Waste Management) Regulations of 2006 enforced by NEMA help in controlling generation, handling, transportation, storage, or disposal of waste that threatens public health, the environment or natural resources.[77] Further, he posits that the ICT Policy 2006 demands electronics dealers to demonstrate their readiness to minimize the effects of their infrastructure on the environment in order to get their licenses renewed.[78] He also hails the spirit of public private partnership that saw NEMA sign a memorandum of understanding with Computer for Schools Kenya (CFSK), an NGO, to set up a recycling plant in Nairobi.[79]

NEMA notes that Sony Ericsson, LG and associated suppliers and service providers are implementing take-back schemes. NOKIA has six take-back points in Nairobi, Kisumu and Mombasa.[80] It further states that Hewlett Packard is currently partnering with Camara

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[74] *ibid,* p. 6.
[75] *supra,* note 42, 7.
[76] *ibid*, p. 8.
[77] *ibid.*
[78] *ibid,* p. 9.
[79] *ibid.*
[80] *supra*, note 32, p. 173.

Education to establish the East Africa Recycling Company. This is to be run as a viable self-sustaining business in Mombasa.[81]

There also exists literature on approaches used globally in management of mobile phone e-waste problem. UNEP estimates that 896 million mobile phone handsets were sold in 2006. 1.2 billion mobile phones sold globally in 2007.[82] On production of electrical and electronic goods, it estimates that in 2010, United States led the world with about 3 million tonnes followed by China at about 2.3 million tonnes.[83] On mobile phone e-waste, China is estimated in 2007 to have produced 7000 tonnes and India 1700 tonnes.[84] Further data from UNEP indicates that mobile phone e-waste in tonnes as at 2007 stood at 1,200 in Colombia, 1100 in Mexico, 2200 in Brazil, 850 in South Africa, 300 in Morocco, 100 in Senegal, 150 in Kenya and 40 in Uganda.[85]

On management approaches, NEMA states that the options are take-back schemes, recycling, reuse and educational research.[86] Ongondo & Williams emphasize the approach of recycling. They note that world reserves of metals such as gold and palladium is in fast decline and becoming more expensive, thus, such valuable metals, such as copper, aluminium and gold need to be recovered from old equipment through recycling.[87] Herat gives five options to mobile phone e-waste management.[88] First is reuse, which involves the recovery and trade of used products or their components as originally designed. Second is servicing, a strategy aimed at extending the usage stage of a product by repair or maintenance. Third is remanufacturing, the process of removing specific parts of the waste product for further reuse in new products. Fourth is recycling, which can be done with or without disassembly, including the treatment, recovery, and reprocessing of materials contained in the used products or components in order to replace the virgin materials in the production of new goods. Finally, there is disposal, the processes of incineration with or without energy

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[81] *ibid.*
[82] *supra*, note 23, p. 7.
[83] *ibid,* p. 42, Table 12: Quantity of EEE put on the market in metric tons/year.
[84] *ibid,* p. 44, Table 14: Quantity of e-waste generated in metric tons/year.
[85] *ibid.*
[86] *supra*, note 19, p. 173.
[87] *supra*, note 62, p. 362.
[88] Dr Sunil Herat (2009), *Environmentally Sound Management of Ewaste: Emerging Issues, Challenges and Opportunities for Material Recovery and Recycling*, Inaugural Meeting of the Regional 3R Forum in Asia, Meguro Gajoen, Tokyo, Japan, 11-12 November 2009, available at: http://www.env.go.jp/recycle/3r/en/forum_asia/results/pdf/20091111/09.pdf. (last accessed 3rd June, 2013).

recovery or landfill.[89] Neira *et al* have done a study on mobile phone e-waste in United States. They state that the printed wiring board (PWB) of cell phones is a copper-rich metal scrap that contains other trace metals, highly recyclable.[90] Further, plastic which comprises 40% to 65% of total mass can be recycled to make plastic fencing poles and other products. They posit three options for management of end-of-life cell phones: reuse of phones, reuse of components, and recycling of materials.[91]

Asimwe has done a study on e-waste in East Africa. For Uganda, he notes that the country in January 2010 passed a regulation that strictly bans importation of used electronics.[92] This step was aimed at protecting the environment and encouraging local assembly. He however notes that the country lacks a policy on recycling or any specific policy for e-waste. The Government has placed tax waivers on brand new computers, encouraging long life equipment in bid to reduce e-waste.[93] Further, he explains that the Government is in the process of developing a disposal centre. He posits that due to limited capacity, private sector companies involved in recycling could only recover plastics and a few metallic materials.[94]

In Rwanda, the study notes that there is huge importation of ICT products leading to accumulation of e-waste.[95] Government initiatives such as "one laptop per child" increases accumulation rate of e-waste. Mobile phone e-waste is accumulated through imports of poor quality mobile handsets. To manage e-waste, the Government has banned imports of old electronics. Beside the ban, the country has no e-waste management plan, no recycling policy and no solutions for e-waste.[96]

In Tanzania, it is noted that recycling is done by informal sector which has its own business motives.[97] The Government lacks specific solutions for e-waste. Awareness of ICT environmental issues is almost non-existent and the country's current legal and regulatory framework on e-waste is deficient. The Government is only said to be seeking collaboration with NGOs so as to set up recycling centres.[98]

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[89] *supra*, note 65, p. 25.
[90] *supra*, note 65, p. 28.
[91] *ibid*, p. 54.
[92] *supra,* note 42, p. 11.
[93] *ibid,* p. 12.
[94] *supra,* note 42, p. 12.
[95] *ibid.*
[96] *ibid,* p. 13.
[97] *ibid*, p. 14.
[98] *ibid,* p. 15.

In Burundi, accumulation of e-waste is blamed on preference towards cheap products, mainly from China.[99] The cheap ones are either old or refurbished. E-waste awareness in Burundi is stated to be non-existent. E-waste lies mostly in houses not in streets. The Government has no plan for e-waste management and there is no recycling policy either.[100]

HP 2009 had evaluated e-waste management in South Africa, Kenya, Senegal and Morocco. The study noted that informal collectors, dismantlers and recyclers play an increasing role in processing domestic e-waste. South Africa is hailed as the only country, of those studied, where an e-waste recycling industry has evolved, but it is still inadequate.[101] The country is noted to have launched a pilot waste recovery facility in 2008 to test the feasibility of integrated local e-waste management. The unit focused on refurbishment, repair, reuse, dismantling and recycling; environmentally responsible disposal was a last resort. The project excluded shredding or mechanical granulation processes. The project processed over 58 tonnes of waste with 79% recycled or reused, and 100% disposed of safely. The project generated US$14,000 via three revenue streams: the sale of recovered/refurbished equipment, the sale and disposal of recovered materials, the sale of Waste-2-Art products and refurbishment of corporate IT equipment for donation and resale.[102]

Despite the initiative in South Africa, it is noted that formal recyclers process approximately 20% of e-waste. The rest is either stored by the owner, recycled informally, added to the domestic waste stream or dumped illegally.[103] The study notes that by then, there was no specific legislation to deal with e-waste in South Africa. Only the National Environmental Management Waste Act, passed in 2009, attempted to deal with issues such as hazardous waste and to introduce measures such as extended producer responsibility.[104]

In Morocco the HP study found no organised e-waste management system. The bulk of collection and recycling is performed by the informal sector who have little awareness of the dangers and who rarely wear protective equipment.[105] Ferrous metals, aluminium, copper and

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[99] *supra,* note 42, p15.
[100] *ibid.*
[101] *supra,* note 42, p. 3.
[102] *supra,* note 42, p. 8.
[103] *ibid,* p. 9.
[104] *ibid.*
[105] *ibid,* p. 6.

plastic are recycled in Morocco derived from circuit boards. A large amount was exported to foreign smelters. To enhance e-waste management efforts, the study noted that the Department of the Environment proposed a National Hazardous Waste Master Plan and a feasibility study of a hazardous waste treatment plant. The plant would be suitable for e-waste components that cannot be reused; particularly lead-rich glass, plastics containing flame retardants, and other toxic wastes.[106]

In Senegal, there lacked formal infrastructure for e-waste management, with all e-waste being dealt with informally.[107] The informal scrap sector had evolved, with some units specializing in the collection and dismantling of e-waste. This sector was controlled by small-scale smelters who focus on aluminium and lead. Ferrous metals and plastics were increasingly being recycled. However, other hazardous fractions of e-waste like CRT tubes, batteries, capacitors and mercury switches are disposed off in landfills. About 20% of e-waste, principally diodes and transistors, was refurbished and reinserted into the system. The country had no specific laws for e-waste management[108]

For Malaysia, Junaidah Ahmad Kalana studied methods of electronic waste disposal in Shah Alam, Selangor.[109] The main methods of disposal were noted to be storage at 48% and sale as secondhand equipment at 37%. The study further posits that only a fraction of electronic waste, 22%, finds its way to recycling facilities as there is no efficient takeback scheme for consumers.[110] It further posits that most of the households do not know where and how to dispose of electronic waste in a proper manner. Consequently, they resort to disposing electronic waste outside their premises together with other household wastes. The study recommends that the Government needs to improve collaboration among stakeholders in order to enhance public awareness on electronic waste.[111]

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[106] *supra,* note 42, p. 7.
[107] *supra,* note 42, p. 7.
[108] *ibid*, p. 8.
[109] Junaidah Ahmad Kalana (2010), *Electrical and Electronic Waste Management Practice by households in Shah Alam, Selangor, Malaysia,* International Journal Of Environmental Sciences Volume 1, No 2 ,2010, available at: www.ipublishing.co.in/ijesarticles/ten/articles/volone/EIJES1013.pdf, (last accessed 1st June, 2013).
[110] *ibid,* p. 137, Figure 2: E-waste Disposal Practices.
[111] *ibid,* p. 142.

Ongondo & Williams evaluate the approach in Europe. They hail EU for taking steps to address e-waste through its WEEE Directive (Directive 2002/96/EC).[112] This directive requires Member States to transpose as legislation in their respective countries e-waste management strategies. The directive hinges on the Extended Producer Responsibility (EPR), obliging manufacturers to finance the take back of WEEE, classified in 10 categories, from consumers and ensure their safe disposal. The directive promotes Individual Producer Responsibility (IPR), reuse, recycling and other forms of recovery in order to reduce the disposal of WEEE. It sets a target for member states to collect least 4kg of household WEEE per person per year.[113] Despite these efforts, the European Commission (EC) reports that only one-third of generated WEEE is collected and treated according to the stipulated procedures with prevalent exports to developing countries.[114]

Ongondo & Williams then specifically study UK, US, Brazil, Switzerland, Japan and Australia. The UK is noted to use designated collection points and retailers take-back. The US utilizes municipal waste services. Brazil uses municipalities, recyclable waste collectors. Switzerland has a national take back programmes.[115]

For Japan, the study notes that people rarely dispose of their used EEE due to the perception that goods retain a residual value which might have future uses. The country is hailed for developing legislation, referred to as the home appliance recycling law. This law sets specific recovery targets for reuse and recycling. It requires consumers to pay a recycling fee at the time of disposal. Collection of e-waste is executed through retailers.[116]

For Australia the study notes that e-waste is sent to landfills. It however explains that the Government developed the National Waste Policy in 2009, a 10-year vision for resource recovery and waste management. The policy saw establishment of a Government supported scheme for recycling TVs and computers in 2011, reducing levels of e-waste.[117]

Kurian evaluates the e-waste position in India. He notes that a significant amount of e-waste is recycled by the informal sector. Workers in these informal establishments dismantle and

[112] *supra*, note 62, p. 363.
[113] *ibid.*
[114] *ibid,* p. 364.
[115] *ibid,* p. 365, Table 1: WEEE generation and management in selected countries.
[116] *supra*, note 62, p. 363.
[117] *ibid*, p. 364.

sort the accrued electronic and electric waste manually to fractions such as printed wiring boards, cathode ray tubes (CRT), cables, plastics, metals, condensers and batteries.[118] The valuable fractions are processed to directly reusable components and to secondary raw materials in a variety of refining and conditioning processes. No sophisticated machinery or personal protective equipment is used for the extraction of different materials. All the work is done by bare hands and only with the help of hammers and screwdrivers. Children and women are routinely involved in the operations.[119] Waste components which does not have any resale or reuse value are openly burnt or disposed of in open dumps. Several health risks are cited. CRT breaking operations result in injuries from cuts and acids used for removal of heavy metals and respiratory problems due to shredding, burning. The workers use strong acids to retrieve precious metals such as gold. Working in poorly ventilated enclosed areas without masks and technical expertise results in exposure to dangerous and slow poisoning chemicals.[120]

The reviewed literature also makes certain recommendations on proper e-waste management. NEMA calls for Kenya to amend the current Environmental Management and Coordination (Waste Management) Regulations of 2006.[121] It proposes that the amendments should embrace e-waste and promote refurbishment to extend the life of appliances through recycling.[122] It also calls for stringent enforcement of the Basel Convention so that Kenya does not unwittingly become an importer of e-waste. It finally calls for strengthening of the inter-agency cooperation required to prevent dumping of illegal and sub-standard electrical and electronic goods in the country.[123]

UNEP in reference to Kenya, decries limited capacity of the important Government agencies to deal with e-waste.[124] It also notes that there is lack of coordinated approach across the ministries to deal with e-waste. Further, there is no regulatory and policy structures to safeguard health, environmental and social consequences of e-waste. Players in e-waste management are not recognized by the policy and legislative framework. No infrastructure available for the disposal of the hazardous fraction from e-waste. There lacks mechanism to

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[118] *supra,* note 52, p. 3.
[119] *ibid.*
[120] *supra,* note 52, p. 4.
[121] *supra*, note 32, p. 173.
[122] *supra*, note 32, p. 173.
[123] *ibid.*
[124] *supra,* note 23, p. 60.

separate e-waste from solid waste, and an effective collection systems, leading to e-waste being stockpiled in homes, offices and repair shops. There also lacks awareness of the need for an e-waste management system.[125] There are no business and financing options for e-waste operators and the principle of extended supplier responsibility is not enforced. Further electrical and electronic appliances have a value to their owner, even if broken. Hence people expect to receive something when giving it away for disposal.[126] There is thus need well designed incentive methods to encourage disposal of e-waste, which might have impacts on recycling costs.

Mureithi *et al* in reference to Kenya recommend: development of a policy and specific regulations on e-waste, more awareness, separation of e-waste from other solid waste during disposal, increase recycling capacity, establishment of a funding mechanism for recyclers, and establishing dumping sites far from residential areas.[127]

Herat also makes a raft of recommendations in dealing with e-waste in Asia. Some of these recommendations are global, for adoption in any country.[128] They include creating an appropriate legislative framework, and adopting sustainable development policies, including policies on the collection, recycling and recovery of electronic and electrical wastes and ones that address the trans-boundary movements of such wastes. Countries should also have economic incentives for environmentally sound practices and technologies and also insist on green designs aimed at reducing the use of hazardous materials in electrical and electronic products and enhancing their recyclability. Countries are called to ensure closing the loop for recyclables, extending the life of products through reuse, refurbishment or repair, elimination of hazardous constituents in products, worldwide environmentally sound management standards or criteria for recycling and final disposal of electronic wastes, action to prevent illegal traffic and broad public awareness. They should further put in place public-private partnerships to engage all stakeholders and also regional level playing field on how to deal with export and import of electronic and electrical wastes.[129]

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[125] *ibid,* p. 61.
[126] *ibid.*
[127] *supra,* note 35, p. 508.
[128] *supra,* note 88, p. 21.
[129] *supra,* note 88, p. 21.

Neira *et al* call upon the US to: ensure collection efficiency, set collection target, share collection responsibility between producers, retailers and end users, mandate a labeling program, ensure reuse, which is critical for profitability and put in place policy setting minimum reuse rate.[130]

Kurian, writing on India proposes that the best option for dealing with E wastes is to reduce the volume.[131] This calls on designers to ensure that the product is built for re-use, repair and upgradeability. There should be stress should on use of less toxic, easily recoverable and recyclable materials which can be taken back for refurbishment, remanufacturing, disassembly and reuse. The second option to reduce e-waste is recycling and reuse of material. Recovery of metals, plastic, glass and other materials reduces the magnitude of e-waste.[132] The above two options have a potential to conserve the energy and keep the environment free of toxic material that would otherwise have been released.

1.10 Research Methodology

To sufficiently answer the research questions, this study reviewed data on the e-waste regulation in many jurisdictions in the world which have sought to tackle this issue through progressive legislation and supportive regulatory framework. The current policy, legal and institutional framework for the management of e-waste in Kenya was also reviewed.

The study will, thus, rely on primary sources of data, including several statutes and subsidiary legislation from both developing and developed jurisdictions. The study shall also rely on Kenyan legislation including; EMCA and the draft E-Waste Management Regulations 2013. These shall reveal the current Government approach on regulating e-waste in Kenya and also give comparative perspectives from other countries.

There are two approaches to inquiry in research; qualitative and quantitative.[133] This study employed a qualitative approach in the collection and analysis of the data necessary for the research. This approach was used since the study purely examines people's perspectives and

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[130] *supra*, note 65, pp. 113-115.
[131] *supra,* note 52, p. 5.
[132] *ibid.*
[133] See Family Health International (2010), *Qualitative Research Methods: A Data Collector's Field Guide*, p. 2, available at: http://www.fhi360.org/NR/rdonlyres/etl7vogszehu5s4stpzb3tyqlpp7rojv4waq37elpbyei3tgmc4ty6dunbccfzxtaj2rvbaubzmz4f/overview1.pdf, (last accessed 9th February 2012).

it has the potential of providing adequate information for the study.[134] In this regard, data was collected from interviews and engagements with legal practitioners with knowledge on e-waste regulation and experts from other fields on matters concerning e-waste. Further, officials from NEMA, CCK, Radiation Protection Board and the Taskforce for the Development of the draft E-Waste Management Regulations 2013 were consulted.

These stakeholders from NEMA, CCK, Radiation Protection Board and the Taskforce for the Development of draft E-Waste Management Regulations 2013 provided information on magnitude of the e-waste problem form the regulator's perspectives. They assisted in highlighting the legal options that were considered during drafting the draft E-Waste Management Regulations 2013 and also provide reasons for the approach adopted by these draft Regulations.

Finally, secondary sources such as books, journals, websites, working papers and newspaper articles were reviewed. Desk research was used to collect data from such sources. This captured various opinions from different writers on the extent of the e-waste problem in Kenya.

1.11 Description of Chapters

1.11.1 Chapter One: Introduction

This chapter gives background information to the study including such matters as; the statement of the problem, objective of the study, research question, hypothesis, and research methodology.

1.11.2 Chapter Two: Kenya's E-waste Problem and its Response Thereto

This chapter highlights the magnitude of the e-waste problem in Kenya, pointing out the negative effects to the environment. It shall then trace Kenya's response to the problem so far. It shall analyse the draft e-waste regulation to establish their efficacy in addressing the e-waste problem in Kenya.

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[134] Johann Mouton, *How to succeed in your Masters and Doctoral Studies: A South African Guide and Resource Book* (11th edn, Van Schaik Publishers, Pretoria 2001) p 194.

1.11.3 Chapter Three: Comparative Analysis

This chapter examines how both developing and developed countries have addressed the e-waste problem. From the comparative perspective, it shall outline the various options in addressing e-waste, and engage in an evaluation on what would be the most suitable option for Kenya.

1.11.4 Chapter Four: Conclusion and Recommendations

This contains a summary of the findings of the study as well as recommendations that should be adopted to attain success in regulating e-waste in Kenya.

CHAPTER TWO: E-WASTE MANAGEMENT IN KENYA: THE POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK IN KENYA

2.1 Introduction

The demand for electronic devices in Kenya has been on a steady and rapid rise over the years.[1] This has been fuelled by the increase in adoption of ICT technologies by both Government and private persons and this is projected to increase.[2] Within this development, the rapid growth in use of mobile phones has had a significant impact to the economy and the manner in which personal and business communications as well as transactions are conducted. However, mobile telephony also comes with challenges such as the management of e-waste emanating from discarded mobile phones.

Poor disposal of used mobile phones or parts of the mobile phones present a serious threat to the environment. Most of the mobile phone devices contain toxic materials that are harmful to human, plant and animal lives.[3] Dumping, which in this study is taken to mean the exportation of defective, unusable and or old mobile phones to mostly third world economies, has made the situation worse because Kenya and other third world countries have become so-called dumpsites for used and end-of-life mobile phones.[4] It is largely fuelled by high poverty levels as a large section of the population cannot afford new quality mobile phones and there is a general desire to access cheap things.[5]

2.2 Effects of Mobile Phone E-Waste to the Environment

E-waste is a rising challenge in the society today and poses numerous risks to health and the environment if disposal is not well handled.[6] E-waste has negative environmental, economic and social effects.

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[1] See OECD, African Economic Outlook, AFDB/OECD 2004, Country Kenya, p 183.
[2] See generally World Bank, Mobile Phone Usage at the Kenyan Base of the Pyramid Final Report, infoDev / World Bank, Washington DC 20433, November 2012.P 50.
[3] To appreciate the gravity of the harm of mobile gadgets, see Liu, Q., Li, Q. K., Zhao, H., Li, G., & Fan, Y. F, The global challenge of electronic waste management, Environmental science and pollution research international, 2009 16(3), 248–249.
[4] See Samuel Munene, E –Waste Management In Kenya, WEE/E-Waste Management Workshop, 13-15 July 2011, Osaka, Japan.
[5] See Edgar N. Asiimwe, E-waste Management in East African Community, Swedish Business School, Örebro University, Sweden. P 8.
[6] See William Aino Shivoga, E-Waste: Impacts, Challenges And The Role Of Government, CCK Service Providers and The Consumers Workshop held at Ole Sereni Hotel, Nairobi –Kenya, 9th -10th June 2010.

2.2.1 Environmental Effects of E-waste

There many negative effects of e-waste on the environment. One of these is air pollution. Air pollution results when the waste mobile phones are burnt. Burning of e-waste causes emission of harmful gases that are not only damaging to animal life, but plant life as well.[7] For instance heavy metals and poisonous gases, mainly dioxins and furans, are emitted if e-waste is burnt openly.[8] In most African countries, open burning of e-waste is done to extract the metals.[9] These gases and heavy metals increase susceptibility to certain diseases.[10]

E-waste can also have a harmful effect on the soil if not properly disposed. Recycling and disposal of e-waste often take place on naked ground and harmful substances can be released directly to the soil.[11] In the case of burning the resultant ash may also accumulate at the burning site causing a change in the soil ph. and other forms of harm.[12] Moreover, the unburned solids such as metals may pose a serious threat to both humans and animals.[13]

Poor handling of e-waste can also cause grievous harm to the ground water.[14] This may be in the form of the harmful chemical going to the water or the solid wastes. These are hazardous to aquatic environment and the life forms therein. Polluted water is also harmful to humans and animals.[15] Pollution of water is not just limited to the surface water. Ground water is also polluted by heavy metals associated mobile phone e-wastes.[16] Solid plastic and metallic wastes

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[7] See SBC, Where are WEEE in Africa? Findings from the Basel Convention E-waste Africa Programme, Basel December 2011.

[8] *ibid.* P 10.

[9] *ibid.*

[10] For the technical and scientific explanation of the effects of e-waste burning on human and plant life, see Brian K. Gullett et al, Characterization of air emissions and residual ash from open burning of electronic wastes during simulated rudimentary recycling operations, Journal of Material Cycles and Waste Management March 2007, Volume 9, Issue 1, pp 69-79. Available at http://link.springer.com/article/10.1007%2Fs10163-006-0161-x.{Accessed on 22nd July 2013}.

[11] See Wei-Hua et al, Soil Contamination due to E-Waste Disposal and Recycling Activities: A Review with Special Focus on China, PedosphereVolume 22, Issue 4, August 2012, Pages 434–455.

[12] See generally Manhart, A., Prakash, Towards Environmentally and Socially Sound E-Waste Management in W-Africa - Results from a survey in Ghana and Europe, 2010.

[13] See generally Richard Amfo-Out et al, Assessment of Soil Contamination through E-Waste Recycling Activities in Tema Community One, Environment and Pollution, Vol. 2, No. 2, April 2013.

[14] See G. Fred Lee, Electronic Wastes and MSW Landfill Pollution of Groundwater, G. Fred Lee & Associates, California 2009. P 4.

[15] For a detailed relationship between e-waste management and water pollution, see

[16] See Lee, G. F., "Comments on 'The Effectiveness of Municipal Solid Waste Landfills in Controlling Releases of Heavy Metals to the Environment,'" Report of G. Fred Lee &

from e-waste can also be a water pollutant when dumped. This study observes that since water sustains life, any threat to its quality must be addressed with the haste that it deserves. Pollution of drinking or cooking water is the most worrisome.

Environmental pollution in Kenya has manifested in many ways. Dumpsites continue to be an eyesore and a threat to health. Unusable mobile phones disposed negligently in pits are a serious source of pollution. For instance, the Dandora dumpsite continues to pose a major threat to the environment and human health in the surrounding residential areas.[17] A study commissioned by the United Nations Environmental Program (UNEP) found that one of the sources of heavy metals which are harmful to health is electronic waste.[18] The study found high concentration of the heavy metals, especially mercury and cadmium in the soil and water around the dumpsite. This is partly due to the non-existence of a proper legal framework with enforcement capabilities for the disposal of e-waste in Kenya.

In 2010, Lake Naivasha, located in the Rift Valley in Kenya, witnessed a mass death of fish and other aquatic organisms and this was blamed on pollution from the flower firms but it is possible that e-waste played a part due to uncontrolled disposal of electronic devices.[19] The uncontrolled growth and encroachment of water hyacinth on Lake Victoria and other water bodies is also a manifestation of pollution.[20] The development and proliferation of water hyacinth has been connected to heavy metals and as discussed, e-waste is a major source of these heavy metals.[21]

The negative environmental effects of e-waste in Kenya are far reaching. This study proposes that e-waste management should be among the top Government priorities.

Associates, El Macero, CA, July (2004), available at: http://www.gfredlee.com/Landfills/SWANA-heavymetals-comments.pdf

[17] See UNEP, Environmental Pollution and Impacts on Public Health: Implications of the Dandora Municipal Dumping Site in Nairobi, Kenya, Urban Environment Unit United Nations Environment Programme (UNEP).

[18] Ibid. Pp 5-7.

[19] See http://www.the-star.co.ke/news/article-118708/stakeholders-fury-over-l-naivasha-fish-deaths. {Accessed on 23rd July 2013}.

[20] See UNEP, Water hyacinth – Can its aggressive invasion be controlled? UNEP Global Environmental Alert Service, Ecosystem Management,

[21] See generally Patel, S, Threats, management and envisaged utilizations of aquatic weed Eichhorniacrassipes: an overview. Rev Environ SciBiotechnol (2012) 11:249–259. DOI 10.1007/s11157-012-9289-4.

2.2.2 The Social Effects of E-waste

A number of social problems emanate from poor management of e-waste. E-wastes contribute to the harsh environment that is a threat to the very human survival.[22] For instance, living around dumpsites can have psychosocial problems especially on children.[23] Societies live in the environment and a degraded environment will affect social lives. Social problems such as child employment, prostitution and other social maladies indirectly result from environmental degradation.[24]

2.2.3 The Economic Effects of E-waste

E-waste also has negative economic effects to the population in many ways. In the example of Lake Naivasha, the fish in the lake are a source of livelihood for many families and when their existence is threatened, they are affected economically. Moreover, water hyacinth hampers the quality of fishing in water bodies leaving fishermen and other persons in fish related industries at a disadvantaged position.

E-waste increases susceptibility to various diseases and as a result there is increased spending on both public and private health. Substantial spending on health care leaves other development programs unattended to due to limited funds. Remedies for degraded environment are often times expensive.[25]Environmental remediation technology investments are complex and expensive and a burden on public funds.

E-waste can be a resource if properly managed. For instance, end-of-life mobile phones can be recycled to produce other products instead of disposing them carelessly.[26] Recycling mobile phone e-waste can create employment and thus improve the economic condition of a number of livelihoods.

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[22] See Lundgren, Karin, The global impact of e-waste: addressing the challenge / Karin Lundgren; International Labour Office, Programme on Safety and Health at Work and the Environment (Safe Work), Sectoral Activities Department (SECTOR). – Geneva: ILO, 2012. Pp 20-21.

[23] *Ibid.*

[24] Environment is connected to all aspects of life and that is why it has an impact, direct or indirect, on all spheres of life.

[25] See generally Charles W. Abdalla, Brian A. Roach & Donald J. Epp, Valuing Environmental Quality Changes Using Averting Expenditures: An Application to Groundwater Contamination, University of Wisconsin, Land Economics , Vol. 68, No. 2 (May, 1992), pp. 163-169.

[26] On details on how recycling of cell phones can be done and the economic benefits thereof, see GSM, Mobile Phone Lifecycles Use, Take-back, Reuse and Recycle, GSM Association. www.gsmworld.com. {Accessed on 23rd July 2013}.

Pollution in the environment has direct economic viable consequences. Any effect on the environment touches on the economy because the economy is dependent on the environment. Professor Wangari Maathai[27] referring to the need to protect the environment predicted:-

> *"In a few decades, the relationship between the environment, resources and conflict may seem almost as obvious as the connection we see today between human rights, democracy and peace"*

This study proposes that the truth of the above statement is evident today and any expectation of economic and social development without proper environmental protection is untenable.

2.3 Kenya's Response to E-Waste: Formal and Informal

Kenya's response to e-waste management is both formal and informal. Informal e-waste management plays a bigger role in Kenya's e-waste management system.[28] The informal handling of e-waste is predominantly through the so called *Jua Kali* sector by individuals who are unskilled, many of whom operate clandestinely because they do not have licenses.[29] These informal operators simply disassemble discarded mobile phones in order to recover usable parts. Whatever remains is just thrown away, at best, in the dumpsite or other places.[30] These methods used in the informal sector contribute significantly to the adverse environmental degradation that is the result of unstructured disposal of toxic e-waste.

At present there is very limited formalised e-waste management in Kenya. The management of e-waste in the country has been described as still being in its infancy.[31] The country lacks e-waste specific policies and Regulations and relies on the general policies and Regulations on waste management. This affects the gravity with which the matter is addressed.[32] However,

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[27] Wangari Maathai (1940 - 2011), environmental activist and the first African woman to receive the Nobel Peace Prize in 2004 . Available at http://nobelwomensinitiative.org/meet-the-laureates/wangari-maathai/ (last accessed 11th November 2013)

[28] See NEMA, Guidelines for E-Waste Management in Kenya, NEMA/MEMR , December 2010 at page 20.

[29] *Ibid.*

[30] See presentation by Samuel Munene, E –WASTE MANAGEMENT IN KENYA, WEE/E-Waste Management Workshop, 13-15 July 2011, Osaka, Japan.

[31] See UNEP, Global Partnership on Waste Management, Country Needs Assessment Analysis, Kenya, available at http://www.unep.org/gpwm/InformationPlatform/CountryNeedsAssessmentAnalysis/Kenya/tabid/106550/Default.aspx. (last accessed on 23rd July 2013).

[32] *Ibid.*

NEMA intimates that institutions are being developed to be in charge of waste stream.[33] There is also a limitation of funds to establish an e-waste management infrastructure.[34] There are therefore no adequate facilities for handling e-waste.[35]

It is worth noting that the public concern over mismanagement is still very low largely because of ignorance of the adverse effects of mismanaging e-waste.[36] As a result, there is lack of any serious or co-ordinated public push or participation which calls for increased public awareness.[37] Government participation in e-waste management is exercised through policy, legal and regulatory framework including guidelines and through mandated institutions.

2.4 The Legal Framework

The Kenyan legal framework is both international and municipal. The principal environment statute in Kenya is the Environmental Management and Coordination Act, 1999 (EMCA). It establishes the legal and institutional framework for the management of the environment and related matters.[38]

EMCA addresses environmental conservation and protection as a whole and it is not specific on e-waste management. However, there are a number of provisions from the Act which provide a statutory basis for addressing e-waste. EMCA identifies e-waste as part of the wastes under the Act. Section 3 of the Act reiterates article 42 of the Constitution on the right to a clean and healthy environment.

2.4.1 International Legal Framework

At the international level, Kenya is a signatory of many environment conventions. Article 2(6) of the Constitution is the basis for application of conventions ratified by Kenya.[39] Some of the

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[33] See NEMA's submission to the UNEP on Global Partnership on Waste Management. http://www.unep.org/gpwm/InformationPlatform/CountryNeedsAssessmentAnalysis/Kenya/abid/106550/Default.aspx. (Visited on 23rd July 2013).

[34] *Ibid.*

[35] Ibid.

[36] See Lundgren, Karin, The global impact of e-waste: addressing the challenge / Karin Lundgren; International Labour Office, Programme on Safety and Health at Work and the Environment (Safe Work), Sectoral Activities Department (SECTOR). – Geneva: ILO, 2012, at 20-21.

[37] *Ibid.*

[38] See Preamble of the EMCA.

[39] The article provides that, "Any treaty or convention ratified by Kenya shall form part of the law of Kenya under this Constitution."

conventions do not address the issue of e-waste specifically but they all have a link since they are all directed toward environmental conservation.[40]

The environmental convention that addresses e-waste management is the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (the Basel Convention). The principal objective of the Convention is to protect human health and the environment against the adverse effects of hazardous wastes.[41] E-waste from mobile phone is part of the waste addressed by the convention.[42] EMCA domesticates the Basel Convention. It prohibits and punishes failure to manage hazardous waste according to its provisions including the importation of such materials in the country.[43]

The primary obligation of state parties under the convention is to take measures that ensure there is control of trans-boundary movement of hazardous wastes. Of special concern to this study, in furtherance of the Convention, the Mobile Phone Partnership Initiative (MPPI) came up with guidelines for the management of expired mobile phones and the guidelines are being applied in relevant facilities.[44]

2.4.2 Constitutional Basis for Management of E-wastes

Apart from paving way for the application of conventions that are ratified by Kenya, the Constitution addresses the environment quite substantially. Although no direct reference is made to e-waste in it, the Constitution nonetheless provides for environmental conservation and protection which is a basis for e-waste management.[45]

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[40] For a list of the environment conventions, see UNO, United Nations Environment Conventions. http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CF0QFjAF&url=http%3A%2F%2Fwww.unngls.org%2Forf%2Fdocuments%2Fpdf%2Fngo.guide%2F5envconv.pdf&ei=70_uUZ6zKcTxsgba04CwAw&usg=AFQjCNHzWAv74jVcI72BtraaNjjFb6EbcA&sig2=1nmkKV-izvCRjttgD2VjVA&bvm=bv.49641647,d.Yms. (last accessed on 23rd July 2013)

[41] See the preamble of the Convention. Available at www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf. (last accessed on 23rd July 2013).

[42] See Annex VIII of the Convention A1180, B1110.

[43] See section 41 of the Environmental Management and Coordination Act.

[44] Available at http://www.basel.int/Implementation/PartnershipProgramme/MPPI/MPPIGuidelinesandGlossaryofTerms/tabid/3251/Default.aspx (last accessed on 23rd July 2013)

[45] See article 69-72 of the Constitution of Kenya, 2010.

Article 42 thereof provides for the right of every Kenyan to a clean and healthy environment and as part of ensuring that this right is respected, the relevant legislations must be put in place and enforced as provided in Article 69 (1) (a0 and Article 70 of the Constitution. The question remains whether Kenya has adequate and effective legislation to meet these Constitutional requirements.

2.4.3 Environmental Management and Coordination Act

Section 90 of the EMCA provides that NEMA shall, upon the recommendation of the Standards and Enforcement Review Committee issue guidelines and Regulations for the management of each category of hazardous wastes. In implementing this provision, NEMA released the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. The Regulations are a body of rules that provides for the management of wastes in the country.

2.5 Draft Environmental Management and Co-Ordination (E-Waste Management) Regulations 2013

2.5.1 Introduction

NEMA has from 2010 to 2012 been holding discussions with stakeholders from various lead environmental agencies and industries to develop specific e-waste management Regulations that will address the importation and disposal of e-waste in Kenya.[46] These have culminated in the development of the draft Environmental Management and Co-ordination (E-Waste Management) Regulations 2013.[47] It is these draft Regulations that this study shall examine for effectiveness and whether they will provide an adequate legal framework to enable Kenya achieve effective e-waste disposal of end-of-life mobile phones and other e-waste.

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[46] See, New e-waste rules for Kenya, available at, http://www.biztechafrica.com/article/new-e-waste-rules-kenya/4475/ (last accessed on 22nd July 2013) where the then NEMA Director for Environmental Education, Dr. Ayub Macharia was quoted as saying with reference to the draft Regulations that "Offenders will pay a fine of between Sh350,000 and Sh1 million... More e-waste is expected as a result of switching off of 1.4 million counterfeit handsets and the migration to digital broadcasting."

[47] Available at, EMCA, Draft E-Waste Regulations, http://www.nema.go.ke/index.php?option=com_phocadownload&view=category&id=2:legislationpolicies&Itemid=594

2.5.2 Overview of the draft Environmental Management and Co-ordination (E-Waste Management) Regulations 2013

The draft E-Waste Management Regulations 2013 seek to provide a specific reference point for the management of e-waste in Kenya. At the time of this study the same are still under discussion by NEMA and various stakeholders with the intention that they will be passed as the legal framework for e-waste management in Kenya. The draft E-Waste Management Regulations, 2013 are intended to save the country from a wide range of health hazards caused by unsafe disposal of e-waste and are a reflection of the Government's environmental policy direction following a proclamation by the Environmental Minister that the Government had identified the e-waste issue as a national priority.[48]

With regard to their application, the draft E-Waste Management Regulations, 2013 are indicated to apply to all categories of electric and electronic equipment as well as their transportation, refurbishment and recycling. This provision is however inadequate and focuses on processes and equipment as opposed to the persons with the responsibility to ensure that e-waste is dealt with in a particular manner. By failing to directly mention that it applies to Consumers, Generators, Manufacturers, Producers and Recyclers, this provision falls short of providing the clarity that is needed for enforceability of the Regulations. In comparison for example, the E-waste (Management and Handling) Rules, 2011 of India provides:-

> "These Rules shall apply to every Producer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components as specified in schedule 1, collection centres, dismantler and recycler of e- waste and shall not apply to..."[49]

Such an application provision provides clarity for both the regulator and to persons expected to comply with the e-waste Regulations and their obligation are known to them.

With regard to the definitions in the draft E-Waste Management Regulations 2013, the terms used to describe the various persons involved in the process of importing, using, collecting, transporting, re-using and recycling the e-waste are complex and do not lend themselves to easy

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[48] See, Kenya All Set To Finalize E-Waste Management Regulations, http://www.recyclinginternational.com/recycling-news/7258/e-waste-and-batteries/kenya/kenya-closer-e-scrap-regulations

[49] See, India Ministry of Environment and Forests Notification, E-waste (Management and Handling) Rules, 2011, published in New Delhi on 12th May 2011. These rules were however given a commencement date of 1st May 2012.

understanding. The draft E-Waste Management Regulations 2013, uses terms such as 'Generator' to mean any person whose activities or activities under his or her direction produces e-waste or if that person is not known, the person who is in possession or control of that e-waste. This term could be better understood, especially by consumers who are deemed to be generators, if it was discarded and its meaning incorporated into that of consumers. As it is now obligations are placed on generators and at the same time on consumers leading to a confusing situation that may undermine compliance and enforceability.

The definition of consumers in the draft E-Waste Management Regulations 2013 is all encompassing. It does not make a distinction between individual consumers and corporate or bulk consumers, with both bearing similar obligation with regard to compliance. This is impractical and may lead to unequal application. A distinction should be made between individual consumers and bulk or corporate consumers. In the latter category should be included the Government, multi-national companies, local companies and other corporate entities within a prescribed threshold. These bulk consumers shall have stricter obligations placed upon them given their ability to import and use equipment which generates e-waste, For example they would be required to file returns in relation to e-waste annually.[50]

The draft E-Waste Management Regulations, 2013 have not addressed the issue of historical e-waste. This is the e-waste that will be pre-existing at the time when these Regulations come into force. No mention is made as to which mechanisms will be used to identify which persons will be responsible for this e-waste and equally no mention has been made of any financial arrangements that will be made to address this waste.

The draft E-Waste Management Regulations, 2013 have not addressed the issue of Extended Producer Responsibility (EPR) which means the responsibility of any Producer of electrical or electronic equipment, for their products beyond manufacturing until environmentally sound management of their end-of-life products. Incorporation of the concept of EPR within the draft E-Waste Management Regulations, 2013 would ensure that any e-waste Producer is responsible for collection of e-waste generated from the 'end of life' of their products in line with the

[50] Supra at section 8 (3)

principle of EPR and to ensure that such e-wastes are channelled to a registered refurbisher or collection centre or recycler[51].

The key provisions of the draft E-Waste Management Regulations, 2013 are examined in detail below.

2.5.3 Importation of Mobile Phone Handsets and E-wastes from Africa and Beyond.

Addressing importation remains important as there is minimal local manufacture of mobile phones and other electronic devices in Kenya. These appliances are mostly imported from other countries. The main process of e-waste management is embedded in the following processes: importation of mobile phones, collection of e-waste from phones, recycling of e-waste and disposal of the same. There are different legal provisions surrounding these processes but persons intending to deal with waste management are required to apply for a license from the National Environmental Management Authority.[52] In addition, under the draft E-Waste Management Regulations, 2013 any Producer, defined as any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler, must apply for and obtain a registration certificate from NEMA.[53]

The importation of phone handsets into the country has a direct relationship with the amount of e-waste resulting from the same once they reach the end of useful life.[54] UNEP estimates that the e-waste generated from mobile phones in Kenya, together with other electronic appliances, amounts to 3000 tonnes per year.[55] NEMA estimates that the amount of e-waste in Kenya currently stands at 17,501 tonnes, with mobile phones making up 151.3 tonnes (0.08 per cent) of

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[51] See, India Ministry of Environment and Forests Notification, E-waste (Management and Handling) Rules, 2011 at section 4 (2)

[52] See sections 87 and 88 of EMCA.

[53] The draft E-Waste Management Regulations, 2013at Regulation 4

[54] See William Aino Shivoga, E-Waste: Impacts, Challenges And The Role Of Government, CCK Service Providers and The Consumers Workshop held at Ole Sereni Hotel, Nairobi –Kenya, 9th -10th June 2010 P 8.

[55] www.unep.org/Documents.Multilingual/Default.Print.asp?DocumentID=647&ArticleID=6744&l=en. (last accessed on 22nd July 2010).

the waste and that only 1,247.6 tonnes of the waste is either recycled or reused.[56] Given the rapid uptake in use of mobile phones in Kenya as discussed in Chapter 1 of this study, it is justifiable to say that the harm of e-waste from mobile phones will continue to grow if nothing is done.

In 2012, CCK imposed a ban on use and importation of counterfeit phones in Kenya.[57] Through a directive issued to all mobile phone users, CCK declared its intention to switch off any mobile devices that were deemed to be counterfeit.[58] This directive had the intention to reduce counterfeits devices in use in Kenya which have a high failure rate and therefore partly contributed to efforts to reduce e-waste from mobile phones.[59] The success of this particular directive is difficult to establish as counterfeit mobile phones remain available in many trading outlets in Kenya and many counterfeit mobile devices that have been switched off by mobile networks have been "unlocked" through re-programming by backstreet technicians and returned to circulation.[60] Re-programming of mobile phones is illegal and the offence attracts a fine of up to Kenya Shillings One million or an imprisonment term not exceeding five years.[61]

As mentioned, under Regulation 4 of the draft E-Waste Management Regulations, 2013, any Producer intending to introduce new or used electrical and electronic equipment into Kenya shall apply for and obtain a registration certificate from NEMA. The issuance of the certificate is based on the information provided in the prescribed form and the payment of prescribed fees.[62] There is no limit on the minimum tonnage of mobile phone handset that can be imported into the country. This is largely determined by market demands.

This Regulation falls short of providing an end-to-end overview of e-waste management at the point of registration of a Producer. Such Producers should be required to demonstrate how they intend to dispose of the e-waste that will be produced once the imported electrical and electronic

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[56] See, Evelyn Situma What becomes of CCK's 2.5m e-waste phones?, Business Daily Newspaper, 22 August 2012, available at http://www.businessdailyafrica.com/What+becomes+of+CCK+s+2+5m+e+waste+phones+/-/1248928/1484822/-/89ujyaz/-/index.html (last accessed on 23rd August 2013)

[57] The ban was effected by CCK drawing authority from the Kenya Information and Communications Act and Kenya Information and Communications Regulations of 2010.

[58] See Macharia Kamau, CCK Readies To Plug Off Counterfeit Phones, Standard Newspaper, June 29th 2012.

[59] *Ibid.*

[60] See James Ratemo, *Rogue Technicians Keep CCK Awake,* available at http://www.businessdailyafrica.com/Rogue+technicians+keep+CCK+awake+after+banning+fakes/-/1248928/1757192/-/jo9boxz/-/index.html (last accessed on 23rd July 2013)

[61] See Section 84G of the Kenya Information & Communications Act, Cap 411A

[62] The draft E-Waste Management Regulations, 2013at Regulation 4.

equipment reaches end of life with a licensed recycler. This can be achieved by requiring such a Producer to have a contract with a licensed recycler.

The definition of a Producer, in the draft E-Waste Management Regulations, 2013 means any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler is so wide as to incorporate every single corporate or indeed individual that deals with electrical and electronic equipment as described above. For purposes of registration under Regulation 4, it would mean that every vendor of mobile phones in Kenya shall be required to obtain a registration certificate from NEMA. From a practical perspective this will require significant administrative strengthening of NEMA and possibly decentralisation of the registration process none of which have been addressed in the draft E-Waste Management Regulations, 2013. In the absence of this, registration will be seen as a difficult, time-consuming and expensive undertaking leading to widespread non-compliance.

In addition, the timelines indicated in Regulation 4 of the draft E-Waste Management Regulations, 2013 are bureaucratic, lengthy and will impact the speed of doing business if all Producers sought certification. It should be understood that mobile phone vendors require quick turnaround times to facilitate their businesses which directly impact communication penetration in Kenya.

Regulation 15 proposes that NEMA may establish a mechanism to ensure collaboration within African States on importation of e-waste. It further provides that any e-waste imported into Kenya from within Africa shall be for the purpose of recycling, refurbishment, and material recovery and that a permit will be required from NEMA to do this upon application in the prescribed form and payment of applicable fees.[63] Given that Kenya has not developed any capability of dealing with e-waste, this provision may allow dumping of e-waste into Kenya from African nations that have porous e-waste importation laws and thereby defeat the objectives of Regulation 22 which prohibits any importation of e-waste from outside Africa.

[63] The draft E-Waste Management Regulations, 2013at Regulation 15

In addition it should be imperative for NEMA as opposed to elective for it to establish collaborative associations with other environmental agencies in Africa to stem the exportation to Kenya of harmful e-waste. In the case of mobile phones Africa in general has the specific problem of being the target for importation of counterfeit mobile phones. This study has mentioned the efforts by CCK[64] to curtail the importation and use of mobile phones in Kenya. Unfortunately the consequence of this is that such devices are exported to neighbouring countries. In Zambia, the Zambia Bureau of Standards (ZABS) introduced a pre-export verification-of-conformity-to-standards plan, designed to ensure that imported products are first verified through physical inspections and laboratory testing by ZABS inspectors with the help of two international companies, the Bureau Veritas of France and Societe General de Surveillance of Switzerland. Once counterfeit products are detected, they will not be allowed to enter the Zambian market.[65]

It has been reported that counterfeit mobile phones from China are being sold cheaply, flooding markets in Africa and coming close to putting genuine mobile phone manufacturers out of business.[66] Over the past two years, Chinese Embassy officials in the region have tried to help African governments including Zambia, Kenya, Uganda and Nigeria counter the influx of counterfeit electronic products including mobile phones. The possibility of importation of these into Kenya form other African countries should make it imperative for NEMA to establish close links with other regulators to prevent this and such provisions must be embedded in the draft E-Waste Management Regulations, 2013.

Regulation 15 also falls short of prescribing any penalty to any Producer who imports e-waste into Kenya from within Africa. To encourage compliance and enable enforcement, appropriate penalties should be developed for any Producers flouting this Regulation. This should be in the form of stiff monetary fines, forfeiture of the goods, an obligation to export them back or to have

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[64] CCK is assisted in this effort by the Anti-Counterfeit Agency, established under the Anti-Counterfeit Act 2008 as a State Corporation with the mandate to combat counterfeiting and co-ordinate with national, regional or international organizations involved in combating counterfeiting

[65] See, Michael Malakata, *Africa Steps Up Fight Against Counterfeit Mobile Phones*, available at http://www.cio.co.ke/news/top-stories/Africa-steps-up-fight-against-counterfeit-mobile-phones (last accessed on 23rd July 2013).

[66] Ibid

them destroyed at the Producer's own cost. This study opines that as currently drafted, Regulation 15 falls short on a number of key measures as described above.

2.5.4 Provisions on Production of Mobile Phone Handsets in Kenya

Although there is currently no single mobile phone handset production plant in Kenya, there are however regulations that are intended to monitor e-waste in production.

Under Regulation 4 of the draft E-Waste Management Regulations, 2013, any Producer intending to introduce new or used Electrical and Electronic Equipment into Kenya shall apply for registration from NEMA. This means that all phone importers should apply for license from NEMA. It is not clear what NEMA will consider in granting or denying such license except the filling in of the prescribed form and the payment of the prescribed fees.[67]

NEMA is required to maintain an Electric and Electronic Equipment Registry to receive and store information of the tonnage by Producers.[68] This information will be used to calculate individual Producer responsibility by market share for problematic fractions. The register is a public document accessible at no fee.[69]

Producers are required to apply for an operation license every year.[70] A Producer applying for an Annual Compliance Certificate is required to declare the previous year's weight of electrical and electronic equipment introduced in the market by product type. [71] At this stage it is indicated that the Producer must produce evidence of a valid contract with a licensed Treatment Facility and pay the prescribed fee. This is the first mention that a Producer must be contracted with a Treatment Facility and comes belatedly in the process. In addition there is no indication of any penalty or sanction for failure to obtain an Annual Compliance Certificate. The consequences of such action should be clear to facilitate compliance.

The draft E-Waste Management Regulations, 2013 allow for the transfer of responsibility in the event that a Producer intends to cease operations. A six month notice must be issued to NEMA in

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[67]The draft E-Waste Management Regulations, 2013at Regulation 4.
[68] Ibid at Regulation 4(8).
[69] Ibid.
[70] The draft E-Waste Management Regulations, 2013at Regulation 5.
[71] Ibid.

this regard and evidence provided of the arrangements for alternative entities to bear their obligation.[72] These provisions however fall short of providing for a situation where there is transfer or a change of ownership and also they do not provide for a Producer to apply for a variation of the registration certificate, if there is a change of conditions during the operational period.[73]

2.5.5 Collection and Transportation of Mobile Phone E-waste

Producers are required to support the financing of collection incentives and treatment for 'problematic fractions' to ensure effective take back and treatment of e-waste as appropriate. The question that this Regulation raises is what amounts to 'problematic'.[74] This is a subjective term and the Regulations should not use them unless the threshold is defined or Guidelines in this regard are made available. Is financing the collection of problematic fractions going to be calculated according to market share? It is not clear what standard will be applied. There is need to qualify and give a better understanding of 'problematic fractions' in the draft E-Waste Management Regulations, 2013.

A Producer or any person acting on their behalf intending to set up an e-waste Collection Centre must notify NEMA of the location and physical address of the centre.[75] The operation of the collection centre must adhere to this rule and be operated according the Occupational Safety and Health Act, 2007.

In the case of end-of-life mobile phones or discarded counterfeit mobile phones, consumers will be required to ensure that these are transported to an e-waste Collection Centre. As the establishment of collection centres by mobile operators industry has not been made compulsory this provision will remain impractical as the number of e-waste Collection Centres will be relatively few. This will add to the costs of a consumer wishing to comply with e-waste management Regulations. It may be more practical to require all mobile phone vendors, especially representatives of manufacturers such as Nokia, Samsung, LG and others as well as

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[72] The draft E-Waste Management Regulations, 2013at Regulation 21

[73] Application for variation should be allowed in case a Producer significantly changes the nature of its operations that increases or diminishes its obligation to e-waste management.

[74] See definition of Problematic Fractions in draft E-Waste Management Regulations, 2013 and also at Regulations 6(4) and 7(1)

[75] The draft E-Waste Management Regulations, 2013at Regulation 6 (1).

mobile phone operators to have collection points at designated areas to facilitate collection of end-of-life mobile phones. This would facilitate better compliance.

2.5.6 Recycling of Mobile Phone E-wastes

Under the draft E-Waste Management Regulations, 2013, Recyclers of e-waste must be licensed in accordance with the Environmental (Impact Assessment and Audit) Regulations of 2003 in addition to the Operation License by NEMA.[76] The role of Recyclers of e-waste is to receive and dismantle the equipment into hazardous and non-hazardous components in an environmentally sound manner and ensure that components that cannot be recycled locally are exported according to the Regulations;[77]

The draft E-Waste Management Regulations, 2013 provides that Recyclers are required to carry out their mandate according to the contractual agreement between the licensed facility and the Producer.[78] This means that a lot of trust is placed on the content of the contractual agreement which may not be sufficient to ensure safety and effective management of e-waste. It would be more effective to prescribe standards or promulgate Guidelines in the draft E-Waste Management Regulations, 2013 so that even if the contract is lacking in any way, the prescribed Standards or Guidelines will apply and ensure standards of safety are adhered to.

With regard to mobile phones, Nokia has a recycling scheme for its end-of-life phones in Finland.[79] In Kenya, the WEEE Centre was launched in 2008, with a view to providing e-waste management services for decommissioned electrical and electronic equipment.[80] The Centre deals with electronic waste by disassembling it into useable and non-useable components. The useable components are recycled and used whereas the toxic and hazardous components are exported to recyclers overseas who have the technical capacity to safely extract the valuable materials from them.[81] Safaricom, the leading mobile operator in Kenya, has partnered with the

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[76] Supra at Regulation 9.

[77] The draft E-Waste Management Regulations, 2013, at Regulation 10. Although the Regulations do not specifically provide the mechanism for export of hazardous e-waste, they are anchored in Regulation 27 of the Environmental Management And Co-Ordination (Waste Management) Regulations 2006.

[78] The draft E-Waste Management Regulations, 2013, at Regulation 10 (2).

[79] See PiaTanskanen, Electronics Waste: Recycling of Mobile Phones: Post-Consumer Waste Recycling 132 and Optimal Production, Nokia Corporation, Finland May, 2012.

[80] See, the WEEE Centre in Kenya, available at http://www.weeecentre.com/About%20Us.html (last accessed on 16th August 2013)

[81] Ibid.

Centre with regard to disposal of mobile phones. This Centre would have to apply and obtain the relevant certification under the draft E-Waste Management Regulations, 2013 to continue operations once these Regulations come into force.

As a matter of Policy, the Ministry of Environment, Water and Natural Resources should initiate incentives to encourage Recyclers to set up recycling centre in various towns in Kenya. Requiring Recyclers to pay application licence fees and other associated costs may not result in any applications to set up this vital service which underpins the effectiveness of the draft E-Waste Management Regulations, 2013.

2.5.7 Provisions on Disposal

Disposal is an important stage in mobile phone e-waste management process. E-waste that cannot be recycled should be disposed of in a manner that does not cause harm to the environment.[82]

At the time this study was conducted, there were no specific express Regulations governing disposal of e-waste in Kenya.[83] The management of e-waste management has therefore been carried out largely from a business approach.[84] Institutions such as CFSK[85] and Camara Kenya[86] engage in e-waste disposal.

Since e-waste disposal is a process in e-waste management, disposal organisations are required to apply for a license from the NEMA.[87] The drafts E-Waste Management Regulations, 2013, provide that County Governments shall not allow disposal of e-waste in their waste facilities in a manner that is contrary to that prescribed by these Regulations.[88] Allowing disposal of waste in contravention of the Regulations is an offence which shall attract a penalty upon conviction of

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[82] See Liu, Q., Li, Q. K., Zhao, H., Li, G., & Fan, Y. F, The global challenge of electronic waste management, Environmental science and pollution research international, 2009 16(3), 248–249.
[83] See William Aino Shivoga, E-Waste: Impacts, Challenges And The Role Of Government, CCK Service Providers and The Consumers Workshop held at Ole Sereni Hotel, Nairobi –Kenya, 9th -10th June 2010
[84] *Ibid.*
[85] www.cfsk.org (Accessed 16th August 2013)
[86] www.camara.org (Accessed on 16th August 2013)
[87] See sections 87 AND 88 of EMCA.
[88] The draft E-Waste Management Regulations, 2013, at Regulation 25.

imprisonment for a period not less than thirty-six months and a fine on not less than Kenya Shillings Two Million.[89]

Whereas the penalties prescribed are significant and may seem appropriate to enforce compliance, more should be done by NEMA to educate the public as to why it is important not to dispose of e-waste in municipal dumps and landfills rather than rely on hefty penalties. Social compliance based on knowledge of the harmful nature of e-waste to the environment, water and ultimately human health may act as a better compliance mechanism than stiff penalties.

2.5.8 Classification of Mobile Phone and other E-wastes in Kenya

It is unfortunate that in spite of its gravity, EMCA classification does not list e-wastes as part of the classification of hazardous wastes.[90] This means that e-wastes are relegated to the level of 'any other' waste in spite of the dangers posed by this type of waste. In addition there are no provisions in EMCA on what amounts to e-waste and how the different categories of e-wastes should be treated.

2.5.9 Penalties for Offences under draft E-Waste Management Regulations, 2013

A number of offences relating to e-waste are created under the abovementioned draft Regulations. These offences arise due to omissions, inappropriate registration and failures to meet certain requirements under the draft E-Waste Management Regulations, 2013.

It may be argued that the penalties for these offences are just remedial and not punitive enough. For instance, the penalty for importing equipment without a license is forfeiture of the goods and to export back or have them destroyed at their own cost. The penalty for not meeting the obligations under the Regulations is merely deregistration. For multinational companies, Government or other high-net-worth organisations, these fines may be seen as non-deterrent and unlikely to facilitate compliance.

Other offences include false information,[91] failure to furnish information[92] and handling unauthorized e-waste consignments[93]. The general penalty for these offences is imprisonment of

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[89] Ibid at Regulation 29

[90] See section 90[1] of EMCA.

[91] The draft E-Waste Management Regulations, 2013, at Regulation 26..

not less than 36 months and a fine of not less than Kenya shillings two million as contained in Regulation 29 of the draft E-Waste Management Regulations, 2013. Unlike the Penal Code, this Regulation prescribes the floor of the punishment instead of the ceiling. It also appears to take away judicial discretion in sentencing and may not sit well with human rights activists and the Judiciary.

With regard to enforcement, County Governments are required to comply with the Regulations but no specific duties have been assigned to them.[94] This study posits that the draft E-Waste Management Regulations, 2013, should have a category of bulk consumers into which the Central and County Governments would fall together with other large Corporate Organisations and Companies. These bulk consumers would have specific obligations to undertake with regard to e-waste management and disposal that they would be required to report on annually.

While the Environmental Management and Co-ordination (Waste Management) Regulations, 2006 substantially domesticate the standards and principles of the Basel Convention, there may be need to re-look at these particular Regulations in the light of the draft E-Waste Management Regulations, 2013, to avoid any concurrent or overlapping provisions, align roles and responsibilities as well as penalties. This would avoid forum-shopping for Producers, Recyclers and Consumers in the event of contravention of either set of Regulations.

2.6 Conclusion

The draft E-Waste Management Regulations, 2013 are a bold step by Kenya to identify e-waste as a significant environmental and human health concern and to provide a legal framework for managing this.

This is a significant step given the damning assessment by the UNEP in 2010 that:

> "E-waste management efforts in Kenya are (sic) in infancy. There are no policies and regulations specifically addressing e-waste, although they are currently being developed, and different institutions will be put in charge of the waste stream. Funds have also not yet been made available to set up e-waste management infrastructure. Waste collection, storage, transportation and disposal facilities (and potential recycling and recovery facilities) currently do not exist specifically for this waste stream. Nevertheless, more research is still required in order to assess

[92]Ibid at Regulation 27.
[93]Supra at Regulation 28.
[94] The draft E-Waste Management Regulations, 2013, at Regulation 25.

CHAPTER THREE: COMPARATIVE ANALYSIS

3.1 Introduction

This chapter undertakes a comparative analysis of how e-waste is managed in different jurisdictions. The study highlights specific issues in the legal, policy and institutional frameworks of different jurisdictions and puts them into perspective with the situation in Kenya.

The comparative analysis will focus on the key areas of the draft E-Waste Management Regulations, 2013 discussed in Chapter 2, mainly importation of mobile phone handsets, trends in e-waste generation and management and legislation on mobile phone use and disposal. In this way this study will attempt to reconcile Kenya's initiatives in e-waste management and the disposal of end-of-life mobile phones and continue to examine the efficacy of the draft E-Waste Management Regulations, 2013 as a foundation for e-waste management in Kenya.

Across the world, the increasing tonnage of e-waste produced from various electronic and electrical appliances is common and well recognised culminating in the development of international treaties to tackle the problem. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal[1] (the Basel Convention) was adopted in 1989 and came into effect in 1992. This international treaty was adopted in response to concerns about escalating shipments of hazardous wastes from developed to developing countries. The treaty aims to reduce the generation of hazardous wastes and to minimise their shipment to the developing world. A primary goal is the "environmentally sound management" of hazardous wastes to protect human health and the environment. The Convention contains lists of wastes that are hazardous and establishes controls on their shipment. Among the wastes defined as hazardous are circuit boards containing lead-based solder, used in most mobile phones.[2]

[1] See United Nations Treaty Collections available at http://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-3&chapter=27&lang=en (last accessed on 8t November 2013).

[2] See, Strategies for a Better Environment, The Basel Convention and Its Mobile Phone Partnership Initiative (MPPI), October 2003, at page 1.

In addition to the Basel Convention, African Nations developed the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa (1991). The Bamako Convention is a treaty of African nations prohibiting the import into Africa of any hazardous (including radioactive) waste. The convention came into force in 1998. The Bamako convention is a response to Article 11 of the Basel convention which encourages parties to enter into bilateral, multilateral and regional agreements on Hazardous Waste to help achieve the objectives of the convention. It was also a response to the failure of the Basel convention dealing with direct export of toxic hazardous waste from developed to countries in Africa and aims at ensuring that no radioactive wastes are imported into Africa. The Convention covers more wastes than covered by the Basel Convention as it not only includes radioactive wastes but also considers any waste with a listed hazardous characteristic or a listed constituent as a hazardous waste. The Convention also covers national definitions of hazardous waste. Products that are banned severely restricted or have been the subject of prohibitions are also covered under the Convention as wastes. Kenya is a signatory to the Bamako Convention.

There has been a steady growth of mobile phone related e-waste due to the increasing demand and usage of mobile phones all over the world. For instance, in the European Union, it is estimated that by the year 2020, the annual e-waste will be 12.3 million tons.[3] It is further estimated that every citizen within the European Union produces between 17-18 kilograms of e-waste every year.[4]

The trend is similar in Japan where over 450 million tons of e-waste is produced every year. Of more concern about Japan is the fact that the disposal sites are dwindling.[5]The trend shows that in 10 years, all factors remaining constant, Japan will not have any room to dispose e-waste.[6] It

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[3]See Puja Sawhney et al, Best practices for E-waste Management in Developed Countries, Adelphi Research, Europe Aid August 2008, p 8.

[4] See Savage, M. et al. (eds.), 2006, Implementation of the Waste Electric and Electronic Equipment Directive in the EU 25, Technical Report Series, Ref: EUR 22231 EN. http://www.jrc.es/publications/pub.cfm?id=1408 (21/04/08)

[5] See DTI Global Watch Mission, 2005, Waste electrical and electronic equipment (WEEE): innovating novel recovery and recycling technologies in Japan, September 2005. http://www.prc.surrey.ac.uk/sumeepnet/detail.aspx?table=news&id=17 (13/05/08).

[6] Ibid.

has been reported that in Japan alone it was estimated that by 2010, 610 million mobile phone units would be discarded.[7]

In America, it has been reported that in 2010, 384 million units of e-waste were generated and 152 million mobile phones were discarded. In effect the e-waste generated per day amounted to 142,000 computers and 416,000 mobile devices per day. In total 3.41 million tons of e-waste was generated in America in 2011.[8]

The increasing volumes of mobile phone e-waste are not unique to the EU, Japan, America and Kenya. It is a worldwide concern.[9]The same can be said of West Africa and other parts of the world.[10]

The above summary demonstrates the global impact of e-waste management and sets the stage for examining the efforts various countries have adopted to manage e-waste in their respective jurisdictions. Every country has a growing concern with regard to management of e-wastes. The difference is the level of development of their respective e-waste management policies, legal and regulatory frameworks, investment and overall e-waste management initiatives.

3.2 E-Waste Production

Production, is discussed in the context of actual processing or creating the products that contribute to generation of e-waste, and also in the context of a Producer as defined in the draft E-Waste Management Regulations, 2013 that is any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler.[11]

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[7] See Mobile Phone Working Group, Basel Convention & Mobile Phone Partnership Initiative: Guidance document on the environmentally sound management of used and end-of-life mobile phones, 30th June 2010 at page 11

[8] See U.S. Environmental Protection Agency Office of Resource Conservation and Recovery, Electronics Waste Management in the United States Through 2009, May 2011, reference EPA 530-R-11-002

[9] See Electronics Take back Coalition, Facts and Figures on E-Waste and Recycling, June 25, 2013.

[10] See SBC, Where are WEEE in Africa? Findings from the Basel Convention E-waste Africa Programme, Secretariat of the Basel Convention, December 2011.

[11] See The draft E-Waste Management Regulations, 2013at Regulation 2.

Australia has a product stewardship structure that sees to it that e-waste management begins with safe practices on production of electric and electronic devices.[12] The product stewardship is to ensure that manufacturers, importers, governments and consumers all have a role in e-waste management.[13]

The Environmental Protection Heritage Council is mandated with ensuring this product stewardship.[14] The product stewardship scheme is a co-regulation system involving the industry itself and the government. Manufacturers may voluntarily commit product stewardship agreement within the industry.[15] There are also regulatory laws of production that are implemented by the government.[16] Thus, producers regulate themselves on one hand and the government on the other. The regulation by government sets the minimum standards.

In India, manufacturers are required to reduce the levels of toxic wastes in their products.[17] The E-waste (Management and Handling) Rules 2010 in India introduced the Extended Producers' Responsibility (EPR)[18] for recycling, provided for collection centres and brought down the levels of hazardous substances in electronics.[19] The rules further restrict the use of toxic substances specifically cadmium, mercury, lead, hexavalent chromium, polybrominated biphenyls and polybrominated biphenyl ethers in electronics. Rule 4 gives provides for the duties of the producer in e-waste management. Among the duties is collection of end of life and near, creating awareness, collection of e-waste resulting from their manufacture, setting up collection centres and financial support among other duties.

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[12] See Sunil Herat, Electronic Waste: An Emerging Issue in Solid Waste Management in Australia, Griffith University, Queensland ,Australia. p13.

[13] Ibid.

[14] See Environmental Protection Heritage Council, Product Stewardship. http://www.ephc.gov.au (accessed on 19th August 2013).

[15] See generally Environment Protection and Heritage Council, 2004. Industry Discussion Paper on Co-regulatory Frameworks for Product Stewardship, EPHC Australia.

[16] Ibid.

[17] See RSC, Manufacturers targeted by India's e-waste laws, 13th July 2011. http://www.rsc.org/chemistryworld/News/2011/July/13071101.asp (Accessed on 20th August 2013).

[18] OECD defines EPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle. An EPR policy is characterised by: (1) the shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities; and (2) the provision of incentives to producers to take into account environmental considerations when designing their products. See http://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm (Visited on 20th August 2013).

[19] *Ibid.*

In South Korea, the Law for Promotion of Resources Saving and Reutilization puts in place the Producer deposit-refund system where manufactures make deposits and recover it upon carrying out recycling as specified.[20] By so doing, manufacturers are determined to carry out recycling so that they can recover their deposit. Manufacturers in Korea use different ways to carry out the recycling including contracting with profit making recycling companies.[21]

The regulation of production by several jurisdictions is a key part of the e-waste management process. Some regulations require producers to use limited or no hazardous wastes in their products. Some require producers to commit to recycling and to establish collection facilities where the waste products can be kept. Manufacturers may also be required to pay some fee which goes to a fund that finances e-waste management in the country. There may also be a co-regulation system where the government is involved on one hand and the manufacturers regulating themselves through professional bodies like in Australia.

In Kenya, the draft E-Waste Management Regulations, 2013 attempt to tackle this concern in Regulation 4 which seeks to control the production of e-waste by setting out the circumstances under which this may be done and the certification required to implement this.

3.3 E-Waste Exports and Imports

For countries within the European Union, the Basel Convention governs the importation and exportation of hazardous wastes including e-wastes. Trans-boundary shipment of waste is also governed by OECD Council Decision C (2001)107/Final of the OECD Council concerning the Control of Trans-boundary Movement of Wastes Destined for Recovery Operations (OECD Council Decision). The convention and the OECD council decision have been domesticated by the European Union via the EU Waste Shipment Regulation.

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[20] See Sung-Woo Chung & Rie Murakami-Suzuki, A Comparative Study of E-waste Recycling Systems in Japan, South Korea and Taiwan from the EPR Perspective: Implications for Developing Countries. P 18. Available at http://www.ide.go.jp/English/Publish/Download/Spot/pdf/30/007.pdf (Accessed on 20th August 2013).

[21] *Ibid.*

Export of hazardous waste from the European Union to non-OECD member countries is prohibited.[22]This is because it is considered that these countries do not have proper and adequate capacity to manage e-waste effectively.[23] It is therefore not only an internal e-waste management effort but also a trans-boundary concern.[24]

It is however, possible to ship all kinds of wastes within the union but member states can implement a general or specific ban on import and export of waste.[25] Moreover, any imports or exports of wastes within the union have to be notified before shipment is done.

It is imperative to note that the European Union is not just concerned about e-waste management within its territory but even beyond. This is perhaps why there is implementation of the ban on exporting hazardous wastes to non-OECD members by the Basel Convention.

The European Commission directive on Recycling of e-wastes requires member states to introduce procedures that will reduce illegal exports. People wishing to export electronics will be require to test whether the equipment works or not and to document exports that could be thought illegal. The aim of this requirement is to reduce dumping of e-wastes in developing economies.
This directive has been criticized for setting high standards without considering issues of capacity.[26]

Germany, being a member of the European Union, OECD and a signatory to the Basel Convention, has the German Waste Shipment Law to give effect to the foregoing. In addition to the international and regional instruments, Germany has municipal laws that govern the

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[22] See EEA, Waste without borders in the EU? Transboundary Shipments of waste, EEA Report No 1/2009, ISSN 1725-9177.
[23] Ibid.
[24]The banning of export of hazardous wastes to non-OECD members was done through the export ban amendment to the Basel Convention.
[25] See EEA, Waste without borders in the EU? Transboundary Shipments of waste, EEA Report No 1/2009, ISSN 1725-9177.P 9.
[26] See comments by Environmental law expert Simon Colvin of Pinsent Masons, on the directive. Available at http://www.out-law.com/en/articles/2012/august/revamped-eu-electronic-waste-rules-target-85-collection-rate-by-2019/.(Visited on 29th July 2013).

importation and exportation of e-wastes. The laws provide for inspection, clear procedures and steps to be taken if a shipment is found to be illegal.

Under the law, the federal authorities in the state in which the shipment of waste begins are responsible for measures and duties relating to shipments of wastes out of the country.[27] Moreover, it is upon the federal governments to carry out inspection of wastes destined for Germany.[28] Thus, it is not just the duty of the central government to monitor shipment of e-wastes in and out of Germany. These federal states can be equated to County Governments in Kenya.

Inspection of waste shipment is done by the customs officers in cooperation with the Federal Office for the Transport of Goods and other authorities.[29] It is also the duty of the parties to the shipment to carry out an inspection of the shipment to ensure that it complies with the relevant laws. It is therefore not always the duty of the police.[30] Suspicious cases of illegal waste shipment are detected by the customs officials during inspections and then the responsible waste management authorities are alerted.[31] If there is a violation, the goods may be seized or the shipment impounded. If it is just a suspicion, the waste management authority is required to conduct further investigations before making an assessment.

If it is exported out of Germany, the inspection authorities are required to inform the inspection authority of the destination of the shipment of the measures of the shipment. The shipment may

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[27] See Section 14 par. 1 of German Waste Shipment Law.
[28] See Section 14 par. 2 of German Waste Shipment Law.
[29] See Section 11 par. 2 German Waste Shipment Law.
[30] See Braun, J., Bremen Police/WV 12, WirksameKontrollengrenzüberschreitenderAbfalltransporte – Eine internationaleHerausforderung (Effective controls of cross-border waste transport - An international challenge), DeutschePolizei (German Police) 1-2009, pages 22-25.
[31] See K Sander and S Schilling, Transboundary Shipment of Waste Electrical and Electronic Equipment/ Electronic Scrap – Optimization of Material Flows and Control – An Environmental Research of The Fede ral Ministry of The Environment, Nature Conservation and Nuclear Safety Project No. (FKZ) 3708 93 300, Report No. (UBA-FB) 001331/E available at http://archive.basel.int/techmatters/e_wastes/germany-report-18May2010.pdf

or may not proceed depending on the decision by the authority at the destination of the shipment.[32]

Some countries such as Singapore do not have a ban on export of hazardous wastes but there is a requirement for a Basel export permit. Export and import of used electrical and electronic equipment (EEE) must conform to a number of requirements. For instance, an importer must show a surveyor report demonstrating that the equipment is in good shape. He must also show that the market for the import is ready. For repair and refurbishment, the importer is required to show that they have a good repair facility and that there is a ready market. In Pakistan, there is an express prohibition of importing hazardous wastes.

Many countries monitor importation and exportation of electronic and electrical products and e-waste within and without the territories. Some countries have prohibited importation. Others, especially from the Europe, have gone ahead and prohibited exportation of e-waste to other countries. Institutions have been put in place to monitor imports and exports of e-waste. Some jurisdictions have also taken steps to prevent dumping of e-waste in emerging economies. Exporters and importers maybe required to demonstrate that their products are not waste or near end of life.

The question remains whether the provisions of the draft E-Waste Management Regulations, 2013 are sufficiently robust to ensure that e-waste is not exported or imported into Kenya. This is especially a concern with mobile phones as a large number of mobile phones are discarded in developed economies, many of which are re-shipped to developing countries like Kenya. The draft E-Waste Management Regulations, 2013 make no mention of an enforcement unit that will be charged with the task of inspecting imports to ensure that end-of-life mobile phones and other e-waste is not imported into the country. These weaknesses may betray the good intentions of the draft E-Waste Management Regulations, 2013 and fail to provide the required protection to the environment and human health that is endangered by e-waste.

[32] See Art. 11 par. 4 of German Waste Shipment Law.

3.4 Recycling of E-Wastes

Recycling of e-waste from mobile phones is one of the best ways of managing e-waste.[33] A country's environmental practices and approach to recycling of e-waste is very informative of how e-waste is managed in the country.[34]

E-waste management in Japan is managed on two fronts. Firstly, there is the Law for Promotion of Effective Utilization of Resources.[35] It concentrates on recycling goods and thus bringing down waste generation. Secondly is the Recycling of Specified Kinds of Home Appliance which puts responsibilities on both manufacturers and consumers on certain home appliances. These pieces of legislations were inspired by the growing decline of disposal sites.

Recycling of e-waste in Japan has contributed largely to the reduction in the quantity of e-waste generation in the country.[36] The Law Recycling of Specified Kinds of Home Appliance (LRHA) imposes mandatory obligations on manufacturers of the specified appliances. It must be noted that the LRHA imposes duties on the manufacturer, retailer and the consumer. Manufacturers have the responsibility to physically collect the recycled home appliances that have been disposed by consumers. Therefore, therefore, their responsibility does not end with supplying the electronic to the retailer.[37]

Under the European Union, the European Commission has put in place a concrete directive on recycling e-waste from TVs, laptops and mobile phones in 2012.[38] Under the directive, EU member states will be required to see to it that 45% of electrical and electronic equipment sold in each country is collected for recycling. The target of the rules is progressive targeting that by the year 2019, a collection rate of over 85 per cent of e-waste, including mobile phones, within the

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[33]See PiaTanskanen, Electronics Waste: Recycling of Mobile Phones, Post-Consumer Waste Recycling and Optimal Production, Nokia Corporation, Finland

[34] See generally Chancerel, P., Rotter, S. (2009), Recycling Oriented Characterisation of Small Waste Electrical and Electronic Equipment, Waste Management, volume 29, Issue 8, August 2009, pp 2336-2352.

[35] See article 1 of the Law on Promotion of Effective Utilization of Resources, Japan.

[36]DTI Global Watch Mission, 2005, Waste electrical and electronic equipment (WEEE): innovating novel recovery and recycling technologies in Japan, September 2005.
http://www.prc.surrey.ac.uk/sumeepnet/detail.aspx?table=news&id=17. (Accessed on 29th July 2013)

[37] See Sung-Woo & Rie Murakami-Suzuki, A Comparative Study of E-waste Recycling Systems in Japan, South Korea and Taiwan from the EPR Perspective: Implications for Developing Countries,

[38] See DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE).

Union should be recycled and ultimately, approximately 10 million tons of e-waste will be collected for recycling by the year 2020.[39]

Kenya does not have a policy or regulatory framework on recycling mobile phones and other electronics.[40] Many scholars in this area agree that there is a need to have recycling and re-use facilities and these can be run by the private sector.[41] The recycling that goes on is informal through the so called Jua Kali sector. There are no targets of e-wastes to be recycled.[42]

The involvement of social enterprises in e-waste management is an aspect that cannot be overlooked by states that take the issue seriously.[43] Social enterprise involvement in e-waste management is part of the corporate civil responsibility and has both social and economic benefits in addition to environmental protection. The distinguishing features of social economy enterprises are in their mode of the economic operation and not necessarily their legal make up.[44]

Austria has put in place a number of initiatives that encourage the social enterprises in the country to participate in recycling and treatment of e-waste.[45]Social enterprises are allowed to run WEE treatment plants in the country.[46] The treatment plants are certified by the government to repair or dismantle used electronic equipment depending on the conditions of the waste.[47] By so doing, they complement government efforts. Social enterprises have been hailed in Austria specifically on e-waste recycling.[48] Thus, in addition to helping in e-waste management, the

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[39] See article 7(1) of the Directive.

[40]See Asiimwe Edgar Napoleon (2010), E-waste Management in East African Community, available at: http://www.spidercenter.org/sites/default/files/master_theses_sponsored/Edgar_Napoleon.pdf, (last accessed 3rd June, 2013). P 8.

[41] For example see David Ong'are, Emerging Challenges, Emerging issues, cap 9

[42] See generally Mureithi, M., Waema, T., Wanjira, A., Finlay, A. and Schluep, M., (2008). E-waste in Kenya: Baseline Assessment. Proceedings of the 19th Waste management Conference of the IWMSA (WasteCon2008).6-10 October 2008. Durban, South Africa. ISBN 978-0-620-40434-1.

[43] See generally Puja Sawhney et al, Best practices for E-waste Management in Developed Countries, Adelphi Research, EuropeAid August 2008.

[44] Ibid. p 36 . They are ordinary business enterprises with an objective of achieving social or community related goals such as a clean environment. They are self governed and supported and the commercial operations are secondary to the social and community goals.

[45] Ibid. p 35.

[46] See Reparaturneztwerk http://www.repanet.at (Accessed on 13th August 2013).

[47] *Ibid.*

[48] See generally Puja Sawhney et al, Best practices for E-waste Management in Developed Countries, Adelphi Research, EuropeAid August 2008. P 35.

initiatives also create permanent employment and thus reduce social exclusion which in turn translates to a better society. E-waste management can therefore be a source of employment.[49]

The state of California in the United States of America has the Electronic Waste Recycling Act.[50] It provides for reduction in certain hazardous substances in electronics that are sold within California. It also provides for an e-waste recycling fee which is distributed to qualified entities which indulge in electronic waste collection and recovery.

The issue of a recycling fund features prominently in most jurisdictions that have e-waste legislations. Moreover there is the involvement of all stakeholders from the producer to the consumer in e-waste management. In most jurisdictions, the duty of the Producer does not just end with releasing the product but is linked to the end-of-life of the product.

As a matter of Policy, the Ministry of Environment, Water and Natural Resources should initiate incentives to encourage Recyclers to set up recycling centre in various towns in Kenya. Requiring Recyclers to pay application licence fees and other associated costs may act as a disincentive against setting up of this vital service which underpins the effectiveness of the draft E-Waste Management Regulations, 2013.

3.5 Collection of E-waste

In Nigeria, the National Environmental (Electrical/Electronic Sector) Regulations came into force in 2011. Collection of e-waste in Nigeria is both formal and informal. The informal sector is mainly by waste pickers and dealers all over the country.[51] The formal collection is in the form of private public partnerships.[52] The main institutions in this sector are the Lagos State Environmental Protection Agency (LASEPA) and Lagos State Waste Management Authority (LAWMA).[53] They do door to door collections with arranged pick- up days. The PPPs maintain

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[49] These initiatives are also complemented at the European Union level through Reuse and Recycling European Union Social Enterprises http://rreuse.org (Accessed on 13th August 2013)

[50] See CalRecycle, Electronic Waste Recycling Act of 2003: Covered Electronic Waste Payment System (SB 20/SB 50) http://www.calrecycle.ca.gov/electronics/act2003/ (Visited on 20th August 2013)

[51] See Olakitan Ogungbuyi et al, e-Waste Country Assessment Nigeria, e-Waste Country Assessment Nigeria e-Waste Africa project of the Secretariat of the Basel Convention, May 2011. P 65.

[52] *Ibid.* P 66.

[53] *Ibid.* P 18.

collection centres where the collected e-waste is stored. In places where door-to-door collection is not practical, there are special bins called *dino* bins set up specifically for this purpose.[54]

There is also collection by organisations through consultants working with the Maintenance System Consultancy and LASEPA where the collected e-waste is stored in warehouse for recycle and disposal. There is no money charged for the consultancy and it is observed that this serves as an incentive to encourage collection.[55]

In Rwanda, permanent and special drop-off facilities have been established in addition to door to door pick up.[56] An enviable practice in Rwanda is the organisation of special drop-off points and days where collection of all waste is undertaken on a communal basis.[57]

In Taiwan, manufacturers and importers are charged collection fees using a specific formula.[58] The sum payable is arrived at by multiplying the amount of sales of the previous year by recycling and collection costs.[59] The collection and recycling cost are determined by a committee called the Fee Rate Reviewing Committee. It is from this fund that collection and recycling organizations are funded.[60] There are also Collection sites in Taiwan managed by the collection firms. Japan has sites but they are managed by the manufactures.[61]

Canadian Regulations of e-wastes sets the minimum standards for collection equipment.[62] There are standards for collection pipes, manholes, pump stations and other collection facilities. Moreover there are clear prescriptions on how the same should be made.[63] This is aimed at ensuring that e-waste collection is done with the minimal interference with the environment. The

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[54] *Ibid.* P 67.
[55] *Ibid.*
[56] See Hermogene Nsengimana, Assessment of e-wastes status and trends in Rwanda and development of recommendations for the prevention and management of e-wastes, NUR-CB, May 2011. P 66
[57] Ibid. P 66.
[58] See Sung-Woo Chung & Rie Murakami-Suzuki, A Comparative Study of E-waste Recycling Systems in Japan, South Korea and Taiwan from the EPR Perspective: Implications for Developing Countries. P 18. Available at http://www.ide.go.jp/English/Publish/Download/Spot/pdf/30/007.pdf (Accessed on 20th August 2013). P 11.
[59] *Ibid.*
[60] *Ibid.*
[61] *Ibid.* P 13.
[62] See for example Regulation 11 of Waste Resource Management Regulations, Canada.
[63] Ibid. Regulations 11-20.

Environmental Protection Act in Canada is the basis of the Waste Resource Regulations which provide for the above standards.

Collection of e-waste is an area that has not escaped the reach of the law in many jurisdictions that have e-waste management laws. Prominent features include collection centres, collection licensing, private sector involvement, collection and recycling fees and funds. Featuring prominently is also the presence of robust monitoring bodies.

In the Kenyan context the introduction of the draft E-Waste Management Regulations, 2013 should be accompanied a clear mechanism for creating and funding Recycling Centres. Merely relying on self-interest by organisations to set these up may lead to a failure in the proper implementation of the Regulations. The draft E-Waste Management Regulations, 2013 should be re-drafted to identify clear methods and sources of raising the financial resources required to create the Recycling Centres. Alternatively the Government should implement Policy incentives to facilitate the establishment of these Centres.

3.6 Disposal of E-Waste

In Germany, the Electrical and Electronic Equipment Law, which considers requirements of disposal, environmentally sound processing, reuse and recycling of electronics such as mobile phones at the end of their useful period is used to govern the disposal of e-waste.[64] This law provides for the procedure of notifying waste management authorities.[65] This is perhaps to enhance compliance and reduce corruption.

In Japan, the Law Recycling of Specified Kinds of Home Appliance imposes on manufacturers the responsibility to physically collect the recycled home appliances that have been disposed by consumers.

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[64] See Knut Sander et al, Transboundary shipment of waste electrical and electronic equipment / electronic scrap – Optimization of material flows and control, Federal Environment Agency (Germany), Report No. (UBA-FB)001331/E. Pp 22,23.

[65] For details of the procedure, see Kropp, O., "Zuständigkeiten und Vorgehensweisebei der KontrollegrenzüberschreitenderAbfalltransporte" (Responsibilities and procedures for controlling cross-border waste transport) Mainz. UPR 6/2008.

The Canadian Law provides that any person wishing to undertake disposal of e-wastes or set up disposal facilities must acquire permit from the Minister to ensure that the standards in the Environmental Protection Act and the Waste Resource Regulations are adhered to.[66] It is not like in Kenya where anybody can dig a pit and bury e-waste without treatment or burn the same in open fires thus causing negative effects on the environment.

In America there is a system where consumers pay a small fee to recycling centres which specialise in dismantling and disposal of e-waste.[67] The centres may also sell the e-waste to foreign traders.[68] Questions have been raised about the US policy and approach to e-waste management as what is out rightly hazardous has been found to be 'green'.[69]

3.7 Conclusion

There are many tried and tested practices that are effective in e-waste management. These practices are encompassed in different legal and regulatory frameworks of waste management in various countries.

There are several areas in the Kenyan legal regulatory frameworks that need to be relooked at. The areas include involvement of the private sector and other stakeholders, classification of wastes and clarity of the law, export and import of e-wastes. The institutional framework should be developed around the Extended Producer Responsibility principle to ensure end-to-end management of equipment that contribute to e-waste.

This chapter puts the issues in perspective by comparing with best practices in the world. It is this analysis that informs the content of chapter four which comes up with law reform recommendation that could see some of these best practices inculcated in the Kenyan system.

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[66] See Regulation 2 of the Waste Resource Regulations, Canada.

[67] See Jennifer Joines, Globalization of E-waste and the Consequence of Development: A Case Study of China, *Journal of Social Justice, Vol. 2, 2012 (© 2012). P 5.*

[68] See generally Mazurek, Jan. Making Microchips: Policy, Globalization, and Economic Restructuring in the Semiconductor Industry. Cambridge: MIT Press, 1999, 78.

[69] See Samaddar, AB 'Dumps of Despair', *The Statesman*, 2003, 25 March. Retrieved 20th August 2013 from LexisNexis database.

CHAPTER FOUR: CONCLUSIONS AND RECOMMENDATIONS

4.1 Introduction

The study sought to investigate the various legal options available to Kenya which address mobile phone e-waste. It has examined the efficacy of the proposed e-waste regulations, specifically the draft E-Waste Management Regulations 2013, in regulation of mobile phone e-waste. It has reviewed the provisions of the EMCA which relation to e-waste management and their linkage to the draft E-Waste Management Regulations 2013. It has also evaluated how other developing and developed countries have regulated mobile phone e-waste.

This final chapter makes recommendation for changes in the existing and proposed e-waste management laws for regulation of mobile phone e-waste. These proposals are aimed at helping Kenya effectively manage the growing e-waste problem presented by end-of-life mobile phones. It summarises the major conclusions of the study and also makes the recommendations.

The recommendations and proposals presented in this study are partly as a result of comments, findings, interviews and remarks made by the stakeholders described in Chapter 1 of this study in Workshops facilitated by NEMA in February 2013 at Nakuru and in September 2013 at KICC in Nairobi.

4.2 Summary of Conclusions

4.2.1 Conclusion on the Extent of Mobile Phone E-Waste Problem in Kenya

The CCK estimates that mobile phone usage was at 28 million in December 2011, 29 million in March 2012 and is expected to exceed 31 million in 2013. The widespread use of mobile money services and the introduction of 3G internet access on mobile phones continue to fuel demand for mobile phone handsets in Kenya. The mobile phone handsets in use in Kenya are all imported. Genuine mobile phone handsets have a limited lifespan, estimated to be around four years and thereafter have to be disposed. This is compounded by the high number of counterfeit handsets which have a relatively shorter useful lifespan, contributes to the high rate of accumulation of mobile phone e-waste in Kenya.

UNEP estimates that Kenya produces 150 tonnes of mobile phone e-waste produced every year[1].

4.2.2 Conclusion on Effects of Mobile Phone E-Waste

A mobile phone can contain over 40 elements from the periodic table. Its disposal has potential devastating effects on the environment. Burning of e-waste causes emission of harmful gases that are not only damaging to animal life, but plant life as well. For instance heavy metals and poisonous gases, mostly dioxins and furans, are emitted if old mobile phones are burnt openly

Accumulation of the resultant ash at the burning site may also cause a change in the soil pH and soil pollution. The waste may also be washed over or percolate into water bodies, causing water pollution. Water pollution is not limited to the surface water as ground water is also susceptible to pollution by heavy metals associated with mobile phone e-waste. For instance, cadmium from one mobile phone battery is enough to pollute 600 m^3 of water.[2] The hazardous substance of most concern contained within cell phones is lead. This heavy metal is a suspected carcinogen which has negative effects on the central nervous system, the immune system, and the kidneys, and has been associated with development abnormalities. Landfilling of e-wastes can lead to the leaching of lead into the ground water.

Continued wrongful disposal of e-waste will lead to adverse health conditions and possible climate alterations, resulting into social and economic effects.

4.2.3 Conclusion on Kenya's Response to the Mobile Phone E-Waste Problem

Most Kenyans dispose of near end-of-life mobile phones by selling them to the public, donation to family and friends, disassembling and using spare parts, disposing in garbage collection points or selling them to dealers in scrap metal and plastics. The largest proportion of mobile phone e-waste in Kenya is handled by the informal operators, mainly technicians, who simply disassemble discarded mobile phones in order to recover usable parts: capacitors,

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[1] See NEMA, E-Waste Management available at http://www.nema.go.ke/index.php?option=com_content&view=article&id=317:e-waste-management&catid=120&Itemid=659

[2] See Kurian Joseph, Electronic Waste Management in India–Issues and Strategies, Centre for Environmental Studies, Anna University, Chennai, India, 2007 available at http://www.swlf.ait.ac.th/UpdData/International/NRIs/Electronic%20waste%20management%20in%20India.pdf (last accessed aon 19th September 2013)

transistors, batteries, network cables, circuit boards, diodes and cables. Whatever remains is just thrown, at best, in the dumpsite or other places, with significant negative consequences to the environment.

Kenya attempted to minimise accumulation of mobile phone e-waste by banning import and use of counterfeit mobile phones in 2012. This directive has not been fully effective, as counterfeit mobile phones remain available in many trading outlets in Kenya and while many counterfeit mobile devices that have been switched off by mobile networks, many have been "unlocked" through re-programming by backstreet technicians and returned to circulation.

4.2.4 Conclusion on Kenya's Legal Framework on E-Waste

The Constitution guarantees the right to a clean and healthy environment and as part of ensuring that this right is respected, demands the enactment of the relevant legislations.[3] This is yet to be fully implemented. Though EMCA establishes the legal and institutional framework for the management of the environment and related matters, it does not address e-waste specifically. EMCA authorises NEMA, on the recommendation of the Standards and Enforcement Review Committee, to issue Guidelines and Regulations for the management of each category of hazardous wastes.[4] In implementing this provision, NEMA released the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. These regulations address other forms of waste, but do not specifically address e-waste.

Recently, NEMA has issued the draft E-Waste Management Regulations 2013 in an attempt to specifically address e-waste through specific provisions. This remains the most focused attempt to deal with mobile phone e-waste and e-wastes in general in the Kenyan legal framework.

4.2.5 Conclusion on the Draft Environmental Management and Co-ordination (E-Waste Management) Regulations 2013

As mentioned, NEMA has published the draft E-Waste Management Regulations, 2013 in attempt to enact a framework for regulation of e-waste in Kenya. These regulations are however deficient in their current form, and would be inadequate in regulating e-waste in Kenya. The deficiencies are evident in several aspects.

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[3] Article 42.
[4] Section 90.

First, they define persons with the responsibility to ensure that e-waste is dealt with in a vague manner, failing to directly mention that they apply to consumers, generators, manufacturers, producers and recyclers. Second, they do not make a distinction between individual consumers and corporate or bulk consumers, with both bearing similar obligation with regard to compliance. Third, they have not addressed the issue of historical e-waste. They further fail to incorporate Extended Producer Responsibility (EPR) which would see producers of electrical or electronic equipment, being responsible for their products beyond manufacturing until environmentally sound disposal of their end-of-life products. In addition, they require registration of all mobile phone vendors. This would require significant administrative strengthening of NEMA and possibly decentralisation of the registration process none of which have been addressed in the draft E-Waste Management Regulations, 2013. Finally, they have weak provision on establishment of collection centres and recycling mechanisms.

4.2.6 Conclusion on Comparative Analysis

Other jurisdictions have better ways of enforcing EPR. Producer deposit refund system in Korea and the co-regulation system in Australia stand out as best practices in enforcing this responsibility. India has restricted the use of toxic substances in manufacture of mobile phones and other electronics. The countries further require producers to commit to recycling and to establish collection facilities where the waste products can be kept.

With regard to imports and exports, these countries closely monitor trade in electronic goods and regulate illegal shipments. Emphasis is placed on reducing imports of e-waste with a bias to shipping their own to third world countries. As regards collection of e-waste, the manufacturers and importers are obligated to bear the responsibility and costs for collection. They are required to establish the collection centres, or contribute to a central fund, from which the government sets up collection centres. Door to door collection and permanent designated collection points are the main methods employed for collection.

The above are some best practices noted in other jurisdictions which Kenya should consider as the regulatory framework on e-waste is developed.

4.3 Summary of Recommendations

4.3.1 Recommendation on Manufacture, Import and Sale of Mobile Phones

Kenya has attempted to reduce the rate of accumulation of mobile phone e-waste. The Anti-Counterfeit Act, 2008 and the Kenya Information and Communications (Importation, Type Approval and Distribution of Communications Equipment) Regulations 2010 are aimed at eliminating counterfeits, which have shorter life compared to genuine phones. However, more needs to be done. More recently NEMA has introduced the draft E-Waste Management Regulations 2013.

This study recommends that Kenya should establish a pre-import verification of conformity to standards plan, designed to ensuring that only genuine handsets are imported into Kenya. A system similar to the one for eliminating overage second hand motor vehicles should be put in place in the mobile phone handsets sector.

Further, the regulations should be amended to impose harsh penalties on importers of counterfeit phones. Stiff monetary fines, forfeiture of the goods, an obligation to export them back or to have them destroyed at the importers' own costs are some of the available measures. Sellers of such phones should also be sanctioned through hefty fines to deter such conduct.

In addition, the study recommends that the Regulations should be more explicit on the requirement that a producer or an importer have a contract with a licensed recycler before licensing. This contract should be a requirement for issuance of the Annual Compliance Certificate. There should be penalties, including cancellation of license for producers and importers who lack such contracts.

4.3.2 Recommendation on Collection of Mobile Phone E-Waste

The draft E-Waste Management Regulations 2013 only require a producer or any person acting on their behalf intending to set up an e-waste Collection Centre to notify NEMA of the location and physical address of the centre. They are no couched in mandatory terms.

The study recommends that there be a clear mandatory duty on importers and producers of mobile phones to set up collection centres for old end-of-life mobile phones. This can be implemented in two ways. First, the producers can at their own cost establish the centres, but

be required to provide evidence of their existence and location before licensing, or be required to contribute in proportion of their market share to a common fund which would then establish and maintain the centres.

For the second option, the study recommends the establishment and maintenance of the centres through urban, municipal and county councils. This would reduce administrative costs for these bodies already have established waste collection systems within their structures.

In a further alternative, the collection centres can be established through public-private partnerships where tax incentives are extended to interested firms to encourage investment in the sector.

4.3.3 Recommendation on Recycling of Mobile Phone E-Waste

The draft regulations are not clear on the government's role in recycling of e-waste. They operate on the assumption that there are sufficient private entities interested in and operating recycling plants.

The regulations need to be amended to elaborate on the role and obligations of recyclers. The first option would be for the Ministry of Environment, Water and Natural Resources to initiate incentives, monetary or otherwise, to encourage Recyclers to set up recycling centres in various towns in Kenya. The second option would be to require manufacturers, through a self-regulating approach to set up recycling centres. Alternatively, they can be required to contribute to a central fund, which would then be administered as a government agency to set up recycling firms across the country. These Policy initiatives must be implemented to support the draft E-Waste Management Regulations 2013 or they will lack the necessary framework to achieve proper implementation.

4.3.4 Other Recommendations

The draft regulations should be amended to create a distinction between individual consumers and bulk or corporate consumers. In the latter category should be include the Government, multi-national companies, local companies and other corporate entities within a prescribed threshold. These bulk consumers shall have stricter obligations placed upon the given their

ability to import and use equipment which generates e-waste, the study recommends that should be required to file returns in relation to e-waste annually

4.4 Conclusion

This study has noted the existing and proposed regulatory framework for the management of e-waste in Kenya can benefit from significant improvement. The study has addressed each of the research questions that were posed as a point of departure for the study and the findings as well as the proposed recommendations if implemented will address the existing and potential shortfalls in the e-waste management regulatory framework in Kenya.

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Annexures

Draft Environmental Management and Co-ordination (E-Waste Management) Regulations 2013 – Version available in the NEMA website as at March 2013.

IN EXERCISE of the powers conferred by Sections 86 and 147 of the Environmental Management and Co-ordination Act No. 8, of 1999, the Cabinet Secretary for the time being responsible for Environmental matters, on the recommendation of the National Environment Management Authority and upon consultation with the relevant lead agencies, and in fulfilment of the requirement of Public participation makes the following Regulations:

The Environmental Management and Coordination (E-Waste Management) Regulations of 2013

PART I: PRELIMINARY

Citation

1. These Regulations may be cited as the Environmental Management and Co-ordination (E-Waste Management) Regulations, 2013.

Interpretation

2. In these Regulations unless the context otherwise requires:

'Authority' means the National Environment Management Authority established under section 7 of the Environmental Management and Coordination Act of 1999;

'collection centre' means a centre established individually or jointly or a registered society or a designated agency or a company or an association to undertake collection operations of e-waste;

'consumer' means user of electrical and electronic equipment or generator of E-waste;

'electrical and electronic equipment' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in schedule 5 of these regulation;

'electrical and electronic equipment registry' means a unit housed by the Authority for the purposes of effecting registration of all electrical and electronic equipment producers and recyclers;

'entity' includes Agency, organisation, establishment, business, partnership, body corporate with capacity to sue or to be sued;

'environmentally sound management' means taking all steps required to ensure that e-waste are managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such waste;

'evidence note' means

'e-waste' also referred to as waste electrical and electronic equipment means waste resulting from electrical and electronic equipment including components and sub-assemblies thereof;

'generator' means any person whose activities or activities under his or her direction produces e-waste or if that person is not known, the person who is in possession or control of that e-waste;

'market' means an environment that facilitates trading in Electrical and electronic equipment and e-waste;

'manufacturer' means an entity involved in the making or production of electrical and electronic equipment either locally or internationally;

'minimum collection incentive' means the minimum collection price paid by recyclers to the collection network to ensure collection of problematic fractions;

'problematic fractions' means components or parts of e-waste where the collection and treatment cost far outweighs the material recovery value;

'**producer'** means any person or entity who introduces or causes to be introduced new and used electrical and electronic equipment into the market by sale, donation, gifts, inheritance or by any such related methods and can either be a manufacturer, importer, distributor or assembler;

'recovery' means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfill a particular function;

'recycling' means any operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes;

'recycler' means any person or entity engaged in recycling or reprocessing used electrical and electronic equipment or assemblies or their component;

'refurbisher' means any person who repairs, dismantles or re-assembles electrical and electronic equipment to extend the working life of the product;

'refurbishing' means the action of repair, dismantling, improvement of e-waste for the purposes of extending the working life of the product;

'take-back' means the process of returning or repossessing used products from the market to the producer or their representative;

'transporter' means a person or entity that is in the conduct of carrying or conveying e-waste from one point to another;

'treatment' means processing e-waste through modern and eco-friendly technologies to ensure compliance with environmental protection; and

'treatment facility' means a licensed plant, premise, and establishment for processing e-waste.

Application

3. (1) These regulations shall apply to all categories of electrical and electronic equipment as set out in schedule 10 and facilities for transportation, recycling, re-use and recovery as provided for herein.

(2) These regulations may be read together with the Guidelines for E-waste Management in Kenya.

PART II: E-WASTE

Registration of Producers

4. (1) A Producer who intends to introduce new or used electrical and electronic equipment into Kenya shall apply for registration from the Authority.
(2) An application for registration shall be made to the Authority;

(a) In a form as set out in schedule 1; and

(b) Upon payment of a prescribed fee as set out in schedule 13.

(3) Every Producer operating in Kenya must register with the Authority within sixty (60) days of the coming into force of this regulation as per sub-regulation (2);

(4) After submission of the application, the Authority shall make a decision and communicate the decision within fourteen (14) days.

(5) (1) The Authority upon receipt of the application may;
- (a) Approve the application;
- (b) Request for further particulars; or
- (c) Reject the application.

(6) where the Authority rejects the application under sub-regulation 5 (c), the applicant shall have a right to appeal to the National Environmental Tribunal within 60 days.

(7) If the decision is to approve, then the Authority shall issue a registration certificate to the producer as set out in the schedule 2 of these regulations;

(8) The Authority shall maintain an electrical and Electronic Equipment producer's register as specified in schedule 3 which shall be opened to the public for inspection.

Annual compliance certificate of Producers

5. Every producer shall obtain an annual compliance certificate upon-

(a) declaring the previous year's weight of electrical and electronic equipment introduced in the market by product type;

(b) production of an evidence note with a licensed treatment facility;

(c) production of a valid contractual agreement with a licensed treatment facility; and

(d) payment of the prescribed fee.

Producer Responsibility

6. (1) Every producer shall, declare to the Authority-

(a) The previous year's electrical and electronic equipment products introduced into the market; and

(b) Provide to the Authority subsequent year's projected imports of any electrical and electronic equipment products.

(2) The declaration referred to in Regulation 6 (1) shall be in the format stipulated in schedule 11;

(3) Every producer shall provide information to recyclers on how to dismantle their product at the end of life and the location of any hazardous substances or items within the product;

(4) Every producer shall, within their relevant product category and on the basis of their market share, support the financing of collection and treatment for problematic fractions by the licenced treatment facility to ensure effective take back and treatment of e-waste;

(5) (a) Every producer shall pay upon receipt of the evidence note from the licence treatment facility the treatment fee determined by the Authority based on the market share of the producer.

(b) In determining the market share of the producer the authority shall be guided by the formula as indicated in schedule 11.

(6) Any producer or a third party acting on behalf of the producer and intending to establish an e-waste collection centre shall notify the Authority of the location

and physical address of the center indicating the Global Positioning System coordinates;

(7) (a) Every producer shall ensure that e-waste returned under individual take-back schemes, is not disposed of at municipal disposal site/facility,

(b) A producer or a third party acting on behalf of the producer shall:

(i) provide evidence of affiliation with a recycling facility;

(ii) facilitate e-waste take-back;

(iii) facilitate the receiving, sorting and transfer of e-waste to recycling facilities or refurbishers;

(8) the Authority may from time to time and on case by case basis require other persons to undertake the functions specified under sub-Regulation 6 (3) (1);

(9) every producer or a third party acting on behalf of the producer shall ensure that the collection centre is operated in accordance with the Occupational Health and Safety Act of 2007 and the rules there under.

Electrical and electronic equipment *Registry*
7. (1) The Authority shall maintain an electrical and electronic equipment Registry.

(2)The purpose of the registry shall include:

(a) To receive and determine applications for registration.

(b) Issue certificates of registration and registration numbers

(c) to calculate individual producer responsibility by market share for problematic fractions and shall communicate this to the producer;
(d) The electrical and electronic equipment Registry shall keep a register on the following;

(i) The tonnage and categories of e-waste collected and processed by the licenced treatment facilities;

(ii) The total tonnage and categories of electrical and electronic equipment placed on the market by all producers;

(iii) Status of compliance based on percentage of obligation fulfilled.

(e) the Authority shall operate the electrical and electronic equipment Registry through multi-sectoral stakeholder participation;

(f) the Authority shall keep the register in the format stipulated in schedule 11.

Disclosure

8. (1) The Authority shall ensure that the register is open to the public for perusal during official working hours;

Provided no confidential information, held by the Authority shall be disclosed to third parties unless

a) pursuant to a court order; or

b) required by any other act or regulation.

Licencing of Recyclers

9. (1) Any person intending to establish an E-waste recycling facility shall obtain an EIA licence in accordance with the Environmental (Impact Assessment and Audit) Regulations of 2003;

(2) Every owner/operator of a recycling facility shall obtain an operating license from the Authority in accordance with the Environmental Management and Coordination (Waste Management) Regulations of 2006

(3) An application for a license to operate a recycling facility shall be made to the Authority and shall be—

(a) lin a form set out in schedule 12 of these regulations; and

(b)Accompanied by the prescribed fee

(4) (a) After submission of the application, the Authority shall make a decision to approve or reject and communicate the decision in writing within twenty one (21) days

(b) If the decision by the Authority is to reject the application, then the communication shall state;

(i) The reasons for the decision; and

(ii) The right of appeal

Responsibilities of Recyclers

10. (1) Recyclers shall;

(i) Receive and dismantle the Waste electrical and electronic equipment into hazardous and non-hazardous components in an environmentally sound manner;

(ii) Ensure that the components which cannot be recycled locally are exported as specified in this regulation.

(2) The licenced recycler shall collect and treat e-waste in accordance with the Guidelines published by the Authority;

(a) the standards set out in this regulation,

(b) the contractual agreement between the licenced facility and the producer

(3) The licenced recycler owners/operators shall submit to the electrical and electronic equipment registry on a quarterly basis and as per schedule

13 including the following;

(a) Quantities in weight by category of e-waste received

(b) Quantities in weight by category of whole components refurbished for reuse

(c) Quantities in weight by category of materials for recycling and recovery within the facility

(d) Quantities in weight of precious metals recovered

(4) The licenced recycler shall ensure that they receive or collect e-waste from approved collection centres or other persons;

(5) The licenced recycler shall give priority to the refurbishment of used electrical and electronic equipment to increase its working life before dismantling for recycling purposes, material recovery or reprocessing;

(7) The licenced recycler shall ensure that the e-waste fractions that cannot be recycled in the country are exported in accordance with the provisions of the Environmental Management and Coordination (Waste Management) Regulations of 2006

(8) Subject to sub-regulation (7)of this regulation the licenced recycler shall obtain an export permit for any e-waste fractions after application to the Authority in the manner set out in Schedule 14 of these regulations.

(9) The Authority shall notify the applicant in writing of its decision under sub-regulation (8) of this regulation not later than eight (8) weeks after the application was made and if the decision is a decision to refuse approval such a notification shall state—

(a) The reasons for the decision; and

(b) The right of appeal.

Responsibilities of Generators

11. The generator shall ensure e-waste is segregated from other forms of waste and is taken to licenced refurbishers, collection centres or recyclers.

Responsibilities of Refurbishers

12. (1) Refurbishers shall ensure that the resultant e-waste is transferred to a collection centre or to licenced recyclers;

(2) Every person involved in the repair or refurbishment of electrical and electronic equipment shall ensure that the e-waste is recycled in a facility licenced by the Authority.

Transportation of E-Waste

13. All transporters of e-waste shall;

(1) obtain necessary licences from the Authority upon application in a prescribed form and payment of the prescribed fee;

(2) maintain *tracking documents* at all times which shall be made available on request by environmental inspector; and

(3) ensure that the mode of transport used complies with Regulation 8 of the Environmental Management and Coordination (Waste Management) Regulations of 2006.

Responsibilities of Collection Centres

14. Any person intending to establish a collection centre shall notify the authority in the form prescribed in schedule xxxx.

E-WASTE- Control and handling

15. (1) The Authority may establish a mechanism to ensure collaboration within African States on importation of e-waste;

(2) Any e-waste imported into Kenya from within Africa shall be for the purpose of recycling, refurbishment, and material recovery;

(3) Any person importing e-waste referred to under these regulations from within Africa into Kenya shall apply to the Authority for a permit in accordance with the prescribed format upon payment of the prescribed fee set out in schedule 10;
Importation of Electrical and Electronic Equipment

16. (1) The importation of electrical and electronic equipment containing Cathode Ray Tubes into the country are restricted except for essential services such as medical equipment;

(2) The importers of all electrical and electronic equipment donated to individuals, educational institutions, religious organizations, communities, or body corporate by whatever means, shall obtain the necessary approvals from the Authority in accordance with the prescribed form and fee.

(3) Every electrical and electronic equipment imported into the country shall bear a label indicating the year and country of manufacture

Prohibitions

17. (1) No person shall dispose e-waste;
(a) by burning;

(b) in non-designated waste receptacles; or

(c) By burial or at a dump site.

(2) No person shall;

(a) Treat Cathode Ray Tubes in an unsound environmental manner;

(b) Cause leaching of precious metals with acids and other hazardous waste from printed wire boards or Printed Circuit Board in an uncontrolled manner;

(c)Carry out open burning of electrical and electronic equipment /e-waste at the recycling facilities;

(d) Abandon e-waste anywhere other than in the collection centres and/or in the licenced recycling facilities.

Any person who contravenes this regulation commits an offence and liable on conviction to a fine not exceeding one hundred thousand shillings or to imprisonment for a term not exceeding six months or to both.

Environmentally Sound Management

18. Every person dealing in e-waste shall practice principles and standards of Environmentally Sound Management of e-waste.

Reporting

19. (1) Every refurbisher of electrical and electronic equipment shall keep records of quantities of e-waste transferred to the collection centres;

(2) every recycler of e-waste shall submit to the Authority every six months records of;

(a) Quantities of e-waste received of each category for recycling;

(b) Quantities and types of recovered materials including precious metals;

(c) Recycling technologies applied;

(d) Quantities exported for further recycling; and

(e) Certificate of disposer recovery;

(3) The records required under sub-regulations 1 and 2 shall be in a format as prescribed under schedule 13.

Minimum collection incentives/values

20. The Authority shall establish a framework through which to provide incentives to actors in the e-waste value chain.

The minimum collection value is the value that will be paid by the recycler to collectors ensuring that all e-waste is collected. Some e-waste does not have a positive recovery value due to the cost to process being more than the revenue recovered. As a result currently these materials may not be collected. The regulation will need to be clear that recyclers must supplement these materials to ensure collection. The recycler will recover these costs from the producers based on their market share of the respective category of products. This will prevent the 'cherry picking' of only valuable e-waste.

Transfer of Responsibility

21. A producer intending to cease operations shall notify the Authority six (6) months in advance in writing and shall provide evidence of arrangements for alternative entities to bear their obligation within the compliance period.

PART III-MISCELLANEOUS

Offences and Penalties

22. No person shall import any near end-of–life and e-waste from outside Africa into Kenya;

Offences relating to Registration

23. (1) It is an offence for any producer introducing electrical and electronic equipment into the Country without registration by the Authority. The producer in addition to the penalty prescribed by the law shall be required to forfeit the goods so introduced and to export back or have the electrical and electronic equipment destroyed at their own cost;

(2) Any person who introduces or distributes electrical and electronic equipment contrary to this regulation or any other law commits an offence.

Failure to meet Obligations

24. (1) Any person who fails to meet their obligations under these Regulations or any other written law commits an offence;

(2) In addition to the penalty prescribed by the law, and without prejudice to any other lawful remedy, the producer may be deregistered by the Authority.

Disposal of e waste by County governments

25. (1) No County Government shall allow disposal of e-waste in their waste facilities save for in the manner prescribed by these regulations;

(2) It shall be an offence for any county government to allow disposal of e waste in their waste facilities save for in the manner prescribed by these regulations.

Offence relating to false information

26. Any person who submits false information in records or evidence or deliberately misleads the Authority commits an offence.

Failure to furnish information

27. Any producer who upon ceasing operations in Kenya, fails to inform and provide evidence to the Authority of transfer of responsibilities to alternative entities, commits an offence.

REGISTRATION REQUIRMENTS

(a) A duly filled application form set out in schedule 1 of these regulations,

(b) Pay the prescribed fee and;

(c) Provide a valid written contractual agreement with a licenced treatment facility. Provided that all documents in support of the application shall be submitted by the applicant;

SCHEDULE 1 (sec. 4(2) (a))
APPLICATION FORM FOR REGISTRATION OF PRODUCERS

Reg.37
Application Reference No.
.....

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT
Act No. 8 of 1999
APPLICATION FOR REGISTRATION AS AN ELECTRICAL AND ELECTRONIC EQUIPMENT (EEE) PRODUCER

Part A: DETAILS OF APPLICANT

A1 Name of producer
Company □
Business name □
Others.....
A2
Nationality.....

A3 PIN No.
.....

A4 Identification number/Business Registration Number/Incorporation Number (as applicable).....

A6 Postal and physical Address (Road/Street/Building):
.....
.....
A7 Telephone No. .....

A8 Fax No. .....

A9 Email.....

Part B: NATURE OF BUSINESS

B1 Nature of business (State whether Importer, Manufacturer or which other)).....

B2 Location of business (GPS Coordinates).....

PART C: DETAILS OF EEE

C1 Category of EEE

Category 1. Large household appliances □

Category 2. Small household appliances □

Category 3. IT and telecommunications equipment □

Category 4. Consumer equipment □

Category 5. Lighting equipment □

Category 6. Electrical and electronic tools □

Category 7. Toys, leisure and sports equipment □

Category 8. Medical devices □

Category 9. Monitoring and control instruments □

Category 10. Automatic dispensers □

Part D: DECLARATION BY APPLICANT

D1 I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief.

....
.....

Signature of Applicant Full Name in Block Letters
Position

On Behalf of .....
.....

Name Seal/Official stamp .....

Date.....

Part E: FOR OFFICIAL USE

Approved/ Not Approved

.....

.....

.....

Comments

.....

.....

.....

.....

.....Name of Official

.....

Designation .....Sign.....

Date .....

SCHEDULE 2 (sec. 4(7))

REGISTRATION CERTIFICATE

Reg. 37

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

Act 8 of 1999

CERTIFICATE OF REGISTRATION AS AN ELECTRICAL AND ELECTRONIC EQUIPMENT (EEE) PRODUCER

Registration Certificate No. .....
Name.....
.....
Address.....
.....You are hereby registered as an Electrical and Electronic Equipment (EEE) Producer for the following categories:
.....
.....
Subject to the following conditions
.....
.....
.....
Date: .....
Signature.....
For Director General
National Environment Management Authority

SCHEDULE 3
REGISTER FOR EEE PRODUCERS

Regxx
x

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT
Act 8 of 1999

Reg .Certificate No.	Name of Producer	Address	Contact Person Information	Nature of business	County	Category of EEE	Affiliated Recycling facilities

SCHEDULE 4

ANNUAL COMPLIANCE CERTIFICATE

Reg. xxx

THE ENVIRONMENTAL MANAGEMENT AND COORDINATION ACT

Act No 8 of 1999

ANNUAL COMPLIANCE CERTIFICATE

Certificate No. .....

Name.....
.....
.....

Address.....
.....
I CERTIFY that the individual/entity named above complies with the

Environmental Management and Coordination (E-Waste Management) Regulations, 2013 for the year.....

Subject to the following
conditions.....
.....

Date: .....

Signature.....
For Director General
National Environment Management Authority

SCHEDULE 5 (sect 2)
CATEGORIES OF PRODUCTS

List of products which shall be taken into account for the purpose of this Regulation include, but are not limited to;

1. Large household appliances

i. Large cooling appliances
ii. Refrigerators
iii. Freezers
iv. Other large appliances used for refrigeration, conservation and storage of food
v. Washing machines
vi. Clothes dryers
vii. Dish washing machines
viii. Electrical Cooking equipment
ix. Electric stoves
x. Electric hot plates
xi. Microwaves
xii. Other large appliances used for cooking and other processing of food
xiii. Electric heating appliances
xiv. Electric radiators
xv. Other large appliances for heating rooms, beds, seating furniture
xvi. Electric fans
xvii. Air conditioner appliances
xviii. Other fanning, exhaust ventilation and conditioning equipment

2. Small household appliances

i. Vacuum cleaners
ii. Carpet sweepers
iii. Other electrical appliances for cleaning
iv. Appliances used for sewing, knitting, weaving and other processing for textiles
v. Ironing, mangling and other clothing appliances.
vi. Toasters
vii. Fryers
viii. Grinders, coffee machines and equipment for opening or sealing containers or packages
ix. Electric knives
x. Appliances for hair-cutting, hair drying, tooth brushing, shaving, massage and other body care appliances
xi. Clocks, watches and equipment for the purpose of measuring, indicating or registering time
xii. Scales

3. IT and telecommunications equipment

i. Centralized data processing:
a. Mainframes

b. Minicomputers
c. Servers
ii. Printer units
iii. Personal computing:
a. Personal computers (CPU, mouse, screen and keyboard included)
b. Laptop computers (CPU, mouse, screen and keyboard included)
c. Notebook computers
d. Notepad computers
iv. Copying equipment
v. Electrical and electronic typewriters
vi. Pocket and desk calculators and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means
vii. User terminals and systems
viii. Facsimile
ix. Telex
x. Telephones
xi. Pay telephones
xii. Cordless telephones
xiii. Cellular telephones
xiv. Answering systems and other products
xv. Broadcasting equipment for transmitting sound, images or other information by telecommunications
xvi. And other products or equipment for the purpose of recording or reproducing sound or images, including signals or other technologies for the distribution of sound and image than by telecommunications

4. Consumer equipment

i. Radio sets
ii. Television sets
iii. Video cameras
iv. Video recorders
v. Hi-fi recorders
vi. Audio amplifiers
vii. Musical instruments

5. Lighting equipment

i. Luminaries for fluorescent lamps. Straight fluorescent lamps
ii. Compact fluorescent lamps
iii. High intensity discharge lamps, including pressure sodium lamps and metal halide lamps
iv. Low pressure sodium lamps
v. Other lighting or equipment for the purpose of spreading or controlling light
vi. (KPLC and Kengen to give inputs)

6. Electrical and electronic tools

i. Drills
ii. Saws
iii. Sewing machines

iv. Equipment for turning, milling, sanding, grinding, sawing, cutting, shearing, drilling, making holes, punching, folding, bending or similar processing of wood, metal and other materials
v. Tools for riveting, nailing or screwing or removing rivets, nails, screws or similar uses
vi. Tools for welding, soldering or similar use
vii. Equipment for spraying, spreading, dispersing or other treatment of liquid or gaseous substances by other means
viii. Tools for mowing or other gardening activities

7. Toys, leisure and sports equipment

i. Electric trains or car racing sets
ii. Hand-held video game consoles
iii. Video games
iv. Computers for biking, diving, running, rowing, and other similar gadgets.
v. Sports equipment with electric or electronic components
vi. Coin slot machines

8. Medical devices (with the exception of all implanted and infected products)

i. Radiotherapy equipment
ii. Cardiology
iii. Dialysis
iv. Pulmonary ventilators
v. Nuclear medicine
vi. Laboratory equipment for in-vitro diagnosis
vii. Analysers
viii. Freezers
ix. Other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability

9. Monitoring and control instruments

i. Smoke detector
ii. Heating regulators
iii. Thermostats
iv. Measuring, weighing or adjusting appliances for household or as laboratory equipment
v. Other monitoring and control instruments used in industrial installations (

10. Automatic dispensers

i. Automatic dispensers for hot drinks
ii. Automatic dispensers for hot or cold bottles or cans
iii. Automatic dispensers for solid products
iv. Automatic dispensers for money

11. Batteries

12. Security and Military Equipment

13. Florescent tubes

SCHEDULE 6

APPLICATION FORM TO OWN/OPERATE A RECYCLING FACILITY

APPLICATION/RENEWAL FOR A LICENCE TO OWN/OPERATE AN E- WASTE RECYCLING/TREATMENT FACILITY

I hereby apply for a licence to own/operate an e-waste recycling/treatment facility, particulars whereof are given below:-

Name of Applicant.....
Address .....
.....
Phone No.....
Contact Person.....
.....
PIN Number
.....
Location of plant/site
.....
.....
.....
.....
Recycling Technology
applied.....
.....
Types of e-waste to be treated/recycled at plant/site
.....
.....
.....
Installed Capacity (tonnes/annum).....
Quantity of e-waste treated/recycled during the previous year
(tonnes/kg) .....
.....
.....
Estimated life span of plant/site
Any (.....
.....
Proposed hectarage/area of plant/site (include plan or
designs).....
.....
Executive summary of environmental impact statement (please attach)
Is Application for: □ Initial license □ Renewal
Previous License Number
.....
E.I.A. License Number

.....

Additional information.....

.....

.....

.....

Date:.....

Signature:.....

Designation/Title:.....

FOR OFFICIAL USE ONLY

Application received by.....on.....20.....

Fee paid Kshs..... (in words).....

Signature.....Date.....

.....

.....

.....

For: Director General

National Environment Management Authority

SCHEDULE 7
REPORTING FORMAT FOR E-WASTE RECYCLING/TREATMENT FACILITY

Name of Facility:

.....

Category of waste	Total Quantity of waste received for treatment (tonnes)	Quantities of materials recovered (tonnes)			Quantity of materials Exported to reprocessor (tonnes)		Remarks	
		Treated on site	Reuse	Precious metal recovered	Material Description	Tonnes		

Approved by

CEO .....Sign.....Date.....

□ **Note; Report to be submitted on Quarterly basis**

SCHEDULE 8 (sect. 14(1))

E-WASTE COLLECTION CENTRE

REQUIREMENTS FOR NOTIFICATION TO THE AUTHORITY

1. The collection centre should indicate:
a. Physical Location
b. GPS position
c. Postal Address
d. Contact Person
e. Tel. No
f. E-mail address
2. Type of e-waste to be collected
3. Name of the transporter
4. Recycling/Treatment plant where e-waste is taken for recycling
5. Safety Measures in Place
6. Emergency Preparedness

SCHEDULE 9 (sect. 14(1))

NOTIFICATION FORM FOR ESTABLISHEMENT OF COLLECTION CENTRES

Name of Collection centre.....

Address.....

Provide details of;

a. Physical Location.....

.....

b. GPS position.....

c. Postal Address.....

.....

.....

d. Contact Person.....

e. Tel. No.....

f. E-mail address.....

Indicate the type of e-waste to be collected at the centre.....

.....

...

Recycling/Treatment plant where e-waste is taken for recycling

.....

.....

.....

.....

Safety Measures in Place at the collection centre.....

.....

....

.....

....

Emergency Response Plan.....

.....

.....

.....

SCHEDULE 10 (sect. 15(3))

APPLICATION FORM FOR E-WASTE EXPORT PERMIT

APPLICATION FOR TRANSBOUNDARY

MOVEMENT OF WASTE

(FOR EXPORT OR TRANSIT PURPOSE ONLY)

1. NOTIFIER*
Name: Telephone:.....
Address: Telefax:.....
E-mail.....
Contact person (name, address, telefax, e-mail)

2. GENERATOR (S) OF WASTE
Name:.....Telephone.....
Address:..... Telefax:.....
E-mail.....

Contact person (name, address, telephone, telefax, e-mail)
.....
Process by which the waste was
generated:.....
Site of
generation:.....

3. REASON FOR WASTE EXPORT
Why the waste cannot be disposed of in the country of origin Why the waste has to be exported/imported through Kenya

4. WASTE
Description of the waste:
Y number H number UN class UN number:
Shipping name IWIC code
Physical state at 20oC:
Î Powder Î Solid Î Paste/viscous Î Sludge Î Liquid
Î gaseous Î Other (specify)
Estimated quantity (Kg or L) of the shipment:
Type of packaging:.....
Number of packages:.....
Special handling requirements including emergency provisions in case of accidents:
Method of disposal:

5. EXPORT/IMPORTER OF THE WASTE
Competent Authority and details of approval

Exporter/Importer of the waste in the country of origin/destination

Name:.....Telephone: Telefax

E-mail

6. DISPOSER OF WASTE (final disposal facility)
Contact person in case of emergency:

Name:.....Telephone .....Telefax

E-mail:

Approximate date of disposal:

Actual site of disposal:

Signature and official stamp of disposer:

7. TRANSIT

Projected length of time the waste shipment shall be in transit in Kenya territory

Expected date of entry

Expected date of exit

Means of transport envisaged:

Information relating to insurance:
***(To confirm if there is more information on the asterik)**

SCHEDULE 12(sect. 9(3) (a))

FORMULA FOR PRODUCER OBLIGATION CALCULATION

a. Market Share calculation for a producer is:
The weight of products put on the market by an individual producer in his product type/s

divided by

The total weight of products put on the market by all producers in this **product type/s**

b. Obligation calculation for a producer is:
Total reported tonnage treated by **product type**
multiplied by

The individual producers market share

c. Pollution impact factor (develop pollution index table)

SCHEDULE 13 (sect. 10(3))
FEES

1. Application fee for Producer registration -R-37 -1 Kshs. 3,000

2. Annual compliance certificate - Kshs. 500 – 10,000 (based on producer annual turn-over)

3. Licensing of recyclers-R-52b, ksh-40,000

4. Transportation fee for e-waste- R- 65-1 ksh-5,000

5. Importation of e-waste permit fee-R-66-3-5, ksh-30,000

(Annual renewal fee based on the producers turn-over)

Develop schedule for:

EEE DECLARATION FORMAT