



E-WASTE MANAGEMENT IN ACADEMIC INSTITUTIONS IN NIGERIA: A CASE FOR UNIVERSITY OF JOS

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Abstract: This paper explored the ICT waste generation, its management in Nigeria and academic institutions in Nigeria and made a case for University of Jos. The various definitions and understanding for ICT waste were identified. Why ICT waste management is considered an ethical issue bearing in mind its hazardous substances and effects on humans and the environment was explained. The policies and legislative practices in Nigeria were also examined. Stakeholders and professionals are considered as valued subjects in ICT waste management in Nigeria as well as information which is the life wire of development. Where there is information there will be understanding and wisdom in the management of e-waste. Academic institutions are advised to put in place policies to handle e-waste management. The Nigerian government and the States would also be on safer grounds if they enforce the laws in the country to avert any health hazard for its academic community and the Nigerian citizens as a whole.

Key words: E-waste management, ICT hazardous components, policy, academic Institutions, stakeholders.

1.0 Introduction

The desire to keep abreast with Information and Communication Technology (ICT) in recent years particularly in Nigerian higher institutions has led to millions of electronic waste (e-waste) from obsolete computers and other electronic sets to be imported in the country as donations, gifts and for sell.

Statistics has it that 20-50 million tons of E-waste is generated every year while a huge amount that is uncounted for is exported to developing nations as “donations” or “scrap” which makes it difficult to quantify the amount of illegal waste that is exported and dumped on these countries (Greenpeace, 2009). An estimate of “500 containers of second-hand electronics are imported to Nigeria every month from Europe, with each container holding 500 computers”. (Terada, 2012). with three-quarters as junk and are dumped in landfills (The Guardian cited in Terada, 2012).The problems with the Landfills is that it is a waste of resources and space, many of these high tech items contain poisonous elements like Arsenic, Barium, Beryllium, Cadmium and Selenium and thus posing environmental and health risk. Dumping high tech items into landfills generates harm and is not morally acceptable. Some of these high tech items are recycled mostly by individuals out of necessity and poverty because they follow practices that are risky. The impact on the health of individuals who are working directly with e-waste and its recycling can come back to harm the developed countries too (LaBossiere, 2008). The need therefore to address e-waste management by Nigerian Universities who are actively involved in the use of ICT equipments cannot be over emphasized.

1.1 What is e-waste?

E- Waste or ICT waste is understood and defined by various people from different perceptive. Erasmus, (2009) defined it as “electrical or electronic equipments which is waste, including all components, subassemblies and consumables which are part of the product at the time of discarding. It includes computers and entertainment electronics consisting of valuable as well as harmful and toxic components’. Ogbomo, et al (2012) considered information and communication technology waste as keyboard,

mice, screen, printers, modems etc. Ogbomo, et al (2012) has seen ICT waste as anything digital that is out of use or not useful. E-waste is 'the disposal of electronic goods, such as cell phones, MP3 players, televisions and computers'. Because e-waste is expensive to dismantle and recycle in a way that is safe to humans and environment, it is often shipped directly or indirectly to countries with cheap labor and less stringent environment laws (Terada, 2012).

1.2 Ethical issues

Most people in the world and Nigerian academic institutions use one form of information communication technology equipment or the other today, and they have ethical responsibility in the broken or unused equipments that are disposed. It is considered as a moral issue and is viewed at the angle of improper disposal of the e-waste, which is a global ethical problem and each individual who uses electronics is a stakeholder. ICT ethics has to do with ethical questions regarding the amount of electronics products discarded globally, considering the large amount of human, water, air, and soil and biota pollution that this toxic and hazardous waste creates (Ethics and Electronic Recycling part 2). The problem with this waste is that it does not only lie in the high toxicity of the products, but the way and manner they are disposed. It is also important to note that environmental degradation which is unaccounted for will snowball into different types of problems once the ecosystems are destabilized and will gradually contaminate food, health and water supplies are just as harmful as sudden natural disasters or epidemics disease that we would feel a moral jolt to assist (Ethics and Electronic Recycling part 2).

EFFECTS OF TOXIC SUBSTANCES FOUND IN COMPUTERS AND OTHER ELECTRONIC EQUIPMENTS.

HAZARDOUS COMPONENTS	EFFECTS
Arsenic (a poisonous Metallic element)	Various skin diseases and lung cancer
Barium	Brain swelling, muscle weakness, damage to the heart, liver and spleen.
Beryllium(classified as human carcinogen)	Lung cancer
Cadmium	May have serious impact in the kidneys. Inhalation due to proximity to hazardous dump can cause severe damage to the lungs, kidney damage, cognition
Selenium	Selenosis
Toxic emission	Hormonal disorders
Mercury	Impairment of neurological development in fetuses and small children, tremours, emotional changes, cognition, motor function, insomnia, headaches, changes in nervous response, kidney effects, respiratory failures, death
Lead (classified as human carcinogen)	Probable human carcinogen, damage to brain and nervous systems, slow growth in children, hearing problems, blindness, diarrhoea, cognition, behavioural changes (e.g. delinquent), physical disorder.
BFR	May increase cancer risk to digestive and lymph systems, endocrine disorder

Table 1: Effects of toxic substances found in computers and other electronic equipments. Erasmus, 2009,(UNEP, 2007a; MoEF, 2008; ENVIS, 2008; Pinto, 2008; Osuagwu, 2010; Chen et-al, 2011 cited in Adediran & Abdulkarim, 2011).

2.0 Literature Review

Ogbomo, et al (2012) in their study on managing ICT Waste: The Case of Delta State University Abraka, Nigeria, established the fact that there is inadequate management of Information and Communication Technology waste in Nigeria, Nigeria Universities and Delta State University, Abraka in particular. This was attributed to lack awareness and policy on ICT waste management and some other contributory factors. It also revealed that Nigeria is fast becoming a dump site for e-waste from all over the world which exposes the environment and the citizenry to grave health hazards and environmental degradation. Adediran & Abdulkarim, (2011) examine the issues of e-waste sources, inherent dangers and its management. Terada, (2012) discussed on recycling electronic wastes in Nigeria and the effects on Environmental and Human Rights, stressing the need for the ratification of the Basel convention by US and that other related regulatory bodies should rise up to their duties.

Cases of lack of computer recycling facilities, young boys scavenging for value components, black smoke hang over Nigerian's dumps is the scenario found in Nigeria. Furthermore Nigeria has had a situation where 3800 tones of e-waste material were imported into the country in 1988 through a bribery of the Nigerian port officials (Ford, 2009& Carney, 2006). The cost of the clean up was said to be 1 million dollars stemming from the fact that there are no effective management system in place. The Standard Organization of Nigeria and the Registration Council of Nigeria has not effectively controlled e-waste trade in Nigeria (Terada, 2012).

The incessant continued trans-boundary operations on e-waste from UK, US, and other countries is the absence of sound environmental management. Nigeria on the national level lacks a legal instrument that regulates the import of e-waste into Nigeria and to implements the Basel Convention into law according to (Terada, 2012). A proposed electronic waste Bill, which would ban the importation and illegal trafficking of electronic and electrical waste from developed countries to Nigeria, is being considered by the Nigerian legislature. Tougher regulations to ensure effective environmental governance through compliance monitoring and law enforcement by Nigeria are the National Environmental standards and Regulations Enforcement Agency (NESREA) is being looked into.

NESREA is saddled with the responsibility of coordinating the national implementation of the Toxic Waste Dump Watch programme, which monitored and prevented the illegal dumping of hazardous wastes in Nigeria (Aginam, 2010).

Terada (2012) pointed out that NESREA has in collaboration with the Consumer Protection Council (CPC) and the Standards Organization of Nigeria (SON) signed a Memorandum of Understanding (MOU) with the Alba International Market Amalgamated Traders Association (AIMATA) to help investigate case of illegal e-waste dumping in Nigeria. NESREA could be taking a step in the right direction, although it remains to be seen whether or not its initiatives will take flight and effect change in an established, unregulated black market (Terada, 2012).

Nigeria needs to create effective legislation that would be strictly enforced and ratify the Bamako Convention, by finding ways to handle the illegal movement of e-waste into its ports from overseas and to shut down the black markets.

2.1 Policies, legislation and best practice in Nigeria regarding e-waste

The e-waste trade has continued to flow into Nigeria even though Nigeria is a party to the Basel convention which was signed in the Bamako convention in February 2008, but is yet to ratify the Bamako convention. The Bamako convention made the trade of hazardous e-waste illegal in sub-Saharan African countries. *'It is estimated that 500 containers of second-hand electronics are imported to Nigeria every month from Europe with each container holding 500 computers'*. About three-quarters of these imported products are junk that cannot be reused and are dumped in landfill (Terada 2012). Without comprehensive legislation

and enforcement protocols on both ends of the trade route, the e-waste will continue to flourish. Nigeria has remained a dumping ground for e-waste from European and Asian markets because of lack of ratification of Bamako convention although the Basel convention was ratified May 24, 2004. The Africa Institute is also involved in a number of regional and national projects such as national projects on hazardous industries waste for Nigeria, Tanzania and Mauritius (Terada 2012).

3.0 University of Jos

University of Jos was founded in November 1971 and was granted autonomy in 1979. It had an intake of undergraduate students of 575 in 1975 and 37 postgraduate in 1977/78. The total enrolment of student population stood at 20,111 fulltime, 2001 Post graduate students and 15,032 part time students at the end of 2010/2011 academic session. Teaching and research are done using a mixture of traditional and electronic learning systems. The academic curricular runs along 8 faculties and four centers (University of Jos, 2011). It has a total record of 2828 ICT equipments in good condition, 453 bad ones and a total of 31 broken down items plus one new one as at 2012 count (University of Jos, 2012). As time goes on the number of these ICT items will grow, taking cognizance of the alarming intake of university students and the new evolving system of e-learning in the Nigerian Universities. Individual and personal ICT equipments of the university community will also amount to a higher number of available e-waste in the academic environment. This therefore calls for necessary intervention on e-waste management in academic institutions.

3.1 E-Waste policy for Academic institutions

E-waste policy for all academic institutions cannot be over emphasized. Egwali & Ekong, (2012) in their study pointed out the need for development of policies that would address awareness issues on e-waste disposals. University of Jos in its present stage only has a draft ICT policy and should include e-waste management as part the policy.

Notwithstanding an institutional e-waste policy must be supported from all levels within the institution, which should include the following.

1. A definition of e-waste i.e. the non-operational/ operational, technical obsolesce, age, asset value.
2. Understand and define what computing equipment the institution is going to manage in terms of e- waste.
3. A tracking system availability to track the end of life of the e-waste leaving the institution, stating from where the waste goes and where the duty of care ends. Where all the disposed computer scraps go to and the amount of electronic waste deposited in the general waste.
4. There should also be knowledge of how much e-waste is generated in the institution and the area they come from which will help to proffer practical solutions and the impact change.
5. Knowing of waste stream associated with full financial cost of replacement, refurbishment, disposal and IT support to be used as alternative disposal solutions to evaluate any responses to lenders and bench marks.
6. Legal responsibilities and regulations must be known at the state and federal level for any hazardous waste and its movement.
7. Persons responsible for waste/ resource management and should know their responsibilities with adequate knowledge and training to deal with electronic waste issues.

8. The Institution must be up to date with current regulation and best practices. Standards such as IEEE 1680 should be employed to deal with e-waste under the following; material selection, design for end of life, environmentally sensitive materials, end of life, management, Product longevity and life- cycle extension, packaging and corporate performance (Griffith University n.d).

4. Recommendations

Stakeholders in e-waste management in academic institutions: A case for University of Jos

Each individual who uses electronics is a stakeholder (Ethics and Electronic Recycling part 2) Solving the E-waste Problem (StEP) therefore encourages the collaboration of all stakeholders connected with e-waste, emphasizing a holistic, scientific yet applicable approach to the problem. University of Jos at this stage has not put in place any strategy for effective collaboration for these stakeholders for the effective management of e-waste. These wastes are only transferred from the various departments and dumped at the physical facilities department for resell to the resellers. Most times the ICT staff from the ICT directorate cannibalizes the Central Processing Unit (CPU) to remove useful parts for repairs of broken down computers.

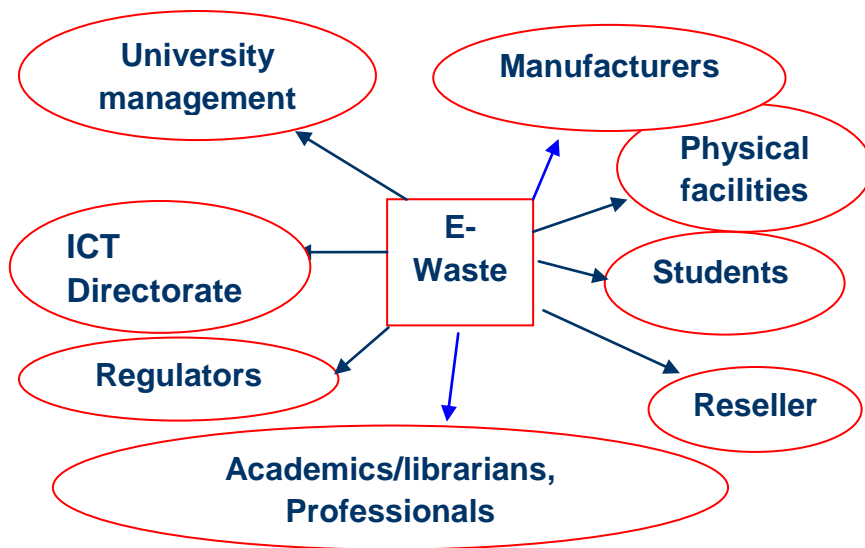


Diagram 1: Stakeholders in e-waste management (adopted from Adediran Y.A & Abdulkarim,A 2011).

1. University Management: Approves the policy.
2. ICT directorate: Draft the policy for approval.
3. Regulators: ensures that waste is dispose in accordance to rules and regulations of e-waste management in the state and country.
4. Academic/Librarians, professional: Assist in educating and advocating for all stakeholders
5. Resellers: ensure proper handling of disposed items and resell.
6. Students: Must be aware of e-waste effects, efficient use and handling of ICT equipment to increase its life span.
7. Physical Facilities: Should ensure proper storage, resell and disposal.

8. Manufacturer: Ensure quality production of ICT equipments to last for a longer time.

Information is a life wire of development, where there is information there is understanding and wisdom in management of e-waste. Academic institutions should put in place policies to handle e-waste management in collaboration with the Nigerian government and the States. This will place them on better grounds to enforce the laws in the country and to avert any health hazard for its citizens. Librarians and other professional can be good advocates to this cause.

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