

# E-WASTE POLLUTION IN AFRICA AND THE URGENT NEED FOR APPROPRIATE RESPONSE

Onyenekenwa Cyprian Eneh (Ph.D.)<sup>\*1</sup> and Prof. Ndowa Ekoate S. Lale<sup>2</sup>

<sup>1</sup> Institute for Development Studies, Enugu Campus, University of Nigeria, Nsukka

<sup>2</sup> Prof. of Crop Science and Vice-Chancellor, University of Port Harcourt, Choba, Rivers State, Nigeria

\* Author for correspondence, Mobile: +234-803-338-7472, Email: [onyenekenwa.eneh@unn.edu.ng](mailto:onyenekenwa.eneh@unn.edu.ng)

## ABSTRACT

*Increasing ICT adoption leads to rocketing acquisition of ICT facilities which results in rapid e-waste generation and attendant environmental pollution and health hazards. The study gathered that the volume of e-wastes being generated grossly outweighs the existing capacity to manage it in an environmentally sustainable way. Uncontrolled burning, disassembly, and disposal of e-wastes cause a variety of environmental problems, such as ground water contamination, atmospheric pollution, and water pollution either by immediate discharge or due to surface run-off. Bonfire refuse of e-wastes are discarded into drainage ditches or water ways feeding the ocean or local water supplies. This does not only contaminate water bodies, but also results in blockage of drainages, leading to flooding that destroys fauna and flora, lives and properties, and causes health hazards, deterioration of health quality, air and noise pollution, diseases and economic wastes. The situation necessitates the need for urgent and appropriate response to bring about efficient management and control of e-waste for sustainable African environment.*

## INTRODUCTION

The information communications technology (ICT), which encompasses all communications devices and applications, drives the 21<sup>st</sup> century globalizing economy [1]. The infusion of computer into human activity, plus advances in the telecommunications arena, especially digitization, characterizes the information revolution, which has transformed the world into a global, knowledge-based society, referred to as the information society [2].

The developing countries, known for information poverty or as the “information-haves-not”, are in a hurry to adopt ICT in the bid to bridge the information gap and the resultant marginalization in the global market system. Indiscriminate adoption and usage of ICT informs the rising consumption of ICT in developing countries [3-9]. The 2006 global e-readiness rankings of some African countries positioned South Africa

35<sup>th</sup>, Egypt 55<sup>th</sup>, Nigeria 60<sup>th</sup> and Algeria 63<sup>rd</sup>. This confirms a wake-up to the broadband race [10].

Side-by-side with rocketing acquisition of ICT facilities, e-waste is being generated (sometimes by as much as 500%). According to Rogers [11] and Carr [12], the reason for high rate of generation of e-wastes include the faster rate of adoption of ICT, compared with the previous technology innovations. Responsible for the higher rate are (a) more available critical mass of adopters who convince the mainstream teachers of the technology’s efficacy; (b) more regular and frequent use of ICT; and (c) different ways and purposes to which ICT is applied as part of a dynamic process that may involve change, modification and reinvention by individual adopters.

Another reason for the explosive rate of e-waste generation in developing

countries is very high level of poverty of citizens, who can only afford the cheap, inferior and second-hand ICT facilities. Virtually all the used ICT components that escape recycling and incineration in the developed countries find their way to sub-Saharan Africa (SSA) [13].

Aside these reasons, the developed countries take advantage of weak regulation in developing countries to dump outright e-wastes or fairly used or near-end-of-life ICT products in developing countries. Forge [14] reported that e-waste is routinely exported by developed countries to developing ones, often in violation of international law. Inspections of 18 European seaports in 2005 found as much as 47% of illegal waste, including e-waste, destined for export. In the U.K. alone, at least 23,000 metric tons of undeclared or 'grey' market e-waste was illegally shipped in 2003 to Asia (China and India) and also to Africa. In the USA, it is estimated that 50-80% of the waste collected for recycling is being exported in this way. In 1987, about 3,880 metric tons of toxic and hazardous wastes of Italian origin were transported in five shiploads and dumped in Koko, Delta State, Nigeria by a foreign firm in collusion with Nigerian businessmen [15].

To make the matter worse, rapid technology change, low initial cost, and planned obsolescence have resulted in a fast growing problem of increasing e-waste generation. ICT products manufacture is designed to increasingly reduce the life-cycle of the products. They come as new software, which render older models/versions obsolete, with the new models creating problems of incompatibility with old ones. In most cases, the service parts of the old models are no longer in stock, thus systematically discouraging the usage of even functional products and encouraging the throw-away mentality of Africans with the attendant hazards on the environment. This also causes economic

waste on the largely economically challenged African population.

About 50 million tonnes of e-wastes are generated worldwide each year. Increasing at a rate of 3-5% per year (faster than any other category of waste), the global volume of e-wastes produced annually is soon expected to double [16].

The volume of e-wastes being generated grossly outweighs the existing capacity to manage it in an environmentally sustainable way [17]. The developing countries in Africa lack the waste management culture and infrastructure to manage e-wastes in a manner that is environmentally sustainable, more so as developing countries are technologically backward and lack the capacity. In most cases, e-wastes are treated and/or discarded improperly, posing a serious environmental and health danger. In most developing countries, the waste management authorities dump the wastes in open fields near residences without any form of cover, and at best incinerate them. In some cases, they are used to fill construction pits. This appears to be economical and convenient in the short run, but it poses serious health and environmental danger in the long run, both on the people and the environment because, toxic chemicals in electronic products can leach into the land over time or are released in the atmosphere, impacting nearby communities and the environment. In developing countries, e-wastes containing plastics are commonly littered in collection points for days before they are actually collected. Plastics in electronics easily leach off in hot weather, especially when left outside. The record levels were 93 times higher than in soil without contact with e-wastes.

The uncontrolled burning, disassembly, and disposal of e-wastes can cause a variety of environmental problems, such as ground water contamination,

atmospheric pollution, and water pollution either by immediate discharge or due to surface run-off (especially near coastal areas) [18]. Tossing e-waste equipment into an open fire in order to melt plastics and to burn away invaluable metals, are harmful and wasteful. The process of burning e-waste releases carcinogens and neurotoxins into the air, contributing to acrid, lingering smog. These noxious fumes include dioxin and furans. In Nigeria, for instance, bonfire refuse and other e-wastes are disposed of into drainage ditches or water ways feeding the ocean or local water supplies. This does not only contaminate water bodies, but also results in blockage of drainages, leading to flooding, destruction of lives and properties within flooded areas, causing diseases and economic wastes [19]. Industrial activities, lead to pollution of water resources, destruction of fauna and flora, health hazards and deterioration of health quality, air and noise pollution, as well as destruction of traditional economic infrastructure within communities [20].

Stream pollution endangers local sources of water supply. The problems associated with inadequate water resources in Nigeria threaten to place the health of about 40 million people at risk and would cost in excess of 10 billion US Dollars a year to correct, if ground and surface water contamination goes unchecked [21].

While legislations are used in the developed countries to control this manner of disposal, the developing countries are considered weak at such and particularly lack the capacity for such enforcement, as even some multinationals that contribute to the environmental degradation are more powerful than the government of some African countries.

With growing African population, growing adoption of the ICT culture and the attendant escalation of the quantity of waste electrical electronic equipment (WEEE) will

further heighten the danger posed by e-wastes on African environment. Already, mountains of these wastes are spotted in major ICT trading centres in African cities, e.g. the Computer Village in Lagos, Nigeria. Besides, almost all households and most offices in Nigeria still harbour outdated and unserviceable ICT products, such as gramophones, analogue telephone sets, wall clocks, wrist watches, radio sets, cassette player sets, and cartridge player sets. Others are grinders, micro-wave, video player sets, compact disk (CD) sets, digital versatile disc or digital video disc (DVD) sets, black and white television sets, and turn-table sets. Yet others are mobile phones, computers and the accessories, cameras, refrigerators, freezers, hair driers, washing machines, pressing irons, shavers, toys and more.

In support of this identified threat and the need for planned appropriate response, the United Nations Environmental Programme (UNEP) forecasts rocketing sales of cell phones, gadgets, and appliances over the next 10 years in developing countries and the urgent need to prepare the countries for surge in e-wastes. UNEP predicts that by year 2020, e-waste from old computers would have jumped by 200%-400% from year 2007 levels in South Africa and China, and by 500% in India. By the same year, e-waste from discarded mobile phones will be about 7 times higher than year 2007 levels in China, and 18 times higher in India. Again, e-waste from televisions will be 1.5 to 2 times higher in China and India, while e-waste from discarded refrigerators will double or triple in India. China already produces about 2.3 million tons (2010 estimate) domestically, second only to the United States of America with about 3 million tones. And, despite having banned e-waste imports, China remains a major e-waste dumping ground for developed countries. Moreover, most e-waste in China is improperly handled, much

of it being incinerated by backyard recyclers to recover valuable metals, like gold – practices that release steady plumes of far-reaching toxic pollution and yield very low metal recovery rates compared to state-of-the-art industrial facilities [22].

With the waste from electronic products growing exponentially in developing countries, sometimes by as much as 500%, UNEP on 22 February 2010 advocated proper e-waste collection and recycling to key recovering valuable materials, in order to protect health and build new green economy. It warns that

unless action is stepped up to properly collect and recycle e-waste materials, many developing countries face the serious consequences for the environment and public health.

The adverse health effects associated with pollution related to hazardous chemical components of e-waste materials is a negation of sustainable development, which ICT use aims to promote. There is the need to protect health and build new green economy against the serious danger to the environment and public health posed by e-waste pollution in Africa.

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