

Chapter 4

E–Waste Dilemma: Unravelling the Health and Equity Issues

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ABSTRACT

The proliferation of electronic devices in today's digital age, while ushering in technological advancements, has given rise to a pressing global issue: the exponential accumulation of electronic waste (e-waste). Not only is this a grave environmental concern, but its ramifications also spill over into health and equity domains. Delving into the social dimensions of e-waste, this chapter seeks to spotlight the pressing health risks associated with improper e-waste management and the equity concerns inherent in its production, disposal, and recycling. Drawing from various studies, the chapter posits that addressing the e-waste conundrum requires a multi-pronged approach, emphasizing the importance of global collaboration, regulatory frameworks, public awareness, and technological interventions.

1. INTRODUCTION

The rise of the digital age, underpinned by rapid technological advancements and innovations, has catalyzed the proliferation of electronic devices across the globe. With this boom, however, has come an unintended consequence: electronic waste, more commonly termed as e-waste. This mounting crisis, often shadowed by other pressing environmental issues, carries with it profound implications that ripple across ecological, socio-economic, and health spheres.

1.1 Historical Overview

The genesis of the e-waste problem can be traced back to the mid-20th century, when the first wave of electronic consumer goods began permeating households. Radios, televisions, and eventually personal

DOI: 10.4018/979-8-3693-1018-2.ch004

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computers became symbols of modernity and progress (Wilson, J., 2009). As manufacturers produced more advanced, compact, and affordable versions of these devices, the lifespan of electronic goods started to diminish. The trend towards built-in obsolescence, spurred by rapid innovations and the consumer's desire for the latest technology, amplified the volume of discarded devices (Kang, H., & Schoenung, J. M., 2005).

1.2 Defining E-Waste

At its core, e-waste encompasses a vast array of discarded electronic devices. This includes, but is not limited to, computers, smartphones, televisions, refrigerators, and even toys embedded with electronic components. Notably, these discarded electronics are a potent mix of materials – some valuable like gold and copper, and others hazardous like mercury and lead (Kiddee, P., Naidu, R., & Wong, M. H., 2013).

1.3 The Global Scale of the Issue

The sheer volume of e-waste generated worldwide is staggering. As of 2020, it was estimated that 53.6 million metric tons of e-waste was generated, with only a fraction being appropriately recycled (Baldé, C. P., Forti, V., & Kuehr, R., 2020). This global discrepancy in e-waste generation and its management creates hotspots, particularly in countries with lax regulations and oversight.

1.4 Environmental Ramifications

The environmental impacts of improperly managed e-waste are multifaceted. Landfills brimming with discarded electronics leach toxic substances into the soil and groundwater, resulting in long-term contamination. Moreover, informal e-waste recycling hubs, particularly prevalent in parts of Asia and Africa, employ rudimentary methods such as open burning. This releases toxic fumes laden with dioxins, furans, and heavy metal particulates into the atmosphere, which not only degrades air quality but also exacerbates the greenhouse effect (Chan, J. K., & Wong, M. H., 2013).

1.5 Socio-economic and Health Dimensions

Beyond environmental concerns, the e-waste conundrum has grave socio-economic implications. Informal recycling sectors, often devoid of health and safety standards, employ marginalized communities, including children. These workers, in their bid to extract valuable metals, are exposed to a cocktail of hazardous chemicals, leading to an array of health issues ranging from skin and respiratory ailments to more severe conditions like neurotoxicity and carcinogenic effects (Grant, K., Goldizen, F. C., Sly, P. D., et al., 2013).

Moreover, the e-waste trade has economic ramifications. While it provides a source of income for many in the informal sector, the externalized health and environmental costs far outweigh the immediate economic benefits. Furthermore, the shipment of e-waste from developed to developing countries under the guise of “second-hand goods” further complicates the issue, creating a disparity in e-waste responsibilities (Widmer, R., Oswald-Krapf, H., Sinha-Khetriwal, D., Schnellmann, M., & Böni, H., 2005).

As the curtain rises on the e-waste narrative, it's evident that the issue is not just about discarded electronics. It's a tale of rapid technological progression, societal consumption patterns, environmental

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