Chapter 2
Advancing E-Waste Management:
Integrative Methods and Practices

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ABSTRACT

This chapter focuses on the strategies regarding e-waste management involving the use of technology, policy, and community intervention for reduction of environmen-

DOI: 10.4018/979-8-3693-7383-5.ch002

tal and health effects, as well. Taking insights in state-of-art recycling approaches, policies including EPR and engaging the public, the authors discuss ways to enhance collection, resource recovery, and pollution. Examples suggest that respective policy and advanced technologies result in better rates of recyclability and decreased emissions. Some major highlights reveal efficiency improvement in the context of using AI in sorting programs and cuts in emissions with circular economy strategies. The third section discusses future trends such as online tracking of e-waste using blockchain and sustainable design. They provide practical information about how to design an e-waste framework that is both sustainable in the long run and capable of being reproduced across the globe.

INTRODUCTION

Electronic scrap, or e-scraps, is one of the most rapidly accruing waste fractions all over the world due to increasing technological development, shrinking life spans of commodities and consumer demand for electronic products. This waste consists of numerous end-of-life products – small appliances and tools, abandoned industrial machinery and much more. Lots of electronic equipment contain one or more precious metals such as gold, silver and copper alongside hazardous substances like lead, mercury and cadmium if not disposed off correctly (Johnson, L., & Roberts, P. 2019). Thus, toxic components can pollute soil and water, and, in regions with increased informal recycling, negatively affect people's health and the environment.

It is noteworthy, that all consequences of e-waste fulfil their missions not only on a local level but also exert influence on all environmental spheres throughout the world. For example, recycling informal sector in developing countries discharges toxic fumes of gases into the air, which affects air quality and health of communities living close to initiation sites (Chen, Y., & Wang, X. 2020). Moreover, lead in efficient segregated processing of e-waste which is a cause a loss of the value of raw materials which need to be reclaimed. In this regard, the management of e-waste is a topical issue that is in integration to the sustainable development aims and objectives which include the protection of resources, control of pollution and the health of the public. This chapter examines the multi-approach strategies in e-waste management, including technology, policy and society strategies in this way (Ahmed, S., & Kumar, R. 2018). With these dimensions in mind, it seeks to offer a broader and more environmentally friendly outlook to the problem of e-waste management, together with its negative impact on society.