

Chapter 9

E–Waste Reduction Methods in Sustainable Ways

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ABSTRACT

The problem of e-waste generation is increasing day by day in India and worldwide. This rise in e-waste poses damage to public health and the environment as a whole. Toxic substances and poor disposal of e-waste significantly affects plant and animal lives. When it comes to e-waste generation, India is the fastest growing country when it comes to electronics use. Various policy measures and initiatives have been introduced over the past decades in India related to e-waste management. It is still a source of distress and unsolved matter. Sustainable development needs a lot of effort and well-organized e-waste management can be possible only with a systematic waste collection system, accurate estimations, and early forecasting. This chapter presents existing e-waste scenarios in India that are posing significant challenges to meet sustainable development goals and highlights some of the sustainable ways to reduce e-waste. This chapter serves as a basis for awareness and knowledge about the potential harms of e-waste to human health and the environment to promote sustainability.

INTRODUCTION

The “electrical or electronic equipment (EEE)” turns “Waste electrical or electronic equipment (WEEE)” when it is thrown or discarded inappropriately or without any recycling approach (Borthakur & Singh, 2012). There has been a steep rise in demand and manufacturing of electronics items due to the huge consumption pattern (Borthakur & Singh, 2012). Hence, it becomes important to promote sustainable consumption of those goods. It goes without saying that e-waste consists of toxic elements which may pose an ill effect on both environment and public health (Chandra, 2015). It becomes vital to avoid the unwanted use of EEE to make lives easier for current and next generations and protect the planet as a whole.

There is a need to switch to the modern approach of a circular economy from a typical linear economy in order to protect the environment (Stefansdotter et al., 2016). In a linear economy, a product is produced and thrown away after its final use. In a circular economy, once a product is used, it is recycled. There are significant economic benefits of a circular economy for electrical and electronic industries. It is possible to reduce consumer cost by 7% to 14% by 2030 and 2040, respectively, with a circular business model (Morlet, 2018). It is also seen that non-functional items are wrongly classified as “used items” and sent to third world countries of Asia and Africa with a license to export surplus items for refurbishment or reuse (Ananno et al., 2021).

There is a need to implement 4 Rs of recycling – (1) Reuse – Reusing items to maximum possible extent; (2) Reduce – Cutting down waste by avoiding excessive use of equipment; (3) Recycle – New products can be made of e-waste; and (4) Recovery – Valuable resources can be restored from e-waste (Stone, 2020). With technological advancements and changing scenarios, recovery is very important. There are three design-specific principles which reportedly serve as a basis of the circular economy - (1) Circulation of supplies and goods at highest value; (2) Reducing waste to control pollution; and (3) Recovery (Morlet, 2018).

Because of constant technological improvements and upgrades, new and latest devices and electronics have become the center of attraction for young consumers. This urge of being relevant to latest technological advancements and social validation is creating a mountain of e-waste. The 4Rs are much needed to reduce the impact of e-waste and manage the same to save the environment. Proper e-waste reuse and recycling can save the environment by keeping a lot of valuable metals like Gold, Silver, Cerium, Gadolinium, and Palladium into landfill as they can be reused for making other electronic items (Sethurajan et al., 2019; Anand, 2022).

If everyone switches to energy-saving lights, it is possible to save up to US\$120 billion every year and it can take the natural resources of over 3 planets to maintain the existing lifestyle of 9.6 billion people on earth by 2050 (UNEP, 2022). There is a 38% rise in e-waste from 2010 to 2019, according to Goal-12 of “Sustainable Development Goals (SDG) Report 2020”, which titles “sustainable consumption and production patterns” (Guterres, 2020). It is among the most important reasons to look closely at sustainable development goals for governments in both developing and developed countries (CPCB, 2021). However, sustainability is more than the responsibility of any organization or the government as everyone should play their role in adopting sustainable activities in daily life.

Every year, the “weight of e-waste generated every year in the world is similar to the weight of five thousand Eiffel Towers (Parajuly et al., 2019). In 2019-20 alone, 1,014,961 tons of e-waste will be generated in India, i.e., 32% more than the amount of e-waste generated in 2018-19. In 2018 and 2019, only 3.6 percent and 10 percent of wastes were collected, respectively (CPCB, 2021). These numbers are so

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