**Group III**

**Task 5**

E-waste, or electronic waste, refers to discarded electrical or electronic devices. It includes a wide range of products such as computers, televisions, smartphones, refrigerators, and other household appliances that have reached the end of their useful life. The key points about e-waste are E-waste is the fastest-growing waste stream in the world, with over 44 million metric tons generated annually. Common e-waste items include small and large household appliances (60% of e-waste), as well as IT equipment and consumer electronics like smartphones and computers. Improper disposal and recycling of e-waste can lead to environmental degradation, pollution, and health risks for workers handling the waste. Proper recycling and disposal of e-waste is important to recover valuable materials and prevent environmental and health hazards. In many countries, it is illegal to simply throw away electronics and they must be properly recycled.

**Ill-effects of e-waste:**

E-waste, or discarded electrical and electronic devices, poses several significant issues and environmental concerns:

1. E-waste contains hazardous materials like lead, mercury, cadmium, chromium, and flame retardants that can accumulate in the environment and enter the food chain, posing risks to human health and ecosystems.
2. Soil and Water Contamination
3. Air Pollution: Burning e-waste releases toxic fumes and particulates into the air.
4. Health Risks: Toxic substances from e-waste have been linked to various health issues like cancer, neurological disorders, reproductive problems, and skin irritation.
5. Accelerated Climate Change: E-waste contributes to climate change through greenhouse gas emissions during improper disposal and inefficient recycling processes.
6. Resource Depletion
7. Illegal Trade and Dumping: Much of the world's e-waste is illegally exported to developing countries in Asia and Africa where it is often dumped or recycled using unsafe methods, exacerbating environmental and health risks.

**e-Waste management:**

e-waste management is a key issue that need to be addressed immediately. Proper e-waste collection system is very key step in this process for effective waste management, and every step after collection of e-waste is crucial till the waste is recycled effectively.

**Economy of e-Waste management:**

E-waste extraction. While most of the discussion concerning solutions centers around reducing the

hazards of, and the volume of, e-waste, another concerns the extraction of valuable metals, minerals,

and other substances from the e-waste. Often categorized under the term “urban mining” the recovery

or extraction of materials can yield valuable resources from e-waste. The e-waste generated in just

one year, 2019, can yield as much as 57 billion dollars of secondary raw materials (Forti et al., 2020).

These include rare earth metals (REMs) such as gold, silver, and copper, and various other materials

which are valuable, and can also be useful in manufacturing and production of various goods. While

the extraction of these valuable resources is a positive, there are also issues with removing them

from several types of e-waste, and whether the extraction and removal is worthwhile with regard to

return vs. the costs and efforts involved in the extraction process (Dutta et al., 2023; Chakraborty et

al., 2022; Islam et. al, 2020).

Bioleaching is a method which has received more attention recently, since it denotes a means for

recovering both valuable (and toxic) metals and mineral resources from e-waste, using microorganisms,

which shows promise of being an effective alternative for resource recovery

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**Retraction of metals**: E-waste contains valuable materials like gold, silver, copper, and iron worth an estimated $91 billion globally. In 2022, the value of secondary raw materials reclaimed through urban mining was $28 billion. Proper recycling can recover over 100 times more gold from mobile phones than mining gold ore.

**EPR(extended producer/manufacturer responsibility):** EPR states that producers also hold responsibility for disposal of the manufactured goods. By this, the manufacturer’s responsibility is also an extended economy for the recycling units.

**Incentivizing e-Waste management**: Governments should encourage e-Waste management by incentivizing e-waste recycling units, that encourages the manufacturers and customers and even lead to a new industry for e-waste management.

Several countries go for black market to dispose their e-waste in developing countries. Thus e-waste management can be a new industry, e-waste along with incentives for recycling can be received by the industry, also the by products of recycled waste i.e. precious metals can be sold in the market