DELHI SCHOOL OF ARTIFICIAL INTELLIGENCE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

EDUCATION Ai

Sustainable consumption & production patterns

AI for Responsible Consumption and Production

Data availability for SDG 12 is notably limited, with only 32% of data availability, posing challenges in tracking progress towards the targets. Currently, only 4 out of the 11 targets are deemed to be on track, underscoring the critical nature of the situation.

This is critical since SDG 12 is a direct enabler of various other SDGs such as SDG 13 - Climate Action, and could thus make it more challenging to reach those goals.

AI plays a crucial role in supporting the green transition as shown by the list of various AI UN use cases for SDG 12: 8 use cases out of 40 in AI for Good: Innovate for Impact and approximately 50 use cases out of 408 in the UN Activities on AI.

AI can support SDG 12 in process optimization and driving circularity in organizations. For example, AI can be used for environmental data monitoring and optimization related to energy use, waste generation, GHG emissions, logistics, and other environmental data. This monitoring can help companies make data-driven decisions that incorporate environmental considerations, thereby reducing their overall environmental impact. This also extends to individuals who now have access to improved data on the products they buy, and can nudge behaviors towards more sustainable options, forcing companies to adapt in turn. In the fashion sector, for instance, AI can be used to provide personalized recommendations to avoid waste or use predictive analytics to help with forecasting. Furthermore, the proliferation of data can enhance sustainability reporting, fostering collaboration with external stakeholders, attracting investors, and ensuring compliance with environmental regulations. This streamlined approach to data reporting can help advance SDG 12.6 – Corporate Sustainable Practices.

AI however also poses some risks for SDG 12. Specifically, process improvement and optimizing may not necessarily align with positive environmental impact. Increased efficiency could incentivize organizations to produce more thereby using more resources. Moreover, the use of AI in social media and marketing may further drive consumer consumption by making targetted marketing more efficient. However, AI can play a positive role in identifying and mitigating greenwashing claims by raising the disclosure quality of ESG rating scores. However, the substantial resources required for AI implementation can pose challenges in aligning with SDG 12, as shown with SDG 6 and SDG 7.

Key Considerations for Stakeholders

- **Impact assessment:** Aligning AI use case development and incentives with OECD AI principles to maximize sustainable value creation. The objective is to prioritize governmental tools for AI use cases related to the SDGs.
- **Technology improvement:** Reducing energy consumption is imperative to support the development of SDG 12, hence technologies with less energy requirements should be prioritized.

Impact

AI could act as an (positive) enabler for 82% of the SDG 12 targets and act as an inhibitor (negative) for 27% of the targets.

Use case 1

Providing access to environmental data to end-customers to nudge them into selecting the most sustainable option.

Use case 2

Monitoring environmental data with AI to drive sustainability reporting capacity for organizations.

Use case 3

Using AI to reduce forecasting risks within the supply chain and to minimize waste creation.

Responsible consumption and production

- Countries have made strides in meeting obligations under international environmental agreements on hazardous waste and other chemicals and implementing comprehensive approaches to combat environmental degradation. Patterns of unsustainable consumption and production persist, however. In 2022, global food waste reached 1.05 billion metric tons, yet only 9 of 193 countries included food waste in their nationally determined contributions (NDCs) on climate change actions. The rapid growth of global e-waste remains largely unaddressed, with only 22 per cent collected and managed sustainably.
- While domestic material consumption and material footprints continue to expand, growth rates have slowed. Regional disparities underscore the need for targeted interventions based on varying consumption patterns and environmental impacts.
- Achieving Goal 12 requires fostering circular economy models, sustainable production practices and responsible consumption.

A young man in Ghana burns scrap electrical cables to recover copper after migrating from his village to Accra to engage in e-waste work.

These approaches can take advantage of opportunities at every stage of production to reduce resource and fossil fuel use, drive innovation, conserve energy and mitigate emissions. Progress largely depends on robust regulatory frameworks, financial incentives and public awareness campaigns.

The world wastes 1.05 billion metric tons of food even as hundreds of millions face hunger

In 2021, 13.2 per cent of food produced globally was lost after harvest and during transport, storage, wholesale and processing. An alarming 19 per cent of all food at the retail or consumption stage was wasted in 2022, totalling 1.05 billion metric tons of all food available to consumers. Most food waste occurred in households (60 per cent); each person wasted an average of 79 kilograms annually, more than the weight of the average person.

Globally, an estimated 1 billion meals of edible food are wasted every day, equivalent to 1.3 meals per person impacted by hunger per day, considering that 783 million people faced hunger in 2022.

Data suggest that household food waste varies by just 7 kilograms per capita each year across high-income, upper-middle-income and lowermiddle- income countries. Hotter countries tend to have higher waste per capita, possibly due to increased consumption of fresh food with substantial inedible parts and inadequate refrigeration.

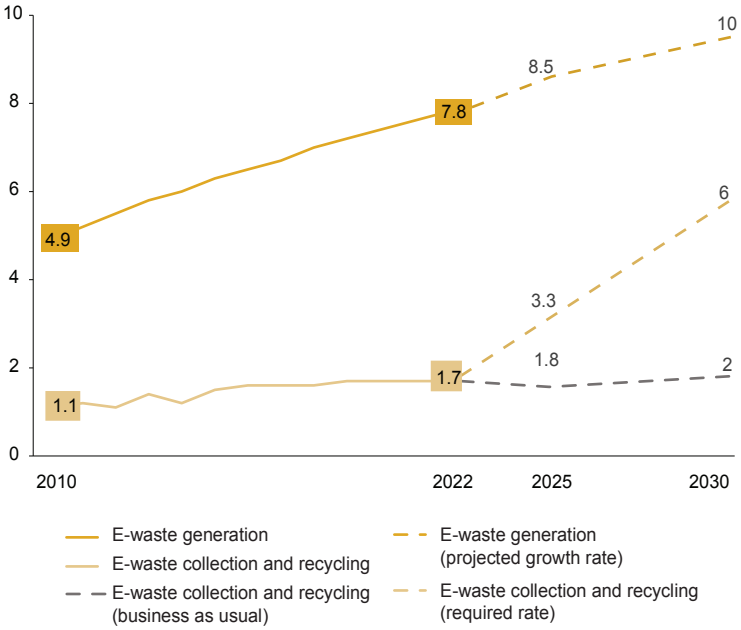
Further, each year, food loss and waste generate 8 to 10 per cent of greenhouse gas emissions, costing over $1 trillion and straining land resources and biodiversity. At the same time, as of 2022, only 9 of 193 countries had included food waste in their NDCs, revealing a significant gap in connecting this issue with climate action and the objective of halving food waste and reducing losses by 2030.

High rates of consumption and insufficient reuse or recycling are producing vast piles of e-waste

Uncontrolled disposal of electronic and electrical equipment fuels vast e-waste stockpiles, exacerbated by rising consumption, short product life cycles and little repair. E-waste generation rose from 6.3 to 7.8 kilograms per capita from 2015 to 2022, reaching a total of 62 million metric tons of e-waste in 2022. Only 1.7 kilograms per capita was collected and managed in an environmentally sound manner. High-income countries achieved collection rates of over 40 per cent, yet most e-waste was inadequately recycled or exported to lower-income countries where management infrastructure is not developed, inadequate or absent. In Central and Southern Asia, Latin America and the Caribbean, and sub-Saharan Africa, collection rates are below 5 per cent. Inappropriate management by the informal sector results in environmental pollution and health hazards for workers and communities.

By 2030, e-waste generation is projected to increase to 10 kilograms per capita per year (or 82 million metric tons in total). If all countries boost their collection rates to 60 per cent, 54 million metric tons of e-waste would be managed in an environmentally sound manner, with 30 million metric tons of metal resources viably recovered. This would also prevent 34,000 kilograms of mercury emissions and 209 million metric tons of CO2-equivalent emissions in 2030.

E-waste generation and environmentally sound e-waste management, 2010–2022 and 2023–2030 projections (kilograms per capita)



Global Youth AI Advisory Body

Delhi School of Artificial Intelligence