

Sustainable Development Goals (SDG)

Waste Indicators

Outline

- Introduction
- SDG indicator 11.6.1
- SDG indicator 12.3.1a
- SDG indicator 12.3.1b
- SDG indicator 12.4.1
- SDG indicator 12.4.2
- SDG indicator 12.5.1
- SDG indicator 14.1.1b
- Data availability

Introduction

Wastes are any materials that are not prime products (i.e., products produced for the market) for which the generator has no further use for purpose of production, transformation, or consumption, and which s/he discards, or intends, or is required to discard.

Within the Sustainable Development Goals, the Goals and indicators addressing waste include:



11.6.1: Municipal Solid Waste Management



14.1.1: Coastal Eutrophication and Plastic Debris Density



12.3.1: Food Loss and Waste
12.4.1: Information Transmitted under Chemicals and Waste Conventions
12.4.2: Hazardous Waste generated and treated
12.5.1: National Recycling Rate

SDG indicator 11.6.1

Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal solid waste generated by cities

Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

The indicator measures the progress of performance of a city's municipal solid waste (MSW) management. It aims at determining the proportion of municipal solid waste regularly collected and treated in a city

It quantifies:

- i. The total MSW generated in the city (tonnes/day)
- ii. The total MSW collected in the city (tonnes/day)
- iii. Proportion of population with access to basic MSW collection services in the city (%)
- iv. The total MSW managed in controlled facilities in the city (tonnes/day)
- v. MSW composition

UN-Habitat is the custodian agency for SDG 11.6.1

Methodology

To calculate SDG indicator 11.6.1, the following formula is used:

$$\text{SDG 11.6.1} = \frac{\text{Total MSW collected and managed in controlled facilities tonnes per day}}{\text{Total MSW generated tonnes per day}} * 100$$

SDG 11.6.1 also provides two important sub-categories with varying policy implications:

$$\text{SDG 11.6.1. category a} = \frac{\text{Total MSW collected (t/day)}}{\text{Total MSW generated (t/day)}} \times 100 (\%)$$

$$\text{SDG 11.6.1. category b} = \frac{\text{Total MSW managed in controlled facilities (t/day)}}{\text{Total MSW generated (t/day)}} \times 100 (\%)$$

UN-Habitat is the custodian agency for SDG 11.6.1

SDG Indicator 12.3.1a

Food loss index

Target: 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

Indicator 12.3.1a aims at measuring the efficient food systems on the supply side and consumption side and ensuring they contribute to food security while ensuring sustainability of natural resources.

(a) Food loss index: measures the changes in food loss over time

Food loss are all crops and livestock human-edible commodity quantities that, directly or indirectly, completely exit the post-harvest/slaughter production/supply chain by being discarded or incinerated or otherwise. Losses occurring during storage, transportation and processing, also of importing quantities, are all included.

FAO is in the custodian agency of indicator 12.3.1a

Methodology

Food loss index (FLI) is computed as a ratio of Food Loss Percentage in the current year against Food Loss Percentages in base year.

$$FLI_{it} = \frac{(FLP_{it})}{FLP_{i0}} = \frac{\sum_j lij_t * qij_0 * pjo}{\sum_j lij_0 * pjo} * 100$$

- FLP_{it} is the average food loss percentage of the country in the current year,
- FLP_{i0} is the average food loss percentage of the country in the base year,
- i = country,
- j = commodity,
- t = year, 0 is the base year
- lij_t is the loss percentage (estimated or observed) of commodity j in country i in year t ,
- qij_0 is the production quantities of commodity j in country i in the base period,
- pjo is the average international price of commodity j (at international \$) in the base period.

FAO is in the custodian agency for indicator 12.3.1a

SDG Indicator 12.3.1b

Food waste index

Target: 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

The indicator aims at measuring the total amount of food that is wasted in tonnes. It helps identify where food is wasted, therefore providing governments, citizens, and the private sector with information that will help reduce food waste.

UNEP is the custodian agency for indicator 12.3.1b

Methodology

Food waste index for year (t) aims at estimating the amount of food in the total waste stream, by using the following formula:

$$\text{Food Waste Index} = \frac{\text{Food waste per capita in year } t}{\text{Food waste per capita in base year}} \times 100$$

With:

$$\text{Food waste per capita} = \frac{\text{Total food waste}}{\text{Population}}$$

$$\text{Total food waste} = FW_{\text{Out of home consumption}} + FW_{\text{Retail}} + FW_{\text{Manufacture}}$$

UNEP is the custodian agency for indicator 12.3.1b

SDG Indicator 12.4.1

Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

The indicator refers to the number of Parties (countries that have ratified, accepted, approved or accessed) Multilateral Environmental Agreements (MEAs), including:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;
- Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade;
- Stockholm Convention on Persistent Organic Pollutants;
- Montreal Protocol on Substances that Deplete the Ozone Layer;
- Minamata Convention on Mercury

The indicator focuses on compliance with the obligations that contribute to the overall target of achieving the environmentally sound management of chemicals and all wastes throughout their life cycle.

Methodology

	Convention	Available Points (ap)	Points per year [p(t)]	Country Score (cs)
a	Basel Convention			$[p(t1)]+[p(t2)]+[p(t3)]+[p(t4)]+[p(t5)]/ap$
b	Rotterdam Convention			
c	Stockholm Convention			
d	Montreal Protocol			
e	Minamata Convention			

$$\text{Transmission Rate} = \frac{a_{cs} + b_{cs} + c_{cs} + d_{cs} + e_{cs}}{N. \text{ of conventions}} * 100$$

Note: p= Points per year
cs= Country score

UNEP is the custodian agency for indicator 12.4.1

SDG Indicator 12.4.2

- (a) Hazardous waste generated per capita; and
- (b) proportion of hazardous waste treated, by type of treatment

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

Hazardous waste is any waste with properties that make it toxic or capable of having a harmful effect on human health or the environment and is regulated and controlled by law.

The indicator aims at determining the hazardous generated, hazardous waste generated by type (including e-waste as a sub-indicator) and the proportion of hazardous waste treated.

Hazardous waste generated refers to the quantity of hazardous waste that is generated within the country during the reported year, prior to any activity such as collection, preparation for reuse, treatment, recovery, including recycling, or export, no matter the destination of this waste.

UNEP and UNSD are the custodian agencies for indicator 12.4.2

Methodology

To determine hazardous waste generated

Hazardous waste generated

= hazardous waste collected through municipal services or private companies

+ hazardous waste given by generator to treatment or disposal facilities

+ estimation of hazardous waste unaccounted for

To determine the proportion of hazardous waste treated

Proportion of hazardous waste treated (%) = (quantity of hazardous waste treated during the reporting year x 100)
/(total quantity of hazardous waste generated during the reporting year)

Note: Hazardous waste treated in the country plus materials exported for treatment minus the materials imported for treatment.

UNEP and UNSD are the custodian agencies for indicator 12.4.2

SDG Indicator 12.5.1

National recycling rate, tons of material recycled

Target 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

National recycling rate is defined as the quantity of material recycled in the country plus quantities exported for recycling out of total waste generated in the country, minus material imported intended for recycling.

UNEP and UNSD are the custodian agencies for indicator 12.5.1

Methodology

$$\text{National recycling rate} = \frac{\text{Material recycled} + \text{material exported for recycling} - \text{material imported for recycling}}{\text{total waste generated}} \times 100$$

UNEP and UNSD are the custodian agencies for indicator 12.5.1

SDG Indicator 14.1.1b

Plastic debris density

Target 14.1 by 2025, prevent and significantly reduce marine pollution of all kinds, from land-based activities, including marine debris and nutrient pollution.

The indicator aims to reduce the impacts of pollution through prevention and reduction of marine pollution of all kinds, in particular from land-based activities, including marine debris.

- Washed onto beaches or shorelines (beach litter)
- Floating on the water or in the water column
- Deposited on the seafloor/seabed
- Ingested by biota (e.g. sea birds).

➤ **Level 1: Proposed global indicators:**

- Plastic patches greater than 10 meters (for Areas Beyond National Jurisdiction or Total Oceans)
- Beach litter originating from national land-based sources

➤ **Level 2: Proposed national indicators:**

- Beach litter (beach surveys)
- Floating plastics (visual observation, manta trawls)
- Water column plastics (demersal trawls)
- Seafloor litter (benthic trawls (e.g. fish survey trawls), divers, video/camera tows, submersibles, remotely operated vehicles)

➤ **Level 3: Supplementary indicators:**

- Beach litter microplastics (beach samples)
- Floating microplastics (manta trawls, e.g. Continuous Plankton Recorder)
- Water column microplastics (demersal plankton trawls)
- Seafloor litter microplastics (sediment samples)
- Plastic ingestion by biota (e.g. birds, turtles, fish)
- Plastic litter in nests
- Entanglement (e.g. marine mammals, birds)
- Plastic pollution potential (based on the use and landfilling of plastics)
- River litter
- Other parameters related to plastic consumption and recycling
- Health indicators (human health and ecosystem health)

Data availability

- **Indicator 11.6.1:** data is available on UNSD SDG Global Database from 2000 to 2018 and it is disaggregated by municipality
- **Indicator 12.3.1a:** one year data 2016 is available and it is aggregated at regional and global level
- **Indicator 12.3.1b:** one year data 2019 is available at national, regional and global level (Food Waste Index Report 2021, UNEP)
- **SDG indicator 12.4.1:** data for this indicator is reported every five years, the first data was reported in 2015 and it covers years from 2010 to 2014. the second year of reporting was 2020 and covers years from 2015 to 2019. Only Minamata has one data point reported in 2020
- **SDG indicator 12.4.2:**
 - Electronic waste: Estimated data on e-waste generated is available from 2000 to 2019 at regional and global level. National data is available for few countries reports electronic waste data to UNSD/UNEP questionnaire, Eurostat and OECD.
 - Hazardous waste: National data is available from 2000 to 2019 on hazardous waste generated, generated per capita and treated by type of treatment. There no sufficient data to aggregate to regional and global

Data availability

➤ **SDG indicator 12.5.1:**

Electronic waste recycled: Estimated data on e-waste recycled is available from 2000 to 2019 at regional and global level. National data is not available.

Municipal waste recycled: National data are available from 2000 to 2019 and the data is collected using UNSD/UNEP questionnaire on Environment Statistics Waste

➤ **SDG indicator 14.1.1b:**

Beach litter per square kilometer: Estimated data is available from 2015 to 2020 and the data is a citizen science data that was collected from Earth Challenge 2020. Ghana was the first country to report this indicator. Work is ongoing on the earth challenge 2021.

References

United Nations Environment Programme (2021). Global Chemicals and Waste Indicator Review Document: <https://wedocs.unep.org/handle/20.500.11822/36753>

UN Environment (2018). Global Manual on Ocean Statistics. Towards a definition of indicator methodologies: <https://wedocs.unep.org/handle/20.500.11822/35086>



Thank you

UN 
environment
programme

5 
1972-2022

Dany Ghafari
Programme Management Officer
Science Division, UNEP
dany.ghafari@un.org

United Nations Avenue, Gigiri
PO Box 30552 – 00100 GPO Nairobi, Kenya

www.unep.org