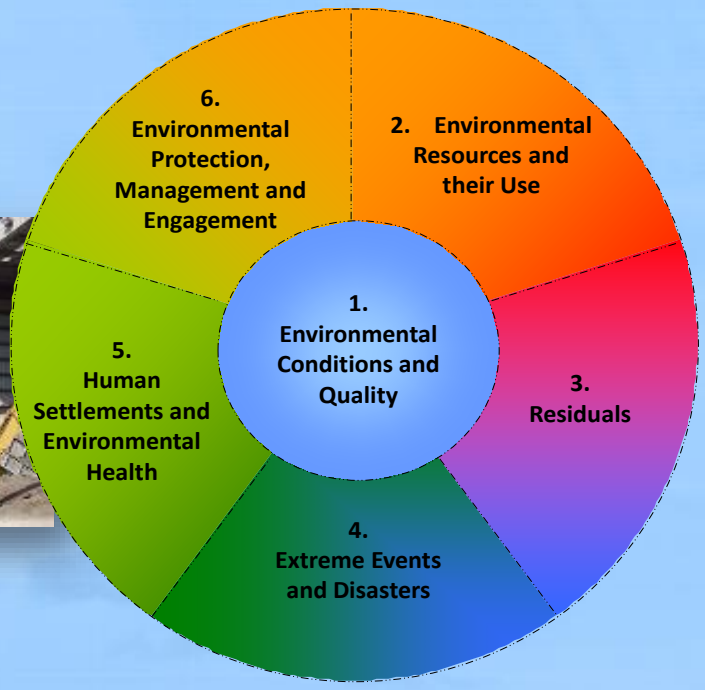
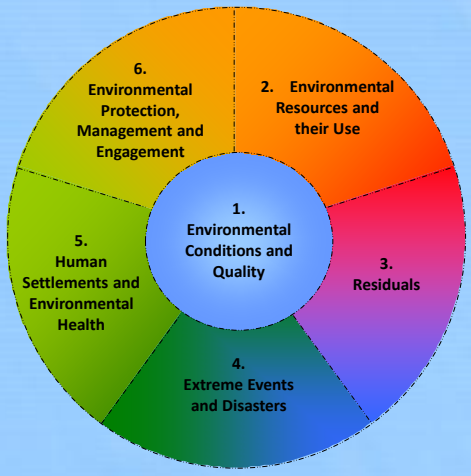
Waste statistics in the Framework for the Development of Environment Statistics

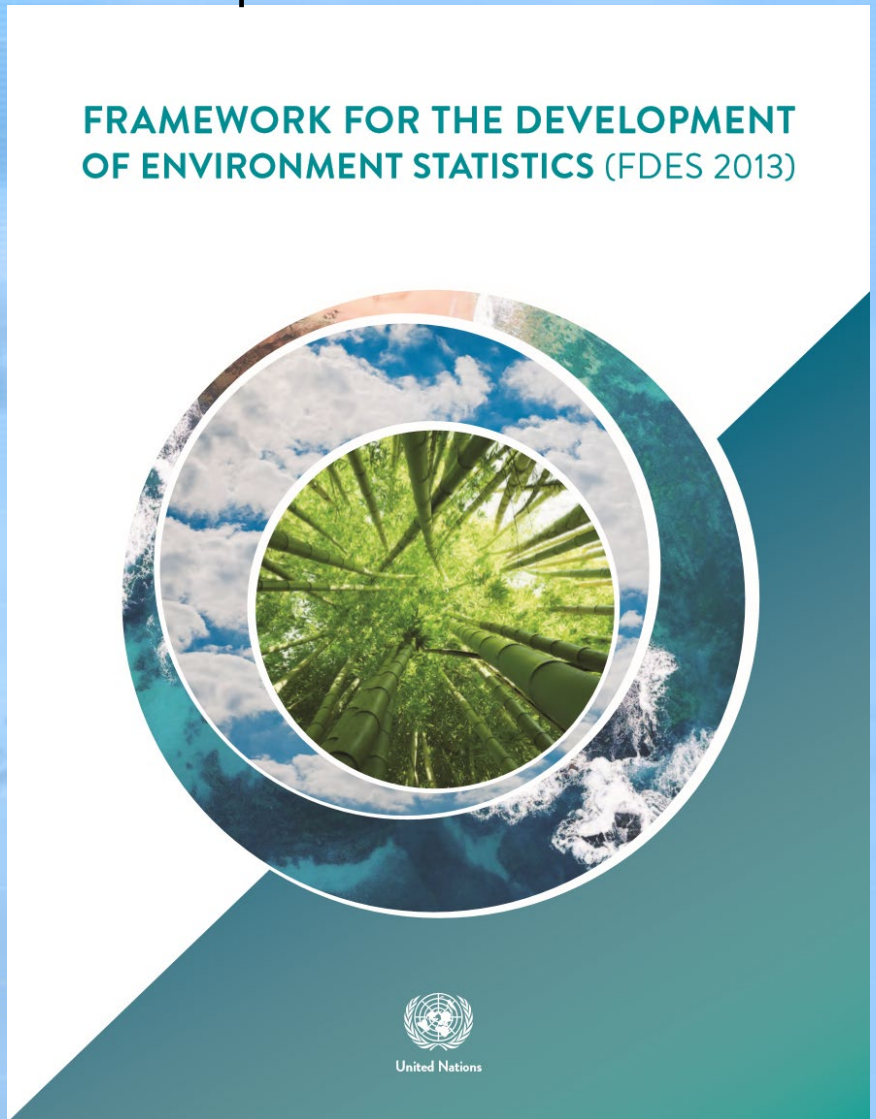


Prepared by the Environment Statistics Section, United Nations Statistics Division
for National Technical Training Workshop on Environment Statistics
Windhoek, Namibia, 3 – 5 December 2019

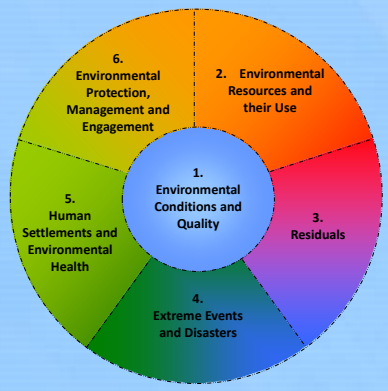
This presentation has been elaborated by the Environment Statistics Section of the United Nations Statistics Division.

It is based on segments of Chapters 3 of the…





Outline…



1. Describe why waste and waste statistics are important
2. Demonstrate demand for waste statistics via two processes at international level (UNSD/UNEP Questionnaire on Environment Statistics; Sustainable Development Goal Agenda).
3. Show how waste statistics feature within the Framework for the Development of Environment Statistics (FDES).
4. Request your participation in a breakout group exercise where you are invited to compile waste-related Sustainable Development Goal indicators.

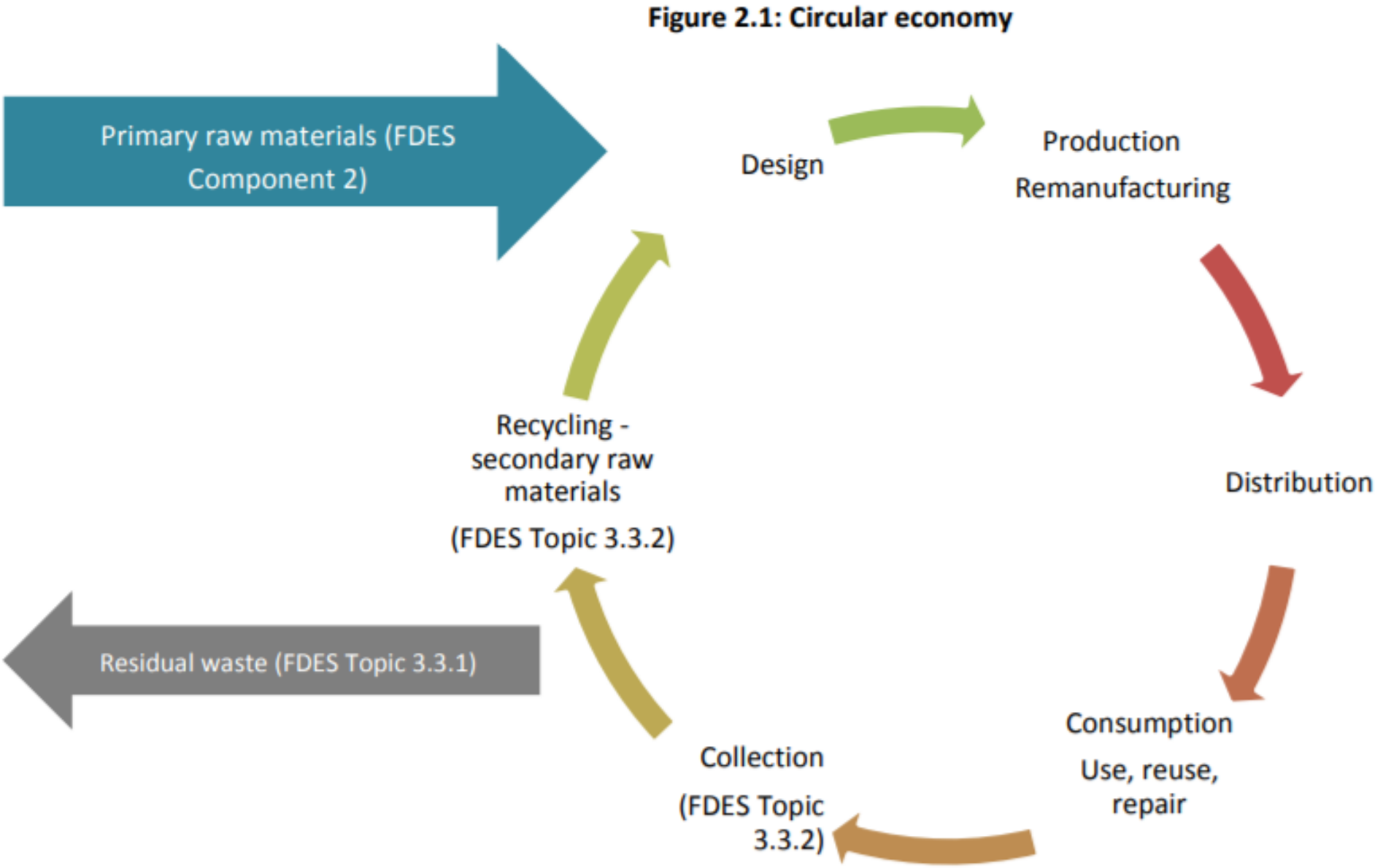
Environment statistics on waste provide important information to policymakers to support the protection of the environment.*

Issues arising include: air pollution, water and soil contamination; increasing volumes of hazardous waste, such as electrical and electronic waste, and other wastes such as plastics.*

Waste management policies are moving towards a focus on prevention and minimisation of waste under the concept of the circular economy.*

* Source: https://unstats.un.org/unsd/environment/FDES/MS_3.3.1_3.3.2_Waste.pdf page 2.

Circular economy concept* (as opposed to “cradle to grave”)



* Source: https://unstats.un.org/unsd/environment/FDES/MS_3.3.1_3.3.2_Waste.pdf page 2.

United Nations Statistics Division (UNSD) and United Nations Environment Programme

QUESTIONNAIRE 2018 ON ENVIRONMENT STATISTICS

Section: WASTE

TABLE OF CONTENTS

Source: https://unstats.un.org/unsd/envstats/questionnaire

Table R1: Generation of Waste by Source

Line	Category	Unit
1	Agriculture, forestry and fishing (ISIC 01-03)	1000 t
2	Mining and quarrying (ISIC 05-09)	1000 t
3	Manufacturing (ISIC 10-33)	1000 t
4	Electricity, gas, steam and air conditioning supply (ISIC 35)	1000 t
5	Construction (ISIC 41-43)	1000 t
6	Other economic activities excluding ISIC 38	1000 t
7	Households	1000 t
8	**Total waste generation (=1+2+3+4+5+6+7)**	1000 t

Table R2: Management of Hazardous Waste

Line	Category	Unit
1	Stock of hazardous waste at the beginning of the year	tonnes
2	Hazardous waste generated during the year	tonnes
3	Hazardous waste imported during the year	tonnes
4	Hazardous waste exported during the year	tonnes
5	**Hazardous waste treated or disposed of during the year (=6+7+9+10)**	tonnes
6	*Amounts going to:* Recycling	tonnes
7	Incineration	tonnes
8	*of which:* with energy recovery	tonnes
9	Landfilling	tonnes
10	Other, please specify in the footnote	tonnes
11	Stock of hazardous waste at the end of the year (=1+2+3-4-5)	tonnes

Source: https://unstats.un.org/unsd/envstats/questionnaire

Table R3: Management of Municipal Waste

Line	Category	Unit
1	Total amount of municipal waste generated	1000 t
2	Municipal waste collected from households	1000 t
3	Municipal waste collected from other origins	1000 t
4	**Total amount of municipal waste collected (=2+3)**	1000 t
5	Municipal waste imported for treatment/disposal	1000 t
6	Municipal waste exported for treatment/disposal	1000 t
7	**Municipal waste managed in the country (=4+5-6)**	1000 t
8	*Amounts going to:* Recycling	1000 t
9	Composting	1000 t
10	Incineration	1000 t
11	*of which:* with energy recovery	1000 t
12	Landfilling	1000 t
13	*of which:* controlled landfilling	1000 t
14	Other, please specify in the footnote	1000 t
15	Total population served by municipal waste collection	%
16	Urban population served by municipal waste collection	%
17	Rural population served by municipal waste collection	%

Table R4: Composition of Municipal Waste

• If the

Line	Category	Unit	1990
1	Paper, paperboard	%	
2	Textiles	%	
3	Plastics	%	
4	Glass	%	
5	Metals	%	
6	Other inorganic material	%	
7	Organic material	%	
8	*of which*: food and garden waste	%	
9	TOTAL	%	100

Table R6: E-Waste Generation and Collection

Line	Category	Unit
1	**Total E-waste generated**	1000 t
2	**Total E-waste collected**	1000 t

Source: https://unstats.un.org/unsd/envstats/questionnaire

The Sustainable Development Goals

Make cities and human settlements inclusive, safe, resilient and sustainable

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.

Indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

Related to table UNSD/UNEP Questionnaire on table R5 on Municipal Waste Management in Cities

Indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities (tier II)

- Custodian Agencies: UN-Habitat and UNSD; partner agencies: UN Environment Programme
- UNSD participating in UN Environment and UN-HABITAT Joint Expert Group Meeting on Waste SDG indicators 11.6.1, 12.4.2, 12.5.1 (participating in refinements to methodologies)
- Modified wording which helps statisticians measure this indicator. Modified wording: "Proportion of municipal solid waste regularly collected and with adequate treatment and disposal out of total municipal solid waste generated."
    - What is adequate treatment? Could it be (recycling) + (composting) + (incineration with energy recovery)?
    - Denominator: Municipal waste "generated" => This is difficult to estimate.
    - OECD/Eurostat do not collect data at the city level. Eurostat did a pilot at the European regions level => No city level for "developed" countries.
- Available metadata are here: https://unstats.un.org/sdgs/metadata/files/Metadata-11-06-01.pdf

Table R5, line:	Category	Unit
2	**Total amount of municipal waste generated**	1000 t
7	Recycling	
8	Composting	
10	Incineration with energy recovery	

Indicator = (Lines 7 + 8 + 10)/Line 2

Table R5: Management of Municipal Waste – City Data

Line	Category	Unit
1	Total population of the city	1000 inh.
2	Total amount of municipal waste generated	1000 t
3	Percentage of city population served by municipal waste collection	%
4	Municipal waste collected from households	1000 t
5	Municipal waste collected from other origins	
6	**Total amount of municipal waste collected (=4+5)**	
7	*Amounts going to:* Recycling	
8	Composting	
9	Incineration	
10	*of which:* with energy recovery	
11	Landfilling	
12	*of which:* controlled landfilling	
13	Other, please specify in the footnote	

Ensure sustainable consumption and production patterns

- Target 12.4: By 2030, 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.

Indicator 12.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment (Table R2: Management of Hazardous Waste)

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

Indicator 12.5.1: National recycling rate, tons of material recycled (Table R1: Generation of Waste by Source; Table R2: Management of Hazardous Waste; and Table R3: Management of Municipal Waste)

Indicator 12.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment (tier III)

- Custodian Agencies: UN Environment Programme (more specifically the BRS Secretariat) and UNSD; partner agencies: OECD and Eurostat
- UNSD involved in the methodology and data collection
- Issues:
  - Terminology of the UNSD/UN Environment Programme Questionnaire and national reports under the Basel Convention not harmonized.
  - Definition of treatment: recycled and incinerated or incinerated with energy recovery? (The Basel Convention does not have a definition of treatment)
  - Year of treatment can be different from year of generation.
- Work plan available here: https://unstats.un.org/sdgs/tierIII-indicators/files/Tier3-12-04-02.pdf

Indicator a = Line 2/Population

Indicator b = Line 6/Line 5

Indicator c = Line 7/Line 5

Table R2, line:	Category	Unit
5	Hazardous waste treated or disposed of during the year	tonnes
6	Recycling	
7	Incineration	

Table R2: Management of Hazardous Waste

Line	Category	Unit
1	Stock of hazardous waste at the beginning of the year	tonnes
2	Hazardous waste generated during the year	
3	Hazardous waste imported during the year	
4	Hazardous waste exported during the year	
5	**Hazardous waste treated or disposed of during the year (=6+7+9+10)**	
6	*Amounts going to:* Recycling	
7	Incineration	
8	*of which:* with energy recovery	
9	Landfilling	
10	Other, please specify in the footnote	
11	Stock of hazardous waste at the end of the year (=1+2+3-4-5)	

Indicator 12.5.1: National recycling rate, tons of material recycled
(tier III)

- Custodian Agencies: UN Environment Programme and UNSD; partner agencies: OECD and Eurostat
- Issues:
  - Difficult to have statistics representing all waste, and other types of waste (hazardous waste) already monitored by other indicators => use of municipal waste as a proxy.
  - Discussion with respect to municipal waste "collected" as opposed to municipal waste "generated" is also a feature (as in indicator 11.6.1).
  - Should "composting" and "incineration with energy recovered" be excluded or included?
  - Inclusion of imports-exports of municipal waste.
  - Work plan available here: https://unstats.un.org/sdgs/tierIII-indicators/files/Tier3-12-05-01.pdf

Indicator = Line 8/Line 7; or

Indicator = Line 8/Line 1

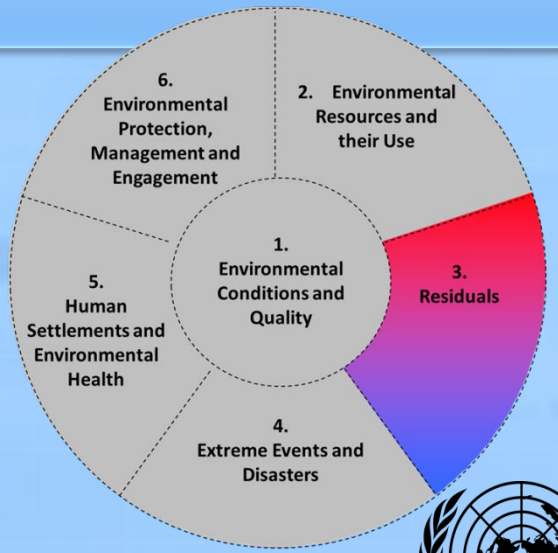
Table R3, line:	Category	Unit
1	Total amount of municipal waste generated	1000 t
7	Municipal waste managed in the country	
8	Recycling	

Table R3: Management of Municipal Waste

Line	Category	Unit
1	Total amount of municipal waste generated	1000 t
2	Municipal waste collected from households	
3	Municipal waste collected from other origins	
4	**Total amount of municipal waste collected (=2+3)**	
5	Municipal waste imported for treatment/disposal	
6	Municipal waste exported for treatment/disposal	
7	**Municipal waste managed in the country (=4+5-6)**	
8	*Amounts going to:* Recycling	
9	Composting	
10	Incineration	
11	*of which:* with energy recovery	
12	Landfilling	
13	*of which:* controlled landfilling	
14	Other, please specify in the footnote	

Contents of Component 3: Residuals

- Contains statistics on the amount and characteristics of residuals generated by human production and consumption processes, their management, and their final release to the environment.
- Residuals:
  - are flows of solid, liquid and gaseous materials, and energy, that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation.
  - may be discarded, discharged or emitted directly to the environment or be captured, collected, treated, recycled or reused.



Component 3: Residuals

- The FDES covers the main groups of residuals that are emissions of substances to air, water or soil, wastewater and waste, and the release of residuals from the application of chemical substances.
- Generally, emissions are analysed by the type of receiving environment (air, water or soil) and type of substance.
- Statistics on residuals must be broken down according to the economic activity that generated them, based on ISIC.

Component 3: Overview

Component 3 Residuals	**Sub-Component 3.1 Emissions to Air (3 topics, 20 statistics)**	**Topic 3.1.1: Emissions of greenhouse gases** **Topic 3.1.2: Consumption of ozone depleting substances** **Topic 3.1.3: Emissions of other substances**
	Sub-Component 3.2 Generation and Management of Wastewater (3 topics, 11 statistics)	**Topic 3.2.1: Generation and pollutant content of wastewater** **Topic 3.2.2: Collection and treatment of wastewater** **Topic 3.2.3: Discharge of wastewater to the environment**
	Sub-Component 3.3 Generation and Management of Waste (2 topics, 20 statistics)	**Topic 3.3.1:** Generation of waste **Topic 3.3.2:** Management of waste
	Sub-Component 3.4 Release of Chemical Substances (1 topic, 7 statistics)	**Topic 3.4.1:** Release of chemical substances

Sub-Component 3.3: Generation and Management of Waste

- Includes statistics on the amount and characteristics of waste, defined as discarded material for which the owner or user has no further use, generated by human activities in the course of production and consumption processes.
- Relevant statistics cover the amount of waste generated by different sources that are economic activities (by ISIC categories) and households.
- Policy makers, particularly local governments, require statistics on waste in order to assess how its generation changes over time.

Sub-Component 3.3: Generation and Management of Waste
Topic 3.3.1: Generation of waste

- This topic includes statistics describing the amount of waste generated before any collection or treatment, by waste type, and by generator (by economic activity (by ISIC) and households).
- The waste lists that countries and international organizations use for waste statistics are usually based either on the generating process or the material content of the waste, or on the combination of the two.
- Statistics on waste generation are usually estimated from the records of the economic units engaged in waste collection, treatment and disposal.
- Hazardous waste is a special group of waste that, due to its toxic or other hazardous character, requires special management and is controlled by law in many countries.

- The Basel Convention, a multilateral environmental agreement, focuses on the control of transboundary movements of hazardous waste across international borders and establishes criteria for the environmentally sound management of such waste.
- Reporting needs under this convention include the generation of hazardous waste, as well as the imports and exports of hazardous waste covered in Topic 3.3.2: Management of Waste.

Sub-Component 3.3: Generation and Management of Waste

Topic 3.3.1: Generation of waste

Component 3: Residuals

Sub-component 3.3: Generation and Management of Waste

Topic	Statistics and Related Information (**Bold Text - Core Set/Tier 1**; Regular Text - Tier 2; *Italicized Text - Tier 3*)	Category of Measurement	Potential Aggregations and Scales	Methodological Guidance
Topic 3.3.1: Generation of waste	a. **Amount of waste generated by source**	Mass	▪ By ISIC economic activity ▪ By households ▪ By tourists ▪ National ▪ Sub-national	▪ European Commission: European List of Waste, pursuant to European Waste Framework Directive ▪ Eurostat: Environmental Data Centre on Waste ▪ Eurostat: European Waste Classification for Statistics (EWC-Stat), version 4 (Waste categories) ▪ Basel Convention: Waste categories and hazardous characteristics ▪ Eurostat: Manual on Waste Statistics ▪ Eurostat: Guidance on classification of waste according to EWC-Stat categories ▪ SEEA Central Framework (2012) ▪ UNSD: Environment Statistics Section-Waste Questionnaire
	b. Amount of waste generated by waste category	Mass	▪ By waste category (e.g., chemical waste, municipal waste, food waste, combustion waste) ▪ National ▪ Sub-national	
	c. **Amount of hazardous waste generated**	Mass	▪ By ISIC economic activity ▪ National ▪ Sub-national	

Sub-Component 3.3: Generation and Management of Waste

Topic 3.3.2: Management of waste

- Includes statistics on:
  - (i) the amount of waste collected and transported to treatment facilities or final disposal;
  - (ii) the amount of waste treated and disposed of by type of treatment and disposal (e.g., reuse, recycling, composting, incineration, landfilling, other);
  - (iii) the physical infrastructure for waste treatment and disposal, including the number and capacity of treatment and disposal plants; and
  - (iv) other relevant information.

Sub-Component 3.3: Generation and Management of Waste

Topic 3.3.2: Management of waste

Topic 3.3.2: Management of waste	a.	Municipal waste		▪ By type of treatment and disposal (e.g., reuse, recycling, composting, incineration, landfilling, other) ▪ By type of waste, when possible ▪ National ▪ Sub-national	▪ Eurostat: Environmental Data Centre on Waste ▪ Eurostat metadata: Organisation for Economic Co-operation and Development (OECD)/Eurostat definition of municipal waste ▪ UNSD: Environment Statistics Section-Waste Questionnaire ▪ Basel Convention: Waste categories and hazardous characteristics ▪ Eurostat: EWC-Stat, version 4 (Waste categories) ▪ European Commission: European Waste Framework Directive (Waste treatment operations) ▪ Eurostat: Manual on Waste Statistics ▪ Eurostat: Guidance on classification of waste according to EWC-Stat categories ▪ Rotterdam Convention
		1. **Total municipal waste collected**	Mass		
		2. **Amount of municipal waste treated by type of treatment and disposal**	Mass		
		3. **Number of municipal waste treatment and disposal facilities**	Number		
		4. Capacity of municipal waste treatment and disposal facilities	Volume		
	b.	Hazardous waste			
		1. **Total hazardous waste collected**	Mass		
		2. **Amount of hazardous waste treated by type of treatment and disposal**	Mass		
		3. **Number of hazardous waste treatment and disposal facilities**	Number		
		4. Capacity of hazardous waste treatment and disposal facilities	Volume		
	c.	Other/industrial waste			
		1. Total other/industrial waste collected	Mass		
		2. Amount of other/industrial waste treated by type of treatment and disposal	Mass		
		3. Number of other/industrial treatment and disposal facilities	Number		
		4. Capacity of other/industrial waste treatment and disposal facilities	Volume		
	d.	**Amount of recycled waste**	Mass	▪ By specific waste streams (e.g., e-waste, packaging waste, end of life vehicles) ▪ By waste category ▪ National ▪ Sub-national	
	e.	Imports of waste	Mass	▪ By waste category (e.g., chemical waste, municipal waste, combustion waste)	
	f.	Exports of waste	Mass		
	g.	Imports of hazardous waste	Mass		
	h.	Exports of hazardous waste	Mass		

Sub-Component 3.4: Release of Chemical Substances

Topic 3.4.1: Release of Chemical Substances

- This topic deals with chemical fertilizers to enrich soils and pesticide use in protecting plants and animals from disease. Other chemicals accelerate the growth of biota and preserve and enhance the quality, size and appearance of biological products.

- Environmental effects are generated by the diffusion of chemicals through cycling systems and build-up of contaminants in water, land and living organisms (through the food chain).

- Statistics under this topic include the amount of natural and chemical fertilizers, pesticides and other chemicals (hormones and pellets) used by type of active ingredients (see also Sub-component 2.5: Biological Resources), the area under application and the method employed.

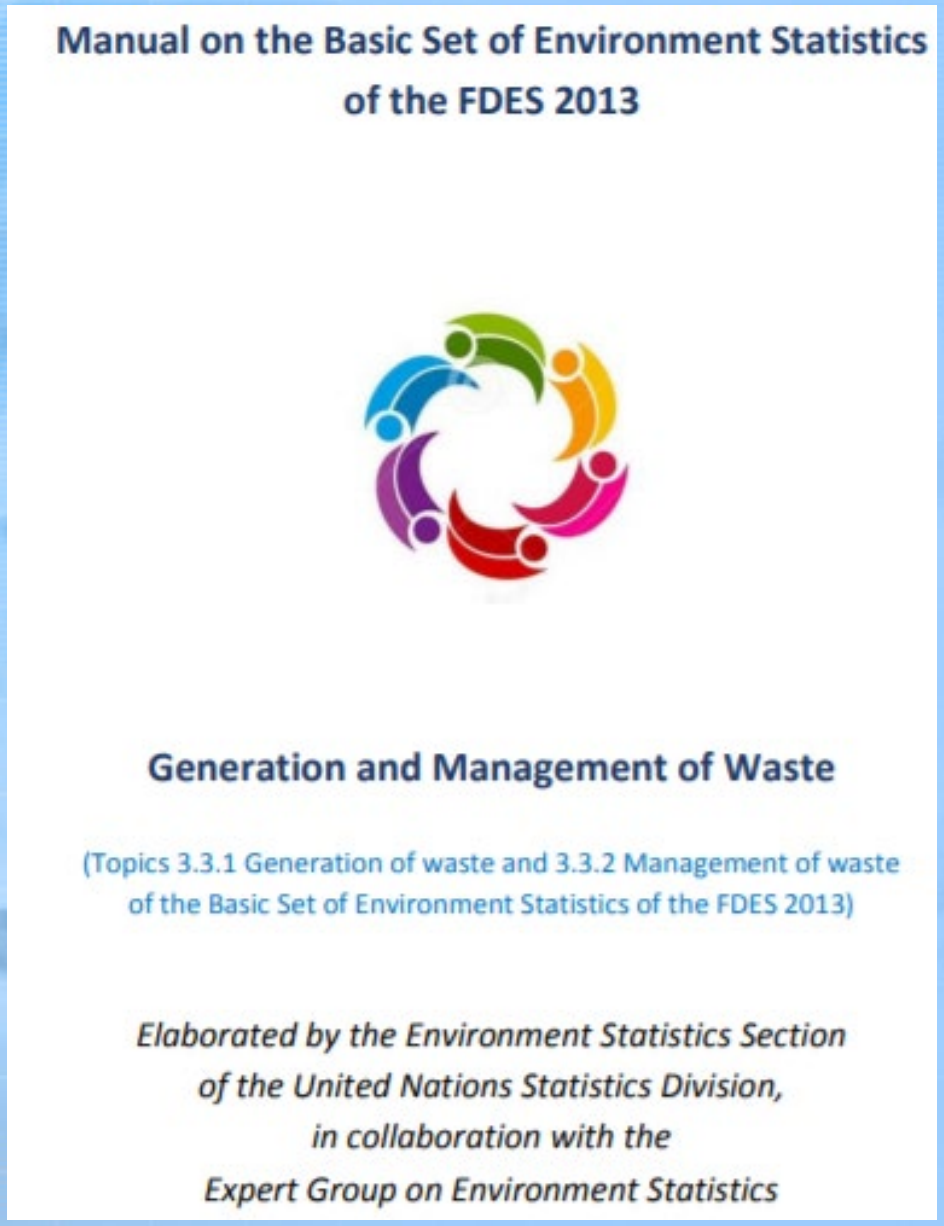
Sub-Component 3.4: Release of Chemical Substances

Topic 3.4.1: Release of Chemical Substances

Multilateral Environmental Agreements (MEAs):

- The Stockholm Convention on Persistent Organic Pollutants (POPs) aims to eliminate or restrict the production and use of POPs. POPs are defined by the convention as “chemical substances that persist in the environment, bio-accumulate through the food web, and pose a risk of causing adverse effects to human health and the environment”.
- The Stockholm Convention identified initial 12 chemicals or chemical groups for priority action, including aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, PCBs, polychlorinated dioxins and polychlorinated furans.

Reference document for compiling waste statistics…



https://unstats.un.org/unsd/envstats/fdes/manual_bses.cshtml

Contents

https://unstats.un.org/unsd/envstats/fdes/manual_bses.cshtml

Exercise in three breakout groups…

- Group A: Calculating SDG indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

- Group B: Calculating SDG indicator 12.4.2:Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

- Group C: Calculating SDG indicator 12.5.1: National recycling rate, tons of material recycled

Beyond calculating these indicators, what practical issues did you encounter?

How can Namibia ensure that the sources of data can be communicated to those international agencies (e.g. UNSD) who are collecting the data?