



UNSD/UNEP Questionnaire on Environment Statistics and its application to waste SDG indicators

**United Nations Statistics Division (UNSD) and United Nations Environment Programme
QUESTIONNAIRE 2018 ON ENVIRONMENT STATISTICS**

Section: WASTE

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Second Expert Group Meeting on Chemicals and Waste SDG indicators

Sarajevo, Bosnia and Herzegovina, 11-13 February 2019

Environment Statistics Section, United Nations Statistics Division



Outline

1. UNSD/UNEP Questionnaire on Environment Statistics (waste section)
2. Analysis of newly added variables relevant to SDG indicators



UNSD/UNEP Questionnaire on Environment Statistics

- Objective: to provide internationally comparable statistics on environmental issues based on standard questionnaires and methodology.
- About 170 member states and areas in 5 languages.
- Complemented by the OECD/Eurostat Joint Questionnaire on the State of the Environment – their member states.
- Close collaboration is maintained on conceptual issues, validation procedures and data validation.
- Collaboration is also maintained with, inter alia, FAO/Aquastat (water statistics), the Basel Convention (hazardous waste), UN Regional Commissions on similar issues, including translation.
- Sent to National Statistical Offices and Ministries of Environment.
- Linked to economic statistics through the use of ISIC Rev. 4 in several tables allowing for better alignment with System of National Accounts, System of Environmental-Economic Accounting.



UNSD/UNEP Questionnaire on Environment Statistics

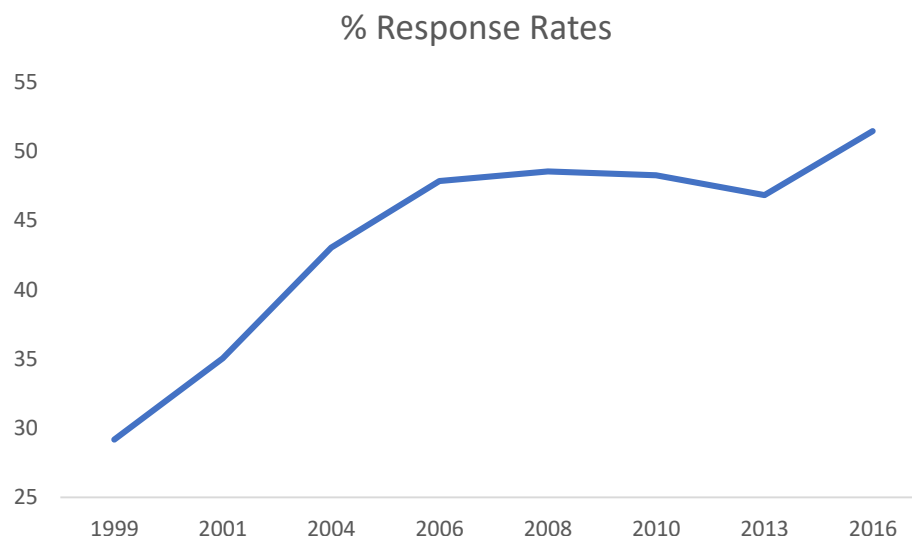
- To promote data quality assurance, UNSD carries out extensive data validation procedures that include built-in automated procedures, manual checks and cross-references to national sources of data.
- Communication is carried out with countries for clarification and validation of data.
- UNSD does **not make any estimation or imputation for missing values** so the number of data points provided are actual country data which are considered to be official statistics.
- Only data that are considered accurate or those confirmed by countries during the validation process are included in UNSD's environment statistics database and disseminated.



UNSD/UNEP Questionnaire on Environment Statistics

- Mandated by the UN Statistical Commission in 1995 to compile environmental indicators.
- Nine (usually biennial) collections have been completed spanning 1999-2018. 2018 collection round currently being validated (48 responses as of 1 Feb 2019).
- Many stable time series for many waste and water variables already exist such as for, “municipal waste collected”.

Response rate to the Questionnaire was above 50% in the latest (2016) collection round, and has been improving since 1999.





UNSD/UNEP Questionnaire on Environment Statistics

- Data completeness and data quality remain a challenge (in particular for developing countries).
- Challenges: national capacity constraints (financial, human, technical), inadequate institutional set-up and collaboration within countries in environment statistics.
- Measures to address challenges: Environment Statistics Section of UNSD, in collaboration with key partners, is assisting countries in strengthening their statistical capacity through training workshops and direct country assistance.



Waste Questionnaire

Waste

R1: Generation of Waste by Source

R2: Management of Hazardous Waste (**relates to 12.4.2**)

R3: Management of Municipal Waste (**relates to 12.5.1**)

R4: Composition of Municipal Waste

R5: Management of Municipal Waste – City Data (**relates to 11.6.1**)

R6: Electronic Waste Generation and Collection

<http://unstats.un.org/unsd/environment/questionnaire.htm>



11 SUSTAINABLE CITIES
AND COMMUNITIES



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

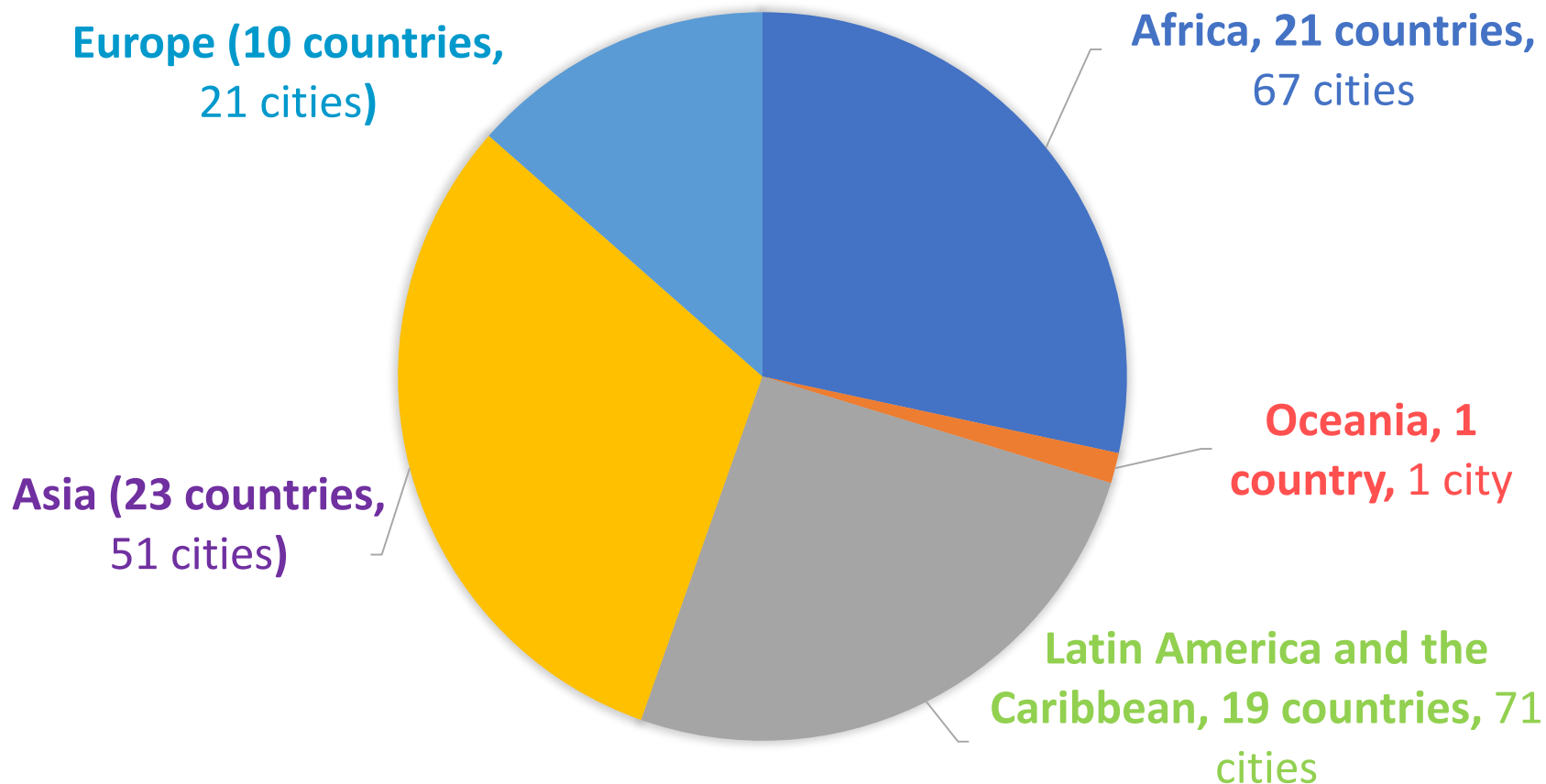
- Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

=> 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



Scope of city data by region in the UNSD environment statistics database (per end of 2016 collection round)...

There are data for 211 cities from some 74 countries



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)

- Using the five variables, a prospective estimate of the indicator can be derived.
- Adequate final discharge: Recycling, composting, incineration with energy recovery and controlled landfilling.
- Time series exist for waste “collected” in the UNSD/UNEP Questionnaire at the city level. UNSD is now collecting data on municipal waste generated at the city (and national) level.

| Table R5, line: | Category | Unit |
|----------------------------|--|-------------|
| 2 | Total amount of municipal waste generated | 1000 t |
| 6 | Recycling | |
| 7 | Composting | |
| 9 | Incineration with energy recovery | |
| 11 | Controlled landfilling | |

$$\text{Indicator} = (\text{Lines } 6 + 7 + 9 + 11) / \text{Line } 2$$

Example of disseminated outputs for 11.6.1

| Country | City | Year | Municipal waste collected 1000 tonnes | Municipal waste landfilled % | Municipal waste incinerated % | Municipal waste recycled % | Municipal waste composted % | Municipal waste managed via other treatment or disposal % | |
|--------------|-----------|------|--|---------------------------------|----------------------------------|-------------------------------|--------------------------------|--|---|
| Albania | Durres | 2012 | 86.0 | 89.5 | 0.0 | 3.5 | ... | 7.0 | 1 |
| Albania | Elbasan | 2012 | 40.0 | 95.0 | 0.0 | 2.5 | ... | 0.0 | 1 |
| Albania | Shkodra | 2012 | 31.0 | 12.9 | 9.7 | 6.5 | ... | 67.7 | 1 |
| Albania | Tirana | 2003 | 1270.0 | 45.0 | ... | ... | ... | ... | |
| Algeria | Algiers | 2015 | 1000.0 | 82.0 | ... | 10.0 | 1.0 | ... | |
| Algeria | Wahran (C | 2015 | 380.0 | 82.1 | ... | 10.0 | 1.0 | ... | |
| Algeria | Qacentina | 2015 | 257.0 | 82.1 | ... | 10.0 | 1.0 | ... | |
| Algeria | Djelfa | 2015 | 400.0 | 82.0 | ... | 10.0 | 1.0 | ... | |
| Algeria | Adrar | 2015 | 11.0 | 82.0 | ... | 10.0 | 1.1 | ... | |
| Armenia | Yerevan | 2015 | 295.1 | 100.0 | 0.0 | 0.0 | 0.0 | ... | |
| Armenia | Vanadzor | 2015 | 16.8 | 100.0 | ... | ... | ... | ... | |
| Armenia | Gyumri | 2015 | 9.9 | 100.0 | ... | ... | ... | ... | |
| Azerbaijan | Baku | 2015 | 853.7 | 31.0 | 59.6 | ... | ... | 9.4 | |
| Azerbaijan | Sumgait | 2015 | 149.8 | 100.0 | ... | ... | ... | ... | |
| Azerbaijan | Ganja | 2015 | 93.5 | 100.0 | ... | ... | ... | ... | |
| Bangladesh | Dhaka | 2014 | 912.5 | 82.9 | 0.0 | 13.0 | 4.0 | 0.0 | 2 |
| Belarus | Minsk | 2015 | 1007.7 | 84.3 | 0.0 | 15.7 | 0.0 | 0.0 | 3 |
| Benin | Parakou | 2002 | 3.2 | ... | ... | ... | ... | ... | |
| Bhutan | Thimphu | 2012 | 20.8 | 60.0 | 15.0 | 15.0 | 10.0 | ... | |
| Bolivia (Plu | Cobija | 2015 | 59.7 | ... | ... | ... | ... | ... | |

Table R5: Management of Municipal Waste – City Data (relates to 11.6.1)

Country: _____

City name: _____

Table R5: Management of Municipal Waste — City Data

• If t

| Line | Category | Unit | 19 |
|------|--|-----------|----|
| 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 | 1000 t | |
| 6 | Total amount of municipal waste collected (=4+5) | 1000 t | |
| 7 | <i>Amounts going to:</i> Recycling | 1000 t | |
| 8 | Composting | 1000 t | |
| 9 | Incineration | 1000 t | |
| 10 | <i>of which:</i> with energy recovery | 1000 t | |
| 11 | Landfilling | 1000 t | |
| 12 | <i>of which:</i> controlled landfilling | 1000 t | |
| 13 | Other, please specify in the footnote | 1000 t | |

Total amount of municipal waste generated: Newly added in 2018 collection round



Total amount of municipal waste generated

This variable not previously collected because “total amount of municipal waste collected” was instead.

| Total amount of municipal waste collected | Total amount of municipal waste generated |
|--|--|
| Easier to collect data (typically an estimated figure is derived based upon a sample of trucks carrying waste which are weighed at weigh bridges). Expenses are associated with managing weigh bridges. | More margin for error in estimating this figure. Equal to “total amount of municipal waste collected” + “waste from areas not served by a municipal waste collection service (mainly rural areas) even if they are disposed of by the generator himself.” (source: OECD 2014 Questionnaire on the State of the Environment, table SW-5A) |
| Not so suitable as a denominator for SDG indicator 11.6.1 | Better fits as a denominator for SDG indicator 11.6.1 |
| Collected by UNSD, OECD and Eurostat for decades; well established time series; validated data of quite good quality | Only collected by OECD and Eurostat until 2016. As of 2018 collection round, UNSD is also collecting data on this variable. |



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

(relates to 12.4.2)

| 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 | <i>Amounts going to:</i> Recycling | |
| 7 | Incineration | |
| 8 | <i>of which:</i> 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 12.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment (Tier III)

- Inclusion of imports-exports in the denominator => use of line 5: Hazardous waste treated or disposed of during the year.
- Treatment defined as recycled and incinerated.
- Using the four variables below, prospective estimates of the indicator can be derived, one per capita, and two for the types of treatment.
- Data from the UNSD/UNEP Questionnaire and the national reports under the Basel Convention can be viewed as complementary (e.g. in terms of number of countries reporting) and can be used for quality checks.

| | | |
|-------------------------------|---------------------------|---------------------------|
| Indicator = Line 2/Population | Indicator = Line 6/Line 2 | Indicator = Line 7/Line 2 |
|-------------------------------|---------------------------|---------------------------|

| Table R2, line: | Category | Unit |
|-----------------|--|--------|
| 2 | Hazardous waste generated during the year | tonnes |
| 5 | Hazardous waste treated or disposed of during the year | tonnes |
| 6 | Recycling | tonnes |
| 7 | Incineration | tonnes |

Example of disseminated outputs for 12.4.2: Hazardous waste treated or disposed, (tonnes)

| Cou | Country | 2011 | fn | 2012 | fn | 2013 | fn | 2014 | fn | 2015 | fn |
|-----|------------------|----------|----|----------|----|----------|----|----------|----|----------|----|
| 20 | Andorra | 0 | | 0 | | 0 | | 0 | | 0 | |
| 51 | Armenia | 462895.8 | 2 | 470505.7 | | 579049.8 | | 576419.4 | | 555075 | |
| 40 | Austria | ... | | 338860 | | ... | | 439247 | | ... | |
| 31 | Azerbaijan | 138281.5 | | 205211.2 | | 152446 | | 529106.5 | | 382998 | |
| 50 | Bangladesh | ... | | 28946 | | ... | | ... | | ... | |
| 112 | Belarus | 1110646 | 3 | 1704035 | 3 | 1848646 | 3 | 2093567 | 3 | 1557852 | 3 |
| 56 | Belgium | ... | | 2059944 | | ... | | 2140043 | | ... | |
| 84 | Belize | ... | | ... | | ... | | ... | | ... | |
| 60 | Bermuda | 601 | | 576 | | 543 | | 615 | | 668.9 | 5 |
| 72 | Botswana | ... | | ... | | 386.68 | 6 | ... | | 719.19 | 6 |
| 100 | Bulgaria | ... | | 13389620 | | ... | | 12176438 | | ... | |
| 854 | Burkina Faso | ... | | ... | | ... | | ... | | ... | |
| 120 | Cameroon | ... | | ... | | ... | | ... | | ... | |
| 156 | China | 26895300 | 7 | 27028500 | | 24012900 | | 29908200 | | 32237000 | |
| 344 | China, Hong Kong | 34409 | 8 | 31981 | 8 | 30772 | 8 | 30318 | 8 | 31699 | 8 |
| 446 | China, Macao | 17573 | | 17683 | | 17252 | | 20157 | | 23668 | |
| 191 | Croatia | ... | | 73404 | | ... | | 66055 | | ... | |
| 192 | Cuba | 230469 | | 537508 | | 467293 | | 345665 | | 272285 | |
| 196 | Cyprus | ... | | 24201 | | ... | | 161446 | | ... | |
| 203 | Czechia | ... | | 753402 | | ... | | 597309 | | ... | |
| 208 | Denmark | ... | | 977663 | | ... | | 1819120 | | ... | |

Full data set available at: <https://unstats.un.org/unsd/envstats/qindicators>

Example of disseminated outputs for 12.4.2: Hazardous waste incinerated (tonnes)

| Coun | Country | 2011 | fn | 2012 | fn | 2013 | fn | 2014 | fn | 2015 | fn |
|------|------------------------|---------|-----|---------|-----|---------|-----|---------|-----|--------|-----|
| 20 | Andorra | ... | ... | ... | ... | 0 | ... | 0 | ... | 0 | ... |
| 51 | Armenia | 12 | 1 | 1678 | ... | 17 | ... | 2379 | ... | 3767 | ... |
| 40 | Austria | ... | ... | 193421 | ... | ... | ... | 215076 | ... | ... | ... |
| 31 | Azerbaijan | 37132.1 | ... | 113898 | ... | 86426.5 | ... | 111310 | ... | 210858 | ... |
| 48 | Bahrain | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 50 | Bangladesh | ... | ... | 1447.3 | 2 | ... | ... | ... | ... | ... | ... |
| 112 | Belarus | 57230.1 | 3 | 29050.4 | 3 | 21244.5 | 3 | 59290.2 | 3 | 24501 | 3 |
| 56 | Belgium | ... | ... | 310150 | ... | ... | ... | 583144 | ... | ... | ... |
| 84 | Belize | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 204 | Benin | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 60 | Bermuda | 7 | ... | 5 | ... | 8 | ... | 5 | ... | 6.6 | 7 |
| 70 | Bosnia and Herzegovina | 0 | ... | 0 | ... | ... | ... | ... | ... | ... | ... |
| 72 | Botswana | ... | ... | ... | ... | 386.68 | 8 | ... | ... | 719.19 | 8 |
| 100 | Bulgaria | ... | ... | 5540 | ... | ... | ... | 7504 | ... | ... | ... |
| 120 | Cameroon | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 344 | China, Hong Kong | 6029 | ... | 5930 | ... | 6376 | ... | 6480 | ... | 8266 | ... |
| 446 | China, Macao | 457 | 9 | 414 | 9 | 436 | 9 | 486 | 9 | 473 | 9 |
| 191 | Croatia | ... | ... | 8425 | ... | ... | ... | 11371 | ... | ... | ... |
| 192 | Cuba | 15423 | ... | 11678 | ... | 15423 | ... | 21194 | ... | 25718 | ... |
| 196 | Cyprus | ... | ... | 92 | ... | ... | ... | 1432 | ... | ... | ... |
| 203 | Czechia | ... | ... | 109339 | ... | ... | ... | 124806 | ... | ... | ... |
| 208 | Denmark | ... | ... | 130114 | ... | ... | ... | 213454 | ... | ... | ... |
| 233 | Estonia | ... | ... | 18704 | ... | ... | ... | 15299 | ... | ... | ... |

Tables also available for hazardous waste (i) recycled; and (ii) landfilled



Ensure sustainable consumption and production patterns

- Target 12.5: 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 12.5.1: National recycling rate, tons of material recycled

Table R3: Management of Municipal Waste (relates to 12.5.1)

Country:

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 | <i>Amounts going to:</i> Recycling | 1000 t |
| 9 | Composting | 1000 t |
| 10 | Incineration | 1000 t |
| 11 | <i>of which:</i> with energy recovery | 1000 t |
| 12 | Landfilling | 1000 t |
| 13 | <i>of which:</i> controlled landfilling | 1000 t |
| 14 | Other, please specify in the footnote | 1000 t |



Total amount of municipal waste generated: Newly added in 2018 collection round

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

- Using two of the four variables, a prospective estimate of the indicator can be derived.
- UNSD collects data only on “municipal waste generated”, “municipal waste collected”, and “total waste generation”, but not on “chemicals and all wastes” per SDG target wording.
- Imports-exports can be either included in the denominator (R3,6) or not (R3,1).

| Table and line: | Category | Unit |
|-----------------|---|--------|
| R1, 8 | Total waste generation | 1000 t |
| R3, 1 | Total amount of municipal waste generated | |
| R3, 6 | Municipal waste managed in the country | |
| R3, 7 | Recycling | |

Indicator = (R3, 7)/(R3,6); or

Indicator = (R3, 7)/(R3,1); or

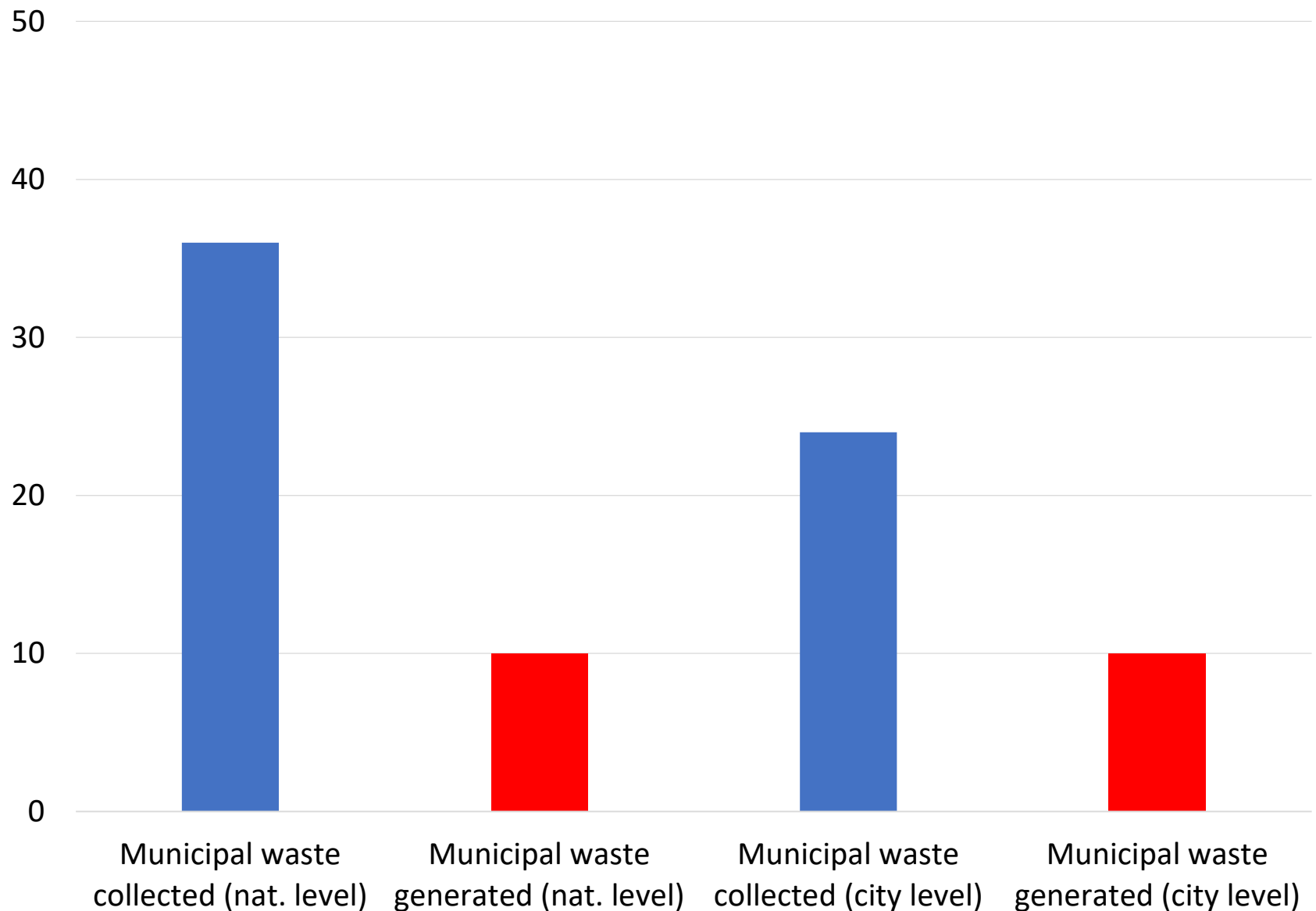
Indicator = (R3, 7)/(R1, 8)

Example of disseminated outputs for 12.5.1: Percentage of municipal waste which is recycled

| Coun | Country | 2010 | fn | 2011 | fn | 2012 | fn | 2013 | fn | 2014 | fn | 2015 | fn | 2016 | fn |
|------|------------------------|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|----|
| 12 | Algeria | ... | | ... | | ... | | ... | | 10 | | 10 | | ... | |
| 20 | Andorra | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | ... | |
| 660 | Anguilla | ... | | ... | | ... | | ... | | ... | | ... | | ... | |
| 36 | Australia | ... | | 45 | | ... | | ... | | ... | | 42 | | ... | |
| 40 | Austria | 27 | | 24 | | 24 | | 25 | | 25 | | 26 | | ... | |
| 31 | Azerbaijan | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | ... | |
| 50 | Bangladesh | ... | | ... | | ... | | ... | | 15 | | ... | | ... | |
| 112 | Belarus | 10 | 6 | 11 | 6 | 12 | 6 | 13 | 6 | 15 | 6 | 15 | 6 | ... | |
| 56 | Belgium | 34 | | 34 | | 32 | | 31 | | 33 | | 34 | | 33 | |
| 60 | Bermuda | 2 | | 2 | | 2 | | 2 | | 2 | | 2 | | ... | |
| 64 | Bhutan | ... | | ... | | 15 | 7 | ... | | ... | | ... | | ... | |
| 72 | Botswana | ... | | ... | | ... | | 1 | 8 | ... | | 1 | 8 | ... | |
| 76 | Brazil | 4 | | 2 | | 2 | | 2 | | 3 | | 3 | | ... | |
| 92 | British Virgin Islands | ... | | ... | | ... | | ... | | ... | | ... | | ... | |
| 100 | Bulgaria | 24 | | 24 | | 22 | | 25 | | 21 | | 19 | | 23 | |
| 132 | Cabo Verde | ... | | ... | | 0 | | 0 | | ... | | 0 | 9 | ... | |
| 120 | Cameroon | ... | | ... | | ... | | ... | | ... | | ... | | ... | |
| 344 | China, Hong Kong | 52 | 10 | 48 | 10 | 39 | 10 | 37 | 10 | 37 | 10 | 35 | 10 | ... | |
| 446 | China, Macao | 0 | 11, | 0 | 11, | 0 | 11, | 0 | 11, | 1 | 11, | 1 | 11, | ... | |
| 170 | Colombia | ... | | ... | | 14 | 13 | 13 | 13 | 18 | 13 | ... | | ... | |
| 191 | Croatia | 3 | | 7 | | 13 | | 13 | | 14 | | 16 | | 19 | |
| 192 | Cuba | 4 | | 5 | | 4 | | 4 | | 4 | | 4 | | ... | |
| 196 | Cyprus | 11 | | 13 | | 12 | | 13 | | 13 | | 13 | 5 | 13 | 5 |
| 203 | Czechia | 14 | 5 | 15 | 5 | 21 | 5 | 21 | 5 | 23 | 5 | 26 | 5 | 27 | 5 |
| 208 | Denmark | ... | | 27 | | 26 | | 26 | | 27 | | 26 | | 28 | |

Full data set available at: <https://unstats.un.org/unsd/envstats/qindicators>

Response count to four selected variables to 2018 collection round as of Feb. 1, 2019 (N=48)





Areas where UNSD can contribute on monitoring these indicators

- Ex poste 2018 data collection round analysis of data availability of “municipal waste generated”; explore reasons why data availability of this variable may be less than that of “municipal waste collected” (which has been collected many times before)
- Carefully consider further modification of variables within the Questionnaire (while maintaining harmonization with OECD/Eurostat; e.g. via piloting variables related to e-waste)
- Utilise its strong network of contacts in National Statistical Offices for expert comment/review
- Share comments and expertise on existing knowledge of metadata at fora and EGMs like this one, or at the Expert Group on Environment Statistics scheduled for 21-23 May in New York
- Can offer data collected (available at below links) from NSOs as a source or complementary source (<https://unstats.un.org/unsd/envstats/qindicators> and https://unstats.un.org/unsd/envstats/country_files)