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**BACKGROUND DOCUMENT TO THE REPORT OF
THE SECRETARY-GENERAL ON ENVIRONMENT
STATISTICS (E/CN.3/2023/27)**

Prepared by the United Nations Statistics Division (UNSD)

17 February 2023

Introduction

The present background document complements the Report of the Secretary-General on Environment Statistics to the United Nations Statistical Commission at its fifty-fourth session, 28 February-3 March 2023 in New York.¹ The relevant paragraphs in the Report of the Secretary-General that refer to this background document are paragraph 23 to 34 within section C: Data collection and dissemination activities.

The purpose of the present background document is: to introduce the history of the long-standing data collection which the Statistics Division has led regarding water and waste statistics; to give a description of each of the tables used for data collection, and their respective relevance to policy demand, especially Sustainable Development Goal-related policy demand; to specify modifications to the data collection; and to provide a description of the water and waste data to which the Statistics Division is custodian.

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¹ E/CN.3/2023/27 (https://unstats.un.org/UNSDWebsite/statcom/session_54/documents/2023-27-EnvironmentStats-E.pdf) Item 5(e) of the provisional agenda of the fifty-fourth session of the United Nations Statistical Commission.

1.1: The history of the long-standing data collection which the Statistics Division has led regarding water and waste statistics: how did we get here?

1. The UNSD/UNEP Questionnaire on Environment Statistics (hereafter, the Questionnaire) is the Statistics Division's instrument of the regular biennial data collection on water and waste. The Questionnaire serves as a key and official data source for many different purposes, including Sustainable Development Goal (SDG) indicator compilation, and water and waste accounts. Data collection was first conducted in 1999 with a request for data from 168 countries and areas (hereafter, countries). Ten data collection rounds have now been completed, making the current (2022) collection round, which is collecting data from 163 countries, the eleventh one. While data are still being provided by countries to the Statistics Division for the 2022 collection round, the final dissemination of all country data is planned for the first half of 2023.
2. Response rates fall well short of 100% in every data collection round but have steadily improved over the course of the ten completed collection rounds. They climbed above 50% in the 2018 and 2016 collection rounds, however, fell to 45% in the most recently completed and COVID-affected collection round of 2020. At the time of writing, 48 country responses have so far been received for the 2022 collection round.
3. Data are made publicly available at a biennial frequency as Country Files², Indicator Tables³ and Country Snapshots⁴ on the Statistics Division's website. The fact that so much data collected via the Questionnaire is now made public contrasts to humbler beginnings where, for instance, limited and broken time series hardly allowed for data dissemination and subsequent critical analysis. This gradual process of allowing for more and more data to be made public is a credit to the contributions of countries to provide data, and their collaboration with the Statistics Division, and other key stakeholders to continue to develop and devote resources to the advancement of environment statistics, especially water and waste statistics.

² United Nations Statistics Division, Country Files from the UNSD/UNEP data collection on environment statistics (available at: https://unstats.un.org/unsd/envstats/country_files).

³ United Nations Statistics Division, Indicator Tables from the UNSD/UNEP data collection on environment statistics (available at: <https://unstats.un.org/unsd/envstats/qindicators>).

⁴ United Nations Statistics Division, Country Snapshots with data sourced from the UNSD/UNEP data collection on environment statistics (available at: <https://unstats.un.org/unsd/envstats/snapshots/>).

4. In line with the biennial frequency, the next (twelfth) data collection round will commence in 2024. As is the case for any collection round, careful consideration will be made regarding possible refinement of the variables in the Questionnaire while bearing in mind the need to balance policy and related demands with supply capacity of data and statistics concerning water and waste from countries. In order to be in a position to carefully consider any such possible refinement, the Statistics Division is in continual communication with key stakeholders such as international agencies and countries. The Expert Group on Environment Statistics⁵ (a group which has met nine times annually since 2014) serves as a regionally representative forum for such communication with all interested stakeholders, and is planned to meet again in the fourth quarter of 2023.

5. When considering the thematic scope of what is collected via the Questionnaire, those environment statistics already collected by other United Nations agencies and other international organizations are excluded. The Questionnaire gives opportunity to respondents (typically a country's National Statistical Offices (NSO) or Ministry of Environment, but mostly and increasingly, the NSO) to take ownership of certain SDG indicator compilation and reporting aggregated to the national level.

6. When considering scope on a geographical basis, per a long-standing agreement between the Organisation for Economic Cooperation and Development (OECD), Statistical Office of the European Union (EUROSTAT) and the Statistics Division, the countries covered by the Joint OECD/EUROSTAT Questionnaire on the State of the Environment are not covered in the UNSD/UNEP Questionnaire on Environment Statistics. Such a decision is taken to avoid duplication, minimize reporting burden of countries, and to minimize validation burden of international organisations. Both data collection processes are well coordinated and the questionnaires are fully compatible using identical definitions and classifications. The UNSD/UNEP Questionnaire is sent to all non-OECD/Eurostat countries⁶, covering two sections for statistics on waste and water. Between 1999 and 2022, many countries have become members of OECD or the European Union or become candidate or potential candidate countries of the European Union. Whenever such a progression occurs, the country has moved out of scope of the UNSD/UNEP Questionnaire on Environment Statistics and into scope of the Joint OECD/EUROSTAT Questionnaire on the State of the Environment. This is the main explanation for change in the number of countries to whom the UNSD/UNEP Questionnaire on Environment Statistics was sent in

⁵ United Nations Statistics Division, Expert Group on Environment Statistics, available at: https://unstats.un.org/unsd/envstats/fdes/fdes_eges.cshtml (accessed 17 February 2023).

⁶ To be factual, the UNSD/UNEP Questionnaire is also not sent to candidate and potential candidate European Union countries.

each collection round, especially the decrease to 163 countries in 2022 as illustrated in Table 1 below. It further explains challenges that the UNSD/UNEP Questionnaire on Environment Statistics faces in terms of maintaining response rates as high as possible from countries, since it tends to be countries with more advanced statistical systems moving into the scope of the Joint OECD/Eurostat Questionnaire.

Table 1: Summary of responses for all collection rounds: 1999-2022

Year that UNSD/UNEP Questionnaire was sent:	1999	2001	2004	2006	2008	2010	2013	2016	2018	2020	2022
Total responses	51	62	68	80	84	84	81	89	86	74	Pending
Response rate (percentage)	30	35	43	49	49	49	47	51	52	45	Pending
Countries that received the questionnaire	168	177	158	163	171	172	173	173	165	164	163

1.2: What do the tables used for data collection focus upon? And how are they relevant to Sustainable Development Goal- and other policy related-demands?

7. The Questionnaire’s two sections on water and waste consist of five and six data collection tables respectively. The Questionnaire itself pre-dates certain policy agendas such as the 2030 Agenda for Sustainable Development, but is used to provide key inputs into such policies. Further, although the Questionnaire dates back to 1999, many variables are relevant for informing on waste and water accounts as the Questionnaire applies the International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4⁷ closely.

8. For the Questionnaire’s waste section, the tables are:
- Table R1: Generation of Waste by Source
 - Table R2: Management of Hazardous Waste
 - Table R3: Management of Municipal Waste
 - Table R4: Composition of Municipal Waste
 - Table R5: Management of Municipal Waste – City Data
 - Table R6: Electronic Waste Generation and Collection

⁷ United Nations Statistics Division, International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4, available at: https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf (accessed 13 February 2023).

9. Table R1 allows for measurement of waste generated by various industries within the ISIC, and households. Given that ISIC is applied to this table, data collected can be considered for application to waste accounts. The variable, “Total waste generation” (the summation of waste generated by all industries and households) serves as a denominator for SDG indicators 12.4.2 (a) Hazardous waste generated per capita; and (b) Proportion of hazardous waste treated, by type of treatment (hereafter, SDG indicator 12.4.2)⁸; and 12.5.1: National recycling rate, tons of material recycled (hereafter, SDG indicator 12.5.1)⁹.

10. Table R2 collects many variables pertinent to hazardous waste (e.g. hazardous waste generated, hazardous waste treated (e.g. recycled, incinerated (with or without energy recovery), landfilled), etc. Seven of the variables in Table R2 directly correspond to SDG indicator 12.4.2.

11. Ten variables collected via Table R3 serve as inputs for measurement of SDG indicator 12.4.2. These include municipal waste generated, municipal waste collected, municipal waste managed, treated methods of municipal waste (e.g. recycling, composting, incineration (with or without energy recovery), landfill (whether or not controlled)).

12. Table R4 collects data on composition of municipal waste. Variables collected include paper, paperboard; textiles; plastics; glass; metals; other inorganic material; organic material; and food and garden waste. Such a table can provide great insight into analysis of movement of materials, especially bearing in mind a sustainable consumption and production policy analysis. Furthermore, data collected can be considered as input for SDG indicator 12.3.1(b): Food waste index.

13. Table R5 collects municipal waste data at city level which serve as an input into SDG indicator 11.6.1: Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities¹⁰.

⁸ United Nations Statistics Division, SDG indicator metadata, indicator 12.4.2 (a): Hazardous waste generated per capita; and (b) Proportion of hazardous waste treated, by type of treatment. Available at: <https://unstats.un.org/sdgs/metadata/files/Metadata-12-04-02.pdf> (accessed 13 February 2023).

⁹ United Nations Statistics Division, SDG indicator metadata, indicator 12.5.1: National recycling rate, tons of material recycled. Available at: <https://unstats.un.org/sdgs/metadata/files/Metadata-12-05-01.pdf> (accessed 16 February 2023).

¹⁰ United Nations Statistics Division, SDG indicator metadata, indicator 11.6.1: Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities, available at: <https://unstats.un.org/sdgs/metadata/files/Metadata-11-06-01.pdf> (accessed 13 February 2023).

14. Table R6 was only added in the 2018 data collection cycle via demand from key users. Two variables, namely, electronic waste generated and electronic waste collected, are both now used for SDG indicator 12.4.2.

15. For the Questionnaire's Water section, the tables are:

Table W1: Renewable Freshwater Resources

Table W2: Freshwater Abstraction and Use

Table W3: Water Supply Industry (ISIC 36)

Table W4: Wastewater Generation and Treatment

Table W5: Population Connected to Wastewater Treatment

16. Tables W1 through W4 all contain variables that provide inputs that inform for the compilation of water accounts. Within Table W1, for example, variables such as precipitation, actual evapotranspiration, inflow, etc. measure flows between economy and environment. Within Tables W2 and W3, ISIC is rigorously applied to measure abstraction, use and supply of volumes of water that are key building blocks to a water account, measuring flows of water between environment and economy, broken down by various ISIC industries, typically to the two-digit level. Table W4, which measures volumes of wastewater, also applies ISIC and helps trace economy's discharge of wastewater (by treatment level) to the environment.

17. Aside from the purposes mentioned above, Tables W1, W2 and W3 also serve as a source for SDG indicators for which the Statistics Division is a partner agency. This is the case for SDG indicator 6.4.1: Change in water-use efficiency over time; and 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.

18. Table W4 also is invaluable for measurement of SDG indicator 6.3.1: Proportion of domestic and industrial wastewater flows safely treated (hereafter, SDG indicator 6.3.1)¹¹. Variables such as total wastewater generated, wastewater treated in urban/other wastewater treatment plants, wastewater treated in independent treatment facilities are all invaluable in this regard. At a finer level of analysis, this table's collection of wastewater to various levels of treatment (primary, secondary or tertiary) also provides input into compilation of SDG indicator 6.3.1.

¹¹ United Nations Statistics Division, SDG indicator metadata, indicator 6.3.1: Proportion of domestic and industrial wastewater flows safely treated, available at: <https://unstats.un.org/sdgs/metadata/files/Metadata-06-03-01.pdf> (accessed 13 February 2023).

19. Table W5 captures data which originally took into consideration the Millennium Development Goal policy agenda, but which now are also relevant for analysis relating to SDG indicator 6.3.1.

20. During the era of the 2030 Agenda for Sustainable Development, the Questionnaire and its associated data have received increased interest from several international organisations each of whom have a custodian responsibility for SDG indicators. These include the United Nations Environment Programme (UNEP), UN-HABITAT, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Institute for Training and Research (UNITAR), United Nations University (UNU) and the World Health Organization (WHO), as well as academia. This is testament to the long-established practices of the Questionnaire in endeavouring to meet its original 1999 mandate received from the United Nations Statistical Commission, while ensuring its metadata are harmonized with the Joint OECD/EUROSTAT Questionnaire on the State of the Environment. The foresight of the United Nations Statistical Commission dating back to 1999 in requesting such a data collection has also proven the test of time, and it has meant that custodians of various SDG indicators have been attracted to the Questionnaire. Having said that, the Statistics Division considers itself privileged to lead such a data collection and is circumspect when considering any modification to data being collected via the Questionnaire.

21. A comprehensive list of SDG indicators toward which data collected via the Questionnaire can contribute are tabulated below.

Table 2: SDG indicators towards which data collected via the UNSD/UNEP Questionnaire on Environment Statistics can contribute¹²

SDG indicator	Tier	Possible Custodian Agency(ies)	Partner Agency(ies)
6.3.1 Proportion of wastewater safely treated	II	WHO, UN-HABITAT, UNSD	UNEP, OECD, Eurostat
6.4.1 Change in water-use efficiency over time	I	FAO	UNEP, IUCN, UNSD, OECD, Eurostat

¹² Interagency Expert Group – Sustainable Development Goals: Tier Classification for Global SDG indicators (3 February 2023). <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/>

SDG indicator	Tier	Possible Custodian Agency(ies)	Partner Agency(ies)
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	I	FAO	UNEP, IUCN, UNSD, OECD, Eurostat
11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities	II	UN-HABITAT, UNSD	UNEP
12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	II	UNSD, UNEP	OECD, Eurostat, UNU
12.5.1 National recycling rate, tons of material recycled	II	UNSD, UNEP	OECD, Eurostat, UNU

1.3: What recent modifications to the data collection have been made?

22. In the 2022 data collection cycle, the Questionnaire requested from countries for data for some 79 variables on its water section, and 73 variables on its waste section, same as in the 2020 collection cycle. In 2018, 77 variables were collected for water, and 59 for waste.

23. The addition of two variables for the water section in 2020 was owing to increased interest in understanding the impact of industry on environment (in particular, “water returned without use” was added to more closely understand volumes of water abstracted and returned mostly by mining and quarrying (ISIC 05-09), and in turn, “net freshwater abstracted” was also added (as opposed to “gross freshwater abstracted”) to allow for more accurate analysis of water abstractions by industry from the environment. In such a manner, more accurate compilation of water accounts can be made.

24. For waste, 14 additional variables were collected for the first time in 2020 to provide more detailed breakdowns of types of electronic waste (e-waste). For example, variables such as generation and collection of “large e-waste”, “small e-waste”, “screens, monitors and equipment containing screens”, etc. were added. All such breakdowns are in agreement

with UNU-KEYS, which are product groups for e-waste such that comparability of weight, material composition, end-of-life characteristics and lifespan distribution is achievable. Furthermore, the UNU-KEYS allow for categorisation according to the EU Waste Electrical and Electronic Equipment (WEEE) directive and correspond to the Harmonised System (HS)¹³. The Questionnaire now makes effort to capture volumes of e-waste (and particular types of e-waste) generated and collected for SDG indicators 12.4.2 and 12.5.1.¹⁴

1.4: What is the Statistics Division doing to liaise with countries and provide capacity development support for countries' provision of data to the Questionnaire?

25. Initially during the 2020 data collection cycle, and again during the 2022 data collection cycle, the Statistics Division has offered hour-long video call sessions to all interested countries responding to the Questionnaire. In 2021, approximately 20 countries attended while colleagues from the Statistics Division described and summarized concepts, definitions and common issues to the Questionnaire. In 2022, multiple sessions of the same content were offered at varying hours of day and in English, French and Spanish in an endeavour to service as many countries as possible. Furthermore, in 2022, other key stakeholders such as United Nations Regional Commissions and SDG custodian agencies such as UNEP, WHO and UN-HABITAT attended these video call sessions as resource persons, and approximately 60 countries attended.

26. The Statistics Division often suggests a bilateral video call to discuss the Questionnaire's concepts, definitions and issues when countries communicate with it via e-mail. Such bilateral calls have taken place with countries in the African and Western Asian regions in the 2020 and 2022 data collection cycles. It is always possible to schedule such a call with any country which has interest to do so.

27. It is a general practice that whenever the Environment Statistics Section of the Statistics Division may utilize resources to undertake capacity development work, a segment or session of the capacity development be devoted to the Questionnaire and how water and waste statistics relate to it. This applies also to capacity development work that

¹³ United Nations University - Institute for the Advanced Study of Sustainability, E-waste Statistics – Guidelines on classification, reporting and indicators, available at: https://i.unu.edu/media/ias.unu.edu-en/project/2238/E-waste-Guidelines_Partnership_2015.pdf (accessed 13 February 2023).

¹⁴ Namely, (i) Total amount of municipal waste generated (national level); (ii) Total amount of municipal waste generated (city level); (iii) Total electronic waste generated; and (iv) Total electronic waste collected.

the Statistics Division undertakes in collaboration with United Nations Regional Commissions.

1.5: What conclusions can be drawn from the water and waste data already collected and housed in the Statistics Division's database?

28. Since well over 100 variables have been collected from more than 160 UN member states in ten completed collection cycles (with an eleventh cycle ongoing and a twelfth one planned to begin in 2024), an invaluable volume of data exists on water and waste within a database housed by the Statistics Division. Data sets such as long-term time series, long term proportions of one variable upon another (e.g. recycled waste upon collected waste; treated wastewater upon generated wastewater, etc.) and others can be easily generated for users. Biennial dissemination of mass data sets as Indicator Tables, Country Profiles and Country Snapshots has become a matter of routine for the Statistics Division. Due to the collaboration between countries, the Statistics Division and other key stakeholders, from which a significant volume of data being housed by the Statistics Division are readily accessible and essentially available on demand to key institutional users. Since there is such close collaboration between the Statistics Division and both OECD and Eurostat, the same data sets are readily available for UN member states who reply to the Joint OECD/Eurostat Questionnaire on the State of the Environment.^{15, 16} As such, a quasi-global aggregation of data for water and waste statistics collected by both questionnaires is available.

29. Tapering of counts of responses to variables currently occurs and is known to always have occurred. There are three main reasons for the tapering of counts of responses which are observable in Figures 1 to 6 below. Firstly, data has only been collected for the final two years in all figures (2020 and 2021) during one data collection cycle (the 2022 one); for the years 2018 and 2019, data has been collected in only two collection cycles (the 2022 and 2020 data collection cycles), so tapering of responses is less pronounced. For all preceding years, data have been collected in three or more cycles. Secondly, the 2022 data collection cycle is not yet complete. As more country responses are validated and finalized, the tapering in Figures 1 to 6 is expected to be less apparent. Thirdly, much of the work by countries to provide data to the 2020 data collection cycle took place during 2020 and 2021 when the COVID pandemic may have been influencing workflows. The 2020 data collection cycle did show a fall in response rates compared to the 2020 and 2018 collection cycles.

¹⁵ OECD, OECD.Stat, available at: <https://stats.oecd.org/> (accessed 14 February 2023).

¹⁶ Eurostat, Eurostat Database, available at: <https://ec.europa.eu/eurostat/data/database> (accessed 14 February 2023).

30. The Questionnaire and all of its associated metadata, theory and concepts existed well before the 2030 Agenda for Sustainable Development, and were put to the test by that Agenda. Thankfully, the 16 years of effort on this Questionnaire prior to 2015 (and even more years in the case of the Joint OECD/Eurostat Questionnaire on the State of the Environment) have been viewed as the state of the art for many international agencies concerned with custodian responsibility for various SDG indicators. Prior to this, the Questionnaire was also a valuable source of data during the period of the Millennium Development Goals.

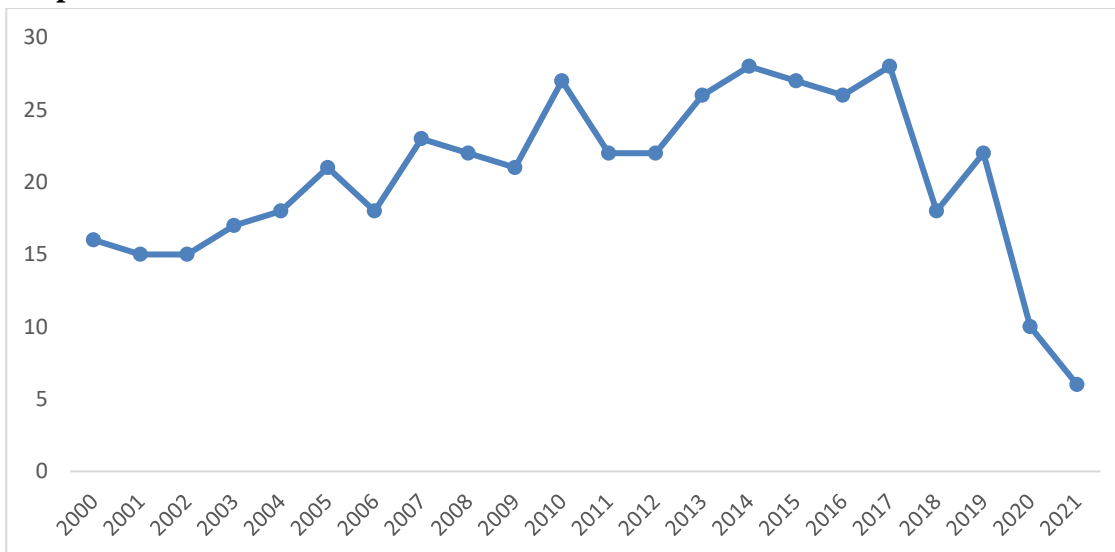
31. The Statistics Division must collaborate closely with key stakeholders (be they United Nations member states, other international organisations collecting data on water and waste, SDG indicator custodian agencies, etc.) who are concerned with the Questionnaire. Understanding the fine balance between countries' capability to supply data, and the demand for data from certain policy frameworks requires dialogue among these stakeholders and must be mindful of balancing respondent burden with policy demand.

32. Counts of responses by variable and year are provided in Annex I. Partial response rates (responses to individual variables) of 28 out of a possible 163, for example, in the case of Total Waste Generation in the year 2017, reveal the great need for capacity development within countries in the domain of environment statistics. The need for improved environment statistics compiled by countries is further demonstrated by the demands from international organisations and other key users who regularly approach the Statistics Division to investigate the possibility of adding or modifying the content of the Questionnaire, and who rely on the results of data collection for making better informed policies and decisions.

33. The data captured by the Questionnaire can be used to compile certain SDG indicators, but there are limitations to doing this due to unavailability of data, and the sporadic nature of existing data sets. A good example to demonstrate this is for compilation of SDG indicator 12.4.2. To be compiled, this indicator calls for just two variables from the Questionnaire: hazardous waste treated or disposed; and hazardous waste generated. Both are measured in tonnes and a proportion of treated or disposed upon generated can be compiled. However, due to data limitations, in any given year, data are typically only available for both variables for a limited number of countries. In this example, for the year 2017, 28 countries (out of 163 respondent countries) have data available.

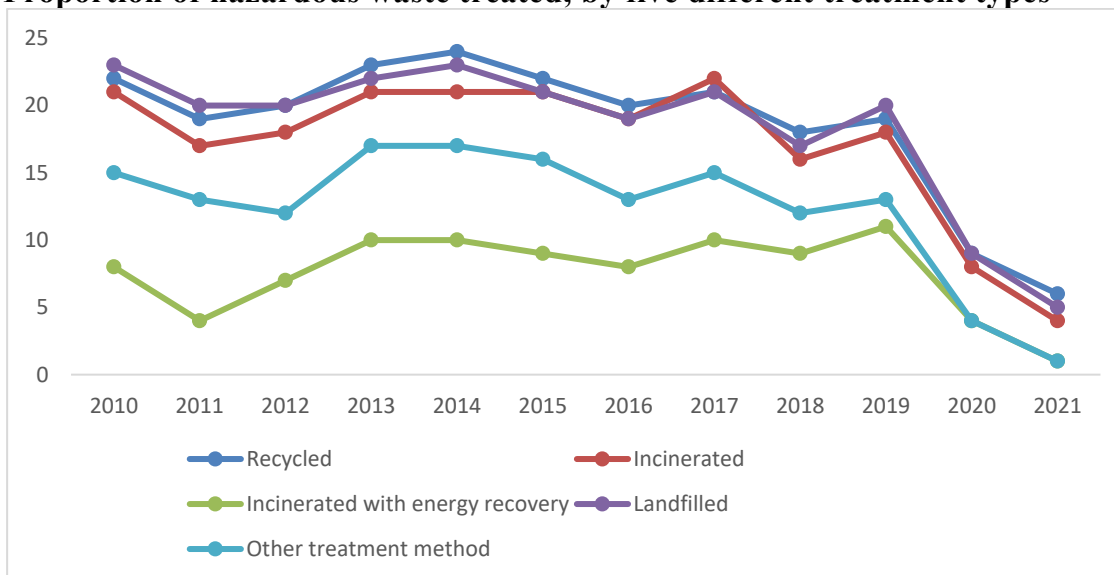
34. Figures 1 to 4 illustrate various scenarios for using Questionnaire data to compile SDG indicators 6.3.1, 12.4.2 and 12.5.1. In all four Figures, tapering is apparent and for a description of the reason behind this, refer to paragraph 29 above.

**Figure 1: Count of countries with data available to compile SDG indicator 12.4.2:
Proportion of hazardous waste treated**



35. Continuing with the example of SDG indicator 12.4.2, the policy demand also calls for hazardous waste treated by treatment type. Since the Questionnaire collects variables for hazardous waste (i) recycled, (ii) incinerated, (iii) incinerated with energy recovery, (iv) landfilled, and (v) other treatment, each of these five variables can serve as the numerator upon hazardous waste treated.

Figure 2: Count of countries with data available to compile SDG indicator 12.4.2: Proportion of hazardous waste treated, by five different treatment types



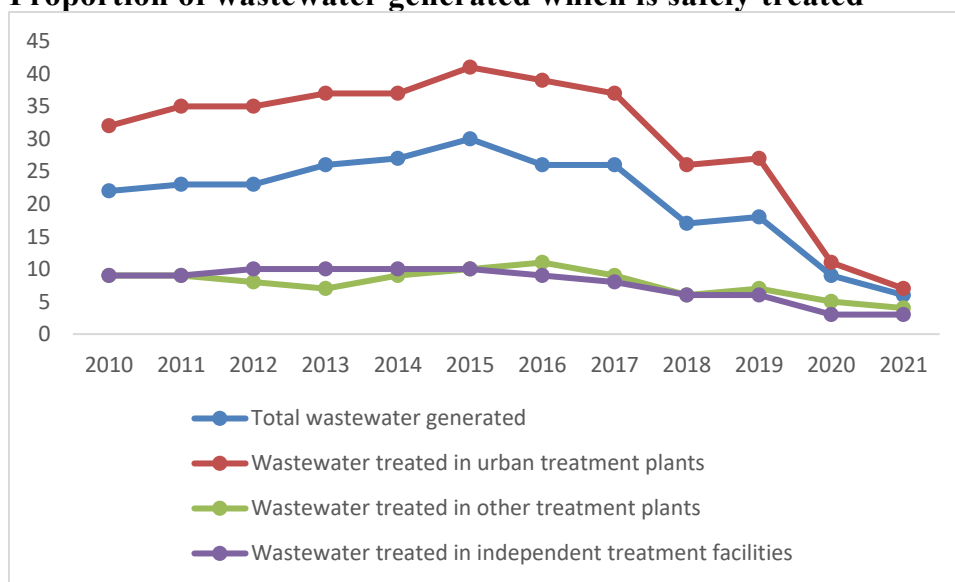
36. For all the time series presented in both Figures 1 and 2 above, two variables were required. However, other SDG indicators, such as, for example, SDG indicator 6.3.1 (proportion of domestic and industrial wastewater flows safely treated) requires four variables in order to be compiled. Strictly using country-owned data from the Questionnaire, all of the variables: (i) total wastewater generated, (ii) wastewater treated in urban wastewater treatment plants, (iii) wastewater treated in other treatment plants, and (iv) wastewater treated in independent treatment facilities are required. In such a case, the capability and supply of country data falls so far short of meeting SDG policy demand that SDG custodian agencies at international level (WHO, UN-HABITAT) may still use the country data, but then apply it to an estimation technique. From the Statistics Division’s standpoint, whenever such a practice occurs, effort is made to ensure correct citation of data sources and methodology used for any results being made public.

37. SDG 6.3.1 provides a good example of a case where country data fall short of meeting demand leading experts to consider alternative and proxy estimation techniques. Since SDG 6.3.1 requires data for four variables in a given year, satisfying such demand presents difficulties. For instance, in each of the years between 2010 and 2021, only between five and seven countries have provided sufficient data via the Questionnaire for indicator compilation. A significant cause for limitation is the requirement that data be provided for wastewater treated in independent facilities which is essentially a representation of those residing beyond a collection system who otherwise have their wastewater treated. If the

condition of requiring data for wastewater treated in independent facilities is not strictly followed, up to approximately 30 countries may be able to provide data in a given year. Whenever not strictly following such conditions when making data public, the Statistics Division is adamant about specifying the methodology being applied. This is important so as to avoid any misleading of publicly presented information to a user.

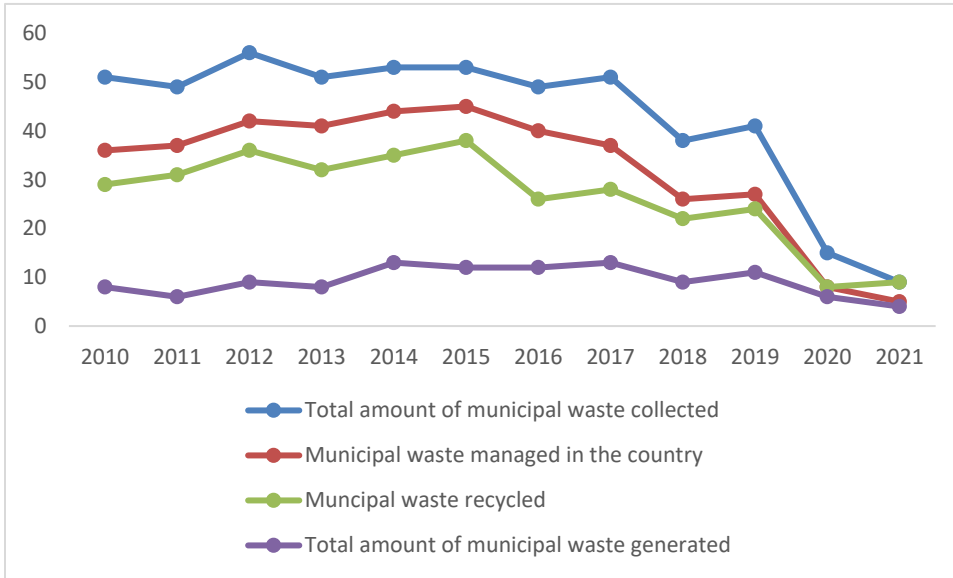
38. Figure 3 below provides a demonstration of the limitations to data availability for SDG indicator 6.3.1. It clearly demonstrates counts per relevant variable in each year. Beyond raising counts, of course, in order to compile SDG indicator 6.3.1, all four variables should be available for a given country in a given year. This additional condition explains why only between five and seven countries have provided data for all four variables for the years 2010 to 2021.

Figure 3: Count of countries with data available to compile SDG indicator 6.3.1: Proportion of wastewater generated which is safely treated



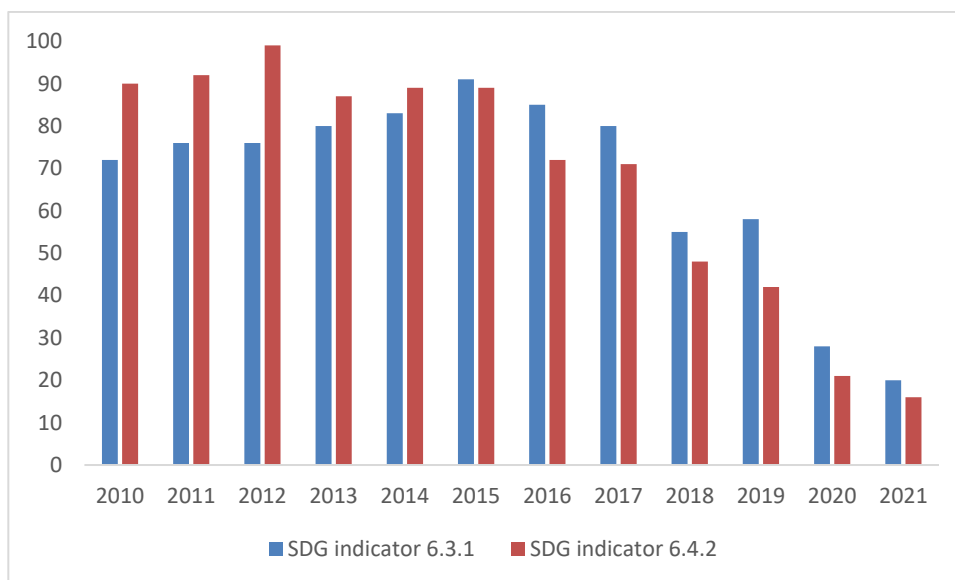
39. For SDG indicator 12.5.1 (national recycling rate), a proportion of municipal waste recycled upon municipal waste collected serves as a very good proxy. Such a proportion matches quite closely to the methodology specified in the SDG indicator metadata, and purely relies upon country-sourced data. Counts of responses for relevant variables collected via the Questionnaire are presented in Figure 4 below.

Figure 4: Count of countries with data available to compile SDG indicator 12.5.1: National recycling rate



40. To take an alternative perspective in viewing how well the Questionnaire is doing to meet SDG indicator demand, Figures 5 and 6 below attempt to demonstrate the volume of data collected from countries via the Questionnaire which apply to SDG indicator demand. The tapering effect which can also be observed in Figures 5 and 6 is explained in detail in paragraph 29 above.

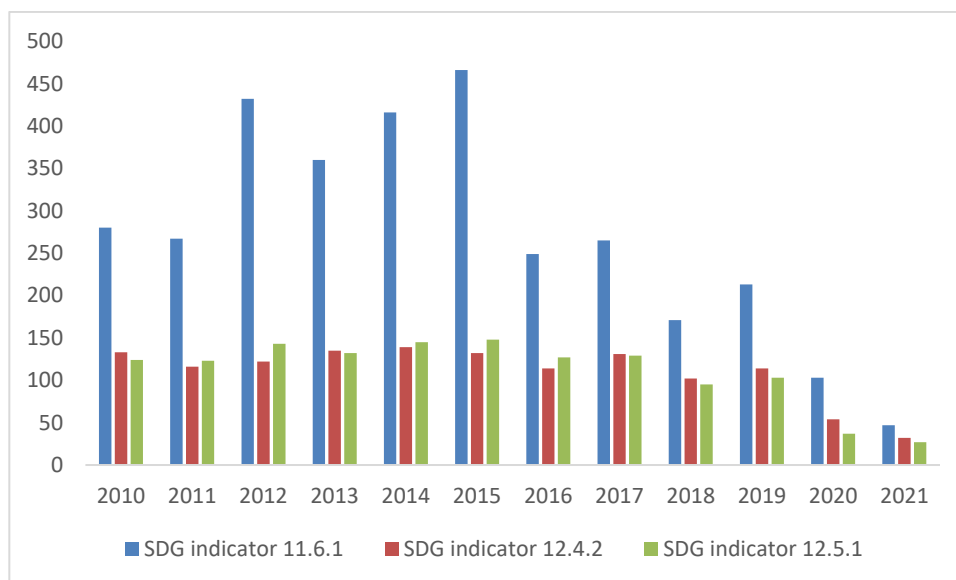
Figure 5: Count of responses for variables relevant to compile SDG indicators 6.3.1¹⁷ and 6.4.2¹⁸



¹⁷ For SDG indicator 6.3.1, numbers shown are summation of counts for the four variables: total wastewater generated, wastewater treated in urban wastewater treatment plants, wastewater treated in other treatment plants, and wastewater treated in independent treatment facilities

¹⁸ For SDG indicator 6.4.2, numbers shown are summation of counts for the two variables: gross freshwater abstracted, and renewable freshwater resources.

Figure 6: Count of responses for variables relevant to compile SDG indicators 11.6.1¹⁹, 12.4.2²⁰ and 12.5.1²¹



41. Observing the preceding figures, it is clear that a vast volume of country-owned data which is relevant to compilation of various SDG indicators is available. Throughout the era of the 2030 Agenda for Sustainable Development, the Questionnaire increases to receive attention from international agencies and institutional stakeholders. The Statistics Division will complete the 2022 cycle of data collection during 2023, and has plans to commence the 2024 cycle the following year.

¹⁹ For SDG indicator 11.6.1, numbers shown are summation of counts for the eight variables: total amount of municipal waste generated, total amount of municipal waste collected, amounts recycled, amounts composted, amounts incinerated, amounts incinerated with energy recovery, amounts landfilled, and amount landfilled in a controlled manner. All variables are collected at the city level, so countries have opportunity to provide data for multiple cities.

²⁰ For SDG indicator 12.4.2, numbers shown are summation of counts for the six variables: hazardous waste treated or disposed of during the year, hazardous waste recycled, hazardous waste incinerated, hazardous waste incinerated with energy recovery, hazardous waste landfilled, hazardous waste treated in another manner.

²¹ For SDG indicator 12.5.1, numbers shown are summation of counts for the four variables: total amount of municipal waste generated, total amount of municipal waste collected, municipal waste managed in the country, municipal waste recycled.

Annex I: Count of responses by variable and year to the UNSD/UNEP Questionnaire on Environment Statistics

1. Tables I.1 to I.11 show count of responses by variable and year. These are counts of the 152 variables that were collected in the 2022 data collection cycle. Most of those same variables were also collected in several previous collection cycles. The tables also demonstrate the tapering effect. Counts for figures in the years 2020 and 2021 are italicized to denote that they are counts from the 2022 data collection cycle which has not yet been completed.

Waste section

Table I.1: Count of responses by variable and year (Table R1: Generation of Waste by Source)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Agriculture, forestry and fishing (ISIC 01-03)	17	19	19	17	19	18	14	14	10	10	6	5
Mining and quarrying (ISIC 05-09)	13	14	16	12	18	17	15	17	13	13	7	6
Manufacturing (ISIC 10-33)	21	21	25	22	29	24	21	24	18	19	11	8
Electricity, gas, steam and air conditioning supply (ISIC 35)	12	12	14	10	17	15	14	17	12	12	6	5
Construction (ISIC 41-43)	21	25	26	23	25	22	18	22	14	14	9	8
Other economic activities excluding ISIC 38	22	24	25	22	28	24	20	20	15	15	8	6
Households	36	41	40	36	40	39	28	32	23	24	10	6
Total waste generation	34	35	36	35	35	33	27	28	22	23	9	8

Table I.2: Counts of responses by variable and year (Table R2: Management of Hazardous Waste)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Stock of hazardous waste at the beginning of the year	11	12	14	14	13	13	13	14	11	11	4	3
Hazardous waste generated during the year	36	35	35	38	41	38	36	41	29	31	14	8

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Hazardous waste imported during the year	25	25	27	25	26	23	19	20	17	21	8	5
Hazardous waste exported during the year	26	28	32	31	31	29	24	27	25	31	14	7
Hazardous waste treated or disposed of during the year	31	26	27	30	30	29	28	31	23	26	13	8
<i>Amounts going to:</i>												
Recycling	24	23	23	27	28	27	22	24	20	21	11	8
Incineration	24	22	23	24	24	24	20	25	17	19	9	5
<i>of which: with energy recovery</i>	10	5	9	10	10	9	8	10	9	11	4	1
Landfilling	26	25	25	26	28	26	22	25	20	23	12	8
Other, please specify in the footnote	18	15	15	18	19	17	14	16	13	14	5	2
Stock of hazardous waste at the end of the year	16	15	18	16	17	16	15	16	11	11	4	3

Table I.3: Count of responses by variable and year (Table R3: Management of Municipal Waste)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total amount of municipal waste generated	8	6	9	8	13	12	12	13	9	11	6	4
Municipal waste collected from households	29	31	36	34	37	37	28	28	19	21	6	4
Municipal waste collected from other origins	24	24	28	28	27	25	21	20	13	16	5	4
Total amount of municipal waste collected	51	49	56	51	53	53	49	51	38	41	15	9
Municipal waste imported for treatment/disposal	17	15	19	18	19	19	18	17	12	13	6	3
Municipal waste exported for treatment/disposal	16	14	17	15	17	16	15	14	9	11	7	4
Municipal waste managed in the country	36	37	42	41	44	45	40	37	26	27	8	5
<i>Amounts going to:</i>												
Recycling	29	31	36	32	35	38	26	28	22	24	8	9
Composting	21	23	30	26	27	29	19	17	15	16	7	7

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Incineration	25	25	29	27	27	30	22	22	15	16	7	6
<i>of which: with energy recovery</i>	20	20	23	22	21	21	16	15	13	14	5	5
Landfilling	41	40	48	43	46	50	41	43	32	33	13	11
<i>of which: controlled landfilling</i>	32	31	34	34	37	40	31	29	22	23	9	7
Other, please specify in the footnote	15	17	21	21	23	22	18	17	13	13	6	5
Total population served by municipal waste collection	36	38	40	39	40	43	35	36	25	29	12	10
Urban population served by municipal waste collection	22	23	25	25	29	27	27	30	18	22	8	7
Rural population served by municipal waste collection	17	19	19	21	24	23	19	21	13	16	5	4

Table I.4: Count of responses by variable and year (Table R4: Composition of Municipal Waste)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Paper, paperboard	23	21	23	17	26	28	19	23	12	14	5	3
Textiles	20	18	21	15	21	24	17	18	12	13	5	3
Plastics	22	20	22	17	26	28	19	22	12	14	5	3
Glass	22	21	23	17	26	28	19	21	12	14	5	3
Metals	23	21	23	18	26	29	19	22	12	14	5	3
Other inorganic material	22	19	22	16	22	27	18	21	11	13	5	3
Organic material	22	18	21	16	24	27	18	21	12	14	5	3
<i>of which: food and garden waste</i>	6	6	5	3	4	9	4	6	3	6	3	2

Table I.5: Count of responses by variable and year (Table R5: Management of Municipal Waste – City Data)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total population of the city	107	109	143	125	135	132	93	105	57	63	27	11

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total amount of municipal waste generated	8	6	9	6	20	21	25	27	10	17	10	5
Percentage of city population served by municipal waste collection	56	42	70	55	64	65	32	45	26	35	18	5
Municipal waste collected from households	61	67	84	75	91	94	52	59	31	36	9	4
Municipal waste collected from other origins	34	38	54	47	50	51	30	33	19	25	6	4
Total amount of municipal waste collected	80	80	113	89	103	109	69	75	59	68	33	8
Amounts going to:												
Recycling	25	24	46	38	44	53	23	27	12	17	7	7
Composting	23	19	40	33	42	49	18	17	7	12	5	5
Incineration	22	21	41	34	34	42	19	23	12	15	7	4
of which: with energy recovery	18	15	35	29	29	35	14	14	7	9	2	2
Landfilling	62	59	85	74	84	90	46	50	35	40	20	11
of which: controlled landfilling	42	43	63	57	60	67	35	32	29	35	19	5
Other: please specify in footnote	11	12	30	25	24	29	10	10	6	12	7	4

Table I.6: Count of responses by variable and year (Table R6: E-Waste Electronic Waste Generation and Collection)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total e-waste generated	9	9	11	11	11	11	11	14	6	7	2	3
Large equipment generated	3	3	4	4	4	4	5	6	3	3	1	1
Screens, monitors and equipment containing screens generated	2	2	3	3	3	3	3	4	2	2	1	1
Temperature exchange equipment generated	2	2	3	3	3	3	3	4	2	2	1	1
Small e-waste generated	3	3	3	3	3	3	4	4	3	3	1	0
Lamps generated	3	3	3	3	3	3	4	4	3	3	0	0
Small equipment generated	3	3	4	4	4	4	5	5	4	4	1	1

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Small IT and telecommunications equipment generated	1	1	1	1	1	1	2	2	1	1	0	0
Total e-waste collected	6	6	7	8	11	11	12	15	9	10	8	5
Large equipment collected	0	0	0	0	0	0	0	4	5	4	4	2
Screens, monitors and equipment containing screens collected	0	0	0	0	0	0	0	4	4	3	3	1
Temperature exchange equipment collected	0	0	0	0	0	0	0	4	5	4	5	3
Small e-waste collected	0	0	0	0	0	0	0	4	5	4	4	1
Lamps collected	0	0	0	0	0	0	0	4	5	4	4	2
Small equipment collected	0	0	0	0	0	0	0	0	0	0	0	1
Small IT and telecommunications equipment collected	0	0	0	0	0	0	0	0	1	1	1	2

Water section

Table I.7: Count of responses by variable and year (Table W1: Renewable Freshwater Resources)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Precipitation	66	69	70	64	62	64	55	51	38	35	15	12
Actual evapotranspiration	34	34	34	32	32	33	28	28	19	19	8	6
Internal flow	33	34	34	32	33	34	29	28	20	19	10	7
Inflow of surface and groundwaters from neighbouring countries	32	32	34	30	30	31	22	21	17	16	8	6
Renewable freshwater resources	33	33	34	29	30	30	25	26	18	17	9	7
Outflow of surface and groundwaters to neighbouring countries	20	21	20	20	19	20	13	13	9	8	3	2
<i>Of which:</i>												
Secured by treaties	11	12	12	13	13	14	9	9	4	4	1	1
Not secured by treaties	11	11	11	12	12	13	9	9	3	3	1	1
Outflow of surface and groundwaters to the sea	11	13	12	13	13	14	10	11	7	6	3	2

Table I.8: Count of responses by variable and year (Table W2: Freshwater Abstraction and Use)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fresh surface water abstracted	55	55	59	58	59	60	47	43	29	24	15	12
Fresh groundwater abstracted	52	52	55	55	56	57	46	43	27	23	13	11
Gross freshwater abstracted	57	59	65	58	59	59	47	45	30	25	12	9
Water returned without use	1	1	1	1	1	1	2	1	2	2	2	1
Net freshwater abstracted	6	6	7	7	7	7	9	8	8	7	4	3
<i>of which abstracted by:</i>												
Water supply industry (ISIC 36)	37	35	41	43	43	44	38	38	25	21	12	9
Households	22	21	23	23	26	26	20	17	9	8	6	4
Agriculture, forestry and fishing (ISIC 01-03)	27	27	32	31	32	32	27	26	22	19	11	9
<i>Of which for: Irrigation in agriculture</i>	12	12	12	12	11	13	14	13	8	8	4	3
Mining and quarrying (ISIC 05-09)	7	7	7	7	9	9	11	14	11	9	5	4
Manufacturing (ISIC 10-33)	29	29	33	31	31	31	25	26	19	17	11	9
Electricity, gas, steam and air conditioning supply (ISIC 35)	10	10	11	11	11	13	15	15	10	9	6	5
Construction (ISIC 41-43)	5	5	5	5	6	7	8	12	7	7	3	3
Other economic activities	11	11	12	11	14	14	16	19	14	11	6	5
Desalinated water	33	31	32	32	31	33	21	18	13	13	7	6
Reused water	28	28	30	28	27	27	17	17	13	13	8	5
Imports of water	30	30	30	27	25	26	15	14	8	8	6	6
Exports of water	25	25	25	21	18	19	13	12	7	7	5	6
Total freshwater available for use	40	39	40	35	35	37	29	27	18	16	9	8
Losses during transport	39	38	40	34	34	35	28	25	18	15	7	7
Total freshwater use	40	39	40	35	35	37	29	27	18	16	9	8
<i>of which used by:</i>												
Households	49	47	49	49	51	49	37	34	22	19	9	6
Agriculture, forestry and fishing (ISIC 01-03)	40	37	40	38	41	39	33	28	21	19	10	8

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>of which for</i> Irrigation in agriculture	27	27	28	27	27	26	21	19	12	12	7	6
Mining and quarrying (ISIC 05-09)	6	6	6	7	8	9	10	9	7	7	3	3
Manufacturing (ISIC 10-33)	42	43	45	43	44	42	35	30	23	21	11	8
Electricity, gas, steam and air conditioning supply (ISIC 35)	9	9	9	9	11	13	12	12	9	8	4	4
<i>of which for:</i> Electric power generation, transmission and distribution (ISIC 351)	22	24	26	24	25	26	22	19	14	13	7	6
Construction (ISIC 41- 43)	5	5	5	5	6	7	7	8	6	6	3	3
Other economic activities	11	11	12	14	17	18	17	17	13	11	4	4

Table I.9: Count of responses by variable and year (Table W3: Water Supply Industry (ISIC 36))

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Gross freshwater supplied by water supply industry (ISIC 36)	57	59	65	58	59	59	47	45	30	25	12	9
Losses during transport by ISIC 36	46	48	53	47	48	48	36	34	24	18	9	8
Net freshwater supplied by water supply industry (ISIC 36)	52	54	58	52	55	53	41	40	26	19	8	7
<i>of which supplied to:</i>												
Households	46	48	53	50	51	52	41	40	27	24	11	9
Agriculture, forestry and fishing (ISIC 01- 03)	20	23	26	27	26	25	19	19	11	9	4	4
Mining and quarrying (ISIC 05-09)	5	7	7	7	7	7	8	9	3	2	0	0
Manufacturing (ISIC 10-33)	25	31	33	32	31	30	25	23	14	11	4	4
Electricity, gas, steam and air conditioning supply (ISIC 35)	5	6	6	6	6	6	6	8	4	2	1	1

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>of which to:</i> Electric power generation, transmission and distribution (ISIC 351)	15	16	18	18	18	17	14	12	5	3	1	1
Construction (ISIC 41-43)	3	5	5	5	5	5	5	6	2	1	0	0
Other economic activities	9	12	13	14	17	17	16	17	11	9	4	4
Total population supplied by water supply industry (ISIC 36)	42	43	45	39	39	40	32	32	26	25	7	8
Urban population supplied by water supply industry (ISIC 36)	32	27	32	32	31	34	26	28	20	19	6	7
Rural population supplied by water supply industry (ISIC 36)	25	20	25	23	23	26	23	23	17	16	5	6

Table I.10: Count of responses by variable and year (Table W4: Wastewater Generation and Treatment)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total wastewater generated	22	23	23	26	27	30	26	26	17	18	9	6
by:												
Agriculture, forestry and fishing (ISIC 01-03)	12	11	12	12	12	15	10	9	5	5	3	3
Mining and quarrying (ISIC 05-09)	4	4	4	4	4	4	4	5	4	4	2	2
Manufacturing (ISIC 10-33)	12	13	15	15	16	17	12	12	5	5	3	3
Electricity, gas, steam and air conditioning supply (ISIC 35)	5	5	5	4	4	4	4	5	4	4	2	2
<i>of which to:</i> Electric power generation, transmission and distribution (ISIC 351)	9	9	9	9	9	9	6	6	5	5	2	2
Construction (ISIC 41-43)	4	4	5	5	5	5	5	6	3	4	1	1
Other economic activities	5	4	6	7	7	7	8	7	3	4	1	1
Households	15	16	16	16	18	21	16	15	6	9	4	3

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Wastewater treated in urban wastewater treatment plants	32	35	35	37	37	41	39	37	26	27	11	7
<i>Of which:</i>												
Primary treatment	19	20	21	22	23	26	23	21	15	17	7	4
Secondary treatment	20	22	21	22	23	27	23	21	13	17	8	5
Tertiary treatment	16	17	16	17	17	18	15	15	10	13	6	4
Wastewater treated in other treatment plants	9	9	8	7	9	10	11	9	6	7	5	4
<i>Of which:</i>												
Primary treatment	8	8	7	6	7	7	7	7	4	5	4	3
Secondary treatment	8	8	7	5	6	6	7	6	3	5	4	3
Tertiary treatment	7	7	7	6	6	6	5	5	2	3	3	3
Wastewater treated in independent treatment facilities	9	9	10	10	10	10	9	8	6	6	3	3
Non-treated wastewater	21	23	22	24	25	27	22	21	15	16	6	4
Sewage sludge production (dry matter)	17	17	19	20	21	22	17	17	10	10	3	1

Table I.11: Count of responses by variable and year (Table W5: Population Connected to Wastewater Treatment)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Population connected to wastewater collecting system	39	39	42	36	38	41	37	37	25	26	9	8
Population connected to wastewater treatment	33	32	33	31	32	35	33	34	24	24	8	7
<i>of which at least secondary treatment</i>	19	20	18	19	21	23	18	19	15	16	6	5
Population with independent wastewater treatment (e.g., septic tanks)	27	31	29	26	30	31	25	26	18	20	5	5
Population not connected to wastewater treatment	22	24	23	22	28	30	25	26	16	19	6	5