Goal: 6
Target: 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
Indicator: 6.3.2 Proportion of bodies of water with good ambient water quality

Institutional information

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UN Environment (United Nations Environment Programme)

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Concepts and definitions

Definition:
The indicator is defined as the proportion of water bodies in the country that have good ambient water quality. Ambient water quality refers to natural, untreated water in rivers, lakes and groundwaters and represents a combination of natural influences together with the impacts of all anthropogenic activities. The indicator relies on water quality data derived from in situ measurements and the analysis of samples collected from surface and groundwaters. Water quality is assessed by means of core physical and chemical parameters that reflect natural water quality related to climatological and geological factors, together with major impacts on water quality. The continuous monitoring of all surface and groundwaters is economically unfeasible and not required to sufficiently characterize the status of ambient water quality in a country. Therefore, countries select river, lake and groundwater bodies that are representative and significant for the assessment and management of water quality to monitor and report on indicator 6.3.2. The quality status of individual water bodies is classified based on the compliance of the available water quality monitoring data for the core parameters with target values defined by the country. The indicator is computed as the proportion of the number of water bodies classified as having good quality (i.e. with at least 80 % compliance) to the total number of assessed water bodies, expressed as a percentage.

Rationale:
Good ambient water quality is essential for protecting aquatic ecosystems and the services they provide, including: the preservation of biodiversity; the protection of human health during recreational use and through the provision of drinking water; the support of human nutrition through the provision of fish and water for irrigation; the enabling of a variety of economic activities; and the strengthening of the resilience of people against water-related disasters. Good ambient water quality is therefore closely linked to the achievement of many other Sustainable Development Goals.

Target 6.3 aims at improving water quality and indicator 6.3.2 provides a mechanism for determining whether, and to which extent, water quality management measures are contributing to the improvement of water quality over time. The indicator is also directly linked to indicator 6.3.1 on wastewater treatment because inadequate wastewater treatment leads to degradation in quality of the waters receiving the wastewater effluents. It directly informs progress towards target 6.3 and is strongly linked to target 6.6 on water-related ecosystems, as well as target 14.1 on marine pollution (coastal eutrophication).

The methodology recognises that countries have different capacity levels to monitor water quality, with many developed countries operating extensive and complex programmes that collect and report data to existing reporting frameworks beyond the scope of this methodology. For these countries it is recognised that this methodology will not contribute to improving their water quality; however it must be sufficiently flexible to capture data from existing monitoring frameworks without burdening countries with additional reporting obligations. Conversely, many of the least developed countries currently do not monitor water quality or operate very limited monitoring programmes. The methodology must therefore allow these countries to contribute to the global indicator, according to their national capacity and available resources.

The development of the methodology builds on best practice for water quality monitoring promoted by the UN Environment GEMS/Water programme since 1978 together with testing by several pilot countries during the Integrated Monitoring Initiative Proof of Concept phase of 2016, and external review by experts and international organizations. This led to revision of the original methodology, which was then further tested through the 2017 global data drive. The feedback received has contributed to the present refined methodology.

Concepts:

The concepts and definitions used in the methodology have been based on existing international frameworks and glossaries (WMO 2012) unless where indicated otherwise below.

Aquifer: Geological formation capable of storing, transmitting and yielding exploitable quantities of water.

Classification of water quality: If at least 80% of the monitoring values for prescribed parameters in a water body comply with their respective target values, the water body is classified as having a “good” water quality status**.** Each water body is classified as being of “good” or “not good” status.

Groundwater: Subsurface water occupying the saturated zone.

Groundwater body: A distinct volume of groundwater within an aquifer or aquifers (EU 2000). Groundwater bodies that cross river basin district (RBD) boundaries should be divided at the boundary with each separate portion of the groundwater body being reported separately along with its respective RBD.

Lake: Inland body of standing surface water of significant extent.

Non-point-source pollution: Pollution of water bodies from dispersed sources such as fertilizers, chemicals and pesticides used in agricultural activities.

Parameter: Water quality variable or characteristic of water quality, also called a determinand.

Point source pollution: Pollution with a precisely located origin.

Pollution (of water): Introduction into water of any undesirable substance which renders the water unfit for its intended use.

Pollutant: Substance which disrupts and interferes with the equilibrium of a water system and impairs the suitability of using the water for a desired purpose.

Reservoir: Body of water, either natural or man-made, used for storage, regulation and control of water resources.

River: Large stream which serves as the natural drainage for a basin.

River basin: Geographical area having a common outlet for its surface runoff.

River basin district: Area of land, made up of one or more neighbouring river basins together with their associated groundwaters (EU, 2000).

River water body: A coherent section of a river that is discrete (does not overlap with another water body) and is significant rather than arbitrarily designated.

Stream: Flowing body of water in a natural surface channel.

Surface water: Water which flows over, or lies on, the ground surface. Note: Indicator 6.3.2 does not include the monitoring of water quality in wetlands under monitoring level 1.

Target value: A value (or range) for any given water quality parameter that indicates the threshold for a designated water quality, such as good water quality rather than acceptable water quality.

Toxic substance: Chemical substance which can disturb the physiological functions of humans, animals and plants.

Transboundary waters: Surface or ground waters which mark, cross or are located on boundaries between two or more States; wherever transboundary waters flow directly into the sea, these transboundary waters end at a straight line across their respective mouths between points on the low-water line of the banks (UNECE, 1992).

Water quality index: The measured water quality results for all parameters combined into a numeric value for each monitoring location. These scores are then aggregated over the time of the assessment period. The index score can range between zero (worst) to 100 (best).

Comments and limitations:

The monitoring and reporting of SDG Indicator 6.3.2 requires considerable national financial and human capacities to regularly measure water quality parameters at sufficient spatial and temporal resolutions, and to consistently collect, quality-assure and process the monitoring data to compute the indicator. Substantial investments in monitoring and data management infrastructures, as well as targeted capacity development in water quality monitoring programme design and operation, will be required in many countries to enhance national capacities to regularly and consistently report on the indicator.

Recognizing the differences in monitoring and data processing capacities among countries, the indicator methodology offers a progressive monitoring approach allowing countries to start with reporting based on their existing capacity and progressively enhance the data coverage and indicator significance with increasing capacity.

Level 1 monitoring includes a set of general, easily measurable, physico-chemical water quality parameters that can indicate water quality degradation. They can be used to assess the quality status of water bodies, facilitating global comparability and maintaining a balance between the significance of the indicator and the monitoring requirements for each country.
Level 2 monitoring allows countries with enhanced capacities to include additional water quality parameters, such as toxic substances and biological monitoring, as well as more sophisticated quality classification schemes to assess and report on the quality of their water bodies more accurately.

Methodology

Computation Method:
The indicator is computed by first classifying all assessed water bodies based on the compliance of the monitoring data collected for selected parameters at monitoring locations within the water body with parameter-specific target values:

$$C_{wq} = \frac{n_c}{n_m} \times 100$$

Where

C_{wq} is the percentage compliance [%];
n_c is the number of monitoring values in compliance with the target values;
n_m is the total number of monitoring values.

A threshold value of 80% compliance is defined to classify water bodies as “good” quality. Thus, a body of water is classified as having a good quality status if at least 80% of all monitoring data from all monitoring stations within the water body are in compliance with the respective targets.

In a second step, the classification results are used to compute the indicator as the proportion of the number of water bodies classified as having a good quality status to the total number of classified water bodies expressed in percentage:

$$WBGQ = \frac{n_g}{n_t} \times 100$$

Where

$WBGQ$ is the percentage of water bodies classified as having a good quality status;
n_g is the number of classified water bodies classified as having a good quality status;
n_t is the total number of monitored and classified water bodies.

Disaggregation:
The indicator can be disaggregated by water body type (river, lake, groundwater) and river basin district. This disaggregated data can support informed decision-making at the national and sub-national scale to monitor and improve water quality management measures.

Treatment of missing values:

- At country level

Missing values are not imputed.

- At regional and global levels

Missing values are not imputed.

Regional aggregates:
http://pre-uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf.

Sources of discrepancies:
Not applicable as no internationally estimated data is used to impute.

Data Sources

Description:
The recommended sources of data are water quality monitoring data derived from in situ measurements and the analysis of samples collected from surface and groundwaters in national or sub-national ambient water quality monitoring programmes implemented by governmental authorities. Additional water quality monitoring data from research or citizen-science monitoring programmes can be used to supplement the available authoritative monitoring data, provided they are authorised by the national reporting agency.

The number of monitoring locations required to determine the quality status of a water body depends on the type and size of the water body, but a minimum of one monitoring location per water body is required. The minimum data requirements for calculating this indicator are measurements for all of the recommended or alternative core parameters appropriate to the type of water body as defined in the methodology.

Measurements should be taken routinely, at prescribed intervals, or the same time of year each year, from the same locations. Even if new monitoring stations are introduced, data should continue to be collected from the original locations. This ensures that results are comparable between reports, thereby enabling trends to be established over time. The monitoring data needed for the indicator computation may be collected by different monitoring programmes involving different agencies and organizations. It is therefore important to establish and maintain centralized data repositories at the national level that collate the data from the various stakeholders, ensuring compatibility in reporting units between all agencies submitting data. Data should be compiled for each core parameter at each sampling location in order to calculate the indicator.

Collection process:
The data will be collected by UN Environment and its Global Environment Monitoring System for Water (GEMS/Water) through electronic reporting in the global water quality information system GEMStat. At the national level, data reports will be provided by the GEMS/Water National Focal Points or any other official counterpart appointed by the respective government. GEMS/Water offers consultation and support in selecting and compiling the required monitoring data, defining suitable river basin districts and delineating water bodies, as well as computing the indicator, upon request through its helpdesk. Data reported by the countries will be checked for consistency with respect to the monitoring parameters, target values and spatial units and compared with monitoring data available in GEMStat, if applicable.

Data Availability

Description:

An initial baseline data collection has been conducted in 2017 with 48 country data submissions as of February 2018.

Time series:

The reporting on this indicator will follow a 5-year cycle.

- Initial baseline data collection completed in 2017; First reporting cycle in 2020: data collected from 2015 to 2019; Second reporting cycle in 2025: data collected from 2020 to 2024; Third reporting cycle in 2030: data collected from 2025 to 2029.

Calendar

Data collection:

1. First reporting cycle: 2020;
2. Second reporting cycle: 2025;
3. Third reporting cycle: 2030.

Data release:

1. First reporting cycle: June 2021;
2. Second reporting cycle: June 2026;
3. Third reporting cycle: June 2031.

Data providers

1. GEMS/Water National Focal Points in relevant Ministries, Water Authorities, etc. or their nominated representative.

Data compilers

1. UN Environment (United Nations Environment Programme)

References

URL: http://www.sdg6monitoring.org/indicators/target-63/indicators632/

References:

EU (European Parliament, Council of the European Union) 2000. Water Framework Directive (WFD) 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, Official Journal L327, 1–72. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

UNECE 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Available at: http://www.unece.org/fileadmin/DAM/env/water/pdf/watercon.pdf

WMO 2012 *International Glossary of Hydrology.* No. 385 World Meteorological Organization and United Nations Educational, Scientific and Cultural Organization. Available at: http://library.wmo.int/pmb_ged/wmo_385-2012.pdf

Related indicators

Indicators 6.3.1, 6.6.1, 14.1.1