Progress on Ambient Water Quality

Mid-term status of SDG Indicator 6.3.2 and acceleration needs, with a special focus on Health

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Presenting the UN-Water Integrated Monitoring Initiative for SDG 6

Through the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6), the United Nations seeks to support countries in monitoring water- and sanitation-related issues within the framework of the 2030 Agenda for Sustainable Development, and in compiling country data to report on global progress towards SDG 6.

IMI-SDG6 brings together the United Nations organizations that are formally mandated to compile country data on the SDG 6 global indicators, and builds on ongoing efforts such as the World Health Organization (WHO)/United Nations Children's Fund (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), the Global Environment Monitoring System for Freshwater (GEMS/Water), the Food and Agriculture Organization of the United Nations (FAO) Global Information System on Water and Agriculture (AQUASTAT) and the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS).

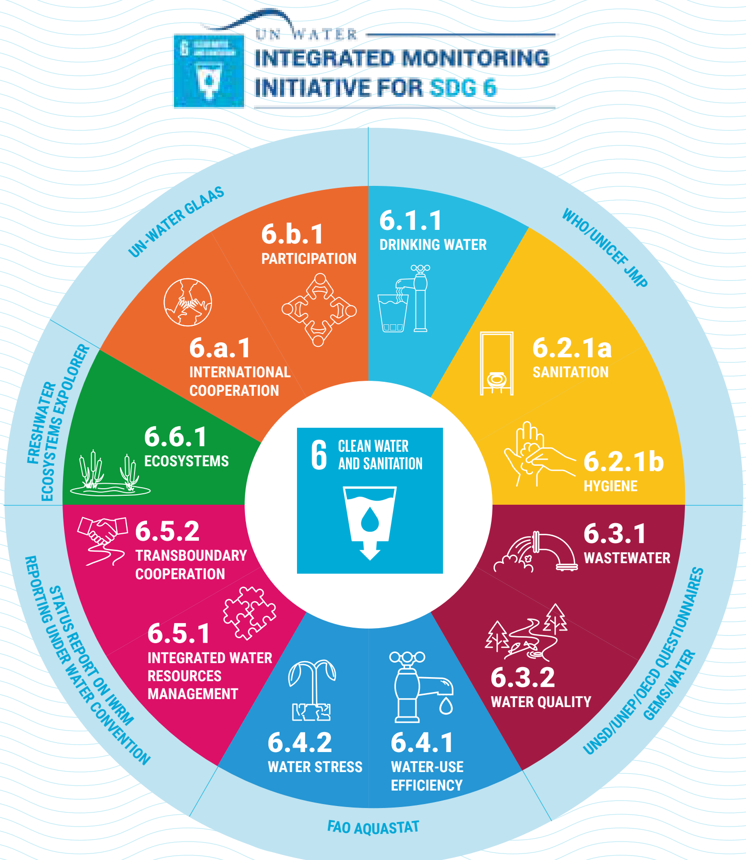
This joint effort enables synergies to be created across United Nations organizations and methodologies and requests for data to be harmonized, leading to more efficient outreach and a reduced reporting burden. At the national level, IMI-SDG6 also promotes intersectoral collaboration and consolidation of existing capacities and data across organizations.

The overarching goal of IMI-SDG6 is to accelerate the achievement of SDG 6 by increasing the availability of high-quality data for evidence-based policymaking, regulations, planning and investments at all levels. More specifically, IMI-SDG6 aims to support countries to collect, analyse and report SDG 6 data, and to support policymakers and decision makers at all levels to use these data.

- Learn more about SDG 6 monitoring and reporting and the support available: http://www.sdg6monitoring.org

- Read the latest SDG 6 progress reports, for the whole goal and by indicator: https://www.unwater.org/publication_categories/sdg6-progress-reports/

- Explore the latest SDG 6 data at the global, regional and national levels: http://www.sdg6data.org



INDICATORS	CUSTODIANS
6.1.1 Proportion of population using safely managed drinking water services	WHO, UNICEF
6.2.1 Proportion of population using (a) safely managed sanitation services, and (b) a handwashing facility with soap and water	WHO, UNICEF
6.3.1 Proportion of domestic and industrial wastewater flows safely treated	WHO, UN-Habitat, UNSD
6.3.2 Proportion of bodies of water with good ambient water quality	UNEP
6.4.1 Change in water-use efficiency over time	FAO
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	FAO
6.5.1 Degree of integrated water resources management	UNEP
6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	UNECE, UNESCO
6.6.1 Change in the extent of water-related ecosystems over time	UNEP, Ramsar
6.a.1 Amount of water and sanitation-related official development assistance that is part of a government-coordinated spending plan	WHO, OECD
6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	WHO, OECD

UN-Water Foreword

We stand at a critical juncture. At the midpoint of the United Nations 2030 Agenda for Sustainable Development, we risk failing to meet the promise of SDG 6 – to ensure the availability and sustainable management of water and sanitation for all.

The 2024 series of indicator reports, published by the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6), depict a crisis with profound repercussions for many other SDGs, particularly those related to poverty, food, health, education, gender equality, sustainability and environmental integrity.

Billions of people worldwide are still living without access to safely managed drinking water and sanitation services. Water pollution levels are alarmingly high. Inefficient water use practices are common. Water scarcity is a growing problem. Degradation of water-related ecosystems continues unabated. Governance and transboundary cooperation on water resources are too weak, and every continent suffers the impacts of inadequate investment in water and sanitation infrastructure.

Despite concerted efforts and global commitments, we are compelled to acknowledge that progress so far has been insufficient to meet all eight targets of SDG 6. In some regions and countries, for some indicators, progress is even reversing.

However, over the past year, the UN-Water family has come together to develop a response that aims to accelerate progress through a more holistic and integrated approach.

After the UN 2023 Water Conference, in response to the high ambitions set by Member States, UN-Water released the Blueprint for Acceleration: SDG 6 Synthesis Report on Water and Sanitation 2023, which identifies two crucial needs: for Member States to develop a UN political process for water and for the UN system to better unify its water-related efforts to support Member States.

On the first, Member States adopted a resolution that, among other things, established two future UN water conferences – one in 2026 and one in 2028.

On the second, the resolution requested of the UN Secretary-General to present a United Nations system-wide water and sanitation strategy in consultation with Member States. The Secretary-General looked to UN-Water, under my leadership, to assist with this.

The strategy will be presented in July 2024: the middle of a year that marks a pivotal moment in our collective journey towards achieving SDG 6. It is time to redouble our efforts, recalibrate our strategies, and mobilize resources to make good on our commitments to global society and the future of our planet.

We face unprecedented challenges, but we now have unprecedented tools and political momentum. The data and insight gathered by the IMI-SDG6 must guide our prioritization of efforts and investments to the areas of greatest need, ensuring no one is left behind.

Thank you for your unwavering dedication to this vital cause.

Alvaro Lario,
President of the International Fund for Agricultural Development (IFAD) and Chair of UN-Water

UNEP Foreword

Water is vital to human and planetary health and the internationally agreed goals that back it, including the 2030 Agenda for Sustainable Development, the Kunming-Montreal Global Biodiversity Framework, the Sendai Framework and the Paris Agreement. Yet the triple planetary crisis – the crisis of climate change, nature and biodiversity loss and pollution and waste – is affecting the availability, distribution, quality and quantity of water.

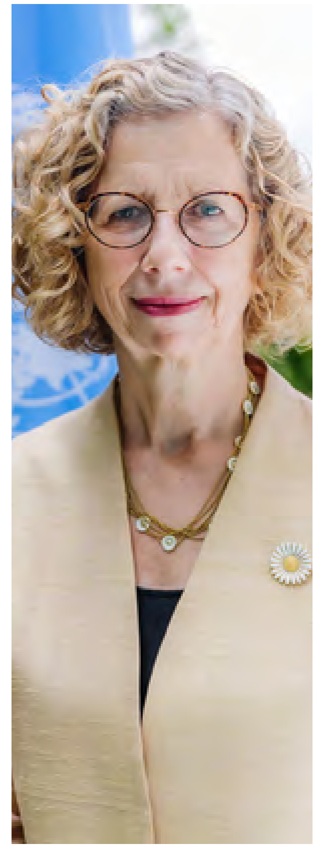
Sustainable Development Goal (SDG) 6 on water and sanitation for all is alarmingly off-track. About two billion people lack access to safe drinking water, while roughly half of the world's population experiences severe water scarcity for at least part of the year. The human rights to water and sanitation and to a clean and healthy environment are not being delivered. Climate change and population growth are expected to worsen the situation. Data indicates that the health and livelihoods of 4.8 billion people could be at risk by 2030 if water quality and monitoring is not improved.

Countries are taking positive steps. Following the 2023 UN Water Conference, countries and partners have secured over 800 commitments on water. Member States passed the UNEA 6 Resolution on Water, which aims to accelerate the achievement of SDG 6. Some 45 countries and the European Union have joined the Freshwater Challenge, which backs the restoration of 300,000 km of degraded rivers and 350 million hectares of degraded wetlands by 2030. But we must do more.

The key to increased ambition and action is decision-making based on accurate and timely data. This is where the SDG 6 indicators come in. UNEP has been working with Member States over the past three years to provide data for this series of reports on the three indicators for which the organization is custodian – water quality, integrated water resources management and changes to freshwater ecosystems.

UNEP's analysis of water-related ecosystem data shows that half of countries have one or more freshwater ecosystem type in degradation. River flow has significantly decreased in 402 river basins, a fivefold increase from 15 years ago. Surface water bodies are shrinking or being lost in 364 basins. Droughts, floods and water scarcity are impacting more people. There is ineffective revenue-raising to turn water laws, policies and plans on integrated water resources management into practice in 60 per cent of reporting countries.

While this is, of course, bad news, it does at least tell nations where to direct efforts to manage water resources and freshwater ecosystems better. Data matters, and countries are supplying more of it than ever. Some 120 countries reported on the water quality indicator in 2023 – significantly more than in 2020. Citizen science-generated data is also now being used. But we still need to fill critical gaps, because when we show that integrated water management bolsters other development objectives, we can secure political will, adequate resources and real progress on SDG 6.



Inger Andersen,
Under-Secretary-General
of the United Nations and
Executive Director of UNEP

Executive summary

This report presents the latest results and findings from the 2023 data drive for SDG Indicator 6.3.2 on ambient water quality, and provides key messages on water quality monitoring and assessment and highlights acceleration needs.

Indicator 6.3.2 is the proportion of water bodies with good ambient water quality, compared to national or subnational standards. The indicator is based on measurements of five water quality parameters that provide information on the most prevalent pressures on water quality at the global level and, over time, indicates whether efforts to "improve water quality" by 2030 are on track.

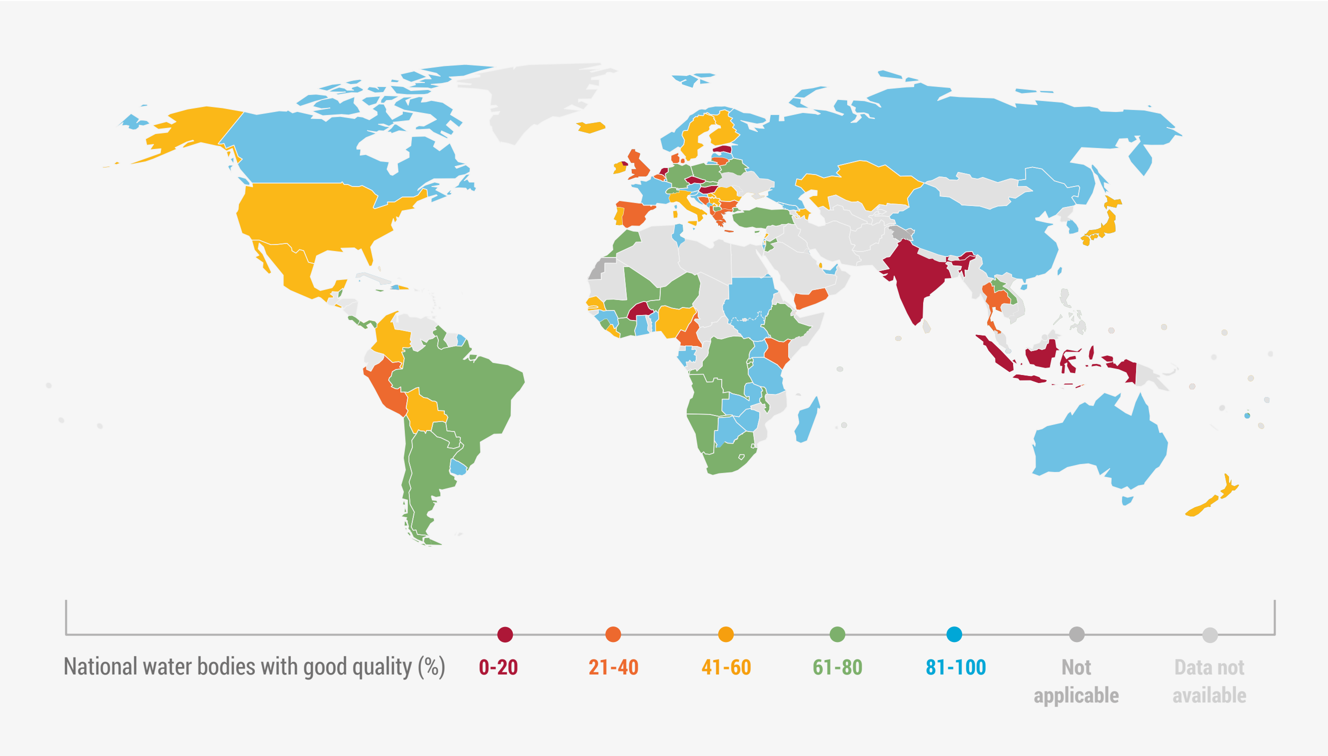
Freshwater is of undeniable importance in supporting human and ecosystem health, but the quality of the source water is often undervalued or neglected. Water quality falls on a spectrum according to whether a river is a healthy, life-sustaining ecosystem or whether it has more in common with an open sewer; whether a lake can provide essential ecosystem services or is a dead zone emitting greenhouse gases; or whether an aquifer is a source of essential water for people and ecosystems or a source of disease for its users. Unless we fully recognize the interlinkages of water quality across sectors, it will be impossible to leverage the synergies between protecting and restoring water quality and advancing many other ambitions in relation to health, social, economic, agricultural or fisheries objectives.

Key messages

In 2023, 120 countries reported on this indicator, which is a significant increase from the 89 that reported in 2020. This increased engagement is a positive sign, but the new information further highlights the pressing need for many low- and middle-income countries to strengthen their monitoring capacity so that progress towards Target 6.3 can be made clear.

Countries' indicator scores differ in the way they are calculated. Differences include the proportion of the country monitored, the parameters used and which types of water body are covered, the suitability of the classification method used and, most notably, the volume of data used. This important insight can be used to create a capacity development road map to improve water quality monitoring and assessment and to better understand water quality status and trends.

By 2030, the health and livelihoods of 4.8 billion people could be at risk if current water quality monitoring is not improved. Action is needed on water quality and its assessment by regular monitoring. However, data collection and



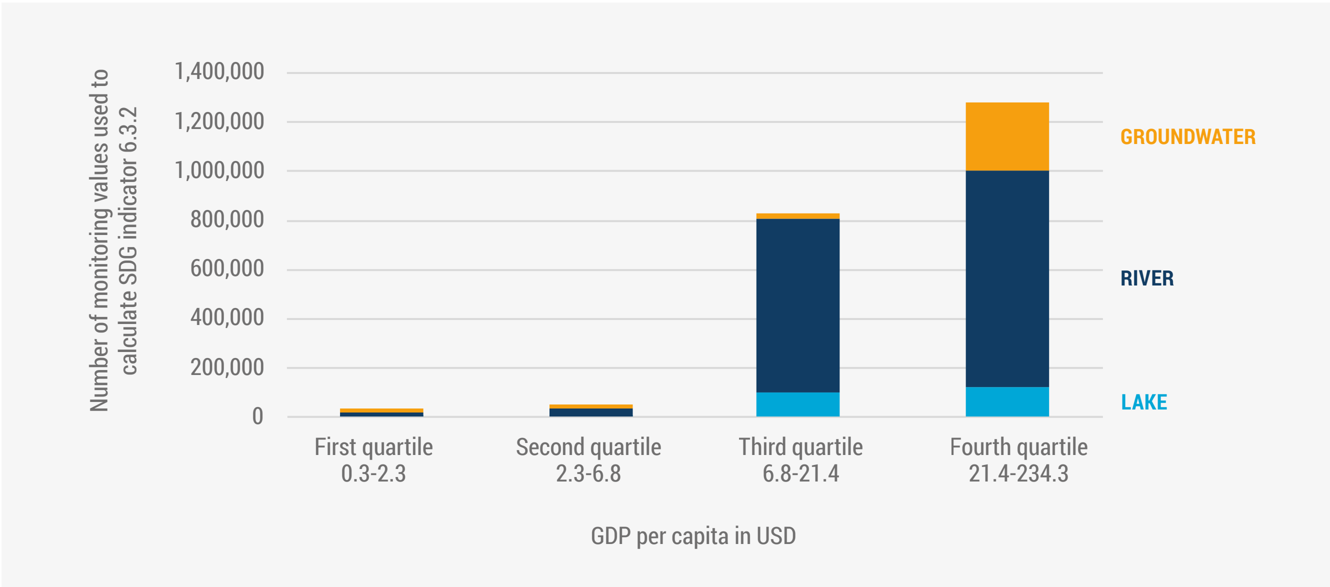
Map of national SDG Indicator 6.3.2 scores from 120 countries, showing the proportion of water bodies with good ambient water quality.

reporting on basic water quality parameters is beyond the capacity of many low-and lower middle-income countries. In 2023, over 2 million water quality measurements were used to report on this indicator, but the countries that represent the lowest-income half of the world contributed less than 3 per cent of this total (60,000).

The chart below shows the number of monitoring values used to calculate SDG Indicator 6.3.2. Each bar represents the total number of monitoring values used by countries categorized by GDP per capita quartiles – Q1 countries being the lowest income and Q4 the highest. Q1 and Q2 countries together reported only 62,623 measurements. This is a large number but only 2.9 per cent of the global total of 2,147,657.

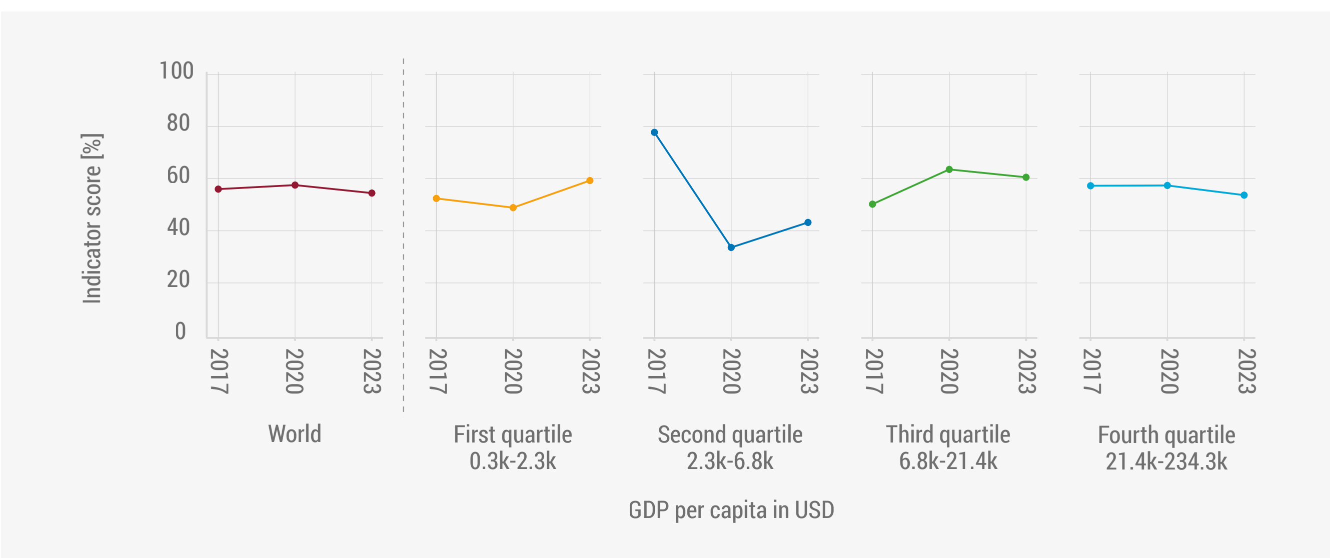
This chart also makes clear the need to strengthen lake and groundwater monitoring as a priority, especially in low-income countries. Considering the vital importance of these water body types for the provision of ecosystem services and climate mitigation, their value needs to be recognized through improved monitoring, assessment and management. The lowest income half of the world reported using fewer than 4,500 lake water quality measurements from a total of nearly a quarter of a million.

Where we have good data, this indicator shows that water quality is degrading. Where data are limited, we simply do not know – but the signs are not promising.



Number of measurements reported by water body type and partitioned by GDP per capita category.

Each line in the figure below shows the change in the proportion of water bodies classified as "good" for those countries that reported for all three reporting years. Countries are grouped by GDP per capita quartiles – Q1 countries are the lowest income and Q4 the highest. Water quality tends to change slowly and indicator scores should reflect this, with marginal changes between reporting years. Indicator scores that change erratically suggest that there have been changes in the monitoring programme or in the indicator calculation method rather than in the water quality. Only more data, and better use of these data, can help us to understand water quality status and trends and to track progress towards SDG Target 6.3.



Progress of indicator scores for countries partitioned by GDP per capita category.

Note: Only countries that reported for all reporting periods are included.

Major data gaps exist across many countries that have the greatest exposure to climate, biodiversity and pollution impacts. Water quality information is needed urgently if policies to mitigate and adapt to these challenges are to be effective.

Health is directly and indirectly linked to water quality, yet countries with low capacity to monitor and assess their freshwaters are unprepared to understand the impacts from human activities on their freshwaters and the subsequent effects on health. Many of the same countries that lack the capacity to monitor their freshwaters are predicted to be most influenced by, and the least resilient to, climate change-related water impacts such as droughts and floods. These countries are also predicted to experience the greatest population growth (with associated wastewater generation, urbanization and agricultural intensification). Prioritizing water quality monitoring in these countries, will help to better understand health risks.

For the first time, citizen science data have been used for national SDG 6 reporting. To improve data coverage, Sierra Leone and Zambia combined citizen-generated data with national monitoring data to report on ambient water quality. This work is part of several pilot projects that aim to normalize the use of citizen science data for SDG 6 reporting.

Citizen science (CS) has yet to realize its potential to contribute to SDG 6. UNEP and its partners are working on multiple fronts to address this through the World Water Quality Alliance (WWQA) Workstream on CS for SDG indicator 6.3.2. This SDG indicator serves as an ideal platform for catalysing these efforts and ensuring that everyone has a voice when it comes to SDGs.

The implementation of Indicator 6.3.2 identifies capacity gaps and builds strong relationships between member states and UNEP and its partners. This helps to ensure that the necessary capacity development is targeted and delivered where it will be most effective. Data management is a weak link in the water quality monitoring and assessment chain that is addressed by the support provided by UNEP GEMS/Water.

Many countries are struggling with data management, which goes beyond the water quality sector. This is the main reason for the renewed emphasis on providing data management support for water quality monitoring and reporting: to significantly improve the availability of water quality data for policy-making.

Key recommendations

Many agencies tasked with monitoring and assessing their freshwaters lack the capacity to do so – this needs to change. We call upon:

- governments to fund routine and regular monitoring programmes for rivers, lakes and groundwaters – check how much data was used to calculate your country's indicator score at https://sdg632hub.org/ and consider whether this is sufficient to protect national water resources;
- citizens to collect and share water quality data – contact us at SDG632@un.org to find out how you can contribute to global water quality data collection; and,

- private sector organizations, academic institutions and public utilities to share data collected through compliance monitoring and research projects: consider sharing your data through the UNEP global water quality database at https://gemstat.org/.

Collected data are often underused. We call on national monitoring authorities:

- to assess their capacity to utilize existing water quality data and identify capacity development actions to improve data management practices;
- to review their data management procedures and consider adopting open data-sharing policies; and,
- to review their data requirements, data use and data redundancy and to develop an action plan to ensure that freshwater resource management is optimized given the available resources.

Summary and way forward

Monitoring alone will not solve the water quality crisis, but it is an essential prerequisite for informed decision-making. At the midpoint of the SDG cycle, through implementation of this indicator, we better understand the challenges faced by national authorities tasked with monitoring and assessing freshwater quality and the extent and type of data gaps that need to be filled.

This indicator has made a significant contribution to understanding the scale of the challenge faced. Important progress has been made in addressing monitoring and reporting deficits, through improved and targeted capacity development and support for the production of SDG-ready data.

This indicator provides a basis for tracking the efficacy of protection and restoration efforts and progress towards SDG Target 6.3 – Improve water quality. Whether or not this progress is being made can only be known through robust collection and assessment of water quality data.

Context

This section provides context and relevance for this SDG indicator within the broader SDG framework.

The United Nations Environment Programme (UNEP) is the custodian agency for Sustainable Development Goal (SDG) Indicator 6.3.2 and the UNEP Global Environment Monitoring System for Freshwater (GEMS/Water) is the implementing programme. All SDG 6 indicators are coordinated by UN-Water under the Integrated Monitoring Initiative for SDG 6 (IMI-SDG6). Indicator 6.3.2 is one of two indicators for 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".*

The importance of this indicator extends beyond its associated target to many other SDGs that rely, directly or indirectly, on good ambient water quality. The information provided by Indicator 6.3.2 is relevant to decisions on many other SDGs, including hunger (SDG 2), health (SDG 3), increasing access to energy (SDG 7), promoting sustainable tourism and industrialization (SDGs 8 and 9), marine pollution (SDG 14) and terrestrial biodiversity (SDG 15).

Indicator 6.3.2 is the proportion of water bodies with good ambient water quality, compared with national or subnational standards. The indicator is based on measurements of five water quality parameters that provide information on the most prevalent pressures on water quality at the global level. It indicates whether efforts to "improve water quality" by 2030 are on track.

The data generated by this indicator will help policy-makers to understand where to prioritize protection and restoration efforts and inform them regarding the efficacy of existing measures.

Introduction

This section highlights the major pressures on our freshwaters and explains why early warning is essential to help mitigate and adapt to the challenges posed. It also describes the multiple impacts on health, biodiversity and climate and the interlinkages between these impacts.

Freshwater is of undeniable importance in supporting human and ecosystem health, but the quality of the source water is often undervalued or neglected. Water quality falls on a spectrum according to whether a river is a healthy, life-sustaining ecosystem or whether it has more in common with an open sewer; whether a lake can provide essential ecosystem services or is a dead zone emitting greenhouse gases; or whether an aquifer is a source of essential water for people and ecosystems or a source of disease for its users. Unless we fully recognize the interlinkages of water quality across sectors, it will be impossible to leverage the synergies between protecting and restoring water quality and advancing many other ambitions in relation to health, social, economic, agricultural or fisheries objectives.

Investments in ecosystem restoration, including freshwater ecosystems, provide a return of between 8 and 38 times in economic value depending on the ecosystem targeted (European Commission 2022). This huge return comes from the value associated with the ecosystem services that support food security, ecosystem and climate resilience and mitigation, as well as health. This makes sense when you consider that estimates of the economic value of water reach trillions of dollars per year. The World Wildlife Fund (WWF) estimates that the total quantifiable economic value of water is around $58 trillion per year – equivalent to the combined GDPs of the United States, China, Japan, Germany and India (WWF 2023). Going beyond financial analyses and considering the people behind the numbers, the cost of inaction to improve water quality is felt most severely by the estimated 122 million people around the world who directly drink untreated and potentially unsafe surface water (World Health Organisation *et al.* 2022) and who are consequently exposed to major health risks. Going further and considering the capacity of existing infrastructure, water quality treatment capacity is being exceeded due to degrading source water, ageing infrastructure and climate change. This means that the number of people at risk is far greater than this figure.

Agricultural activities and wastewater effluents are the two main stressors affecting the quality of freshwater quality globally. Despite this information long being known, global phosphorus and nitrogen pollution from these sources has approximately doubled during the last century (Beusen *et al.* 2016) and is expected to double again by 2050 (Mogollón *et al.* 2018). Excess phosphorus and nitrogen destabilizes freshwater ecosystems. This can create dead zones downstream, cause mass fish mortality, species loss and reduced biodiversity, as well as enabling invasive species to spread and increasing methane emissions. But agricultural activities and wastewater effluents have other consequences too: they introduce excess sediment, pathogens, pesticides, pharmaceuticals, heavy metals, microplastics and other toxic compounds.

Awareness of the need for action on water is growing. In 2023, the United Nations Water Conference adopted the Water Action Agenda,[1] including over 700 voluntary commitments to accelerate action on water. More recently, the 2024 United Nations Environment Assembly (UNEA-6) resolution on *Effective and inclusive solutions for strengthening water policies to achieve sustainable development in the context of climate change, biodiversity loss and pollution* (UNEP/EA.6/L.13[2]) makes clear that collection of water quality data needs to be enhanced and used for evidence-based decision-making and informed water resource management. Also, in 2022, the United Nations General Assembly adopted a resolution recognizing access to a clean, safe and sustainable environment as a fundamental human right (A/RES/76/300[3]). Although United Nations Member States have committed to providing all people with access to safe, clean drinking water and sanitation, as well as access to a clean, safe and sustainable environment, as basic human rights, there is often insufficient data available to check whether or not these rights are being upheld, especially in low-and middle income countries. Water quality data are also needed to track progress within the Kunming-Montreal Global Biodiversity

1 https://www.unwater.org/news/summary-proceedings-un-2023-water-conference.

2 https://www.unep.org/environmentassembly/unea6/outcomes.

3 https://undocs.org/Home/Mobile?FinalSymbol=A%2FRES%2F76%2F300&Language=E&DeviceType=Desktop&LangRequested=False.

Framework (GBF), now commonly known as The Biodiversity Plan. In particular, Target 2 on ecosystem restoration and Target 7 on reducing pollution and nutrients cannot be tracked unless countries have effective water quality monitoring and assessment programmes.

Where data are available, the evidence suggests that freshwater bodies are facing a crisis and their ability to sustain the pressure we put on them is being substantially exceeded. One of the greatest challenges we face at global level is that of understanding the extent of this crisis and reducing uncertainty, so that we can better predict where the impacts will be felt most severely and understand how effective our protection and restoration efforts are. Without this information we are gambling with the health and livelihoods of the most vulnerable. We cannot monitor our way out of the water quality crisis facing our freshwater bodies, but it is an essential prerequisite for informed decision-making.

Early warning for the environment

Early warning is essential to minimize the risk of disasters resulting from the triple planetary crisis of climate change, pollution and biodiversity loss and their interlinkages and cascading effects. For those risks related to water quality, we are ill prepared to do so. Given the evidence of declining water quality globally, we are no longer talking about tomorrow's problem. For many, the health and livelihood-related water quality impacts are here today.

Where robust water quality data are available, they show that water quality is generally degrading, but where data are limited, we simply do not know. This means that in many countries, water quality is changing due to anthropogenic stressors, yet we understand neither the extent nor the rate. As well as the linear degradation that these stressors cause, some water bodies, especially shallow lakes, can suffer from sudden negative changes driven by excess nutrient pollution. How close these ecological tipping points are is unknown and much work is needed to better understand their effects and how best to avoid them (Lenton *et al.* 2023). Once they have been passed, the services provided by freshwater ecosystems fail and restoration measures are ineffective or, at best, more difficult to implement. Nutrient pollution is the most pervasive of stressors and when added to all of the others to which water bodies are exposed greatly increases the likelihood that degradation will occur more rapidly and be more difficult to reverse (Hessen *et al.* 2024).

Since the late 1970s, the UNEP GEMS/Water Programme has been working on establishing a global ambient water quality evidence base by supporting countries in implementing water quality monitoring programmes and by collecting the resulting monitoring data (Chapman *et al.* 2022). Currently, the global water quality database, GEMStat[4], contains about 30 million records from more than 20,000 monitoring locations in almost 100 countries but large gaps remain even for basic water quality parameters, such as those used in Indicator 6.3.2 reporting. Despite the efforts of GEMS/Water over the last 40-plus years, many countries still face major challenges in effectively monitoring, assessing and reporting on the state of their freshwater resources.

The fact that data are available does not always mean that they are effectively used, but it remains an essential prerequisite for informed action. A major concern is that the countries that lack the capacity to monitor and assess their freshwaters are often located in low- and mid-latitude regions where the impacts of climate change are predicted to be most severe (Intergovernmental Panel on Climate Change 2022). Overlaying the predictions for economic and population growth, recent research suggests that sub-Saharan Africa will increasingly become the dominant hotspot for surface water pollution (Jones *et al.* 2023). There is therefore a strong case for strengthening water quality information in this region but, as this report makes clear, strengthening water quality early warning capacity should be prioritized in all world regions.

Water scarcity is already a significant problem for many, yet when predictions for water quality degradation are overlaid on scarcity, this issue intensifies. A recent study estimated that the number of sub-basins with water

4 https://gemstat.org/

scarcity will triple by 2050 due to nitrogen pollution, meaning that three billion more people may potentially face water scarcity in 2050 than the figure for quantity-based scarcity alone (Wang *et al.* 2024). This same study highlights that many of the new hotspots will develop in sub-Saharan Africa, where ambient water quality monitoring is insufficient to fully understand these risks, and will be driven by agricultural intensification and population growth.

Water quality and health

Partitioning the impacts of poor water quality in terms of health, biodiversity and climate serves as a useful approach to draw attention to specific problems, but water quality is ultimately linked to all three (Figure 1). This introduces complexity to potential solutions and highlights the need to employ an integrated approach, but this in turn has the consequence that measures designed to protect and improve our freshwaters will have benefits that reach far beyond the local water body and may potentially be global (Downing *et al.* 2021).

Direct contamination of drinking water sources with pathogens or toxic compounds is both prevalent and widespread. Globally, in 2019, water pollution was responsible for 1.4 million premature deaths (Fuller *et al.* 2022), with women and children being disproportionately affected. Poor water quality and scarcity due to climate change increase the burden on women, affecting their health, time and opportunities for education and employment.[5] With 122 million people relying on untreated surface drinking water sources globally in 2022 (WHO *et al.* 2022), this high number is unsurprising. But, due to the nature of water, although most pollution remains near the local source, or at least within the river basin, there is growing evidence that pollutants travel long distances through the food chain and have direct health impacts in other countries, since producers and consumers are connected over great distances (Gall *et al.* 2015). The contamination of exported food poses a threat to global food safety.

This contamination is a consequence of polluted water being used for food production and the pollutants accumulating in the food, for example the contamination of cocoa beans with cadmium (Maddela *et al.* 2020). Gender plays a significant role in how water quality issues impact communities. Women often bear primary responsibility for water collection and management in many parts of the world, making them more vulnerable to water quality issues. Gender-sensitive approaches are necessary to ensure equitable access to clean water and participation in water management.

Globally, the impacts of mining pollution are widespread and accelerating. They are estimated to date back 7,000 years (Grattan *et al.* 2016) and with the continuing inadequate management of mine waste, they are projected to put at risk around 23 million people who are living in contaminated areas (Macklin *et al.* 2023). Following the failure of the Mariana dam in Minas Gerais, Brazil, in 2015, in which 19 people lost their lives, numerous others have had their health affected in the aftermath. More than eight years after the dam failure, heavy metal contamination of the sediments remains a health risk because the metals can be remobilized by human activity or extreme weather events (Kütter *et al.* 2023). This example serves as a warning highlighting the downstream effects of such catastrophic pollution events and the need to assess water quality for both environmental and health impacts (Brito *et al.* 2021), but the incremental effects of poor mine waste management should also not go unmonitored.

This report includes a special focus (pages 31 to 34) on the interlinkages between water quality and health, with an emphasis on supporting and aligning with the One Health Joint Plan of Action (FAO, UNEP, WHO, & WOAH 2022).

5 Water and Gender | UN-Water (unwater.org).

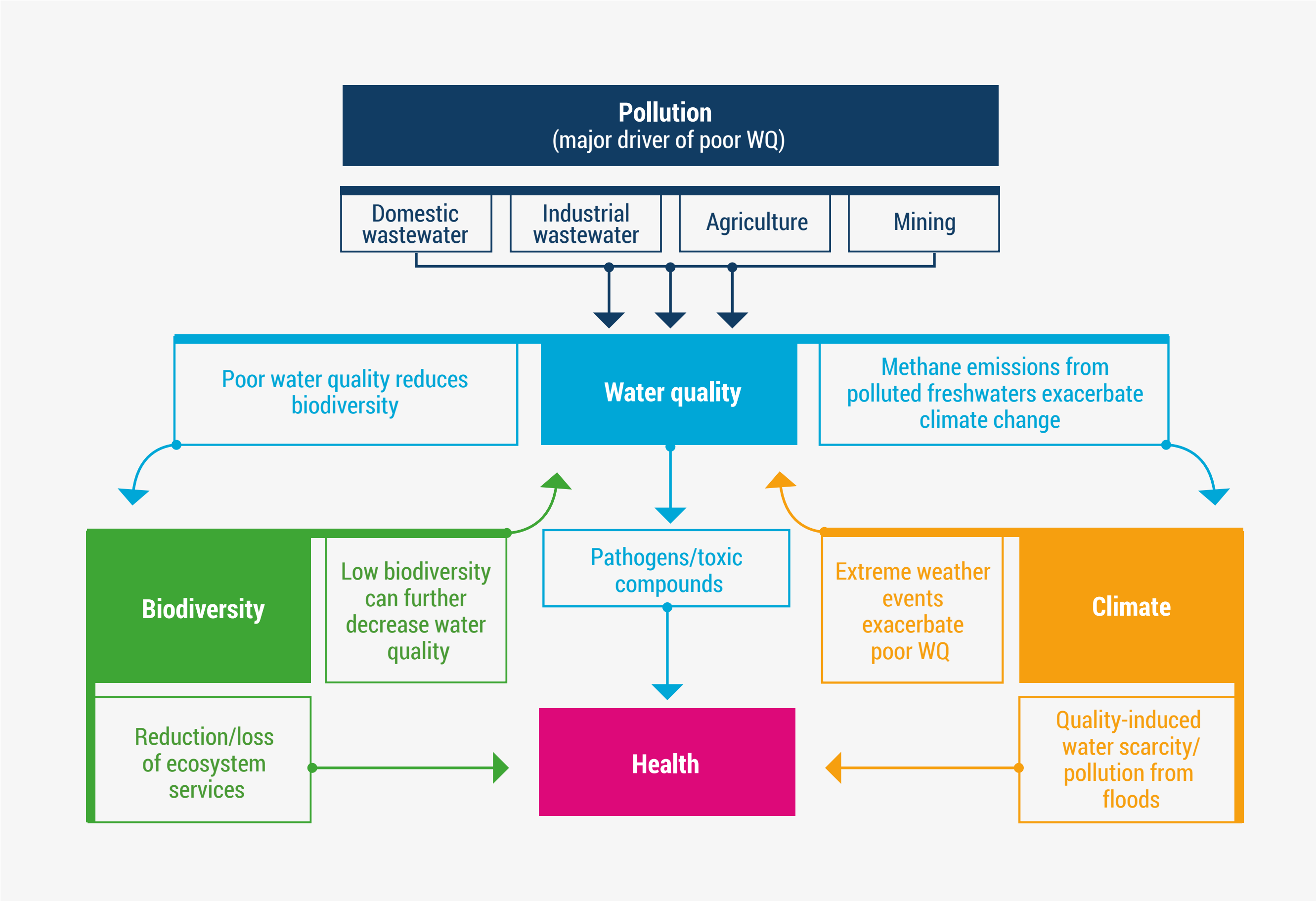


Figure 1: Schematic of water quality linkages to the triple planetary crisis and health.

Water quality and biodiversity

It is clear that there is a widespread deterioration of freshwater ecosystems. The loss of freshwater biodiversity is outpacing that of terrestrial and marine ecosystems. The latest WWF Living Planet Report reveals a devastating 69 per cent decline in wildlife populations in less than an average human lifetime, with freshwater species populations suffering an 83 per cent loss since 1970 (WWF 2022). This decline in freshwater biodiversity is having a major impact on the ecosystem services we rely on. With a focus on lakes, this situation and actions to address it were outlined in the recent white paper Embedding lakes into the global sustainability agenda (WWQA 2023), which called for "international policy makers to consider a new sustainable approach to lake management, with ecosystem protection and restoration at its core". It proposed four actions to reach this ambitious target:

1. Build capacity in monitoring and assessment;
2. Embed lake management into national policies;
3. Foster green finance partnerships; and,
4. Raise global awareness of the benefits of change.

The white paper recognizes the complexity of the solutions needed to bring about change, but also makes clear that many of the pieces needed for the necessary coordinated international response to reverse degradation and loss and promote ecological restoration are already in place.

Water quality and climate

In addition to the prevailing problems associated with pollution, habitat destruction and fragmentation, over abstraction of water and intensive land use practices, climate change and the associated extreme weather events of droughts and floods pose serious challenges for water quality. Linkages between water quality and climate change are bidirectional – climate change-driven floods and droughts can impact water quality, while polluted water bodies release greater quantities of the powerful greenhouse gas methane into the atmosphere (Rosentreter *et al.* 2021), thereby forming a positive feedback loop (Lenton *et al.* 2023).

Current estimates suggest that half of global methane emissions come from freshwater ecosystem sources (Rosentreter *et al.* 2021), including significant amounts from rivers and streams (Rocher-Ros *et al.* 2023) but with most coming from lake ecosystems (Sanches *et al.* 2019). And with global temperature increases, this proportion is expected to rise further (Zhu *et al.* 2020). Lakes also play an important role in global climate processes by circulating terrestrial carbon back to the atmosphere as greenhouse gases and will likely provide substantial feedback contributing to climate change (Andersen *et al.* 2023).

Droughts and heatwaves result in low-flow conditions in rivers and streams and can lead to increased concentrations of point-source pollutants, increased temperature, algae, salinity and low levels of dissolved oxygen (van Vliet *et al.* 2023). Conversely, rainstorms and floods can mobilize pollutants from areas in the catchment that were previously hydrologically unconnected and can transport plastics, suspended solids, adsorbed metals, nutrients and other pollutants from agricultural and urban runoff into rivers and lakes (Walter *et al.* 2000). These peak flow hydrological conditions are rarely monitored adequately, with most monitoring programmes relying on normal base flow conditions. This results in significant undercalculation of pollutant loads (the actual amount of pollutant being transported).

Monitoring ambient water quality

This section provides an overview of the Indicator 6.3.2 methodology.

There are many types of water quality monitoring programmes with different objectives, but the requirements for reporting under Indicator 6.3.2 should include water quality data that are collected over a wide spatial scale and in a consistent and regular manner. Aggregating data from such a programme will help to answer questions about water quality at different spatial scales and over time, such as "where is our water quality improving or degrading?".

Various monitoring methods may be used, each designed to address specific information gaps. Indicator 6.3.2 uses methods that focus on the physico-chemical characteristics of water that change in response to pressures that are globally relevant. These are nutrient enrichment, oxygen depletion, salinization and acidification (Table 1).

In addition to these basic water quality parameters, there are many other parameters and monitoring approaches that are often used routinely and which go beyond the basic parameter groups listed in Table 1. These additional parameters and approaches are covered in Figure 2, which is included to provide flexibility to include information that may be of national concern or relevance. Level 2 reporting is an optional workflow additional

Table 1: Suggested parameters for Level 1 parameter groups (in bold), the relevant water body types and reasons for their inclusion in the global indicator.

PARAMETER GROUP	PARAMETER	RIVER	LAKE	GROUNDWATER	REASON FOR INCLUSION
Oxygen	**Dissolved oxygen**	•	•		Measures oxygen depletion
	Biological oxygen demand, Chemical oxygen demand	•			Measures organic pollution
Salinity	**Electrical conductivity** Salinity, total dissolved solids	•	•	•	Measures salinization and helps characterize the water body
Nitrogen*	**Total oxidized nitrogen** Total nitrogen, nitrite, ammoniacal nitrogen	•	•		Measures nutrient pollution
	Nitrate**			•	Consumption threatens human health
Phosphorus*	**Orthophosphate** Total phosphorus	•	•		Measures nutrient pollution
Acidification	**pH**	•	•	•	Measures acidification and helps characterizes the water body

* Countries should include the fractions of nitrogen and phosphorus which are most relevant in the national context.
** Nitrate is suggested for groundwater due to the associated human health risks.

to Level 1 reporting. Further details on the indicator methodology and supporting materials are available on the SDG Water Quality Hub.[6]

Water quality is classified using a target-based approach. This means that measured values are compared against values that represent "good ambient water quality". These targets may be water quality standards that are defined by national legislation or derived from knowledge of the natural or baseline status of water bodies. Targets may be nationwide values or, alternatively, they may be specific to a water body or even a site. The more specific a target, the more likely it is to identify potential pollution problems.

The indicator may be reported at different spatial levels. Countries can choose to report at national, river basin (reporting basin district or "RBD"), or water body level.

Water bodies are classified based on an 80 per cent compliance ratio. If 80 per cent or more of the monitoring values meet their targets for a given water body, it is classified as "good". This water body level information is then aggregated at either RBD or national level to calculate the indicator. More detailed information on the methodology can be obtained from the SDG Water Quality Hub[7].

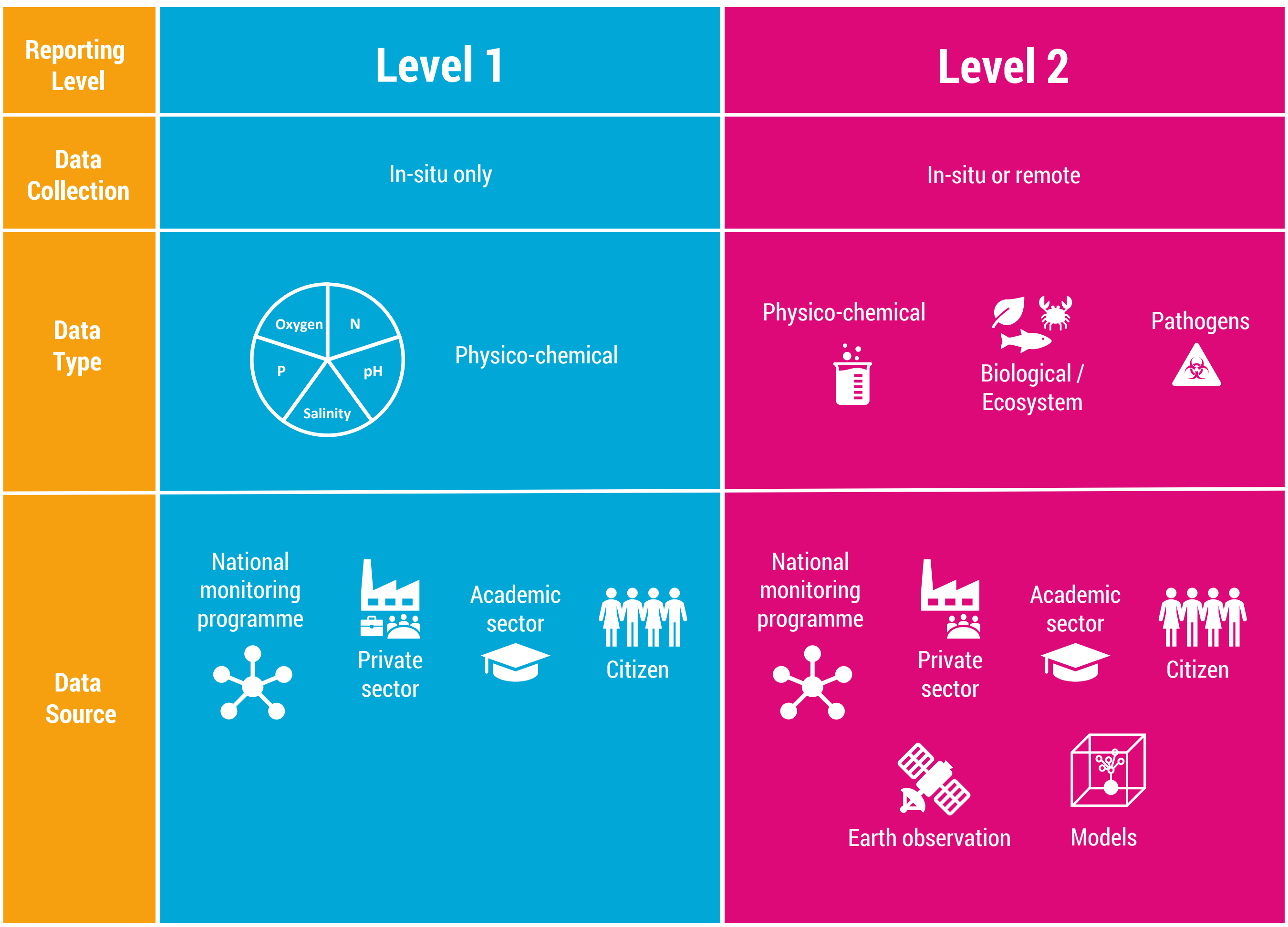


Figure 2: Summary of Level 1 and Level 2 data collection methods, data types and data sources that can be used for SDG Indicator 6.3.2 reporting.

6 SDG Water Quality Hub (sdg632hub.org).
7 https://sdg632hub.org/.

Global status of ambient water quality

This section presents a summary of the data drive results and compares them with 2020 and 2017. To gain further insight, these indicator data are combined with additional data sets including SDG global regions and national gross domestic product (GDP) per capita.

For all SDG indicators, countries that are new to reporting can report for the current reporting cycle and also retrospectively for previous years. This explains the inconsistencies in the numbers of countries reporting compared with previous progress reports. In addition, countries can choose to overwrite previous submissions. This may be necessary if any change has been adopted in the indicator calculation method, for example if new target threshold values have come into effect. This approach ensures that any temporal trend in a country's indicator better reflects water quality rather than a change in the assessment approach used. The information presented here is the most recent country data reported. The latest country-level information is included in Annex 1 and these data have been aggregated to various spatial scales as shown in Annex 2.

Summary results from the data drive

Information is now available for 120 countries, as shown in Figure 3. This global coverage is greater compared with previous data drives, but there are still significant regional gaps. Most notable are those in North Africa, West Asia, Central Asia and South-East Asia. As highlighted below, due to monitoring and assessment capacity-related differences between countries, although each country is coloured according to the reported indicator score, it does not necessarily mean that the indicator score shown is relevant for the whole country.

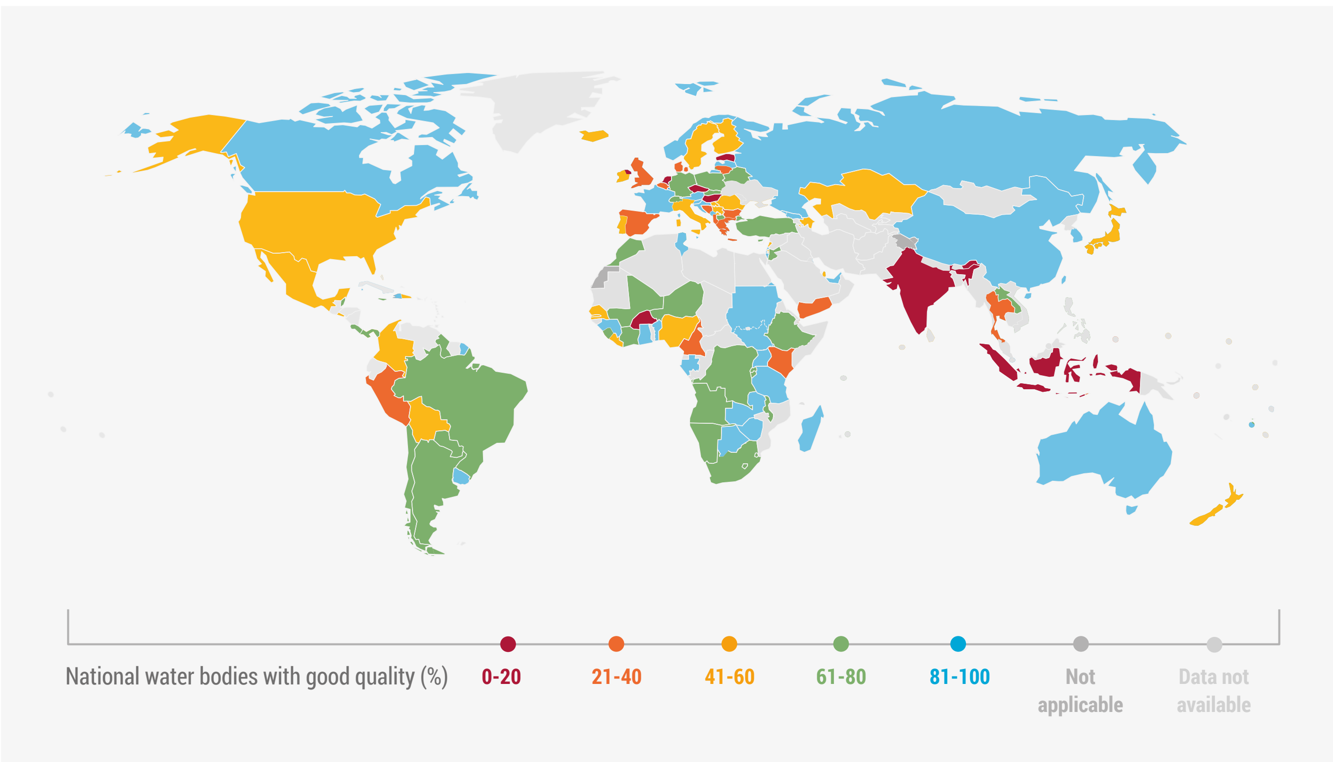


Figure 3: National SDG Indicator 6.3.2 scores from 120 countries, showing the proportion of water bodies with good ambient water quality. Some scores are calculated using data from national monitoring programmes that do not provide national coverage.

Results by water body type

The indicator scores at national level are shown by water body type for all three data drives in Figure 4. The indicator scores have been classified into six groups, ranging from very low (less than 10 per cent) to very high (more than 90 per cent).

In 2023, the water body type that most countries reported on was rivers (102 countries), followed by lakes and groundwater (71 countries each). Comparing the number of countries reporting with the figure for 2017 shows that the greatest increase was in rivers (an extra 39 countries), with a moderate increase in the number of countries reporting on groundwaters and lakes (19 extra countries for each).

The range and total indicator scores for all three reporting years are shown in Figure 5. Descriptive statistics are used to illustrate the ranges (left of box = twenty-fifth, notch median, right of box = seventy-fifth percentiles; the left and right whiskers represent minimum and maximum scores, respectively). The individual indicator scores ranged between 0 per cent (no water bodies with good quality) and 100 per cent (all water bodies with good quality) for all three data periods. The median scores of all reporting countries are 71, 75 and 68 for 2017, 2020 and 2023 respectively. For lakes the medians are 79, 74 and 69; for rivers, 69, 75 and 67; and for groundwaters, 76, 84 and 77.

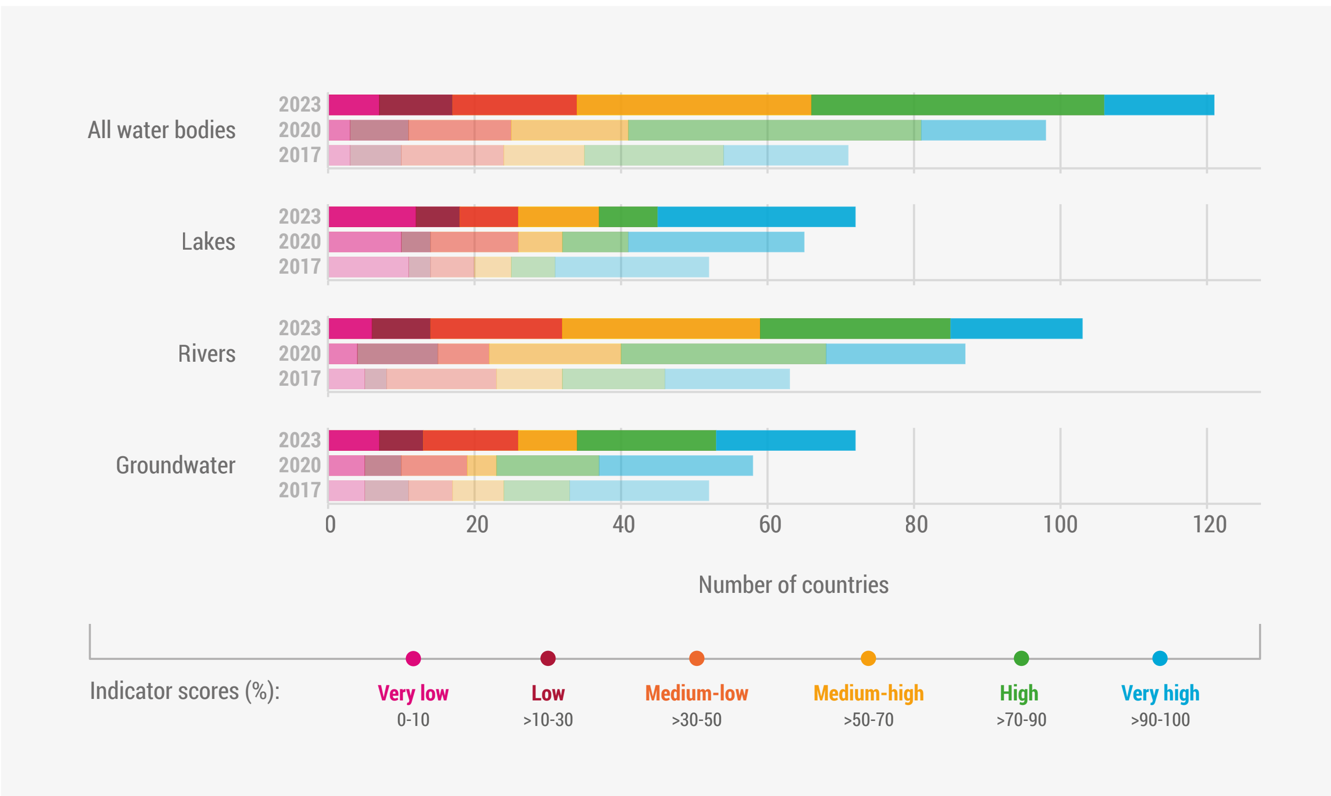


Figure 4: Summary of the number of countries reporting and the indicator scores reported by water body type and reporting year. The percentages refer to the indicator scores, ranging from very low (less than 10 per cent) to very high (more than 90 per cent).

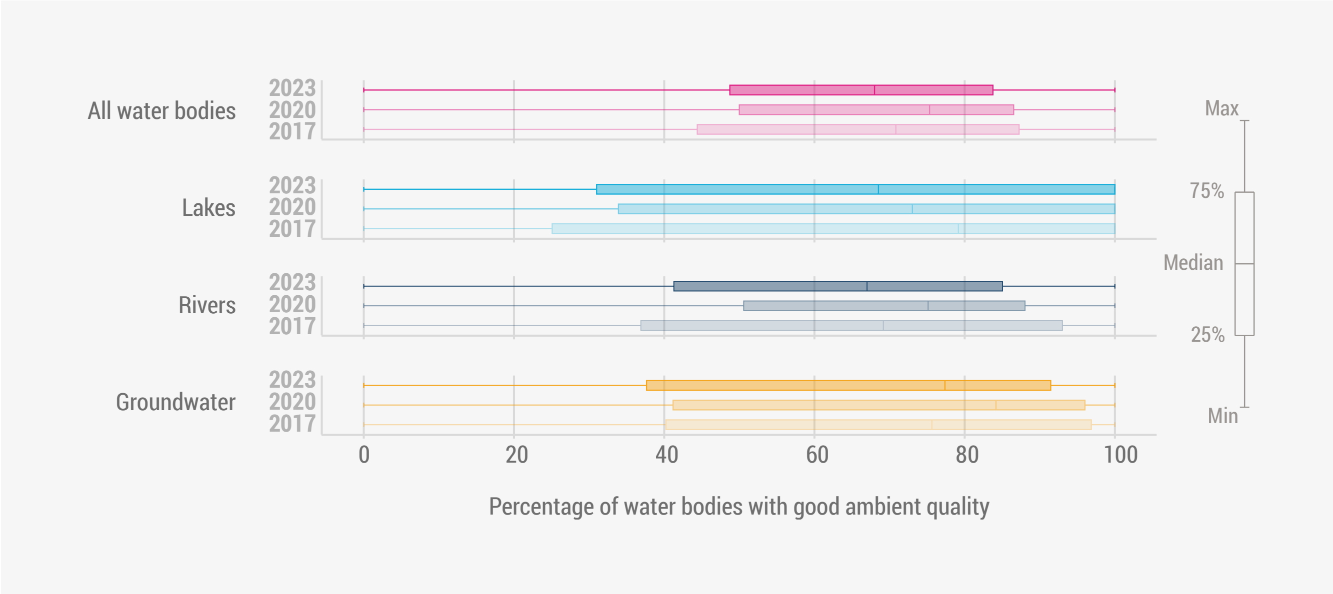


Figure 5: Range of Indicator 6.3.2 scores reported for all three reporting years (left of box = twenty-fifth, notch median, right of box = seventy-fifth percentiles; the left and right whiskers represent minimum and maximum scores, respectively).

Figure 6 shows the number of water bodies that countries reported on. Similar to Figure 5, the results are expressed by the same descriptive statistics. Figure 6 shows that the minimum and maximum number of water bodies a country reported on remained similar. The median number reported by each country in 2023 (83) was slightly higher than in 2020 (68) yet lower than in 2017 (102).

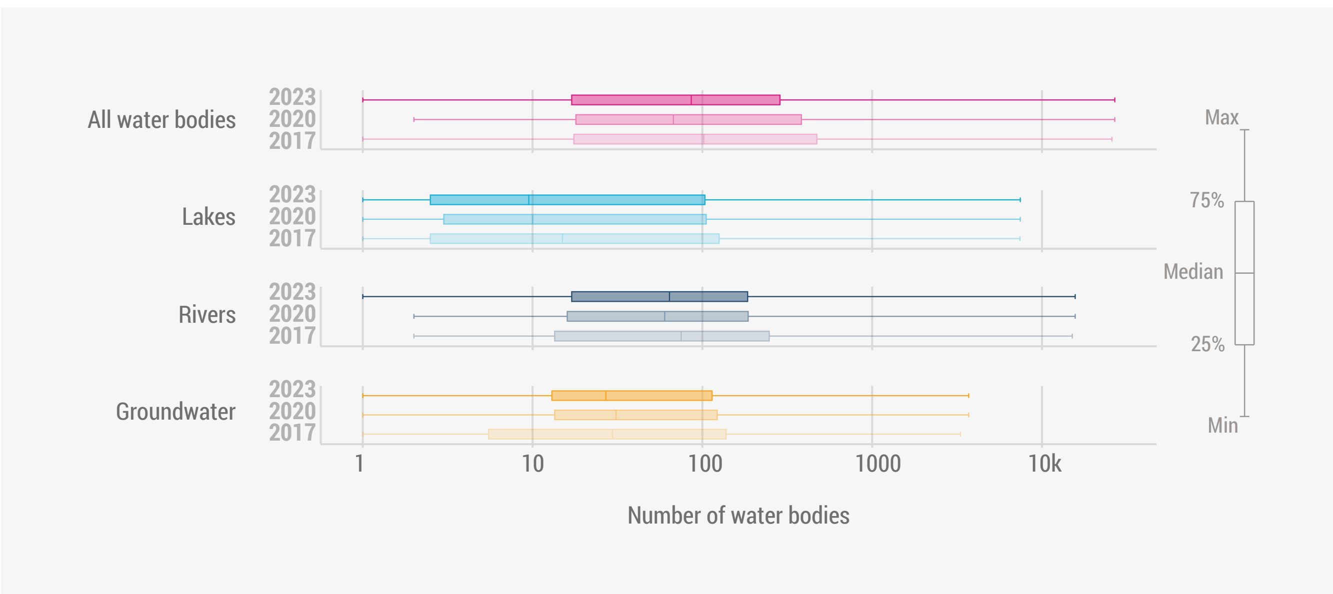


Figure 6: Number of water bodies that countries reported on for all reporting years (left of box = twenty-fifth, notch median, right of box = seventy-fifth percentiles; the left and right whiskers represent minimum and maximum scores, respectively).

Results by region

The change in the proportion of water bodies classified as “good” since 2017 for different world regions is shown in Figure 7. To avoid any biases introduced by different numbers of countries reporting, only those countries that reported for all three reporting years are included. This figure shows that at both global scale (left column) and for the European and Northern America region (third from right column), there was minimal change in the indicator score. The other world regions show more significant positive and negative changes.

Results by GDP per capita

Figure 8 below shows countries that reported in 2023 for Indicator 6.3.2 assigned to one of four categories that are based on gross domestic product per capita (GDP per capita). These categories are used to make patterns clear that are not obvious when the data are analysed by SDG region alone. These categories are created by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 countries are those that reported and which were assigned to the lowest income category, whereas Q4 countries are the highest income countries. Figure 8 shows the global distribution of these countries.

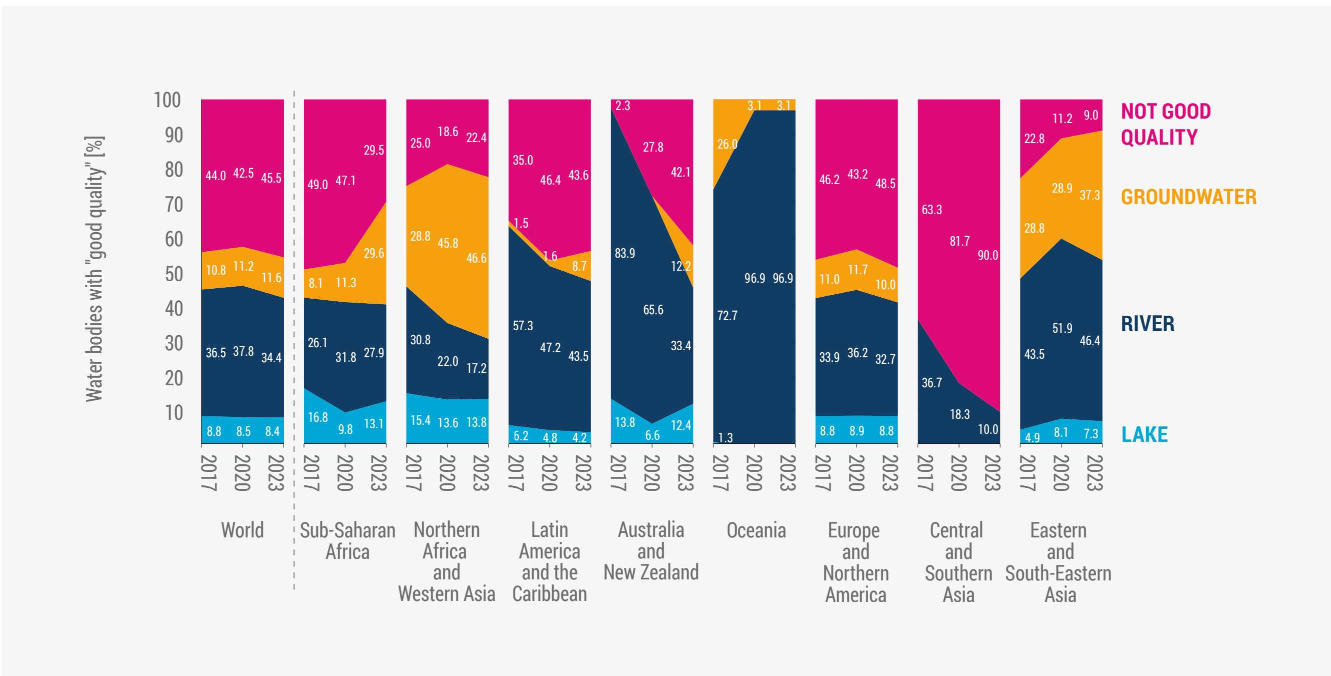


Figure 7: Proportion of water bodies with good ambient water quality in countries that reported for all three data drives, by water body type and SDG region.

Notes: The pink area at the top of the figure represents the proportion of all water bodies reported that were not classified as “good quality”. Only countries that reported for all three data drives are represented in this figure.

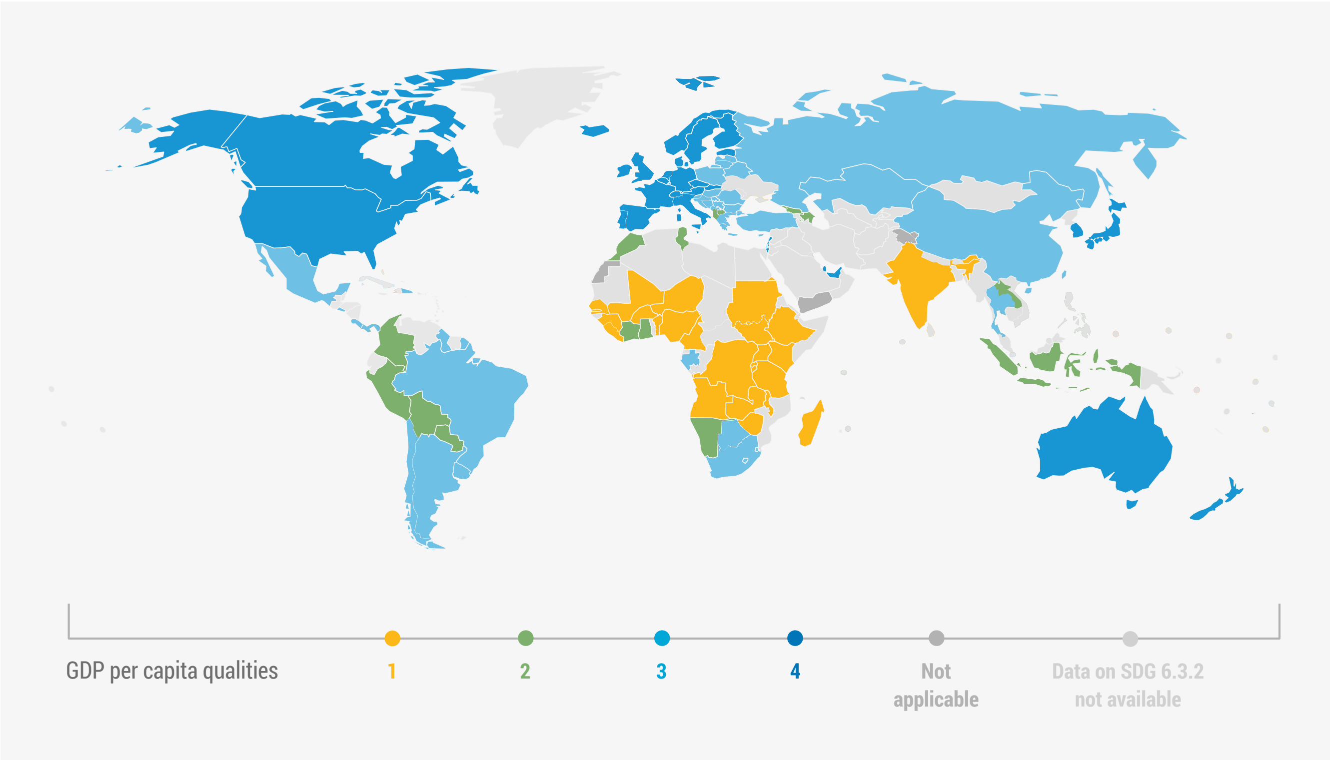


Figure 8: Map of countries that reported in 2023 categorized according to GDP per capita quartiles of all United Nations member states. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

Figure 9 shows the change in the indicator score for the different GDP categories. This figure shows that at both the global scale (left column) and for the Q4 countries (right column), there was minimal change in the indicator score. As in Figure 7 above, the other categories show more significant changes, both positive and negative, but these are more likely due to changes in the indicator calculation and implementation rather than changes in water quality. This is discussed in detail below.

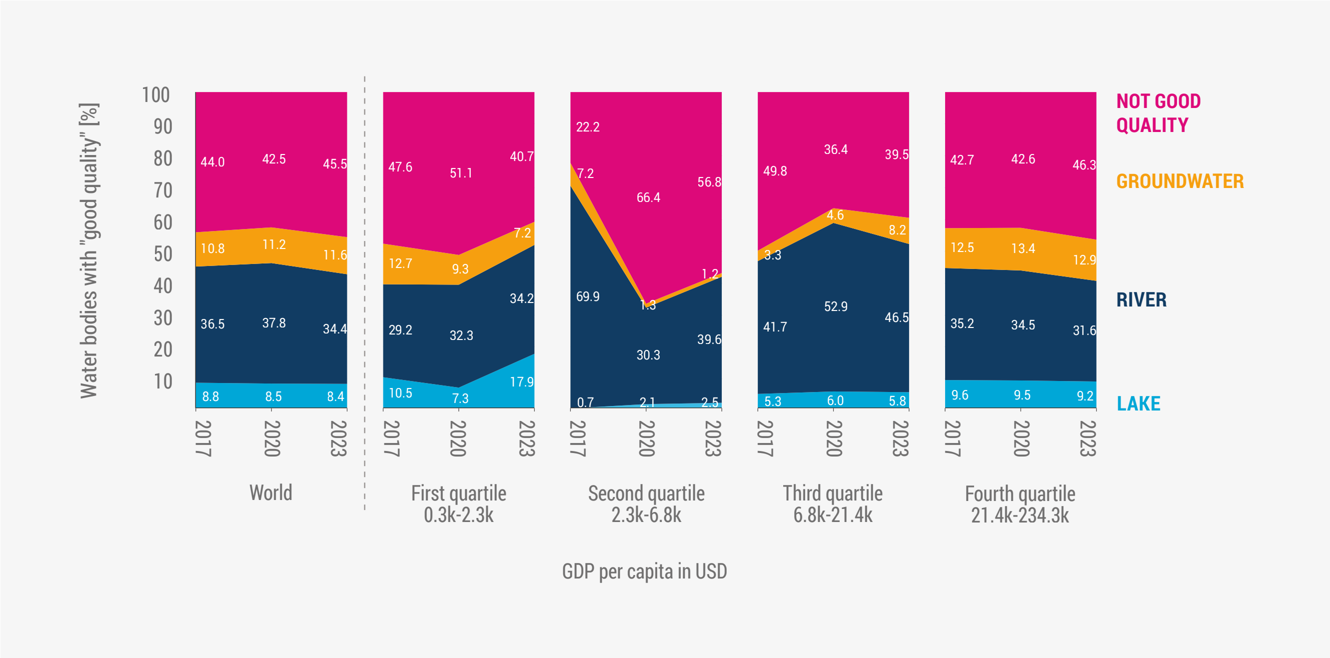


Figure 9: Proportion of water bodies with good ambient water quality, by water body type and GDP per capita category. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

Notes: The pink area at the top of the figure represents the proportion of all water bodies reported that were not classified as "good quality". Only countries that reported for all three data drives are represented in this figure.

Target values

The target value information that countries provide offers considerable insight into the classification methods used in their assessment of ambient water quality. These values suggest whether countries are using target thresholds designed specifically for the protection of ecosystem health, or targets or standards for other purposes such as drinking water supply.

The targets that countries use have a significant influence on the indicator score and its international comparability. Figure 10 shows the range of target values reported for the core parameter groups in 2023. Salinity is represented by conductivity and salinity, while oxygen is represented by oxygen saturation (per cent) and oxygen concentration (milligrams per litre).

The various fractions of nutrients (nitrogen and phosphorus) that countries reported (for example, total oxidized nitrogen or nitrate for nitrogen, or total phosphorus or orthophosphate for phosphorus) have been converted to element concentrations in milligrams per litre. The left- and right-hand side of the boxes represent the twenty-fifth and seventy-fifth percentiles, respectively.

As in previous years, a wide range of target values was reported but, worryingly, the targets reported for the nutrients nitrogen and phosphorus significantly exceeded the "optional" target values suggested by UNEP, which are based on a review of internationally relevant ecosystem-based target thresholds (Warner 2020). For comparison, these optional target values are indicated by green vertical lines. This suggests that the water quality classification used by some countries is too lenient and that, in reality, some water bodies may be incorrectly classified as "good".

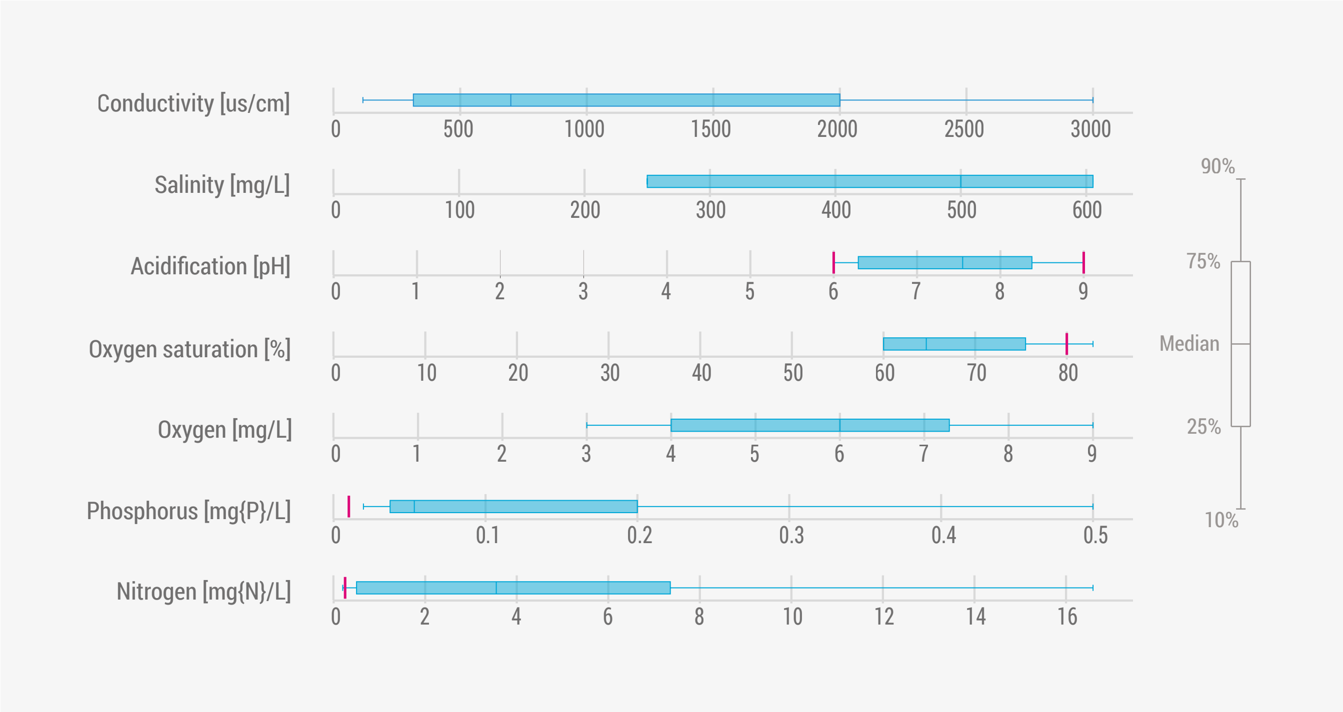


Figure 10: Range of target values for the five core parameters reported by countries in 2023 (left of box = twenty-fifth, notch median, right of box = seventy-fifth percentiles; the left and right whiskers represent minimum and maximum scores, respectively).

(Note: Pink lines indicate "optional" target values suggested by UNEP. For conductivity, an optional target of 500 µS/cm is suggested with the recommendation that a more specific threshold be set. There is no optional target for either salinity or oxygen concentration).

Focus box 1: Data management in Argentina

Context

Efforts to report on SDG Indicator 6.3.2 require an unbroken chain of activities that starts with monitoring programme design and includes data collection, data management, data assessment and reporting of the information generated. UNEP engagement with countries through implementation of this indicator has made clear that water quality data management is one of the greatest capacity gaps globally. There are several causes for this, but ultimately, in many cases, collected data go unused or, at best, fails to meet its potential for informing decisions.

Argentina is a large and geographically diverse country that covers over 3,700 km from north to south) and an altitudinal range up to 7,000 masl. Argentina is a federal country made up of 23 provinces and one autonomous city, each with its own political, administrative, and economic powers. The Argentine National Constitution establishes that the provinces have full ownership of their natural resources, including water and its management.

Argentina has been sharing information with the UNEP water quality database GEMStat[8] since the 1980s and recently engaged with capacity development provided by the UNEP GEMS/Water[9] Capacity Development Centre based at University Cork College, Ireland. Courses undertaken by Ministry staff included Continuous

8 https://gemstat.org/

9 https://www.ucc.ie/en/gemscdc/

Professional Development (CPD) and Master's degrees in Freshwater Quality Monitoring and Assessment.

During this engagement the benefit of developing a specific database to facilitate data storage and SDG Indicator 6.3.2 calculation was identified. Previous submissions for this indicator from Argentina had been hampered by problematic data access and the national report was limited to a small number of unrepresentative water bodies.

Results

A database was developed by ministry staff with the support of the UNEP GEM/Water Data Centre[10] that could manage the water quality data for the national water quality network of Argentina and incorporated an "indicator calculation" function. Using this database meant that reporting obligations could be easily met.

The main steps of this co-design process are summarized below:

- Definition of problem
- Analysis of information
- Definition of requirements
- Design of database
- Input of historical data
- Creation of user interface
- Testing and revision

The database successfully brings together existing historical data and allows new data to be added. Target values that are specific to particular river basins or administrative areas can be entered. These targets are still under discussion by the basin committees and the indicator may be updated in the future.

Using the new database, Argentina's SDG Indicator 6.3.2 for 2023 was calculated (Figure 16). A schematic of the database is shown in Figure 17.

Discussion and next steps

Figure 11: Map showing classification of water bodies using the database.

This case study highlights how a country-driven support demand for database management was met. It included in-depth capacity development followed by co-design and specific training and support by GEMS/Water.

The next steps are to expand the functionality of the database to include additional parameters in the calculation to generate a level two indicator.

Although this database is specific to Argentina, it serves as a useful starting point from which to develop a generic extendable database for water quality data that can be deployed in other countries. It will be essential to ensure that it is built on non-proprietary open-source software that has the flexibility to meet local requirements.

This work will help to address one of the greatest capacity gaps faced globally regarding water quality monitoring and assessment, as a result, it will support restoration and protection activities by improving the utility of these data.

As with all SDG indicators, at its coarsest level this indicator is presented as a single number per country to represent progress towards its respective target, but it

10 https://gemstat.org/

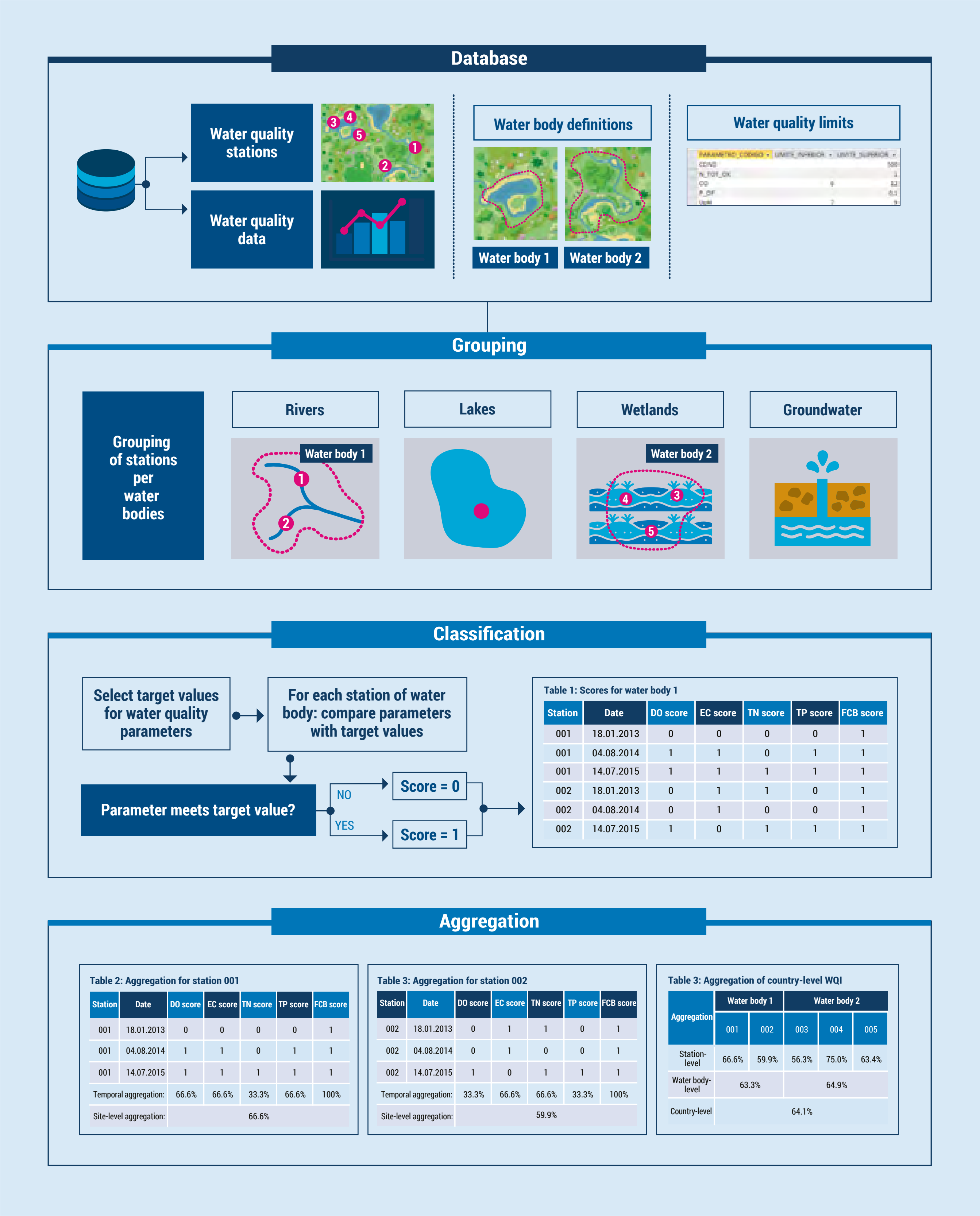


Table 1: Scores for water body 1

Station	Date	DO score	EC score	TN score	TP score	FCB score
001	18.01.2013	0	0	0	0	1
001	04.08.2014	1	1	0	1	1
001	14.07.2015	1	1	1	1	1
002	18.01.2013	0	1	1	0	1
002	04.08.2014	0	1	0	0	1
002	14.07.2015	1	0	1	1	1

Table 2: Aggregation for station 001

Station	Date	DO score	EC score	TN score	TP score	FCB score
001	18.01.2013	0	0	0	0	1
001	04.08.2014	1	1	0	1	1
001	14.07.2015	1	1	1	1	1
Temporal aggregation:		66.6%	66.6%	33.3%	66.6%	100%
Site-level aggregation:		66.6%				

Table 3: Aggregation for station 002

Station	Date	DO score	EC score	TN score	TP score	FCB score
002	18.01.2013	0	1	1	0	1
002	04.08.2014	0	1	0	0	1
002	14.07.2015	1	0	1	1	1
Temporal aggregation:		33.3%	66.6%	66.6%	33.3%	100%
Site-level aggregation:		59.9%				

Table 3: Aggregation of country-level WQI

Aggregation	Water body 1		Water body 2		
	001	002	003	004	005
Station-level	66.6%	59.9%	56.3%	75.0%	63.4%
Water body-level	63.3%		64.9%		
Country-level	64.1%				

Figure 12: Schematic of indicator calculation using the database developed as part of the capacity development project for Argentina.

Interpreting the results

This section identifies important considerations for interpreting the indicator data drive results.

should be noted that these national level indicators mask subnational patterns in water quality.

When considering the results presented, the differences in the capacity of countries to monitor and assess their freshwater bodies should be recognized. These include:

- the spatial extent of the monitoring programme – for example a single river basin versus national coverage;
- the type of water bodies included – rivers only, versus rivers, lakes and groundwaters;
- the target threshold values used – repurposed drinking water standards versus ambient water quality standards designed for ecosystem and human health;
- the water quality parameters used – a subset of the five core indicators versus all five core parameters;
- the volume of data used in the indicator calculation – hundreds of measurements versus many tens of thousands.

Water quality is degrading in countries that used significant amounts of data

Figure 11 shows the spread of the indicator scores reported partitioned by GDP per capita. One important trend is for Q4 countries (highest income), which shows a marginal downward trend in water quality across the three reporting years. This is likely to be the most reliable trend represented among these graphs, given the vast amount of data being processed by these countries (see Figure 13).

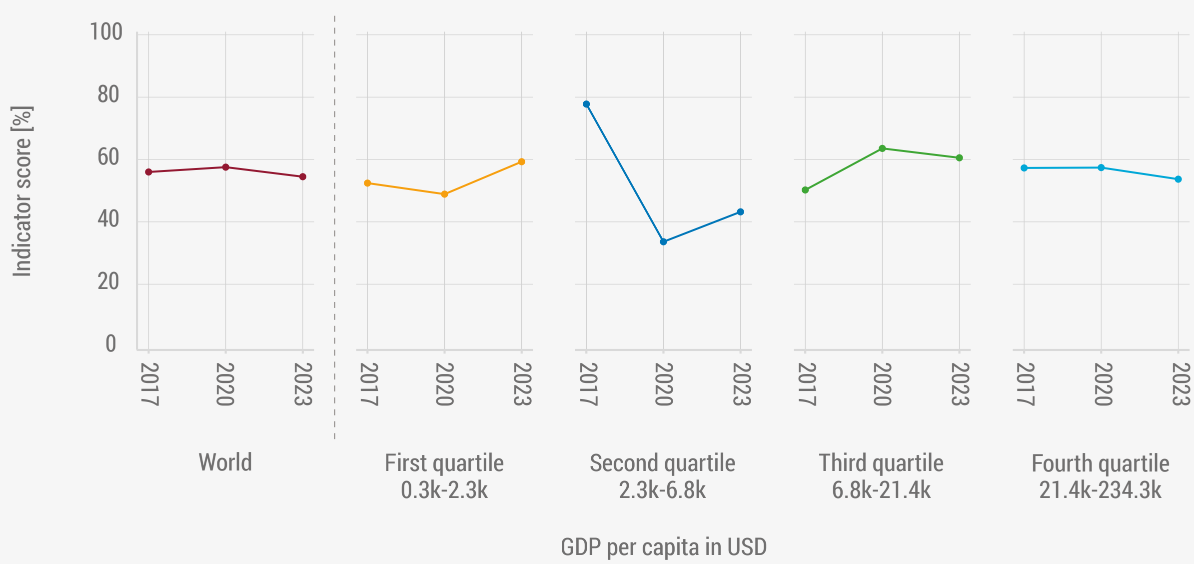


Figure 13: Progress of Indicator scores across 2017, 2020 and 2023 data drives, with results for all countries (left) and partitioned by GDP per capita categories. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

Note: Only countries that reported for all reporting periods are included.

Figure 12 shows the mean number of water bodies used to calculate this indicator, again partitioned by GDP. As reported in 2021 (UNEP 2021), high-income countries reported on many more water bodies than low-income countries. This trend was repeated in 2023 and, given that 120 countries are included in the data pool, the evidence for this trend is now even more reliable.

High-income countries reported on an average of 1,800 water bodies each, compared with fewer than 200 for both the Q1 and Q2 GDP per capita categories.

This discrepancy in monitoring capacity is even more stark when the actual number of measurements is considered. This is the number of actual measurements of the core parameters included in the indicator calculation (nitrogen, phosphate, pH, oxygen and electrical conductivity measurements). Figure 13 shows that over 1.2 million measurements were used by Q4 countries (average 31,000) compared with less than 25,000 by the group of lowest income countries (average 870). In addition, through engagement with countries, it was noted that many were unable to maintain long-term routine monitoring programmes, and different water bodies were reported on during different data drives. This indicator requires long-term consistent data to be collected to be able to determine robust trends. This means that some indicator scores generated in low-income countries are less likely to reflect actual water quality changes.

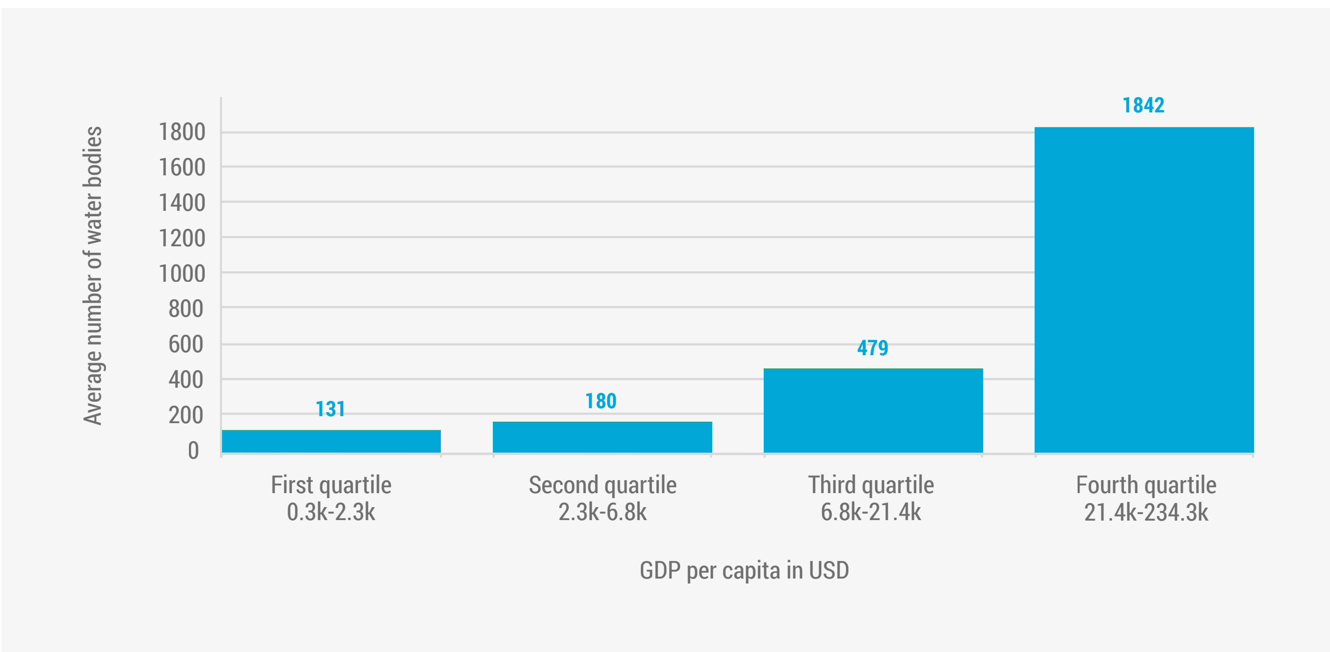


Figure 14: Mean number of reported water bodies, partitioned by GDP per capita category. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

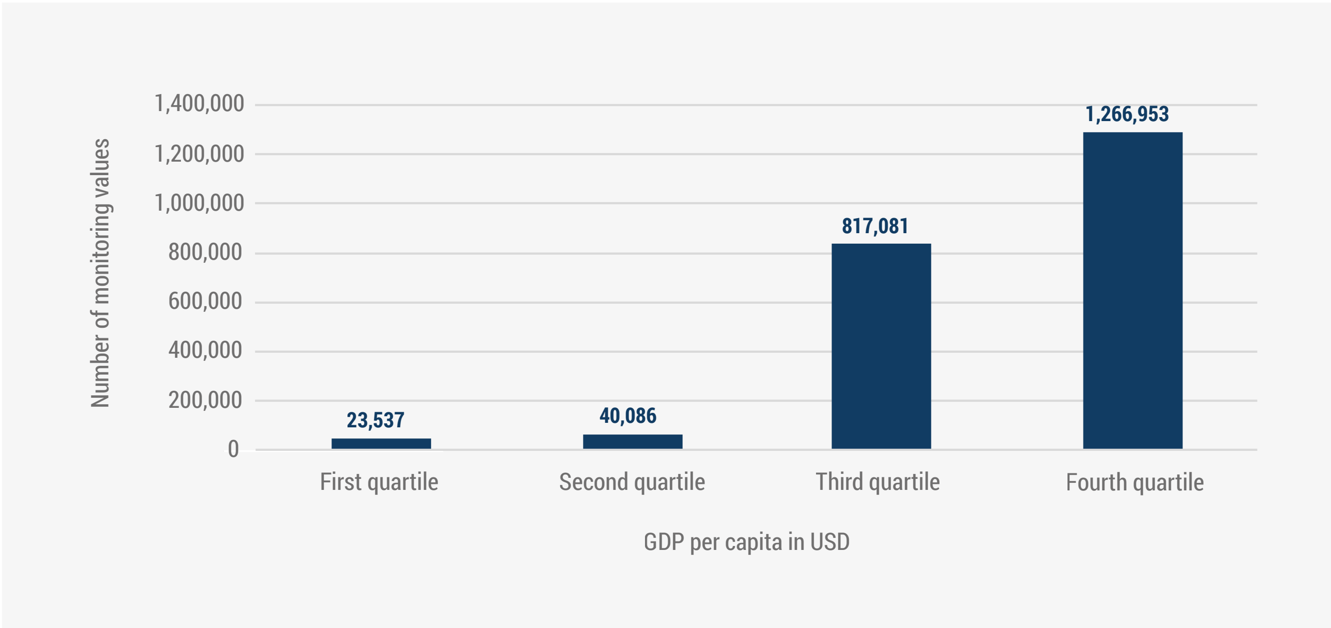


Figure 15: Number of measurements used for all water body types partitioned by GDP per capita category. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

Lake and groundwater monitoring needs to be expanded

Analysing the number of monitoring values used to calculate indicator scores by water body type shows that lakes and groundwaters are far less monitored than rivers as shown in Figure 14.

For lakes, the lowest income half of the world reported on fewer than 300 of a total of nearly 14,000 lakes. This statistic is skewed by the fact that the majority of lakes are found in northern latitudes which coincides with the location of many high income countries, but, this stark difference in lake monitoring data still highlights the limited capacity of low income countries to implement and maintain routine lake monitoring programmes. A similar trend is observed for groundwaters – 13,500 groundwater bodies were reported on in 2023, yet fewer than 1,000 were from the lowest income half of the world.

The fact that rivers dominate the indicator reports of low-income countries, very few of which include all three water body types reflects the additional technical demands of lake and groundwater monitoring programmes compared with those of rivers and streams. Only 20 per cent of Q1 and Q2 countries reported on all three water body types, compared with 44 per cent of Q4 countries. This is a major information gap considering that millions of people use untreated waters for drinking in low-income countries (WHO *et al.* 2022).

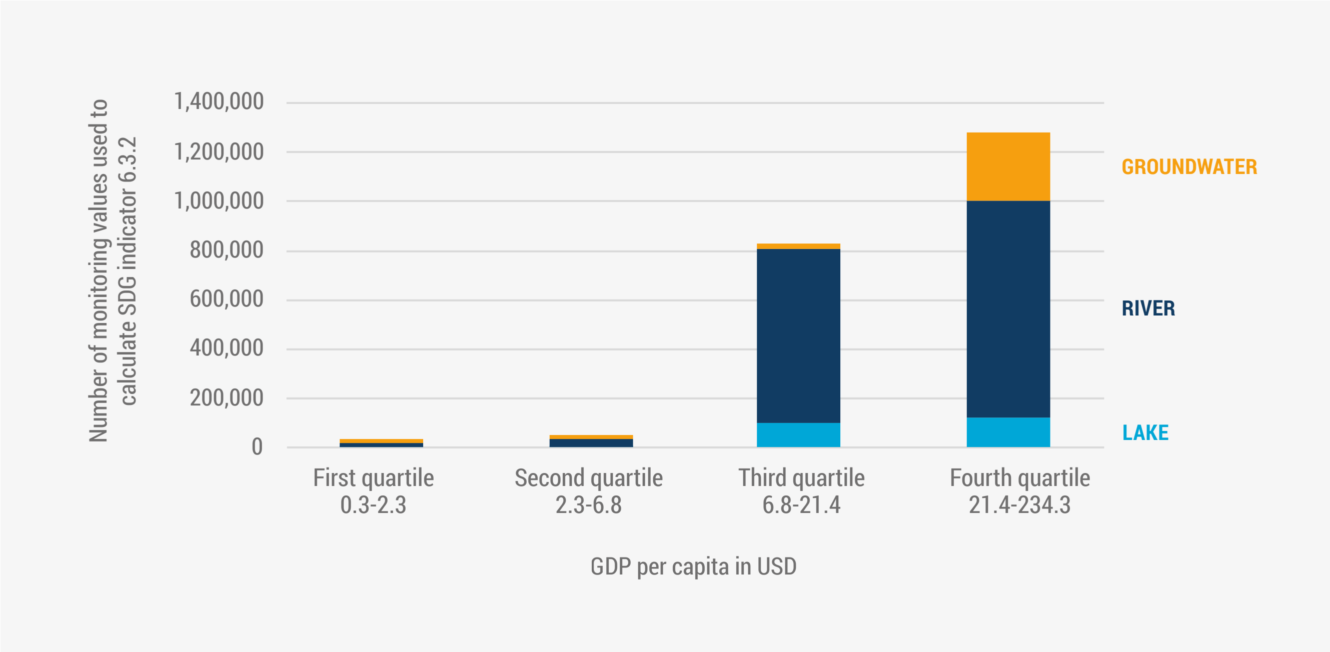


Figure 16: Number of measurements reported by water body type and partitioned by GDP per capita category. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest.

Looking ahead to 2030

This indicator provides clear evidence that national authorities tasked with monitoring the quality of freshwater bodies in low-income countries require greater capacity to do so adequately. This is supported by SDG Indicator 6.5.1, through which more than 45 per cent of countries report having limited or ad-hoc management instruments for pollution control (SDG Indicator 6.5.1, question 3.1c, (UNEP 2024)).[11]

When considering the amount of data being collected in terms of actual water quality measurements, Q1 and Q2 countries use a fraction of the data used by Q3 and Q4 countries. Currently, in 2024, the combined population of Q1 and Q2 countries is 4.4 billion, looking forward, this is predicted to rise to 4.8 billion by 2030 and to over 5.9 billion by 2050 (Figure 15). This means that, under a "business as usual"" scenario with no expansion of monitoring efforts, by 2030, the health and livelihoods of 4.8 billion will be at risk because there are insufficient data to understand how these water bodies are responding to the pressures put on them. This statistic highlights the pressing need to accelerate monitoring, assessment, protection and restoration of freshwater bodies, which will likely extend beyond 2030 unless significant resources are made available to drive change in the next six years.

11 Free text responses to question 3.1c from the SDG 6.5.1 survey provide further information on the management instruments in place, barriers and next steps. Country surveys and a global summary are available at https://iwrmdataportal.unepdhi.org/country-reports

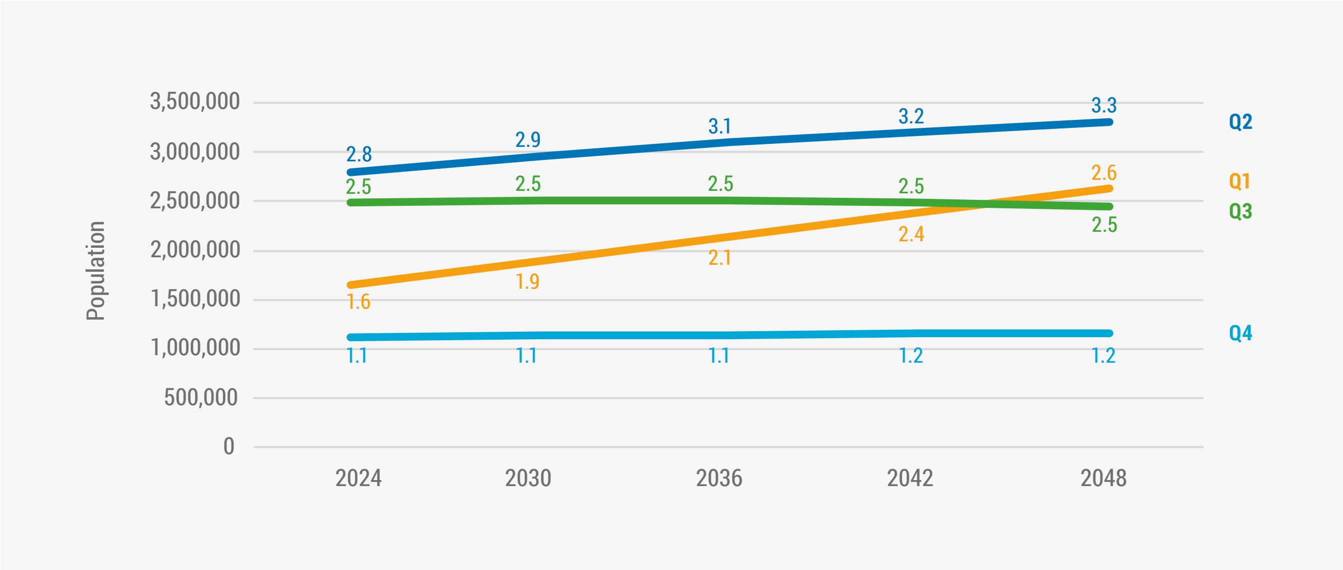


Figure 17: Current and predicted population partitioned by GDP per capita category. Categories are generated by arranging all 193 member states in order of GDP per capita and then assigning an equal number of countries to each. Q1 is the lowest and Q4 the highest (Source: World Population Prospects - Population Division - United Nations).

*Assumes that countries do not change GDP per capita category.

Focus Box 2: Citizen science and SDG Indicator 6.3.2

Citizen science (CS) has yet to achieve its potential to contribute to SDG 6. UNEP and partners, through the WWQA Workstream on CS for SDG Indicator 6.3.2, are working on multiple fronts to address this. These efforts are already paying off – Sierra Leone and Zambia combined CS data with national regulatory data to report on SDG Indicator 6.3.2. This is a first for SDG 6!

Background

SDG Indicator 6.3.2 is focused on identifying long-term temporal and spatial trends in water quality, to support national decision-making. To achieve this objective, consistent data with high spatial and temporal coverage are more important than methods providing elevated analytical resolution, as long as appropriate accuracy and precision objectives are met.

Through the World Water Quality Alliance,[12] GEMS/Water and Earthwatch Europe[13] are implementing projects with the aim of "normalizing" the use of CS-generated data for SDG Indicator 6.3.2 reporting. These projects have been developed together with the national authorities tasked with monitoring and protecting freshwaters, as well as with local communities.

12 https://wwqa.info/

13 https://www.freshwaterwatch.org/

The projects bring together the national authority's water quality data with FreshwaterWatch[14] data collected by citizen scientists, to provide greater coverage and better temporal resolution for a more comprehensive indicator. Importantly, by engaging with the communities and sharing their results in the context of the river basin, this approach engages those who are directly impacted by poor water quality and who are best placed to oversee

its protection and improvement. In Sierra Leone for example, citizen scientists participated in the River Basin Management Plan stakeholder meetings and provided valuable input for development of the plan.

Activities

At the moment, there are five active projects (blue) that are collecting CS data and new projects starting up (green).

Policy and Technical briefs:[15] a short policy brief aimed at decision-makers has been created that showcases the benefits of using CS approaches, as well as a more detailed technical brief with specific guidance for various pathways based on the national situation.

CS data integration project: this pilot project led by UNEP GEMS/Water and Earthwatch Europe will test the collation of various types of CS water quality data for a comprehensive SDG Indicator 6.3.2 assessment. It is being launched in Kenya in collaboration with the Kenyan Water Resource Users Association, the Water Resource Authority and Drinkable Rivers[16] and in South Africa with the miniSASS[17] team and Groundtruth.[18]

Academic publication[19] Empowering citizen scientists to improve water quality: from monitoring to action explores innovative ways to embed CS approaches in national monitoring and to ultimately improve water quality.

Outcomes and way forward

All existing projects are expanding activities and two new projects are starting in Ethiopia and South Africa.

Two countries have combined CS-generated data with national agency data for SDG Indicator 6.3.2 reporting: Sierra Leone and Zambia. In Sierra Leone, the number of water bodies assessed and the number of data records, doubled when CS data were included, compared with using national data alone. Building on this example, five more countries are expected to use CS data for Indicator 6.3.2 reporting in 2026.

Efforts will continue to mainstream citizen science by showcasing the multiple benefits of using CS data for SDG Indicator 6.3.2 reporting, with the goal of making this approach "the new normal".

Figure 18: Map showing active and new citizen science project countries.

14 https://www.freshwaterwatch.org/

15 Policy Brief - https://doi.org/10.5281/zenodo.12650972; Technical Brief - https://zenodo.org/records/12634359

16 https://drinkablerivers.org/

17 https://minisass.org/map/#/

18 https://www.groundtruth.co.za/

19 Frontiers | Empowering citizen scientists to improve water quality: from monitoring to action (frontiersin.org)

Special focus on interlinkage between ambient water quality and health

This section highlights the links between ambient water quality and health and makes clear why monitoring is essential to understand health risks.

Health challenges require holistic and sustainable solutions including access to good ambient water quality in the environment. As highlighted in the One Health Joint Plan of Action (OH JPA) (FAO, UNEP, WHO and WOAH 2022) "*The health of the environment is a critical foundation for the health and well-being of humans, animals and plants"*, and recognises that "*Environmental contamination is an important factor in many non-infectious diseases, including cancer and respiratory illness"* and makes clear that "*the role of environmental determinants of health have not been well understood by other sectors and there is good potential to integrate environmental considerations more consistently"*. This is especially relevant for water quality; there are many direct and indirect linkages between water quality stressors and health impacts that are varied and intertwined. Some are direct and easily understood, such as contamination of drinking water sources with pathogens or toxic compounds, which were responsible for 1.4 million premature deaths in 2019 (Fuller *et al.* 2022). Women and children are more susceptible to waterborne diseases. Pregnant women, in particular, face higher risks from contaminated water. For indirect links between poor water quality and health, such as transport of contaminants through the food chain affecting consumers in countries far removed from the source of pollution (Gall *et al.* 2015), delineating these impacts is more complicated and therefore more difficult to solve.

Recognizing the need to monitor ambient water quality

In order to understand health challenges, the need to monitor and assess water quality in the environment is widely recognized, but as shown in this report, there are many capacity gaps, meaning that sufficient data are unavailable and water-related risks remain unknown.

At the core of this indicator's methodology is the definition that "*good ambient water quality is water of a certain standard that flows in our rivers, lakes and aquifers without causing harm to human or ecosystem health"*. This indicator builds on long-standing recognition of these links, and efforts made to bring together different United Nations agencies to address these issues. This started at the 1972 United Nations Conference on the Human Environment in Stockholm, where UNEP and WHO were commissioned to launch a global health-related water quality monitoring programme as part of the UNEP Global Environment Monitoring System (GEMS). Following this event, the interagency UNEP/WHO/UNESCO/WMO programme on water quality monitoring, known as GEMS/Water, was formally founded in December 1977 (Chapman *et al.* 2022).

More recently, the necessity for ambient water quality monitoring to support health protection can be found in the WHO Water Safety Plans, which reference the protection of surface (Rickert *et al.* 2016) and groundwaters (Schmoll *et al.* 2006). These plans provide a comprehensive risk assessment and management approach to ensuring the safety of a drinking-water supply from catchment through to the consumer. Although the number is decreasing, in 2022, there were still 122 million people relying on untreated surface drinking water sources globally (WHO *et al.* 2022), and therefore vulnerable to poor water quality in the catchment of the drinking water source.

This problem is not limited to low-income countries that lack water infrastructure. Populations in countries that have over 90 per cent access to safely managed drinking water are also at risk. These national-level statistics often mask subnational realities, where the burden of disease is greater for marginalized communities, who are more at risk of gastrointestinal disease and cancer from drinking contaminated water (Lee *et al.* 2023). One pervasive issue is from cyanotoxins entering drinking water supplies from source waters with harmful algal blooms. Worryingly, the algal bloom frequency and intensity have increased in recent decades, most notably in Asia, followed by South America, Africa and Europe although there have been recent reductions in North America (Fang *et al.* 2022).

One Health approach and ambient water quality

One Health calls for a holistic and systems-based approach that recognizes the interconnection between the health of humans, animals, plants and the environment. It is essential to integrate gender considerations into this framework in order to create equitable, sustainable, and effective health solutions but without robust and extensive water quality data, early detection of water-related impacts, or protection from them, is impossible.

The One Health Joint Plan of Action (OH JPA) vision, within a 15- to 20-year period, is:

A world better able to prevent, predict, detect and respond to health threats and improve the health of humans, animals, plants and the environment while contributing to sustainable development.

Outcomes are divided into long and medium-term goals, with the former aligning with the 2030 Agenda and the latter being achieved by 2026.

The OH JPA theory of change includes three "pathways to change" designed to overcome the numerous technical, collaborative and institutional challenges hindering effective implementation of One Health at various scales. These pathways represent areas where the four organizations (WHO, FAO, UNEP and WOAH) have the greatest capacity to effect change. For this SDG indicator, pathway 3 is the most relevant: *Data, evidence and knowledge – encompasses the strengthening of the scientific evidence base, knowledge translation into data for evidence, technical tools, protocols and guidelines, information and surveillance systems.* Under this pathway there are two relevant Action Tracks: AT6.2 and AT6.3. These action tracks and their most relevant activities are listed below.

Action Track 6.2 Mainstream the health of the environment and ecosystems into the One Health approach

- 6.2.1 Map the evidence on the socioeconomic impacts of environmental degradation (including land-use change, biodiversity loss, pollution and waste, and climate change).
- 6.2.3 Identify incentives and co-benefits, and raise awareness of the central role of the environmental sector, the importance of its participation and its role in One Health.

Action Track 6.3 Integrate environmental knowledge, data and evidence in One Health decision-making

- 6.3.1 Map interoperability between health, animal disease and environmental databases and information systems.
- 6.3.2 Establish linkages between disease databases and environmental databases to support risk modelling, shared information and informed/ science-based decision and policymaking.
- 6.3.3 Develop joint information management systems and analytical tools integrating ecosystem, environmental, animal and human health knowledge and data.
- 6.3.6 Translate environmental knowledge and data to improve policies and legislation and propose practical solutions to prevent and mitigate health threats at the interfaces.
- 6.3.8 Engage with citizen science on data collection for monitoring the health of the environment to inform action.

Mechanisms for SDG Indicator 6.3.2 implementation to support the One Health Joint Plan of Action

This SDG indicator supports the OH JPA by providing information on water quality data coverage and conversely where data gaps exist. In addition it provides insight into the capacity of national water quality monitoring authorities and direct links to the relevant focal points. Through this indicator, awareness is raised of the need for robust water quality monitoring and assessment and linked to the need to better understand where and how water quality is changing (improving and degrading) and the potential impacts (positive and negative) on human, animal and environmental health.

Using the indicator score at national level (one indicator score per country) is unlikely to provide useful information to support the OH JPA, but UNEP requests that countries report information at river basin or water body-level, which does provide sufficient resolution to better understand risks. Regardless of the reporting level (national, river basin or water body), the data used to generate the indicator are collected at monitoring station level, and this local-level information is required to understand very local ”point of use” risks, and the risks in the wider catchment area.

Level 1 of Indicator 6.3.2 covers basic water quality parameters, yet if countries are unable to collect data and report at this level, the likelihood of reporting at Level 2, which may include additional health-related parameters such as pathogens, heavy metals or organics, is small.

This indicator brings this information to the fore and opens the channels for capacity development to be delivered. It should be noted that the core parameters of SDG Indicator 6.3.2 do not directly provide information on risk to human health, with the exception of nitrate in groundwater, but they could indicate indirect risks, such as toxic algal blooms driven by high nutrient and low oxygen concentrations.

Conclusions

This section summarizes the findings of the report and lays out the future steps for this SDG indicator's implementation.

Indicator reflections

Since the indicator methodology was developed, country uptake and engagement has significantly increased. In 2017, only 39 countries reported on this indicator despite considerable resources being directed towards engagement and outreach. This relatively low number of submissions can be attributed to the need for national authorities tasked with fulfilling this request to understand the reporting requirements, and then act upon the request while simultaneously fulfilling existing workloads.

For several countries, calculating SDG Indicator 6.3.2 requires a deviation from existing practices; for example, calculating a *national* indicator rather than providing subnational or administrative district level information. This requires data collation across several administrative jurisdictions. Also, delineating water bodies, especially river water bodies, remains a challenge for many countries that usually assess data at monitoring station level.

One of the greatest insights gained through this indicator is the urgent need to develop target threshold values that are suitable to protect ecosystem *and* human health. Many countries do not have ecosystem-based target threshold values embedded in national legislation and instead repurpose target values designed for drinking water or agricultural use. Without these ecosystem-based target thresholds, freshwater ecosystems continue to be assessed against inappropriate criteria and their degradation persists unnoticed. As highlighted in Focus Box 3, this indicator provides information on the target values used globally (Figure 10) in the context of those that would better protect freshwater ecosystem health. The opportunity is available for countries to use this information as part of a review of the national targets used for reporting on this indicator (Focus Box 3).

Implementation of this indicator provides an opportunity for countries to review their capacity concerning the monitoring, assessment and reporting cycle. By asking countries to report on this indicator, this request intrinsically tests whether a country has the capacity to design and implement a monitoring programme, to collect and store data, to apply the methodology, to set suitable target threshold values, to calculate the indicator and to report the indicator score. Many steps are needed if water quality data are to be collected, assessed and converted into information that can be made available for decision-makers. If countries are unable to do this for basic water quality parameters, such as those prescribed for this indicator, it is extremely unlikely that they will be able to monitor additional toxic or parameters of concern such as pathogens or heavy metals that have a direct health impact.

In countries where data are routinely collected, SDG Indicator 6.3.2 provides important information towards measuring the global target progress (improve water quality). At Level 1, the indicator is simple and robust and provides valuable long-term and spatial trends. Whereas, in data scarce countries, this indicator is unable to track progress towards SDG Target 6.3 but it does make capacity gaps clear and serves as an ideal entry point for delivery of capacity development.

The value of this indicator is diminished if only national-level data are reported. National level reporting masks the subnational spatial variation in water quality that can be used to better understand risks to marginalized communities. Through the IMI-SDG, an initiative is being developed to delineate standardized global river basins so that all SDG 6 indicators can be disaggregated. This will facilitate interlinkage analyses, add significant value to the SDG 6 data and better track progress to the respective targets.

Since 2017, there has been a year-on-year increase in countries engaging and reporting on this indicator (Table 2), and, additional information is now available through retrospective submissions. For example, in 2017 only 39 countries reported but since then, countries newly engaging with this indicator reporting process have calculated a 2017 indicator score and information is now available for 70 countries. Similarly for 2020, there is now information for 98 countries despite 89 reporting that year.

Table 2: Summary of country submissions during each data drive year and the current total including retrospective submissions.

DESCRIPTION	2017	2020	2023
Count of countries reported during data drive year	39	89	120
Total country count (including retrospective submissions)	70	98	120

Where data management practices are strong, the indicator is easily calculated, but where data management practices are weak, it is a challenge for countries to collate and organize their data appropriately. UNEP GEMS/Water provides an "indicator calculation service" and through this engagement, it has become clear that many countries struggle with data management which is most likely a broader issue that goes beyond the water quality sector. This is the main driver for the renewed emphasis on providing data management support as showcased in Focus Box 1 above.

The number of countries engaging and reporting is increasing with each subsequent data drive, but there are several countries where UNEP have failed to connect, most notably in North Africa, West Asia, Central Asia and South-East Asia, and where targeted engagement is needed. Implementation is resource-heavy, especially when engaging with countries that are new to the reporting, but the SDG framework and the coordination provided through IMI-SDG6 is essential for its implementation.

Future Indicator 6.3.2 implementation

Significant progress has been made since the 2020 data drive in terms of the amount of data reported and the number of countries engaging with this indicator, but it remains clear that accelerated progress is needed if SDG Target 6.3 is to be reached by 2030.

Evidence of progress towards Target 6.3 can be accelerated through simultaneous advances on several pathways. These advances will be guided by the *2024 feedback process* (see below), which will gather input from the national indicator focal point network and water quality experts. The specific advances needed are discussed below.

Fill regional gaps

Targeted engagement is urgently needed in North Africa, West Asia, Central Asia and South-East Asia. Enhanced regional engagement through the United Nations regional commissions, United Nations resident coordinators and UNEP regional offices will help to ensure that countries in these poorly represented world regions are included in the next data drive. This engagement must highlight the benefits of reporting with a focus on regionally specific benefits and communicate the relevance of this indicator for all countries.

Deliver capacity development

In addition to the indicator-related support provided to countries by UNEP GEMS/Water, engagement through this indicator makes it clear that in-depth capacity development is required for all aspects of the monitoring and assessment cycle. Through the GEMS/Water Capacity Development Centre based at University College Cork, Ireland, support ranged from Master's and Postgraduate diplomas (46 students graduated), through to short, "continuous professional development" (CPD) courses (over 200 registrations to date). Through a model developed by the WWQA Capacity Development Consortium, the GEMS/Water training courses are being adapted for Hispanophone countries of Latin America.

Targeted capacity development was the driver of two major outcomes: the development of the national water quality database of Argentina (Focus Box 1); and the commencement and subsequent advancement of monitoring and assessment in Sierra Leone, which laid the foundations for the citizen science project, which was initiated with support of the WWQA[20] (Focus Box 2).

It is essential that capacity development continues and expands to address the known capacity gaps, especially in low- and middle-income countries that struggle to collect sufficient data for management.

Beyond the collection of water quality data, the use of these data for robust assessment and to determine where priority action is needed relies on correct classification of water quality status and trends. This report highlights that the range of target threshold values used is extremely wide and many countries are using target values that are too lenient for ecosystem health protection. Further capacity development is needed to address this issue and to ensure that freshwater bodies are protected.

Provide “SDG-ready” data

In situ data collected as part of a well-designed and implemented monitoring programme provides the foundation for understanding national water quality trends. In the absence of such data, information from alternative data sources is needed. Provision of ”SDG-ready” information from innovative sources is being developed through two WWQA-funded projects:

- ***Citizen Science Data Integration for SDG 6.3.2***. This project will progress the normalization of citizen science data use for SDG Indicator 6.3.2 reporting, focusing on identifying barriers and developing solutions to known data mobilization and integration issues (Focus Box 2).

  and

- ***Earth Observation for SDG Indicator 6.3.2.*** The aim of this project is to define the pathway for SDG-ready Earth Observation (EO) data for Indicator 6.3.2. Through a co-design process, an EO-based indicator and user dashboard will be designed that will lay the foundation for global upscaling.

Efforts to develop water quality models that can help to define water quality trends and to link these trends to stressors in the catchment are underway. These models also help to predict water quality changes based on various future scenarios. These innovative products will be made available through the *SDG Water Quality Hub*[21] in readiness for the 2026 data drive.

Raise Awareness

Making clear the critical relevance of good water quality for other sectors is a key priority. This can partly be resolved through targeted gender-responsive awareness-raising focused on direct and indirect interlinkages of good water quality to each respective sector. This report supports this process with a special focus on health, but more work is needed to make clear the connection to climate, biodiversity and pollution. Ultimately, water quality monitoring needs to play a bigger role and to be embedded into sustainable integrated water resource management policies (UNEP 2024) and across climate change adaptation plans, national biodiversity action plans and river basin management plans.

Develop the SDG Water Quality Hub

The *SDG Water Quality Hub* is the primary outreach platform for this indicator, but by design its main purpose is to serve the interests of the global network of national indicator focal points. The Hub will be revised based on guidance received through the 2024 feedback process with one possible way forward being to broaden the Hub’s relevance to a wider audience, by including dedicated thematic spaces for both citizen science and Earth Observations.

Despite the significant increase in the number of countries reporting in 2023, several improvements are needed in implementation. For some countries with available water quality data, overcoming the reporting burden still remains a challenge. UNEP GEMS/Water is developing an *automatic indicator calculation function* to reduce this burden, but this requires water quality data sharing. One option is to submit data to the GEMS/

20 https://wwqa.info/
21 https://sdg632hub.org/

Water GEMStat[22] database together with the additional information on target values and water body delineations. This approach will allow the indicator to be calculated automatically at any given time, rather than being limited to the current three-year reporting cycle, and will therefore better serve Member States and provide timely information that may be better aligned with national reporting frameworks.

The dissemination of SDG-ready datasets that can be used by countries for SDG reporting, such as Earth Observations, citizen science and modelled products, will be made available through the Hub. This development will be guided by the feedback process, with the aim of creating dedicated sections for each data source, with options for download and further use.

To better communicate the need for robust water quality data, case studies demonstrating the central role of data in successful protection and restoration activities will be shared through the Hub. These will highlight the fact that water quality data are essential for measuring the effectiveness and shortcomings of these activities.

Way forward

Ambient water quality data are essential for the development, implementation and refinement of policies to protect and restore freshwater quality. As this report makes clear, many countries do not have these data available; in others, the value of existing data could be improved. Improving the generation and use of water quality data through implementation of this SDG Indicator 6.3.2 will provide a clearer picture of water quality status and trends globally, while further highlighting capacity gaps. Ultimately, the target is to "improve water quality" and to achieve this we need:

- better data **coverage** so that fewer people depend on "unmonitored" water bodies;
- better data **resolution,** including information on local water bodies – including urban and small water bodies – rather than just the major rivers, lakes and aquifers. This is where citizen approaches to data collection have a role to play;
- better historical or **baseline data,** so that we can set target thresholds to ensure that our classifications are accurate and the health of freshwater ecosystems and human health is protected.

There are many good examples of data informing policy worldwide, but the Water Framework Directive[23] or WFD (2000/60/EC) stands out as one of the most ambitious, aiming to protect and improve the quality of water resources in the 27 European Union Member States. Water quality data are central to WFD as they are used to define the status of water bodies, with clear time-bound targets to achieve "good status". The WFD requires Member States to use River Basin Management Plans (RBMPs) and Programmes of Measures to protect and restore water bodies.

Next steps

The 2021 feedback process, designed to make methodological and organizational improvements to implementation of the indicator, will be repeated in 2024. In order to learn where further improvements can be made, this process will target countries that were able to report as well as those that were not. The feedback survey will be sent to focal points from countries that have reported, to gather input on their experience of the process, and seek ideas for improving implementation, as well as to countries that have not reported, to better understand the barriers to reporting. In addition, the survey will be circulated to technical experts from fields relating to water quality to ensure that it includes the latest innovations and current thinking on water quality monitoring and assessment.

22 https://gemstat.org/

23 Directive - 2000/60 - EN - Water Framework Directive - EUR-Lex (europa.eu)

These surveys have been crucial to the success of this indicator since its inception in 2016 and have guided each revision and refinement of its implementation. Importantly, the feedback survey process serves as a useful outreach tool that helps to build connections with the indicator focal point network and strengthens ownership of this indicator by those tasked with fulfilling reporting requirements.

Expected outcomes

Monitoring alone will not solve the water quality crisis, but it is an essential prerequisite for informed decision-making. At the mid-point of the SDGs, through the implementation of this indicator, we better understand the challenges faced by national authorities tasked with monitoring and assessing freshwater bodies, and the extent and type of data gaps that need to be filled. This indicator has made a significant contribution to understanding the scale of the challenge faced and real progress is being made to address these challenges through improved and targeted capacity development, as well as support for the creation of SDG-ready data. More work is needed, especially to support efforts to protect and restore water quality, track progress towards SDG Target 6.3 and improve water quality. Whether or not this progress is being made, can only be determined through the collection of water quality data.

As SDG Indicator 6.3.2 information and water quality data flows improve and more countries are included in the global indicator it is likely that the global SDG indicator score will decline. This is especially true if, as is suggested in this report, countries also use stricter target threshold values that are better suited to the protection of freshwater ecosystems as part of their assessment. In addition, as countries expand their monitoring capacity by including additional parameters of concern such as those related to particular industries, this will also provide a clearer, but more realistic insight into the state of freshwater bodies. This realistic picture of global water quality is an essential starting point upon which protection and restoration measures must be built.

Focus Box 3: Creating a national road map for water quality improvement through a review of SDG Indicator 6.3.2 implementation

Introduction

Implementation of SDG Indicator 6.3.2 provides an opportunity for countries to review current monitoring capacity and also to assess whether water quality data are being used effectively for water resource management.

Given the stark data gap highlighted in this report, the need to accelerate the monitoring, assessment, protection and restoration of freshwaters will likely extend beyond 2030 unless significant resources are made available to drive change in the next six years. Regardless of resource availability, efforts to meet this challenge will be hindered by the lack of information on where and how to prioritize action. This challenge can be met by countries undertaking a comprehensive review of their own implementation of SDG Indicator 6.3.2. By comparing national capacity against international benchmarks, this information can be used to guide the creation of a **national capacity development road map**.

Through this review process, countries can also **identify how to improve SDG Target 6.3 progress**. This would include considering whether the maximum amount of information is being generated from the available water quality data. This review process can provide valuable insight that can be compared against established and future water resource management objectives. The reference point would be consideration of the suitability of current objectives against future scenarios, which might include growing pressures on water quality from population growth, industrial development or climate change. River basin management plans are an effective tool for this purpose.

Water quality monitoring and assessment capacity review

Fulfilling the reporting requirements of this indicator can be considered a starting point upon which to build more ambitious objectives. To support this assessment, a new **Relative Monitoring Capacity Index (RMC Index)** is being piloted. This index will provide a "monitoring capacity benchmark" for global and regional comparison. The RMC Index (0 = lowest, 5 highest) uses information supplied to UNEP as part of the indicator submission process that combines monitoring station density; monitoring frequency; and the core parameter coverage.

Figure 19 shows the RMC Index at global scale for all water body types.

This index and its subcomponents can help identify key priority actions for improving monitoring capacity and can also be used to track national improvements over time. These may include:

- the total amount of data available;
- the temporal coverage of data;
- the spatial distribution of data nationally;
- the type of water bodies included.

Calculation, and reporting on, this indicator provides insight into an organization's **data management practices**. Water quality data must be accessible and available and stored in a readily useable format as a prerequisite to reporting. If challenges were faced during the reporting process, identifying and addressing these issues will improve the readiness and overall effectiveness of the organization to support the management of freshwater bodies.

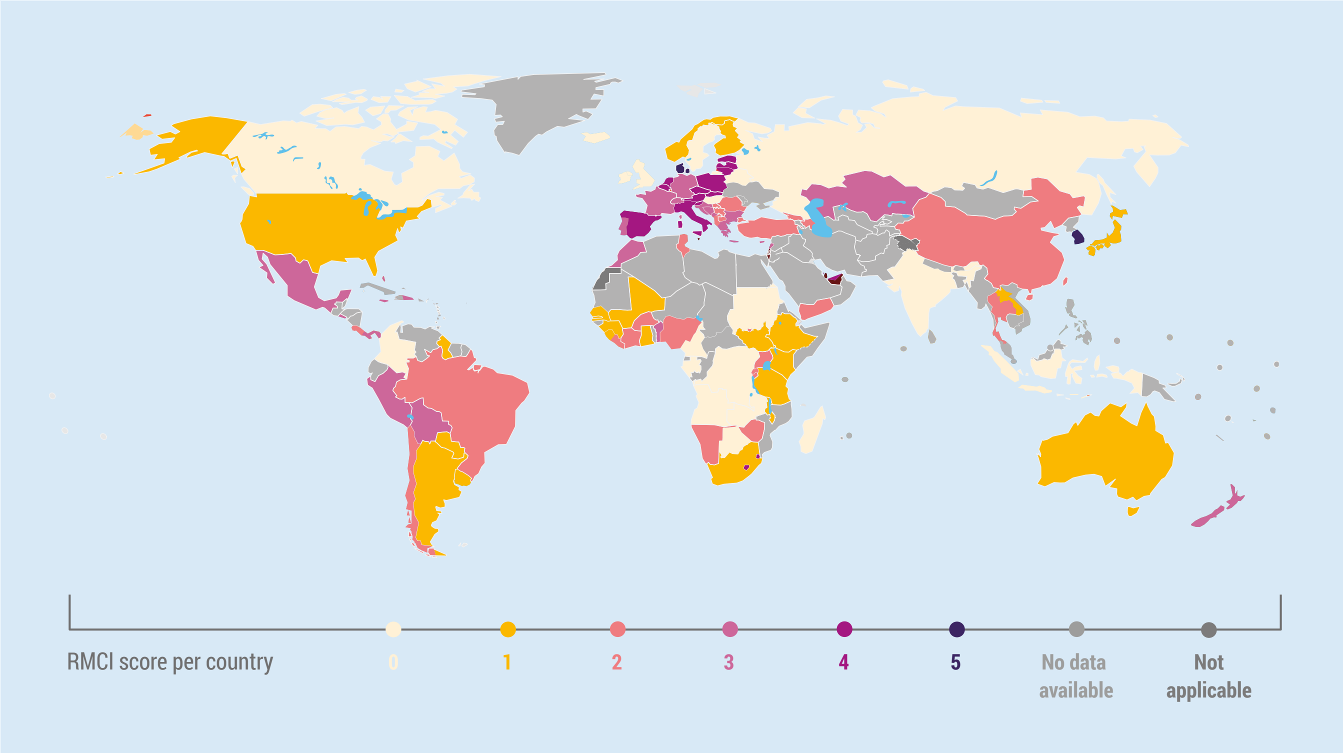


Figure 19: Map of Relative Monitoring Capacity Index for all water body types combined using data supplied in 2023.

Does water quality data support protection and restoration needs

A key finding from this SDG indicator is that there is considerable variability in the ambient water quality target threshold values used as shown in Figure 10. Water quality varies naturally, which makes it more complex to establish these thresholds than those designed for a specific use such as drinking water, but it is quite clear that many are too lenient and could result in **water bodies being misclassifed as having ”good water quality”**. As part of this assesment process, all target threshold values should be reviewed.

Although reported at national level, this indicator is calculated at the water body level and therefore provides information on which water bodies need to be protected and which need to be restored. Overlaying this information on water use requirements (such as drinking water demand) can identify hotspots where priority action is needed.

SDG Indicator 6.3.2 relies on a binary classification of ”good” versus ”not good” based on an 80 per cent compliance of water quality measurements when compared to their respective target values.

The calculated per cent compliance can be further nuanced to create a clearer picture of management measures needed. For example, a water body with a 79 per cent compliance that narrowly missed the “good” threshold of 80 per cent may require a less drastic management approach to one that scored 15 per cent. This information can easily be extracted from the indicator calculation process to provide better information than that available using the binary approach alone.

Way forward

National authorities can contact UNEP GEMS/Water at SDG632@un.org for in-depth feedback on their submission. This feedback will include the RMC Index score provided at regional and GDP per capita quartile levels, as well as feedback on the suitability of the target threshold values used.

In addition, using the data and information used to calculate the indicator, GEMS/Water can support countries in identifying their respective priority issues and in developing and implementing response plans intended to achieve progress towards Target 6.3 and improve national ambient water quality.

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Annexes

Annex 1: Country data

COUNTRY	2017 SCORE				2020 SCORE				2023 SCORE			
	LW	RW	GW	Total	LW	RW	GW	Total	LW	RW	GW	Total
Andorra	0	100	75	92.86	0	86	0	86	0	68	0	68
United Arab Emirates	100	0	100	100	100	0	100	100	100	0	100	100
Antigua and Barbuda					0	0	0	0	0	0	0	0
Albania									0	21.61	95	39.06
Angola									0	100	67	75.25
Argentina					0	0	21.88	17.95	0	62.2	0	62.2
Austria	91.94	80.12	94.57	80.44	95.56	81.42	96.24	81.77	90.33	81.97	96.43	82.26
Australia					0	92	87	87.65	0	91	83	83.76
Azerbaijan									53.32	57.9	0	56.6
Bosnia and Herzegovina	100	4.89	16.67	5.79	100	28.35	94.74	30.58	100	28.35	94.74	30.58
Belgium	0	2.94	39.39	20.59	0	2.17	48.48	21.25	0	6.52	54.55	26.25
Burkina Faso					100	100	95.29	97.7	0	0	18.55	8.99
Bulgaria	100	28.87	41.98	35.56	50	23.4	47.14	33.73	100	31.82	31.75	32.68
Bahrain									0	0	4.5	4.5
Burundi					100	100	100	100	100	100	100	100
Benin					100	100	88.89	89.42	100	88.89	89.34	89.39
Bolivia (Plurinational State of)									0	55.56	0	55.56
Brazil	33.62	71.75	64.86	63.25	46.96	75.87	67.86	71.02	70.57	68.28	37.5	68.23
Bahamas	0	0	58.82	58.82	0	0	64.71	64.71	0	0	64.71	64.71
Botswana	94.44	94.74	7.69	50	0	90	75	78	100	96	82	83.81
Belarus					92	69	0	76.11	95	58	0	69.22
Belize					0	60	100	78.95	0	60	100	78.95
Canada					0	82.19	0	82.19	0	87.95	0	87.95
Democratic Republic of the Congo					0	66	0	66	0	66	0	66
Switzerland	0	83.87	0	83.87	0	70.75	0	70.75	0	79.41	0	79.41
Côte d'Ivoire					100	66.67	0	80	85.71	66.67	0	76.92
Chile	0	76.06	0	76.06	0	78.52	0	78.52	0	67.63	76.75	73.06
Cameroon									0	50	33.33	40

COUNTRY	2017 SCORE				2020 SCORE				2023 SCORE			
	LW	RW	GW	Total	LW	RW	GW	Total	LW	RW	GW	Total
China	62.5	71.8	0	70.84	76.8	87.4	0	86.31	73.8	90.2	0	88.52
Colombia									0	52.58	0	52.58
Costa Rica					0	68.48	0	68.48	0	63.92	0	63.92
Cabo Verde					0	0	89	89	0	0	89	89
Cyprus	87.5	57.14	100	71.74	87.5	61.9	91.67	79.25	87.5	47.62	95.65	75
Czechia	0	0	24.22	24.22	0	0	20.5	20.5	0	0	15.53	15.53
Germany	0	34.3	81.53	73.26	0	40.67	83.33	75.81	0	42.5	84.05	76.7
Denmark	0	0	37.91	37.56	25	22.22	41.18	38.3	0	0	29.31	29.31
Dominican Republic					88.89	50	0	70.59	100	86.67	0	88.24
Estonia	100	100	0	100	44.2	86.2	100	75.65	4.58	18.04	51.29	18.5
Spain	0	28.54	62.58	29.84	0.8	27.08	62.23	32.7	3.65	19.22	33.71	21.6
Ethiopia					100	96.43	0	96.77	50	85.71	0	72.73
Finland	90.64	41.35	19.19	60.59	93.97	11.21	25.97	57.18	91.48	29.29	25.33	59.71
Fiji	100	100	100	100	0	100	100	100	0	100	100	100
France	99.28	97.79	41.08	83.53	100	92.53	39.43	78.93	66.22	86.19	85.4	85.26
Gabon					100	91.3	100	93.55	100	91.3	100	93.55
United Kingdom of Great Britain and Northern Ireland	99.37	95.95	56.2	87.1	100	95.99	57.76	89.9	32	33	0	32.88
Georgia					0	0	92	92	0	0	92	92
Ghana									0	83	0	83
Gambia									0	0	58	58
Guinea	0	0	80.89	80.89					0	0	80.89	80.89
Greece	6.67	31.67	7.67	17.28	16.67	24.12	12.17	16.89	66.67	40.88	7.41	20.37
Guyana					0	67.76	0	67.76	0	67.76	0	67.76
Croatia	100	89.8	96	92.31	75	91.49	100	93.33	100	89.8	92	90.91
Hungary	41.77	53.6	81.98	57.66	34.04	60.72	78.38	59.33	7.83	3.53	65.41	12.98
Indonesia									0	5	0	5
Ireland	45.78	56.72	91.42	61.69	50.45	53.18	92.22	59.44	69	50	92	58.2
Israel					0	0	50	40	0	0	50	40
India	0	36.67	0	36.67	0	18.33	0	18.33	0	10	0	10
Iceland	100	100	100	100	100	100	0	75	100	50	0	50
Italy									36.88	51.89	50.08	50.66
Jamaica	0	92.08	0	92.08	0	94.31	33.4	57.21	0	93.25	38.52	62.98
Jordan	90	66.67	100	92	100	0	0	100				

COUNTRY	2017 SCORE				2020 SCORE				2023 SCORE			
	LW	RW	GW	Total	LW	RW	GW	Total	LW	RW	GW	Total
Japan	75	30	0	37.5	50	30	0	35.71	50	60	0	57.14
Kenya	0	30.52	42.18	35.5	33.33	90.38	90.32	86.52	50	33.71	42.85	37.05
Saint Kitts and Nevis	0	0	82	82	0	0	85	85	0	0	82	82
Republic of Korea	0	82.61	96.01	87.29	87.76	82.61	96.01	93.3	92.52	86.33	95.16	93.56
Kazakhstan					38.71	72.53	0	63.94	0	48.86	0	48.86
Lao People's Democratic Republic					80	80	0	80	80	80	0	80
Lebanon	0	50	100	50					20	30	30	29.09
Liechtenstein	0	77.78	100	80	0	77.78	100	80	0	78	100	80.2
Liberia					100	33.33	0	50	100	33.33	0	50
Lesotho	0	33.33	0	16.67	100	100	0	100	0	64.71	0	64.71
Lithuania	27.09	30.18	52.63	29.85	33.51	26.5	42.11	29.56	28.17	18.58	44.44	22.36
Luxembourg									0	0	0	0
Latvia	54.82	93.32	100	74.97	66.72	88.21	100	77.48	68.04	95.46	100	83.76
Morocco	85.94	76.14	76.27	79.15					85.94	76.14	76.27	79.15
Republic of Moldova									56	33	90	51.08
Montenegro	100	100	0	94.12	90.91	86.67	100	88.1	100	96.23	90.91	95.35
Madagascar	94.59	94.12	81.58	90.91	94.59	94.12	81.58	90.67	94.59	94.12	81.58	90.67
Marshall Islands	100	0	100	100					0	0	87	87
North Macedonia	100	61.9	0	63.64	0	57.89	0	57.89	0	72.22	0	72.22
Mali					0	77.78	0	70	0	77.78	0	70
Malta									0	0	6.67	6.67
Malawi									100	67	0	75.25
Mexico					58.27	53.09	0	54.91	56.89	56.89	0	56.89
Namibia	60	85.71	100	78.57					0	63	0	63
Niger	0	67	0	67	0	80	0	80				
Nigeria	41	66.27	0	52.46	7.77	15.05	0	12.46	65.06	40	0	50.78
Netherlands	6.51	8.16	12.5	7.32	9.52	7.19	8.33	8.73	11.69	16.38	4.17	12.67
Norway	100	100	100	100	100	100	0	100	100	100	0	100
New Zealand	87.64	99.58	0	97.7	40.35	80.07	0	72.21	49.63	61.36	58.93	57.93
Panama					100	63.64	0	64.36	100	74.77	0	75.23
Peru	0	36.84	0	36.84	23.58	25.62	0	25.41	23.5	39.4	0	37.44
Poland	13.75	55.74	74.07	50.23	42.55	75.13	87.95	72.17	63.33	68.06	79.59	67.59
Portugal	0	43.7	45.45	44.39	0	54.24	38.67	48.19	0	62.28	38.36	52.94

COUNTRY	2017 SCORE				2020 SCORE				2023 SCORE			
	LW	RW	GW	Total	LW	RW	GW	Total	LW	RW	GW	Total
Paraguay					66.67	75.21	0	71.61	66.67	75.21	0	71.61
Qatar									0	0	50	50
Romania	33.33	69.17	24.14	59.87	0	66.37	0	64.66	0	52.21	0	50.86
Serbia	23.08	72.97	23.08	47.37	0	80	15.38	47.76	0	76.47	23.08	50.79
Russian Federation	83.33	100	0	96	83.33	100	0	96	100	100	0	100
Rwanda	0	37.5	0	30	66.67	75	100	78.79	100	72.73	0	77.78
Sudan	70	100	90	86.05					0	100	100	100
Sweden	48.85	31.77	97.7	45.13	52.96	34.58	97.62	48.37	52.96	34.58	97.62	48.37
Singapore	100	0	0	100	100	0	0	100	100	0	0	100
Slovenia	9.09	80.43	90.48	75.81	27.27	89.51	78.57	83.89	30	91.29	85.71	86.81
Slovakia	0	42.11	91.78	70	0	56.92	89.19	74.1	0	35.44	89.19	61.44
Sierra Leone					0	41.7	0	41.7	0	79.41	50	70
Senegal	0	0	66.67	44.44	0	66.67	33.33	44.44	0	66.67	33.33	44.44
South Sudan	100	100	100	100					100	100	100	100
El Salvador	0	43.33	0	43.33	0	59.68	0	59.68	0	51	0	51
Eswatini					0	87.5	0	87.5	0	70	0	70
Togo					100	100	100	100				
Thailand					0	36	0	36	25	38.33	0	36.76
Tunisia					0	83	86	84.94	0	83	86	84.94
Turkey									71	79	0	78.45
Trinidad and Tobago					0	0	87.5	87.5	0	0	87.5	87.5
United Republic of Tanzania	0	0	0	0	80	87	0	85.33	100	85.71	0	88.89
Uganda	100	100	0	100	0	0	0	0	100	78.12	0	84.09
United States of America					44.66	32.63	0	33.67	45.63	39.98	0	41.97
Uruguay					73.04	76.88	0	75.85	78.5	82.29	0	81.75
Samoa					100	100	0	100	100	100	0	100
Yemen									0	0	37.8	37.8
South Africa	62.5	37.05	0	46.92	43.5	52.32	74.19	52.11	47	70	78	70.69
Zambia	100	75	66.67	75					0	100	0	85.71
Zimbabwe	0	76.47	0	76.47	0	83.33	0	83.33	0	80.95	0	80.95

Annex 2: Summary Data

Table below shows the indicator results. These are the proportions of water bodies with good ambient water quality per region. These are not calculated averages of national indicator scores.

M49 CODE (REGION)	REGION NAME	BODIES OF WATER			OPEN WATER BODIES			RIVER WATER BODIES			GROUNDWATER		
		2017	2020	2023	2017	2020	2023	2017	2020	2023	2017	2020	2023
1	World	57	58.2	56	49.5	51.3	52.2	53.7	54.4	49.7	77.5	81.5	79.9
2	Africa (M49)	71.4	66.7	78.8	66.1	43.6	77.5	57.2	62.6	72.9	77.3	86.3	80.8
5	South America (M49)	64.5	53.5	56.6	33.6	39.5	45.5	72.1	55.6	55.6	64.9	42.6	75.2
9	Oceania (M49)	97.9	86.8	81.6	87.8	43.3	54.1	99.6	89.8	82.9	100	86.8	82.4
11	Western Africa (M49)	78.4	61.2	78.6	41	26.7	62.7	64.2	34.8	56.9	80.8	88.5	81.1
13	Central America (M49)	43.3	58.3	59.5		58.6	57.2	43.3	57.7	59.8		100	100
14	Eastern Africa (M49)	62.8	86.2	81.7	85.5	75.8	92.8	64	87.8	80.9	51.8	88.8	72.1
15	Northern Africa (M49)	80.3	84.9	80.2	83.8		85.9	76.9	83	77.2	80.9	86	79.4
17	Middle Africa (M49)		79.6	76.6		100	100		76.6	76.1		100	77
18	Southern Africa (M49)	47.8	58.7	76.8	64.7	43.8	52	41.7	60.7	73.2	11.9	74.5	81.1
19	Americas (m49)	65	48.9	53.4	33.6	45	47.2	72.2	51	53	69.5	53.9	72.3
21	Northern America (M49)		34.6	42.9		44.7	45.6		34.2	41.4			
29	Caribbean (M49)	86.3	65.3	68.9		72.7	50	92.1	88.4	91.9	73.2	55.7	56.8
30	Eastern Asia (M49)	77	88.7	91	44.2	79.4	81.2	72.5	86.4	89.5	95.7	96	95.2
34	Southern Asia (MDG=M49)	36.7	18.3	10				36.7	18.3	10			
35	South-eastern Asia (MDG=M49)	100	53.2	13.1	100	97.9	76.3		41.9	10			

M49 CODE (REGION)	REGION NAME	BODIES OF WATER			OPEN WATER BODIES			RIVER WATER BODIES			GROUNDWATER		
		2017	2020	2023	2017	2020	2023	2017	2020	2023	2017	2020	2023
39	**Southern Europe (M49)**	23.9	34	36.8	10.5	12.7	24.2	23.1	31.3	36.5	30.6	48.6	40.3
53	**Australia and New Zealand (M49)**	97.7	86	80.6	87.6	40.4	49.6	99.6	86.8	77.9		86.8	82.3
54	**Melanesia (M49)**	100	100	100	100			100	100	100	100	100	100
57	**Micronesia (M49)**	100		87	100						100		87
61	**Polynesia (M49)**		100	100		100	100		100	100			
62	**Central Asia (M49) and Southern Asia (MDG=M49)**	36.7	48.9	33.1		38.7		36.7	51	33.1			
142	**Asia (M49)**	76	83.6	77.7	53	76.6	79.1	70.3	79.6	72	95.9	95.5	87.1
143	**Central Asia (M49)**		63.9	48.9		38.7			72.5	48.9			
145	**Western Asia (M49)**	78.3	83	63.6	85	90.9	67	57.1	61.9	75.1	100	89	45.1
150	**Europe (M49)**	53.8	56.9	51.4	49.1	52.3	51.3	50.3	53.2	46.6	76.2	79.3	77.6
151	**Eastern Europe (M49)**	51.6	66.5	49.7	20.3	43.2	54.1	54.9	70.3	48.5	58.3	64.5	53
154	**Northern Europe (M49)**	49.7	51.8	46.4	51.6	54.9	52.7	39.6	41	36.3	88.8	92.3	93.4
155	**Western Europe (M49)**	77	77.1	79	42.2	31.6	35.9	80.2	80.3	79.7	69.4	70.4	83.8
199	**Least Developed Countries (LDCs)**	81.9	86.8	78.3	87.8	84.9	87.5	90.2	85.1	84.7	81	88.4	77
202	**Sub-Saharan Africa (M49)**	70.8	66.4	78.7	62.6	43.6	75.1	54.8	62.4	72.4	77.2	86.3	80.9
419	**Latin America and the Caribbean (MDG=M49)**	65	54.6	57.4	33.6	45.4	49.1	72.2	56.2	56.6	69.5	53.9	72.3
432	**Landlocked developing countries (LLDCs)**	74.6	79	72.8	90.6	53.9	74.9	84.5	81.6	69.6	20.8	85.4	79.9

M49 CODE (REGION)	REGION NAME	BODIES OF WATER			OPEN WATER BODIES			RIVER WATER BODIES			GROUNDWATER		
		2017	2020	2023	2017	2020	2023	2017	2020	2023	2017	2020	2023
513	**Northern America (M49) and Europe (M49)**	53.8	55.8	51	49.1	51.6	50.9	50.3	52.3	46.4	76.2	79.3	77.6
514	**Developed regions (MDG)**	54.7	57.4	52.8	49.8	51.5	50.9	51.5	52.9	46.8	76.2	81	79
515	**Developing regions (MDG)**	70.1	63.1	69.5	47.1	49.6	63	69.8	61.8	63.8	80.7	85.2	81.9
543	**Oceania (M49) excluding Australia and New Zealand (M49)**	100	100	97.3	100	100	100	100	100	100	100	100	88.3
722	**Small island developing States (SIDS)**	91.7	79	81.3	100	90.3	94.1	94.9	85.5	86.3	81.8	62.5	69.9
747	**Western Asia (M49) and Northern Africa (M49)**	79.8	83.5	67.3	84	90.9	77	71.4	69.6	75.5	85.5	88	52.2
753	**Eastern Asia (M49) and South-eastern Asia (MDG=M49)**	77.2	86.9	81.6	49.5	81.3	80.8	72.5	83.5	73.5	95.7	96	95.2

Learn more about progress towards SDG 6

Sustainable Development Goal (SDG) 6 expands the Millennium Development Goal (MDG) focus on drinking water and basic sanitation to include the more holistic management of water, wastewater and ecosystem resources, acknowledging the importance of an enabling environment. Bringing these aspects together is an initial step towards addressing sector fragmentation and enabling coherent and sustainable management. It is also a major step towards a sustainable water future.

Monitoring progress towards SDG 6 is key to achieving this SDG. High-quality data help policymakers and decision makers at all levels of government to identify challenges and opportunities, to set priorities for more effective and efficient implementation, to communicate progress and ensure accountability, and to generate political, public and private sector support for further investment.

The 2030 Agenda for Sustainable Development specifies that global follow-up and review shall primarily be based on national official data sources. The data are compiled and validated by the United Nations custodian agencies, who contact country focal points every two to three years with requests for new data, while also providing capacity-building support. The last global “data drive” took place in 2023, resulting in status updates on seven of the global indicators for SDG 6 (please see below). These reports provide a detailed analysis of current status, historical progress and acceleration needs regarding the SDG 6 targets.

To enable a comprehensive assessment and analysis of overall progress towards SDG 6, it is essential to bring together data on all the SDG 6 global indicators and other key social, economic and environmental parameters. This is exactly what the SDG 6 Data Portal does, enabling global, regional and national actors in various sectors to see the bigger picture, thus helping them make decisions that contribute to all SDGs. UN-Water also publishes synthesized reporting on overall progress towards SDG 6 on a regular basis.

Summary Brief: Mid-term status of SDG 6 global indicators and acceleration needs

Based on latest available data on all SDG 6 global indicators. Published by UN-Water through the UN-Water Integrated Monitoring Initiative for SDG 6.

Progress on household drinking water, sanitation and hygiene 2000–2022: special focus on gender

Based on latest available data on SDG indicators 6.1.1 and 6.2.1. Published by World Health Organization (WHO) and United Nations Children’s Fund (UNICEF).

https://www.unwater.org/publications/who/unicef-joint-monitoring-program-update-report-2023

Progress on the proportion of domestic and industrial wastewater flows safely treated – Mid-term status of SDG Indicator 6.3.1 and acceleration needs, with a special focus on climate change, wastewater reuse and health

Based on latest available data on SDG indicator 6.3.1. Published by WHO and United Nations Human Settlements Programme (UN-Habitat) on behalf of UN-Water.

https://www.unwater.org/publications/progress-wastewater-treatment-2024-update

Progress on ambient water quality: Mid-term status of sdg indicator 6.3.2 and acceleration needs, with a special focus on health

Based on latest available data on SDG indicator 6.3.2. Published by United Nations Environment Programme (UNEP) on behalf of UN-Water.

Progress on change in water-use efficiency. Mid-term status of sdg indicator 6.4.1 and acceleration needs, with special focus on food security and climate change

Based on latest available data on SDG indicator 6.4.1. Published by Food and Agriculture Organization of the United Nations (FAO) on behalf of UN-Water.

Progress on the level of water stress. Mid-term status of the sdg indicator 6.4.2 and acceleration needs, with special focus on food security and climate change

Based on latest available data on SDG indicator 6.4.2. Published by FAO and UN-Water.

Progress on implementation of Integrated Water Resources Management. Mid-term status of SDG indicator 6.5.1 and acceleration needs, with a special focus on climate change

Based on latest available data on SDG indicator 6.5.1. Published by UNEP and UN-Water.

Progress on transboundary water cooperation. Mid-term status of SDG Indicator 6.5.2, with a special focus on climate change – 2024

Based on latest available data on SDG indicator 6.5.2. Published by United Nations Economic Commission for Europe (UNECE) and United Nations Educational, Scientific and Cultural Organization (UNESCO) on behalf of UN-Water.

Progress on water-related ecosystems. Mid-term status of sdg indicator 6.6.1 and acceleration needs, with a special focus on biodiversity

Based on latest available data on SDG indicator 6.6.1. Published by UNEP on behalf of UN-Water.

Strong systems and sound investments: evidence on and key insights into accelerating progress on sanitation, drinking-water and hygiene.

The UN-Water global analysis and assessment of sanitation and drinking-water (GLAAS) 2022 report

https://www.unwater.org/publications/un-water-glaas-2022-strong-systems-and-sound-investments-evidence-and-key-insights

Based on latest available data on SDG indicators 6.a.1 and 6.b.1. Published by WHO through the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) on behalf of UN-Water.

UN-Water reports and other relevant publications

UN-Water coordinates the efforts of United Nations entities and international organizations working on water and sanitation issues. UN-Water publications draw on the experience and expertise of UN-Water's Members and Partners.

United Nations System-Wide Strategy for Water and Sanitation

The United Nations system-wide strategy for water provides a system-wide approach for the United Nations to work collaboratively on water and sanitation. In September 2023, Member States adopted General Assembly resolution 77/334, which requested the Secretary-General to present a United Nations system-wide water and sanitation strategy in consultation with Member States before the end of the seventy-eighth session. The strategy has been developed by UN-Water under the leadership of the UN-Water Chair, as requested by the Secretary-General, and will be launched in July 2024.

Blueprint for Acceleration: Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2023

The report, written by the UN-Water family of Members and Partners, is a concise guide to delivering concrete results – offering actionable policy recommendations directed towards senior decision-makers in Member States, other stakeholders, and the United Nations System to get the world on track to achieve SDG 6 by 2030. It was released ahead of the discussions of Member States and relevant stakeholders at the 2023 High-level Political Forum on Sustainable Development (HLPF), which includes a Special Event focused on SDG 6 and the Water Action Agenda.

United Nations World Water Development Report

The United Nations World Water Development Report is UN-Water's flagship report on water and sanitation issues, focusing on a different theme each year. The report is published by UNESCO on behalf of UN-Water, and its production is coordinated by the UNESCO World Water Assessment Programme.

SDG 6 Progress Update – 9 reports, by SDG 6 global indicator

This series of reports provides an in-depth update and analysis of progress towards the different SDG 6 targets and identifies priority areas for acceleration. *Progress on household drinking water, sanitation and hygiene, Progress on wastewater treatment, Progress on ambient water quality, Progress on water-use efficiency, Progress on level of water stress, Progress on integrated water resources management, Progress on transboundary water cooperation, Progress on water-related ecosystems and Progress on international cooperation and local participation*. The reports, produced by the responsible custodian agencies, present the latest available country, region and global data on the SDG 6 global indicators, and are published every two to three years.

Progress reports of the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)

The JMP is affiliated with UN-Water and is responsible for global monitoring of progress towards SDG 6 targets for universal access to safe and affordable drinking-water and adequate and equitable sanitation and hygiene services. Every 2 years, the JMP releases updated estimates and progress reports for WASH in households (as part of the progress reporting on SDG 6, see above), schools and health care facilities.

UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS)

The GLAAS report is produced by WHO on behalf of UN-Water. It provides a global update on the policy frameworks, institutional arrangements, human resource base, and international and national finance streams in support of water and sanitation. It is a substantive input into the activities of Sanitation and Water for All as well as the progress reporting on SDG 6. The next report will be published in 2025.

UN-Water Country Acceleration Case Studies

To accelerate the achievement of SDG 6 targets as part of the SDG 6 Global Acceleration Framework, UN-Water releases SDG 6 Country Acceleration Case Studies to explore countries' pathways to achieving accelerated progress on SDG 6 at the national level. Since 2022, six case studies have been released from Costa Rica, Pakistan. Senegal, Brazil, Ghana and Singapore. Three new are planned to be released in July 2024 from Cambodia, Czechia and Jordan.

Policy and Analytical Briefs

UN-Water's Policy Briefs provide short and informative policy guidance on the most pressing freshwater-related issues that draw upon the combined expertise of the United Nations system. Analytical Briefs provide an analysis of emerging issues and may serve as basis for further research, discussion and future policy guidance.

UN-Water Planned Publications

- UN-Water Policy Brief on Transboundary Waters Cooperation – update

More information: https://www.unwater.org/unwater-publications/

How is the world doing on Sustainable Development Goal 6?
View, analyse and download global, regional and national water and sanitation data.

http://www.sdg6data.org/

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