

# Global Water Security 2023 Assessment

## Executive Summary



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UNU INWEH is an integral part of the United Nations University (UNU) – an academic arm of the UN, which includes 13 institutes and programmes located in 12 countries around the world, and dealing with various issues of development. UNU INWEH was established, as a public service agency and a subsidiary body of the UNU, in 1996. Its operations are secured through long-term host-country and core-funding agreements with the Government of Canada. The Institute is located in Hamilton, Canada, and its facilities are supported by McMaster University.

# Executive Summary



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Sufficient water of adequate quality is an essential precondition of human life, socioeconomic development, and environmental sustainability. However, the security of our finite freshwater resources is threatened by the competing demands of rapidly expanding populations and global economies and made vulnerable by ongoing conflicts and multiple compounding effects of climate change. To accelerate the efforts to meet water security challenges, the United Nations General Assembly declared 2018-2028 the [Water Action Decade for Sustainable Development](#). This coincides with and complements [the 2030 Agenda for Sustainable Development](#) (SDGs 2015-2030).

Midway into the Water Action Decade and the SDG era, this report – undertaken by the United Nations University Institute for Water Environment and Health (UNU INWEH), the UN’s only think tank on water – provides a preliminary quantitative global assessment that evaluates the state of water security for 7.78 billion people living in 186 countries. While not an easy undertaking, it is essential to track our progress towards realising a more water secure world, and identify where and what more targeted developmental efforts, funding, and policy focus should be to ensure that the most vulnerable and insecure are not left behind. This report is not a definitive assessment of our constantly changing world, which is rarely well measured. It is a necessary first step to establishing a clearer picture of global water security that can and will be updated on a regular basis as additional and more robust data become available.

### ***This report applies the UN-Water definition water security:***

***The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socioeconomic development, for ensuring protection against waterborne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.***



*By European Union*

The SDGs, and SDG 6 specifically, reflect these holistic dimensions of water security. The SDG targets and indicators are universally agreed means of monitoring and reporting on progress towards achieving water security. Therefore, it should be possible to quantify national water security for all countries worldwide using this framework. The preliminary assessment presented in this report addresses 10 development outcomes as components of water security that should be quantifiable using SDG indicators. This report aims to:

- Quantify and compare current levels of the primary components of water security, by country, using SDG-defined indicators and available datasets to reveal an explicit picture of global water security in the middle of the Water Action Decade and Agenda 2030.
- Support the ‘Improved data and information’ acceleration pillar of the UN-Water SDG 6 Global Acceleration Framework, by ensuring that ‘high-quality information on SDG 6 indicators is shared and easily accessible by any decision maker’ ([UN Water, 2020](#)).
- Highlight the overall status of available water data routinely reported by countries within the SDG framework and indicators and identify data gaps that need to be filled to support accurate and confident analyses of water security moving forward.
- Recommend, where gaps are identified, improvements for SDG indicator reporting for the remainder of the SDG era, and key considerations to enhance water security monitoring – for the next phase of SDGs – beyond 2030.

This assessment applies an inclusive approach to ensure a maximum number of countries are represented and compared globally by their assessed national water security levels. All countries with sufficient data to assess the 10 water security components are included, regardless of size, population, or geography.

### **The 10 components of water security assessed are:**

- 1. Drinking water**
- 2. Sanitation**
- 3. Good health**
- 4. Water quality**
- 5. Water availability**
- 6. Water value**
- 7. Water governance**
- 8. Human safety**
- 9. Economic safety**
- 10. Water resource stability**

These components are assessed and mapped at a national level using indicators with clear metrics and publicly available data. Where possible, single indicators are quantified using national SDG indicator data, freely available via online platforms maintained by UN SDG custodian data agencies. When this preliminary assessment was completed in early 2023, the most recent SDG indicator data available were for 2020, and unfortunately, over half of the water indicators had major data limitations that required the application of some sub-indicators and proxy values from open-source datasets.

Each water security component is assessed, and each country receives a score out of 10. All national component scores are then mapped for a global comparison. An overall national water security score is calculated from the sum of each 10 components, with a maximum score of 100 (see Figure A).

National scores are classified as water ‘secure’ (75 and above), ‘moderately secure’ (65–74), ‘insecure’ (41–64), or ‘critically insecure’ (40 or less). National water security status is compared between countries, across global regions (Figure B) and between income groups (Figure C).

## **Key Findings**

**Alarmingly, most of the world’s population live in water-insecure countries today.** Out of 7.78 billion people living in 186 countries, over 0.61 billion people (8%) are critically water-insecure and 5.52 billion (72%) are water-insecure, including 4.31 billion people in the Asia-Pacific region, 1.34 billion in Africa, 415 million in the Americas, and almost 66 million in Europe. 0.65 billion people (8%) live in moderately water-secure countries and over 1 billion (12%) live in water-secure countries, primarily in Europe (0.7 billion) and the Americas (0.6 billion).

**Mapped globally, there is a sharp disparity in water security across global regions and sub-regions.** The least water-secure regions are Africa, including the Sahel, the Horn of Africa and parts of West Africa, in addition to South Asia, and Small Island Developing States (SIDS) across the world. Europe and the Americas are significantly more water-secure than other global regions. At the sub-region level, Eastern Europe are markedly less secure than Northern Europe, and South and Central America less secure than North America.

**Least Developed Countries and SIDS face critical levels of water security.** The 23 countries assessed as critically insecure include 16 Least Developed Countries (LDCs) and 7 SIDS: the Solomon Islands, Eritrea, Sudan, Ethiopia, Vanuatu, Afghanistan, Djibouti, Haiti, Papua New Guinea, Somalia, Liberia, St Kitts & Nevis, Libya, Madagascar, Pakistan, South Sudan, Micronesia, Niger, Sierra Leone, Yemen, Chad, Comoros and Sri Lanka. These countries are severely impeded from achieving water security in seven of the ten components: low levels of access to safely managed drinking water and sanitation services (Components 1 and 2), health, measured by high WASH-attributed mortality (Component 3), water quality (Component 4), water value (Component 6), water governance (Component 7) and water resource stability with high interannual variability and low storage capacity (Component 10).

**Globally, all regions face a trajectory of low levels of water security due to a range of compounding factors.** However, these levels vary in each global region. In Africa, water security scores range from 29 (critically insecure) to 58 (insecure), followed by Asia ranging from 32 (critically insecure) to 81 (secure), the Americas from 52 (insecure) to 80 (secure), Europe from 51 (insecure) to 90 (secure), and SIDS from 23 (critically insecure) to 67 (moderately secure).

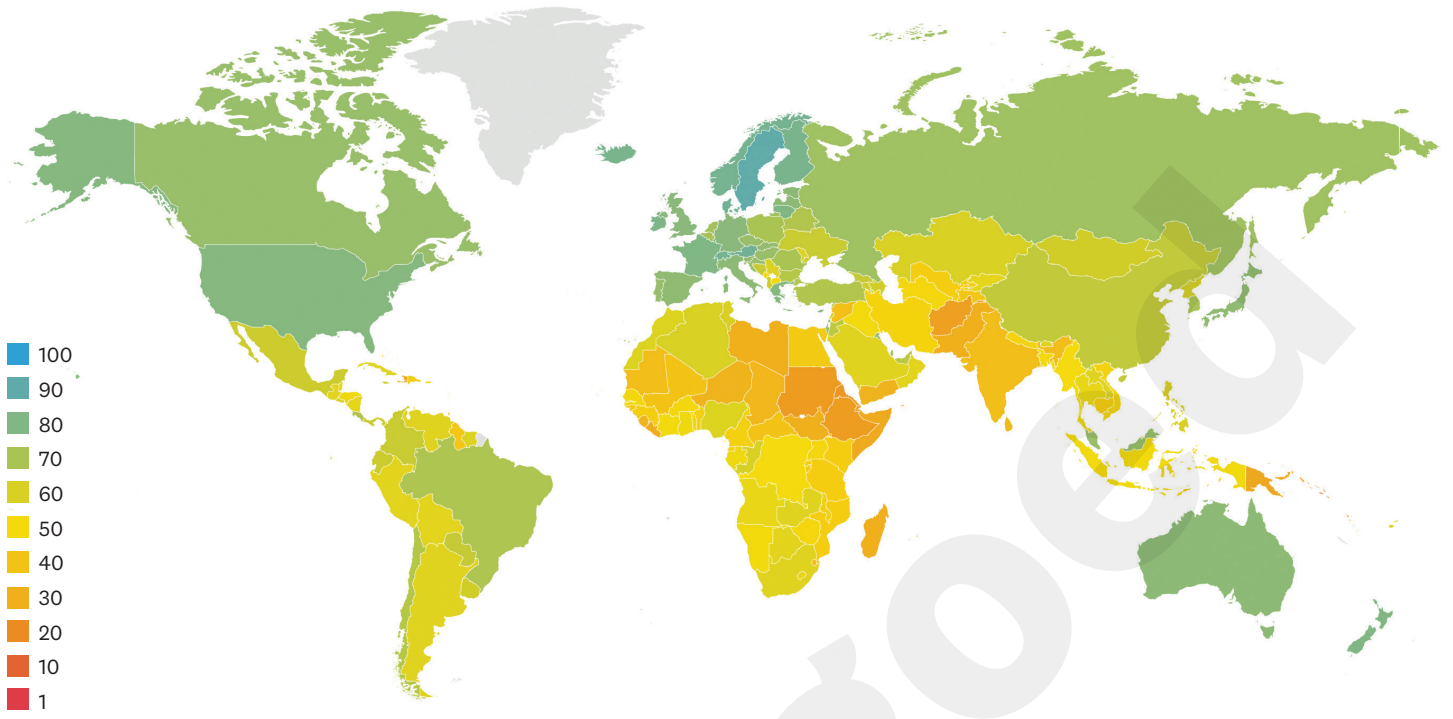


Figure A. National water security mapped globally, based on a score of 1-100.

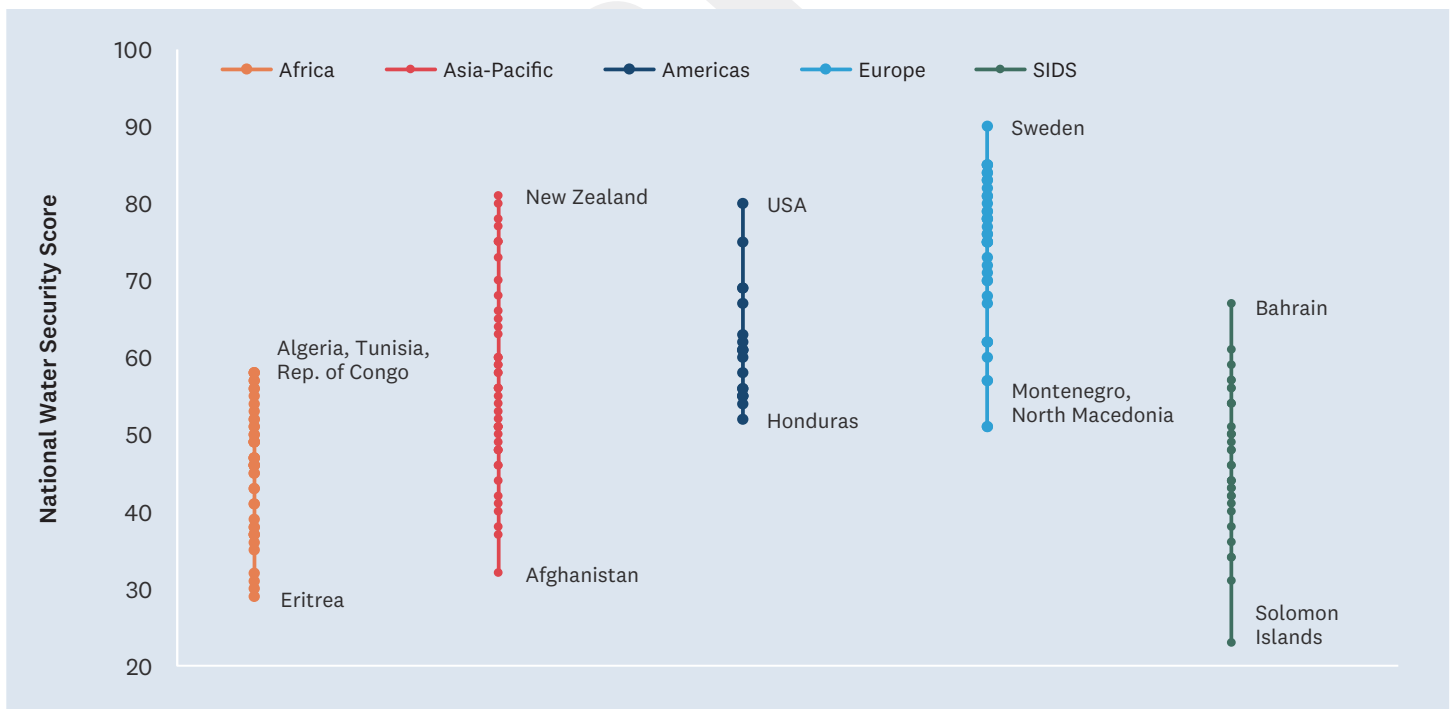


Figure B. National water security scores for 186 countries grouped in 4 regions plus SIDS globally.

**Access to safely managed drinking water and sanitation are still a dream for more than half the global population.** More than 10% of people (close to 800 million) do not have access to even basic drinking water, and more than 70% (close to 5.5 billion) do not have access to a safely managed drinking water service (the SDG 6.1 target). More than 22% (1.71 billion) do not have access to even basic sanitation, and more than 53% (over 4.12 billion) do not have access to safely managed sanitation.

**Africa has the lowest levels of WASH worldwide.** Regionally, Africa has the lowest levels of WASH access. Almost 31% (over 411 million) of people in the 54 African countries, including 33 LDCs and 6 SIDS, do not have access to a *basic* drinking water service. Only 201 million people (15%) have access to *safely managed* drinking water, which is the SDG 6.1 target. In the case of sanitation services, more than 58% of people (780 million) do not have access to even *basic* sanitation services, and 82% (1.1 billion) still live without access to a *safely managed* sanitation service.

**Globally, significantly more people die from a lack of safe drinking water, sanitation, and basic hygiene services than as a result of water disaster.** 25 countries in Africa are severely impacted by WASH-attributed mortality, with estimated rates of over 40 deaths per 100,000 people annually, while 20 Asian Pacific countries have mortality rates between 10–40 deaths per 100,000. This situation is not improving – in 2019, 164 of the countries assessed have increased rates of WASH-attributed mortality compared to 2016 WHO estimates. Clearly, efforts to improve WASH services and wastewater treatment and reduce associated deaths must be significantly accelerated to achieve good health goals globally.

**Comprehensive and accurate water quality assessment at the national level remains a challenge despite a dedicated SDG 6 target.** The level of industrial and domestic wastewater treatment could not be assessed in all countries as defined in SDG 6, due to insufficient data. This is a major failing halfway into the SDG era, as only 14 countries have data available on industrial wastewater treatment (2015 values). The level of domestic wastewater treatment, assessed by WHO using household sanitation statistics, remains very poor (below 30%) in Africa and large parts of the Asia-Pacific, and poor (below 50%) in most South American countries, though there are exceptions in all regions.

**Abundant natural water availability does not necessarily ensure water security.** Many countries in Africa, the Asia-Pacific, and the Americas with abundant freshwater resources (water stress of 10% or less) have low levels of WASH access and water treatment, high rates of WASH-re-

lated deaths, low economic water value, and potentially high losses due to flood or drought impacts.

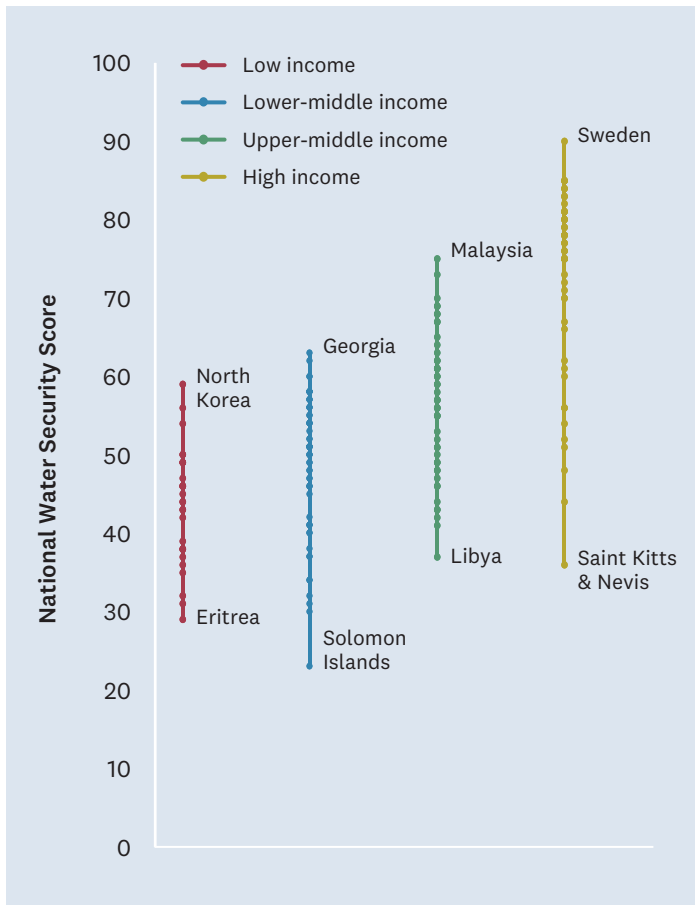
**High water values ('Water Use Efficiency') do not always translate into water security.** Many national economies dominated by petroleum and mining activities have a high economic value per unit of water used (100 USD/m<sup>3</sup> or higher), but this does not necessarily result in increased water security in other components such as governance, WASH, or storage infrastructure. This is particularly true in countries with high levels of economic water value in African countries reliant on petroleum and mining industries.

**The influence of climate change on water security is not well addressed by the water-related SDGs.** Countries with high interannual freshwater variability worldwide experience less stable and reliable water availability, impacting livelihoods and all sectors, but the capacity to mitigate this variability through a range of water storage options is poorly represented in global policy agendas. Likewise, the capacity of some water-stressed countries to utilize intensive water resource management mechanisms, unconventional water supplies, and desalination infrastructure to fulfil their water needs and support water resource stability, in the Middle East for example, is not captured in current water-related SDGs.

**Prosperity is not the main driver of water security.** National wealth, measured by Gross National Income (GNI) per capita, is clearly related to the capacity to fund critical water infrastructure and governance. However, national wealth is not the only driver of water security, particularly when there are multiple determinants of water security with reinforcing effects on each other. Countries within the same income group can have distinctive water security levels as illustrated in Figure C. Countries categorized as low income, lower-middle income or upper-middle income (per capita GNI below US\$ 12,535 – World Bank 2020 groups) have similar distributions and overlapping ranges in national scores, most of them being considered water insecure or critically insecure. At the extremes of rich and poor, the 29 low-income countries had water security scores ranging from 29 to 59, and the 50 high income countries had water security scores ranging from 36 to 90.

**Water security assessment provides at best coarse national-level estimates that mask water security variability at finer scales.** Where global data exist to assess water security at a national level, they clearly do not represent the individual or household experience of water insecurity. The national data currently available at a global extent, do not reflect rural-urban disparities, nor gender, age or social inequalities.





**Figure C. National water security scores for all 186 countries assessed, classified according to 2020 World Bank income groups.**

This assessment revealed that despite all efforts undertaken to date, the state of globally relevant water-related data on almost all water issues remains poor, with the notable exceptions of WASH and health data managed by Joint Monitoring Project (WHO and UNICEF), and nationally reported data on Integrated Water Resources Management (UNEP-DHI). Lack of water data manifests itself so strongly that some critical components of water security simply cannot be assessed without introducing surrogates. Global water resource data is old, and many hydrological features are still considered as ‘constants’ even though almost all components of the water cycle are in flux in a changing climate. No reliable, nationally reported, global data sets are available on the impacts of water-disasters on human safety or national economies, and research data proved the best indicator source. This represents a major challenge for the assessment and compensation of ‘loss and damage’. Many SIDS and LDCs are highly exposed to water-disasters and at risk from low water resource stability suffer particularly from data shortage in these components.

The key underlying methodological assumption in this approach – that needs to be re-iterated from the introduction section above – is that the multi-dimensional nature of water security on one hand, and the mentioned simplicity and pragmatism – on the other, are already captured by the subset of water-related targets and indicators that currently feature in the SDG continuum. While it is accepted that the overall SDG structure and individual indicators themselves are not perfect and may not cover all aspects of water security, they collectively represent the most straightforward and standard way to quantify water security of any nation at present – till 2030 at least – as these should be routinely reported by the United Nations Member States, with the assistance of the custodian UN agencies responsible for SDG 6 indicator level methodology and metadata development.

Overall, poor data availability and quality were major limitations of this assessment, revealing that it is almost impossible to assess progress in water development indicators accurately at a global level. The water security components assessed represent a benchmark from which to assess future progress, but immediate action must be taken by all national governments to radically improve data collection, with support from international agencies and UN data custodians. Without this data, progress in water security towards at least half of SDG 6 (water) targets will remain ‘guesstimates’ at best. It may be argued that water data availability itself should be seen as an indicator in future water resources and security assessments.

Water professionals and policymakers worldwide recognize the importance of reliable data and accurate, up-to-date information for evidence-based decision making. These are essential building blocks of a future where all water resources should be recognised and treated as precious resources and highly valued as cornerstones of the circular economy. This assessment is a step in this direction and hopefully one that can be strengthened in future iterations.

This report targets: i) national water policy actors worldwide, tasked with implementation of relevant SDGs and reporting on progress, allowing assessment and comparison of the components of water security; ii) UN custodian agencies supporting water-related national monitoring and reporting efforts globally, highlighting data gaps and facilitating improvement in the reporting process; iii) NGOs and international donors, revealing water in-security hotspots that require priority support; and iv) researchers and technical staff concerned with design, monitoring and implementation of metrics of water security. The report is not a guide for water security assessment, not the least because the assessment methodology will continue to emerge and evolve with time.



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