

Water Security

OUR ESSENTIAL GUIDE TO
SAFEGUARDING GLOBAL WATER
SUPPLIES



What is water security?



Water security is more important than ever before but also faces increased risks, resulting from climate change, geopolitical conflicts and human activity. Critical to communities, industry and agriculture, the security of water supply underpins society. A recent report from the World Bank shows that water scarcity, exacerbated by climate change, could cost regions up to 6% of their GDP, spark conflict and spur migration.

Yet, how do you define water security?

According to the United Nations Water (UN-Water) water security can be defined as: "The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability."

This was the definition proposed by the UN-Water back in 2013 to open international talks on global water security.

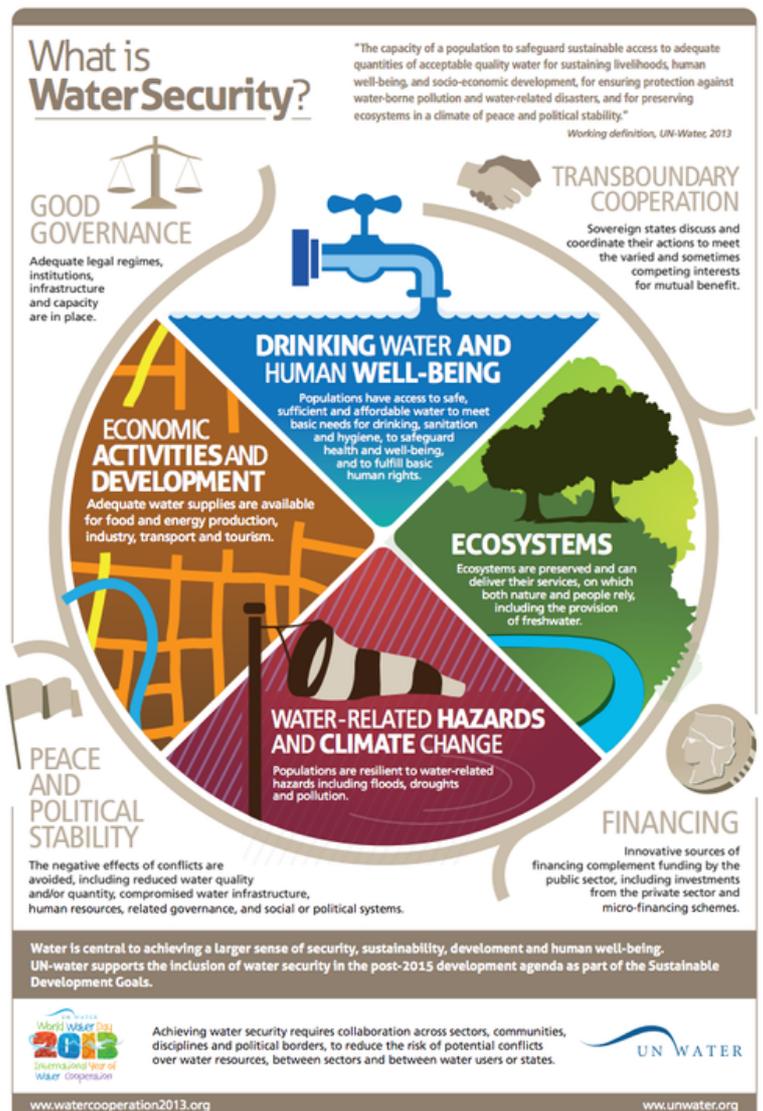


Image credit: UN Water

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While that definition by the UN-Water is comprehensive, what does water security mean?

Water security is designed to safeguard all aspects of water, from our everyday water use to water in our ecosystems, to even political and transboundary conflicts that may arise over water.

"The idea of water security is that it is achievable through mass collaboration from every country, industry and sector in the hopes the one day we can have water security."

When discussing water security it can be easy to think of it as a set of rules or guidelines that countries should be adhering to keep their water safe and secure. In reality, this is not the case. The idea of water security is that it is achievable through mass collaboration from every country, industry and sector in the hopes the one day we can have water security.

Water security at its core is the idea that there is enough clean water to meet current and future demand for human well-being and social-economic development while ensuring the safeguarding of the environment and reducing the risk of pollution and water-based diseases.

It also seeks to establish good governance of water and transboundary co-operation from countries that share a water source. Water security also looks to exempt itself from human conflicts to ensure that our global water infrastructure is never compromised and that there is enough finance to allow for development and innovation.

In truth, the concept of water security is extremely broad and is designed to cover everything about water in regards to how we use it, how we manage it and how we ensure that there will still be acceptable water in enough quantities for years to come – which is where smart water comes into play.



What is smart water security?

In the past decade, two terms have found themselves at the centre of the environment and water sectors respectively, those being smart cities and smart water.

The [UK Department for Business, Innovation and Skills \(BIS\)](#) defines smart cities as a process in which increased citizen engagement, hard infrastructure, social capital and digital technologies make cities more liveable, resilient and better able to respond to challenges.

[Navigant Research](#) found that cities around the world planned to invest \$108 billion in smart city infrastructure this decade.

It is much needed, as the UN found that 68 per cent of the world's population is projected to live in urban areas by 2050 – so there will be an added pressure for cities and urban areas that can adapt to handle an increased pressure on its resources.

Much like a smart city, smart water and smart wastewater infrastructure is water that can be measured and record data on various elements, such as quality and usage.

According to the UN report looking into [water security and the sustainable development](#) goals for 2019, a city's water distribution and management system must be sound and viable in the long term to maintain its growth.

The report went on to say that any smart water system should be equipped with the capacity to be monitored and networked with other critical systems to obtain more sophisticated and granular information on how they are performing and affecting each other.

How does smart water security work?

Smart water security uses monitoring technology to gather meaningful and actionable data about the flow, pressure and distribution of a city's water and wastewater. The data that is returned can then be used to create accurate measurements on water consumption and accurately forecast water use.

It is this data that is vital to achieving smart water security in our urban environments as having this live feed of data allows for the smart cities to share every aspect of their water usage. Through smart water security and the data it collects, cities are able to better estimate water usage, assess the quality of the water and design improved urban water systems.



Why is water security important?

The importance of water security has never been more prevalent than in today's environment, with the 2018 UN report on water and sanitation recording more than two billion people living in countries experiencing high water stress.

With water scarcity becoming one of the greatest challenges worldwide, the goal of achieving water security is one of the main solutions to fight against this global threat.

To find out more on water scarcity and its importance, take a look at our essential guide to water scarcity, [here](#).

Key water sustainability facts from the [UN-Water](#):

- It is estimated that by 2040, one in four of the world's children under 18 – some 600 million in all – will be living in areas of extremely high water stress. ([UNICEF, 2017](#))
- 700 million people worldwide could be displaced by intense water scarcity by 2030. ([Global Water Institute, 2013](#))
- About four billion people, representing nearly two-thirds of the world population, experience severe water scarcity during at least one month of the year ([Mekonnen and Hoekstra, 2016](#))
- With the existing climate change scenario, by 2030, water scarcity in some arid and semi-arid places will displace between 24 million and 700 million people. ([UN, 2009](#)).
- A third of the world's biggest groundwater systems are already in distress ([Richey et al., 2015](#)).

Water security is going to become increasingly important in the management in agriculture. One of the most wasteful and inefficient areas of water management is in our global agriculture sector, with 70 per cent of the world accessible freshwater being used solely by this industry, World Economic Forum.

There are many benefits to achieving water security for the management of agriculture. By adopting new technologies and techniques we will be able to better manage and monitor our water usage for these high water usage sectors.

These benefits will be seen in reducing the industries overall use of freshwater, being able to detect the quality of the water and removed any pollutants, while also improving the distribution of water to significantly reduce water stress at key times during the year.

Water scarcity has the potential to cause several global water security issues, according to [Global Communities](#). They determined five key areas where water security could impact global security:

- Increase global tensions
- Diminish agriculture and reduce food security
- Cause for population shifts
- Increase the spread of water-bound disease
- Seriously undermine economic development.

Water security: principles, perspectives and practices



Principles

In the book [Water Security: Principles, Perspectives and Practices](#), edited by Bruce Lankford, Karen Bakker, Mark Zeitoun and Declan Conway, they look at what the principles of water security should be.

They identified that principles of water security are environmental sustainability, collaboration, the independencies of water such as its role in energy generation, demand from cities, climate change and food, and the equity and justice surrounding water.

These are the foundations of what water security should represent and where we need to look closer to get the correct perspective to implement the right practices.

Perspective

Perspective plays a massive role when discussing water security as the same perspective may not apply to every principle.

For example, from a legal perspective water security is associated as a set of rules to secure entitlements for certain quantities of water. Whereas from an agriculture standpoint, the main issue of water security is seeking protection from floods and droughts.

When looking into any area of water security each sector will have its perspective that will need to be taken into account.

Practices

Only once you have defined the principle and perspective can you determine the right course of action and practices to introduce to achieve water security.

For example, what practices need to be introduced in a poor community that does not have reliable access to fresh water?

Water Aid looked at ways in which different practices could be implemented in a community like this and created a list of practices that would help achieve water security:

- Help people demand their right to clean water from governments
- Support service providers to meet the demand
- Bringing clean, reliable water supplies closer to people's homes
- Support local governments and service providers to assist communities with the ongoing management, financing and technical aspects of keeping services running
- Work with national governments to strengthen processes and revenue streams
- Train users how to protect water from contamination
- Promote technologies that can be operated, managed and financed by communities, with assistance from local government and service providers
- Promote infrastructure and services that accommodate people's different water needs – a 'multiple use services' (MUS) approach
- Encourage community investment in water supply services ('self-supply')
- Promote the monitoring of water resources, to inform early warning systems for drought response and management, as well as equitable water use
- Strengthen the ability of communities and local governments to manage threats to their water supplies

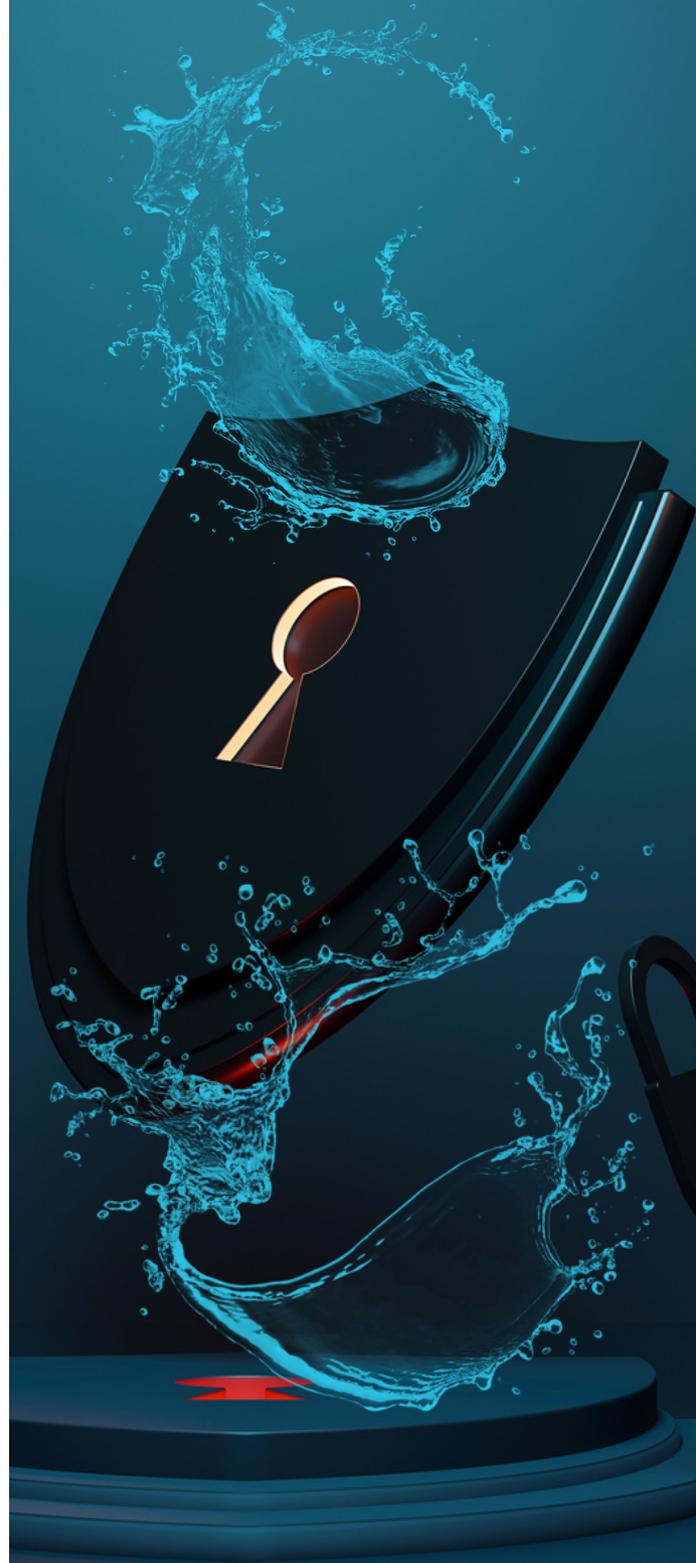


Food and water security solutions

The Guardian reported that by 2030, the world will need an estimated 40 per cent more freshwater and 50 per cent more food and energy. This can be attributed to the accelerating increase in our population that is predicted to cause more stress on our food and water security.

To combat this we need to find solutions to keep our food and water security going forward. The [WBCSD Water Project](#) looked into the long term impact of food and water security and three solutions can be drawn from their report.

- Increase planning and policy interaction – the best way to understand the different challenges and come up with the right solutions is through a collaboration of the food and water industry. Better lines of communication can lead to refined planning and policies that can directly change the industry.
- Invest in new ways to increase resource efficiency while reducing waste – already in the past decade, we have seen new technologies come into the industry and change the way they operate. Water reuse is one of the biggest innovations that is revolutionising both sectors leading them to significantly reduce their water use and wastewater output.
- Find new innovative ways to manage water and food demand – as populations increase, demand increases. Finding new ways to meet the demand for both food and water require innovation and data. New technology allows us to gather data on our food and water consumption and waste. We can use this data to create actionable insights to better equip each sector to meet demand.





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