



SDG 6: Clean Water and Sanitation



Overview

Clean drinking
water

Sanitation
facilities

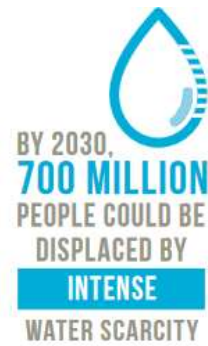
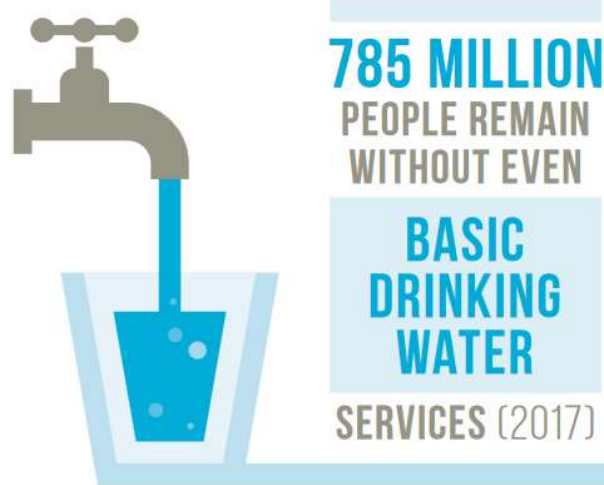
Water
pollution

Water scarcity

<https://www.un.org/sustainabledevelopment/water-and-sanitation/>



Water and Sanitation Facts



More than 80 per cent of wastewater resulting from human activities is discharged into rivers or sea without any pollution removal

Approximately 70 per cent of all water abstracted from rivers, lakes and aquifers is used for irrigation

<https://www.un.org/sustainabledevelopment/water-and-sanitation/>



6.1

Target

- By 2030, achieve **universal and equitable access to safe and affordable drinking water** for all

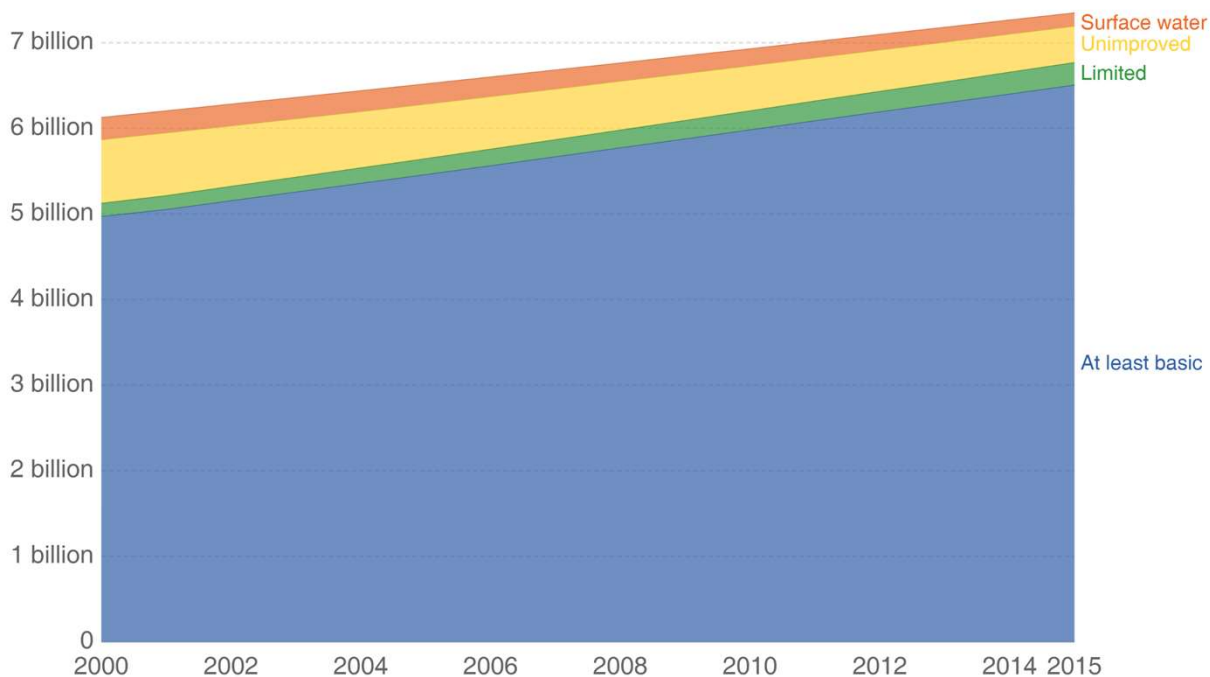
Indicator

- Proportion of population using **safely managed drinking water services**

Drinking water service coverage, World

Total population using a given drinking water source. At least basic drinking water represents an improved source within 30 minutes' round trip to collect water; 'limited' constitutes an improved water source more than a 30 minute round-trip away; 'unimproved' is one that by the nature of its construction does not adequately protect the source from outside contamination; and 'surface' is that from surface water sources.

Our World
in Data



2000: basic- 4.97 billion people
2015: basic- 6.51 billion people

Source: WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)

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6.2

Target

- By 2030, achieve access to adequate and equitable **sanitation and hygiene** for all and **end open defecation**, paying special attention to the **needs of women and girls** and those in vulnerable situations

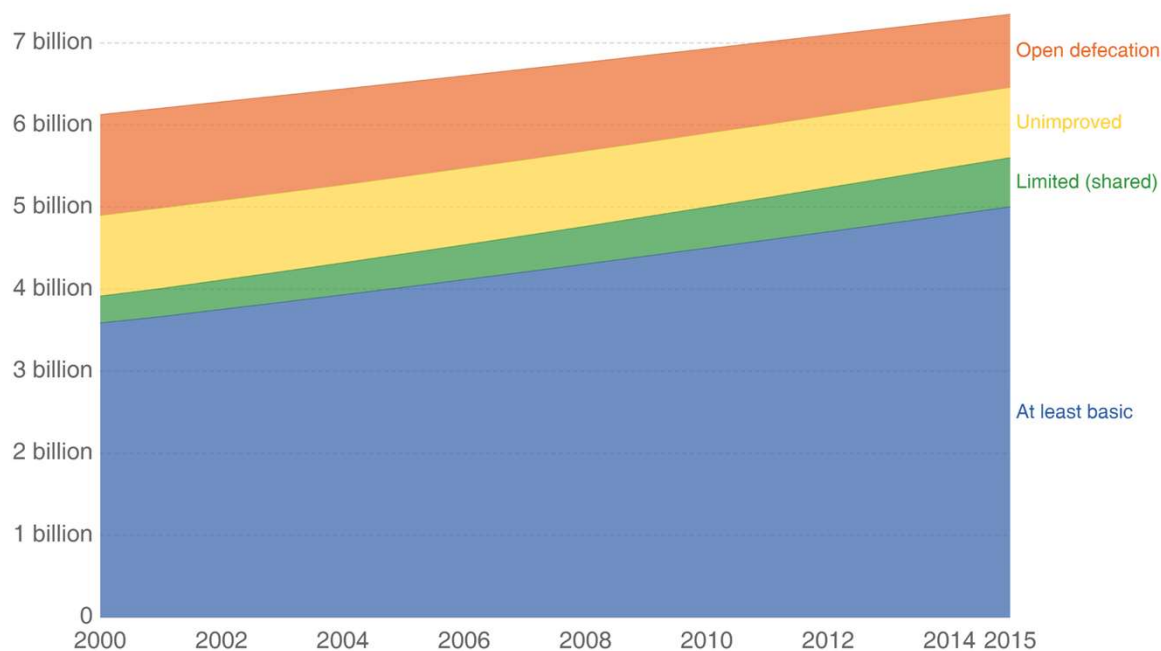
Indicator

- Proportion of population using safely managed **sanitation services**, including a hand-washing facility with soap and water

Sanitation facilities coverage, World

Number of people with access to different sanitation facilities. 'At least basic' are improved sanitation facilities not shared with other households; 'limited' are improved facilities shared with other households; 'unimproved' are facilities without a flush/pour flush (to piped sewer system, septic tank, pit latrine), ventilated improved pit (VIP) latrine, pit latrine with slab, or composting toilet.

Our World
in Data



Source: WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)

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2000: basic- 3.59 billion
open defecation- 1.23 billion
2015: basic-5 billion
open defecation- .89 billion

Progress, but not as much for the
worst sanitation areas



6.3

Target

- By 2030, improve water quality by **reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials**, halving the **proportion of untreated wastewater** and substantially **increasing recycling and safe reuse** globally

Indicator

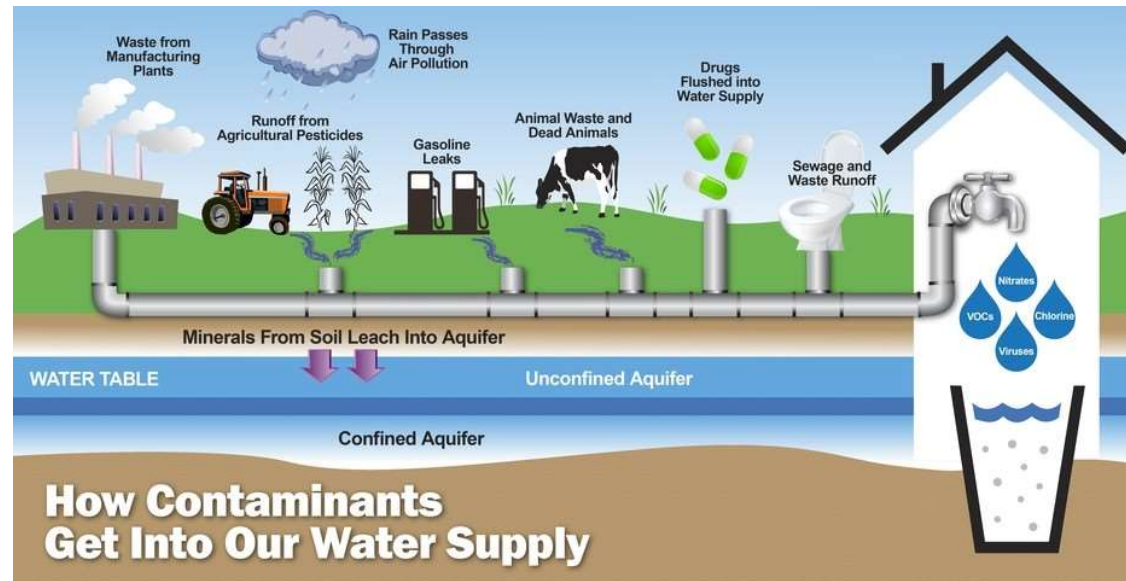
- Proportion of **wastewater safely treated**
- Proportion of **bodies of water** with good ambient **water quality**



<https://passportocean.com/2017/11/20/15-shocking-facts-ocean-pollution/>

Increase recycling and reuse because otherwise it ends up in our oceans and bodies of water

The hazardous chemicals sink into aquifers and flow to rivers after rain



<http://www.kandrwaterservice.com/the-dangers-of-drinking-water/>



6.4

Target

- By 2030, substantially increase **water-use efficiency** across all sectors and ensure sustainable withdrawals and supply of freshwater to **address water scarcity** and substantially reduce the number of people suffering from water scarcity

Indicator

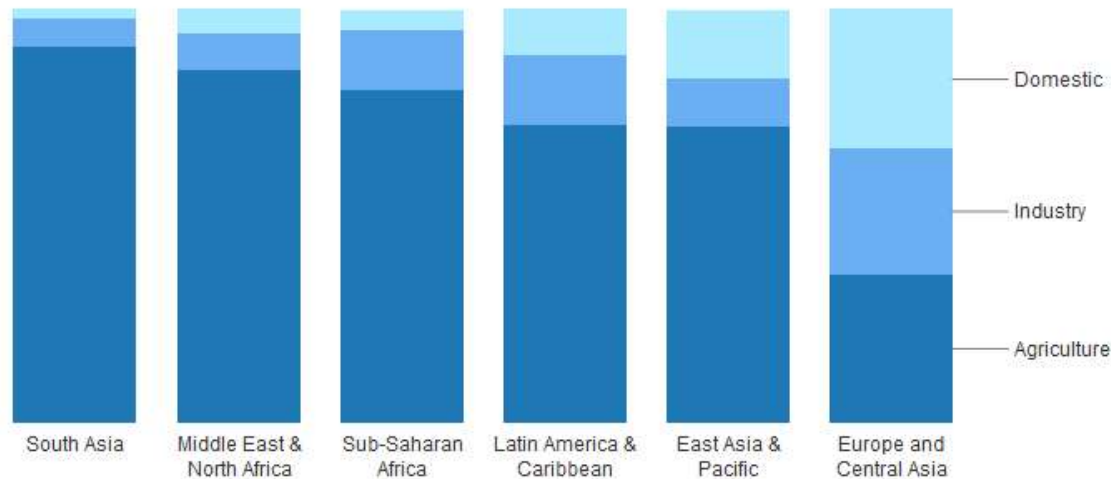
- Change in **water-use efficiency** over time
- Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

Worldwide

Approximately 70 percent of all water abstracted from rivers, lakes and aquifers is used for irrigation

Globally, 70% of Freshwater is Used for Agriculture

Share of freshwater withdrawals by sector (%) in 2014



Source: [World Development Indicators](#)

A Few Efficient Irrigation Factors

For Agriculture

- Grow crops suitable for the local climate
- Manage based on soil type
- Use of technology to manage
- Keeping healthy, fertile soil with cover crops, not tilling, rotation of crops to keep chemical balance

For yards

- Don't have automatic timers
- Drip irrigation delivers to soil
- A simple hose can be best to supplement rainfall

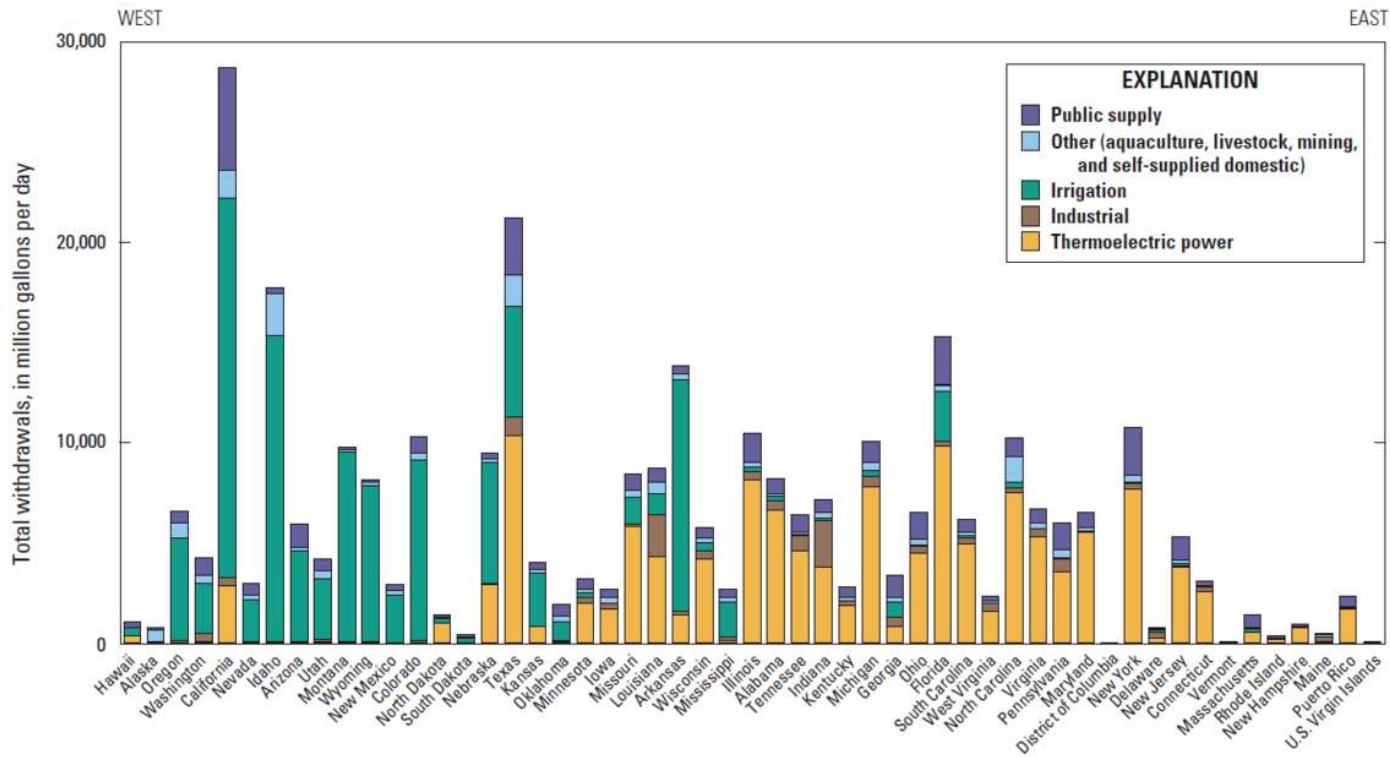


Figure 2. Total water withdrawals by State, and bar chart showing categories by State from west to east, 2015.

Water Usage in The US- primarily thermoelectric power and irrigation

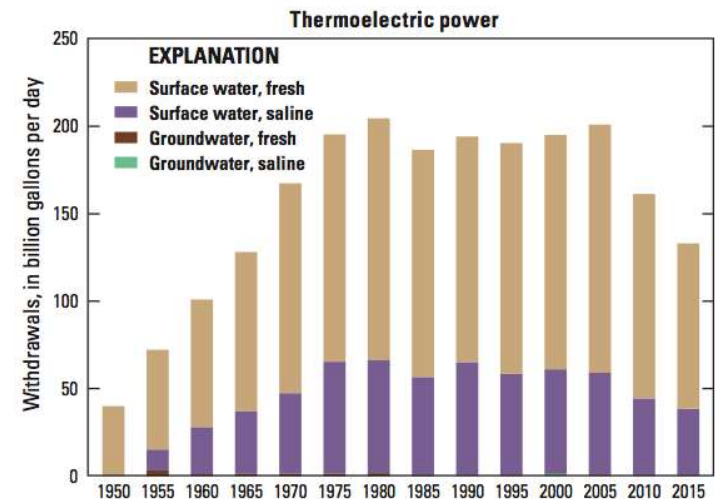
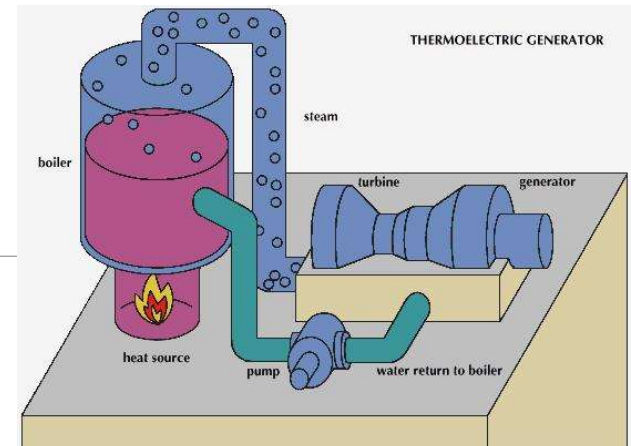
Thermoelectric Power

Used in the process of generating electricity with steam-driven turbine generators

- Once-through cooling refers to cooling systems in which water is circulated through heat exchangers, and then returned to the source
- Recirculating cooling refers to cooling systems in which water is circulated through heat exchangers, cooled using ponds or towers, and then recirculated

Withdrawals were nearly 100 from surface-water sources, predominantly freshwater

- 34 percent of total freshwater withdrawals
- Water lost to evaporation, blowdown, drift, and leakage is replaced





6.5

Target

- By 2030, implement integrated **water resources management** at all levels, including through transboundary cooperation as appropriate

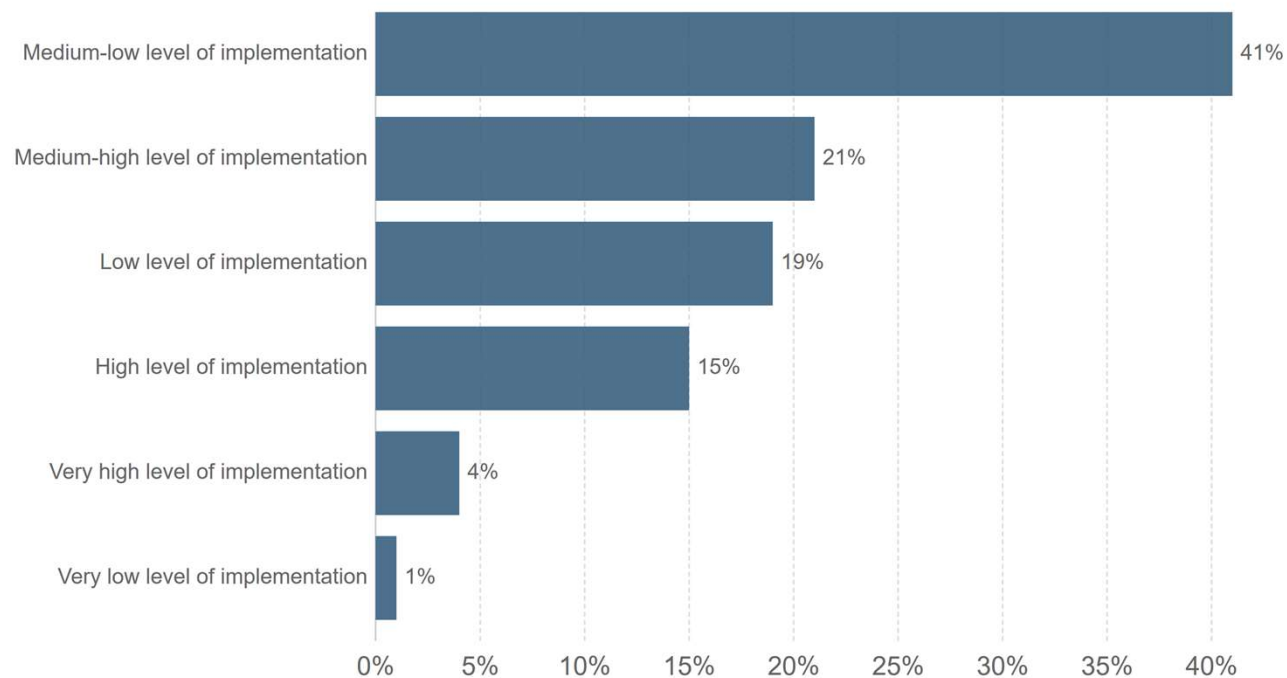
Indicator

- Degree of integrated water resources management implementation (0-100)
- Proportion of transboundary basin area with an **operational arrangement** for water cooperation

Status of the development and implementation of integrated national water resource management plans, World, 2018

Our World
in Data

Share of countries across the various stages of development and implementation of integrated national water resource management plans (IWRM). IWRM is defined as "a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."



Source: UN Statistics Division

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In 2018, the proportion of countries that have or are developing a plan to coordinate their use of resources in a sustainable manner

Not even half of countries have a low level of an integrated plan



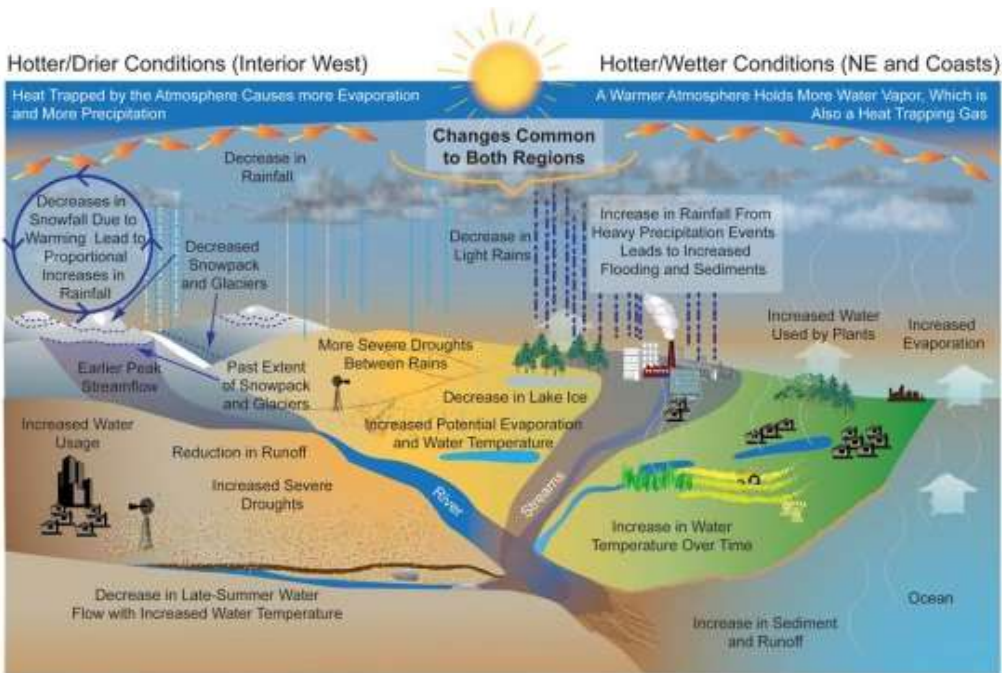
6.6

Target

- By 2020, **protect and restore water-related ecosystems**, including mountains, forests, wetlands, rivers, aquifers and lakes

Indicator

- Change in the extent of **water-related ecosystems** over time



<https://climatechange.lta.org/manage-rivers-lakes/>

How climate change is effecting freshwater ecosystems

Plastic and other pollution is clogging and hurting species necessary for ecosystems in all bodies of water



Chemical runoff from roads, agriculture, wastewater, etc.





Highlighted Organization: WaterAid

- Influence governments to change laws
- Link national and international policy makers with people on the ground
- Change attitudes and behaviors
- Work with others to pool knowledge and resources
- Rally support from people and organizations around the world
- Impact
 - 25.8 million people with clean water
 - 25.1 million people with reliable toilets



WaterAid/ Ernest Randriarimalala

Clean water

385,000 in households

206,000 in schools

1,238,000 in healthcare centers



WaterAid/ Ernest Randriarimalala

Decent toilets

433,000 in households

182,000 in schools

1,080,000 in healthcare centers



WaterAid/ Guilhem Alandry

Good hygiene

1,503,000 in households

695,000 in schools

991,000 in healthcare centers



Desalination

- Make nontraditional water sources, such as seawater and brackish water, into cost-competitive water sources within 10 years
- Have water treated to fit-for-purpose standards and reused locally
- Lawrence Berkeley National Laboratory received a \$100 million award to work on it
- Colleges involved are the University of California, Berkeley and Stanford University

Additionally

- Australia's largest scientific research agency joined with nine major universities in a membrane research program to reduce desalination energy costs, as well as maintenance costs associated with gunk sticking to membranes and fouling them up



Currently not efficient because of costs and gunk buildup

<https://www.bizjournals.com/sanfrancisco/news/2019/09/23/feds-award-100-million-to-lawrence-berkeley-led.html>



Agriculture Water Pollution

- “Pollution is not just the addition of substances that damage or kill organisms, it is any man-made impact that increases the risk of damage to a natural system”
 - Overarching effects- clear natural vegetation, washed out nutrients and replaced with fertilizer, replaces the natural mulch of environment and predators
 - Nutrient loss in chemical balance
 - Loads of soil erosion
 - Alteration of the cycles (irrigation losses, changes in evaporation rate)
 - Moderation of the habitat



Moss, Brian. *Water pollution by agriculture*

2008 Feb 12; 363(1491): 659–666.

Published online 2007 Jul 30. doi: [10.1098/rstb.2007.2176](https://doi.org/10.1098/rstb.2007.2176)



Ted Talks

Great visual graphics and information about scarcity

https://www.ted.com/talks/balsher_singh_sidhu_are_we_running_out_of_clean_water#t-1124