water footprint network

fair & smart use of the world's fresh water

Water scarcity - what does it mean for sustainable development?

Blog by Ruth Mathews, Executive Director, Water Footprint Network

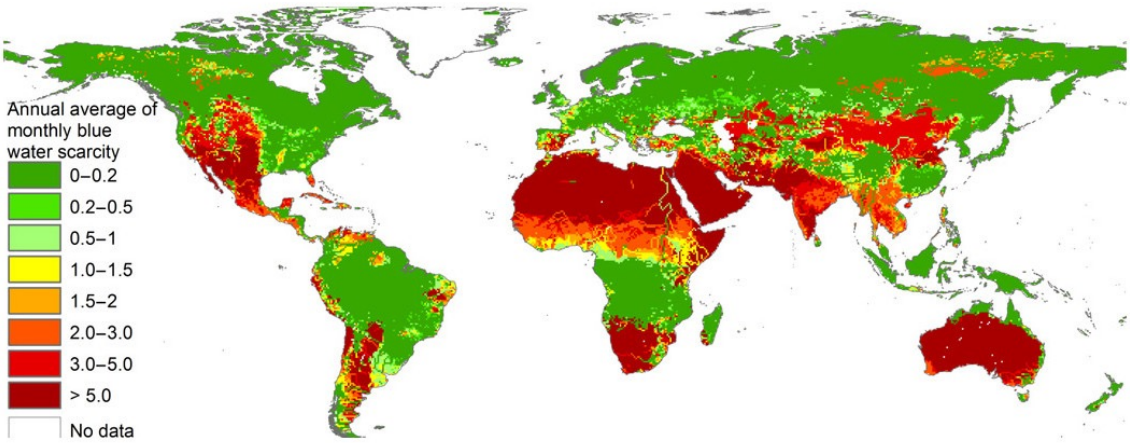
22nd February 2016

Take one look at the news this month and it's clear that water scarcity is causing misery to many. Lack of rainfall in southern Africa will have a "devastating" impact on the region's food security (UN FAO), 49 million people could be affected (UN WFP) and in Zimbabwe, where more than a quarter of the population are now in need of food aid, President Mugabe has declared a state of disaster due to drought. A number of Caribbean countries have been placed under immediate drought warnings or watches, the Marshall Islands has declared a state of national emergency, citing its severe drought conditions as one of the worst disasters to ever befall the archipelago nation, and the central government of India is giving monetary assistance to seven drought-affected states.

Last month's top listing of water crises as the global risk of highest concern (WEF's Global Risks Report 2016) was followed this month with the stirring of political reaction as the Obama administration announced its plans to reduce the U.S. water footprint by a third.

Four billion people. That's how many people live in areas with severe water scarcity at least one month a year, research just published in Science Advances tells us. What's more, in 37 countries, that's the entire population and in 97 countries it's over half of the population.

Annual average of monthly blue water scarcity

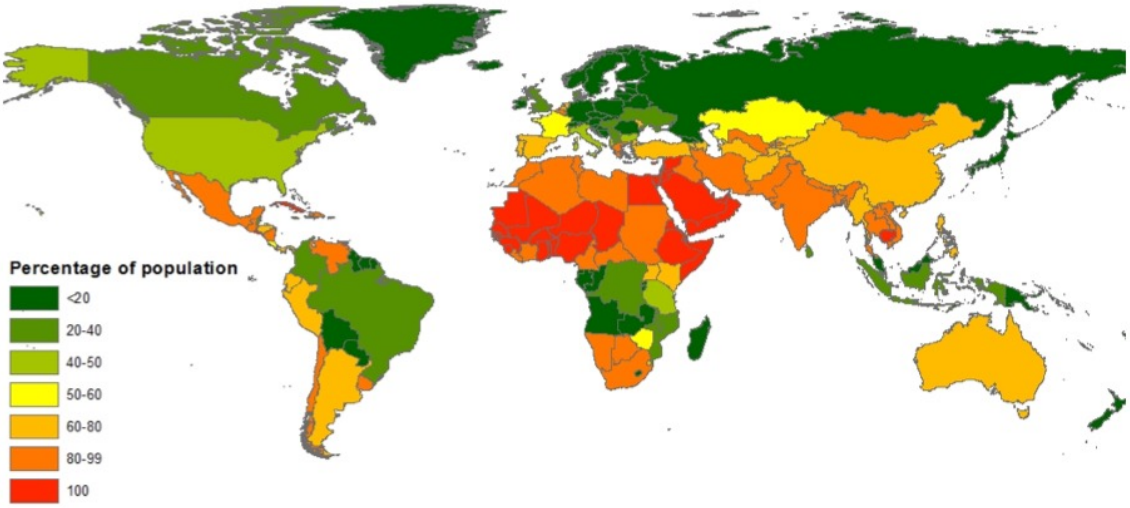


Source: Science Advances, Mesfin M. Mekonnen and Arjen Y. Hoekstra

This startling view of the number of lives affected by water scarcity is made possible by research done by Prof. Arjen Hoekstra and Dr. Mesfin Mekonnen at the University of Twente, which provides a more detailed view of water scarcity – month by month and at a finer spatial resolution than ever before. This gives us a better understanding of how water scarcity changes over time and from one place to another. It also uses the water footprint, instead of water withdrawals to assess the impact on water resources of our water use – making it more representative.

Water scarcity can limit economic opportunities, degrade natural ecosystems, lead to loss of valuable ecosystems services and have negative impacts on subsistence uses, such as access to drinking water and loss of local fisheries.

Percentage of population experiencing severe water scarcity at least one month of a year.

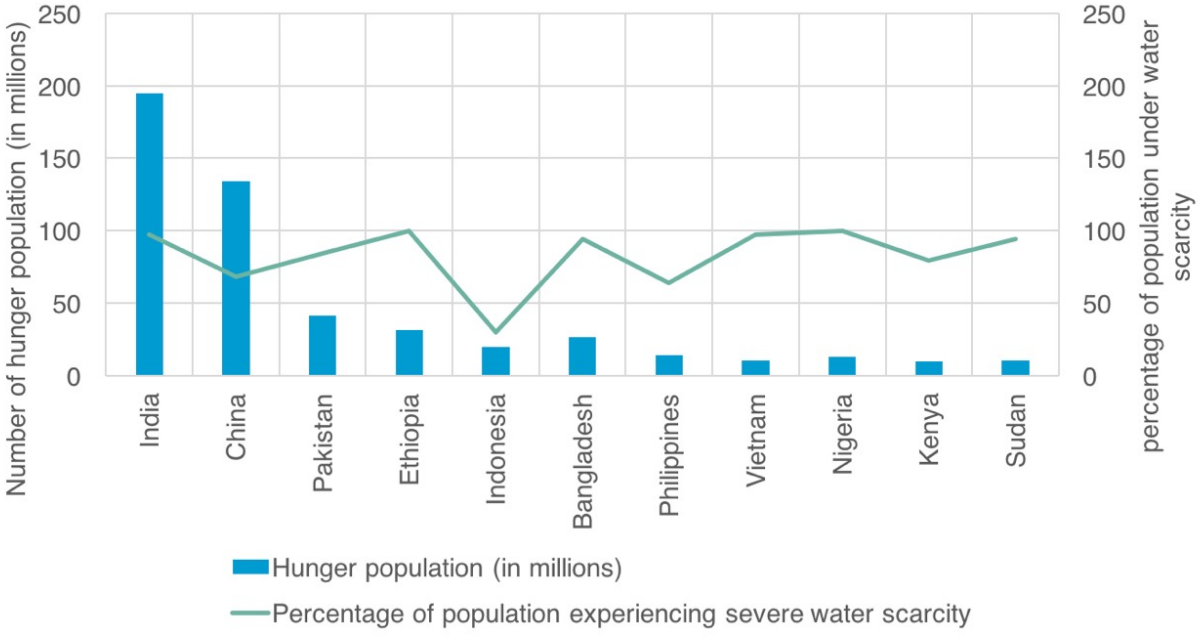


Source: Water Footprint Network
Data: M.M. Mekonnen & A.Y. Hoekstra, University of Twente

In countries already facing water scarcity, opportunities for reducing the number of undernourished people may be limited because increasing food production may

require greater reliance on irrigation to increase crop yields, putting even more pressure on limited water resources.

Percentage of population experiencing severe water scarcity at least one month a year with countries that have the largest number of undernourished people



Source: Water Footprint Network

Data: M.M. Mekonnen & A.Y. Hoekstra, University of Twente, and FAO

But, it is not just water used to feed local populations that is driving the move toward increasing levels of water scarcity, many severely water-stressed countries use huge amounts of water to produce products for export. In the ten largest net blue virtual water exporting countries, over half of the population experience severe water scarcity during at least one month per year.

Percentage of population experiencing severe water scarcity during at least one month a year in largest net virtual water exporters.

Net virtual blue water exporter ranking	Country	Percentage of population experiencing severe water scarcity at least one month of a year
1	Pakistan	84%
2	India	97%
3	Australia	66%
4	Uzbekistan	93%
5	Egypt	100%
6	Turkey	63%
7	Spain	69%
8	Iran	82%
9	Turkmenistan	80%
10	Tajikistan	67%

Source: Water Footprint Network
Data: M.M. Mekonnen & A.Y. Hoekstra, University of Twente

India and Pakistan with 194.6 and 41.4 million undernourished people, respectively, are the top two net virtual blue water exporters. They also have 97% and 84%, respectively, of their population facing severe blue water scarcity at least one month of the year. Export and trade policies in these countries put pressure on the local water resources that goes beyond sustainable limits. This imposes a risk to the sustainability of future exports from these countries, in addition to reducing hunger, when considering constraints of water resources.

To “substantially reduce the number of people suffering from water scarcity” (SDG Goal 6) and to achieve greater food and water security (SDG Goal 2) we all need to work together to ensure that:

- Water is used within sustainable limits such that ecosystem and subsistence uses of water are met;
- Water is shared equitably both locally and globally; and
- Water productivity is improved where beneficial.

This groundbreaking research tells us that the challenge we face is greater than we thought, yet the results also help us take strides in our understanding of the causes of water scarcity and the way forward to sustainable development.

For more news stories on the research, see:
Nature
The Guardian

New York Times
Washington Post
Le Monde
Mother Jones
The Hindu