

## Briefing paper

# Four billion people affected by severe water scarcity

## Number of people living in water scarce areas

Research published in [Science Advances](#) on water scarcity by Prof. Hoekstra and Dr. Mesfin Mekonnen, researchers from University of Twente, reveals that as many as four billion people worldwide live under water scarcity for at least one month of the year. Their research shows that the earlier estimates did not capture the monthly variability of water scarcity and that the number of people affected by severe water scarcity are much higher. For example, the entire population of 37 countries and more than half of the population of 97 countries live under severe water scarcity during at least one month per year (Figure 1). This information is key in addressing Sustainable Development Goal 6.4 which aims to substantially reduce the number of people suffering from water scarcity.

Blue water scarcity is a result of the cumulative impact of the blue water footprint of agriculture, domestic water supply and industry. In areas where blue water scarcity is greater than 1 – moderate, significant and severe water scarcity – environmental flow requirements are not met, which can lead to degradation of natural ecosystems, loss of valuable ecosystem services and negative impacts on subsistence uses, such as access to drinking and other household water and loss of local fisheries.

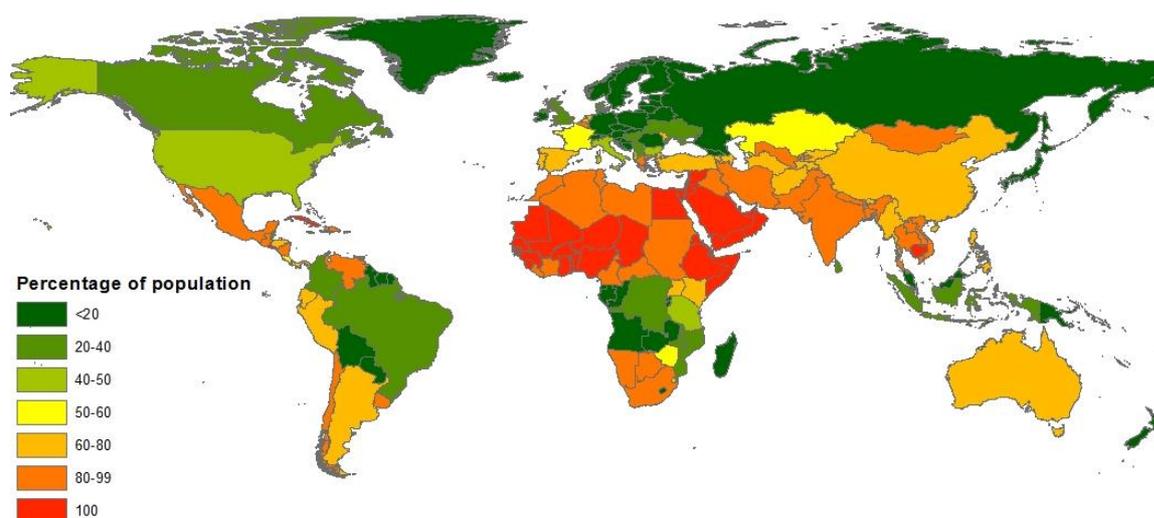


Figure 1: Percentage of population experiencing severe water scarcity at least one month of a year.

Source: Water Footprint Network

Data from M.M. Mekonnen & A.Y. Hoekstra, University of Twente

## Trade risk and water scarcity

As nations work toward securing food, water, energy and other essential inputs for people's well being, livelihoods and the country's economic development, most countries rely on imports as well as exports of goods and services. A country may aim to be self-sufficient by relying primarily on goods that can be produced within its borders. Or a country may choose to reduce the burden on the natural resources within its borders by importing water intensive products. For water-scarce countries it can sometimes be attractive to import virtual water (through import of products), thus relieving the pressure on the domestic water resources. This happens, for example, in Libya, Algeria, Saudi Arabia, Mexico and Tunisia, where blue water scarcity prevails more than half of the year, according to the new research.

On the other hand, net virtual water exporters use their internal water resources to produce good and services that are consumed outside their borders. The ten largest net blue virtual water exporters also have a high percentage of the population experiencing severe water scarcity during at least one month per year – more than 50% (Table 1). This shows that export and trade in these counties put pressure on the local water resources that goes beyond sustainable limits. This imposes a risk on the sustainability of future exports from these countries, when considering constraints of water resources.

**Table 1. Percentage of population experiencing severe water scarcity during at least one month a year in ten largest net virtual water exporters<sup>1</sup>.**

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 from M.M. Mekonnen & A.Y. Hoekstra, University of Twente

## Hunger and water scarcity

The commitment in Sustainable Development Goal 2 is ending hunger by 2030. As water is essential for agricultural production, increasing food production may require greater reliance on irrigation to increase crop yields. In countries already facing water scarcity, opportunities

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<sup>1</sup> The virtual-water export from a geographically delineated area (for example, a nation or catchment area) is the volume of virtual water associated with the export of goods or services from the area. It is the total volume of freshwater consumed or polluted to produce the products for export.

for reducing the number of undernourished people may be limited (Figure 2). 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. Achieving Sustainable Development Goal 2 in these and other water scarce countries will require closer attention to agricultural practices, e.g., making better use of green water resources (rainfall) and reducing evaporative losses from irrigation.

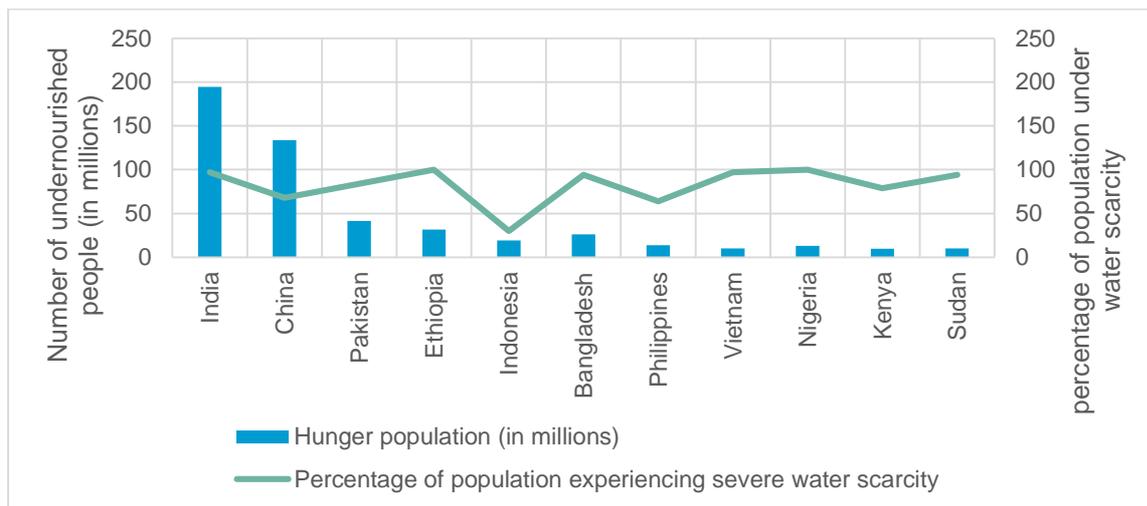


Figure 2: Percentage of population experiencing severe water scarcity at least one month of a year in countries with large numbers of undernourished people.

Source: Water Footprint Network

Data from M.M. Mekonnen & A.Y. Hoekstra, University of Twente and FAO Hunger Map, 2015

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For the definition of 'water footprint' click [here](#).

[www.waterfootprint.org](http://www.waterfootprint.org)