



Water

Availability of fresh water is already a key resource issue for people in many parts of the world, and one which any increase in human population can only magnify. According to the United Nations Food and Agriculture Organisation (FAO), by 2025 two thirds of the world population could be under “water stress conditions”, and 1.8 billion are likely to be living in countries or regions with “absolute water scarcity”.¹

The FAO defines “water stress conditions” to be where there is less than 1,000 m³ of water per person per year, and a region is termed as facing “absolute water scarcity” when supplies drop below 500 m³ per person per year.² However, there are other rather different ways in which the relationship between water supply and demand is sometimes defined, such as the volume of water withdrawn in proportion to the volume potentially available. A *Peak Water* situation may be arising, similar to that of *Peak Oil* (see the [Energy](#) paper), when the rate of water demand is higher than the rate at which the supply is replenished, meaning that the amount of fresh water production must eventually decline as reserves are used up.³

Water is essential for life. Humans need a sufficient quantity of good-quality water for purposes including growing and preparing food, drinking, health and hygiene. Water quality can be compromised by infectious agents, toxic chemicals, and radiological hazards.

Industry and agriculture both use very large quantities of water. Data from the Pacific Institute show typical

water consumption in litres per kg of product as 260 for steel,⁴ 1,000–1,800 for maize⁵ and 11,000 for cotton textiles.⁶ It is estimated that 70 per cent of worldwide fresh water use is for agriculture and 15 per cent for energy production.⁷

The majority of human uses require fresh water, but 97 per cent of water on the earth is sea water. Of the remaining three per cent, five sixths are frozen in glaciers and polar ice caps. The remaining unfrozen fresh water, 0.5 per cent of the total amount of water on the planet, is mainly found as groundwater, with a small fraction present in lakes, rivers and in the air.⁸

Although, in principle, fresh water is a renewable resource, being renewable does not mean that an infinite amount is available; the world’s supply of clean fresh water is decreasing. The demand for fresh water already exceeds supply in many countries, and as the world’s population increases, so too does the demand for water. The importance of water resources as an essential contribution to so many ecosystems has only recently become apparent, but in the course of the 20th century more than half the world’s wetlands have been lost, along with their valuable environmental services.

Climate change is resulting in receding glaciers, reduced stream and river flows, and shrinking lakes. Many aquifers have been over-pumped, and are recharging at a lower rate than that at which water is being withdrawn from them. Although the total fresh water supply has not yet been used up, studies show that much of it has become unavailable for drinking,

industry or agriculture as a result of salt build-up and other forms of pollution. 15 – 35 per cent of present irrigation withdrawals are thought to be unsustainable.⁹

It is possible to augment fresh water supplies by desalination of salt water, but desalination plants represent an unrealistic investment for many

communities, and they require a large amount of energy to run, resulting in a trade-off of one scarce resource (fresh water) against another (energy).

Availability of fresh water is one of the key factors taken into account in the [Global Footprinting/BioCapacity](#) approach to sustainability.

References

Internet references accessed April 2016

¹ UN FAO Water Scarcity http://www.fao.org/nr/water/topics_scarcity.html

² Ibid

³ Pacific Institute Peak Water <http://pacinst.org/issues/sustainable-water-management-local-to-global/peak-water/>

⁴ The United Nations World Water Development Report 2015 <http://www.worldwater.org/data20082009/Table19.pdf>

⁵ Ibid.

⁶ Ibid.

⁷ The UN World Water Development Report 2015, Water for a Sustainable World <http://unesdoc.unesco.org/images/0023/002318/231823E.pdf>

⁸ Ibid

⁹ Ibid.