

Do you suffer from water stress?



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Living in London, where it seems to rain almost every other day, lack of water rarely features on my list of concerns. Elsewhere in the world of course, the story is different. The United Nations has made repeated predictions that countries going to war over water remains a genuine possibility.

In Australia, back in 2007, the then Prime Minister John Howard instructed the population to pray for rain after a seven year drought the Aussies were calling the "Big Dry". The drought was the worst in over a century, with top soil turning into dust and suicide rates among farmers soared. Howard explained that if the power of prayer didn't lead to a downpour, he would have to ban water allocations for irrigation purposes in the Murray-Darling river basin, which produces 40% of Australia's agriculture.¹

When it did eventually rain, children under the age of seven were delighted to play outside, having never played in rain before. This was not enough to keep Howard in power though, and his failure to have taken concrete action undoubtedly contributed to his defeat in the election of December 2007. The Murray-Darling runs through four major states (New South Wales, Queensland, Victoria and South Australia) and the supply of water from the basin had been severely over-allocated for a number of years.

Water shortages in the Middle East

Israel is also now facing its worst water crisis in more than one hundred years.² The Sea of Galilee is drying up after four consecutive years of drought and increased consumption caused by population growth. By mid-November 2008 the water level was 214m below sea level: any lower and the water level will drop below the pumps and there will be no more water available to consume. The other two main water sources for Israel – mountain and coastal aquifers – are also almost empty. As a consequence, the government has launched an advertising campaign urging Israelis to conserve water and has already cut potable water supplies to agriculture. Watering city gardens with fresh water is now banned and the Agriculture Ministry is warning that thousands of acres of orchards will have to be uprooted in an effort to limit demand.³

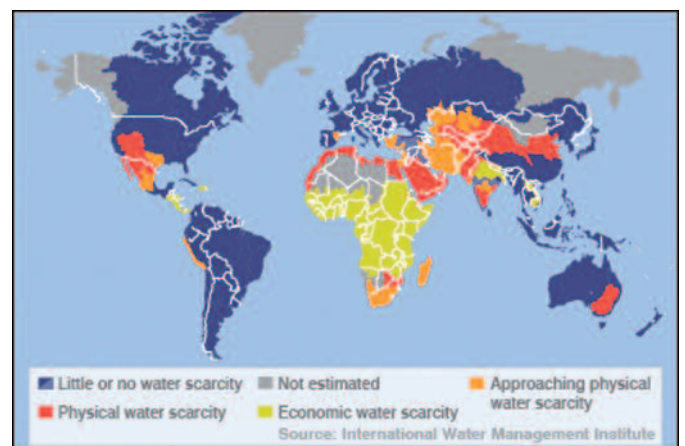
Surrounding countries are facing similar problems. The situation in Jordan is said to be even worse than that of Israel. Some Palestinian cities receive water only three to four hours a week and have to store it in large rooftop tanks. They are demanding more water from Israel and water supply agreements feature in peace negotiations. As you can imagine, the recent conflict in Gaza is making negotiation over water supply increasingly difficult.

Water: a reason for countries to go to war?

Although these are undoubtedly tense situations, unlike many commentators, I do not believe that the next world war will be fought over water. It is downstream states (located away from the source of a stream or river) that would be most motivated to take offensive action, but such a state would be vulnerable to an upstream state deliberately blocking or polluting the water source. They would therefore need to permanently occupy, and possibly depopulate, the entire watershed for full security of supply.

Furthermore, wars are very expensive to fight and, as an Israeli Defence Forces Analyst pointed out: "Why go to war over water? For the price of one week's fighting, you could build five desalination plants. No loss of life, no international pressure, and a reliable supply you don't have to defend in hostile territory."⁴

Water scarcity - a growing global concern



Water stress

Unlike other forms of stress, water stress has a very clear and precise definition. According to the UN: "Countries with freshwater resources in the range of 1000-1500 cubic metres per capita per year face water stress, particularly in drought years."⁵ Levels of water stress have been rising in recent years. By 2025 it is expected that about two thirds of the world's population will live in areas facing some form of water stress⁶. Worst affected areas are North Africa and Western and South

Asia. There is a fixed amount of water on the Earth, 97.5% of which is saltwater in the oceans. Of the 2.5% that is freshwater, 68.9% is locked in glaciers, 30.8% is groundwater and a mere 0.3% is in lakes and rivers.

Desalinisation as a water-based solution

Desalination would seem to be an obvious cure for water stress in many regions of the world though there have been some barriers to this. Cost has been a significant barrier for many years, but with the size of desalination plants increasing more than tenfold in the period 1995 – 2005, capital costs have reduced by 60%. The energy consumption of desalination plants has also reduced from more than 12 kwh/m³ in the 1980's, to 1.5-2.0 kwh/m³ currently⁷. Reverse osmosis membranes have also become cheaper with improved productivity and lifespan, all of which means that the cost of desalination is now comparable to freshwater supply in some areas at about 70cents/m³.

Concerns about the environmental footprint of desalination plants have put some people off their use. Given that the energy intensity of the process has reduced significantly some of these concerns have lost their force. The management of by-products, such as warm water and salt from desalination plants, has also improved to prevent adversely affecting marine life in the area further minimising the environmental footprint of these plants. As such, desalination is now a very viable solution to water stress and an attractive area for investment.

The Israeli government has responded by increasing its desalination target capacity to 700 million cubic meters per year, up from 133 million previously. This capacity would just about cover the annual water amount used by the Israeli population. There are accusations of mismanagement in this

though. Critics argue that more desalination plants should have been built years ago and that the current situation was predictable and could have been avoided. Other countries in the surrounding area are also expected to step up their desalination processes. Jordan has access to seawater, and in desperation could desalinate water from the Dead Sea, though this would require more energy given the sea's notoriously high salinity.

Water management as an investment theme

One type of expenditure that is not likely to be impacted by the credit crisis is spending on water projects. Levels of water stress around the world mean that there is a clear necessity to improve the water supply in many areas. The very last thing that governments will cut spending on is water supply for their population. The Henderson Industries of the Future Fund is invested in companies with products that are well placed to alleviate water stress and which should benefit from continued spend in this area for many years to come.

The fund has Water Management as one of its ten investment themes. We invest in companies that participate in the desalination value chain. One in particular, **Energy Recovery Inc.** manufactures a pressure exchanging device that recovers energy from the pressurised water against the membrane. The process reduces energy consumption by roughly 60%. They have recently announced two new contracts in Algeria in the space of three days, and are well placed to benefit from the expected increase in Israeli projects.

So, to conclude, water stress is on the rise, but cures are becoming cheaper and more effective and governments are increasing spend on water infrastructure. Hence one thing I am justified in not being stressed about is water.

1 "Hot, Flat and Crowded", Thomas Friedman, Farrar Straus Giroux 2008, p127

2 "Israel Facing Worst Water Crisis in More Than 100 Years", Julie Stahl, CNSNews, 19 November 2008
www.cnsnews.com/public/content/article.aspx?RsrcID=39581

3 "Right there, under the ground" Jack Gilron, Haaretz 16 November 2008
www.haaretz.com/hasen/spages/1037277.html

4 Cited in: "The Skeptical Environmentalist", Bjørn Lomborg, Cambridge University Press, p157

5 www.un.org/documents/ecosoc/cn17/1998/background/ecn171998-swami.htm

6 www.news.bbc.co.uk/1/hi/sci/tech/3747724.stm

7 www.news.bbc.co.uk/1/hi/sci/tech/3747724.stm

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