

Engineering water

EXHIBITION

It takes 17 bathtubs of water to produce one bar of chocolate, according to the latest climate change-linked exhibition at the Science Museum in London, which aims to raise visitors' awareness of how sustainable the production of their foodstuffs is. *Water Wars: Fight the Food Crisis*, opened in September in the

museum's shiny blue-glass *Antenna* 'news' gallery. "We couldn't use brown, cracked earth or other classic drought images because they'd look bad against the blue wall. And besides, that would be a bit too Oxfam-y," explains Sarah Richardson, the exhibition manager. Instead, she's opted for a dark, navy abstract, representing the majority of fresh water locked up in ice caps. *Water Wars* focuses on the fact that there will not be enough water to grow the world's food because of climate change and population growth.

In the promotional run-up to the exhibition, the museum conducted a survey of 3,000 adults, asking what things they felt they couldn't live without. 'Clean drinking water' was a rather unsatisfactory third on the list, understandably, behind 'sunshine', but also after 'an internet connection'. In fact,

more people said they'd rather live without a shower, fresh fruit and vegetables, and a flushing toilet, than without Facebook. Awareness of the impending global water crisis, Richardson discovered, is rather lacking. "Many people don't realize that we use a lot of water from other countries, indirectly, because we import about 40% of our food from abroad," she says.

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Perhaps in another bid to avoid being too 'Oxfam-y' (too similar to campaigning aid charities), the small exhibition simply focuses on five technological fixes for the thirsty crop problem — there's not a drip-irrigator or drought-stricken peasant in sight. Instead, Richardson has chosen projects that use the power of microbes, the Sun, wind and fog to water plants in arid conditions. The first of these is perhaps the most speculative: a microbe-powered fuel cell that powers desalination. At present, it takes a few hours to get a teaspoon of fresh water out of the device, so there's some way to go before it becomes useful in agriculture.

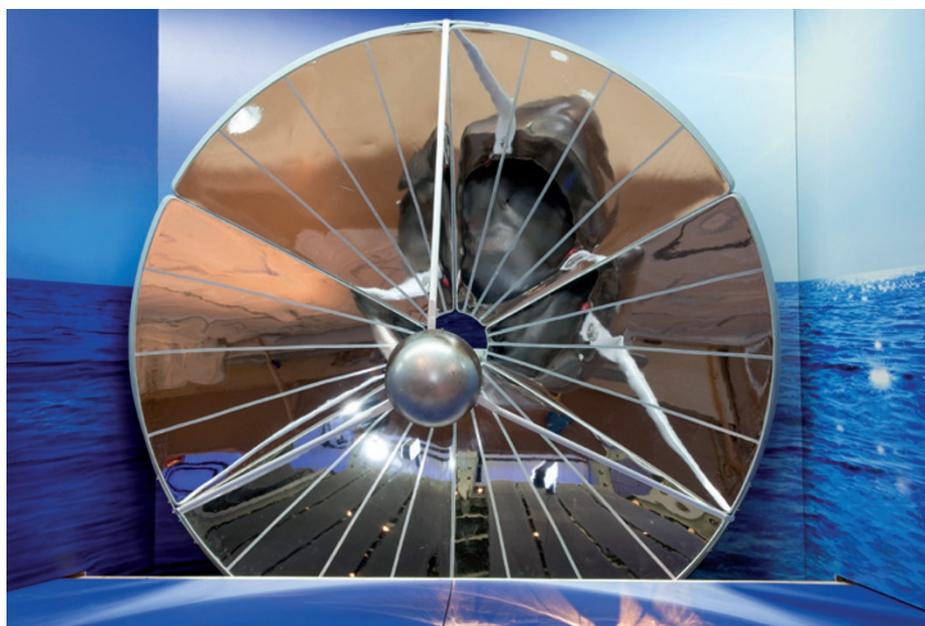
A couple of new fog-net designs are also on show, which work by intercepting fog-laden coastal winds and collecting the condensed water that streams down the net through gravity. One of these designs uses an enhanced run-off material and is based on the Namibian tok-tokkie beetle, which collects dew on its shiny carapace and then delivers it into its mouth by way of a neat headstand. However, having seen various fog-harvesting projects around the developing world, the issue for success does not depend on fractional improvements to the amount of water harvested — the standard nets provide ample water — but in keeping the system cheap enough and ensuring it's maintained by the community.

My favourite project was a honeycomb-inspired sheet of corrugated cardboard that is deployed as a wall for a greenhouse. The wall is sprayed with sea water (using a solar-powered pump and spray) and wind evaporates out the salt, leaving the humid air to condense onto the greenhouse crops. It's ingenious. If there's no wind, solar fans are activated. The system, designed by Charlie Paton in London, is already being used in Australia, and I expect it would work well with hydroponic growing systems as soil fertility becomes more of an issue.

This cute snapshot of engineering innovations didn't touch on the enormous socio-political issues surrounding the global water crisis in agriculture, such as why some of the world's driest countries are producing the thirstiest crops for export, while their domestic populations face food shortages. Nor did it look at different agricultural methods that use water more efficiently. But, the exhibit manages to make farming concerns interesting and showcases some of the ways that technology can provide simple improvements to quite complex and long-term problems. As Richardson says, they didn't want to campaign, they just wanted to raise awareness of the issues and "tell nice inspiring stories about how science can be used creatively to help," in the eventuality that we're left with Facebook and an unquenched thirst. □

REVIEWED BY GAIA VINCE

■ *Water Wars: Fight the Food Crisis* is a temporary exhibition in the *Antenna* gallery at the Science Museum in London, from September 2011 to June 2012.



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Water from the Sun: concentrated solar power is being deployed in Cyprus to desalinate sea water and produce five million litres of fresh water a day.