



# THE MAN WHO CAN CHANGE FIRE INTO WATER

In a south Sinai Bedouin fishing village, a pioneering product developer has introduced solar-powered water purification technology that could be the solution to Egypt's water crisis. *The Traveller* reports



WORDS ▸ BARRY MANSFIELD

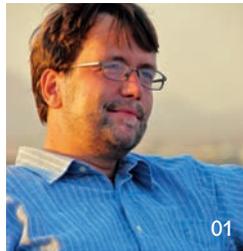


# THE BEDOUIN VILLAGE OF EL ASALAH IS PROBABLY THE WORLD'S MOST UNLIKELY TECHNOLOGY FRONTIER.

In the northern quarter of Dahab, 80km north of Sharm el Sheikh, its winding streets are typical of these parts, with thriving markets selling intricate handicrafts, the aroma of coffee, shisha and spices in the air.

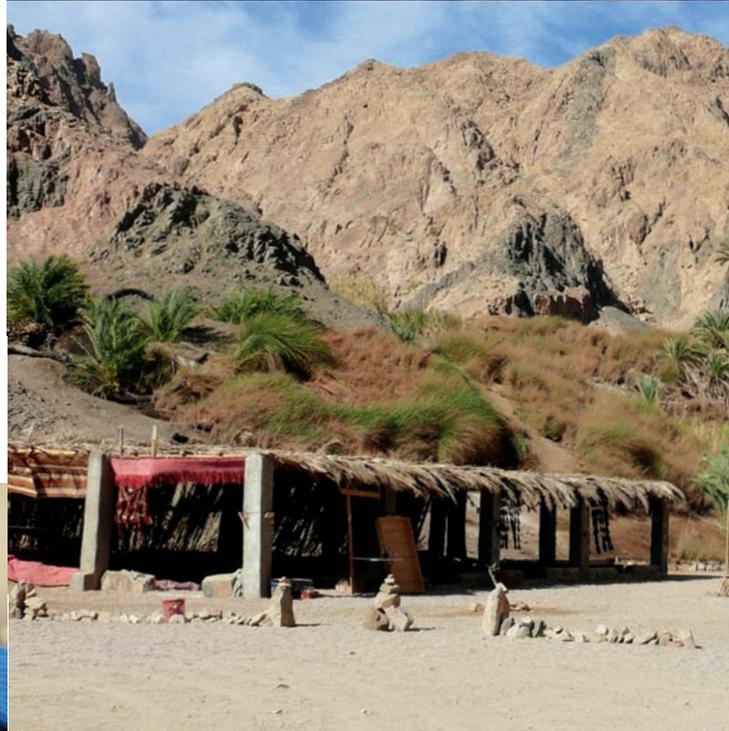
In recent years, tourists have been drawn here by the colourful coral reefs that line the coast, to indulge in watersports and enjoy the beautiful surroundings. As a result, new developments now sit alongside the traditional stone structures that have stood here for generations.

Yet, for the local Muzeina Bedouin tribespeople who first settled in these parts, life has changed very little: hardy desert shrubs are still used for food and medicine; each family keeps goats and sheep, which freely roam the streets; at night, the orange glow of open fires can be seen crackling in the dark as they bake flat bread and cook chicken or fish. And, despite the omnipresent hiss of water sprinklers that can now be heard



keeping hotel gardens green, there still remains one constant, long-endured challenge: finding clean drinking water in these arid conditions.

Things, however, could be about to alter dramatically. The villagers have recently been trialling a revolutionary type of water-purification technology that could change their lives forever. Described as a “multi-effect, solar-powered distillation system”, WaterStillar uses solar collectors to purify water from any source and it is, says its inventor and patent-holder, Tom Juul Andersen, more efficient than anything that has come before. With 2m<sup>2</sup> of collectors, a single unit can distil between 50 and 60 litres a day – that’s five times more than conventional stills and



## DESERT OASIS

- 01 WaterStillar inventor Tom Juul Andersen
- 02 Bedouin tribespeople still live largely as they always have done
- 03 The Bedouin village in El Asalah
- 04 Clean, non-salty water is essential for making tea
- 05 Visitors often come to the region for the diving
- 06 The WaterStillar equipment being installed in the village

enough for the daily requirements of a family. Further, it's solar powered, has no moving parts, and uses gravity and thermodynamics to manage the flow of water, which makes WaterStillar perfect for desert life. "It's designed to be low tech, local and durable," says Juul Andersen, a former telecoms product developer who came up with the idea in 2003 while watching a weather report on TV.

Water is an ever-present issue in Egypt. South Sinai may be best known for its piercing sunshine, sandy beaches and clear sea, but the stark reality most tourists



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don't see is Egypt's water crisis. The last rainfall here was nearly three years ago, with the disastrous flash floods of January 2010. July temperatures in Asalah average out at 33°C, but 38°C is not uncommon and annual average precipitation is 0mm. There is simply not enough of what has been termed, in some circles, 'blue gold'.

Confounding this problem, Egypt has now hit 'zero line' for water, meaning its underground reserves are dangerously low, and the future is even more worrying. Under an agreement with eight of the other countries along the Nile, Egypt is allowed to use 55 billion cubic metres (bcm) of its total annual flow of around 84bcm. The problem is that it will need 50% more of the Nile's water by 2050 to provide for an expected population of around 150 million, according to the National Planning Institute. Already, the Nile provides 97% of Egypt's needs, the remainder coming from groundwater (10bcm yearly), recycled water (7 bcm) and rain water (0.5 bcm).

All of which explains why WaterStillar is such a welcome solution. "Before, it was expensive bottles or salt water," says Ahmed Naeim, a villager. Now, WaterStillar purifies filthy brackish water from a nearby well to deliver "easy, cheap and perfect drinking water for 30 people".

The set-up here, which was arranged by a local Bedouin businessman called Umburak Hemid Sobeh, covers 15m<sup>2</sup> in total and is placed on a roof.

The system has also helped the locals prosper in other ways. Although they live a nomadic lifestyle, many secure an income from tourism, particularly as guides for Westerners who want to visit the desert or sleep under the stars. Before, they had to buy bottled water that was both expensive and inconvenient to carry around to provide for visitors and make tea.

Local market trader Tahnoon Al-Khoury says WaterStillar meets the challenge of "removing saltiness from tea and coffee, at a low cost, so we still profit." Higher-quality water is also used for food preparation.

It's no surprise this type of solar-powered solution has received the thumbs up from Dr Martin Mulenga, of the International Institute for Environment and Development (IIED), which has called for groundwater to be included more often in policies for integrated water resource management. Mulenga believes governments "should take steps to enable poor communities to use groundwater in a safe and sustainable way."

WaterStillar Egypt LLC was formed in 2009. At that time, Juul Andersen, who is based in Sweden, sought the expertise of Helmut Heller, a German-born businessman living in Sharm el Sheikh to promote, sell and



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maintain units in North Africa. Together they have started to see results. For instance, the El Quseir Radisson BLU Resort bought in the technology and, earlier this year, Juul Andersen managed a nine-month test of a two-unit system, trialled as an EcoInnovation project, at Oriental Resort, Nabq Bay. This site was drawing on a mix of sewage and Red Sea water, which is some of the saltiest in the world. These WaterStillar installations have attracted the praise of the Red Sea Environmental Centre (RSEC) and have even become a popular feature of university field trips in the region.

WaterStillar Egypt has also run systems on ground salt water in Cairo and on brine from reverse-osmosis plants, while Heller runs an installation in his garage, which draws on water from a well in the garden.

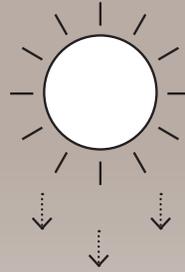
Back in Dahab, Dr Hazem Fouda, whose PhD is in agricultural sciences, says WaterStillar is particularly suitable for Bedouins, because it “is super-efficient

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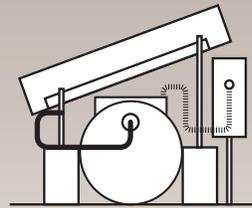
and intuitive, while allowing for independent living in harmony with one’s surroundings.”

“Us Westerners, who barely venture outside the hotel pool areas, often fail to realise that people are really struggling to make things work here,” says Juul Andersen. “There is no electricity or local know-how [in the Bedouin villages].” WaterStillar Egypt plans to run systems for a contracted number of years – in Juul Andersen’s words, to “sell the water, not ownership or responsibility for the technology” – and the company throws in free maintenance and technical support.

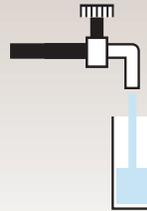
### HOW DOES WATERSTILLAR WORK?



A solar-powered pump feeds impure water into the top of the collector, where the sun’s heat is used to evaporate it.



The apparatus has no moving parts, making it perfect for the desert. It uses gravity to move the water, which is collected as condensation after the sun evaporates it.



Within the system, there’s never any physical contact between the feed water and the resulting product, which is 100% clean drinking water.

Past rivals have included the EU’s now defunct Sodesa project, which purified only 20 litres per day, and a device called WaterPyramid, which costs an eye-watering €20,000 to purchase. In comparison, the WaterStillar technology is cheap, clean and can produce water in suitably large volumes.

“Earlier solar still concepts were so inefficient that you would need to operate five or 10 in the desert to survive,” says Juul Anderson, who intends to sell the concept across the Middle East. “[Now we can] bring more clean water to people who really need it.”

## Sharm el Sheikh need to know

(23)

number of years that Dahab has had electricity



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(1,200)

species of fish in the Red Sea, of which 17% are only found here

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shipwrecks are in the Red Sea, plus the remains of an oil rig



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