

# Turning rainwater into drinking water

Treating rainwater for drinking has become simpler, faster, and cheaper. SUMI THOMAS finds out how a new technology can do that for millions of people in Brazil.



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Anna-Luisa Beserra getting clean water from the Aqualuz. The Aqualuz is mounted on a concrete cistern that stores rainwater.

Anna-Luisa Beserra, 21, has invented a system that purifies water using sunlight. In fact, this is the only technology in the world to **disinfect** rainwater collected in **cisterns**, without transporting the water to water treatment plants.

In the rural parts of Brazil, people often store rainwater in water tanks during rainy season for use during the dry seasons. But, the water in the tanks sometimes becomes polluted with disease-causing bacteria. Those who drink the water fall ill and sometimes die.

As clean drinking water is a basic necessity, Ms Beserra hopes to make it easier to get, especially for the poorer people in rural regions. "My purpose is to bring the basic right of clean water to disadvantaged communities in rural areas. We want to help make people's lives better and potentially save lives," she explained.

## Inventing the Aqualuz

Ms Beserra has been inquisitive since she was a child. She experimented with things such as dirt, soil, and shampoo which she found at home. Hearing about illnesses in the community due to the lack of clean water sparked her desire to help. When she was 15, she

began her venture into innovative and viable solutions for treating water.

She studied possible solutions, and discovered that water can be disinfected using radiation from the sun. She began building a prototype system, which comprised bottles of rainwater left under the sun on an aluminium sheet. Together with the community, she tested it out in **semi-arid** regions of Brazil, where the dry weather ensures lots of solar radiation.

In 2015, Ms Beserra founded a social

enterprise called Safe Drinking Water for All (SDW) to make her water treatment system a reality. Its Aqualuz technology consists of an innovative filter which uses sunlight to disinfect water from a cistern. A pump at the top of the cistern draws the collected rainwater through a pipe and into the Aqualuz filtration tank. The Aqualuz tank filters out any particles and exposes the filtered water to sunlight. After two to six hours of the sun's radiation, an indicator in the Aqualuz tank changes colour. This indicates that the water is clean and ready for drinking. People can then turn on the tap at the side of the Aqualuz tank to get clean water.

"My biggest problem was to convince people that this could disinfect water. The hardest thing was to make it simple," Ms Beserra tells of her experience. Ms Beserra's tests on the Aqualuz-treated water reveal that 100% of the bacteria is eliminated in the process.

The Aqualuz can be easily cleaned using soap and water. It can last up to 20 years and costs only US\$125 (about S\$170). The components of the Aqualuz are recyclable too. This system is also free of chemical components that are harmful to health and nature.

## Pushing ahead

The Aqualuz has benefitted more than 260 people. Ms Beserra believes



The Aqualuz is cheap to produce, and easy to clean and install. Ms Beserra hopes to bring clean water to disadvantaged communities in rural areas.

## WATER IN BRAZIL

Most people in Brazil do not drink water straight from the tap. Many of them opt for filtered and bottled mineral water. Lonely Planet informs travellers on its website about the tap water tasting awful. It recommends "vigorous boiling" for a minute, using a water filter, ultraviolet rays or iodine pills to purify the water before drinking.

Brazil has plenty of water compared to some other countries in the world, but water is not distributed well. Water.org reports that while safe water has become more accessible over the years, "there are still deep inequalities" among the **rural** and **urban** regions in accessing it. Water supply disruption is also a daily concern.

Water shortage occurs from time to time due to pollution at river basins, effects of climate change, and poor water supply infrastructure. There are about four million people who do not have access to safe water in Brazil. The underprivileged in the rural areas heavily depend on their cisterns to collect rainwater for their day-to-day needs.

that the Aqualuz can provide clean drinking water to more than 1.2 million families who have existing cisterns. Her team is negotiating with companies supplying cisterns to help vulnerable communities. They also see the potential to help people in rural parts of the world beyond Brazil. This certified technology won Ms Beserra the prestigious Young Champions of the Earth Prize in Latin America and the Caribbean in 2019.

Like her grandmother who has five academic degrees and still studies, Ms Beserra continues to learn and find sustainable solutions to other social and environmental problems. Her next project is to develop a device which generates biogas. She hopes this can be used as an alternative fuel in urban houses and help to manage solid waste better.

## VOCAB BUILDER

**disinfect** (say "dis-in-fekt"; verb) = clean something by killing germs.

**cisterns** (say "sis-terns"; noun) = tanks for storing water.

**semi-arid** (say "sem-ee a-rid"; adjective) = a climate where there is low annual rainfall.

**rural** (say "ru-rel"; adjective) = in the countryside, far from towns and cities.

**urban** (say "er-ben"; adjective) = relating to towns and cities.

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