WATER

The hidden climate crisis

Martin Atkin

“An approach to climate change that recognizes the importance of water can combat both the causes and impacts of climate change.”

- UN Climate Change

WATER: THE HIDDEN CLIMATE CRISIS

Water is one of nature's great paradoxes. Essential for life on earth, we suffer if there's not enough and we suffer if there's too much. Climate change is increasingly upsetting this delicate balance. More and more people face water insecurity both from extreme drought and extreme flooding.

The data is alarming. Half the world's population live in water-scarce areas. By 2025, two-thirds may face water shortages. More than two billion people have no safe, clean, easily accessible water supply. 800 million people - most of them women and girls - have to walk more than a kilometre from their homes to fetch water. Global water demand has been rising by one percent a year since the 1980s.

"Sixty-three percent of Africa's population do not have access to basic water services and cannot protect themselves from Covid-19; women and girls spend 200 million hours a day collecting water," Sareen Malik, Executive Secretary of the African Civil Society Network on Water and Sanitation (ANEW) told a recent online conference on accelerating action on water and climate at COP26. "These women and girls, and their daughters' daughters, will be locked into a life of ill-health, violence and poverty if we fail to address the water crisis."

Covid-19 has highlighted the gross inequalities of water scarcity. "It's shocking that right now, forty percent of the global population does not have enough water to do adequate hand washing," says Betsy Otto, Director of the Global Water Program at the World Resources Institute (WRI). According to the International Food Policy Research Institute (IFPRI), "In many communities around the world, a lack of water supply and sanitation deprives people of their most basic protections against the spread of the virus."


“The reality is that we are not living within our ecological limits when it comes to fresh water.”
- Betsy Otto, WRI

Even before the impacts of climate change and the pandemic, fresh water was a scarce commodity, representing just three percent of all the water on the planet. Of that, less than a third is available as surface or groundwater - the rest is in the form of snow and ice and may not be readily available. “The water crisis doesn’t get the same level of attention as climate change, the pandemic or global economic disruption,” says Otto.

“It’s a hidden crisis, we don’t always think about where our water comes from and how much we use. But the reality is that we are not living within our ecological limits when it comes to fresh water.”

- Betsy Otto

Behind the global water crisis is a triple-whammy of drought, floods and pollution. “First, there’s water scarcity and overuse of water in relation to available supply. When droughts hit, that chronic condition becomes acute. Secondly, there’s too much water - we’re seeing a documented increase in the frequency and intensity of storms, causing more flooding. And finally, we are polluting a lot of the fresh water that we do have, making it unusable. The only real way to get a handle on these extremes of drought and flooding is to get a handle on climate change - we have to avoid the unmanageable and manage the unavoidable. “We’re facing a future more dire than I want to contemplate on many levels, water being one of them.”

As if that wasn’t enough, growing demand for water exacerbates existing tensions between ethnic groups, rural and urban communities, and between people and governments. According to the World Water Conflict Chronology, clashes over water have risen significantly since the 1990s. Water shortage drives conflicts in, for example, Africa’s Sahel region, Yemen, Syria and India, to name just a few.

The World Economic Forum ranks the water crisis in the top five global risks, noting that “In 2017 alone, water was a major factor in conflict in at least 45 countries…water-related insecurity can easily exacerbate tensions and friction within and between countries.”

As with so many climate change impacts, it’s frequently smallholders and subsistence farmers in developing countries who are hit hardest. Seventy percent of global water demand is for agriculture, much of it wasted on outdated irrigation techniques and thirsty crops. “We need to be clear about which crops we should growing where,” says Otto. “For example, as important as crops like cotton and sugar might be for foreign trade, they use a lot of water and may not make sense where water is in short supply.”

A student at Angkor Chey High School, Cambodia, washes his hands with water piped in as part of an EU-funded project.

Acknowledging the increasingly urgent need to fix the global water crisis, the EU Global Climate Change Alliance (GCCA+) has, since 2007, been helping some of the most climate vulnerable communities around the world to become more water secure.

From solar-powered water pumps in Chad to nature-based farming in Timor Leste, from renovating wells in Niger to installing rainwater tanks on Pacific islands, hundreds of thousands of people now enjoy access to cleaner, safer water.

In Cambodia, for example, staff and students at Angkor Chey High School in Kampot province can now enjoy running water thanks to the EU-funded Mainstreaming Climate Change in Education (MCCE) project. “We have installed a system to bring water into the school,” says Principal Top Thyda. “For the first time, we have water for toilets and hand-washing.”

Young women in Bangladesh queueing at a rainwater tank.

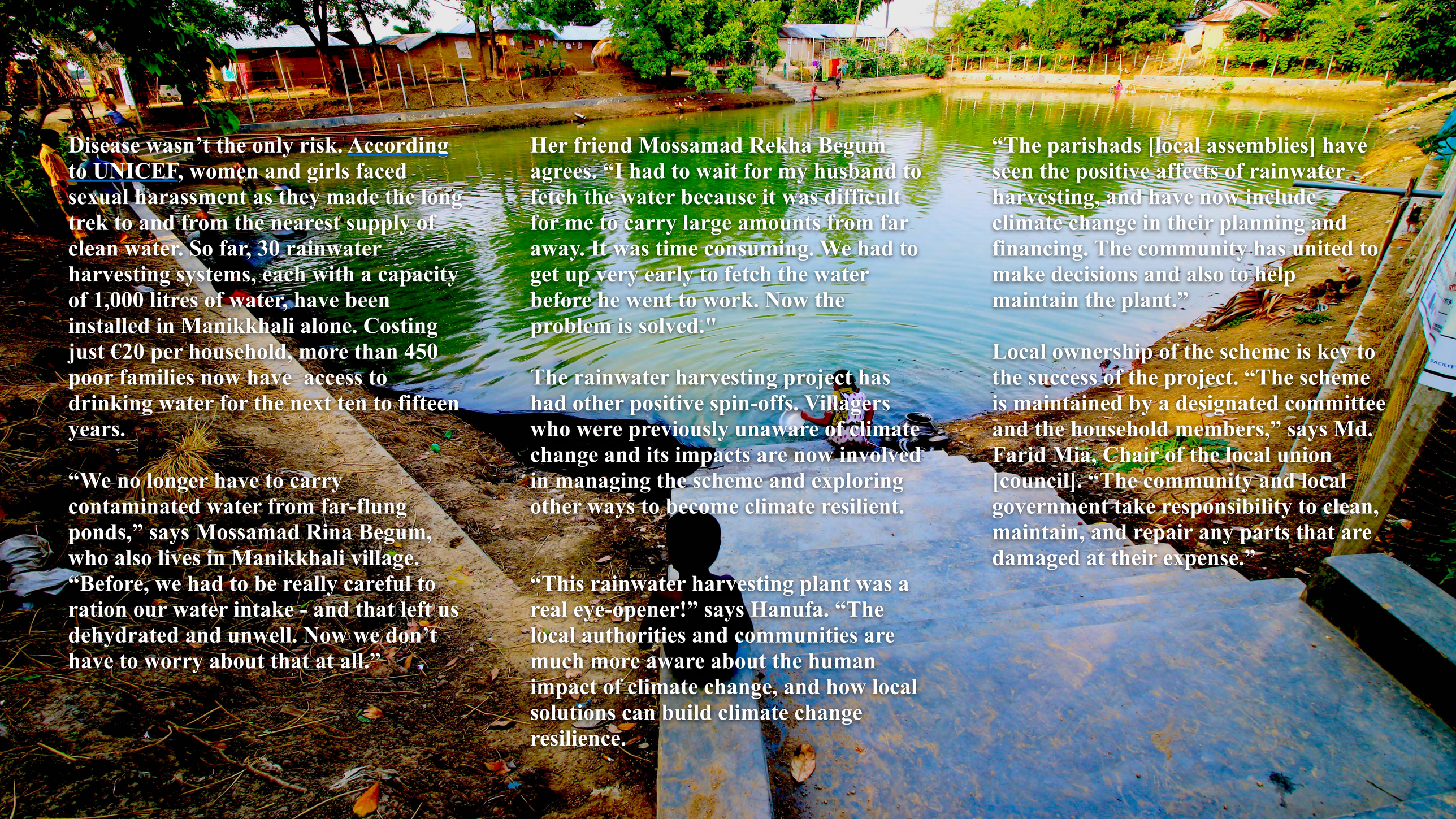
SEARCHING FOR SWEET WATER IN BANGLADESH

“I was heavily pregnant and my feet were swollen, but I still had to walk a long way every day carrying heavy containers of water,” recalls Mossamad Hanufa Begum with a sigh. “My husband was at work all day, there was no-one else available to fetch water, and the water in the ponds near our house was unusable.”

Life is hard in Manikkhali, a small village in the the low-lying Barguna district of southern Bangladesh. Home to the Sundarbans - one of the largest mangrove forests in the world - and bordered by the rivers and the sea of the Ganges delta, the region is highly vulnerable to sea level rise, salt water contamination, tropical storms and flooding. About 20 million people in the coastal areas of Bangladesh are already affected by salinity in soils and drinking water, and around 70 percent of people in the region depend on pond water for drinking and domestic use because the ground water is too salty.

In the past, the residents of Manikkhali drew fresh water from the natural ponds surrounding their village, but in recent years the impacts of climate change have made it unfit to drink. Rivers dry up in the hot season, while saline water intrusion has contaminated canals, ponds and crop fields. The problem is particularly acute for women, who are traditionally responsible for keeping the family home supplied with fresh water. A World Bank study links health problems during pregnancy and early childhood to drinking water contaminated by salt.

Now, however, the lives of villagers like Hanufa have been made easier thanks to new EU-funded rainwater harvesting systems installed by the Local Climate Adaptive Living facility (LoCAL), part of an €8 million EU GCCA+ programme to help Bangladesh cope with the worst impacts of climate change.



Disease wasn't the only risk. According to UNICEF, women and girls faced sexual harassment as they made the long trek to and from the nearest supply of clean water. So far, 30 rainwater harvesting systems, each with a capacity of 1,000 litres of water, have been installed in Manikkhali alone. Costing just €20 per household, more than 450 poor families now have access to drinking water for the next ten to fifteen years.

"We no longer have to carry contaminated water from far-flung ponds," says Mossamad Rina Begum, who also lives in Manikkhali village. "Before, we had to be really careful to ration our water intake - and that left us dehydrated and unwell. Now we don't have to worry about that at all."

Her friend Mossamad Rekha Begum agrees. "I had to wait for my husband to fetch the water because it was difficult for me to carry large amounts from far away. It was time consuming. We had to get up very early to fetch the water before he went to work. Now the problem is solved."

The rainwater harvesting project has had other positive spin-offs. Villagers who were previously unaware of climate change and its impacts are now involved in managing the scheme and exploring other ways to become climate resilient.

"This rainwater harvesting plant was a real eye-opener!" says Hanufa. "The local authorities and communities are much more aware about the human impact of climate change, and how local solutions can build climate change resilience.

"The parishads [local assemblies] have seen the positive affects of rainwater harvesting, and have now include climate change in their planning and financing. The community has united to make decisions and also to help maintain the plant."

Local ownership of the scheme is key to the success of the project. "The scheme is maintained by a designated committee and the household members," says Md. Farid Mia, Chair of the local union [council]. "The community and local government take responsibility to clean, maintain, and repair any parts that are damaged at their expense."

DIGGING DEEP FOR SAFE WATER

Nine thousand kilometres from Barguna, the women of Bazinga in rural Niger know all about the hardships of daily water collection. “Until two years ago, the women endured a real nightmare,” says Mamane Tourba, Mayor of Dogonkiria rural commune in the country’s south-west. “They had a choice - either walk more than five kilometres every day to fetch water or wait for hours to get a trickle of water from the village well. The women’s morale hit rock bottom because it was the only source of water during the dry season.”

Built in 1977 with Japanese aid money, the village well gradually filled with sand until it was nearly useless. “The women told us the well simply wasn’t deep enough to meet the needs of the village,” says the Mayor. “We dug out five metres of sand and the well is now 12 metres deep. It never lacks water any more - much to the delight of the villagers!”

In Niger - one of the driest countries on earth - EU-funded projects are bringing water to remote rural communities.

“Before the wells were renovated, women had to walk up to three hours to look for water. Now we have plenty of good quality water close by. It’s much quicker and our hands are much smoother!”

- Haoua Sounna, President of the Baziga Women’s Group

The Bazinga well was renovated using a grant from the EU's Local Climate Adaptive Living Facility (LoCAL), a €4 million programme designed to help local authorities in least developed countries (LCDs) become more resilient in the face of climate change. Altogether, seven field projects covering more than 30 municipalities in the Dosso and Zinder regions have been completed.
In Dongokiria and neighbouring Sokorbé, eight wells have been brought back to life and three new ones constructed. Nearly six thousand people, including four thousand women, now have better access to drinking water.

"The village well is now deeper, and protected by a retaining wall," notes Mayor Tourba. "Everyone must remove their shoes before entering the enclosure, to protect against contamination. Any soilled water runs away down a channel to avoid stagnation and is used to irrigate newly planted trees which will provide shade around the well. There is a separate channel where animals can drink."

LoCAL stresses community involvement in all its projects. "Everyone pays a monthly user fee, and the money collected is managed by a committee responsible for maintaining the well. This ensures a better sustainable use of the well and its water," he says.

Niger is one of the driest countries in Africa, with three-quarters of its territory lying in the Sahara desert and the Sahel region. Unpredictable rainfall patterns and extreme weather events driven by climate change spell misery for rural communities - last year the country was hit by devastating floods which affected more than 400,000 people and destroyed 9000 hectares of agricultural land.

For most of the year, however, people here are more concerned with the lack of water than by having too much. Less than 100 km from Dogonkiria, another EU-funded programme provides water for nearly 9000 inhabitants and their animals in Dogondoutchi, a mainly farming community. Here, the dry season really means dry - it is common for not one single drop of rain to fall between October and May, while the rainy season brings flash flooding which washes away valuable topsoil.

Women are the main beneficiaries of the six multi-purpose cement wells which have been constructed by EU GCCA+ development partner Eau Vive in the district. For one of them, Fatima Dankani, the new wells mean less time spent fetching and carrying enough water for her family, which previously took an entire day and involved carrying up to 40 litres of water.

"Ever since the well has been rehabilitated, there has been a difference in my life."

- Fatima Dankani

Hauling water is a communal effort in Dogonkiria, Niger.

“Altogether, seven people depend on me for water on daily basis. I cannot let them down. My children used to cry if I took them to the well, but I couldn’t leave them as there was no one to look after them,” she says. “My whole family has greatly benefitted from this well, and it has reduced my suffering.”

The €1.5 million project in Dogonkiria has benefits which go far beyond reducing women’s workloads. Vegetable plots have sprung up around the wells, significantly improving food and nutritional security, and enabling women to sell surplus produce in nearby markets. Livestock farmers can rely on water for their cattle, while some women have been trained to grow tree seedlings, which are then planted to provide shade and to reforest the land. As one village leader says, the wells have helped give women back their freedom.

“They don’t want their daughters to suffer as they did.”

The never-ending search for fresh water dominates the lives of those living in the Sahel region of Africa.

SOURCE OF LIFE AND CONFLICT

For the people of Africa's Sahel region, daily life is not just a struggle - it's a fight for survival. Water - or the lack of it - defines their very existence. Water to drink, water for livestock, water for crops, water for cooking. The never-ending search for fresh water dominates their lives.

At the heart of the Sahel lies Lake Chad, a by-word for climate change which has shrunk to just one-tenth of its 1960s surface area. Once the world's sixth largest inland water body, covering more than 26,000 km2, the waters are now reduced to a mere 1,200 km2. For the 30 million people living in the four countries which border the lake - Chad, Nigeria, Niger and Cameroon - it's an existential climate disaster.

"Living in Chad you see exactly the climate impact right in front of your eyes," Hindou Oumarou Ibrahim, President of the Association for Indigenous Women and Peoples of Chad, told the World Economic Forum.

"About ninety percent of the lake has disappeared since I was a child. That has created conflict among the communities who are fighting to get access to resources that are shrinking. Pastoralists are fighting among themselves as droughts destroy their traditional way of life. People are dying because of climate change. Climate change is real - for us it's not about the future, it's about the present. It's an issue of survival."

"The pastoralists, the herders and the agriculturalists are all competing for the same water. There's is no substitute to working with all parties on the ground to address the complexity of the local situation, from helping increase productivity of farming and grazing to restoring degraded lands and managing the pressure of growing populations on fixed natural resources like water.," says the WRI's Betsy Otto. "There's been mismanagement of Lake Chad, certain users were allowed to over-extract water, and that creates long term pressures and conflict.

But first you need to stabilise the security situation that has deteriorated. All those things that really do matter but which take time - to unwind a situation that was allowed to be created over decades. It's not going to be solved overnight."

Remnants of Lake Chad, February 2015.

In Chad, solar powered water pumps are vital for keeping livestock alive.

Chad may face severe water shortages, but one thing it has in abundance is sunshine - which in turn means huge potential for renewable energy. As part of an €8 million programme in the country, and a larger, five-year, €12 million programme covering the whole of west Africa, the EU GCCA+ has installed solar-powered water pumps to help farmers access clean water for their livestock and households.

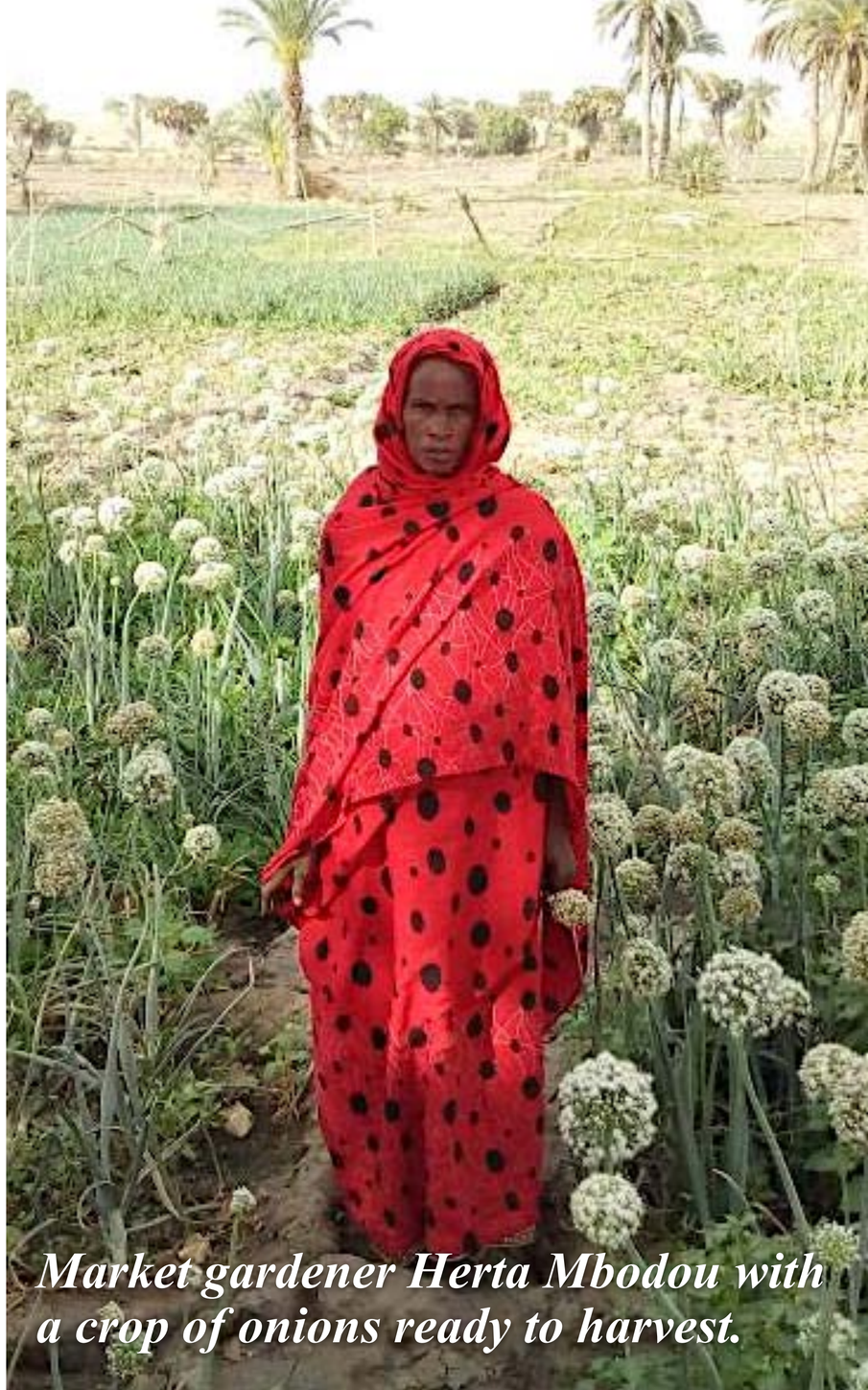
Among those ot benefit are cattle farmers in the Salamat region in southern Chad. In Salamat - described by the World Bank as one of the poorest regions of the world - livestock underpins the entire economy. Without water, the livestock die - and without livestock, the farming communities have no future. Solar powered water pumps fill small local ponds where farmers can bring their cattle to drink, reducing the time and distance previously needed to seek out water supplies.

Near what was once the eastern shore of Lake Chad, in Djigdada Township, market gardener Herta Mbodou used to struggle to grow vegetables on a small plot in a wadi - a dry, sandy ravine prone to sudden flooding in the rainy season. “For decades now, we have suffered from drought,” says Herta. “It’s just not possible to grow enough food to feed my family. It is a constant struggle and the yields are very low.”

However, with the help the EU GCCA+ and local partner SOS Sahel, Herta now has a larger plot of land to cultivate, together with a modern water pump which replaced the traditional pole and bucket *chadouf*, used in the Sahel since the days of the pharaohs. “Since the project started, I have been given training on how to use and maintain the irrigation equipment and how to plant different crops such as okra, garlic, onions and tomatoes which are more resilient to drought,” she says. “When they have been harvested I’ll be able to sell them to support my family.”

“Access to water has made a huge change in our daily life,” says Hapsita Djimet, one of thousands of women in the region to benefit from a new rainwater tank. “Now we have these poly tanks to keep clean water in, it’s made a big difference to our health. There’s been a marked decrease in waterborne diseases such as diarrhoea.”

“Before the infrastructure was put in place, we women had to get water from the borehole, which is several kilometres from the village. That water was unfit for drinking but we had no choice. But today, we are provided with drinking water every day.”



Market gardener Herta Mbodou with a crop of onions ready to harvest.

Spirulina is said to be the secret of long life for Kanembu women. It's also an important source of income.

Tayrah mixing spirulina paste.

In one of the flooded wadis that border the eastern shores of Lake Chad, a group of women and girls work in the shade of a solitary tree. For centuries, the women of the Kanembu tribe have harvested blue-green algae from these shallow lakes. Known as spirulina - or dihé in the local dialect - this nutrient-rich food supplement is said to be why women in the area live longer than elsewhere. Now, spirulina can be found selling for €20 a pack in health food stores all over the world, a boom fuelled by health-conscious consumers.

The EU GCCA+ programme in Chad helps local women to harvest, process and package spirulina both for export and as a possible solution to food insecurity in the region. Creating alternative employment opportunities is vital, but climate change threatens the shallow lakes in the wadis where the spirulina grows.

Aitambodou, one of the young women from the group, demonstrates how she transforms the blue green algae into a dry powder using a grinder, which she then mixes with water to form a thick paste. Nearby, her friend Tayrah scoops handfuls of the bright green paste from a plastic bucket and moulds it for drying in a specially-built rack. According to the FAO, who helped establish the programme, each woman can harvest between four and eight kilos of algae a day. However, you won't find any men working here - the harvesting is supervised by an elderly woman from the community who makes sure they stay away, because local tradition has it that any man entering the water will render the lake barren.

OLD TRADITIONS, NEW SOLUTIONS

“The relationship between fresh water and the people of Timor Leste has always been complex,” says Isabel Pereira, a native Timorese who works as National Adviser for the German development agency GIZ.

“People live on steep mountains and water has never been easy to find or manage. Now that the rains come too late or all at once, people in the villages must use their old traditions to cope with less water.”

For centuries, the mountain farmers of Timor Leste have turned to ‘tara bandu’ to help them make big decisions. The traditional Timorese custom aims to solve community challenges through consensus and without resorting to conflict. Tara bandu - based on collective wisdom and experience - is used to create common guidelines for living in harmony with nature and with other people. So after years of drought, with fresh water becoming increasingly scarce, the farmers turned to their own cultural traditions to avoid conflict.

“People in Timor Leste are becoming aware that if the climate is changing, people must change too. In particular, mountain communities must be prepared to protect their land, to store water and to use their natural resources wisely if their children are to continue living on the land of their ancestors,” says Isabel.

The EU GCCA+ €4 million programme in Timor Leste helps remote farming communities become more resilient to the impacts of climate change, including extreme drought and flooding. Communities used tara bandu to agree conservation agriculture measures, including digging reservoirs to collect rainfall and conserving soil by avoiding slash and burn. Although advised by experts from GCCA+, the UN and NGOs, it was the communities themselves who met, discussed and agreed the best way forward.

In the northern coastal region of Liquiça, for example, the water supply to 36 households in one village was repaired and upgraded following tara bandu. Antonia Alves de Jesus was one of those to benefit. “Before, we didn’t get water and we couldn’t plant any vegetables,” she says. “Now that we get water, we can plant our garden and we also have a good supply of water for the animals.”

“We’ve cut costs, reduced labour and increased yields. Despite long periods of drought, there’s still enough water.”

- Farmer Joao da Cunha

A group of women take a break from collecting water in Timor Leste.

Alongside traditional, nature-based solutions, Timor Leste is also experimenting with 21st century water conservation. A hilltop above Akrema village on the remote island of Atauro is the site of a pilot hydropanel plant which produces water from sunlight and air - although teething problems combined with the relatively high cost have led some to question the technology's viability in low-income countries.

"During the long dry season it's really difficult to access water for drinking, for the animals and for cooking," Adap Coreia, a villager who helps manage the hydropanel project, told Channel News Asia. "In the past we only used the water collected in the tank from the rain. This gives us another option. Climate change is really affecting our activities - the fishing, our agriculture and keeping the animals. It's changing the seasons for corn. It cannot grow well because of not enough water and some coconuts we plant die because it's too hot."

However, for the vast majority of Timorese, the best way to cope with future droughts is to work with nature. "We're not planning for big and expensive solutions, we take small steps to make a difference," says Isabel.

"If the climate is changing, then we can also change ourselves. We can use our traditions and our wisdom, and we can build on what we have learned in recent years."

Farmer Almerino Madeira filling a water tank in Ermera, Timor Leste.

THE WRONG KIND OF WATER

Water insecurity isn't just about having not enough to drink - it's also about having the wrong kind of water. Surrounded on all sides by the ocean, and threatened by rising sea levels, many small Pacific island nations experience chronic fresh water shortages.

Low-lying coral atolls, some just a couple of metres above the waves, have been hit by a double-whammy of rising sea levels and increased droughts - during one particularly severe dry spell in 2013, large families on the Marshall Islands were forced to live on less than five litres of water a day.

Nauru, part of the Micronesia group located roughly half way between Australia and Hawaii, has no piped water system, making residents highly vulnerable to water shortages. Recent research by the EU GCCA+ showed that a third of households have less than 5,000 litres of water storage capacity, with many of them relying on neighbours or having to buy bottled water.

The study, part of the Scaling Up Pacific Adaptation (SUPA) project in 2020, also found that many of the most water-vulnerable homes had elderly or disabled people living in the household.

"Nauru relies on a reverse osmosis water purification system, which produces a maximum of two million litres of water a day if we run all three plants," says General Operations Manager Mohammed Ali. "But it's very expensive, and when the electricity supply fails then we can't run the system at all. Then we have to rely on rainwater or the underground water supply, which is very brackish. When there is a drought demand shoots up."

"There are high levels of bacteria in the ground water supply," explains community leader Haseldon Buraman. "It is also very saline because of inundation from rising sea levels. It's not fit for drinking, we can only use it for toilets or laundry."

The four-year, €15 million EU-funded SUPA project covers the Cook Islands, Federated States of Micronesia (FSM), Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Tonga and Tuvalu. Faced with increasingly urgent water shortages, four of them - FSM, Nauru, Niue, and Kiribati - are focusing on community water security, installing rainwater harvesting and desalination units and providing training to maintain the new systems.

More than 3000 km to the north west, on the tiny island of Fais, a tricky operation is underway to install a giant rainwater tank. Fais - an outlying island of Yap State in FSM - has no harbour and the airstrip can only take small planes, so the 5000 litre tank is first offloaded from a ship anchored offshore onto a small boat, then floated the last few metres onto the beach. From there, the islanders carry the tank by hand to the installation site.

“The islanders are very self-sufficient - the only way to transport anything on Fais island is to carry it.” says Christina Fillmed, Executive Director of the Yap State Environment Protection Agency. “Sometimes during a drought, coconuts are the only source of water and hydration. There’s a community water tank next to the elementary school but access is rationed. The supply of good quality water has been degrading steadily over the last few decades - there are some underground aquifers but they are considered no longer fit for human consumption because of saltwater intrusion.”

Drought in the western Pacific tends to be worse in El Niño years, which bring more frequent and intense tropical storms. The new water tank will help Fais cope with these increasingly unpredictable rainfall patterns is part of the €4.5 million EU-North Pacific Readiness for El Niño (RENI) project, which aims to secure food and water resources for vulnerable communities ahead of droughts.

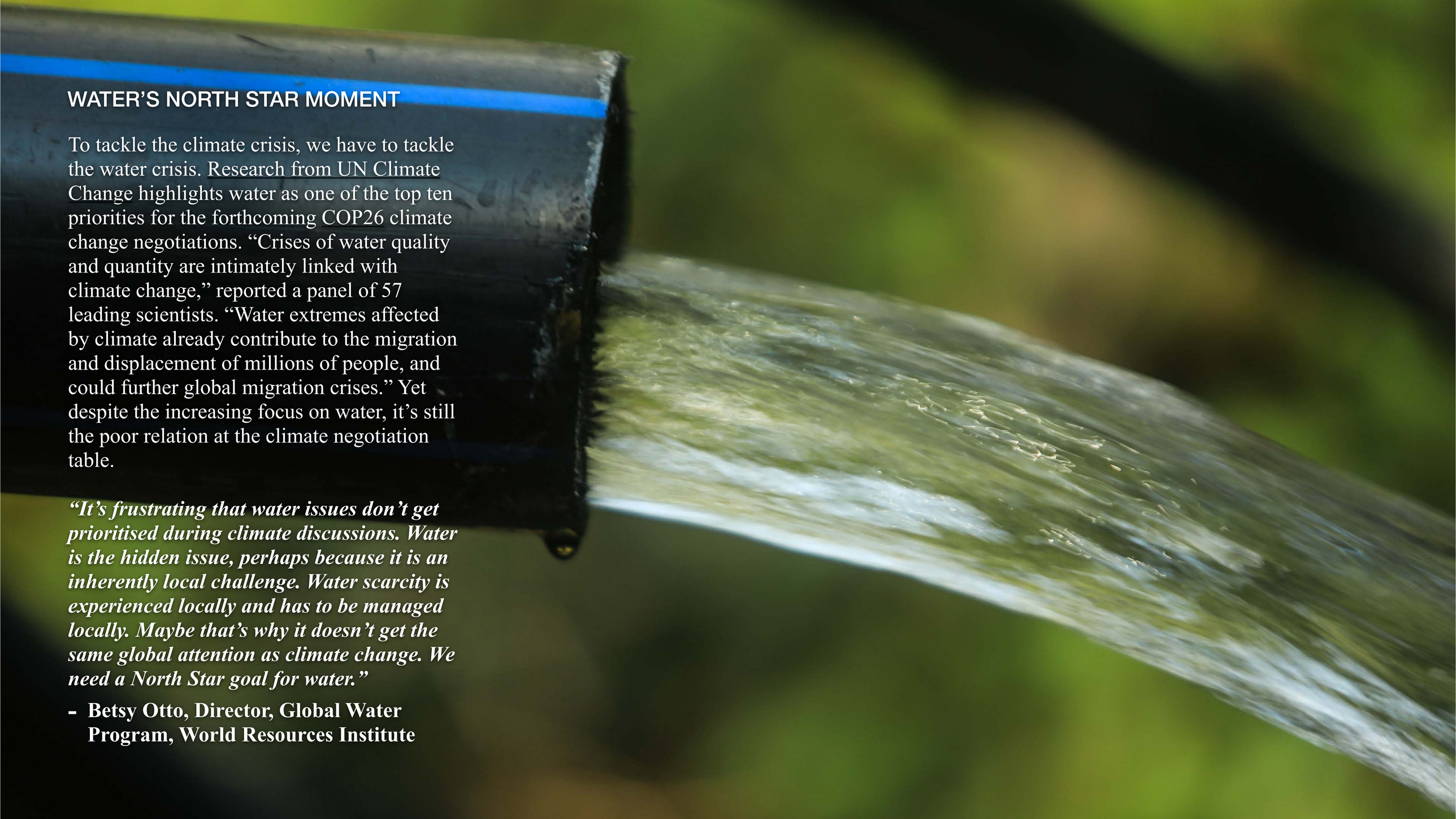
“The availability of fresh water in the outlying islands of the FSM is highly dependent upon favourable environmental conditions,” adds Christina.

“Climate change is having a significant impact on water security in these remote communities.”

Community involvement is vital for the project’s success. Training has been provided so that islanders can maintain the tanks and pumps themselves, and they have signed a maintenance agreement to make sure the infrastructure stays working.

“The community are really providing a huge contribution,” says Raymond Tamow, EU GCCA+ project officer for Yap State. “They dug the foundations, filled them with aggregate and helped offload the tanks to the shore and then to the houses. They work closely with the government officials, and without them the project would not have been completed on time.”

Watching the rainwater tanks come ashore in Fais was Andrew Jacobs, at the time the EU ambassador to the Pacific. “We were on the island when the water tanks were delivered,” he says. “Talking to the community, it’s clear they are going to make a huge difference in in the future. Getting drinkable water has always been a major problem here. We also installed a well which started pumping fresh water up just one day before a major cyclone hit the island. It’s made an immediate difference.”



WATER'S NORTH STAR MOMENT

To tackle the climate crisis, we have to tackle the water crisis. Research from UN Climate Change highlights water as one of the top ten priorities for the forthcoming COP26 climate change negotiations. "Crises of water quality and quantity are intimately linked with climate change," reported a panel of 57 leading scientists. "Water extremes affected by climate already contribute to the migration and displacement of millions of people, and could further global migration crises." Yet despite the increasing focus on water, it's still the poor relation at the climate negotiation table.

"It's frustrating that water issues don't get prioritised during climate discussions. Water is the hidden issue, perhaps because it is an inherently local challenge. Water scarcity is experienced locally and has to be managed locally. Maybe that's why it doesn't get the same global attention as climate change. We need a North Star goal for water."

- Betsy Otto, Director, Global Water Program, World Resources Institute

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