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# The Pacific Islanders fighting to save their homes from catastrophe

Some of climate change's sharpest realities are being felt on small island nations, where extreme weather is claiming homes and triggering displacement. Those able to stay are spearheading inventive adaptation techniques in a bid to secure their future

By Katie McQue

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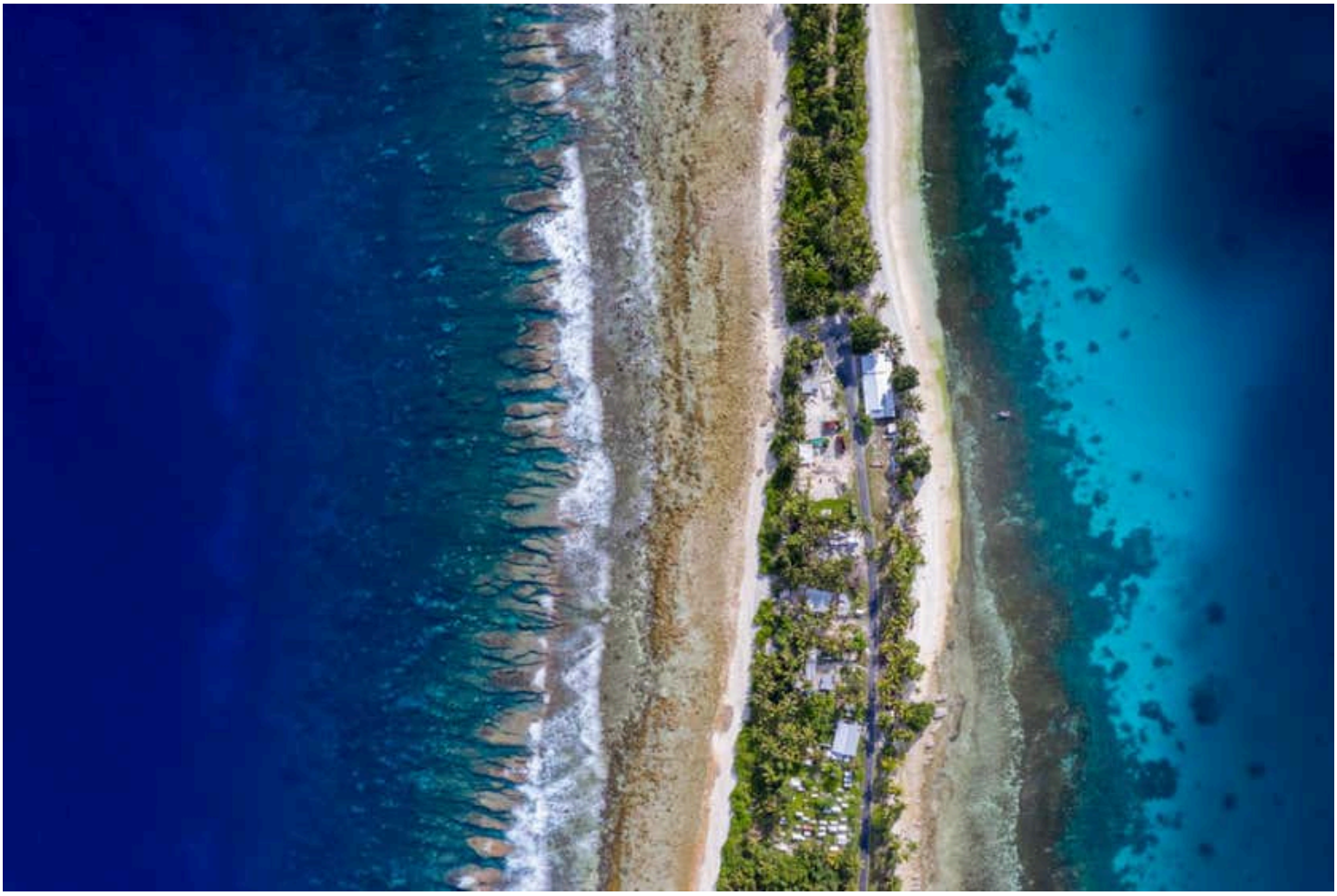

Sean Gallagher

On Sikaiana Atoll, a tiny islet in the Solomon Islands home to 300 people, rising sea levels are anything but a distant projection. High tides regularly wash into areas that used to stay dry year round, and the freshwater reservoir beneath the atoll is increasingly contaminated by sea water pushing up from below, compromising not only the soil in which villagers grow traditional root crops like taro, but also the wells they rely on for drinking water.

It's a similar story across the Pacific, where small island nations like Tonga, Fiji and Samoa are suffering some of the worst impacts of climate change. Rising seas and intensifying storms are already having a devastating effect on people's livelihoods, health and well-being. In some cases, the threat is truly existential. Tuvalu, comprising nine low-lying islands halfway between Hawaii and Australia, could be almost completely submerged at high tide by the end of the century, according to some estimates.

Many Pacific Islanders are being forced to leave. But across the region, others are attempting to secure their future by pioneering adaptation strategies that combine traditional practices with techniques backed by scientific data – from mangrove restoration to farming methods that are better suited to changing soil and erratic weather.

It is too early to tell if their efforts will be enough to preserve the habitability of these islands. For the scientists involved, however, it is already clear what the lessons are for the rest of the world. They concern not only how it can protect its own coastal regions in the coming decades but also what the international community must urgently do to help the people living with the reality of climate change today.

## A warming planet

The climate crisis /web/20260114055945/https://www.newscientist.com/article-topic/climate-change/ is escalating rapidly. A decade on from the Paris agreement /web/20260114055945/https://www.newscientist.com/definition/the-paris-agreement/, the landmark international accord to limit warming to 1.5°C above pre-industrial levels, global greenhouse gas emissions are still rising. In October 2025, United Nations Secretary-General António Guterres told world leaders ahead of the COP30 climate summit /web/20260114055945/https://www.newscientist.com/article/2505518-cop30-keeps-climate-cooperation-alive-but-hanging-by-a-thread/ that exceeding 1.5°C is now inevitable – and some climate scientists argue that the limit has already been breached /web/20260114055945/https://www.newscientist.com/article/2463480-2024-confirmed-as-first-year-to-breach-1-5c-warming-limit/.

Meanwhile, the consequences of global warming are increasingly felt across the world in the form of rising temperatures and extreme weather events /web/20260114055945/https://www.newscientist.com/article/mg25834420-100-the-uncomfortable-reality-of-life-on-earth-after-we-breach-1-5c/. And although it is a crisis driven overwhelmingly by high-income industrialised nations, low-income countries are bearing the brunt of it. In Somalia, record-breaking drought has wiped out livestock and crops, triggering widespread displacement. In Pakistan, catastrophic flooding /web/20260114055945/https://www.newscientist.com/article/2335515-deadly-pakistan-floods-are-a-climate-catastrophe-says-un-chief/ in 2022 submerged huge swathes – estimates range

from around 10 per cent to one-third – of the country, destroying millions of homes. The list could go on.

Pacific Island nations, which account for less than 1 per cent of global emissions, are particularly vulnerable to rising sea levels /web/20260114055945/https://www.newscientist.com/article-topic/sea-level-rise/ for obvious reasons. Their average elevation is just 1 to 2 metres above sea level, with 90 per cent of the population living within 5 kilometres of the coast and half the infrastructure located within 500 metres of it. Given that sea levels in the region also happen to be rising twice as fast as the global average, the 10 million people who live there are uniquely exposed – and the immediate consequences are proving devastating.

The first and most palpable is coastal erosion, with homes and garden plots quite literally disappearing inch by inch. Then there is flooding, increasing in both frequency and severity, and salt water intrusion from below, which is contaminating sources of drinking water and destroying crops, forcing communities to depend more on imported food.

But rising seas are far from the only climate-related problem facing Pacific Islanders. Stronger and more frequent cyclones are repeatedly wiping out homes, schools and roads, leaving islanders to rebuild again and again. Increasing ocean temperatures are killing off coral reefs and depleting fish stocks, while higher temperatures on land are encouraging mosquitoes to expand to new areas /web/20260114055945/https://www.newscientist.com/article/2445495-mosquito-borne-illnesses-are-spiking-across-the-world/, exposing more people to the risk of dengue fever. Finally, more frequent and severe dry spells and droughts are intensifying the pressure on freshwater supplies, food and public health.

“Food insecurity is a huge issue,” says Roannie Ng Shiu https://web.archive.org/web/20260114055945/https://caprifoundation.org/liamanaia-roannie-ng-shiu/, co-director of the Centre for Pacific and Global Health at the University of Auckland, New Zealand. “With the oceans warming, we have a lack of reef fish… and there’s quite a reliance on ultra-processed food, which is having health impacts as well.”

## Missing home

All of these problems overlap, compounding one another to make life increasingly arduous for Pacific Islanders. Inevitably, climate migration is already under way. Entire villages are being relocated to higher ground. On Abaiang Atoll in Kiribati, for instance, the village of Tebunginako has been relocated inland due to severe coastal erosion, rising sea levels and repeated storm surges that made homes uninhabitable.

Others are being forced to leave their islands, relocating either to nearby islands or further afield. The Australian government has offered the people of Tuvalu a migration route, under which 280 Tuvaluans will be granted Australian residency each year through a ballot system. Nearly a third /web/20260114055945/https://www.newscientist.com/article/2485970-nearly-

a-third-of-tuvaluans-have-applied-for-climate-migration-visa/ of the country's 10,000 residents have applied.

All of which might seem practical. But it is also deeply traumatic, posing a grave threat to Pacific Islanders' rich cultural heritage. "In Tonga, people who have been relocated are heartbroken because it's a whole change of a life, and they keep on yearning for their home," says Pelenatita Kara https://web.archive.org/web/20260114055945/https://www.linkedin.com/in/pelenatita-petelo-kara-23759859, programme manager at the Civil Society Forum of Tonga. "Some people still sneak away to spend a couple nights in their old island, then have to get back onto the boat to their new home."

**Despite efforts to build sea walls, big waves can cause huge damage to houses that are liable to flooding on Pacific Islands**
Vlad Sokhin/Panos Pictures

For those unable or unwilling to move, there is little choice but to try to mitigate the problems they are facing and adapt to their new reality.

When it comes to the immediate consequences of sea level rise, the most obvious potential solution is coastal engineering. Land raising, which involves depositing sand to build elevated ground, could provide protection, says Robert Nicholls

https://web.archive.org/web/20260114055945/https://research-portal.uea.ac.uk/en/persons/robert-nicholls/, who studies climate adaptation /web/20260114055945/https://www.newscientist.com/article-topic/adaptation/ at the University of East Anglia, UK. But land raising is expensive and requires dredging the seabed, disrupting deep-sea ecosystems. Some islands have built sea walls, but they only offer short-term protection and can actually worsen long-term vulnerability by accelerating coastal erosion elsewhere, disrupting natural sediment transport that nourishes beaches and undermining coastal ecosystems like mangroves that provide natural wave buffering.

Instead, many communities are turning to nature-based interventions to protect coastline integrity, including the restoration of mangroves /web/20260114055945/https://www.newscientist.com/video/2439751-drones-are-helping-plant-100-million-mangrove-trees-in-the-uae-by-2030/ – salt-tolerant trees and shrubs whose distinctive roots stabilise shorelines, prevent erosion and create vital nursery habitats for marine life. Many original mangrove forests were removed due to coastal development or destroyed by extreme weather. So the idea is that, if you can restore them, you will not only prevent further land loss but also safeguard the fish stocks people rely on for food.

But restoration efforts are challenging. A mangrove restoration project in Tonga has struggled over the past three years, with more than a million seedlings planted but few surviving. Experts cite limited funding and staffing, as well as poor site selection. Many young mangroves failed to adapt to new salinity levels, while others were eaten by birds and pigs. "We don't have a mangrove expert in Tonga," says Kara. "Without expertise and intelligence, a lot of our effort was really wasted, and a lot of money was lost from that."

## Seeking solutions

Research is under way to improve mangrove plantation success, says Charles Mahé https://web.archive.org/web/20260114055945/https://www.linkedin.com/in/mahecharles/ at the Kiwa Initiative, a programme aimed at strengthening the climate change resilience of Pacific Island ecosystems. "We have to work with technical partners to determine things like at which stage you should plant mangrove cultivated in nurseries. Would you plant with this angle or with only two seedlings and not one? There also needs to be a good flow of sediments and nutrients for the mangroves."

In some places, the work is paying off. In Macuata province, Fiji, more than 10,860 mangroves have already been planted across three sites, supported by two nurseries that now hold over 34,000 floating seedlings, or propagules, for future restoration efforts. Local community groups help manage the project, including weeding and watering. The work has already begun to deliver tangible ecological benefits, including the resurgence of sea life after 30 years. "Mangrove restoration is not a magic bullet, but it is a very good nature-based solution," says Mahé.

**How the infamous Pitcairn Island became a model of ocean conservation**

Pitcairn Island, one of the remotest places on Earth, was once home to mutineers. Today it's a trailblazer in biodiversity protection with lessons for us all

/web/20260114055945/https://www.newscientist.com/article/mg26234852-400-how-the-infamous-pitcairn-island-became-a-model-of-ocean-conservation/

Effective mangrove restoration in Fiji depends on the support of the community, as it is important that newly replanted areas are protected from being cut again. Mangrove forests that grew naturally in the country were depleted through harvesting for food and cooking fuel. Efforts focused on promoting alternatives for these purposes, and educating communities on the importance of keeping mangroves healthy, is a vital component of such projects, says Mahé.

Pacific Islanders are also changing the way they raise crops. For generations, they have relied on their understanding of tidal levels and weather patterns to guide the planting of taro, a staple across Pacific nations. But shifting rainfall patterns, hotter dry spells and rising seas have disrupted these rhythms. "These women, many of them in their 60s and 70s and 80s, are saying 'the things that my mom told me, I can't rely on those anymore' and that that's because of the change in climate and just the uncertainty," says Laura Brewington https://web.archive.org/web/20260114055945/https://search.asu.edu/profile/3830543 at the

Global Institute for Sustainability and Innovation at Arizona State University, who is based in Hawaii. "Suddenly you have salt water that's killing your plants."

**A member of Kiribati Climate Action Network explaining to local children the important role of mangroves in protecting the country's shores from coastal erosion**
Vlad Sokhin/Panos Pictures

To help communities adapt, Brewington and other scientists, in collaboration with the National Oceanic and Atmospheric Administration-funded Pacific Regional Integrated Sciences and Assessments programme and the Bureau of Agriculture in Palau, have worked with farmers in Palau to develop a digital tool called the Kakau Dashboard. It is designed to help taro farmers respond to increasingly erratic weather by translating forecasts of dry periods, flooding, high tides or heat spikes into practical, crop-specific guidance on the best planting schedules. It is currently undergoing pilot testing, but Brewington says the dashboard is already having a positive impact on taro harvests, and it will be formally rolled out for wider use early this year.

Brewington is developing a similar dashboard to warn Pacific Islanders of potential dengue fever /web/20260114055945/https://www.newscientist.com/article/2326879-zika-or-dengue-infections-make-you-more-appealing-to-mosquitoes/ outbreaks based on changing weather conditions. When prediction models identify high-risk areas, authorities can target mosquito-control measures by concentrating fogging efforts, in which insecticides are sprayed,

distributing more larvicide, eliminating stagnant water sites and strategically placing traps. These forecasts also enable proactive public health interventions, such as launching awareness campaigns earlier and advising households to remove breeding sites. Communities can then be mobilised for clean-up efforts, while the distribution of repellents and bed nets is scaled up in the most vulnerable areas.

In each case, the local and international scientists assisting with these climate adaptation efforts are coming up against challenges that threaten to stall progress and learning lessons about what needs to happen to overcome them.

## Gathering hyper-local data

The first thing is that local context cannot be overlooked. The Pacific urgently needs more and better data to understand the specific impacts of climate change in their individual countries, says Shiu. Most of the forecasting, such as for coastal erosion, is based on continental environments, overlooking the Pacific's diverse geography, which makes it difficult to design targeted interventions. "It's not always the case that intervention strategies can be taken from other contexts and apply here," says Shiu. "The problem is that you can set yourselves into traps of maladaptive practices."

The other thing is that climate resilience programmes that rely on overseas technical experts often don't understand the cultural nuances of the countries in which they are working. "Soft diplomacy skills are actually really important here… people value relational transactions," adds Shiu. "You need to build those foundations in those relationships first, which takes some time."

By far the biggest problem, however, is obtaining sufficient financing for climate resilience programmes. It's an issue the wider world is grappling with. In a landmark advisory opinion issued in July 2025, the International Court of Justice (ICJ) declared that states have a binding legal duty under international law to protect the climate system, prevent harmful greenhouse gas emissions, and – crucially – assist vulnerable countries in adapting to the impacts of climate change. "The ICJ case was very important, because it recognised that people have human rights in climate change that we should not be allowed to violate," says Jon Barnett https://web.archive.org/web/20260114055945/https://findanexpert.unimelb.edu.au/profile/8871-jon-barnett at the University of Melbourne.

The ICJ's opinion grew out of a campaign led by Vanuatu and other Pacific Island nations, who argued that existing climate commitments were too weak to safeguard their survival. It isn't hard to see why they thought so. To date, the Pacific region has only accessed about 0.22 per cent of global climate funds. Even when money is allocated, it often arrives too slowly. "There's promises around climate finance, but unlocking it takes on average eight to 10 years, just to get access," says Feleti Teo, the prime minister of Tuvalu.

Several roadblocks exist in transferring funds from Western banks to the Pacific, due to regulatory checks, multiple intermediary banks, currency conversions and so on. “Before the Kiribati adaptation project could happen, Kiribati had to totally change its financial management system and budgeting system so it was standardised to one that the World Bank would accept so they could transfer money,” says Barnett. “That took two years.”

**How lab-grown lichen could help us to build habitations on Mars**

Scientists cultivating partnerships of fungi and algae believe their invention has far-out implications for how we create the buildings of the future

/web/20260114055945/https://www.newscientist.com/article/2506992-how-lab-grown-lichen-could-help-us-to-build-habitations-on-mars/

Ultimately, experts warn that the world must dramatically increase support, financing and intervention to help Pacific Island nations adapt – and preserve their sovereignty. Allowing these countries to vanish, Barnett argues, is not only “tantamount to ethnic cleansing” but also scientifically uninformed and politically convenient. He refers to the narrative that the islands are inevitably going to sink as a “cop-out”, one that lets wealthy nations avoid supporting adaptation, which he describes as both a human right and an emissions-driven obligation.

That narrative doesn’t just stall action, says Barnett. It shapes donor behaviour, dulls government ambition and weighs heavily on local people’s mental health. “It’s a permissive, dismissive story that stops us doing what we know we can do,” he says. Nicholls shares that sentiment. With systematic planning, he says, there is no reason that these islands cannot remain habitable for decades. “Some people like to say these islands are going to drown. Well, maybe it’s a choice.”