

Warming oceans and human waste hit Tuvalu's sustainable way of life

Fish stocks on Tuvalu's islands, in the Pacific, are disappearing and islanders are turning to the outside world to survive

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Seawater seeps inland in Funafuti atoll, the capital of Tuvalu. While rising sea levels, due to climate change, and pollution are destroying their sustainable way of life, the islands may disappear altogether. Photograph: Richard Vogel/AP

On the salted and infertile islands of [Tuvalu](#), hunger is kept at bay by the easy access to fish. But as the climate changes and the islands' lagoons heat up, subsistence fishermen are finding it harder to support their families.

Tuvalu, the Pacific island state that is mostly known for its low-lying position, is not only [threatened by rising sea](#) level. Poor waste and wastewater management is adding to the effects of coastal erosion, increased flooding, storms and changing rainfall patterns, all of which are affecting fish stocks and entire ecosystems across its nine inhabited islands.

Almost all families on Funafuti, the main island and the state's capital, get fish from this atoll's lagoon. "If there is a man in the family, he will most likely go fishing. It's cheap – it's for free!" explains Fuli Siaosi at the Tuvaluan fisheries department.

A Tuvaluan eats about 500 grams (1lb) of fish a day; it is the staple food and the only important food item that [Tuvalu](#) does not import. Fish is served for breakfast, lunch and dinner. While commercial fishermen can get tuna from the ocean, most families rely on traditional reef fishing in the lagoon.

As climate change is heating the atoll's shallow lagoon, the [coral – the natural habitat of the reef fishes](#) – is bleaching and dying. On top of this, sewage-water spills are increasingly causing algal blooms in the lagoon, killing the small reef fishes and thereby threatening the lives of larger fishes depending on them.

It is not only [a problem of climate change](#), it's a huge problem of human pollution as well, says Tupalaga Poulasi, a research officer in the fisheries department.

The subsistence fishermen report that they have a harder time getting the daily fish for their families. According to interviews conducted by the fisheries department, the stories from the fishermen are mostly the same: they have to go further out in the lagoon than before (it is about 14km wide and 18km long), they have to fish longer to get the same amount of fish, and the fish they catch are smaller than they used to be.

staple food; it is among the few traditional food items in which Tuvaluans are still self-sufficient.

But Funafuti is rapidly becoming urbanised, and overpopulated. About 5,000 people live there, half of the Tuvaluan population, on the meagre 1.4 square kilometres of land that surrounds the lagoon. Houses, buildings and associated infrastructure are replacing gardens, banana plants, papaya trees and other traditional crops such as pulaka, also known as swamp taro – a root vegetable grown in pits dug into the limestone atoll.

The remaining plants are exposed to rising seawater, salting the soils and ground water. Many have given up their garden production and depend on expensive, imported products: rice, flour, canned and tinned food.

"We used to have banana trees in my garden, just here. But the past 10 years the seawater started seeping through the ground," explains Enele Sopoaga, a member of parliament and former chairman of the Alliance of Small Island States. "The ground got too salted, the plants turned yellow and died."

The islanders now import 80% of their food, brought from Fiji, New Zealand or Australia in the monthly cargo ship. So, the choice and quality are limited and the prices sky high: a litre of milk costs £1.75 (\$2.85), a dozen eggs £2.50, 1kg of rice £1. A good salary is about £300 a month.

Large families often rely on just one salary. Apart from public service jobs there are few opportunities and, despite efforts by the government, unemployment rates remain high, especially among the young.

Tuvaluan society depends heavily on family relations. While one family member is working, others can fish, take care of the children, cook, produce handicrafts, or make other contributions to the community.

Back in the fisheries department, Poulasi believes that the decreasing fish stocks will continue to have a huge impact on families. "We depend on the ocean," says Poulasi. "This is where we get our resources. If we can't catch fish, we have to go to the food shops. And then you have to bring money. Many families don't have that much money."

Tuvaluans are among millions of people in the Pacific, Caribbean, Indian Ocean and in coastal areas around the developing world who rely on this climate-threatened resource to feed their families.

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Main sources of nutrient pollution were identified as:

- ☒ About 640 households in Fongafale, 424 with septic tanks and 162 with pit toilets;
- ☒ Septic tanks are bottomless – leaching of nitrate-rich wastes into coastal waters;
- ☒ Leaching from pit toilets;
- ☒ Pigsties and chicken sheds being cleaned into the lagoon;
- ☒ Direct input of waste into the coastal area (during times of drought) – open