



EL NIÑO Edition

WHAT IS THE
EL NIÑO?

*IS THE
LAKSHADWEEP
IN DANGER?*

WHY ARE
CORALS
& FISH
DYING?

*Can it be
STOPPED?*

About this booklet

Welcome to the El Niño special edition of Melem Keezhem (Above and Below), a campaign by the Nature Conservation Foundation (NCF) dedicated to celebrating and preserving the unique environment and culture of the Lakshadweep islands.

For over 25 years, NCF has been monitoring the health of Lakshadweep's coral reefs and documenting how the fragile ecosystem of the islands is being threatened by climate change. Drawing on our extensive research and long-standing relationship with the Lakshadweep community, we launched Melem Keezhem in 2022 to convey our findings and engage islanders through comic panels and booklets like these, with the intention of fostering a deeper connection to the islands' rich history, vibrant culture, and delicate ecology.

This special edition focuses on El Niño, a complex global climate phenomenon with significant local impacts. Through 2023 and 2024, the coral reefs of the Lakshadweep archipelago have experienced high amounts of mass bleaching, a stress symptom that leads to extensive death of coral and aquatic life, particularly in shallow reefs and lagoons.

As stewards of one of the world's most sensitive marine ecosystems, Lakshadweep islanders are uniquely positioned to observe and respond to the effects of El Niño. This booklet explains the science behind El Niño and bleaching in simple terms, and offers practical steps that islanders can take to mitigate its impacts.

We invite you to dive into this booklet, share its insights with your community, and join us in our ongoing efforts to safeguard the natural beauty and cultural heritage of Lakshadweep. By understanding El Niño, we can better prepare for and adapt to its challenges. This knowledge empowers us to protect our coral reefs, maintain sustainable fishing practices, and preserve our unique island way of life for future generations.



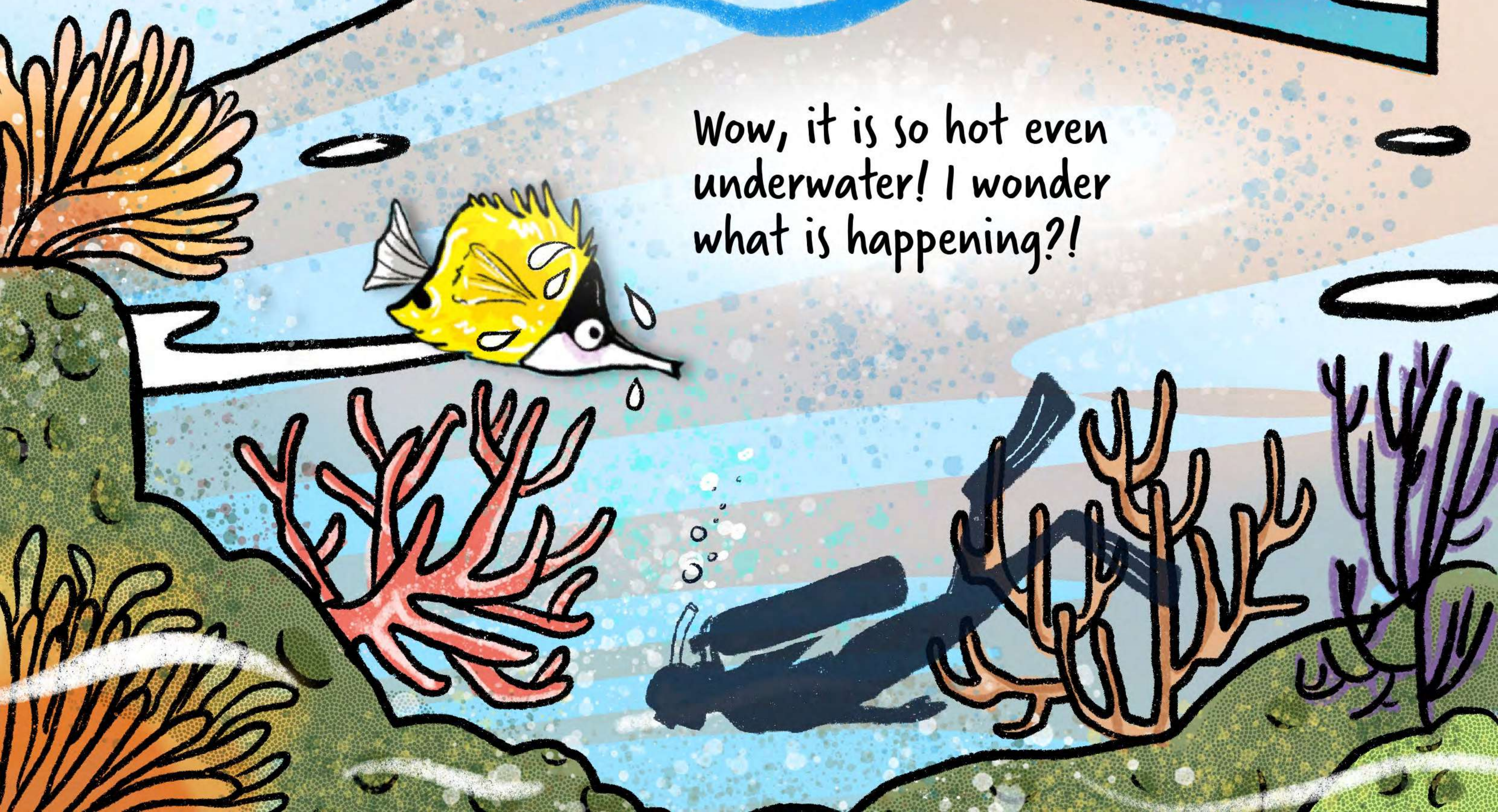
On a fishing boat somewhere in the waters near Kavaratti




It seems the weather is hotter than usual this time of the year.



Wow, it is so hot even underwater! I wonder what is happening?!





Hi Akbar, I've done sampling for the day.

Could you please give me a hand?

Hello! I hope you had a good dive.

Yes, but it felt so much hotter and different than usual.

oh, it's hot underwater as well? I had made some kattan chai. Too warm to drink right now?




It is never too warm
for kattan chai!

It just worries me how hot
this season has been.




Yes, the temperature
this year is really high.





And there is a scientific reason why it is so hot underwater as well. The heat is leading to a lot of suffering for the people on land, but also for the fish and corals below water.



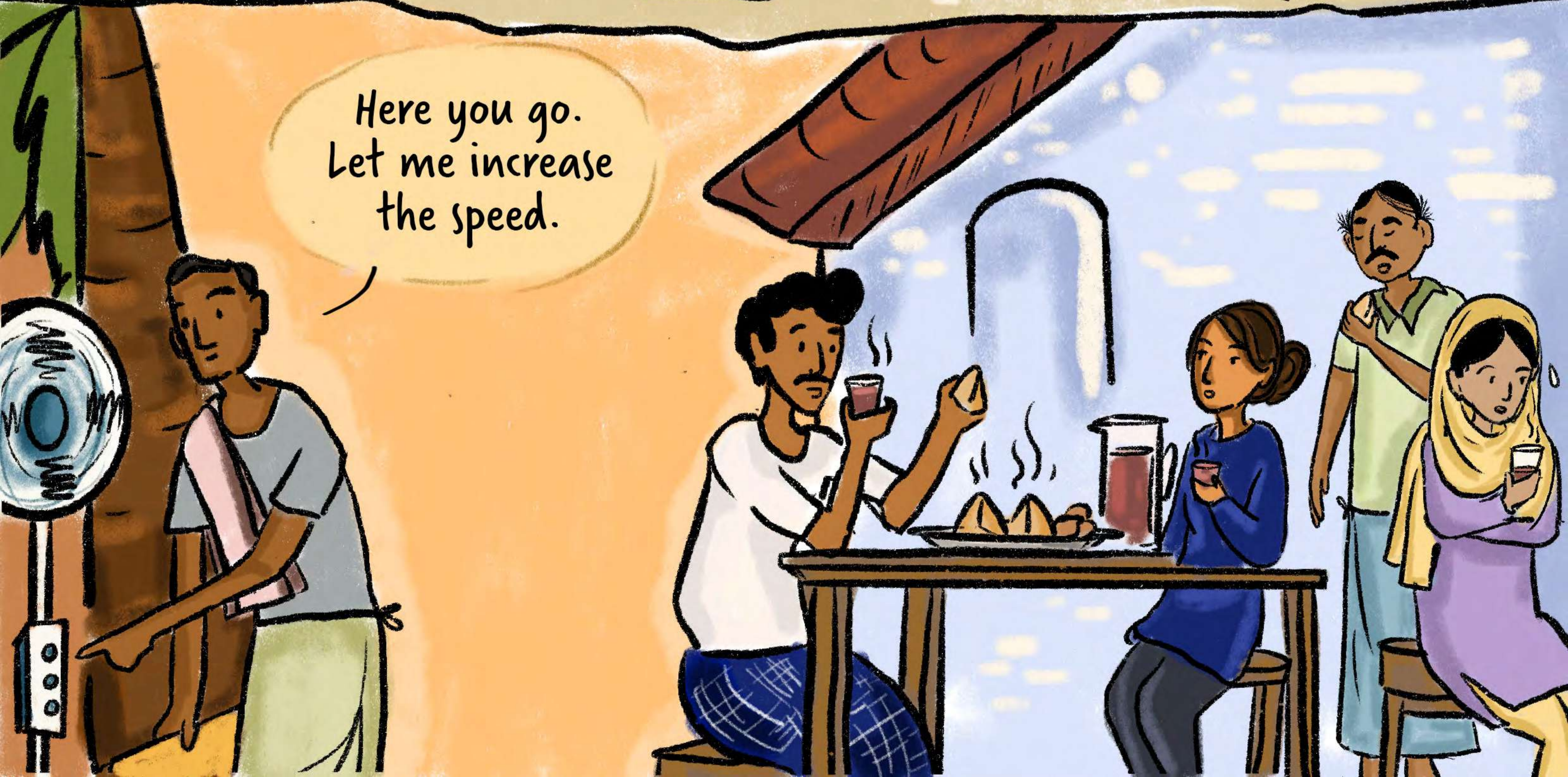
Wait, is this why all the colourful corals have suddenly turned white and we are seeing so many dead fish and other creatures wash up on shore?

Yes, unfortunately these increased temperatures are causing a lot of changes. This is exactly what I've been studying. I will be happy to explain.

Oh yes, but you must be tired. Let's head back to the island and find some shade first.



Here you go. Let me increase the speed.



No matter how hot it gets, a piping hot cup of kattann always helps.

True! But sometimes the heat can get **UNBEARABLE**.

Exactly like the summer right now! You were saying there was a reason for this?



Have you heard of something called the **El Niño**?

No, what is that?

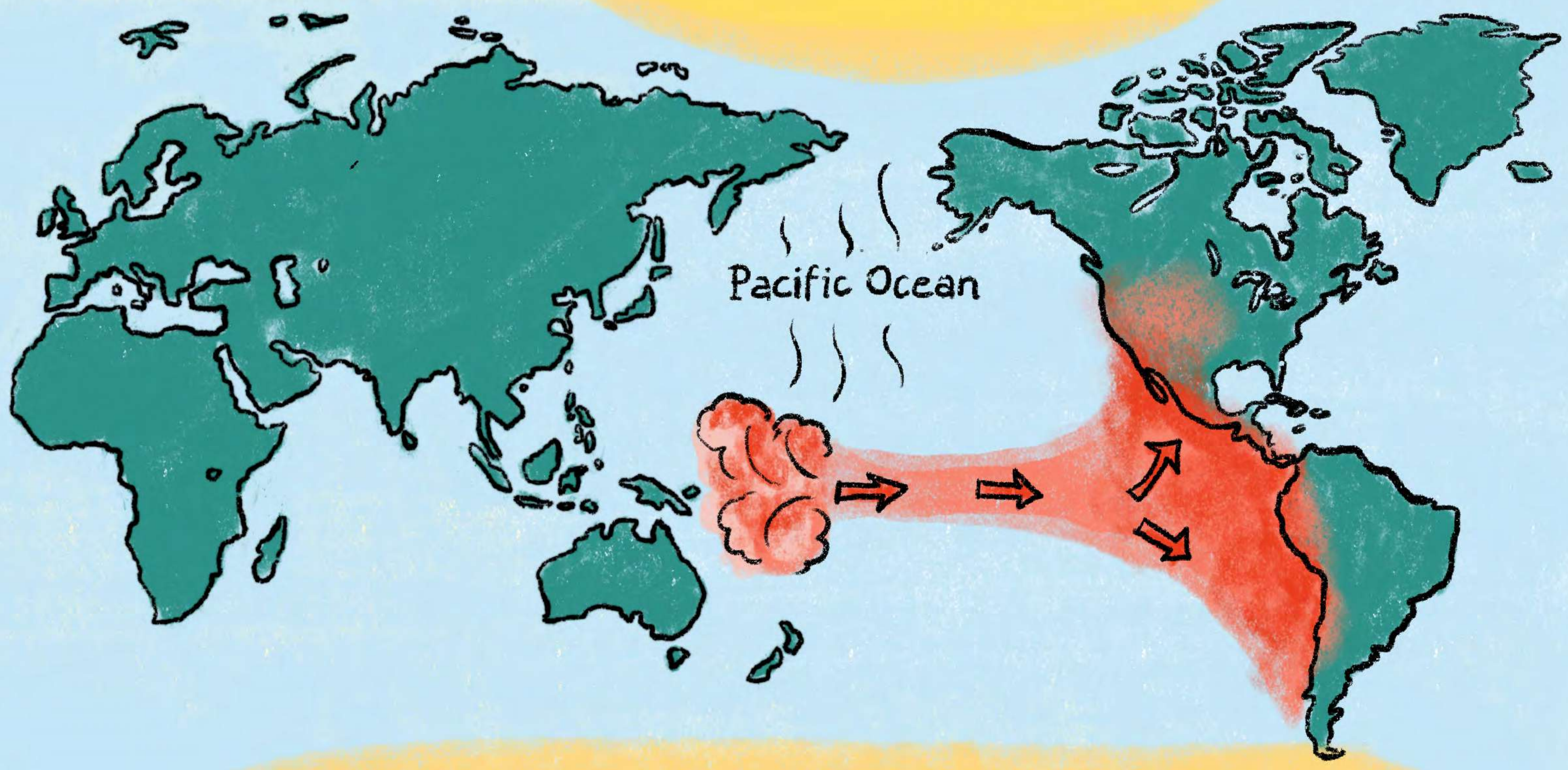


So as you know, Lakshadweep summers are usually hot. The El Niño is a weather event that happens every few years that can make summers even hotter than usual.

oh, does it happen only in India?



Actually no, it doesn't even originate here. It starts all the way on the other side of the world in the Pacific Ocean.



Strong winds usually restrict this warm body of water to the western Pacific, but during an El Niño, the winds weaken and this hot water spreads across the ocean, affecting the weather in many places around the world



So, whenever someone talks about El Niño, they're talking about this warm water in the Pacific ocean moving around and changing weather patterns, including in India.

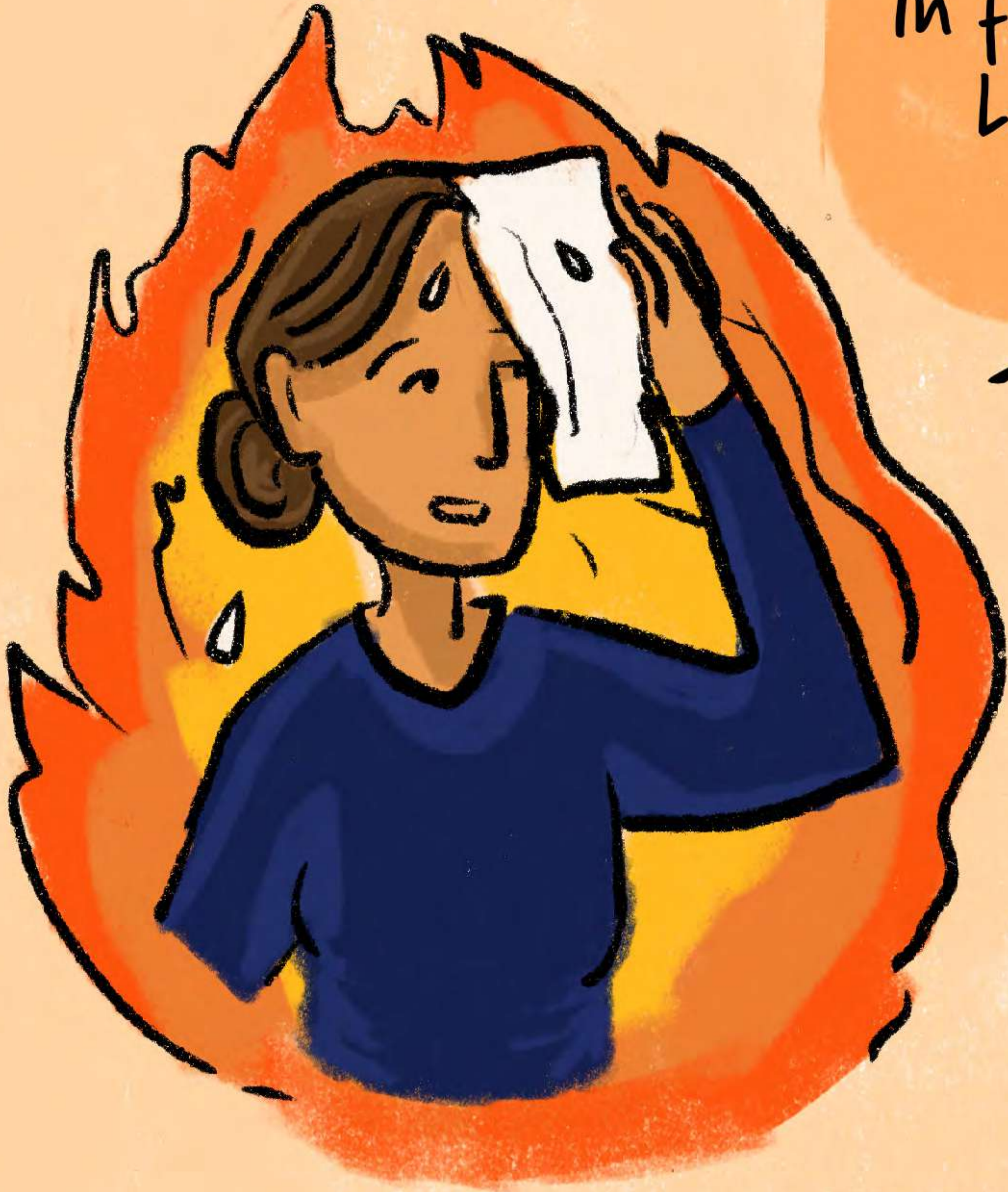




So that's why we can't escape the heat even by jumping in the water as we usually do!



Yes, the oceans are very warm now. In fact, shallow water temperatures around Lakshadweep are currently hovering 1.6°C above what is normal for this season...



FEEELS LIKE 38°C

...and that's badly affecting the fish and corals that live in these waters.



Take this cup of tea for instance. We can sit here and blow on it to reduce the heat. That is similar to how our fans and coolers help us on land.



But try to keep your finger in this glass for a long time. Uncomfortable, right?

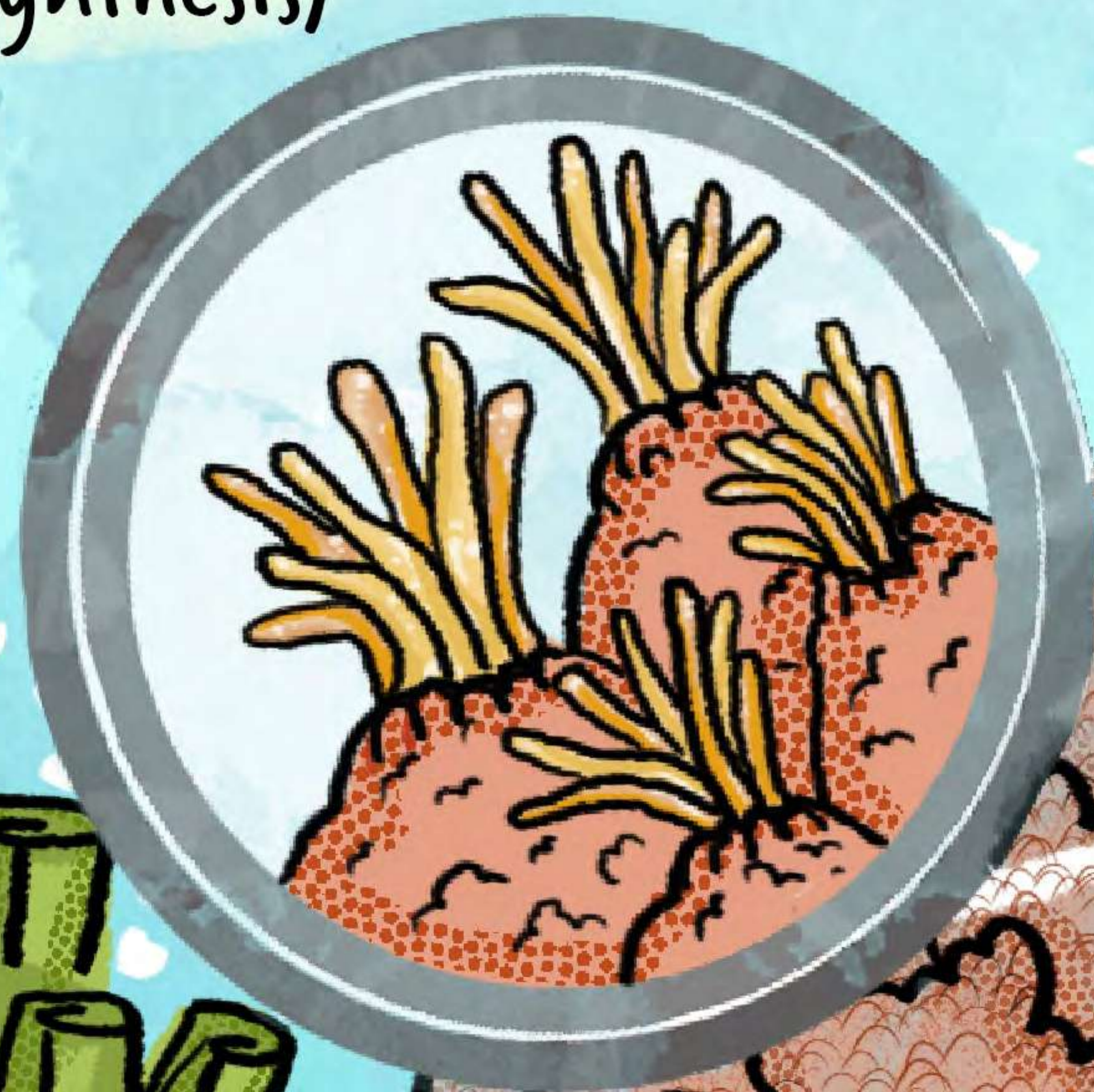


Please don't mind me asking but aren't corals just rocks? How are they getting affected by the heat?



So corals are actually living creatures: a combination of plant and animal. Corals are small soft-bodied animals called polyps that form a partnership with a microscopic algae called zooxanthellae.

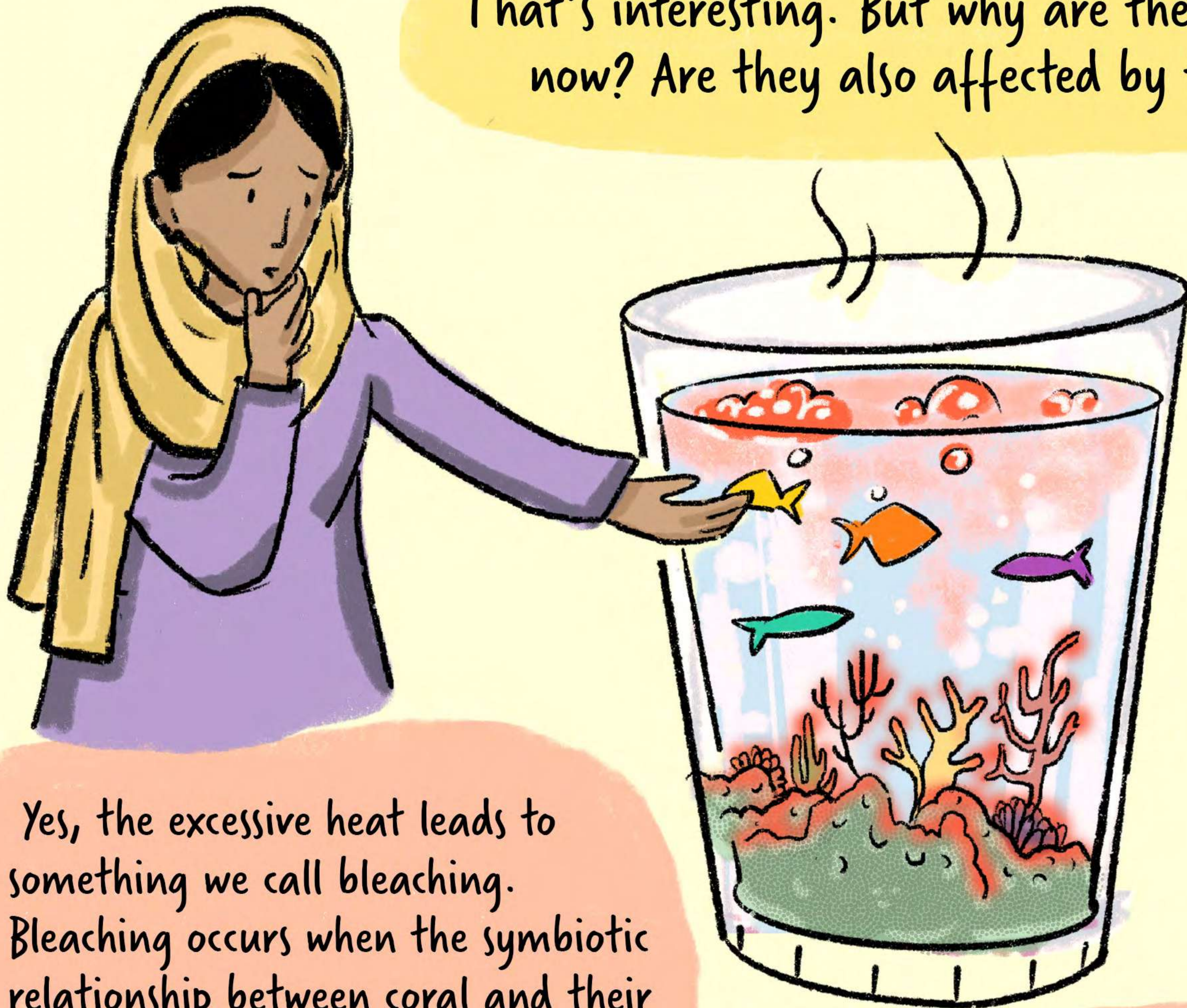
Polyps have tentacles around their mouth to capture prey. But they need their zooxanthellae for photosynthesis, which provides 90% of their daily food requirements.



The beautiful colours you see in the corals are due to pigments produced by zooxanthellae. The relationship between algae and polyps is therefore responsible for the growth of corals, and for the stunning coral reefs of Lakshadweep.



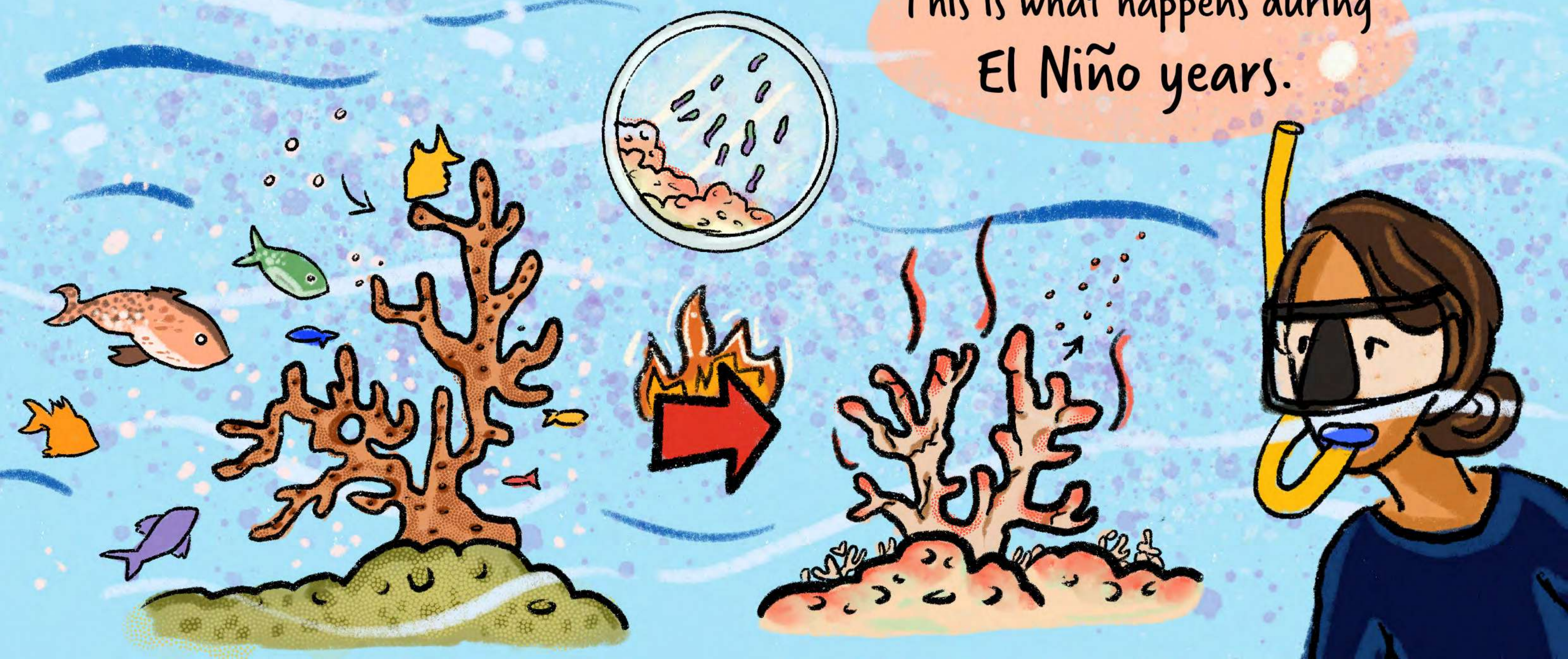
That's interesting. But why are the corals dying now? Are they also affected by the heat?

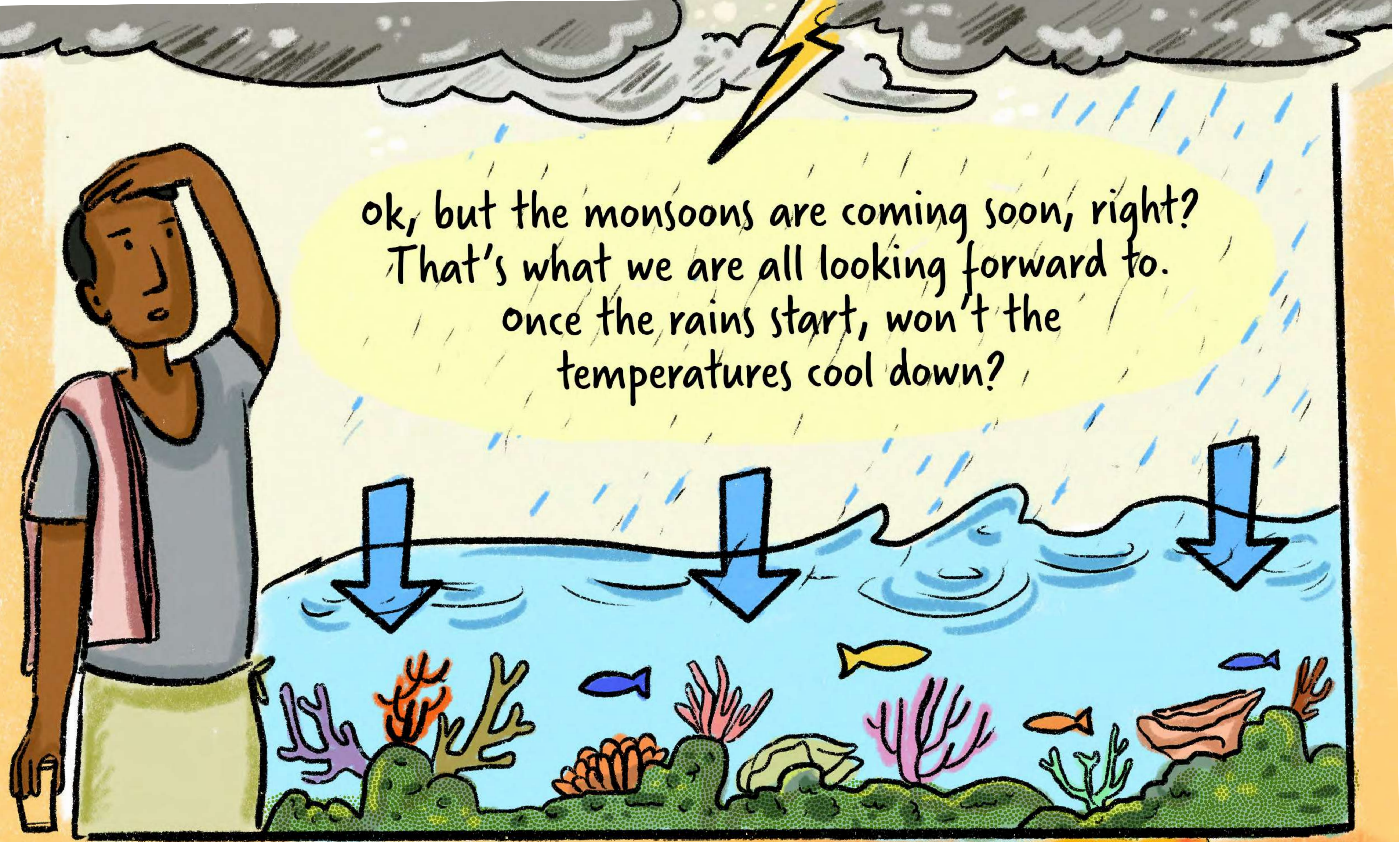


Yes, the excessive heat leads to something we call bleaching. Bleaching occurs when the symbiotic relationship between coral and their photosynthetic partners breaks down under stressful conditions, primarily high temperatures like we are experiencing now.

Without their algae, corals turn white. This is called "bleaching" because they lose their beautiful colors. Without algae, corals also lose their primary source of nutrition, and if stress conditions persist, corals eventually starve and die.

This is what happens during El Niño years.





ok, but the monsoons are coming soon, right? That's what we are all looking forward to. once the rains start, won't the temperatures cool down?

Unfortunately, during the El Niño years rainfall patterns also get disrupted. So the monsoon rains, which usually cool things down, might not be as strong, or might be late.



That's why the weather in India is often hotter and drier during an El Niño year.



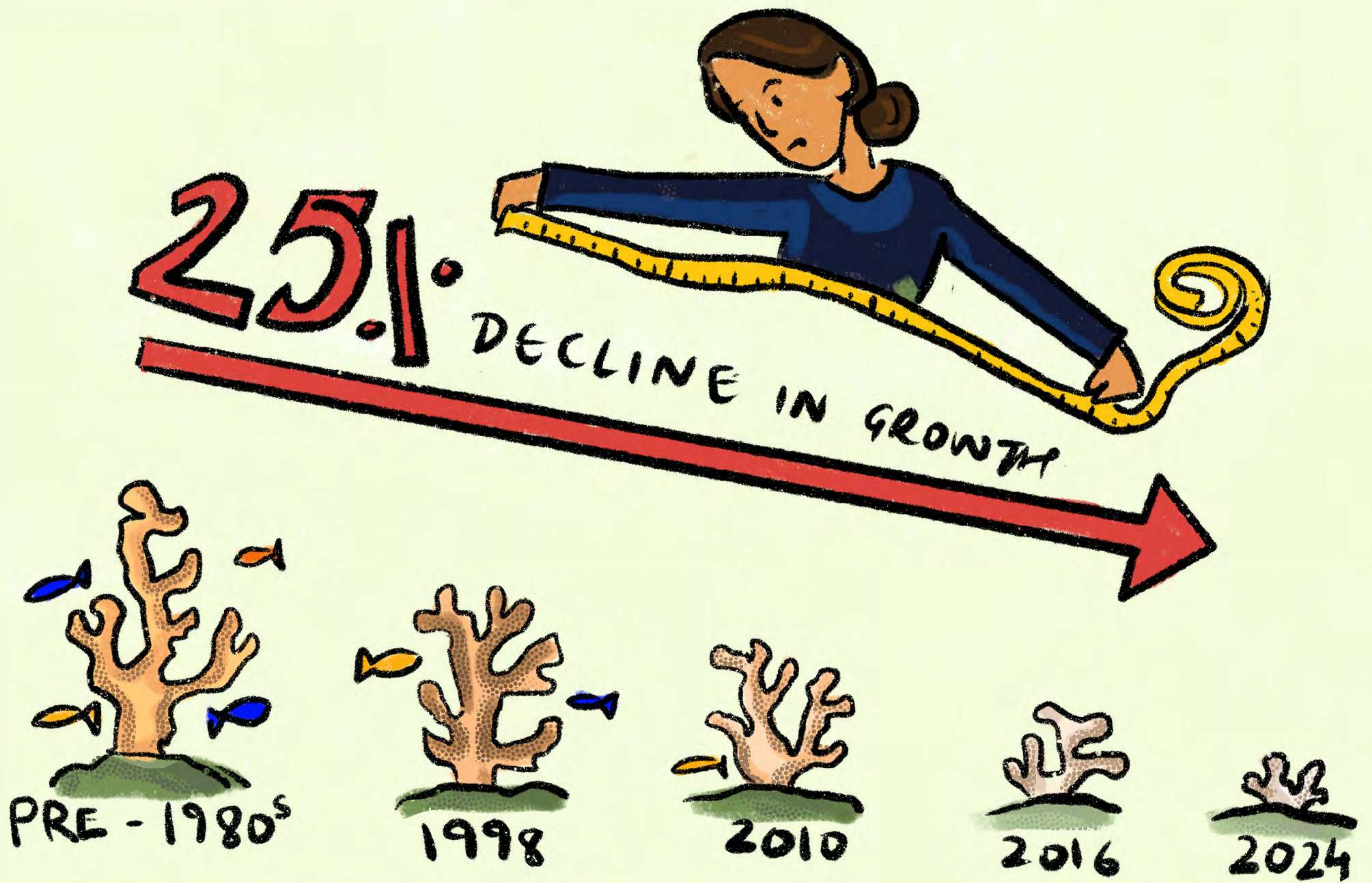
You said this El Niño thing happens every few years. So it has happened in the past and the corals and fish have survived right?

Well, before the 1980s, El Niño events naturally recurred every 30 years or so. But now they are repeating much more frequently. This is the fourth global bleaching event to be declared in the last 25 years.

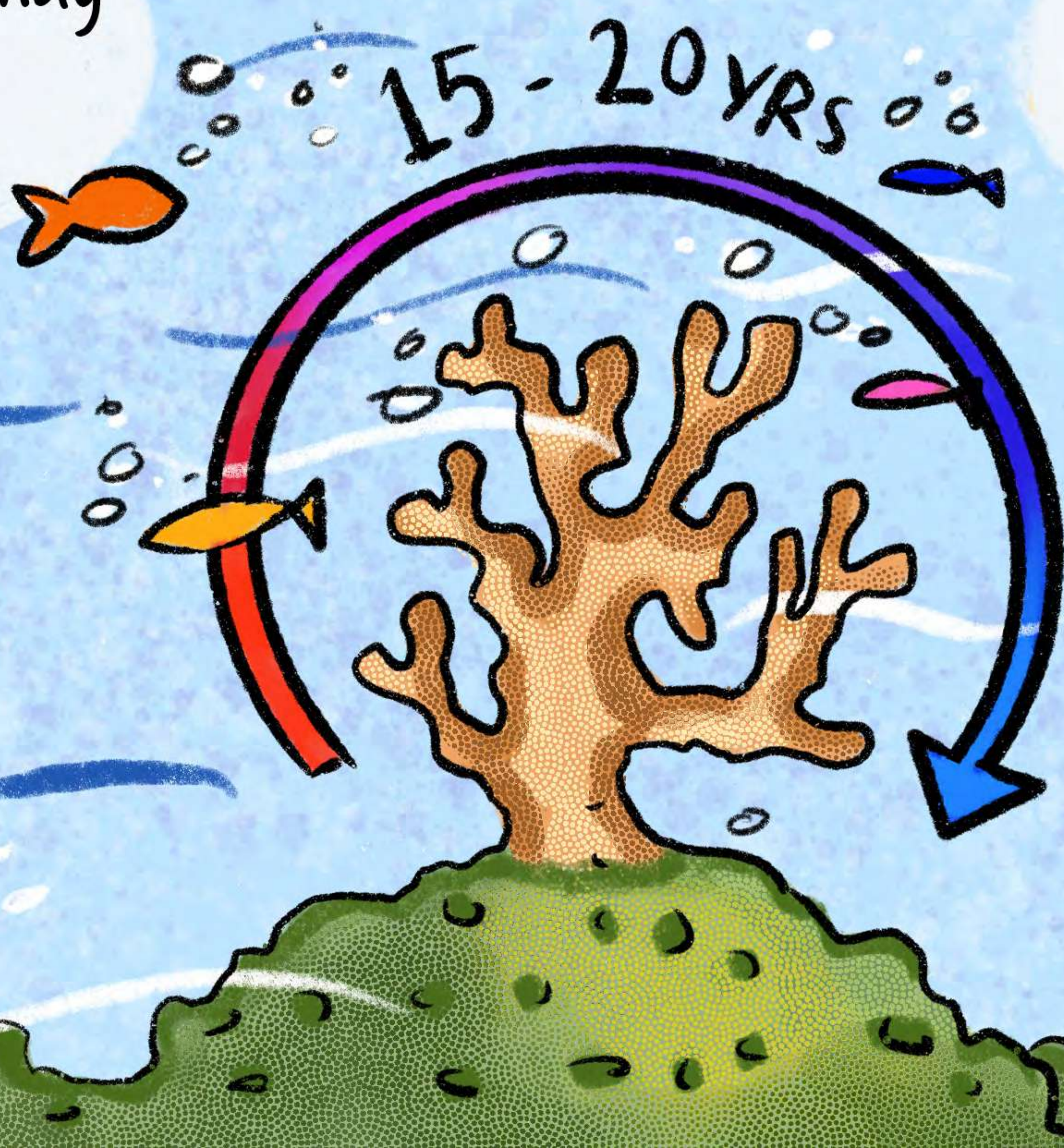
NCF has been monitoring the reefs of Lakshadweep ever since the first global bleaching in 1998, followed by further bleaching events in 2010 and 2016 as well.



NCF's data tells us that Lakshadweep has seen an overall decline of around 25% IN CORAL COVER since the 1998 event.



Reefs take between 6-8 years to begin a process of recovery after each bleaching event, and a full recovery may take as long as 15-20 years.

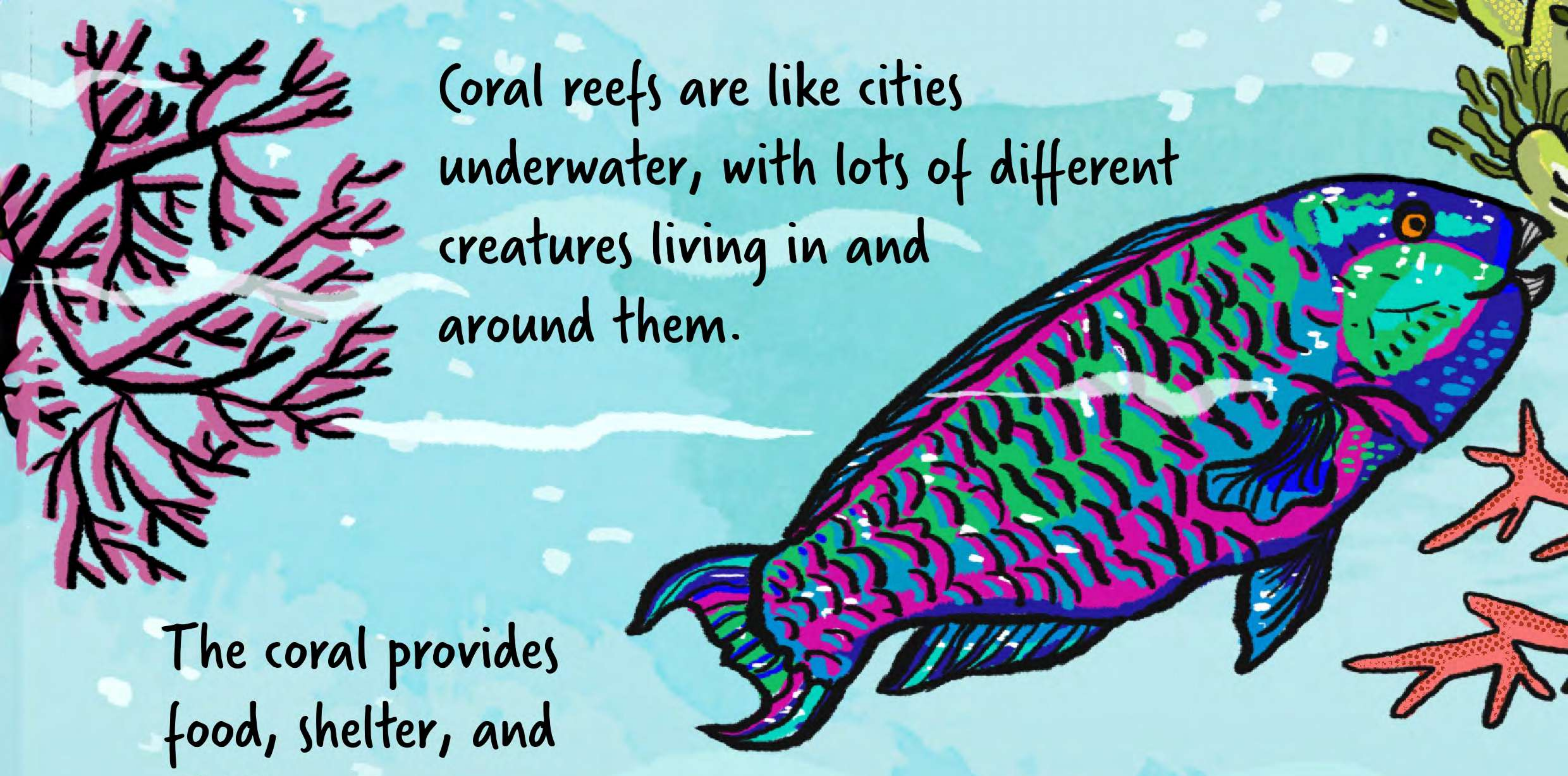


But this increased frequency & intensity of El Niño events is making recovery much harder for corals.


oh, and so because of the death of corals, reef fish are also being affected?

Yes, exactly. Losing coral on reefs is like losing trees in a rainforest.





Coral reefs are like cities underwater, with lots of different creatures living in and around them.



The coral provides food, shelter, and hiding places...



...for small fish, octopuses, crabs, and other animals.

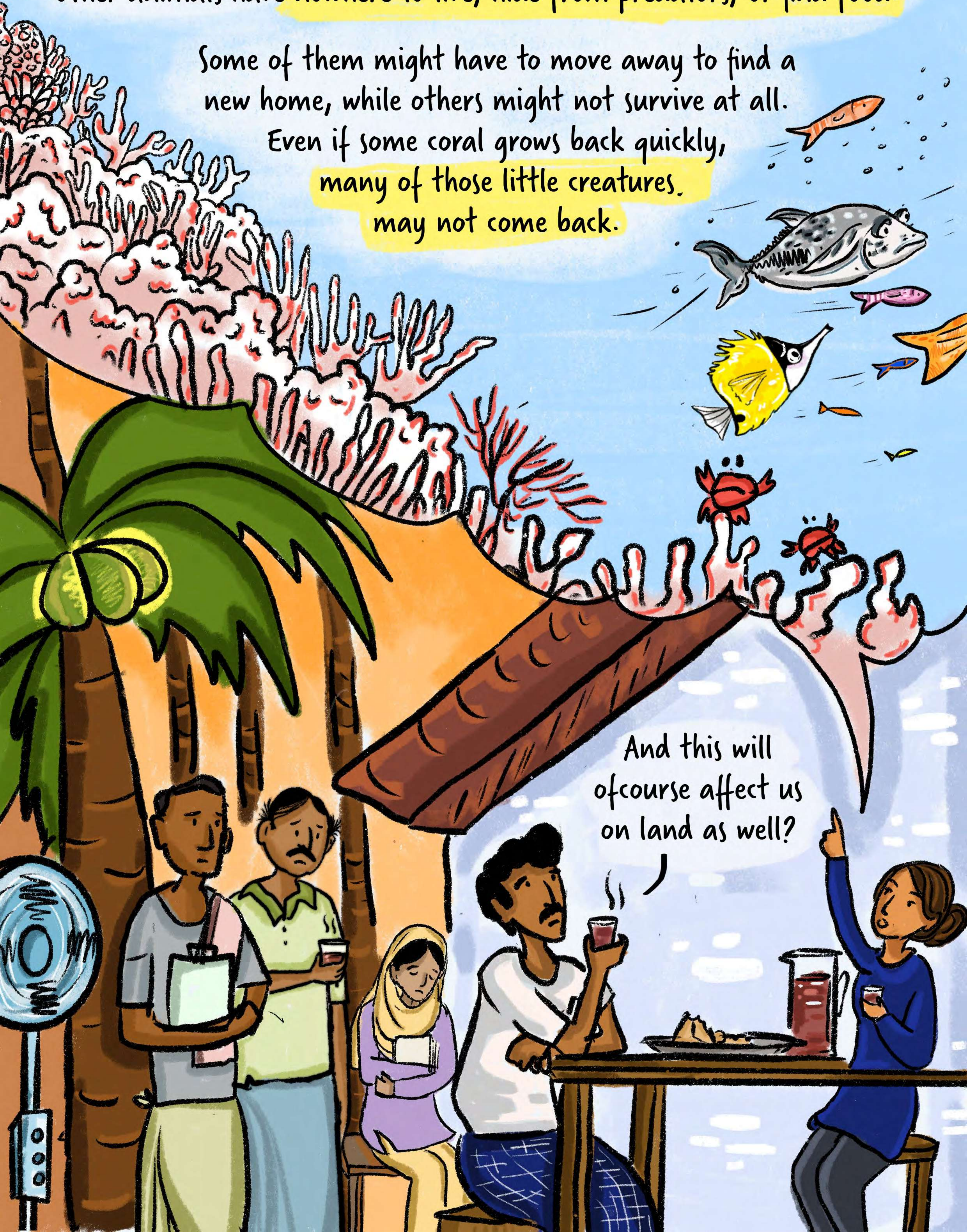



When the coral bleaches and dies, it's like their houses and restaurants are gone. It's like their whole neighborhood is destroyed. The fish and other animals have nowhere to live, hide from predators, or find food.

Some of them might have to move away to find a new home, while others might not survive at all.

Even if some coral grows back quickly, many of those little creatures may not come back.

And this will of course affect us on land as well?



An illustration of three people—two men and one woman in a yellow headscarf—looking at a coral reef that has been severely damaged and bleached. The coral is shown in shades of pink and white, with many dead and broken pieces.

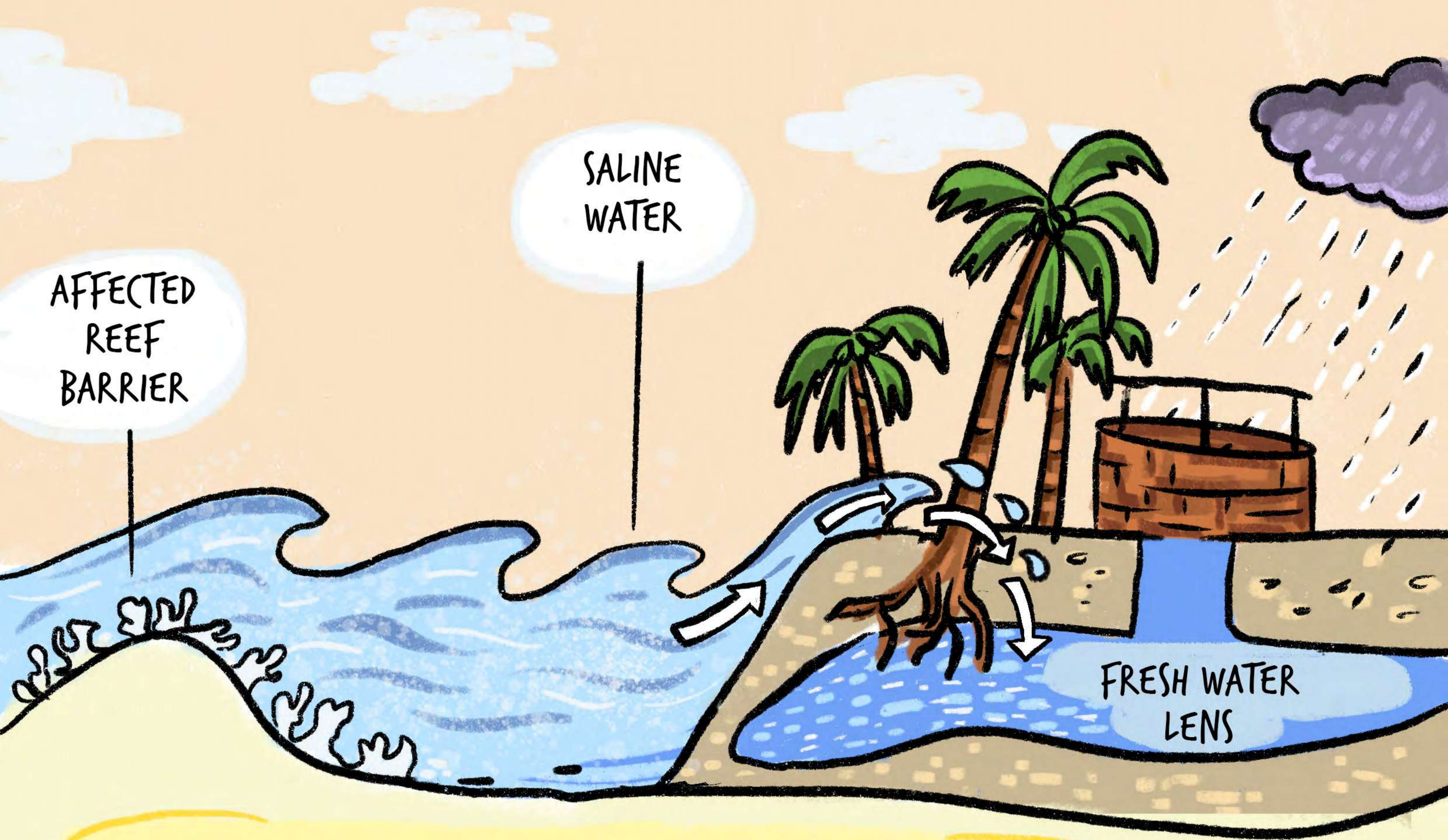
Sadly, yes. For densely populated low-lying coral atolls like the Lakshadweep, the impacts of these repeated bleaching events can be dire.



More than 70,000 people on these islands are completely dependent on the protection a healthy coral reef provides.

It acts as a natural breakwater, protecting our islands from powerful waves and storms that could otherwise cause erosion and damage our homes and boats.





More critically, these islands remain habitable because they have fresh water. Every rain replenishes the tiny aquifers beneath most islands.

As the reef declines, it can no longer prevent storm surges and waves from seeping into these freshwater sources, making them unfit to drink, and the island uninhabitable.



This sounds so grim. What can we even do to protect ourselves against all this?

Let's not lose hope!
The reef can be strong and resilient, even when facing these global forces.

If we support this natural resilience, nature will protect and provide for us just as it has for centuries. I am sure the people of Lakshadweep are aware of how much they owe the corals, fishes and the waters around them for their livelihood.

But things are changing, and we need to spread the word about the El Niño so people can know the urgency of what's happening now. About why it is important to respect the corals and fishes, keep the reefs and waters clean, and ensure we don't waste our precious resources.

Simple things like ensuring we have enough fish in the reef can help the reefs recover quicker. Managing pollution also helps.



Slowly but surely, with everyone's efforts, the reefs will survive and the islands will continue to thrive. Each one of us sitting here can make difference in our own way.

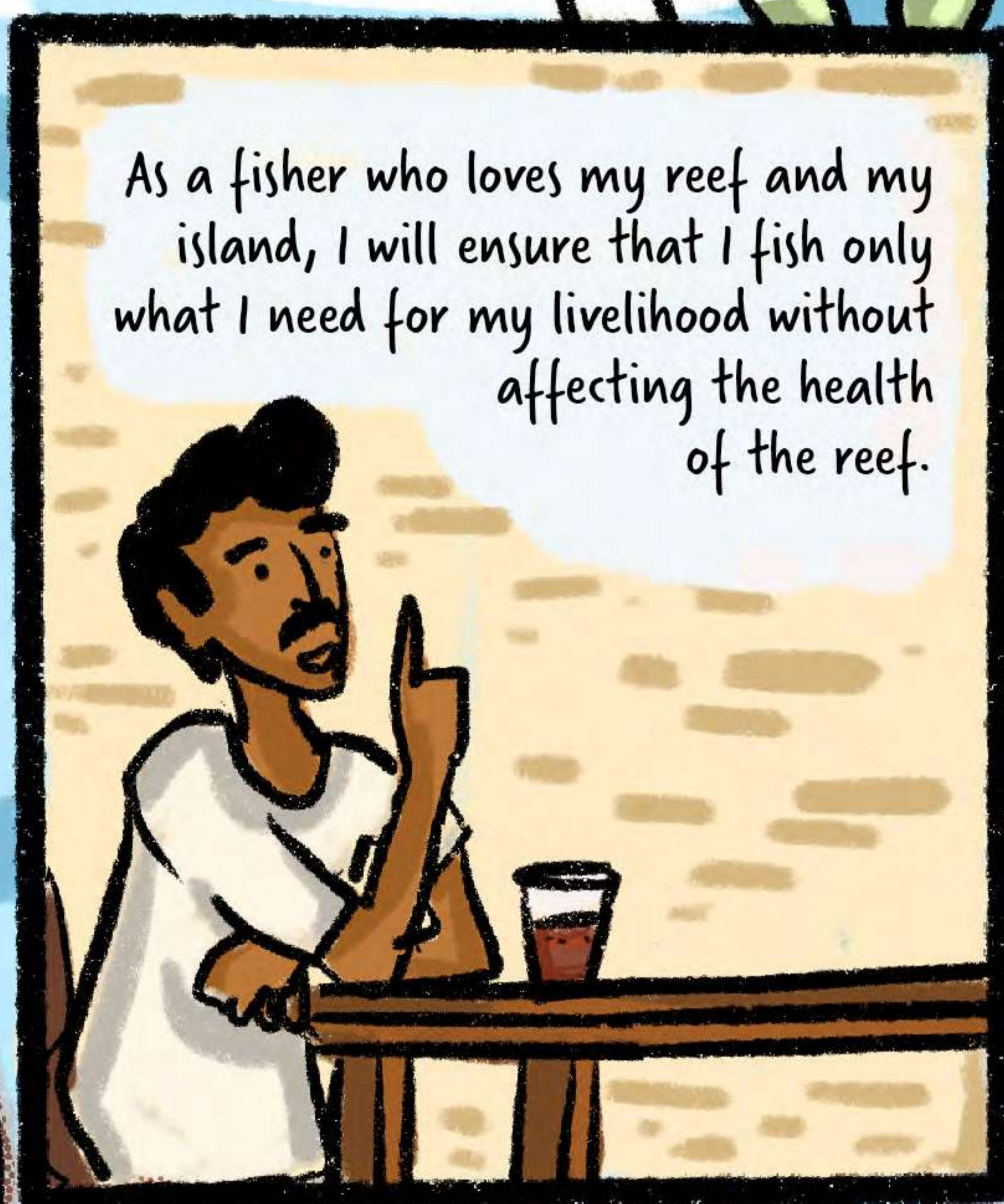
Yes, I will make sure all my students know about El Niño and tell their families about it. Please also come to our school and take a session on this



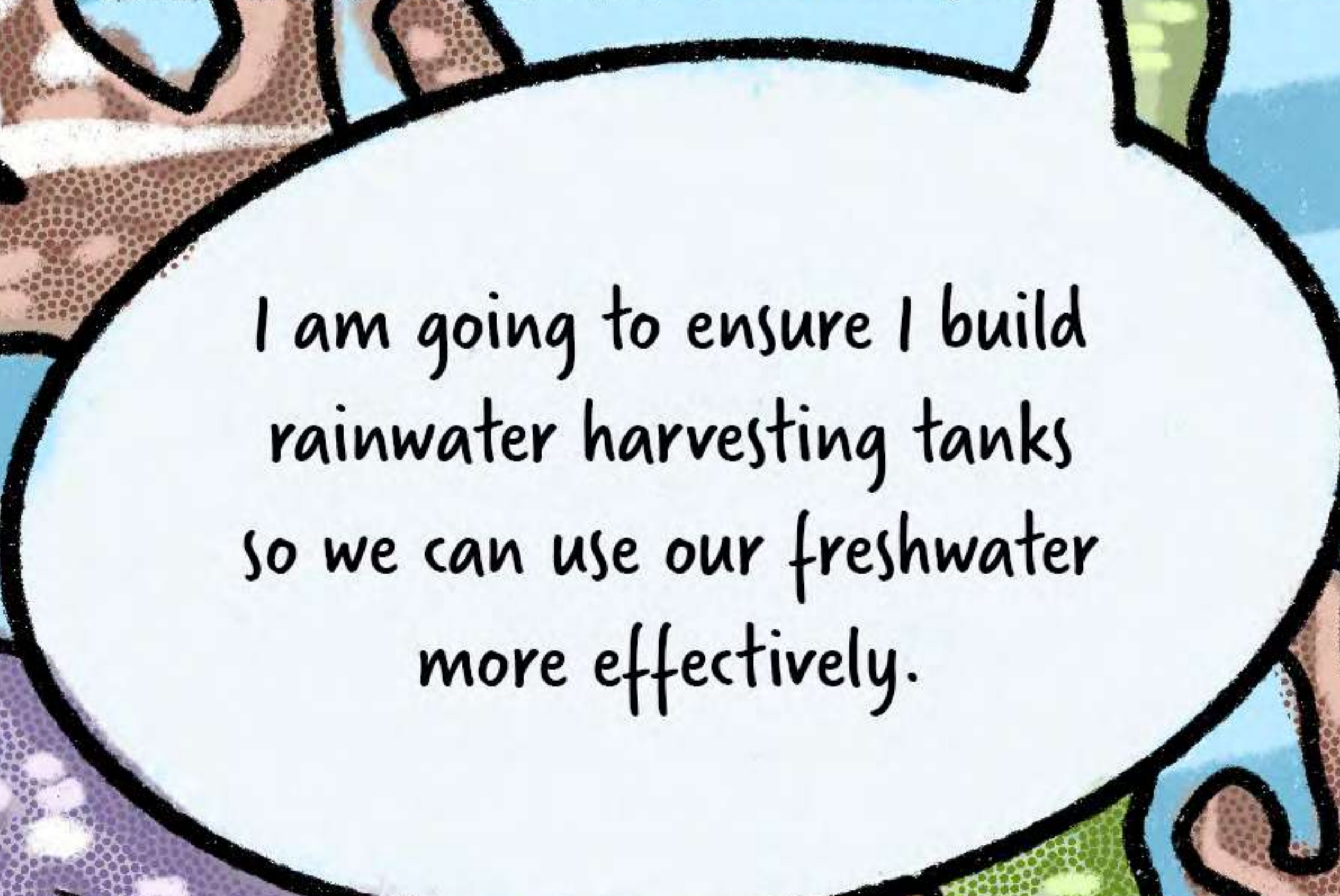
I will make sure I tell everyone who comes to my shop to be careful about disposing waste and about respecting the marine life around us

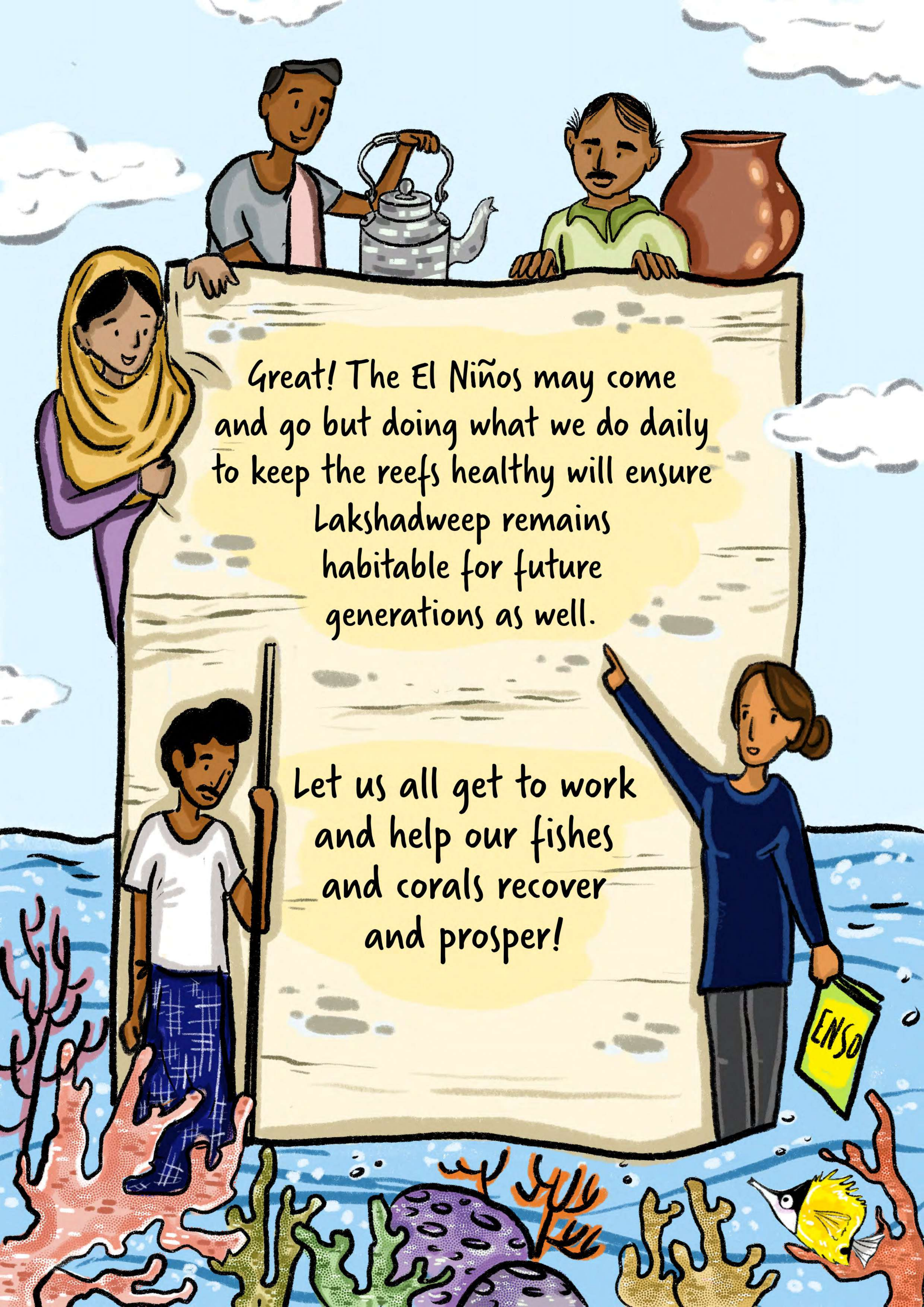


As a fisher who loves my reef and my island, I will ensure that I fish only what I need for my livelihood without affecting the health of the reef.



I am going to ensure I build rainwater harvesting tanks so we can use our freshwater more effectively.



An illustration showing a group of people gathered around a large, yellow banner. At the top, a man in a grey shirt is pouring water from a silver teapot into a large brown pot. Next to him, a man in a green shirt looks on. On the left, a woman in a yellow headscarf and purple dress stands looking at the banner. At the bottom left, a man in a white shirt and blue checkered pants holds a long wooden pole. At the bottom right, a woman in a blue long-sleeved shirt and grey pants points towards the banner while holding a yellow bag labeled 'ENSO'. The background features a blue sky with white clouds and a blue sea with various colorful coral reefs and a yellow fish. The banner is held up by the people and contains two paragraphs of text.

Great! The El Niños may come and go but doing what we do daily to keep the reefs healthy will ensure Lakshadweep remains habitable for future generations as well.

Let us all get to work and help our fishes and corals recover and prosper!



nature
conservation
foundation

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കൺസർവേഷൻ
ഫൗണ്ടേഷൻ

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