

From Coral Bleaching to Blooming: Techniques for Reef Restoration in Chumbe

By Amour Khamis

On a one-kilometre stretch of coral rag off the west coast of Unguja, a reef is quietly recovering, thanks largely to a hands-off approach. While many restoration projects around the world now focus on planting farmed corals, Chumbe Island is demonstrating that passive reef rehabilitation, removing stressors and allowing nature to heal can successfully restore colour, marine life, and resilience in the Indian Ocean.

On Monday, 1st September 2025, students from the State University of Zanzibar (SUZA) and Mawimbi volunteers from the Korea International Cooperation Agency (KOICA) visited Chumbe Island. Their purpose extended beyond leisure; they came to learn about the reef restoration techniques implemented following coral damage and bleaching. “Hundreds and thousands of university students, PhD, Master’s, and Bachelor’s come here to learn,” said Khamis Juma, Environmental Educator at Chumbe.



Students from SUZA and Mawimbi volunteers prepare to snorkel and observe the coral reef ecosystem

The group gathered to snorkel and observe the reef firsthand. Chumbe Island Coral Park (CHICOP) is a privately managed marine sanctuary located off the coast of Zanzibar at coordinates 06°16'39"S, 39°10'59"E. Established in 1992, the island is designated as a Marine Protected Area (MPA), encompassing approximately 600 nautical miles. Its protected forest spans 16.4 miles and is home to 1,078 plant species and around 200 coral species.

CHICOP has pioneered several innovative rehabilitation techniques that blend scientific research with community involvement. Coral gardening is one of the primary methods used, involving the collection of coral fragments from healthy reefs and nurturing them in underwater nurseries. Artificial reefs have also been introduced to promote coral growth and biodiversity. In addition, the establishment of MPAs has helped restrict fishing and other harmful activities in designated zones. “Establishing MPAs helps limit destructive practices in protected areas,” explained Jack, Conservation Manager at Chumbe.



The image displays a variety of coral reef species thriving beneath the water's surface

Recent assessments reveal a significant increase in coral cover within rehabilitated zones. Scientists have observed a marked improvement in biodiversity, with various fish species returning to the reefs. These results underscore the importance of combining conservation efforts with active community engagement. “The number of reefs is increasing because they are being conserved,” noted a researcher from Siberia. “There are nearly 200 reef species here.”



The image highlights the rich diversity of coral reef species surrounding Chumbe Island

As Chumbe Island continues its journey of ecological recovery, it stands as a beacon of hope for other islands facing similar environmental challenges. “The techniques developed here not only restore coral reefs but also foster a sense of stewardship among local communities,” said Khamis Juma. With continued support and innovation, Chumbe Island is proving that effective reef rehabilitation is not only possible but essential for the future of coral ecosystems worldwide.

By carefully evaluating ecological criteria, conservationists can identify the most suitable sites for reef restoration in and around Chumbe Island, thereby enhancing the likelihood of successful rehabilitation and long-term sustainability.

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Coral Whispers: The Conservation Legacy of Chumbe Island

By Salamu Hemed

Chumbe Island is a small, privately managed island located approximately 8 km west of Unguja, Zanzibar. It is renowned for its exceptional coral reef sanctuary, closed forest reserve, and pioneering role in eco-tourism and marine conservation.

On 1st September 2025, environmental students from the State University of Zanzibar (SUZA), together with volunteers from the Korea International Cooperation Agency (KOICA), visited Chumbe Island as part of a field trip focused on environmental conservation. The visit aimed to educate participants about the marine environment of Chumbe Island and coral reef ecosystems more broadly.



Centre for marine protection at Chumbe Island

Once a forgotten speck in the Indian Ocean, Chumbe Island has become a global beacon of marine conservation. Here, coral reefs whisper tales of resilience, community, and visionary stewardship.

Chumbe's coral reef hosts over 500 species of fish, 90 per cent of East African hard coral species, and rare marine life such as the giant clam and hawksbill turtle. The island also supports 104 bird species, 48 reptiles, 15 butterfly species, 2 mammals, 360 coconut crabs (*туру*), red-eyed doves, and eagles. The reef's health is so exceptional that it is often used as a reference site for degraded reefs across the region.

Chumbe Island is also considered a climate adaptation success story. Its coral reef has shown resistance to bleaching. The island's eco-lodge uses solar energy, composting toilets, and rainwater harvesting, setting a benchmark for sustainable tourism.

Marine biologist Dr Saleh Yahya from the University of Dar es Salaam describes Chumbe as “a biological archive of East African marine life.” “It's not just a reef,” he said. “It's a benchmark for what a coral ecosystem should look like.”

In 2019, researchers documented a mass coral spawning event, a rare and spectacular phenomenon where corals release eggs and sperm in synchronised bursts. “It was a sign of a healthy reef, untouched by the bleaching events that devastated nearby areas,” said Jack, a manager from Chumbe Island Marine Conservation.

The island is a marvel of eco-architecture. Its eco-lodge is built from local materials, uses solar power for electricity, harvests rainwater for drinking, and features composting toilets that prevent marine pollution. Additionally, the food served is locally sourced, reducing the carbon footprint and supporting Zanzibar's farmers.

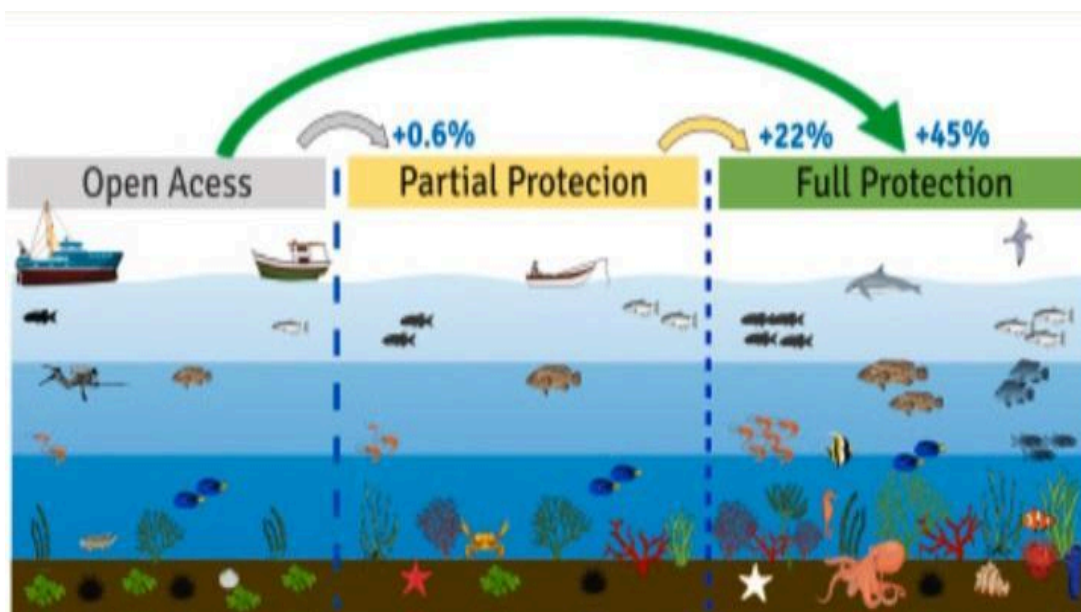


Environmentally friendly lodge built using materials from the region

At the heart of Chumbe Island's conservation success is the Chumbe Island Coral Park (CHICOP), a not-for-profit organisation founded in 1991. CHICOP manages both the Chumbe Reef Sanctuary and the Closed Forest Reserve under a formal agreement with the Government of Zanzibar.

The blacktip reef shark symbolises the beauty of Chumbe due to its ecological role as a top predator. It maintains balance within the reef ecosystem by regulating fish populations, preying on the weak and sick, and helping to keep coral reefs healthy and biodiverse.

Before Chumbe was protected, sightings of this shark were rare due to overfishing. However, after the marine protected area was established in 1991, the sharks began to return. By 2011, both adult and juvenile sharks were regularly spotted proof that the reef was recovering.



Estimation of protected area and conservation model

“Their presence is a strong sign of a thriving ecosystem. Sharks are sensitive to environmental degradation, so their return to Chumbe is a powerful testament to the success of its conservation model,” said Khamis Khalfan, an educator for Environmental Education and Sustainable Development.

As populations grow and habitats recover inside a no-take zone, some species naturally migrate beyond its boundaries, boosting catches for local fishers. Chumbe Island's reef sanctuary has been a no-take zone since 1992, meaning no fishing, anchoring, or extraction is allowed. Over time, this strict protection has led to increased fish populations and the restocking of adjacent fishing grounds.

Despite ongoing challenges such as coral bleaching, ocean acidification, storm surges, and coastal erosion, Chumbe's success is evident in its ecological monitoring, reef resilience management, climate-smart infrastructure, community education and engagement, and strong partnerships in research.

Community involvement has transformed daily lives and attitudes towards conservation. This engagement has sparked a profound shift, not only in environmental outcomes but also in how people live, think, and relate to the ocean that surrounds them.

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Chumbe Island: Where Nature Writes Its Own Story

By Badru Yahya

On the morning of 1st September, members of Mawimbi Youth Ocean Voices of Zanzibar, alongside KOICA volunteers and TROCEN staff, set foot on Chumbe Island, a privately managed Marine Protected Area since 1992. Known for its 16.64 hectares of coral rag forest, more than 200 coral species, and over 500 types of marine life, the island is more than a sanctuary; it is a living classroom. The team came to learn how conservation here blends science with eco-tourism, and why protecting this fragile ecosystem is vital for Zanzibar's future.

Chumbe Island protects 16.64 hectares of coral rag forest, including mangrove patches that have persisted for decades. This forest is home to rare and endangered plant species, providing habitat for a remarkable array of wildlife. Visitors may encounter 104 bird species, including eagles, red-eyed doves, and fruit birds; 15 butterfly species; 48 reptiles; numerous insects; and mammals such as reintroduced antelopes and Ader's duiker. The presence of 360 coconut crabs further illustrates the island's unique ecological complexity.

This terrestrial biodiversity is not only valuable for its intrinsic ecological role but also serves as a living laboratory, demonstrating how forest ecosystems function, recover from disturbances, and support interdependent species. Protecting such habitats is critical, as forests like these regulate soil fertility, provide carbon sequestration, and maintain microclimates that directly influence surrounding marine and terrestrial systems.



Aerial view of Chumbe Island's coral rag forest

The coral reefs surrounding Chumbe Island host over 200 coral species and 525 species of marine life, forming one of the richest marine ecosystems in East Africa. These reefs provide critical nursery grounds, shelter, and food sources for marine organisms. Beyond local significance, marine ecosystems play a pivotal role in human survival. Approximately four in ten people globally rely on the ocean for food, while marine organisms produce 70 per cent of the oxygen we breathe. The ocean also acts as a giant planetary air conditioner, having absorbed 93 per cent of the heat trapped in the atmosphere by greenhouse gases over the past century.

In this context, conserving Chumbe's coral reefs is not only a local priority but also a contribution to maintaining global ecological balance, climate regulation, and food security.



Coral reef habitat supporting diverse fish species in Chumbe Marine Protected Area

Chumbe Island integrates active conservation, education, and sustainable tourism in a holistic model. Staff maintain walking trails through sensitive forest areas, monitor endangered species, and control invasive species such as rats and crows (*kunguru*). Eco-friendly infrastructure including solar-powered bungalows, rainwater harvesting systems, and composting toilets minimises human impact while allowing visitors to experience the island sustainably.

Conservation is paired with education. Youth groups, volunteers, and researchers participate in programmes that emphasise practical skills in habitat monitoring, species identification, and sustainable tourism management. These initiatives foster environmental stewardship among the next generation.



Mr. Khamis Khalfan Juma shares insights on Chumbe's conservation efforts with visitors

Chumbe Island's management aligns with both national and global biodiversity objectives. Tanzania recently engaged in the Kunming-Montreal Global Biodiversity Framework (KMGBF), particularly Target 3, which seeks the effective conservation of at least 30 per cent of marine areas by 2030. In addition, Tanzania's Biodiversity Finance Plan for Zanzibar (UNDP, 2023) aims to bridge funding gaps to address threats such as habitat loss, climate change, and unsustainable resource use. Furthermore, Tanzania's signing of the BBNJ Treaty in 2023 demonstrates its commitment to conserving biodiversity beyond national jurisdictions.

At a local scale, Chumbe Island's privately managed model provides a practical example of these frameworks in action. It integrates eco-tourism, research, and community participation to protect habitats and generate sustainable funding. The island illustrates how small-scale conservation efforts can directly contribute to global goals, while simultaneously creating local economic and educational benefits.

Despite its successes, Chumbe Island faces ongoing environmental pressures. Climate change including sea level rise and ocean acidification threatens coral reefs and alters ecosystem dynamics. Invasive species compete with native flora and fauna, disrupting ecological balance. These challenges highlight the fragility of even well-protected ecosystems and the need for adaptive management strategies.

Balancing conservation with educational visits, eco-tourism, and research activities requires careful planning, monitoring, and enforcement of sustainable practices. The significance of Chumbe lies not only in its biodiversity but also in its role as a model of resilient, sustainable conservation. It demonstrates how locally managed areas can simultaneously protect ecosystems, support livelihoods, and contribute to national and global environmental targets.

Chumbe Island exemplifies how careful management can protect fragile ecosystems. Its forests, coral reefs, and wildlife demonstrate that biodiversity can thrive when conservation and sustainable practices are prioritised. Through integrated monitoring, eco-friendly infrastructure, and education, the island safeguards endangered species and vulnerable habitats while supporting both national and global biodiversity goals. Chumbe stands as proof that protecting nature is not only possible, but essential for the planet's future.