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Paradise restored

A tropical island, a German scientist and something ingenious lurking beneath the waves… No, not a case for James Bond, but a plan to save the planet, as **Gavin McOwan** discovers

It is surprising that the Maldives has never been used as the backdrop for a James Bond film. This unique country, made up of 1,190 tiny coral islands spread over 26 atolls, ticks all the right boxes for a Bond location. There are hundreds of world-class dive sites filled with sharks and manta rays for underwater chases; outrageously exotic white sand beaches lapped by pale turquoise sea where 007 could cavort with 'the girl'; and it doesn't take much imagination to picture one of the beautiful tropical islets, so remote and private, acting as the cunning cover for a secret underwater lair for a Blofeld or Scaramanga.

There is something Bond-like about the metal structure lurking beneath the sea on the island of Vabbinfaru. Shaped like a giant lotus flower, measuring 40ft across, with a small electric current pumping through it, it looks like something designed to snap up unwary swimmers. But this is not part of some megalomaniac's dastardly plot to destroy the planet; rather a highly innovative project playing a small part in helping to save it.

Photography: Photolibrary

As a holiday destination, the Republic of Maldives is something of a guilty pleasure. In just over three decades, the country has risen from a virtually uncharted territory, in tourism terms, to top the luxury holiday lists and become a favourite for honeymooners and anyone seeking solitude on a paradise island. At the same time, we have become acutely aware that global warming and the resultant rise in sea levels have put these islands, described as "a string of gleaming pearls scattered over the deep blue Indian Ocean", in jeopardy. This is the world's flattest country; the highest natural point is 7.5ft above sea level. If ocean levels rise as predicted, the Maldives will be first to go.

Not surprisingly, the Maldivians have been quick to develop a level of eco-awareness that

many other nations have failed to realise. There is a policy limiting each island to one resort. Each island is also self-sufficient, generating its own power, waste management and water supply. But what the Maldives depends upon more than anything is coral.

The islands make up just one per cent of the country's total area. They are merely the tips of some of the world's tallest underwater mountains, just poking their heads above the surface. The coral atolls that encircle them form crystal clear lagoons, which lap lazily at the white sand beaches. But there's more to this than sheer beauty. Where there are no reefs, the Indian Ocean rolls right up to the shore and erodes everything in its path.

In 1998 El Niño, the climatic oscillation in ocean water temperature, was particularly pronounced. The coral reefs form such a complex and fragile ecosystem – they're often described as the rainforests of the ocean – that even the slightest fluctuation in water temperature has disastrous consequences. That year El Niño pushed surface water temperatures up by as much as six degrees centigrade, bleaching and even destroying much of the Maldives' coral, which takes hundreds of years to mature, in just a few months.

Before 1998 the atolls had provided some of the world's most spectacular reef dives. Afterwards, some of the islands themselves began to disappear. The importance of maintaining the reefs was made painfully clear when the tsunami hit the region on

Photography: Banyan Tree

Diving for dear life: the Lotus (bottom right) has succeeded in stimulating new coral growth and visitors to Vabbinfaru are encouraged to join in with the transplanting of coral fragments (left and right)

Boxing Day 2004. A total of 49 inhabited islands were flooded and over 100 lives were lost, but many islands were spared the devastation seen in other countries in the region because the coral reefs absorbed much of the impact. Without them, many islands would have been washed away forever.

The Vabbinfaru Lotus, or 'coral ark', was launched in response to El Niño in 2001, a pioneering project to reverse the course of coral depletion. The metal structure was built on site under the curious eyes of holidaymakers at the Banyan Tree resort. Half a ton of welded construction reinforcing bar was used to build the frame, which was then carried by about 40 volunteers through the lagoon and deposited on the slope of Vabbinfaru's outer reef.

The Lotus now lies at a depth of between three and ten meters, acting as a coral nursery, which maintains a fascinating diversity of species. The open flower shape maximises its surface area, inviting the sun to promote the development and growth of the corals. It works by a method called mineral accretion, or Biorock, which uses low voltage, direct current electricity to grow solid limestone rock structures in the sea and accelerate coral growth. In very simple terms, the process is similar to the calcification that causes lime scale build-up in kettles. Minerals that are naturally dissolved in sea water crystallise into concrete-hard growths on the electrified metal structure.

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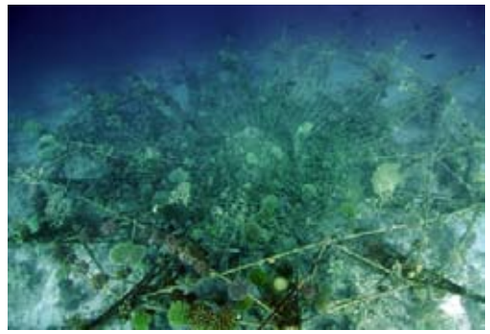
"Under normal conditions, coral regeneration is limited by its growth rate, so what we're looking to do is to speed up that process," says David Campion, marine biologist at the Banyan Tree resort. Mineral accretion does just that, by three to five times. It was invented by architect Wolf Hilbertz for use in construction projects. Together with coral scientist Dr Thomas Goreau, he applied the technology to the restoration of coral, forming the Global Coral Reef Alliance (GCRA) in 1988.

"Using a low-voltage electrical current is perfectly safe and produces calcium carbonate, which is the same material coral skeletons are made from," explains Campion. "The coral grown in this way, in fact, emerges stronger than normal coral and it has more energy to fight off disease, as well as making it healthier and visibly brighter in colour. This benefits the fish that feed and live among the coral, as well as protecting this island



Angels rush in: a myriad of fish species, including angel fish and surgeon fish, are enjoying the restored environment of the Vabinfarru reef, as it recovered from the effects of El Niño

from the sea, as the wave energy gets soaked up by a strong coral reef."

Coral growth on the Lotus is notably more dynamic than the surrounding areas, which are still bleached. Snorkelling around the structure is like swimming in a giant marina, so plentiful are the residents, all at home in the electrically stimulated reef.

"You have to be careful when using this technology," says Campion. "For example, by using a higher current than six volts you can get the coral to grow and reproduce even quicker, but it has no strength and crumbles to dust very easily. We also place settlement tiles around the reef so we can see what corals are native and encourage these to grow rather than outsider species."

Wolf Hilbertz died on August 11th 2007 but not before launching numerous similar reef restoration projects around the world, in places including Jamaica, Phuket, Bali and the British Virgin Islands. In the Maldives the next step is to actually plant coral in the sea. The project is headed by Dr Abdul Azeez, known in these parts as 'the coral gardener'. "Fragments that have been naturally broken off the live coral by wave damage can be collected and attached to the frame of the Lotus, either by wedging them into crevices or using plastic cable ties. You can also plant them in dead reefs and the process is as easy as planting trees. It is not too expensive and it may help the reef in the face of the next El Niño."

The Banyan Tree resort is much like any of the other luxury resorts you'll find in the Maldives, with the addition of a marine biology lab, a bunch of conservationists and, of course, the Lotus. It provides a holiday destination where luxury can be combined with a sense of giving something back. Guests are invited to don mask, flippers and snorkel and get into the sea to inspect the Lotus.

"Our guests are encouraged to become involved in the coral transplanting," says Campion, "and we try to offer as much awareness and interaction in the work of the Marine Lab as they would like.

"This invitation is extended to the local schools as part of our awareness-raising programme. The opportunities for our clientele include environmental classes, coral transplanting, environmental dives and snorkels, as well as the possibility to become involved in our turtle rehabilitation project."

Not quite as high-octane as James Bond perhaps, but now you can holiday in style and feel like you're saving the world.

Photography: 4Corners Images; Michael Aw / Lonely Planet Images