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Electric Reef

Text by: Jo McFarlane
Photos by: Jesper Meyer



The Vila Ombak Diving Academy Crew. Cody and Taufik, the head of the village

Should you be fortunate enough find yourself gazing out from Vila Ombak Diving Academy, across the sparkling seas to Mount Rinjani in Lombok, you will be sure to notice the bright pink marker buoys which denote the location of the Gili Islands first ever Biorock artificial reef installation.

Co-conceived by coral expert Tom Goreau and architect Wolf Hilbertz, Biorock, or Electric Reef installations, have proven successful in creating new coral reef habitats, not only in Indonesia, but in numerous locations around the region.

At the suggestion of Cody Shwaiko, and with the support of Bali Hai Diving Adventures, Tom and Wolf visited Gili Trawangan to assess the areas suitability for a trial installation. All indications were that "Biorock" would be feasible in this location. Funded by Vila Ombak Diving Academy and made possible only by the generous donation of the time and expertise of Tom, Wolf, Cody and Global Coral Reef Alliance, coupled with the energy and enthusiasm of Jo McFarlane and Jesper Meyer, Vila Ombak Diving Academy's management team, the Gili Islands first installation began to take shape on Nov 21, 2004.

Coral Arks

Sometimes referred to as 'Coral Arks' due to their characteristic of rapidly providing new havens for fish and corals in areas where human impact has reduced coral reef habitat, the new artificial reef on Gili Trawangan was constructed using steel bars and copper wiring to produce a tunnel like steel frame. Electrodes are attached to transfer low-voltage elec-



Attaching corals to the framework

tricity into the seawater in contact with the steel. Using an onshore power source, although solar panels can also provide the voltage required, the current used compares to that of 60-100 watt light bulb.

In combination with an anode and cathode, the electric current causes dissolved minerals in seawater to crystallize, forming a limestone coating over the exposed steel, onto which coral larvae are able to settle. In order to accelerate the process, the Vila Ombak Diving Academy team collected live coral fragments already detached from surrounding healthy reef, and physically attached them to the structure, a process sometimes referred to as "seeding"

Stimulated coral

The electric stimulation of these coral fragments, has in some cases, been shown to result in growth rates three to five times that of unstimulated coral. Some studies have indicated stimulated corals may also be more

Editor's Note

The low-voltage direct current applied to the submerged conductive (metal) structure is completely safe for swimmers and marine life. It clears any rust and causes dissolved minerals in seawater to precipitate and accumulate on the metal as a composite of stony limestone and softer brucite (magnesium hydroxide). Adjusting the current and turning it off periodically can control the amount of brucite.

Any artificial or re-seeded reef is unlikely to exactly replicate a natural one. Small differences will alter the balance of ecological competition between reef organisms so the final make-up of creatures may differ but any living reef gives home and protection to myriad of marine creatures.

relevant to changes in surrounding water temperature.

"Stakeholder and community support is imperative to the success of any environmental initiative. We are fortunate the Kepala Dusun, village head on Gil Trawangan, Mr. Taufik, an SCUBA Diver himself Taufik understands both the value of the Gili Islands Coral Reef to his community and the threat to the Coral reefs on a global scale. In addition, the local marine patrol "SATGAS", funded by the Gili Eco Trust, will be key in the ongoing success of the project"

Sense of achievement

On November 23 with the assistance of the local community, and with a hard-earned sense of achievement, Jo, Jesper and the Vila Ombak Diving team lowered the completed structure carefully into place. Taufik was given the honour of becoming the first diver to see the structure with a coral fragment.

"Within just 16-hours of the introduction of electricity, there was a visible white film forming around the exposed steel. In some ways, the structure resembles an underwater Christmas tree adorned with carefully attached coral decorations! Moorish idols and damselfish were already winding their way in and out of the structure. A fantastic green and yellow Miamiridae nudibranch had also found a new home."

Taufik provided the finishing touches by putting a succinct message on the surface marker buoys "Keep and Protect this Place" and the installation was complete.



Head of Gil Trawangan Taufik and marine patrol Satgas member

An open forum and evening screening, highlighting other successful BioRock projects, was held at Hotel Vila Ombak, in the hope of inspiring all dive resorts, hotel owners and the island community to team together and create a larger electric reef installation sometime in 2005. "Our goal was to create something tangible, to demonstrate to everyone just one of the techniques available to secure and augment the coral reef assets of regions such as the Gil Islands," said Jo.

Vila Ombak Diving Academy are now providing a signature Coral Reef Education Program, which includes learning about how coral reef communities are created, current global threats to coral reef and the future of the reef. The program also includes an interpreted dive or snorkel on the structure and the opportunity to attach a coral fragment. If you would like to get involved, please contact Jo and Jesper at either voda@indosat.net.id or diverse@indosat.net.id



The bare bones of the new reef

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TELE +62 (361) 724062
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DIVERSE@INDOSAT.NET.ID
WWW.SCUBALI.COM