

SIXTH BIOROCK WORKSHOP

THE GILI ISLANDS

1ST-7TH DECEMBER 2008

Introduction

The purpose of this document is to give dive centres and business owners a more detailed understanding of the current proposal to hold a BioRock Workshop on Gili Trawangan in December 2008, and what would be required from residents in order to achieve this. After the success of the 4th BioRock workshop in November 2006 on Gili Trawangan, the Gili Eco Trust would like to organise another opportunity to extend all existing BioRock structures, to build new structures around the Gili islands, and to provide a community barrier reef to fight the erosion around the Gili islands.

Support from the businesses is crucial if these projects are to proceed and be a success.

Below are further details on the workshop itself and the BioRock Process.



Why BioRock

The coral around the Gili islands has suffered substantial damage during previous years and it is largely agreed upon that some proactive steps are necessary in order to prevent further destruction. The Gili Islands are dependant on a healthy marine habitat for their fisheries, tourism, sand supply, shore protection and marine biodiversity. This habitat has been largely damaged by combinations of coral heatstroke, disease, land-based sewage, global sea level rise, over-fishing and direct physical damage from destructive fishing practises, boats, anchors, tourists and reef harvesting. As a result, renewable marine resources are declining, endangering local food supplies, shorelines and tourism income. Without large-scale restoration of degraded habitats to make them capable of supporting larger fish and shellfish populations there will be fewer fish in the future and without healthy growing corals there will be fewer beaches or tourism income, affecting all business owners on the island. Restoration of our degraded reefs and coastal habitats on a scale that makes a difference must be an active environmental priority for local businesses and not an afterthought.

However, there is a much more serious purpose to these projects than for ecotourism. By keeping corals alive under lethal conditions and restoring coral reefs where they cannot recover naturally, we aim to restore the reef and its fisheries, to keep ecosystems from going extinct from global warming, and to protect the shoreline from vanishing under the waves.



Erosion in Gilis, June 2008



The erosion in the Gili islands is getting worse. The beach now needs to be held by sand bags and sea walls. A project has been completed in the Maldives (*Maldives shorelines: growing a beach* by Thomas J. Goreau, Wolf Hilbertz, & Azeez A.Hacheem, may 1998) with the goal of developing a sustainable technology that can keep the Maldives from disappearing. For this reason they started growing a reef in front of a severely eroded beach on the tourist resort island of Ihuru, in North Male Atoll. The project is 45 meters long (140 feet), about 4-8 meters wide, and 1.5 meters high. It was constructed with welded steel rods at a fraction of the cost of a concrete or rock wall. This structure was called the Necklace, because it was intended to be the first stage in restoring the ring reef around the entire island and protecting its lovely beaches without concrete, dead coral walls, or plastic mesh bags pumped full of sand, which invariably disintegrate, rip, and leave plastic debris littering the sand.



Maldives

at the start of the project: eroded beaches held by sand bags, palm trees collapsing into the sea, very expensive concrete walls of Male, and the BioRock necklace placed in May 2001.

The results have been astonishing. When it was built the structure lay amid the best snorkeling reef in any tourist island in the Maldives, but in 1998, almost all the surrounding reef corals died when water temperatures reached up to 34 degrees C. In contrast,

most corals on the Necklace survived. The Necklace reef has become a haven for fish, like Giant Moray eels, sweetlips, triggerfish, and others now rarely seen on the dead reef. Fish line up patiently to be groomed by cleaner fish and shrimps, making it an ideal place to see many species behaving without aggression to each other.

The effect on the beach has been even more incredible. As the limestone rock reef and the corals on it grow more massive, the waves that once surged right through it to batter the beach now slow down. As the waves pass through, the friction of the growing surface constantly increases. As a result, sand once held suspended in the water is settling on the seabed.



In the last two years, the once-eroding beach has grown by **15 meters**, and the sand is now forming a sandbar pointing right to the structure. Hopefully, this will assist future generations of Maldivians and tourists to continue to enjoy their idyllic moments of peace on the shoreline while this unique country grows its way out of the very real threats of global warming and sea level rise.



Two years later: the necklace is now full of corals and fish and the sand is accumulating at the base of the necklace. At the start the sand bags were piled against the deck to keep it from collapsing. Now the beach extends 15 meters from the deck.



The BioRock Process (mineral accretion) is a revolutionary technology used to grow and preserve marine ecosystems. It provides a cost-effective and sustainable method to accelerate coral growth and increase coral survival particularly in areas where environmental stress has affected existing reefs. BioRock methods can help restore damaged coral reefs and provide building materials from sustainable energy resources for aquaculture of corals, oysters, clams, lobsters and fish.

BioRock technology has already been applied in around 20 islands worldwide and has been shown to increase coral growth rates from 3 to 5 times their normal rate. It increases coral survival under higher water temperatures and pollution by 16 to 50 times. It keeps corals alive where they would die, grows reefs where corals cannot recover naturally and turns severely eroding atoll island beaches into growing ones within a few years.

The Gili Islands need to recover their beaches and prevent further erosion otherwise there will be serious consequences for all businesses and residents.

The Gili Eco Trust and SATGAS would like to use the knowledge and experience gained from the success of the Necklace reef in the Maldives as a model for the December 2008 BioRock workshop.

Funding

The BioRock projects rely solely on sponsorship. It's therefore necessary to try and obtain as much funding as possible over the next few months. The estimated cost for the workshop and required materials stands at US\$60,000, this sum is to be raised primarily by Gili islands residents and businesses, but sponsorship will be sought from the Indonesian government and abroad. Businesses, industries and companies can help and sponsor the BioRock workshop to contribute to an eco community project to keep the Gili islands the exceptional rich ecosystem it is now.

The proposed idea is to have different levels of sponsorship. Donations from the Gili Islands residents will result in the placement of a structure in front of the donor's premises to preserve the existing beach, reclaim beachfront which has already been lost and promote coral regeneration.

Any size of donation will be appreciated as the community barrier reef project is of critical importance to everyone.

Applications to both PADI and Project Aware for funding will also be made, and Joanne Marston (Project Aware), Johnny Chew (PADI

Asia Pacific Regional Manager) and Sharham Saber (PADI Asia Pacific Marketing) have already been informed of the proposal and are in support.



Workshop Fees

	Registration	
	Before 15 th November 2008	After 15 th November 2008
PADI Professionals:	US\$ 550	US\$ 700
Individuals:	US\$ 550	US\$ 700
Students:	US\$ 300	US\$ 450
Corporate/Institutional	US\$1500	US\$1650

Workshop fees include:

Workshop certificate, Materials for workshop, Scuba tanks and diving equipment, Educational materials, Evening dinner, BioRock workshop T-shirt

Special Gili cat speed boat transfer from Bali (return 900,000rp)

Sponsorships for Gili islands resident businesses and individuals:

- Extension of an existing BioRock reef: US\$1200
- Extension of an existing BioRock reef and contribution to the community barrier reef project: US\$2300
- Construction and installation of a new BioRock reef (10m long): US\$1700
- Anti-erosion BioRock reef (20m long, 5-8m wide): US\$2200
- New BioRock reef and contribution to the community barrier reef project: US\$3000
- Contribution to the community barrier reef project: at least US\$700

The sponsorships include:

Construction, installation, materials, coral attachment, power supply and cable connection of a BioRock reef, teaching materials and maintenance techniques.

Sponsors logo on workshop T-shirts, posters, banners, advert through film and documentary recorded during the workshop.

Participants can be chosen by the Gili islands sponsors and can attend the 6th BioRock Workshop by paying the student's rate.

Accommodation

The Gili islands offer a very wide range of accommodation. Local sponsors have offered free accommodation for scientists, professors, invitees, organisers.

Participants of the workshop will be seeking accommodation of varying levels of comfort during the workshop.

Budget

Description	Estimated price (US \$)
Rolls of pre-welded steel mesh	5000
Solar panels, tidal energy turbines	5000
40 kg of steel wire	500
10 boxes of welding rods	500
60 pliers	200
Rolls of 100m supreme cable	6000
Rolls of 100m focus cable	5000
Roll of titanium, shipping from USA, import Taxes	7000
YOKO power supplies model 87.50	2000
Foundation stones	3000
Chicken wire	1000
Web design	800
T-shirts, name tags, posters, banners, books, pens, photocopy	2500
Sand paper, hose pipe, resin and hardener	2000
Duck tape, gloves, building materials	500
Return ticket for Thomas Goreau (Boston-Bali)	3000
Return ticket for Thomas Sarkisian (Bangkok-Bali)	600
Remuneration for scientists (1month on site)	5000

Remuneration for organizers	4000
Drinking water, tea, coffee	500
Petrol, transport, porters	6000
TOTAL	60000

Workshop Schedule

1st December 2008

Registration, Orientation pack, required reading list.

Introduction of the 6th BioRock workshop: goals, invitees, lecturers, sponsors, program....

Speakers and Guests

Thomas J Goreau

Thomas Sarkissian

Pak Kades

Konservasi Kelestarian Laut

SATGAS

Komang, Karang Lestari Foundation

Buffet dinner

Show of video "Reef Reborn", an internationally acclaimed documentary on the Pemuteran project directed by Michael Balson and produced by New Zealand Natural History Films.

2nd December 2008

Morning - lectures on Global Warming and Coral Reefs. Introduction to BioRock technology by Dr Tom Goreau.

Mid morning – snorkelling or diving on Trawangan BioRock structures.

Introduction to Building and welding Biorock Structures.

Construction of coral nurseries

Lunch break

Afternoon – BioRock Theory: slide and film presentations on the theory of mineral accretion, reef reconstruction, shore protection and architectural applications.

Methods for reef construction, coral transplantation and marine pest control.

Building and welding BioRock structures or diving/snorkeling.

Buffet dinner

Film show

3rd December 2008

Morning and Afternoon – Construction of BioRock steel structures, building and welding.

Coral collection.

Evaluation of new project sites.

Cables and anode connection

Buffet dinner

Film show and debate

4th December 2008

Morning and Afternoon – Construction of BioRock steel structures, building and welding.

Coral collection.

Cables and anode connection

Installation of BioRock reef, cable connection to structure and power supply

Buffet dinner

Film show and debate

5th December 2008

Morning and Afternoon – Construction of BioRock steel structures, building and welding.

Coral collection.

Cable and anode connection

Installation of BioRock reef, cable connection to structure and power supply

Coral attachment on structures

Buffet dinner

Thomas Goreau lecture

Film show and debate

6th December 2008

Morning and Afternoon – Construction of BioRock steel structures, building and welding.

Coral collection.

Cable and anode connection

Installation of BioRock reef, cable connection to structure and power supply

Coral attachment on structures

Buffet dinner

Thomas Goreau lecture

Film show and debate

7th December 2008

Morning and Afternoon - Cable and anode connection

Installation of BioRock reef, cable connection to structure and power supply

Coral attachment on structures

Finalisation of the projects.

Buffet dinner

Question and answer sessions, final discussions, problems encounters in reef restoration and solutions. Future maintenance and directions.

Contact

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Facebook Page: <http://www.facebook.com/pages/BIOROCKR-INDONESIA/20305533246?ref=nf>

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