Proposal for Reef Rehabilitation & Auxiliary Village Studies Centers Program on Lembeh Island

Lembeh Reef Rehabilitation and Village Studies Campaign

It is important to understand just how special and unique Lembeh Strait is in terms of its wide range of marine life. The Strait has been described as “an epicenter of marine bio-diversity;” a “treasure trove of newly discovered species;” and “every dive a chance to see an animal new to science.”

Marine Biologists from all over the world dive at Lembeh Strait because of its unique character and its incredible biodiversity. Scientists claim the Strait has the highest concentration of unique aquatic species found anywhere in the world. Therefore, it is an important obligation of the locals and private sectors to enhance and protect the marine culture and educate those parties involved in its value and conservation.

The ultimate goal of this program will be a greater understanding by the locals of the fragility of under water life and how protecting the marine life provides substantial economic revenue through tourism, create a greater base of infrastructure in the form of local awareness & employment in the tourist trade and hospitality sector and the actual revitalization of local reefs to provide greater habitat for the large variety of species inhabiting Lembeh Strait.

The reef sites selected for this program are adjacent to three villages on Lembeh Island, Pintu Kota Besar, Pintu Kota Kecil and Baturiri. The house reef of Lembeh Resort is currently undergoing rehabilitation. We will use this reef as a test case to refine reef restoration techniques used at the other sites.

Objective of this campaign

To secure funding via individual grants to provide for reef rehabilitation and auxiliary educational facilities and resources for three villages on Lembeh Island, North Sulawesi – Indonesia. The areas selected for this program are located adjacent to Lembeh Resort in Lembeh Strait, a unique aquatic ecosystem with an unusually high diversity of marine life currently threatened with loss of habitat due to developmental pressure and increasing human activities.

The objective of the program is two-fold

1. To fund and oversee the actual physical rehabilitation of degraded coral reef ecosystems at four different sites in Lembeh Strait (Lembeh Resort house reef, Pintu Kota Kecil, Pintu Kota Besar and Baturiri).
2. To establish and fund an educational program for school students and villagers in the three villages adjacent to Lembeh Resort (and in close proximity to the four sites). The program will provide educational facilities, materials and direction to said students and villagers. Educational programs will be based on awareness of marine life.
Implementation

1. The program for reef rehabilitation would include:

   A) Revitalize existing reefs currently damaged and facing further degradation by physically rehabilitating them.
   B) Install concrete structures onto the damaged areas creating three dimensional spaces, where marine species can shelter, mate, lay eggs and find protection from predators, “fish houses.”
   C) Transplant coral from healthy, thriving areas onto degraded / damaged ones incorporating these transplanted corals into the concrete-framed fish houses. In this manner, stimulate habitation of the fish houses and reinvigorating the damaged reef.
   D) Install coral and fish houses into specific areas of the reefs to prevent sediment from surface erosion from covering or smothering healthy corals already existing.
   E) Installing metal structures elevated from the substrate with a low electricity current (Biorock©) and transplanting freely laying broken fragments onto them.
   F) The electric current enhances and accelerates the amount and speed of lime stone deposition, in other words, coral fragments grow faster than their natural rate. Structures created this way will serve as a whole new reef microcosmos.
   G) Creating a deeper artificial reef structures by sinking a man made structure (i.e. fishing boat) to attract schooling fish species and organism living down the reef slope.

2. To establish and fund a supplemental educational program in these two villages

   A) The construction of study “Study Centers,” removed from the distractions of the village scene, where pupils from local schools could pursue their studies of particular courses in a quiet atmosphere. Scholastic direction and materials such as books and reference materials would be provided free of charge under the direction of staff appointed by the school. (i.e. a library, clean, quiet, no distractions)
   B) Supplemental Educational Programs developed in conjunction with the local school district, NGO & private sector. This program would help educate locals in environmental / marine science issues creating a foundation of knowledge and understanding on these issues the school age children would carry with them through future endeavors such as university, career enhancement etc.
   C) Create a local population of informed citizens aware of the sensitive nature of their unique environment empowering them to help protect the local environment of even partake of the opportunities available to them in the form of employment with various local organizations involved in water sports, environmental protection etc.
Conclusion:

Our multi-faceted program would achieve:

- Actual physical rehabilitation of biologically important but degraded marine ecosystems.
- Greater awareness and involvement of local population on the environmental impact of Lembeh Strait.
- A benefit to the overall local populace within the context of a supplemental study center and educational program.
- More access to educational and other reading materials for the local population of villages adjacent to rehabilitation sites.
- A local populace empowered with an actual stake in the heath and vitality of the marine eco-culture.

This program is dedicated to the loving memory of Larry Smith. Larry pioneered diving in Lembeh Strait and all the original dive guides in this area. Larry was a tremendous help to Lembeh Resort, a great friend and dive buddy. We all miss him as do the critters.

Supplemental documentation

1. Costs of Program (listed below)
2. Beneath North Sulawesi by Michael Aw
3. Article: Making the Book – Australasia Scuba Diver
4. Artificial Reefs as a Tool to Aid Rehabilitation of Coastal Ecosystems: Investigating the Potential
5. Educational Program Outline by Angela Beer

Donations are currently being accepted.
**Ad 1:** Cost for Reef Restoration & Educational Centers/Programs Total estimated costs including one year of education programs for three villages is:

IRp 300,050,000,-
USD 33,400,-

Break down:

under water tools, mechanical tools & materials – Rp 11,500,000

Training of university level marine biologists (6 local students)

open water, nitrox & coral handling - Rp 38,800,000

Construction materials for fish houses (cement, steel etc) for 1,000 cement blocks for each of four sites - Rp 43,500,000

A set of four biorocks - Rp 24,000,000

Dive equipment for 6 students - Rp 40,500,000

study center buildings (3) - Rp 51,750,000

books & materials - Rp 10,000,000

educational programs by local NGO (15 programs) - Rp 80,000,000