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## The Re-building of the Refectory and Dinning Area of Ifaty Primary School

On the 22nd of February 2013 cyclone Haruna, registered as a scale 2 storm struck the coast of south-west Madagascar. Intense winds destroyed infrastructure, caused mass flooding that washed away roads and crops. The following weeks promised to be difficult for the local communities who had to rebuild their houses and keep their families fed, despite the increase in food prices. ReefDoctor was extremely fortunate and the base camp itself had only minimal damage to report. Although many people suffered personal loss, Ifaty community school struggled to re-open with extensive damage to the roof of the main building and the loss of the kitchen and refectory. Most important, this not only left vulnerable children without a place to eat but it also affected their eligibility for a free meal funded by the World Food Program – a vital funding scheme aimed at assisting Malagasy primary schools; however it is dependent on the ability of schools to provide a functioning kitchen and dining area.



*The kitchen of the school, the morning after the cyclone Haruna hit Ifaty*

ReefDoctor staff, witnessing this tragic event were driven to help the children of this community,

***‘we truly believe that education is fundamental in saving the reef systems of this region’ -***

Staff reached out to the ReefDoctor network, friend and family across the globe launching the fundraising appeal “MadaKids”. MadaKids aims to provide a safe environment for the continued education of the children of Ifaty. Within several weeks MadaKids had enough support from many generous donors and were able to start the rebuilding work. After consulting with the village elders and the Director of the Ifaty School it was agreed upon to share the load of work and responsibilities needed to bring the project to a successful completion. Community support for the project was inspiring with every single family in the village providing either labour and/or locally sourced materials. ReefDoctor’s MadaKids fund went to providing access to professional builders and expensive imported materials needed for the rebuilding project. As of now, the reconstruction is nearing completion, and depending on funding, the ReefDoctor team is hoping to also donate tables, chairs and cooking utensils.

Once again, we would like to thank everyone who donated to this worthwhile cause, you made this project possible and made an immeasurable difference to the lives of the children of Ifaty, thank you and MISAOTROA !



*Cyclone Haruna approaching the South-West coast of Madagascar*



*Happy Ifaty kids posing in front of the building site*



*The progress of the building of the kitchen and the refectory so far*

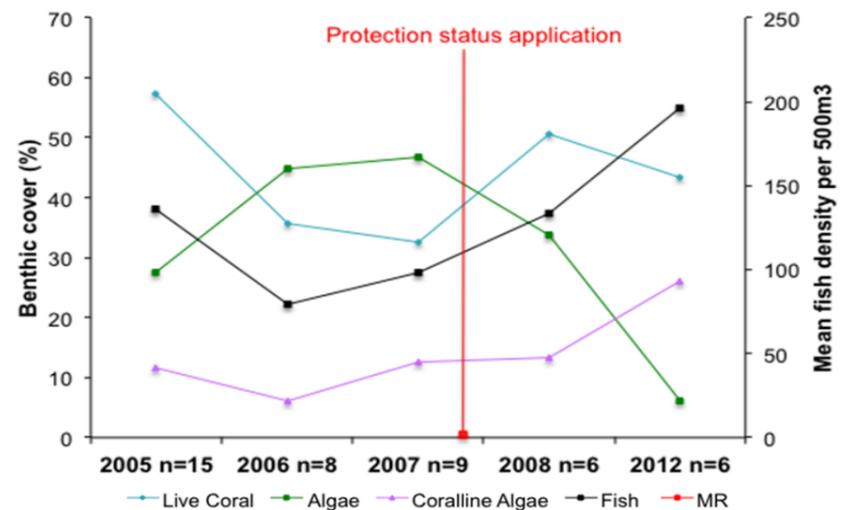
# RESEARCH

## Underwater Visual Surveys Data Analysis

Since 2005, Reefdoctor has monitored changes in fish density, diversity and benthic invertebrate assemblages (flora and fauna of the sea floor) using underwater visual surveys at several sites in the bay. One of the many reasons for this long-term survey program is to observe and record changes of the two community marine reserves formed by the grassroots community fishermen association FI.MI.HA.RA. Rose Garden and Ankaranjelita, established in 2007 and 2009 respectively, are amongst the first community managed marine reserves in Madagascar. Thus, it is extremely important to document the progression of these reserves to provide the community with scientific information to make informed management decisions. Research collected over this time period by ReefDoctor shows that the oldest marine reserve, Rose Garden, has had a significant in-

crease in fish density, including a 15-fold increase in commercially important species. The coral cover at this site remained stable over the 6 years of protection, while coralline algae significantly increased—a shift that could benefit coral recruitment in the future, as chemical cues from this algae is known to induce coral settlement. Assessments of the benthic flora and fauna indicate a reduction in algae suggested to be associated with the increase of herbivorous fish. ReefDoctor hopes that this will increase the resilience of the reserve over the next few years as global environment change is predicted to have a negative impact on tropical reef systems.

The comparison of marine reserve data with other non-protected sites located in the south of the bay highlighted that Rose Garden had the highest fish density. Within non-protected sites, our analysis also showed that reefs in various states of degradation



The graph shows the changes in fish density and benthic cover over time at Rose Garden

(coral cover <10%) could not sustain a high abundance of large bodied fish. As a result, the persistence of these states in the region will continue to remain a problem for local fisheries.

Marine reserves, as a conservation tool, have proved their efficiency worldwide. However, in a country like Madagascar where

livelihoods are highly dependent on natural resources, reserves alone are unlikely to be sufficient to sustain functional coral reef and lagoon ecosystems. Hence, ReefDoctor is working on the development of further management strategies to ensure sustainability.

## Marine Benthic Habitats Mapping

Geographical Information System (GIS) is a computer-based system that analyzes and displays temporal and spatial data. The use of satellite images can help conservation decision-making, such as defining productive coastal ecosystem in need of protection, or in detecting threats like siltation and pollution, which can greatly affect coral reef ecosystems. Monitoring the different habitats of the Bay, includ-



One of the satellite images used for mapping

ing inter-tidal habitats (e.g. mangrove and seagrass meadows) facilitates efficient coastal resource management. Data collected from recent ground-truth surveys combined with high-resolution IKONOS satellite images will be used to create the first benthic habitat map of the Bay of Ranobe. IKONOS images were generously provided by the GeoEye Foundation to the Direc-

tor, Shane Abeare, through their imagery grant program.

## Fisheries surveys expansion



Local ReefDoctor staff at the weigh station of Ifaty

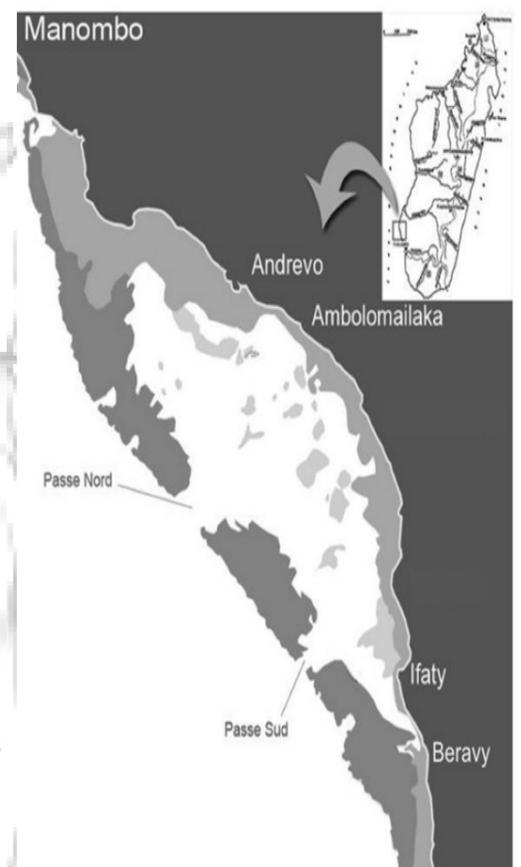
On a global scale, overfishing is considered one of the greatest

threats to marine ecosystems. However, in many parts of the world, the extent of the problem is largely unknown, due to a lack of basic research.

Given the lack of reliable fisheries-related data and information for much of Madagascar, ReefDoctor has started a bay-wide fisheries survey project. Funding for our project was kindly provided by the PADI Foundation. Our new fisheries team now tours the bay every month, moving between weigh-stations we have set-up in various vil-

lages, assessing gear type, fishing grounds, day and night-time fishing activities, and species identification and weights.

It is hoped that the valuable information collected during the course of this project will greatly assist in creating the first fisheries management plan, for the Bay.



Map of the BRB showing the four biggest fishing villages

# EDUCATION AND OUTREACH

## Public Health and the Environment — Salama Soa Project



*Christina, ReefDoctor staff, fully trained to provide free contraception access to local women*

Since October 2011, the Salama Soa has been providing free access to contraception in order to empower women to manage their reproductive status. In the last 6 months, we noticed an increase in younger women participating in this service, whom also are spreading the message of empowerment throughout the area. Informal interviews conducted by the project leader, Christina Tsima, shows that given the choice, women value the ability to control of the planning of

their families. Since January 2013, we have recorded more than 10% increase in the number of contraceptive units dispensed over the same time-frame last year – a small but positive increase.

Since January 2013, all long-term contraceptives have been made freely available to every women in the region. Contraceptive injections provide three months of protection, alleviating the pressure of women to repeatedly take medications.

The aim of this project is to provide protection for as many families as possible throughout the region. In addition, at some point in the future, ReefDoctor hopes to provide pre-natal care, counseling, and education to ameliorate the existing health care services in Ifaty.

## Socio-Economic Surveys on the Local Fisheries of the Bay of Ranobe

Agriculture and livestock production have become difficult livelihoods in southwest Madagascar due to the increased aridity, deforestation, and land degradation. As a result, people that once worked the land turn to the coastal resources for subsistence. This migration trend to the West coast puts additional pressure on the reefs and lagoons, as local fisheries still remain the main source of income for local communities. To better understand this phenomenon, ReefDoctor has implemented a new socio-economic

survey to evaluate the pressure of the fisheries on the local marine environment and their economical value.

Our new socio-economic surveyor, Pierre Angelo Rabearisoa, is recording information about the immigration history of fishermen, their lifestyle (cf. number of children, age), and the price at which catches are sold. He is following the fisheries team to the four biggest fishing villages in the Bay every month to obtain this important information. Understanding how fisheries impact

ecosystems, how they evolve through time, and their economical value is critical to implement better management strategies and to improve the livelihoods of communities dependent of these ecosystems.



*Fishermen back from a day fishing in Ambolomailaka*

## The Women's Group Supported by ReefDoctor



*Some of the embroidered items for sale at ReefDoctor*

The women's group is based in the village of Tsvionoe. These women mostly subsist by making baobab honey, and therefore have small monthly revenue. ReefDoctor is helping them develop small projects in order to provide an alternative source of income over the short-term as well as ease overfishing problem over a longer-term view by creating diversified sources of income. The main activity of the women's group is to embroider various items such as table linens, pill-cases and bags to sell to tourists and ReefDoctor's volunteers. With

the profit made from these sales over the past months our project leader, Christina, was able to purchase a new sewing machine for the leader of women's group, Atsima. With the training and support she has received from ReefDoctor, Astima is now more independent and will be able to teach other women in the region her acquired knowledge. We hope to replicate this success throughout the Bay of Ranobe.



*Christina, Salama Soa project leader, teaching how to use the sewing machine,*

# CONSERVATION

## Fano Project

The marine turtle fishery represents an enormous wealth, culturally and economically, to the Vezo community, yet concerns are being raised over the sustainability of this practice. ReefDoctor's evaluation of the marine turtle fishery over the past 5 years indicates that the capture, trade, and the wholesale of turtle meat is widespread; turtle meat has a high economic value and all segments of society are partaking in its consumption. All five species of marine turtle present in Madagascan waters are targeted by



*A Vezo family preparing their dinner, which traditionally includes sea turtle*

hunters, however, the green turtle, *Chelonia mydas*, dominates the catch (97%). Estimates of annual income indicate an increase from 5,365 USD in 2009 (1.48 USD per kg) to 12,200 USD in 2012 (2 USD per kg). Over the same time period, average length decreased from 78 cm in 2009 to 69 cm in 2012; the capture of larger individuals has become increasingly rare.

ReefDoctor has been pioneering an innovative conservation approach to protect marine turtle

populations through the empowerment of the indigenous populations. The association FI.MPA.MI.FA synthesizes indigenous knowledge into a fisheries management framework, focusing on reducing the illegal exploitation of marine turtles by the 20,000 people that reside in the Bay region.

## Ecosystem-based approach to conservation of the Bay of Ranobe

Coastal and terrestrial ecosystems are closely linked and provide valuable services such as natural shoreline protection from storms and are a source of various food resources. The aim of conservation is to preserve these valuable ecosystem services along with biodiversity in order to meet ecological, economic and social objectives.

In the Bay region, two other NGOs, Ho'Avy and Honko, work on the restoration of terrestrial and

mangroves forests, respectively. Together with ReefDoctor, these NGOs are in the process of signing a Memorandum of Understanding, which unifies the three organizations in the pursuit of an ecosystem-based approach to conservation and management. The first step with regard to this partnership is for ReefDoctor's staff and volunteers to help replant trees in these already degraded forests. This union will hopefully evolve towards integrating

organizations, communities and stakeholders to plan conservation actions aiming at increasing the resilience of all ecosystems in the BRB area.



*Partnership among NGOs in the BRB – a first step toward an ecosystem-based management plan.*

## Monthly Beach Clean-up - Project AWARE



*ReefDoctor's volunteers and staff after a monthly Project Aware beach clean-up*

Since January, the Project Aware beach clean-up project at ReefDoctor has made great progress. In the first week of every month on-site volunteers and staff spend a day out at the beach collecting accumulated debris. A categorization method has been introduced in which different types of debris are classified and the weights for each category are recorded (e.g. plastic, cloth fragments, glass etc.). This allows ReefDoctor to properly monitor their density over time and to see whether our actions will have a sig-

nificant impact on the state of the beach. At this point, a total of 294.5 kilograms of rubbish has been collected, recorded, and removed from the ocean!

In the coming months our aim is to increase the participation of local people, especially children, and make some simple signs to teach them about environmental awareness. Everyone is enthusiastic to push the project forward and improve the environment one step at the time.

# HELLOS AND GOODBYES

## Thank You



*Dominic Stewart-White, Dive Officer*

Reef Doctor would like to bid a fond farewell to the following persons:

Dominic Stewart-White (20) served as our Senior Dive Officer during his 6-month stay here and brought his unique sense of humour and tireless work ethic to the job. We wish him all the best for his future and in his career in diving.

Tom Gray (22) completed his Dive-master Internship and assisted the science team greatly, during his 9 months with us. His easy-going nature and talent for making others laugh brought a sense of warmth to the camp that was



*Tom Gray, intern*

appreciated by all. He will no doubt succeed in his pursuit to further his studies in the field of Marine Biology upon his return to England.

Last but certainly not least, we would like to acknowledge all the volunteers: Laura, Alex, Jenna, Philip, Amaya, Ian, Emily M, Emily S and Marcus who have come and gone in the last months, and thank them for their contributions to Reef-Doctor's mission.

## Welcome !

ReefDoctor would also like to welcome new staff members.

Pierre Angelo Rabearisoa (28), from Antananarivo, joined us as a Socio-Economic Investigator on our fisheries surveys. After his Master in Animal Biology and Ecology from Antananarivo University, Angelo took part in surveys led by BIODÉV and WWF around Madagascar to monitor bird's species and populations in possible new protected areas.



Lucy Fisher (25), from the UK, joined the science team as a new Science Officer. She holds a BSc in Marine Biology from the University of Plymouth and this, coupled with her previous experience working in marine conservation programs in Mozambique, Cambodia, and the Philippines will no doubt make her a valued member of staff.

Douglas Hawkins (49), Sean Forsyth (26) and Tom Lea (24) have come to us to complete our Divemaster Internship.

Sean joins us from South Africa and will be here until the end of October.

Douglas is from the UK and will stay with us until the end of the year and Tom is from Australia and plans on spending 12 months with us until mid-2014.



Three local research assistants were hired to run the fisheries surveys: Emmanuel Pepin (26) from Ifaty, whom has already worked with ReefDoctor in the past, Francois Mima (26) from Ifaty, and Lydia Flontherine (21) from Tulear.



**REEF DOCTOR**  
RESEARCH EDUCATION  
CONSERVATION



ReefDoctor was established in 2001, and began working in the BRB, Southwest Madagascar, in 2002. Initially inspired with the vision of helping local populations restore their heavily degraded coral reef habitats, founder Roderick D. Stein-Rostaing and Daniel Presman began experimenting with coral reef restoration techniques. Since, the mission of ReefDoctor has expanded to include marine conservation, fisheries management, and community development.



Resources is the biannual newsletter produced by the nonprofit organisation, ReefDoctor

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## Visit ReefDoctor

As part of our mission, ReefDoctor promotes the conservation of coral reef ecosystems through education and outreach, thus we are opening our doors to the general public. Come visit us in Ifaty and take part in one of our customizable dive packages designed to introduce the public to our work and to marine conservation in the BRB.

## UNDERWATER NATURALIST

Enjoy a day out with ReefDoctor and meet the hard-working science team who will provide you with a tour of the most visited marine reserve in the Bay, the Rose Garden Community Reserve. For those who are already certified divers, the tour will be conducted using scuba, otherwise, a snorkel-based tour may be arranged.

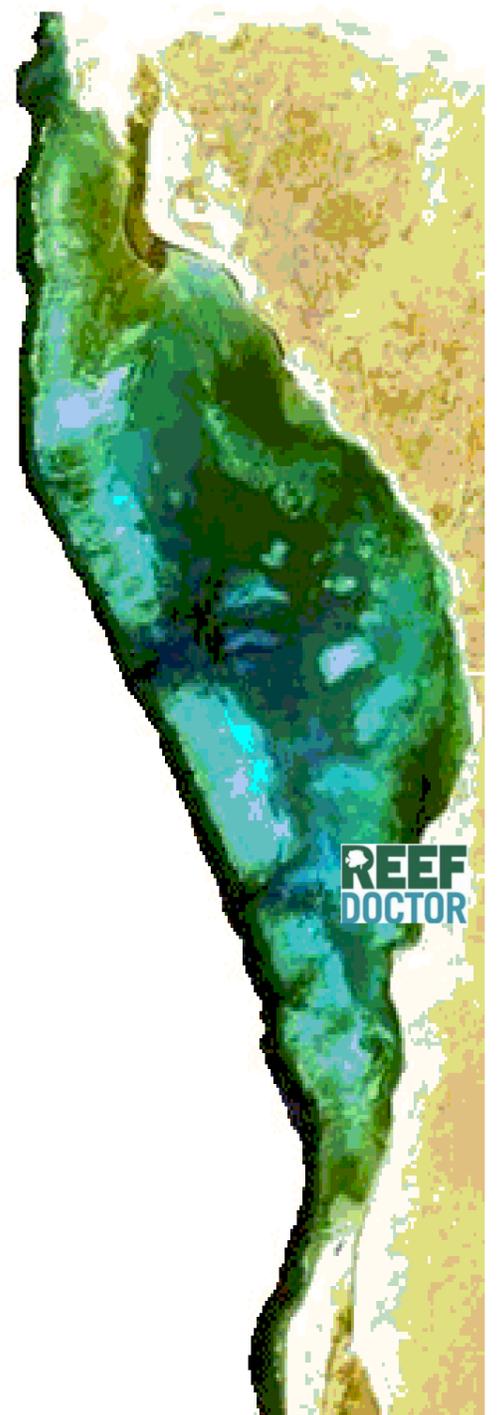
Suggested donation: \$50 - \$75 USD

## UNDERWATER ADVENTURER

Come and explore the underwater coral reef world of the BRB more thoroughly by participating in a single, or multi-day, diving expedition. The Underwater Adventurer programme includes exploring multiple dive sites in the Bay with the option of obtaining a PADI diving certification from one of our experienced PADI instructors.

Suggested donation: dependant on the number of days and dive certification requirements; contact us for further details

*Please be aware, as an NGO we ask all visitors to cover their costs and to support one of our many conservation / development projects by providing the suggested donation amount.*



To learn more about our work visit our website:  
[www.reefdoctor.org](http://www.reefdoctor.org)