

Case Studies of the 2005 Seed Award Recipients

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Partnership for Community-Run Marine Protected Areas in Madagascar

Full Version



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For a short version of this case study, please consult the Seed Initiative Partnership Report 2006 "Partnerships for Sustainable Development: On the Road to Implementation" at www.gppi.net/partnershipreport.

Partnership for Community-Run Marine Protected Areas in Madagascar

The Partnership for Community-Run Marine Protected Areas in Madagascar seeks to combat coral reef and marine life degradation in Andavadoaka, Madagascar, whilst sustaining the livelihood of the local fishing communities. NGOs, research institutes, a fish export company, and local fishermen have come together to implement a regenerative no-take zone, to devise strategies for marine conservation, and to build the foundations for eco-tourism.

BACKGROUND

The southwest coast of Madagascar is one of the West Indian Ocean's largest coral reef systems, stretching across 300 kilometres of coastline. The coral reefs, mangroves, lagoons, offshore islands and sea-grass beds are home to a wide number of plants and animals: over 130 species of reef-building corals, 552 species of reef fishes, and over 600 species of sponge. However, this fragile ecosystem has been subject to natural and anthropogenic impacts. Climate change and El Nino-related sea surface warming, pollution, river discharge, and hypersedimentation caused by the loss of upstream forests have resulted in widespread coral degradation. Moreover, as the size of the coastal population has grown rapidly, so has the exploitation of the region's marine resources.

Over-fishing is a threat to the reef system as well as to the livelihood of the local communities. These communities, largely poor, depend on fishing as their major sources of income. For centuries, fishing was largely at a subsistence level. But recently, this has increased to meet commercial demands. Yet existing methods of collecting sea cucumbers, octopus, fish, and other species for

export are often damaging to the coral reef ecosystem. As demand has grown, new fishing practices have emerged. Net fishing in near-shore habitats – mangroves, intertidal pools, seagrass beds – endangers the survival of reef fishes, who uses these areas as nurseries.

Traditionally, marine and coastal conservation efforts had taken a back seat – the focus was put on terrestrial conservation. The conservation of coastal habitats moved into the limelight thanks Madagascar's environmental plan (NEAP), which identifies the need to engage in the sustainable management of coastal and marine systems. Madagascar's Fisheries Department has taken on marine conservation as part of their strategic plan to ensure sustainable fisheries and the President of Madagascar has pledged to triple the size of protected areas in the country.

CREATING THE PARTNERSHIP

In 2001, Alasdair Harris, of the UK-based charity Blue Ventures, was working with the national marine research institute, *Institut Halieutique et des Sciences Marines* (IHSM), on a research and conservation project in Madagascar.

Much of their work relied on the contributions of short-term researchers, whose output was necessarily limited. This problem got Alasdair interested in designing a research and conservation project that would be managed by the local community and that, one day, could be run without the support of donor money.

To begin such a project, Blue Ventures and IHSM in Andavadoaka would have to collect ecological, socio-economic, and fishing data in collaboration with the local community. This data would provide the foundation for the development of strategies and targets that the local community could use to develop a sustainable environmental strategy for the area. Their goal was to improve the quality of life of the local communities, who rely on the marine resources, whilst maintaining the biological diversity and productivity of the reefs.

One strategy that has been used successfully elsewhere in the world is that of creating 'no-take-zones' which are managed by the local communities. No-take zones are designated areas in which the fishing of a particular species is prohibited for a certain time period. The idea behind no-take-zones is to allow the populations of various exploited species to regenerate to healthier levels: When the no-take-zone is lifted, fisheries are not only presented with a greater amount of marine life from which to fish, but fish with a higher biomass, density, larval supplies and larger carnivorous fish and invertebrates – benefits for both the marine ecosystem and the local fishing community. For example, a rotating no-take-zone system for octopus in Tanzania

dramatically increased average catch size. The idea behind the zones is therefore to ensure that fishing can remain a part of the region's economy while reducing its negative impact on reef environments.

Blue Ventures and IHSM decided to test this approach for the first time in Madagascar. In June 2003, the partners set about finding a site at which to pilot their project. This site was to be an area in which no research had yet been done and where conservation efforts were likely to have a positive impact. The partners eventually settled on the area around the village of Andavadoaka. Andavadoaka, population 1200, is located at the northern end of the Grand Recif barrier reef. The reef and its offshore islands (Nosy Fasy and Nosy Hao) is one of the most remote habitats in the Indian Ocean and renowned for its wealth of biodiversity. The reefs are critical to the livelihood of the local community, the Vezo, whose economy is entirely based on fishing. Commercial fishing arrived to Andavadoaka in 2002, when fish export companies began purchasing fish and octopus from local fishers.

Further partners

Blue Ventures and IHSM have extensive expertise in conducting research on coastal marine habitats. However, they are relatively small organisations and lack detailed knowledge on such issues as coastal management planning. Therefore, they set about looking for partners who would be able to provide additional expertise and resources to their effort.

Their search included gaining the support of Copefrito, a Madagascar-

Mauritius-based fish and octopus export company operating in Andavadoaka. Copefrito began buying octopus, large reef fish (emperor, snapper, grouper), tuna, and mackerel from Andavadoaka in 2002. Copefrito has a history of engaging in humanitarian and sustainable development projects in its area of operation: It has supported a capture limit on cephalopods (octopus, squid, cuttlefish and nautilus) and it has helped fisherman affected by the 2005 Ernest and Felapi hurricanes. In Andavadoaka, a Copefrito employee, Olivier Delpierre, had been working with the local community in Andavadoaka with the aim of setting up a fishing cooperative. Copefrito's support was crucial for the project to succeed. Given its business interest in securing a sustainable stock of fish and octopus on Madagascar's west coast, the company agreed to support the partnership.

The partnership also required an organisation with practical experience in the creation and management of conservation and wildlife areas, including so-called marine protected areas (MPAs), which offer an even more comprehensive protection of marine, plant, and other wildlife in a given coastal area. This partner is the Wildlife Conservation Society (WCS), an international conservation NGO. WCS has been working on conservation projects in Madagascar for over 15 years, engaging in coastal zone management and engaging in research on fisheries, sharks, cetaceans and coral reefs. WCS joined the growing partnership to provide technical and scientific expertise, to help integrate the project into national conservation initiatives, to raise the national and

international profile of the partnership, and to help provide funding for project activities. WCS also possesses an *accord de siège*, a formal agreement with the Madagascar government, that helps WCS work at a national level.

In the process of developing a funding proposal in collaboration with the French Government, WCS brought the *Institut de Recherche pour le Développement* (IRD), aboard the partnership. IRD is a French science and technology research institute that is also based in New Caledonia, Réunion, and Madagascar. The Institute engages in socio-economic research, training and consultancy to enable and support the creation of sustainable development programmes in the developing world. IRD had, in 2004, already done some baseline work in Andavadoaka on the potential impact of eco-tourism on the local communities and they were therefore interested in continuing work in Andavadoaka and contributing their expertise to the development of the partnership.

Following negotiations, the partners agreed on a set of partnership goals and activities and designated responsibilities accordingly.

The first of these is implementation and monitoring of a pilot no-take-zone for the reef flat octopus fisheries. This task is largely in the hands of the local fishing community, though they are assisted by Copefrito, who regulates its purchase of specific species of fish and octopus, WCS and Blue Ventures.

Second, the partners needed to conduct marine and socio-economic research on the effects of the no-

take zone as well as, more generally, on the community and its fishing practices. This research provides the foundation for developing the Marine Protected Area and further no-take zones. As the principal research partners, Blue Ventures and IHSM are responsible for these research activities. WCS provides technical guidance, while IRD contributes information of detailed habitat mapping and input on research design, particularly for socio-economic research. Copefrito assists research activities by making available its catch data.

Thirdly, the partners, spearheaded by Blue Ventures, want to look into eco-tourism as a supplementary income source for the local community. This includes maximising the revenue generated by Blue Ventures' existing volunteer programme and developed further eco-tourism activities from which the community stands to benefit.

Fourthly, WCS is collaborating with various government institutions, including the Fisheries department, to create an "official" protected site (*site de conservation*) and to showcase Andavadoaka as a model for how protected areas can be managed by the local community and improve local livelihoods.

Finally, the partners want to engage in awareness-raising and education on marine conservation, both locally and nationally.

DEVELOPING THE PARTNER-SHIP

Implementing the Marine Protected Area project

Blue Ventures, WCS, IHSM, and Copefrito held a number of meetings and workshops – which are now regular events – with the Andavadoaka community in order to present the idea of the Marine Protected Area and its first project, the no-take-zone. Attendance rates are high, sometimes reaching 300 people – more than a quarter of the village. Local fishermen, concerned about the declining quality of the marine environment, welcomed the idea. Scientific data as well as informal observations from the fishermen have shown a decrease in the average weight of octopus caught in the Andavadoaka region, suggesting over-fishing. Smaller octopuses generate less income for local fishermen.

After 16 months of preparations, on 24 October 2004, the Andavadoaka fishermen signed a traditional law ('*dina*') closing the reef flat around the island of Nosy Fasy to octopus fishing for 7 months starting 1 November 2004. The seven-month period was proposed by Blue Ventures, WCS, and IHSM scientists as an adequate time to sufficiently increase the average size of octopus. Copefrito agreed to increase its price for octopus weighing over 1.5 kg, as an incentive for fishermen to comply with the no-take-zone.

The no-take-zone is guarded by a fisherman from the island of Nosy Hao. The guardian is responsible for the surveillance and enforcement of the *dina*. During the seven-month period, only one infraction occurred. This was penalized with a fine agreed-upon by the local community.

The no-take-zone was reopened during the spring low tide on 6 June 2005. Normally, the Nosy Fasy reefs

are only fished by the communities from the adjacent villages of Andavadoaka and Ampasilava. However, the highly-anticipated reopening attracted 700 to 1000 fishers to Nosy Fasy, some from villages as far as 20 km away. All were hoping to reap the benefits of the no-take-zone by fishing large and valuable octopuses. As a result, octopus fishing was much more extensive than is usually the case, diminishing much of the no-take-zone's positive effect.

Data Collection and Research

Blue Ventures and IHSM researchers monitored Andavadoaka octopus over the course of more than a year, starting in September 2005 (before the no-take-zone was implemented), throughout the no-take period and thereafter. The scientists collaborated with a team of fifteen fish collectors (so-called "sous-collecteurs") in eleven coastal villages of the region. Sous-collecteurs were responsible for collecting a range of data, including the weight of every octopus captured during the twice-monthly spring tide periods; the active periods for octopus fishing. Blue Ventures and the Wildlife Conservation Society have presented their findings at a number of events in 2005, including the Western Indian Ocean Marine Science Symposium and a workshop for socio-economic monitoring of coastal resources in the Western Indian Ocean organised by CORDIO (Coral Reef Degradation in the Indian Ocean).

The data reveal that over 800 octopuses were caught on the first day of the opening of the no-take zone – approximately eight times more than the average number of

octopuses caught in the region on each spring tide before the closure. The closure of the Nosy Fasy reef also produced a very significant increase in octopus weight: during the closure, the average weight more than doubled, increasing from 0.5 to 1.1 kg. The average catch per unit effort (CPUE) increased from 2.2 to 4 kg per fisher per trip.

Unfortunately, the influx of fishers seeking to take advantage of the fruits of the Nosy Fasy no-take zone prevented this benefit from being long-term: Within six weeks (three spring tides) the average octopus weight and the catch per unit values returned to the pre-closure levels.

The data does suggest that had there been a normal fishing effort (100 octopus captured at Nosy Fasy per spring tide, as was the case before the closure), the beneficial effects would likely have lasted longer: approximately 4 months, or 8 spring tides. These results suggest that a no-take zone can increase the productivity and sustainability of octopus fisheries. However, in order for the no-take-zone technique to work, the area must be carefully managed when the zone is reopened.

Strategies

The free rider problem experienced at the Nosy Fasy no-take site did have an upside: Local fishing communities in neighbour villages became interested in establishing their own no-take zones, impressed by the effects it had had in Andavadoaka. Blue Ventures substantiated these impressions by presenting its research results to the Andavadoaka fishing community as well as to fishing communities from neighbouring villages. Fishermen

suggested expanding the Andavadoaka model, setting up a no-take zone for each coastal village. All no-take zones would close for the same period and reopen on the same day. Fishermen from each region would benefit from their local reefs and not feel the need to converge on a single reef site. Currently, Blue Ventures, IHSM, and WCS are engaging in discussion with villages about the feasibility of extending the octopus no-take-zone within the Andavadoaka region.

A further idea is to establish a number of no-take-zones within individual communities, which would "open" and "close" in rotation. Soon after one no-take-zone is opened to fishing, another one is closed in order to allow the octopus on the second flat to settle, grow, reproduce, and reach larger (and more commercially valuable) sizes. Even if the ideas can be put into practice, it will be important to also approach the free-rider problem from a legal perspective. There is currently no law protecting the rights of those fishing communities that invested in a no-take zone. This could be achieved through a permit system, which would allocate access and/or fishing rights among coastal communities in the region.

In order to move these plans forward, Blue Ventures is currently working on expanding the number of staff it has on-site in Andavadoaka and applying for grants that would finance data collection and project management at new no-take zones. Moreover, the SEED Initiative will provide funding for a socio-economic consultant, who will assist the partners in planning their socio-economic and fisheries research programmes and develop the

capacity of local community associations in Andavadoaka and neighbouring villages for coastal resource management.

Lobbying activities

In August 2005, WCS and the Ministry of Fisheries, Livestock and Agriculture hosted Madagascar's first cephalopod workshop in Tulear. The workshop's goal was to develop regulation to increase the sustainability of squid and octopus fisheries in Madagascar. The workshop was well attended by the local and national authorities and NGOs, but most importantly by commercial fisheries companies, fishermen, and sous-collectors from around the country. Scientists from BV (Marc Nadon), ISHM (Daniel Rabinary), and WCS (Herilala Randriamahazo) were able to present preliminary results from the Nosy Fasy octopus no-take-zone.

Following the workshop, the government recommended an annual embargo on octopus fishing in southwest Madagascar from 15 December to 31 January. This period is an important breeding season for octopus, so a fishing ban would give young animals the opportunity to grow. A ban was also implemented on the fishing of octopus below the weight of 350 grams – the average weight at which the *O.cyanea* octopus reaches sexual maturity. Several technical measures were introduced, including a minimum mesh size for squid nets and encouragement for the use of less destructive fishing methods, such as lines and lures instead of spears. A challenge that remains concerns awareness raising and enforcement of the government policy along Madagascar's isolated coastline. The

partnership has welcomed the government's move as a sign of the attention the Andavadoaka project has been generating.

Workshop participants also discussed alternative or supplementary revenue sources, which would be used to compensate the fishing community during the closed period. Proposals included algae farming and the creation of micro-credit funds to finance alternate activities. Currently, the government is looking into means to put these proposals into practice. The IHSM will begin with a pilot project later in 2006 that encourages the farming of sea cucumbers in select communities.

The National Ministry of Fisheries has encouraged the partnership to continue its research and conservation activities in the Andavadoaka region. The partners retain close ties to the Ministries, with a view to possibly expanding cooperation in the future.

Building the infrastructure for eco-tourism

One idea on the part of the partners is to develop eco-tourism as a supplementary income source for the local community in Andavadoaka. Blue Ventures began pursuing this effort in early 2005, by setting up a trilingual (English, French, Vezo) information board in the middle of Andavadoaka that informs tourists (and locals) on the Marine Protection Area and current activities and research. In order to improve services for tourists, Blue Ventures also began a programme of training young villagers to become professional tourist guides in April 2005. The first five Andavadoaka Tourist Guides successfully passed

their course exams in August of the same year.

Blue Ventures is also considering the possibility of building a village-owned and operated hotel in Andavadoaka, which would provide further financial revenue for the Marine Protected Area. Andavadoaka already has three hotels (Coco Beach, Laguna Blu, and Manga Lodge), though these are not owned or managed by members of the local community. Tourism is growing in the region but levels are still low, mainly because of the difficult access to Andavadoaka – it takes several days by car on a poor-quality road to reach the village from Madagascar's capital, Antananarivo. However, the tourism potential of the region is growing, particularly with the creation of a protected area in the Mikea forest adjacent to Andavadoaka and European Union funding for the construction of a paved road to Andavadoaka. The partnership will also explore possibilities of community-owned concessions to private operators as a way of generating incomes for local communities and for enabling high-quality low-impact infrastructure development along the coastline.

Awareness raising on conservation

A long-term goal of the partnership is to enable the villagers to manage the MPA independently and to assist the local community in developing a sustainable environmental management strategy for the area. In order to facilitate these efforts, Blue Ventures' classroom functions as a forum for MPA meetings and workshops. Copefrito and WCS are supporting locals in the creation of a formal fishing cooperative, which

would bring together and represent the interest of local fishermen.

Promoting a bottom-up approach to conservation also requires that community members, in Andavadoaka and beyond, receive training in conservation. Madagascar's Ministry of Education has recently issued a new environmental education curriculum for students aged 8 to 12. Blue Ventures is hiring a local environmental educator to teach this curriculum in schools in the Andavadoaka region. Blue Ventures also runs a scholarship programme which provides university students and NGOs staff from around Madagascar training in the management and monitoring of protected areas. Participants are given the opportunity to travel to the MPA site and attend a 6 week marine science and SCUBA training programme.

The impact of the external environment on the partnership

One of the major external environmental effects the partnership deals with is the geographic isolation of Andavadoaka. However, the government's commitment to creating new protected areas creates a political environment that is very favourable to conservation and from which the Andavadoaka project stands to benefit.

The publicity generated by the Seed Awards, governmental recognition, as well as a grant that the partnership received in December 2004, has had its upsides and downsides. The partners were disappointed by how little the profile of the project was affected as a result of winning the Seed Award.

However, gradually, the partners have been able to raise greater awareness of the partnership. As more external researchers and funders have become interested in the project, the challenge the partners face is to successfully coordinate their activities and to keep the project focused on its primary goals.

PARTNERSHIP GOVERNANCE Structures

The partnership is not a registered entity in itself. Rather, it is structured by a series of bilateral memoranda of understanding (MOUs) between the research partners – i.e. Blue Ventures, IHSM, WCS, and IRD but not the Andavadoaka fishing cooperative or Copefrito. These MOUs set forth the roles and responsibilities of the organisations within the partnership. Some problems have arisen nonetheless. For example, as is often the case in research collaborations, the modalities of data sharing and data ownership are unclear – who has the final "rights" to the data: the organisation collecting the data or the organisation funding the research? Also, may another partner organisation use this data in its reports? However, this is a fairly common problem in many research collaborations.

The partners retain close ties to Madagascar's government, through accords between WCS and the Direction of Fisheries and the Ministry of Environment, Water, and Forests as well as an accord between IRD and Ministry of Higher Education.

The partnership does not have a permanent office. Blue Ventures is the only partner organisation with a permanent on-site research centre and representation in Andavadoaka. This allows BV and ISHM to provide on-the-ground coordination, support, and representation for the project. WCS and IRD offer mostly “punctuated” support on research and conservation activities in Andavadoaka. The partners have employed a Malagasy marine biologist, who helps implement project activities.

Procedures

Partners have regular, mostly bilateral meetings on and off site to coordinate their activities. The local fishing cooperative as well as Andavadoaka village leaders are always consulted and involved in partnership activities. A long-term goal of the partnership is to enable the local community to independently run the Marine Protection Area and to formulate an environmental management strategy for the region. This is why the partners have invested in building the capacity of the fishing cooperative: Blue Ventures has developed its classroom as a meeting house and Copefrito has provided the cooperative with management and quality assurance training. The decision to implement a pilot no-take-zone for octopus was taken by the community itself, and enacted according to a local *Dina* law.

Communication problems have caused some problems between the partners. In part, this can be attributed to the remoteness of the Andavadoaka region: When researchers are on site in Andavadoaka they can only be

reached by satellite phone, making communication difficult and expensive. The partnership is currently developing a website, which will enable partners to exchange information, such as reports, maps, schedules, and some data, more easily.

Finances

Like many conservation projects, the partnership is constrained by a lack of financial resources. The partnership received a grant of 20,000 Euro from the French Government in 2004, which is managed by WCS. The grant money, which is being transferred over a two-year period, is going towards establishing Andavadoaka as an official marine protected area, setting up the fishing cooperative as a legal entity, and extending research on the site.

This joint funding source is significant, yet it does not cover the costs of all activities nor does it provide a sustainable revenue stream to support community-based conservation initiatives. Accordingly, the individual partners bring their own resources to the project in an effort to achieve their common objectives. Blue Ventures conducts a volunteer programme, which brings both funding and volunteer researchers to Andavadoaka.

In addition to administering the French Government grant, WCS has supplied financial, technical, and in-kind resources to the partnership, including a boat. ISHM and IRD contribute to the partnership by sending their scientists to the Andavadoaka site. Copefrito trains the Andavadoaka fishing cooperative and shares its catch data with the

research partners. The Andavadoaka community supported the partnership by implementing and upholding the no-take zone and taking part in the partnership's survey efforts. Efforts to secure a sustainable revenue stream for the partnership and for community-based conservation initiatives through eco-tourism are still in the early stages. Coordinating and implementing this multi-partner effort has been challenging.

The Seed Initiative will support the partnership's research activities by funding a consultant providing assistance on socio-economic and fisheries research and help develop the local community's coastal resource management. Seed is also financing a part-time fundraising consultant, based with Blue Ventures in London, who assists in fundraising efforts.

DEFINING AND MEASURING SUCCESS

Though still a very young undertaking, the partnership is already able to look back at a series of accomplishments. What is particularly noteworthy is the partnership's ability to change the perception and behaviour of people and to promote wide-spread support for conservation among diverse stakeholders in such a short time. The pilot no-take-zone demonstrated to local fishing communities in Andavadoaka and surrounding villages the benefits of sustainable fisheries. Subsequent government policy to improve fisheries regulations reflects the tremendous contribution of the Andavadoaka project to marine biodiversity and conservation in Madagascar.

The partners now plan to open three further no-take zones and to create a permanent marine protected area in the Andavadoaka region as part of the Madagascar System of Protected Areas. The partners hope that, in the future, such no-take zones may be able to function by themselves on a rotating basis. However, it is likely that a certain amount of management will nonetheless be necessary. Copefrito might be able to fund such a management position, as it has a business interest in maintaining a sustainable octopus supply in the Andavadoaka region. Ultimately, the partners hope to replicate – or induce replication – of the Marine Protected Area model in other parts of Madagascar and the Indian Ocean region.

(Information as of April 2006)