

RESILIENCE SOURCEBOOK

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UNDERSTANDING SOCIAL AND ECOLOGICAL RESILIENCE IN ISLAND SYSTEMS
INFORMING POLICY AND SHARING LESSONS FOR MANAGEMENT



CASE STUDIES OF SOCIAL-ECOLOGICAL
RESILIENCE IN ISLAND SYSTEMS

 AMERICAN MUSEUM OF NATURAL HISTORY

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LEARNING THROUGH DOING: THE STORY OF AILAN AWARENESS'S PARTNERSHIPS WITH COASTAL COMMUNITIES

NEW IRELAND PROVINCE, PAPUA NEW GUINEA

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Founded in 1993, Ailan Awareness is a small Papua New Guinean nongovernmental organization that specializes in community-based marine conservation. Below are stories from two of the communities where it has been working. Lovangai, the setting for the first case, is the community from which Ailan Awareness emerged. The founders of Ailan Awareness – John Aini, Bernard Miller Aini, and Michael Ladi – are all from Lovangai and established Ailan Awareness in response to their observations of declining fisheries stocks in their home waters.

The progression of the work in Lovangai illustrates the lessons learned for Ailan Awareness during the organization's beginning years: how it came to its unique approach to marine conservation. The second story, about Pananaru, shows the potential of this approach.

EVOLVING APPROACHES TO MARINE RESOURCE MANAGEMENT ENHANCE RESILIENCE IN LOVANGAI, NEW IRELAND, PAPUA NEW GUINEA

THE SETTING

Lovangai is located on New Hanover Island, at 2° 38'41"S, 150°17'59"E, a 2.5-hour boat ride from Kaveing, the capital of New Ireland Province. Lovangai is home to 1,300 people over the age of 18. People in Lovangai primarily subsist on local resources. The high cost of gas prevents frequent trips to town, but there is often at least one boat from Lovangai in New Kaveing. There are six main villages in Lovangai – three on the coast and three others farther inland, with strong ties of kinship linking the villages. In the highlands, villages farm and raise pigs, and people from all the villages fish.

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THE DISTURBANCE

In 1982-83, when Aini was studying fisheries science in Kaveing, he would periodically come home to Lovangai and saw that fisheries near Lovangai were degraded – reefs were fished out; people had to travel very far in order to catch anything of value, and traditional conservation practices that Aini had followed in his youth had been abandoned. Marine resources for both food and income were in decline. The biggest threat to Lovangai's marine resources was the widespread use of poisonous derris root (*Derris elliptica* and others) for fishing. While derris root was used to harvest specific fish species for food or for sale, it harmed everything in the reef ecosystem, including corals. In the past, derris root had been used very infrequently and only a few individuals within the community would have had the knowledge and the right to use this fishing technique. With the deterioration of the traditional governance system (the Pasingan system) through the influence of

Catholic missionaries, however, more and more people were using the poison to fish, leading to widespread degradation of the reef ecosystems. Locals in Lovangai informally observed the effect of the uncontrolled use of the derris root – dead corals, decreased numbers of fish, and a decrease in the diversity of fish present in the reef. Aini's cousin, Michael Ladi, and his brother, Bernard Miller Aini, also perceived these problems and the three of them decided to work together to do something themselves rather than wait for the government to do something. This was the genesis of Ailan Awareness.

THE RESPONSE

The Aini brothers and their cousin, Michael Ladi, with the assistance from youths at Lovangai, decided to intervene to stop the derris root fishing in order to allow the reef ecosystem to recover. They enforced these restrictions by hiring a group of young men (“thugs” in Aini's own words!) to prevent people from fishing in the area through physical intimidation. In addition, these youths also wrote songs to increase awareness about conservation issues in Lovangai. The Aini brothers and Ladi were able to implement this kind of a heavy-handed strategy because of their kin group's standing in the community.

Over time, however, Ailan Awareness's approach to reef conservation in Lovangai evolved. For instance, on a trip to Samoa and Vanuatu sponsored by the Commonwealth, Aini learned about community based natural resource management while exchanging experiences with individuals in these countries facing similar issues with respect to fisheries. In 2005-2007, during a project with the Asian Development Bank, Aini was inspired to modify Ailan Awareness's approach in Lovangai: first, he needed to create a written community management plan, and second, he needed to engender community buy-in for the plan, not just chase them off the reef. Over time, Ailan Awareness also recognized that the inland villages, not just the coastal village, needed to have a role in the management of the reef, as members of the management committee.

Since 2009, the reef has been managed according to a community based management plan. The approach in Lovangai is to promote eating from the reef, while respecting the reef ecosystem. Ailan Awareness lets people know which ages of fish can be harvested while maintaining the stocks, not to take lobsters with eggs, and not to use derris root. Over time, the management committee has introduced small no-take areas in the reef. Concurrently, Ailan Awareness works to raise awareness in schools with the Lovangai's children. Ailan Awareness has also been working to revitalize traditional management practices in Lovangai. For instance, in June 2013, the management committee began the ceremonial requirements for constructing a traditional fish aggregating device, called polepole. The practice of polepole has not been common in Lovangai since the late 1960s.

While some community members still use derris root to fish clandestinely at night, the reef is in better shape than it was in the past. Fishermen report that catches are improving – including emperor fish (*Lethrinus* spp.) and snappers (*Lutjanus* spp.) using hook-and-line.

Ongoing challenges for Ailan Awareness in Lovangai are the relatively high population, increased consumption of fish, and the loss of traditional conservation practices. In the past, people would eat fish only rarely, master fishermen directed all fishing, and the catch was communal and shared within the community. Today households want to eat fish much more frequently – everyday.



Photo credit: Scuba Ventures, Kavieng

Households fish individually and the expert fishing knowledge has eroded – hence the reliance on derris root, which does not require the same expertise as other fishing techniques. In addition, there is tension between the upland villages and the coastal village. The upland villages used to rely on freshwater fishes, but they have overfished in nearby rivers and streams and so increasingly fish on the reef.

FLEXIBLE MANAGEMENT ENHANCES RESILIENCE IN PANANARU, NEW IRELAND, PAPUA NEW GUINEA

THE SETTING

Located at 2°59'34" South Latitude and 151°18'38"E West Longitude, Pananaru is a reef area on the western coast of New Ireland, near the village of Belifu. Belifu is a small community of 250 people about 2.5 hours by car from Kaveing, the capital of New Ireland. People in Belifu are primarily subsistence fishers and farmers, relying on the good soil and growing conditions found right up to the coast on the western coast of New Ireland. In addition, individuals from the community work in nearby mines and oil palm plantations and send home money to their relatives in Belifu. Historically, there was a robust market for sea cucumber (sometimes also called *bêche-de-mer*) across all of New Ireland, but due to overharvesting, the sea cucumber fishery has been closed since 2009.

THE DISTURBANCE

In the late 1980s, logging operations close to Belifu caused major damage to the community's reefs and sea grass beds. In building infrastructure for the logging operation, bulldozers crossed over the reef. In addition, a jetty was built for loading logs onto boats, which split the near-shore environment in half, creating murky seagrass beds on one side of the jetty, with the original fringing reef on the other side. Following these perturbations, there was a lot of dead coral in Pananaru's reefs and declines in the numbers of fish species that community members most prized for consumption.

Another problem was governance. Although the Pananaru area used to be managed traditionally,

people from the village were taking resources whenever and wherever they wanted, disregarding traditional clan boundaries. Clan leaders felt at a loss: they wanted to stop overfishing but didn't know what to do because of this lack of respect of traditional rules.

THE RESPONSE

In 2006, villagers from Belifu learned about Ailan Awareness and went to the nearby community of Panakais when they heard that John Aini, the founder and director of Ailan Awareness, was doing a campaign there. After hearing Aini speak, they invited Ailan Awareness to Pananaru to see if they could work together to address the problem of how to restore their declining marine resources.

Over time, through an awareness campaign and a series of consultative meetings, Ailan Awareness worked with people from Pananaru to identify the main problems and ways to address them. While the process built mostly on what community members perceived, Ailan Awareness added some ecological information to the framing of the problem. For example, Ailan Awareness highlighted the role of sea grass beds in the recovery: sea grass beds act as nurseries for many marine species; they also stabilize the sea floor and counteract



Photo credit: Patrick Nason



Photo credit: Patrick Nason

sedimentation; finally, the sea grass itself is a food for some fish species.

The community decided to work with Ailan Awareness to develop a management plan and to set up a management committee. Aini presented different potential structures for doing community based management and the community chose that the committee be made up of traditional managers, the Maimai. In this way, the initiative to restore marine resources tapped into traditional institutions that historically dealt with environmental governance, but had shifted in focus in the last two hundred years more towards political and religious governance.

The management plan implemented different levels and types of restrictions on marine resource use around Pananaru. First, certain types of fishing techniques were prohibited: the use of dynamite and poisons such as Derris root (*Derris elliptica*) were categorically outlawed. Second, fishers were required to ask clan leaders for access to the reef. Third, certain species, like *Trochus* spp., were excluded from harvest in the beginning. Finally, there were spatial restrictions on where people could fish – the community designated strict no-take areas as well as places that were closed during certain seasons. The community determined the placement of these no-take and seasonally closed areas through consideration of both biophysical and socio-cultural factors, with the support of Ailan Awareness.

After just four months of implementing these management strategies, there was a marked

improvement in conditions in Pananaru. Surveys from 2011 and 2012 show that corals were growing, the sea grass was getting healthier, and the number and size of sandfish (*Holothuria scabra*) and lollyfish (*Holothuria atra*) increased. Deep-water species of sea cucumbers, such as white teatfish (*Holothuria fuscogilva*), have been observed close to Pananaru. Improvements were observed on both sides of the jetty, albeit with different organisms thriving in the different conditions created by the structure. For the first time in years, community members have seen a school of scads (*Selar crumenophthalmus* and *S. boops*) at the end of the jetty.

Today, the management committee is very effective; community members generally comply with the rules of the management plan and actively seek out the management committee for permission to fish under special circumstances. For example, the management committee members will negotiate with individual community members if there is a request to open the fishery to raise money for an upcoming wedding or to pay for school fees. The management committee – and the customary management structures – are reinforced and strengthened by meeting community members' social obligations through this flexible approach.

LESSONS LEARNED AND RECOMMENDATIONS

- Because Ailan Awareness only responds to community requests and does not actively seek out new sites to work in, communities are already primed to consider the issues of marine conservation when they begin to work with Ailan Awareness. These issues are already important and salient to communities before Ailan Awareness comes in; therefore Ailan Awareness is responding to a recognized need rather than imposing its own perspective on the community.
- Flexible management reinforces the management institution and is therefore more effective in the long run while there may be some trade-offs in terms of how quickly the biological communities are able to recover. Overall, Ailan Awareness perceives less cheating in communities with

- more flexible management committees than in those with more strict committees.
- Open relationships with funders have enabled the success of Ailan Awareness in New Ireland. By being open to changes in Ailan Awareness's projects over time, funders have allowed Ailan Awareness to learn from the projects as they went along.
 - Recognizing the strong ties between the coastal and inland villages is key to Ailan Awareness's effectiveness. Ailan Awareness implements conservation education in inland villages as well as in coastal villages since inland villages also use marine resources. While coastal and inland villages are geographically distinct, socially they are integrated so the work to conserve marine resources must occur in both places.

FUNDING SUMMARY

- The Christensen Fund
<http://www.christensenfund.org>
- Asian Development Bank
<http://www.adb.org>

LEAD ORGANIZATIONS

- Ailan Awareness and New Ireland communities
<http://ailanawareness.org>

PARTNERS

- Departments of Anthropology:
Barnard College
<https://anthropology.barnard.edu>
Columbia University
<http://anthropology.columbia.edu>

As told to Georgina Cullman.

THE MILSTEIN SCIENCE SYMPOSIUM

The collection of this case study and others like it results from the April 2013 Milstein Science Symposium, Understanding Ecological and Social Resilience in Island Systems: Informing Policy and Sharing Lessons for Management. Held at the American Museum of Natural History, the Milstein Science Symposium convened local resource managers, researchers, educators, island leaders, policy makers, and other leading conservation practitioners to examine characteristics, qualities, and processes that may foster resilience for coastal and marine systems as well as explore interactions, linkages, and feedback loops in complex social-ecological systems and what this means for management. The Milstein Science Symposium was organized in collaboration with The Nature Conservancy, the Gordon and Betty Moore Foundation, the National Science Foundation, The Christensen Fund, the Coral Reef Alliance (CORAL), the Scripps Institution of Oceanography at the University of California San Diego, the University of California Santa Barbara, the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States (UN-OHRLS), and the Wildlife Conservation Society.

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