

## Community-Based Coastal Resources Management of Apo Island, Negros Oriental, Philippines: History and Lessons Learned



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**Name of the Site:** Apo Island, Dauin Municipality, Negros Oriental, Philippines

### **Brief History of the Site and its Management Objectives:**

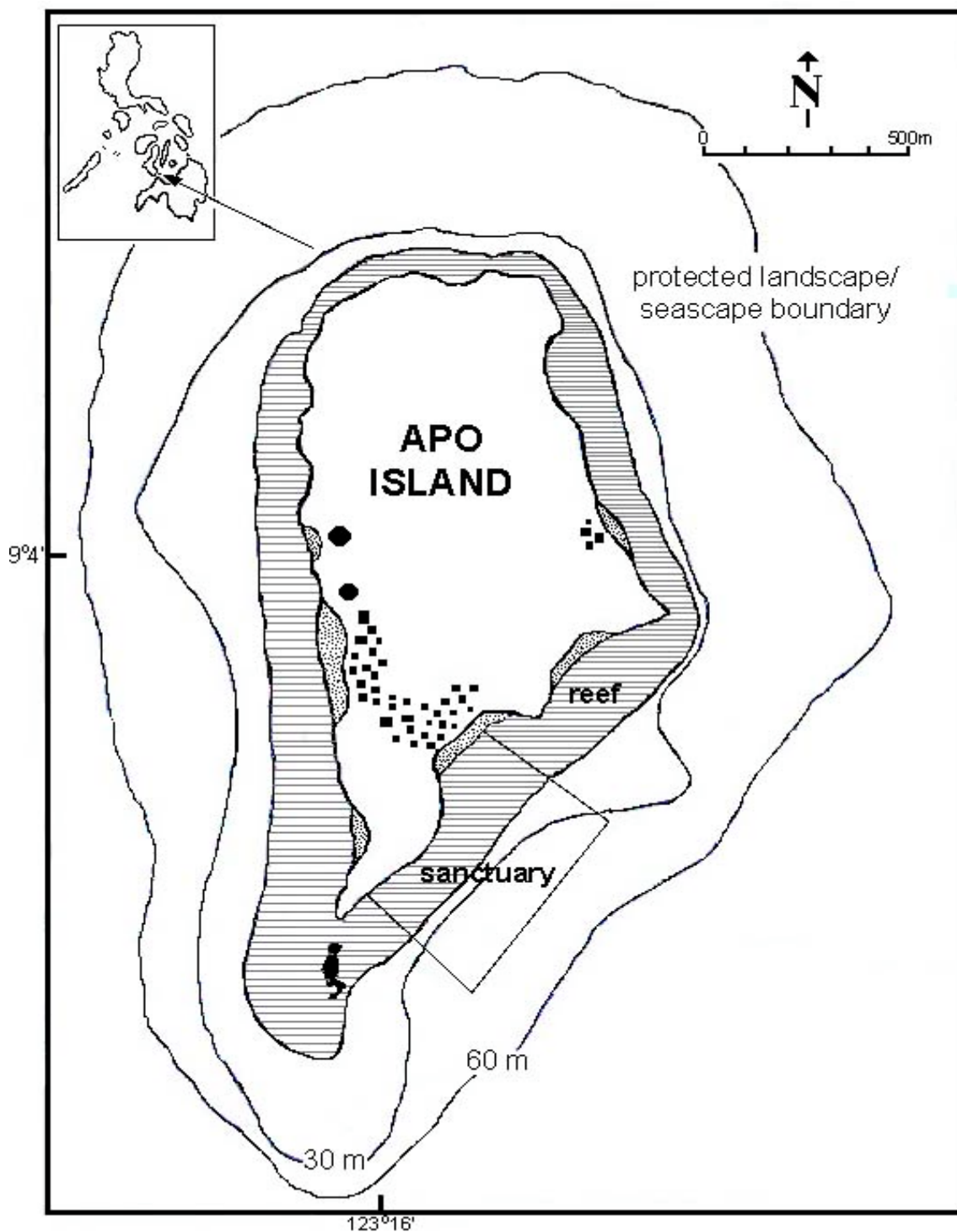
Apo Island (9°4'N, 123° 16'E; Fig. 1) is a 74-ha steep volcanic island, rising 200 m above sea level. It is located in the Mindanao Sea, 25 km south of Dumaguete City, the capital of Negros Oriental. It is surrounded by a fringing reef covering 1.06 km<sup>2</sup> to the 60-m isobath. There are 2 small villages/settlements located along the periphery of the island, home to approximately 700 inhabitants (Maypa unpubl. 2001 census). The island falls under the political jurisdiction of the municipality of Dauin, the nearest town on the island of Negros (approximately 30 minutes by motorized pumpboat from Apo). The no-take Marine Reserve is on the southeast side, covering a 0.45 km stretch of reef, slightly less than 10% of the total reef area (Russ and Alcala 1999).

In the 1970s, small-scale dynamite and *muro-ami* fishing (smashing coral heads with rocks to scare fish into a net) were practiced on Apo Island (Savina and White 1986). Silliman University Biology faculty facilitated the Marine Conservation Education Program initiated in 1976, using a non-formal approach to gain the support and interest of the community in conservation (Cabanban and White 1981). The program consisted of slide presentations showing the benefits of conservation vs. destructive fishing, and the ecology of coral reefs and reef fish (Alcala 2001). The concept of the community as principal stakeholder of its own resources was introduced during this early stage. As a result of this program, the community began discussing prohibition of destructive fishing practices, and eliminating fishing totally within a “no-take” area. A 0.45-km stretch of reef was formally set aside by the community as a sanctuary in 1982. This was supported by a written agreement between the municipality of Dauin and Silliman University.

The Marine Conservation and Development Program (MCDP; White and Vogt 2000) began in 1984, and included Apo as a target site. A comprehensive management plan for the island developed out of this, initiated in 1985. This plan formalized the “no-take” sanctuary and declared the entire reef to 500 m offshore a marine reserve, allowing only traditional non-destructive fishing methods (Russ and Alcala 1999). Emphasis was on encouraging tourism as a supplemental source of income for local residents, protecting fish habitats, and banning non-residents from fishing within Apo. This plan was approved by Municipal Ordinance in Dauin on November 3, 1986. At this point, a Marine Management Committee (MMC) composed of local residents was set up to maintain and enforce the regulations of the sanctuary and reserve. During this period, two community organizers from Silliman University were assigned to the island to work with the community. The MMC managed the reserve and sanctuary until 1994, with enforcement assistance provided by the Philippine National Police (formerly the Philippine Constabulary) and technical advice from Silliman University (Alcala 2001). Apo was also a Coastal Environment Program site, under the DENR, in 1993. Under this program, the island was reforested, and mangroves were planted in the lagoon.

In August 1994, the island was declared a Protected Landscape and Seascape by Presidential Proclamation No. 438, and placed under the National Integrated Protected Area System (NIPAS). The move to place Apo under the NIPAS program was recommended to President Fidel V. Ramos by Dr. Angel Alcala and others involved in its management at the time (A.C. Alcala, pers. comm.). Management was turned over to the Protected Areas Management Board (PAMB) of the national government. The Board created a system of fixed fees for visitors, which were collected by members of the community, and standardized rules and regulations. Members of the local *Bantay Dagat* (“watchers of the sea”; a fisher’s protection enforcement group) were deputized to enforce these rules. The flow of visitors could then be more closely monitored, as all boats were required to check in and pay fees immediately upon arrival at the island. PAMB mandate stated that 75% of tourist-generated income would be channeled into development projects that the community selected to improve their

quality of life, with 25% going to the national treasury. This arrangement was meant to ensure that the maximum number of community members would benefit from tourism income.



**Figure 1.** Map of Apo Island, showing current NIPAS boundaries of the Protected Landscape and Seascape, and the “no-take” 0.45 km sanctuary on the southern side of the island. The two villages are marked with ■ symbols, while the resorts are symbolized by ●.

### **Management Authority:**

Apo is currently managed by PAMB. The Board consists of the DENR Regional Executive Director, currently represented by the PENRO (Provincial Environmental Officer), the Provincial Planning and Development Officer, one representative from the municipality of Dauin, Apo's *Barangay* Captain (the elected village leader), and representatives from various NGOs: Dr. H. Calumpang and Atty. M. Maxino of Silliman University, and two representatives of Apo people's organizations. PAMB works by majority vote, and members serve for five-year periods without compensation. Members are appointed by the national DENR office (see below; CBSI 1999) and meet as needed to address issues as they arise. The Board decides on allocation of funds, and addresses all issues regarding management of the protected area. PAMB was formally organized in 1997, and the current system of management and collection of fees was instituted in late 1999. There was, therefore, a five-year time lag between Apo's declaration as a NIPAS site and the implementation of PAMB. This was primarily because it has taken some time to get the NIPAS program organized and running; PAMB met only twice a year for the first two years.

### **Successful Management Schemes:**

Apo's resources have been managed successfully for approximately 20 years. The Marine Management Council (MMC), chaired by the *Barangay* Captain and composed of members of the Apo community, was the original community-based managing body. The MMC enforced fishing rules to the extent it could under the authority of local government, mediated management conflicts, collected a modest tourist fee, and made decisions regarding how tourism revenue was to be allocated within the community. It served this purpose from 1986 to 1999. Under the MMC, Apo was managed under the Marine Protected Area (MPA) model (Eisma 2002); a municipal reserve established by local government, which included a "no-take" sanctuary, bordered by a fished buffer zone. Management of the sanctuary and surrounding fished waters was participatory, with the community meeting regularly to discuss issues as they arose. The occasional presence of personnel from the local police and DENR strengthened enforcement. Today, the role of the MMC has been drastically reduced; it mainly manages the community building on the sanctuary site, receives donations for community projects, and does not meet on a regular basis.

Figure 2. Participatory management at Apo.



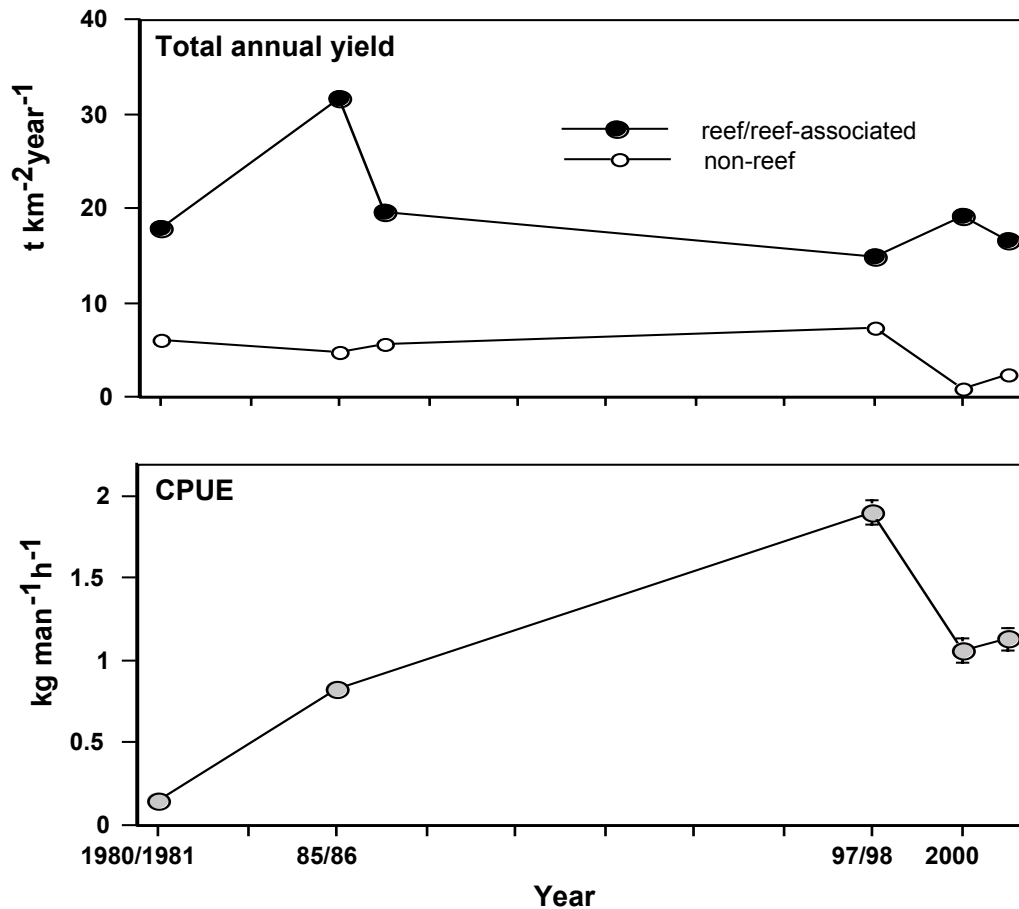
The declaration of Apo into the NIPAS scheme was thought to be a positive move that would result in better management. With the inclusion of Apo into NIPAS, the management approach changed from a purely community-based participatory scheme, to one structured according to the national framework. However, the composition of the PAMB allows for participation of community members; four out of nine current members are Apo residents. It is probably too soon to draw conclusions

regarding the success or failure of PAMB as a managing board, as it has only been fully implemented since December 1999. There may be impacts of reducing the decision-making capacity of Apo residents, to be placed in the hands of a Board where more than half of its members are not from the community. Some residents (particularly those belonging to the political party opposing that of the Barangay Captain) have expressed concern that they do not feel well represented (A. Maypa, pers. comm.). On the other hand, other individuals support the PAMB because they feel that the mixed composition of the Board prevents social and political alliances and rivalries from driving management decisions. In addition, placing Apo into the NIPAS framework increases the level of support the community can draw upon for establishment and enforcement of management regulations. This is of particular importance, as impacts from increasing tourism pressure are starting to affect reef health (Calumpong and Reboton 2000).

It is often difficult to define and quantify "successful management". In the Apo community, signs that the community is prospering in a sustainable way can be seen in the steady increase in the standard of living, evidenced in the growing number of houses made from cement, rather than bamboo and wood. Population size has remained fairly constant over the past ten years, and residents have a working knowledge of family planning and birth control. But the most compelling evidence of successful management of Apo can be seen in fish catch data. Maypa *et al.* (2002) reported that fish yields of 19-25 t km<sup>-2</sup> year<sup>-1</sup> have been maintained for the past two decades (1980-2001; Fig. 2). Catch per unit effort (CPUE) for hook and line fishing has steadily increased over the twenty-year period, from a mean of 0.15 kg man<sup>-1</sup> hr<sup>-1</sup> in 1980/81 to 1-2 kg man<sup>-1</sup> hr<sup>-1</sup> in 1997-2001. The authors argue that these figures are sustainable in the long term, as the reef is actively accreting and the majority of the catch is of planktivorous fish, caught using non-destructive methods. Studies on Apo fishery management have presented some of the first evidence that Marine Protected Areas can contribute to creating a sustainable fishery. Evidence of this sustainability can be seen in increased catch per unit effort, decline in fishing effort, and a change in fishing patterns; drift gill-nets, used in deeper offshore water, are no longer commonly used, as reef fish is more available and fishers stay closer to home (Maypa *et al.* 2002).

Tourism has undoubtedly had a positive impact on the community; Alcala (1998) estimates the reef earns a revenue of US\$500 ha<sup>-1</sup> yr<sup>-1</sup>. Prior to the institution of PAMB, tourism revenue was estimated at \$116 mo<sup>-1</sup>; the implementation of the PAMB fee system has generated mean monthly revenues of \$3,741 (Cadiz and Calumpong 2000). Supplemental income from tourism has also probably contributed to the observed decline in fishing effort (Maypa *et al.* 2002). However, the growing number of tourists visiting the island has impacted the reef, and pressure from boat owners, dive operators and resort owners make it difficult to impose restrictions of visitor number (discussed further, below).

A unique feature of the Apo experience is that, unlike other communities, enforcement and management does not appear to fluctuate with changes in political leadership; political will and commitment has remained fairly constant over time. During recent local elections, for instance, Mr. Mario Pascobello, the Barangay Captain over the past several years, ran for re-election against a man from a neighboring island involved with a lucrative but highly destructive and unsustainable mollusk harvesting practice. The community was alarmed at the possibility of this individual gaining access to Apo's resources. Pascobello was re-elected by an overwhelming majority (P. Cadiz and M. Aldeon, pers. comm.). In contrast, to the north of Apo on the coast of Negros, the Bolisong Sanctuary was fished intensively immediately after new government officials took office, during a period when policing the sanctuary slacked off. This resulted in a substantial drop in target fish numbers (Reef Check 2001). Similarly, tolerated poaching in the sanctuaries of Cangmating, Negros Oriental (Alcala, pers. comm.) and Tambobo, Siaton (Raymundo and Cadiz, pers. obs.) have resulted in continually low fish biomass. The semi-isolated nature of the Apo community could have contributed to this stability; because Apo is an island, it may be less influenced by political whims on the mainland, even though it is under the political jurisdiction of a mainland town. In addition, strong and continuing technical support from Silliman University has provided direction when the community has become divided over issues that threaten management.



**Figure 3.** Total annual fish catch yield and Catch Per Unit Effort of the Apo fishery (from Maypa *et al.* 2002). Graphs reproduced with permission from the authors.

**Current Legislation:**

The establishment of reserves via Municipal Ordinance is usually the first action taken in protecting a reef area in the Philippines. Apo was originally declared a municipal reserve in 1986 (see discussion above). Authority for declaring such reserves is the Local Government Code of 1991. This Code established the authority of municipal governments to decide on establishing a sanctuary, as the Code places management of municipal waters under the jurisdiction of local government units (LGUs). The LGU has the power to generate its own revenue and manage all resources, within the boundaries of national policy (Eisma 2002). More extensive coastal areas, or those perceived as being of particular importance may be classified under the National Integrated Protected Areas System (NIPAS). NIPAS was approved by Congress as Republic Act No. 7586 (CBSI 1999). It is under the administration of the Department of Environment and Natural Resources, its mandate being to protect areas of unique or outstanding ecological value in a national holistic plan. Apo Island was declared a “Protected Landscape and Seascape” of the NIPAS, under Presidential Proclamation 438 in 1994. Under this law, the DENR established the Protected Area Management Board (PAMB) for each NIPAS area (see description above), whose responsibilities include the following:

- ◆ Characterization of the protected area, to prescribe permissible and prohibited human activities within it
- ◆ Enforcement of a zoning scheme in adjacent sites to further protect the area, which includes specifications of any structures, roads, waterworks, sanitation, etc. to be constructed
- ◆ Review of all management plans pertaining to the area
- ◆ Promulgation of rules and regulations necessary to carry out proper protection and management
- ◆ Deputization of field officers to enforce regulations under the Act, which include exacting fines

for violations of regulations

- ◆ Fixing of fees for people or agencies deriving benefits from the protected area, and accepting donations or bequests

#### **Further Needs:**

Organizational strengthening of the PAMB management mechanism is obviously needed. Although PAMB law dictates that 75% of the income from fees collected is automatically relegated to the community, with 25% allocated to the national government, all money must first pass through the national treasury, and will only be channeled back to the community via specific development projects. There is a lag of one year or more for tourism revenue to return to the people who earned it; a limitation of the current system that has caused great concern.

The process is slow and inefficient, causing alarm and insecurity among community members, due to a long-standing mistrust of government bureaucracy. A recent newspaper article noted that the PAMB of Apo "has finally received its two-thirds share of fees collected from island users" (Visayan Daily Star). A total of PhP 1.3M, representing 75% of total tourism income for 2001, was released to PAMB in April 2002. However, this is only the second release of tourist income since December 1999, when the current fee system was instituted. Current tourism-generated income is estimated at P1.6 mil yr<sup>-1</sup> (Alcala, pers. comm.). The funds are earmarked for a generator project, to provide residents with electricity on a regular basis, and for payment of honoraria to the *Bantay Dagat* deputized to enforce the regulations. It is hoped that the process of releasing funds back to the community can be streamlined, so services and projects are not delayed. In addition, increasing community participation in PAMB should be explored. Such moves would increase the level of trust in the current system and would greatly enhance management efficiency.

The transition between the MMC and PAMB has not been entirely smooth; certain services previously paid for with tourism revenue have stopped because PAMB money has not been allocated to them. A monthly health care clinic, for instance, was formerly supported by an allotment from tourism revenue. These funds paid for transportation and meals of a team of doctors and nurses from the Marina Clinic, in nearby Dauin. The medical team volunteered their time monthly to run a day-long health clinic on the island, housed in a health care building constructed primarily from tourism revenue. However, when PAMB took over, this arrangement broke down, and nothing has taken its place. The health clinic building is unequipped and unstaffed, save for the resident midwife. Health care is urgently needed, as there has already been at least one instance where a child has died from a treatable respiratory infection (M. Aldeon, pers. comm.). The Marina Clinic is the nearest health care facility, but is at least one hour away on the mainland, and inaccessible in rough weather. A new health program could be easily accommodated by PAMB funds, providing they are released regularly and on time.

Another issue that has developed quite recently involves the allocation of tourism revenue. It is not currently known how many community members derive direct benefit from tourism, and by how much they benefit. Data suggest that the major recipients of tourism revenue are still resort owners, and dive and boat operators who visit the island (Cadiz and Calumpong 2000). In spite of the fact that PAMB revenue must go directly to community projects, the perception that individuals in the community are substantially benefiting is growing, and may be a source of conflict with non-Apo residents in the future. The Mayor of Dauin, the municipality to which Apo belongs, believes that some portion of Apo's revenue should belong to the municipality. Negotiations are underway to resolve this issue, but NIPAS rules do not allow such an arrangement. This situation presents a new challenge for the community. The ability to generate substantial funds is always a double-edged sword; the money is much needed for projects benefiting the community, but has created some resentment among those who perceive they should also benefit.

The poorly regulated tourism business is having a largely unquantified impact on the reef ecosystem. Calumpong and Reboton (2000) attempted to quantify impacts to the sanctuary by noting the amount of damage to coral along permanent transects within a preferred dive site, but a more in-depth study is required to substantiate these preliminary findings. Fin damage to coral colonies was estimated at 10.7% over a 10-month period. During this same period, 7,312 visiting divers and snorkelers were recorded. In response to tourist-related reef damage, PAMB regulations have been drawn up to regulate the number of daily divers and snorkelers on the reef, to minimize direct contact with reef organisms by prohibiting the use of gloves, to allow only experienced divers with more than 10 logged

dives to dive within the sanctuary, and to prohibit the use of anchors. But these regulations are often difficult to enforce, especially where profit may be reduced. "The customer is always right" attitude clearly prevails among local tourism operators, and the rules governing diving on the reef are not communicated to visitors when they pay their entrance fees. A workshop conducted in the late 1990s to educate and encourage dive operators and resort owners toward an eco-tourism approach probably needs to be reinforced by a follow-up workshop. Further study is needed to determine the tourist carrying capacity of the island, to reduce the impact on the reef structure and on fishing activities. Data derived from such research can be used to aid PAMB in regulating tourism, whether by better managing the number of tourists allowed in a given time period, or by creating closed areas on primary fishing grounds, or some combination of the two.

Local fishers claim tourist divers drive away fish in their fishing grounds, and have reported incidences of fish traps being destroyed by tourists. Recently, the community decided to mark off a prime fishing ground with buoys to prohibit divers from the area (M. Aldeon, pers. comm.). Although this was a positive move that has no doubt eased the tension between fishers and tourists, the move has not yet been presented to PAMB, so enforcing the "no-dive" area will be difficult until it has been approved. Concerns regarding impacts to fishing and to reef structure must be addressed, as tourism pressure has been increasing for some time on this relatively small reef. Although tourism revenue has undoubtedly improved living standards within the community, it is not known how much of this income ends up within the community itself, nor how many families directly benefit, and by how much. Most families still rely heavily on fishing as their major source of income, and, as stated above, PAMB fees go into community projects, not directly to families or individuals. The two resorts on the island generate a limited number of jobs (all employees are from the community), and women's organizations that sell handicrafts can rely on a regular supplemental income, but as fishing continues to be the mainstay for most families, the concerns of fishers must be addressed.

#### **Future Management Plans:**

The following activities are planned as part of the ICRAN/UNEP development project:

- ◆ *Data Acquisition:* As part of this year's activities, a workshop to train Apo residents to monitor tourist volume and impacts to the reserve from divers/snorkelers is being coordinated by Dr. Hilconida Calumpang. Monitoring is expected to begin next year. A workshop to train *Bantay Dagat* fishers to monitor fish catch took place in July. Fish catch monitoring and a study on the "spillover effect" (Russ and Alcalá 1996) is expected to begin next year, under supervision of Dr. Angel Alcalá. Dr. Marjorie Evasco of de la Salle University English and Literature Department has expressed an interest in documenting the perceptions of Apo residents of their environment, as manifested in their folktales and songs. Such a study would complement the largely scientific nature of the current analysis, resulting in a more balanced understanding of the nature of the management successes and challenges of this community. Results of this aspect of the project could be presented as part of the educational materials to be developed (discussed below).
- ◆ *Improved management:* Results of tourism monitoring by community members will be used to plan a follow-up workshop for dive operators and to formulate additional management strategies to address the concerns of fishers. Data derived from fish catch monitoring by the *Bantay Dagat* would be applied to better managing the fishery. Atty. Lisa Eisma has also recommended that law enforcement be strengthened by additional training of the *Bantay Dagat* regarding established rules and regulations, and by establishing linkages with other enforcement agencies.
- ◆ *Health issues:* A preliminary step in addressing the health care issue of the community will be undertaken by a junior faculty of the Silliman Biology Department, Mr. Mark Salve. Mr. Salve is a graduate student working on a Master's Degree in Public Health. He will analyze how residents currently handle household wastewater and quantify coliform bacterial contamination of Apo's coastal waters and wells. He will present his initial results to the community with recommendations for improved wastewater treatment and health practices, and will continue to monitor monthly for the next year, to examine seasonal patterns in contamination. A discussion will be encouraged during his meeting with the community to formulate a plan for health care workers to come to the community on a regular basis. It will be suggested that the community apportion a part of the PAMB income to pay for the minimal expenses required monthly by the health care team.

◆ *Educational materials:* Potential ideas for publishable educational materials on Apo, and its management experience and ecology, include a field guide to marine flora and fauna of Apo, underwater keys to reef fish and invertebrates for divers and snorkelers, and posters depicting the marine ecosystem and conservation issues. All of these items could be sold through the women's organization, as well as in dive shops and resorts, with proceeds donated to the community. A poster with a strong conservation/CB-CRM theme could be designed for dissemination to local schools. A collection of stories and songs from Apo could be worked into a publishable volume. Dr. Douglas Fenner, an underwater photographer and coral taxonomist, and Ms. Aileen Maypa, a fish visual census expert, have agreed to assist with the preparation of the field guide.

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