

The Status of Coral Reef Management in Southeast Asia: A Gap Analysis



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Table of Contents

1. Introduction	5
1.1 Objectives	5
1.2 Methods	5
2. Regional Overview	6
3. Governance	6
4. Country Highlights	6
4.1 Indonesia	6
4.2 Malaysia	9
4.3 Philippines	11
4.4 Thailand	14
4.5 Viet Nam	16
5. Recommendations	17
6. References	21
Annex 1. Examples of Good Practices	22
Box 1. Zoning for Management in Bunaken National Park	22
Box 2. Dive Operators Lead the Way in Bunaken	22
Box 3. Tubbataha Reef National Park: A Study in Collaboration	23
Box 4. Working Together to Protect Komodo’s Reefs	23
Box 5. Continuity and Partnerships: Mu Koh Surin, Thailand	24
Box 6. Apo Island: Community-Based Marine Sanctuary Management	25
Box 7. Building Community Stewards in North Suluwesi	26
Box 8. Community Enforcers: Mabini and Tingloy, Batangas	26
Box 9. Legal Extension: The Legal Environmental Advocacy Program	27
Box 10. Supporting Local Governments Through CRM Certification	27
Box 11. Towards Sustainable Financing: The Malaysian Marine Parks Trust Fund	28

1. Introduction

1.1 Objectives

This report summarizes the results of a coral reef management gap analysis undertaken by the authors as part of a William B. Fulbright scholarship with supplemental support from the International Coral Reef Action Network through UNEP East Asian Seas Regional Coordinating Unit (EAS/RCU). The study was implemented through collaboration with the Coastal Resources Institute, Prince of Songkla University, Thailand and UNEP EAS/RCU. For more information contact Heidi (heidi.schuttenberg@noaa.gov) or David Bizot (david.bizot@noaa.gov).

The goal of this report is to suggest priority areas for future coral reef management activities in Southeast Asia. A particular aim is to provide guidance to the Regional Seas Programme in East Asia as it implements the International Coral Reef Action Network (ICRAN) Project.

This report identifies management “gaps” in Southeast Asia, and recommends strategies for filling those gaps. The study covers five countries: Indonesia, Malaysia, Philippines, Thailand and Viet Nam. The report focuses heavily on management and relies on other reports issued in the last year that update global understanding of reef conditions (Wilkinson 2000) and threats (Burke et al. 2002) in the region.

1.2 Methods

In order to conduct this analysis, the term “management gap” was defined as the lack of an existing strategy to successfully address a threat to coral reefs. Threats in this context include not only direct impacts, e.g., blast fishing, but also more subtle institutional weaknesses that are impacting coral reef condition such as the failure of the judicial system to appropriately prosecute marine resource law offenders. By identifying these threats and then looking at existing management, this analysis was able to identify the gaps.

A five-step process was used:

1. A literature review was conducted to identify factors that define a strategic path to coral reef management.
2. Over 100 experts were interviewed for this study. Those interviewed were reef scientists, managers, and other practitioners with concrete coral reef management experience in one or more of the countries being surveyed. Interviews were “structured” in the sense that standard questions were developed to gather specific opinions regarding threats, governance, and other management issues.
3. Visits by the authors were conducted to most of the good practice sites to document how these strategies were implemented and the context and elements that made them successful.
4. Based on the experts’ interviews, site visits, and literature review, gaps were identified and a series of management recommendations developed for each country.
5. Lastly, these recommendations were grouped and aggregated into a regional perspective.

2. Regional Overview

In Thailand and Peninsular Malaysia, coral reefs are more threatened by tourism and less threatened by blast and cyanide fishing than elsewhere in the region. Both countries have taken a nationally driven approach to coral reef management and have developed systems of national MPAs. The Malaysian MPA system appears to be the most effective in the region as a result of stronger enforcement, more consistent collection of user fees, and more stable marine park leadership. Although there are cultural differences between Thailand and Malaysia, both could benefit by exchanging lessons on management of tourism. National policy in Thailand currently puts a premium on tourism revenue, and Malaysia's successful experience with user fees should be of interest to Thailand in this regard. Additionally, Malaysia's success with marine protected areas and Thailand's experience with national strategic planning could form the basis for beneficial exchange.

Indonesia, Philippines, and Viet Nam all face considerable economic challenges at the core of their management context, with the situation in Viet Nam more serious than in its neighbors. All three countries have a high percentage of the population in poverty and higher coastal population densities than the other study countries (Thailand reports high population density, but not concentrated in coastal areas). These areas are predominantly confronted with direct threats to reefs from overfishing and destructive fishing by dynamite and cyanide.

3. Governance

The evolution of coral reef management in Southeast Asia over the last decade is highlighted by two trends: 1) the widespread development of MPAs, and 2) a transition to decentralized management. Each country in the study relies upon this two-pronged approach to reef management. Reefs of national significance are protected through national MPAs, while management of remaining reefs is devolved to lower government levels to be achieved through local marine sanctuaries and area-based planning. If effectively implemented and enforced, these two strategies have the ability to address the major threats to reefs in the region.

All countries have developed a national system of marine protected areas, with the exception of Viet Nam, which is initiating the process. Similarly, all countries have articulated policies for decentralized management; however, for the most part, implementation of local management is in the early stages. The extent and experience with devolved coastal management varies between countries. The Philippines, which formally began decentralized governance a decade ago, has recently been joined by Indonesia in devolving responsibility for coastal management to the lowest levels of government: municipalities and districts. Malaysia and, since 1997, Thailand, have both devolved authority for natural resources to the state/province level while retaining significant authority for marine resource management at the national level. In 1998, Viet Nam formally declared a dramatic policy change from centralized governance to management at the lowest practicable level, currently viewed as the provincial level.

Decentralized management is potentially an excellent context for management of reefs outside national MPAs if sufficient technical and financial capacity exists. When it is working well, local management will more closely tie resource extraction benefits with responsibilities, accentuating the influence of good stewardship on personal well being. For example, the development of community-based marine sanctuaries in the Philippines and Indonesia has been demonstrated to help alleviate destructive and overfishing. The local level is also an appropriate and manageable context for negotiating tradeoffs in conflicting uses, which is an integral element in addressing indirect threats to reefs. The main impediment to effective decentralized management is insufficient technical and financial capacity at the local level.

4. Country Highlights

4.1 Indonesia

Indonesia's vast and biologically diverse reef area faces substantial threats from destructive fishing, overfishing, and land-based sources of pollution. The recent release of a national policy, action plan,

and action strategy for coral reefs will assist in providing needed guidance to local government. Indonesian coral reef management also benefits from a number of existing good practice management models and involvement by talented local and international NGOs and donors. Significant challenges remain, however, to strengthen enforcement against destructive fishing and to realize Indonesian goals for poverty alleviation through sustainable use of coastal resources.

While community-based sanctuaries are a new idea in Indonesia, the country has considerable experience with national MPAs. Indonesia currently has 31 national MPAs. These include marine national parks, marine recreational parks, wetland and marine nature preserves, and marine and wetland wildlife sanctuaries. In addition, there are nine terrestrial protected areas with a marine component or marine extension that could also be included in this category (Llewellyn et al. 1999). The different types of MPAs were established with varying goals in mind and therefore operate under regulations offering differing degrees of use and protection. Only two of the marine national parks, Komodo and Bunaken, have management plans and can be considered to effectively control destructive fishing, the biggest threat to reefs.

Perhaps the best example of community sanctuaries in Indonesia is in North Sulawesi, where a USAID-University of Rhode Island Coastal Resources Management Project (*Proyek Pesisir* in Indonesian) has piloted several successful community coastal management sites. Working around a centerpiece of capacity building, stewardship development, and trust, *Proyek Pesisir* developed a rudimentary yet effective coastal management capacity in several coastal villages. As a result, small, no-take areas in coral reef areas are now being managed and enforced by the communities. This successful model is also considered a “best practice” warranting replication.

Experts raised several key areas for coral reef management in Indonesia, including the need for better enforcement against destructive fishing, the need to build capacity, constituencies, and support structures for decentralized management, and the need to strengthen MPAs. To address these needs, at least six management gaps should be given priority attention: 1) strengthening and involving communities in enforcement, 2) increasing local capacity for coral reef management, 3) developing extension services, 4) increasing public awareness for coral reef management, 5) incorporating financial incentives into conservation, and 6) replicating existing good practice models for national and community MPAs.

Early efforts have been made to network coastal universities in Indonesia into a support structure for coastal management. Called INCUNE (Indonesian Coastal University Network), this preliminary structure could be strengthened to provide extension services. *Proyek Pesisir*, with additional support from the Packard Foundation, has made initial steps in this direction. The COREMAP project has also made notable gains in addressing the lack of public awareness about reef values among the Indonesian public.

A number of strategies for making conservation pay has been demonstrated through partnerships between communities, NGOs, and the national government. The management gap is less of inventing strategies for integrating economics into conservation and more of incorporating economic considerations into management effectively as part of decentralized governance. International experience suggests that supplemental livelihoods alone will not necessarily result in desired changes in extraction behavior. Combining livelihood projects with community extension or community conservation agreements can be important to achieving conservation goals.

A number of projects have worked with Indonesian communities to develop supplemental livelihood projects, such as shrimp aquaculture, fish or seaweed mariculture, or offshore fishing opportunities. One example is The Nature Conservancy's (TNC) work in Komodo National Park. As part their work to stop destructive fishing TNC worked with communities living within the park to develop seaweed mariculture, which relies on good water quality, and to establish offshore fish aggregating devices, alleviating fishing pressure in reef areas. TNC is now working to develop a hatchery for the high value reef fish often caught through cyanide fishing for the live fish trade. Once the hatchery is established, local communities will be given the opportunity to raise hatchlings to the size prized by Asian restaurants. In addition to these efforts, TNC put substantial efforts into community extension and strengthening park enforcement.

Another good practice example of conservation financing is the user fee recently implemented in Bunaken National Marine Park. The Bunaken model is notable because it is transparent, overwhelmingly directed toward funding local conservation and community projects, and supported by tour operators, who are instrumental to its success.

Several efforts have been successful in addressing destructive fishing over the last several years, and most share the common characteristic of involving communities in a co-management approach to enforcement. COREMAP experimented with two approaches to enforcement in recent pilot projects. One relied on formal enforcement combined with technology—remote detection equipment and high-speed boats. The second strategy relied on involving community members in enforcement efforts, using boats with common outboard motors. After a trial period, project managers unanimously found the community involvement approach more effective. Educated community members were motivated to undertake routine enforcement as a way to protect their resources and livelihood. Staff involved in the first strategy had neither the motivation nor technical competence to take advantage of advanced technology.

Developing a network of effective national and community-based MPAs is a key management gap. The existence of several good practice models—Komodo National Park, Bunaken National Marine Park, and community-based marine sanctuaries in the North Sulawesi villages of Blongko and Talise—will assist in developing and strengthening a network of MPAs. Developing community extension services will be important to achieving a network of community sanctuaries. Plans by the World Commission on Protected Areas, Southeast Asia Marine Working Group, to develop a MPA Center for Excellence will provide useful support to national MPAs (R. Djohani pers. comm.).

4.1.1 Recommended Strategies

Based on the key management gaps and existing governance structure, efforts for coral reef management would make beneficial contributions by:

- 1. Increasing enforcement against destructive fishing.** Destructive fishing is the biggest threat to reefs in Eastern Indonesia, where the country's best reefs are located. Although a challenging problem, additional efforts can be made to increase enforcement against destructive fishing to the benefits of the country's reefs and communities. Developing and strengthening national and community-based protected areas will provide important management structures to improve enforcement. Educating and involving communities in enforcement has been demonstrated to increase effectiveness in these efforts. However, particularly in remote areas of Eastern Indonesia, leveraging additional resources for enforcement would assist greatly filling this important gap. Additionally, strengthening judiciary capacity for enforcement through training, study tours, or workshops would assist in deterring destructive fishing. The Indonesian experience suggests that a few cases of punishments being carried out is a strong deterrent for future violations.
- 2. Strengthen capacity and infrastructure for decentralized coastal management.** Building the human capacity to implement Indonesia's new framework for decentralized management is instrumental to its success. Capacity is needed for both the process of management – democratic, transparent decision-making, and technical skills, both scientific and legal. The Philippines longer history of decentralized management offers useful models and experience in this regard, and suggests the importance of extension services that can facilitate communities in planning, implementing, and enforcing coastal management. There is also a need to provide national guidance and incentives for coral reef management at the regency, district, and community level. Additionally, it would be helpful to continue to demonstrate successful local management models across Indonesia.
- 3. Use financial incentives for conservation.** The expectation that coastal resources will contribute to poverty alleviation is a strong theme in Indonesian coastal management. Linking conservation-friendly changes in behavior to economic incentives will likely increase the success of these efforts. Helpful mechanisms might focus on stabilizing markets for reef fish through better management and processing, replicating successful marine park user fees (e.g. the Bunaken model), use of appropriate supplemental livelihood in combination with

community extension, conservation concessions, or development of a marine park trust fund (e.g. the Malaysia MPA Trust Fund model).

4. **Continue public awareness campaign.** Developing a constituency for coral reef management is important in any context and critical for successful decentralized management. The strategy developed by COREMAP has had some initial successes and should be continued. Thailand's successful teacher training strategy may also have some useful lessons. Encouraging private sector and public involvement in reef management will be useful to winning public support for conservation as will developing extension services that serve an awareness raising function in coastal communities.
5. **Expand and strengthen the network of national and community-based marine protected areas.** Indonesia has a number of good practice models for both national and community MPAs. Developing the support structures to replicate these—community extension service and regional MPA Center for Excellence—will make important steps toward developing a national MPA network. Efforts to incorporate connectivity assessments into the national MPA network could also make important contributions.

4.2 Malaysia

The system of national marine parks and the fishery zoning regulations in place around Peninsular Malaysia have met with some initial successes, and may provide models for other areas. Arguably, Malaysia's national coral reef management efforts are some of the most successful in the region. The country's national marine park system and fishery regulations are good models for the other study countries. However, national governance can only go so far, and Malaysia's federalist system articulates clear boundaries for national and state jurisdictions. To advance Malaysian reef management requires strengthening state capacity, particularly in East Malaysia, and improving the integration of state and federal authorities to achieve sustainable coastal development. The next big challenges for coral reef management in Malaysia are to address destructive fishing in the east, to implement integrated coastal management throughout the country, and to strengthen existing MPAs.

The successes of Malaysian coral reef management are the national efforts implemented by the Department of Fisheries (DoF) under the Fisheries Act of 1985, and its subsequent amendments. The act allows designation of a federal marine parks system and provides the legal foundation for Malaysia's effective fishery regulations. The marine park system was primarily created to conserve coral reefs, and park boundaries and regulations were tailored with coral reefs in mind (Pilicher and Cabanban 2001). A success of the national marine park system is the Malaysia Marine Park Trust, funded by user fees and donations (see Annex 1).

Within the parks, permanent no-take zones (applying to all forms of fishing) are located from the shoreline to 2 nm. Other activities prohibited in park boundaries, include: water skiing, jet skiing, destroying or removing coral, anchoring in coral areas, discharging pollutants and rubbish, and constructing structures without a permit. Swimming, snorkeling, and scuba diving, are permitted (if regulated), providing the primary draw for visitors.

One tool in particular that has discouraged illegal fishing is the use of radar on the islands within the parks. Used day and night, this has allowed rangers to monitor the nearby waters and detect violators of the 2 nm limit. Park boats are then dispatched to investigate and, if necessary, apprehend violators. Fishing vessels guilty of violating park regulations have been fined or, in the case of repeat violators, confiscated and sold.

A second success of Malaysian reef management is the country's effective fisheries regulations that have helped prevented overharvesting and lent protection to coral reefs. The regulations are based on separate fishing zones for different user groups. This zoning system – combined with licensing and regulation of fishing vessels based on estimated maximum sustainable yield, and additional incentives to fish the outer reaches of the 200-nm Exclusive Economic Zone – have all had the effect of decreasing fishing pressure on inshore (mostly coral reef dependant) fisheries. This has resulted in less fishing pressure on coral reefs by large, commercial fishing vessels using modern gear. The success of this system is also likely assisted by relatively low coastal population density, high

industrialization level, and a fairly wealthy population compared with many of the other study countries.

The need to address land-based sources of pollution, destructive fishing, and recreational overuse are recurrent themes in Malaysian coral reef management. To address these threats, at least four management gaps should be given priority attention: 1) improving coordination between agencies and levels of government, 2) increasing community participation in destructive fishing enforcement, 3) developing management plans for national marine parks, and 4) strengthening the MPAs in East Malaysia.

While Malaysian institutions are stronger and more capable than others in the region, the arrangement of these institutions was repeatedly cited as a barrier to coordination (UNEP, 2000). Lack of coordination is evident in many of the most pressing threats to Malaysian coral reefs.

Due to the failure of existing efforts to reduce blast fishing throughout Sabah, a community-based sanctuary pilot project based on these successful models should be considered. However, altering existing institutional arrangements to allow communities to manage nearby reefs must occur first. As local ownership of reefs is not allowed, the Sabah government would have to grant management rights and responsibilities to a carefully selected community (or communities) before such a project could proceed. The goal of the pilot sanctuary would be to reduce destructive fishing, increase local fish catches, and provide a model for replication, if successful.

As for a possible location, destructive fishing practices appear to be concentrated along three sections of Sabah's coastline: the Kota Kinabalu metropolitan area south to Papar; Marudu Bay including both east and west peninsulas and Palau Banggi; and Darvel Bay from Lahad Datu to Semporna (Burke et al. 2002). Because the sprawl of Kota Kinabalu may make true community management challenging, selecting a smaller community from one of the more remote latter locations, perhaps even an island community, might be preferred.

A pilot project could also operate in conjunction with current efforts by the Universiti Malaysia Sabah (UMS) to increase community participation in management of selected marine areas; this effort is just getting underway and is being led by Dr. Ridzwan Abdul Rahman. In addition to UMS, WWF Malaysia has a number of coastal management practitioners familiar with destructive fishing issues (and current regional initiatives to eliminate them) and also represents a potential partner. It should be noted that this recommendation is for true community-based efforts on the Philippines model and therefore represents a step further than the initiative UMS is undertaking, although the university effort represents an important initiative and can be used as a stepping-stone towards true community-based sanctuary development.

Malaysian marine parks are beginning to struggle with handling large numbers of tourists; a comprehensive management document would help managers plan for and mitigate the negative side effects tourism often has. Carrying-capacity studies could suggest when to start limiting visitors and other management actions. Other "best practices" in this field exist in such places as Tunku Abdul Rahman Park in Sabah, where liberal signage, a visitor fee, and the use of buoys to protect sensitive reef areas all help protect reefs from thousands of park visitors each year. Some of these more successful practices might be transferred to other state and federal parks. An ideal first candidate for a management plan (and one currently experiencing a tourism explosion) is Palau Payar Marine Park in Kedah.

The state parks of East Malaysia have seen many management activities undermined by the prevalence of destructive fishing. A number of measures might improve the ability of existing parks to combat this threat. First, parks should develop management plans that reflect much more community involvement and participatory decision making. Second, parks should consider zoning schemes that address both resource protection and the needs of local fishermen; this could reduce the need to use destructive techniques. Bunaken National Park in Indonesia provides an example of what that might look like. Finally, creating community-based marine sanctuaries in the vicinity of parks might also help reduce the threat.

In addition to improving existing parks, several excellent coral reef locations in and around Sabah (namely Sipadan, Layang-Layang, and Semporna) are currently without formal protection. These are

quality reef sites, known to the international dive community, and have the potential to be huge tourist draws. Establishing formal parks at these locations is of highest priority.

4.2.1 Recommended Strategies

Based on the key management issues and existing governance structure in Malaysia, efforts for coral reef management would make beneficial contributions by:

- 1. Better integrating terrestrial and marine environmental management as they relate to development in the coastal zone.** Most important is a national effort to breakdown the federal-state jurisdictional barriers hampering coordinated coastal development. This could take the form of a new integrated coastal management law (on the U.S. CZMA model) or, more likely, a task force-style coordinating body. Several smaller ICM experiments at regional levels, such as the South Johore Coastal Resources Management Plan (an ASEAN-USAID backed endeavor that ran from 1987 to 1990) and the Integrated Management Plan for Darvel Bay (part of a DANCED biodiversity initiative), might serve as starting points for such a larger ICM effort (Ranjith et al. 1999). Alternately or in addition to, a national coral reef action strategy, such as Thailand's, might provide the focus needed to coordinate efforts addressing the decline of reefs.

Other priorities include improving institutional arrangements for sewage regulation and disposal and aggressive utilization of existing EIA laws to control coastal tourism and recreational development. Finally, holding regional workshops for leaders in coastal states to address the impacts of decisions on reefs and coastal waters would meet an ICM human capacity need at the local and state levels. The Philippine "National Course on Integrated Coastal Management," tailored to the Malaysian experience, might serve as a basic model for such training.

- 2. Addressing destructive fishing in Sabah through increased community participation.** Implementing this strategy requires both piloting community-based marine sanctuaries and involving the public much more in the management structure and regulations at existing state MPAs. In addition, economic alternatives to destructive fishing for coastal communities should be developed and—importantly—linked to a behavioral change away from destructive practices.
- 3. Improving the management of existing federal and state marine protected areas, particularly as related to regulating tourism.** All federal and state marine parks should develop management plans, taking into account participation and "buy in" from key constituents such as fishermen, NGOs, and local government leaders. In addition, park visitor fees could probably be significantly increased from RM 5 (about USD 1.30) without impacting foreigner visitation; this would increase contributions to the Marine Park Trust Fund. Improving the means of collection of this fee should also be explored. Carrying capacity studies could be conducted to determine visitation numbers and perhaps suggest the limits required to ensure resource protection. Finally, successful "best practice" tourism control mechanisms found at some parks should be replicated to reduce the direct impacts of tourists on reefs.

4.3 Philippines

The Philippines' relatively long history with coastal management has probably helped slow the decline in reef condition in recent years. Community-based marine sanctuaries, in particular, have demonstrated the capability to halt or reverse this downward trend. For instance, reef substrate remained stable or slightly improved following implementation of sanctuaries in the neighboring communities of Apo, Balicasag, and Pamilacan islands in the Visayas (White and Vogt 2000).

The legal regime governing coastal resource management in the Philippines has changed substantially over the last decade with the passage of several new laws decentralizing coastal resource management from the national government to local government units (LGUs).¹ This has, in turn, led to a proliferation of community-based marine sanctuaries in reef areas, perhaps the most

¹ The term "LGU" is commonly used in the Philippines to refer to the lowest levels of government: municipalities and barangays (villages).

significant management tool currently used in the country. The community level continues to be the focus of most reef management initiatives.

In the Philippine context, the term MPA often refers to community-based marine sanctuaries – small, protected areas established and enforced by a particular municipality. Sanctuaries usually include a fully-protected “no-take” core surrounded by a buffer area, perhaps zoned by use. No fishing of any kind is permitted in the no-take area, but traditional fishing methods and no-extraction tourist activities such as scuba diving may be permitted in the buffer zone (White et al. 2000). These MPAs are known by various names, including marine reserves, marine sanctuaries, and fisheries reserves. Hundreds of community-based marine sanctuaries are in existence, with some LGUs taking full advantage of their new authority. However, many communities still lack the capacity to manage their resources capably, leading to a host of ineffectual “paper parks.”

Well-managed community sanctuaries receiving public recognition include Sumilon, Apo Island, Negros Oriental; Balicasag and Pamilacan Islands, Bohol; Mabini, Batangas; and San Salvador Islands, Zambales (White et al. 2000). Encouraged first by internationally-funded coastal management projects and then by the decentralization laws, the number of such sanctuaries has grown from fewer than 25 in 1990 to over 400 today (White et al. 2000).

In addition to these community sanctuaries, a national network of MPAs has been created under the National Integrated Protected Areas System (NIPAS) law. These 13 MPAs include some of the most famous reefs in the country, including Tubbataha National Park and Apo Island. Despite the good intentions of this legislation, expert opinion over its implementation is mixed. While there have been some notable successes, such as the co-management regime governing Tubbataha, designation under NIPAS has at times weakened existing management by interfering with pre-existing local management efforts (Alcala 2001). In addition, most NIPAS sites suffer from lack of effective management. The consensus is this well-intentioned system works best when significant cooperation with the local population is achieved throughout the designation and management process.

Management gaps in the Philippines range from developing sustainable financing mechanisms for coastal management projects to better enforcement of existing laws. A particularly notable issue is improving existing institutional support to local governments as they attempt to fully implement coastal management as required by decentralization laws. To address these needs, at least six management gaps require priority attention: 1) improving management of existing community sanctuaries, 2) developing sustainable financing mechanisms for coastal management, 3) helping provinces support community management, 4) improving enforcement, 5) linking reef management to ICM initiatives, and 6) filling information gaps.

One way to increase the effectiveness of existing sanctuaries is to continue to encourage networking and coordination between sites. It was demonstrated that a network of small community-level reserves can be successful at protecting fisheries and critical habitat (White et al. 2000). A nationwide association of community-based MPAs (known as PAMANA) was developed; additional support of this group and the creation of smaller, ecosystem level associations can only serve to make individual sanctuaries more successful.

Collection of user fees must be done in a way that supports management. The government-run Integrated Protected Areas Fund, established to support NIPAS sites, is the repository for user fees collected at the system’s protected areas. However, the money must be returned to sites to support local management. In non-tourist areas, other sustainable financing options include establishing an endowment fund or trust for one or more sites. Good alternative livelihood programs, especially those that wean locals off their reliance on marine resources while increasing the overall economy of the municipality, offer another possibility.

A continuing management gap is the need to increase the ability of local governments to manage their marine resources, including coral reefs. To date, this sort of capacity building has been undertaken one community at a time, as a particular project or program was undertaken. While that was adequate in the early stages of coastal management, now that the national government has committed to providing ICM as a basic service, more permanent institutional support is needed.

Improving provincial roles in coastal management should come from several directions. First, creating more well-staffed and well-informed provincial coastal management offices, modeled perhaps on the successful Bohol Environmental Management Office, could provide technical assistance for LGUs province-wide. In addition, formally passing legislation institutionalizing resource management policies, procedures, budgets, and personnel at the provincial level will better establish a framework for management and formalize partnership roles between national government agencies, the provincial government, LGUs, and the academic and NGO communities. Finally, provincial networks of community-based MPAs could be established, which might then allow skills, support, and lessons learned to be shared among the many communities within a province.

Existing laws and regulations are, in general, adequate enough to protect coral reefs and provide for effective management. The problem lies with implementation of management actions and enforcement, due to the large numbers of agencies that have authority to arrest offenders (six) and other jurisdictional entanglements, the law could certainly be simplified. Lack of political will on the part of the enforcers also creates enforcement problems. This applies not only to the locals charged with front-line enforcement responsibilities, but also the prosecutors and others in the judicial system charged with bringing violators to justice. This can range from simple ignorance of the law on the part of the enforcer to more blatant manipulations of the legal system. For instance, community leaders who do not support the sanctuary sometimes undermine the *bantay dagat*¹ in order to support a personal agenda.

Community-based sanctuaries are unfortunately ill-suited to deal with larger, terrestrial problems such as runoff, siltation, and wastewater. This is best addressed via broader ICM initiatives. A concerted, nationwide, effort to expand coastal management activities inland and integrate them with other policies addressing terrestrial concerns – particularly deforestation – has yet to occur and a workable national integrated coastal plan (or coordinating agency) does not exist to help make this happen (Jacinto et al. 2000). The “anachronistic and fragmented” nature of Philippine land laws, which consist of at least four major codes (some dating back 140 years), further complicates the situation (Batongbakal 2001). A low level of awareness of this problem among decision-makers and the general public alike also contributes significantly to this problem, as existing laws – especially those environmental impact assessments – are often ignored.

4.3.1 Recommended Strategies

These recommended strategies address the key management gaps for coral reefs in the Philippines. Overfishing and, in localized areas, destructive fishing remain major issues, but in many ways these can be addressed through better enforcement of existing laws, public education, and improving the effectiveness of community sanctuaries. Based on the key management gaps and existing governance, efforts for coral reef management would make beneficial contributions by:

- 1. Building capacity and resources to better implement and enforce existing laws and regulations.** Improving enforcement will rely heavily upon education at many levels. The public needs to stay engaged via general public awareness campaigns such as the CRMP’s “I Love the Ocean” movement; other audiences require a more targeted message (Pestano-Smith et al. 1999). Prosecutors and the judiciary, in particular, should be the focus of an outreach effort (seminars and workshops) highlighting the importance of coastal management laws and proper enforcement. The cornerstones of community enforcement – the *bantay dagat* – need to be expanded and supported with adequate funding and resources. In addition, experimentation with making the *bantay dagat* politically independent should be considered. Finally, creating more legal assistance offices on the LEAP model, primarily at the provincial level, is required to build LGU legal capacity.
- 2. Strengthening management of existing community-based marine sanctuaries.** Community-based sanctuaries require strengthening in a number of ways, especially by increasing provincial-level institutional technical support (including the capacity of the regional offices of the BFAR and DENR) for LGUs. Sanctuary cross-visits, especially to “best practice” locations, and formal networking would allow experiences and lessons-learned to be

¹ An organized group of citizens who are deputized to enforce marine laws in municipal waters.

translated between sites. Implementation of user fees should be established at locations where tourism numbers support it and trust funds established for high quality sites where such fees might not work. Alternative livelihood efforts should be developed and expanded to both reduce community dependence on reef resources and subsidize community management. Finally, the DENR's local CRM certification program – an important step towards formally tying monetary transfers to resource protection – should be supported and expanded beyond its initial pilot region.

- 3. Expanding national-level support for ICM.** National-level efforts should be focused on developing structures that support LGU management activities. First among these is to implement a coherent national ICM strategy. The DENR has been tasked with developing just such a document (a National Integrated Coastal and Marine Management Strategy) to spell out a national plan for local integrated coastal management (Jacinto et al. 2000, UNEP 2000). This effort would fill this badly needed policy gap and should move forward. In addition, more attention should be given to environmental impact assessment; existing laws are adequate, but the lack of an ICM strategy, ignorance, and multiple jurisdictions over coastal areas render it ineffective. Building the legal capacity of communities will also help address this problem. Finally, tying new community-based forestry initiatives into existing local ICM structures may make sense in some locations to help address local sedimentation and runoff problems.
- 4. Improving the management of national MPAs.** National MPAs, specifically those managed under NIPAS, could play an integral role in protecting coral reefs, but are too weak to be effective. A notable exception is Tubbataha National Park, where collaborative management and strong cooperation between the government, NGOs, and scientists has resulted in effective protection. These lessons should be harvested and applied at other NIPAS locations. In addition, management of the Integrated Protected Areas Fund (IPAF) needs to be completely overhauled so that the fee collection and distribution process is transparent and results in money being funneled back to the sites, not the general treasury. Making the IPAF completely independent, like the Malaysian National Marine Park Trust Fund, would open the door to donations from other governments, corporations, and NGOs and should also be considered.

4.4 Thailand

To realize effective coral reef management, Thailand will need to strengthen its national marine park system, manage tourism as a positive force in conservation, strengthen fisheries enforcement and management of coastal development, and implement remaining areas of the National Action Plan, including local area-based reef management.

Like the Philippines and Malaysia, Thailand has a ten-year history of coral reef management. Thailand has made substantial progress in reef management by adopting and implementing a national coral reef action strategy and creating a substantial network of national marine parks. The national strategy has been very successful in implementing the education and awareness activities. Key challenges remain in effectively managing the park system and implementing other key elements of the national strategy: 1) local management of reefs zoned for extractive use, 2) prevention of impacts from new development, and 3) preparation of voluntary measures for recreational use. An excellent opportunity exists to address these needs as the Thai government revises and reaffirms the National Coral Reefs Strategy for Thailand and implements a major revision in the national institutional structure related to environmental management. Meeting these challenges is further assisted by recent increases in the organization and capacity of fishery cooperatives in southern Thailand that can facilitate meaningful local involvement in reef management.

Although, Thailand has a more developed management infrastructure for coral reef conservation than many other countries, implementing these laws and policies has proven difficult. To address key threats from tourism, fisheries, and development, at least four management gaps should be given priority attention: 1) strengthen the national marine park system, 2) strengthen enforcement of fishery and coastal development laws and regulations, 3) develop more effective tourism guidelines and user fees, and 4) develop a series of local level coral reef management good practices.

Enforcing fishery and development laws involves a combination of activities, including: amending legislation to make laws more “enforceable,” involving interested stakeholders in enforcement (e.g. deputizing community enforcers or increasing collaborative partnerships with dive operators), improving financial resources available for enforcement activities, and building enforcement officer capacity for key skills, such as conflict resolution, facilitation, community outreach, and transparency, and legal action.

Currently, a major impediment to addressing threats from tourism is a lack of political will at the highest levels of government to regulate tourism. Improving collection of existing user fees would assist in strengthening the management of marine parks. Thailand might look to the very successful user fee recently implemented in Bunaken national marine park in Indonesia, which is based on the Bonaire model. Key differences between the Bunaken model and current practice in Thailand are the process used to set the fees, to decide how fees will be spent, and to track actual collection and expenditure. Providing an outside facilitator to work with the Phuket dive association and national marine parks would assist in getting things refocused in a more productive direction. The suggested fee in Thailand is not unreasonable, however, dive operators are not motivated to cooperate because they feel fees are not being spent on promised projects. While Thailand may have a right to collect fees regardless of diver interest, the government currently lacks enforcement capacity for collection without voluntary dive operator compliance. Ultimately, the carrying capacity of Thai reefs requires evaluation by formal research projects, and the results of these studies integrated into local area and national marine park management plans.

A notable omission from the Thai coral reef management experience is local level coral reef management called for in the national strategy. A few examples exist of local management for associated ecosystems, including seagrasses in Trang and mangroves in several locations. Building on these as well as new capacity for community organizing in south Thailand, provides a window of opportunity to demonstrate this important management approach.

4.4.1 Recommended Strategies

Based on the key management gaps and existing governance structure, efforts for coral reef management in Thailand would make beneficial contributions by:

- 1. Strengthen National Marine Parks.** Comparison with other good practice models in the region suggest several measures for strengthening the Thai park system, including: 1) better engagement of local stakeholders in park planning and management, 2) stabilizing park leadership 3) developing management plans 4) improving financing, 5) strengthening park staff capacity and 6) amending national legislation.
- 2. Improve management of tourism and its impacts on coral reefs and coastal development.** Addressing threats from tourism ranges from direct action, such as mooring buoy installation, to raising political awareness about the threats of unsustainable tourism on coral reefs. Specific short-term strategies include: adapting a voluntary compliance certification to the Thai context, better maintenance of mooring buoys, improving user fee collection and expenditure, conducting carrying capacity studies, and amending laws related to EIAs for coastal development.
- 3. Improve fisheries enforcement, particularly of illegal trawling in coral reef areas.** Developing legitimate ways for interested stakeholders, such as dive operators or fishing communities, to participate in enforcement is a good strategy for strengthening enforcement that has already been demonstrated to work in the Thai context. Increasing funding for fisheries enforcement expenses, such as fuel, is also necessary. Ultimately, this additional funding may be partially derived from fines collected during successful enforcement.
- 4. Demonstrate local management of coral reef resources.** Since the recommendation for local management of reefs was included in the 1992 national coral reef strategy, capacity for local management has increased tremendously. There is now a number of NGOs and fishery cooperatives in south Thailand that are capable of organizing around coral reef management

issues. Working to develop a series of good practice models for different scenarios would set the groundwork for future replication across a broader area. If successful, these projects go beyond advising or informing local communities and will empower them to become resource stewards.

- 5. Strengthen capacity and laws to achieve sustainable coastal development.** Ultimately, addressing the significant threat to reefs from land-based sources of pollution will involve much better area-based planning. Pilot projects for area-based ICM have been developed as part of donor-funded projects. However, building the capacity and institutional framework for ICM in Thailand is still in the early stages, and would benefit from additional, priority focus.

4.5 Viet Nam

Coastal and coral reef management in Viet Nam is currently in a dynamic period characterized by both new legal commitments to conservation and policies promoting increased marine exploitation. Compared to the other study countries, coral reef management is in its infancy in Viet Nam, with the laws and institutional structure still very much under development. This period of transition is an excellent opportunity to advance reef management by establishing pilot sites for good management practices, and working to build the capacity and awareness that will allow new management approaches to be successful.

Institutionally, there is not a dedicated ministry or agency for coastal resources, with one study identifying 20 national level ministries and agencies responsible for coastal and marine environmental management (Asian Development Bank 2000). Responsibility falls primarily to the Ministry of Science, Technology, and the Environment (MoSTE), mandated with environmental protection, and the Ministry of Fisheries, charged with fishery resources. MoSTE has taken a leading role in marine conservation through its policy work on the Biodiversity Action Plan for Viet Nam in 1994 and publication of the Scientific Rationale for Marine Protected Area Planning in Viet Nam in 2001. The Ministry of Forestry (MOF) has responsibility for development, conservation, and management of marine resources. Historically, MOF has focused on fisheries development (Asian Development Bank 1999); however, recently the Ministry's Fisheries Protection Department began pursuing integrated coastal management and coral reef management in particular (Chiem Nguyen Van, pers. comm.). The Ministry of Agriculture and Rural Development has also been involved in management of reefs within Con Dao and Cat Ba national parks, and a number of research institutions have played a prominent role in reef conservation, notably the oceanographic institutes at Nha Trang and Hai Phong and the Resources Institute for Marine Products.

The People's Committee at the provincial level will increasingly play a key role in coral reef management as a result of decentralization. A report by the ADB sees an important role for provincial government in achieving integrated, area-based planning as an alternative to the current sectoral regime (Asian Development Bank 2000). Additionally, provincial government is likely to play a key role in MPA development if the experience in terrestrial parks and the pilot MPA in Hon Mun are any indication. For this reason, building human resources capacity at the provincial level takes on greater importance, and donors are giving political will at the provincial level priority consideration in choosing project sites.

Destructive fishing and sectoral management were consistently raised at the most urgent coral reef management issues in Viet Nam. To address these needs at least four management gaps should be given priority attention: 1) strengthening enforcement, 2) building human resources capacity in priority areas (enforcement personnel, provincial government staff, marine protected area staff, and local resource users), 3) increasing awareness and political support for reef management, and 4) addressing legal ambiguities.

There is an urgent need to better communicate the economic and social costs of destructive fishing, highlighting their inconsistency with Viet Namese priorities for social stability and economic development. To design effective strategies for eliminating destructive fishing requires sober analysis of the underlying causes—be they poverty, lack of awareness, or simply self-interest over social good.

Experts interviewed for this study were unanimous in their assessment that the current process of sectoral planning is one of the foremost threats to effective coral reef management in Viet Nam. Without integrated management, the potential to protect coral reefs through marine protected areas will be undermined. Reef degradation in existing national marine parks at Cat Ba and Con Dao serve as reminders that MPAs are only effective in addressing direct threats to reefs, such as fishing or tourism, and cannot compete with sedimentation and pollution from adjacent development of ports, roads, and aquaculture.

To achieve the shift from sector by sector national planning to local integrated planning will require increases in capacity, broader access to information, and strengthening of the legal framework. If the process is to be science-based and genuinely reflective of local priorities, information on coastal resources and the potential impacts of different development options should be widely available to planners and the public. Closing loopholes in the legal requirements for environmental impact assessments is one needed step for generating this information. Another critical legal amendment is clarification of provincial authority to implement zoning in coastal areas.

4.5.1 Recommended Strategies

Based on the key management issues and existing governance structure in Viet Nam, efforts for coral reef management would make beneficial contributions by:

- 1. Protecting reefs from destructive fishing.** Using strategies that have been successful in the Philippines and Indonesia, Viet Nam can make important strides in reducing destructive fishing, as the experience in Van Hung shows. Facilitating community-based management, linking supplemental livelihood opportunities with changes in conservation-friendly behavior, involving communities in patrols, and increasing public awareness about coral reef values are recommended activities. In the Viet Nameese context, it would also be helpful to clarify the jurisdictional responsibilities of different authorities charged with enforcement, and to raise political will for enforcement through policy work that demonstrates the economic and social costs of destructive fishing to Viet Nam.
- 2. Create best practice models for marine protected areas in southern, central, and northern Viet Nam.** Key measures include demonstrating local participation in park planning and management, strengthening MPA staff capacity and morale, and establishing sustainable financing mechanisms.
- 3. Develop a best practice model provincial coastal management plan that maintains a balance of uses and protects reefs.** There is a key need to demonstrate area-based management as an alternative to sectoral planning. To be successful, planning efforts might focus on a limited set of issues initially.
- 4. Strengthen the constituency for coral reef management.** There are several successful models in the region that Viet Nam can adopt. Typical measures include developing a national education strategy, encouraging private sector and public involvement in management, and establishing a media campaign.
- 5. Strengthen the legislative and institutional framework for coastal management.** Key gaps identified by the ADB analysis, include: addressing the open access to fisheries, strengthen EIA legislations, and clarify institutional ambiguity related to enforcement.

5. Recommendations

Based on the key threats and existing management practices in Southeast Asia, efforts for coral reef management would make beneficial contributions by targeting the elimination of destructive fishing, strengthening marine protected areas, building capacity to implement decentralized management, and developing constituencies and human capacity for integrated coastal management planning. Table 1 provides a regional overview of the good practices recommended to “fill the gaps.” The table shows recommendations for specific actions nine management strategies, based on existing “good

practice” models and key management gaps identified during interviews and site visits. The relative applicability of each action to the study countries is suggested (High, Medium, or Low), as well as examples of where the practice is currently implemented.

Table 1. Key Actions For Implementing Top Management Recommendations For Coral Reefs By Country.

Management recommendation	IN	MY	PH	TH	VN	Best Practice Model(s)
Key Actions						
Strengthen National Marine Protected Areas						
Develop/strengthen management plans thru an inclusive, participatory process	H	H	H	H	H	Bunaken (IN)
Conduct regular patrols, in partnership with local communities and dive operators	H	M	H	H	H	Bunaken, Komodo, Gili Islands (IN)
Develop mechanisms to translate park benefits into financial benefits for local communities	H	H	H	H	H	Bunaken (IN)
Stabilize park leadership	M	L	M	H	M	Ko Surin (TH), Malaysian National Parks (MY)
Strengthen park staff morale and capacity thru training, recognition, and financial bonuses	H	M	H	H	H	Ha Long Bay (VN)
Improve user fee collection in marine protected areas	H	M	H	H	H	Bunaken (IN)
Establish partnerships with NGOs, universities, dive associations, or other government agencies to strengthen technical and financial resources	H	M	H	H	H	Ko Surin (TH), Tubbataha (PH), Bunaken, Komodo (IN)
Facilitate/Strengthen Community Sanctuaries						
Strengthen community extension services	H	H	H	H	H	Legal Environmental Advocacy Program (PH)
Establish demonstration CB marine sanctuaries	M	H	L	H	M	Apo Island (PH)
Create cross-CB sanctuary learning experiences	H	H	H	M	H	Apo Island (PH)
Support community enforcement of sanctuary rules	H	L	H	M	H	Anilao, Batangas (PH)
Establish legal mechanisms to recognize CB sanctuaries	H	H	L	H	M	Philippines
Strengthen Fisheries Management and Enforcement						
Eliminate open access fisheries by establishing legal and management frameworks for limited extraction, such as protected areas and gear restrictions	H	L	L	M	H	Malaysia, Philippines, Thailand
Zone fishery gear use to keep damaging gear, such as trawlers away from reefs	M	L	L	M	H	Malaysia
Strengthen community extension to build awareness and capacity for fisheries management	H	L	H	H	H	Philippines
Improve state/province support to community-based and local government for coastal resources management	H	M	H	H	H	Bohol Environmental Management Office (PH)
Expand coastal resources management certification	H	L	H	M	H	Coastal Resources Management Program (PH)
Outreach to judiciary about CRM	H	L	H	H	H	LEAP (PH)
Establish/support deputized community wardens	H	H	H	H	H	Anilao, Batangas (PH)
Conduct joint government-community patrols	H	H	H	H	H	Trang (TH)
Increase transparency/accountability in enforcement	H	H	H	H	H	
Develop MOUs to clarify coordination in enforcement	H	H	H	H	H	Con Dao (VN)
Strengthen Decentralized Integrated Coastal Management						
Improve sewage treatment	H	H	H	H	H	
Integrate CB forestry management into ICM	M	M	H	M	H	

Expand coastal resources management certification	H	L	H	M	H	CRMP (PH)
Establish environmental or coastal management offices at the state/provincial level	H	L	H	H	H	BEMO (PH)
Develop and implement a national ICM plan	H	H	H	H	M	
Provide national guidance for key CRM issues	H	H	H	H	H	
Facilitate community coastal management planning	H	M	H	M	M	CRMP (PH)
Increase grants for CB coastal resources management	H	M	H	M	M	
Complete and implement local-level coastal resources inventories and management plans	H	M	H	M	M	
Complete and implement state/provincial-level coastal resources inventories and management plans	M	H	H	H	H	CRMP (PH)
Improve and enforce EIA procedures	H	H	H	H	H	
Strengthen tourism management						
Form a management group of divers, government, and NGOs to address impacts from divers	L	M	L	H	L	
Install/maintain mooring buoys	M	H	M	H	M	
Revise national policies on tourism development to reflect sustainability	L	H	M	H	H	
Strengthen land-use planning/zoning to address tourism-related development	M	H	H	H	H	
Improve EIA focus on tourism and recreational activities	M	H	M	H	H	
Develop "green certification" programs	M	H	M	H	M	
Better control tourism impacts in marine parks with zoning and signage	M	H	M	H	H	Tunku Abdul Rahman Marine Park (MY)
Building Constituencies						
Develop a national reef curriculum and teacher training	M	M	M	M	H	DoF & Teacher College (TH)
Involve communities in reef monitoring and management	H	H	H	H	M	UPMSI (PH), Proyek Pesisir (IN), Reef Check
Arrange a study tour for the journalist association	H	H	H	M	H	Thai Environ. Journalist Assoc. & DoF (TH)
Develop a national public awareness strategy, including radio/TV spots, events, games, etc	M	M	M	M	H	COREMAP (IN)
Involve the private sector in reef management	H	H	H	H	M	Buoy installation (TH)
Conduct a high-level awareness campaign on the economic costs of short-term, unsustainable tourism	L	M	L	H	M	
Conduct high-level awareness campaign on the economic costs of destructive fishing	H	H	H	M	H	
Integrate information about coastal management and the reasons and laws behind it into existing public awareness campaigns	H	M	H	H	H	LEAP (PH)
Strengthen Conservation Financing						
Involve local dive associations in user fee collection administration, and spending decisions	M	H	M	H	L	Bunaken, Gili Islands (IN)
Establish legal mechanism for keeping user fees in local park areas	H	L	H	H	H	Bunaken (IN)
Increase transparency/accountability in user fee collection and expenditure	H	L	H	H	M	Bunaken (IN), Marine Park Trust Fund (MY)
Establish/ reform an independently-audited national marine park trust fund	H	L	H	H	H	Marine Park Trust Fund (MY)
Explore conservation concessions	H	H	H	L	L	
Link supplemental livelihood opportunities to changes in community behavior thru conservation agreements	H	H	H	M	H	Cat Ba (VN)
Strengthen Capacity						
Strengthen Capacity for ICM	H	M	H	H	H	Nat'l Course on ICM (PH)
Develop intensive training programs for national marine park leadership in developing management	H	H	H	H	H	

plans thru a participatory process						
Develop intensive training programs for local/provincial/national government staff on integrated land-use planning, zoning, and pollution regulations.	H	H	H	H	H	
Strengthen capacity for fisheries enforcement	H	H	H	H	H	
Strengthen capacity for community extension work	H	H	H	M	M	
Strengthen capacity for EIAs	H	M	H	H	H	
Improve Legal Tools						
Pass a national ICM law	M	H	M	H	M	U.S. Coastal Zone Mgt Act
Amend Thai law to allow limited extractive use by local communities in national marine parks	NA	NA	NA	H	NA	
Amend Indonesian laws regarding destructive fishing to make prosecution easier	M	NA	NA	NA	NA	
Amend Viet Nameese law to clarify provincial jurisdiction in marine zoning	NA	NA	NA	NA	H	
Amend Viet Nameese law to expand EIA requirements	NA	NA	NA	NA	H	
Direct Research						
In partnership with Indonesian and Viet Nameese scientists, conduct biophysical assessments for reefs that have not been described	H	NA	NA	NA	H	
Improve monitoring to address discrepancy between scientific and diver assessment of changes in reef condition.	M	L	M	H	L	
Improve assessment of reefs in eastern Mindanao, Sulu Archipelago, Palawan, and other underdescribed locations by Philippine scientists	NA	NA	H	NA	NA	
Conduct carrying capacity assessments of diver use in Thailand and Malaysia	NA	H	NA	H	NA	

IN = Indonesia, MY = Malaysia, PH = Philippines, TH = Thailand, VN = Viet Nam

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Annex 1. Examples of Good Practices

This annex attempts to provide some insight into some of the better examples of coral reef management in the region by individually highlighting some of the better practices noted by experts during the course of this analysis.

Box 1. Zoning for Management in Bunaken National Park

The recent rezoning of Bunaken National Park demonstrated how successful zoning can be as a management tool if planned correctly. Previous to development of this new scheme, the same location also served to remind of how zoning can be ineffective if too complicated or done without adequate consultation and input from the various user groups. Originally, the marine areas of Bunaken were divided into eight different zones laid out by two (sometimes conflicting) management schemes. Each of these zones was created with a particular use in mind. The boundaries separating the zones, confusing even on a paper chart, followed no clear pattern and were nearly impossible to distinguish when on the water. Making matters worse, rules outlining allowed and prohibited activities in each zone were ambiguous and therefore rarely complied with. This combination of problems essentially rendered the zoning scheme ineffective.

These issues prompted increased calls by the villagers and the tourism sector for an improved management scheme. With support from the USAID-funded Natural Resources Management Program, an extensive consultation process was initiated to determine current use patterns and public desires. A village-by-village consultancy process, which ultimately involved over 50 public meetings, was conducted. Input from dive operators and other tourism outfits was likewise gathered. In the end, the revised zoning scheme reflected only three different use zones, each with clear borders and explicitly defined activities and prohibitions. Because of the long consultative process with stakeholder groups, this new, simplified scheme enjoys widespread public support and results in far fewer enforcement problems (and hence fewer enforcement costs).

This effective zoning scheme, and the process by which it was created, is an excellent model for national parks which are experiencing similar pressures to adequately provide for many different interests (commercial and local fisheries, tourism, and conservation). For parks with inadequate management plans or that lack them altogether, this consultative zoning process may offer an excellent solution to this increasingly common management issue.

Box 2. Dive Operators Lead the Way in Bunaken

Bunaken National Park, established in 1991, encompasses almost 90,000 hectares, including five islands and some of the North Sulawesi mainland. Bunaken is noted throughout the region for its exceptional coral reefs and high marine diversity, which has led to major efforts to improve its management over the years and eliminate some of the primary threats to its condition, including illegal fishing, anchor damage, pollution, and coral mining. The Bunaken National Park Management Advisory Board (BNPMAB), comprised of local and national government agencies, NGOs, academia, and representatives from some of the 21 communities residing within the park boundaries, was established in 2000 and is now managing the park with improved effectiveness.

Some of the success of these management efforts can be traced to the efforts of an association of local scuba diving operators, the North Sulawesi Watersports Association (NSWA). Formed in 1998 by seven dive operators (membership has since doubled), the goal of the NSWA is to promote sustainable use of the park's resources and protection of its reefs. NSWA seeks to achieve that goal through what it called the "3 E's": education, employment, and enforcement. Through the combined initiative and financial support of its members, NSWA has successfully undertaken a multitude of projects in these areas, including:

- Supporting the printing of coral reef educational cartoon books
- Establishing a scholarship donation program
- Hosting a mooring buoy design competition for villages
- Sponsoring a PADI Project AWARE workshop on marine resource management for dive professionals
- Sponsoring an Earth Day 2000 Reef Cleanup for Bunaken villages

- Donating coral reef identification books and photos to community information centers
- Committing to hiring more villagers directly in dive operations (dive guides, receptionists, boatmen, etc.)
- Starting a village handicraft program
- Purchasing pelagic fish products from villagers (mahi-mahi, etc.)
- Recruiting villagers into a joint patrol operation
- Enforcing a strict ban on anchoring by dive boats
- Involving villagers in enforcement efforts
- Participating and funding a patrol program to combat destructive fishing within the park

This unique, private-sector initiative has been highly effective in increasing village awareness of the marine conservation issues and involving the villagers more intimately in the park's management. The association's efforts are well regarded among the other park stakeholders.

In addition to these activities, as an active participant in the BNPMAB, NSWA supported the board's implementation of an entrance fee system to help finance future management efforts. This system is two-tiered (different rates for domestic and foreign visitors) and is based on the results of willingness-to-pay surveys. For a typical foreign dive tourist, a multi-visit tag good for one year costs Rp 75,000 (approximately US\$ 8). Implemented in March 2001, these entrance fees are projected to bring in nearly Rp 1 billion (US\$ 100,000) a year. By law, eighty percent of the revenues generated by these fees go into a trust fund for park management and conservation activities (Mongdong 2001). The remaining twenty percent go to national, provincial, district, and city governments. NSWA is playing a critical role in the success of this system, as it is the dive operators themselves who are primarily responsible for the issuing of tags and remittance of fees.

Box 3. Tubbataha Reef National Park: A Study in Collaboration

Tubbataha Reef is comprised of two uninhabited coral atolls in the middle of the Sulu Sea, approximately 150 km southeast of Palawan. The marine biodiversity of this reef is among the highest in the Philippines, which makes it important ecologically (it's a UNESCO World Heritage Site) and a popular site for divers. One of the few marine protected areas in the Philippines being managed at the federal level under the National Integrated Protected Area System (NIPAS) Act, since its establishment in 1988 the park has been very successful of reducing the illegal and destructive fishing in the area.

The management of Tubbataha is notable for its successful use of public-private partnerships to achieve success. A multi-stakeholder Protected Area Management Board, comprised of NGOs and government agencies, establishes priorities and coordinates management activities. Technical assistance and scientific support is provided by research institutions and NGOs. Financial support for park management is provided by the government, external grants, and, increasingly, park revenue generated by user fees.

Long-term collaboration by these stakeholders has turned around a park that was being increasingly degraded by illegal fishing, anchor damage, and collection of marine life. Dedicated activities by the NGO community (including research programs, mooring buoy installation, and construction of field stations) are in large part responsible for the success of the park to date. However, the Philippine government has played a significant role in park management. The Philippine Navy, for instance, routinely patrols the area against illegal fishing. Private tourism operators also assist by ensuring divers do not inadvertently damage reefs. This strong cooperation between government, NGOs, and the private sector has proven critical to the conservation of this marine resource and offers an interesting study in such collaboration.

Box 4. Working Together to Protect Komodo's Reefs

Famous worldwide for endangered dragons, the island of Komodo and its neighbors are also home to some of Indonesia's finest coral reefs. Both the terrestrial and marine ecosystems of Komodo were brought under legal protection in 1980 when they were declared a national park. The unusual diversity of the region brought about further designation as a UNSECO World Heritage Site in 1991. However, despite these efforts, this unique ecosystem continued to find itself under increased threat from human activities. Within the park, marine threats included blast and cyanide fishing, reef gleaning, overfishing of reef fishes (particularly species such as grouper), land-based pollution due to deforestation and

nutrient runoff, and anchor damage.

This range of threats brought about an unusually strong partnership between an NGO – The Nature Conservancy (TNC) – and the Indonesian government. Working together, the combined efforts of these two organizations have developed a variety of approaches to persuade the residents in and around the park to move towards more sustainable use of their marine resources. The population involved is sizable. Around 4,000 people live in four main villages within the park; as many as 15,000 more inhabit the surrounding area and depend upon the same resources.

This partnership has adopted what might be termed a “carrot and stick” approach to management. To encourage residents to cease overfishing species popular with the live reef fish trade, TNC is implementing a mariculture hatchery that will allow highly-prized commercial fish such as mouse grouper and barramundi to be cultured locally. Along with seaweed mariculture, this will provide residents with a sustainable export product and provide them with an alternative to extracting these key species from local waters. In addition, TNC has installed Fish Aggregating Devices in deep water outside the park and has developed a pelagic fisheries project designed to teach villagers to sustainably harvest pelagic fishes rather than reef species. This has included teaching new fishing techniques to the traditional male fishers while involving the women in fish processing. A robust awareness program designed to foster a sense of stewardship among those who rely on reefs has accompanied this effort.

Along with this “carrot” came the “stick” of tougher enforcement. With TNC support, more boats and rangers began conducting routine patrols of park waters. This effort was initially tested by illegal fishers in tense and, briefly, violent stand-offs. After initial confrontations, however, rapid reductions in blast fishing within the park boundaries followed. Expansion of enforcement capacity has continued with five floating ranger stations planned to further increase monitoring capability.

Together, this push for alternative income sources along with increased enforcement has given hope to protecting a resource which was increasingly at risk. Recent monitoring by TNC indicates that overall destruction of coral reefs in and around Komodo has stopped and that a slow rehabilitation has started. This indicates the efforts of this partnership are having measurable effects.

Box 5. Continuity and Partnerships: Mu Koh Surin, Thailand

Aside from a small mainland launching-point, Mu Koh Surin National Marine Park consists of five islands and 135 km² off the north-central coast of Thailand in the Andaman Sea. It is a place of breathtaking beauty, where an easy snorkel provides quick rewards. Exceptional fish and coral diversity is accentuated with frequent sea turtle sightings.

Happily, Koh Surin is regarded as a paradise of coastal management as well. Continuity of management, the development of many successful partnerships, and the consideration of indigenous people in management decisions have all helped park management succeed. The enviable results have effectively protected coral condition against illegal fishing, excessive numbers of tourists, and the effects of ill-planned coastal construction.

Surin’s geography presents a unique set of management challenges compared with the marine parks in closer proximity to mainland Thailand. Immediate pressure from neighboring fishing communities is greatly reduced, although not eliminated. Limited access to the island—for most overnight visitors, a patient, four-hour ferry ride—has allowed the park head to cut off visitor occupancy at 300 people, protecting it from the explosive tourist numbers seen elsewhere.

However, remote location is not a panacea and, in fact, might be expected to attract fishers, particularly destructive fishers, who would prefer to take advantage of the rich marine resources far from watchful eyes. Effectively enforcing against illegal fishing has been the overwhelming success of Koh Surin and remains its most important task. This success stems from the consistent and persistent efforts of the park head, supported by several unique partnerships.

Koh Surin park has enjoyed the sustained leadership of one Head of Park for over five years. This uninterrupted tenure has allowed this leader to grow into the job, continuously improve upon park management, and provide a consistency to enforcement that has served as a deterrent against

violators. Contrast that with the equally remote Similan National Park, which has seen six park heads in the last three years, and has had much less success in addressing similar management issues.

The park's success is also the result of important partnerships with academia, police, foreign volunteers, other government departments, and outside assistance projects. These partnerships have provided technical assistance and streamlined the enforcement process. They have also facilitated inclusion of the Chao Lay or "Sea Gypsy" people in the park's management, which has been important to both conservation of the park's resources and the unique Chao Lay lifestyle.

One example of a successful partnership is the two undercover police officers who are stationed on the island during the tourist season to assist in fisheries enforcement. Their presence gives both confidence to the enforcing park rangers and efficiency to the prosecution procedures, since the police are familiar with the details of cases from the beginning.

Close ties with Kasetsart University's marine science department has provided invaluable technical assistance. Additional collaboration with the Department of Fisheries and two years of assistance from a volunteering British marine biologist have also provided Koh Surin with scientific support. Improved coral monitoring has guided implementation of management activities, such as area closures to promote recovery of damaged reefs. In addition, the university-park partnership has spawned innovative tourism management strategies including the creation of an interpretive snorkeling trail. It has also provided a stream of graduate students to conduct needed research on an on-going basis.

The extent to which Koh Surin's success is a function of remoteness may be tested by a proposal to extend the park boundaries to include a very popular dive site. This expansion would test the park's ability to manage tourist impacts and to work in successful partnership with dive operators. Inauguration of a user fee this year, modeled on the Australian system, has met with mixed success. While some of the fees have been collected, dive operators have expressed concern that the fee will not be effectively directed toward improved resource and tourism management and that the process is unaccountable and non-transparent. Some operators have protested by not paying the overnight mooring fee. Establishing effective partnerships with this broader base of resource users will be an important part of Koh Surin's continued success.

Box 6. Apo Island: Community-Based Marine Sanctuary Management

Apo Island is perhaps the best-known example of a successful community-based marine sanctuary in the Philippines. The product of a Silliman University program begun in the late 1970s, Apo has demonstrated lasting success managing its community sanctuary. Over the past decade, fish species richness and abundance have increased within the sanctuary, coral cover has improved, and fish landings have increased in the area. The community considers the sanctuary an unqualified success.

Several key elements helped ensure this sanctuary would be successful, including:

- Close and continuous support for the sanctuary by the university
- Integration into the community by field workers to gain community trust
- Community education, including marine ecology, coastal management, and informal awareness building
- Constituency building. This included identifying and engaging existing political groups as well as forming a sanctuary management council
- Alternative livelihood and other development assistance

It took nearly four years to gain sufficient community "buy in" to establish the sanctuary and several more before it was officially gazetted. However, support for the sanctuary grew over time as the benefits became apparent.

In 1994 Apo Island was designated a Protected Landscape and Seascape under National Integrated Protected Areas System (NIPAS) legislation. This took management of the reserve away from the community and into the hands of a Protected Area Management Board run by the Department of Environmental and Natural Resources. While this action validated the sanctuary's success, the "nationalization" of management damaged the community's relationship with their sanctuary. One example of this is the distribution of user fees collected from tourists, once kept by the community.

Revenues collected are now placed in an Integrated Protected Areas Fund (IPAF) operated by the Philippine treasury. Apo Island residents now encounter some difficulty receiving their share of this revenue from their sanctuary. Although time will tell if management of the reserve will suffer due to such bureaucratic log-jams, the community remains enthusiastically supportive of the reserve.

Box 7. Building Community Stewards in North Sulawesi

The USAID-URI Coastal Resources Management Project (“Proyek Pesisir” in Indonesian) began work facilitating community-based management in North Sulawesi with an extension model. The most publicized success of this project is the community sanctuary in village of Blongko, followed by sanctuary replication in the nearby village of Talise. However, Proyek Pesisir’s work cultivating community-based coastal management capacity in these villages resulted in far more than these marine protected areas. They developed capacity and commitment from the villagers that resulted in a range of coastal management actions.

In Bentenan -Tumbak, the sanctuary concept became only one piece of a multiple-use marine zoning scheme. Along with the sanctuary “no-take” zone, areas for tourism, seaweed mariculture, fishing, and even boat lanes were designated as part of a plan to address user conflicts.

Through small grants programs, communities undertook a variety of projects which addressed community priorities and also had positive benefits for the coastal environment. Latrines were constructed, mangroves replanted, and hillsides reforested. The grants were awarded based on community-generated proposals and required community contributions in the form of labor or materials. They did not pay for community labor, which was donated by villagers. Communities were trained in simplified accounting and Proyek Pesisir audited the village accounts as part of the grant administration. Thus, the grants served as important learning tools for community empowerment.

These accomplishments were the results of an extensive effort to build trust and capacity in the communities. Much of the success goes to the extension workers, who lived in the community, learning its political dynamics and developing relationships. With support from the project office in the provincial capital, they negotiated the political pitfalls, raised public awareness, and facilitated a genuinely participatory process.

Community capacity-building was a centerpiece of the project’s work in the villages. It initiated with community training in coral reef mapping and monitoring. These exercises were critical to developing a sense of stewardship within the community and converting destructive fishers, who saw the results of their unsustainable practices for the first time. Community leaders were trained in week-long, off-site ICM trainings. Cross-visits with Apo Island and later Blongko, gave community leaders a vision, which led to the creation of the community sanctuaries.

Successfully developing a true sense of community stewardship also required that the project listen carefully to the village concerns. In the village of Talise, until the Proyek Pesisir facilitated formalization of the village land tenure, community-capacity building alone could not persuade the village to implement management actions. They required the security that those investments would result in future benefits.

Box 8. Community Enforcers: Mabini and Tingloy, Batangas

In the Philippines, the Luzon municipalities of Mabini and Tingloy have for years been plagued by destructive fishing practices which threatened to destroy some of the most diverse reefs on the country. However, thanks to the support of several proactive NGOs, destructive and illegal commercial fishing in these municipalities has been nearly eliminated. One key to this success was strengthening the local *bantay dagat* (literally, “sea watchers”), a group of deputized fish wardens empowered to enforce local marine laws in the community.

In 1991, the Local Government Code gave municipalities control over marine resources out to 15 kilometers. Even so, many local governments lacked the capacity to create or enforce the laws. As a result, many remained powerless to prevent illegal activities from continuing to occur. The existence of *bantay dagats* to help with enforcement became common; however, many suffer from lack of funding, training, high turnover, or political maneuvering.

In Mabini-Tingloy, NGOs such as WWF-Philippines helped address these weaknesses, providing training and funding for boats, fuel and equipment. In addition, by raising the program's profile and demonstrating its success to local politicians, WWF created stability and continuity, allowing the organization to mature and become increasingly effective.

Several dozen *bantay dagat* members work for the organization part-time on a rotating schedule. WWF provides a small remittance for their services on the days they work as deputies. Other services provided by external assistance range from buying t-shirt "uniforms" for *bantay dagat* members to hosting seminars with the U.S. Department of Interior on environmental law enforcement. NGOs have also provided legal services to assist with prosecution of violators caught by *bantay dagat* patrols.

As a result, law enforcement efforts have become quite successful. Dynamite fishing is virtually unheard of in the area, and the coastal waters at night are now dark where once they were illuminated by illegal commercial vessels. Local fishers continue to harvest the resources of the local reefs using legal, sustainable fishing methods, and support a thriving fish market. It is yet another success story owing much to a partnership between NGO and government.

Box 9. Legal Extension: The Legal Environmental Advocacy Program

The Legal Environmental Advocacy Program (LEAP) at Silliman University's School of Law was established in 1996 as a legal research and extension program. A component of the Center of Excellence in Coastal Resource Management, LEAP specializes in the legal foundation and implications of community-based resources management. It also caters to the needs of indigents who have been displaced or adversely affected by the degradation of the environment. In the Philippines, it is the only legal aid program solely focused on the environment.

Typical of LEAP's assistance to communities is the help it provided the municipality of Dauin in drafting a community-based marine reserve ordinance, and the lectures on relevant environmental law given in the municipality of Guihulngan when a controversial new cement plant was proposed.

LEAP's other activities include:

- Conducting surveys and investigations into pressing environmental problems
- Informing coastal communities on Philippines environmental law through on-site seminars, lectures, and information campaigns
- Informing communities of legal and extra-legal solutions to their problems, including mediation, arbitration, and negotiation
- Sponsoring environmental conferences for government and NGOs
- Rendering legal advice and opinion to communities
- Translating, popularizing, and publishing basic environmental laws in forms easily digested by the public

Program funding from 1996 through March 2001 was via the U.S. Agency of International Development's Coastal Resource Management Project (CRMP). At its height, nearly 100 law student volunteers were involved in LEAP activities. The university now provides continuing support for a scaled-down version of the program.

Box 10. Supporting Local Governments Through CRM Certification

Implemented by the DENR as a component of the Coastal Resources Management Project, the certification of municipal coastal resource management (CRM) plans is a new idea being piloted in several regions of the country where the development of community-based marine sanctuaries has been ongoing. The goal of such a program is several-fold. First, it will benchmark local government unit (LGU) performance towards achieving coastal resource management standards. In addition, it gives LGU's a tool by which to evaluate their process and propose changes to their management plans. Finally, certified municipalities will achieve recognition for their efforts and, it is hoped, eventually be given priority status for future funding. Municipality participation in the certification process for now is voluntary.

Certification is modeled after the international standards system. Given set criteria, municipalities undertake a self-assessment to determine which of the three levels of certification is appropriate. Basic certification is expected to be achieved in the first several years of CRM planning and includes such activities as drafting multi-year CRM plans, completing a baseline assessment, and planning CRM interventions. Intermediate certification includes conducting annual evaluations, implementing shoreline plans, and permanently assigning human resources to CRM implementation. Advanced CRM is reached when, among other things, measurable results can be seen resulting from the planned interventions.

The certification process is begun at the municipality level, where each LGU conducts a self-assessment and recommends a certification level. A provincial-level technical working group provides assistance to the community in conducting this assessment and endorses their certification to a regional committee. This group, comprised of government agencies, environmental NGOs, and academic institutions, reviews the evaluation before issuing the appropriate certification. The certification process occurs yearly and is timed to coincide with the budgeting cycle.

This program will probably generate the most enthusiastic response from municipalities when funding is tied more closely to it. In any case, the program meets several growing needs. It promotes CRM as a basic local government service and provides an institutional structure to support community-based management. Additionally, it provides an evaluation framework to measure the success of CRM programs. Finally, it represents a needed step towards standardizing the way CRM is measured.

Box 11. Towards Sustainable Financing: The Malaysian Marine Parks Trust Fund

Recognizing the need to better finance the administration of its National Marine Parks and Fisheries Protected Areas, in 1987 the Government of Malaysia passed legislation establishing a Marine Park Trust Fund with an initial grant of RM 35 million (US\$ 9.2 million). Although originally envisioned as a way to improve park infrastructure and purchase needed vessels and vehicles, since the mid-1990s most trust fund expenditures have gone towards operation and maintenance of the parks themselves.

Because of the fund's structure, financial contributions come not only from the Malaysian government but also from donations from companies and individuals. Trust fund regulations also allow the Department of Fisheries (which manages the parks) to raise revenues for the fund through the sale of books, posters, t-shirts, videos, and the like. Products such as these are clearly labeled that the proceeds go towards the conservation and management of these protected areas.

Since 1999, marine parks have been collecting "conservation charges" (user fees) from all visitors, including divers and snorkelers. These fees are reasonable – RM 5 (US\$ 1.30) allows an adult five days of park access – yet significant when considered cumulatively. These fees also go into the fund.

Those familiar with the fund are pleased with its management. Several factors are critical to this success and distinguish this fund from similar concepts elsewhere. First, administration of the fund is largely transparent, which builds public trust in the accounting; park rangers on the ground, for instance, believe the money is largely used wisely. Also, the fund's separation from the Malaysian treasury is sufficient enough to encourage external donors to give. Finally, the continued support of the Malaysian government reaffirms its status as an environmental priority, encouraging others to also contribute.