BACKGROUND PAPER 4

BEST PRACTICES IN GOVERNANCE AND ENFORCEMENT OF MARINE PROTECTED AREAS: AN OVERVIEW[1]

by

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Summary

Marine protected areas (MPAs) have emerged as an important tool for meeting various biodiversity conservation, fisheries management and social goals. While global targets have been set and considerable effort and resources are being expended, important governance and institutional questions remain largely unanswered. In particular, greater attention to social dynamics, trade-offs and incentives is necessary to ensure MPA success in a variety of contexts. This study attempts to capture our current understanding of these matters in various locations. It is limited, to some degree, by the lack of published work on these matters.

There is considerable understanding as to how MPAs, particularly community-based ones, are most effectively planned and implemented in places such as the Philippines. This knowledge is grounded in decades of trial and error, as well as carefully designed empirical research. A standard planning process generally follows these phases.

- Phase I: Issue identification and baseline assessment
- Phase II: Plan preparation and adoption
- Phase III: Action plan and MPA implementation and enforcement
- Phase IV: Monitoring and evaluation
- Phase V: Information management, education and outreach

Each of these phases is grounded in a carefully orchestrated education and community organizing process designed to empower resource users. The planning process should be flexible and iterative. MPA implementation and stabilization is a slow process. Such systems generally evolve into co-management regimes to ensure that resource user communities and government entities (and other constituencies) are engaged in a productive and collaborative partnership.

Such community-based MPAs are designed to meet both artisanal fishery management and biodiversity conservation goals. Experience and empirical evidence demonstrates that the generation and equitable distribution of benefits from such MPAs is essential to long-term success. Important challenges, such as scaling up such MPAs into networks and improving their resilience in light of global change processes, remain ahead. This type of MPA has been most commonly implemented in the tropics, although attempts are underway in developed country contexts.

Large-scale, centrally-planned MPAs are important for biodiversity conservation and will likely emerge as an important tool for remote areas and high seas. They require strong institutions and

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considerable financial resources to implement and, as such, are likely most appropriate for developed country contexts. Reviewed examples strongly suggest that governance mechanisms which ensure meaningful consultation with the public about design and management are possible and essential to success.

Traditional MPA systems as found in the West Pacific and with private reserves, will likely have an important, but more limited role globally. Most traditional management systems have been undermined for too long by colonial and globalizing economic systems in most contexts. Private MPA management, while potentially effective, tends to generate considerable controversy given the typical status of marine resources as either public or common pool resources.

To be effective on a wide scale, MPAs should be embedded within large planning frameworks such as integrated coastal management (ICM) or ecosystem-based management (EBM). ICM has been under development around the world for at least 30 years, although it is only beginning to take hold in many countries. EBM is a more recent planning framework, and is largely untested. These frameworks are designed to balance resource management and economic development, consider ecologically-significant processes, and encourage cross-sectoral planning. Impacts from terrestrial activities, inter-sectoral conflicts, overfishing and the management of trophic interactions are central issues being addressed by these broad models. These comprehensive frameworks should emerge incrementally from past management practices and match institutional human and fiscal capacity.

MPAs and networks of MPAs are increasingly important tools for EBM and ICM. The networking of MPAs to improve ecological and implementation function is widely recommended, however little field experience exists. Many so-called networks are actually collections of MPAs in a particular region without carefully designed ecological or social linkages. Networking can strengthen the management of an individual MPA by linking resource users and managers to support systems. The transactions costs and complexity of formal network management are likely considerable, although not well established. As a result, careful ongoing evaluation of such nascent efforts is critical.

MPA implementation requires supportive legal and jurisdictional frameworks—a relatively rare condition around the world. MPAs affect resource user behaviour and large-scale development and transportation patterns and, as such, entail trade-offs. The legal encoding of the boundaries and management rules of any MPA is a fundamental step that legitimates management decisions. Similarly, multiple institutions and various levels of governance will likely become involved in any MPA implementation process. Clear jurisdictions between formal institutions are not common in most marine contexts.

MPAs are now at the centre of an important and fascinating debate about resource and environmental management. The common pool or open access nature of most living marine resource management regimes creates both opportunities and challenges for MPA implementation. Collective action by interested and informed constituencies has proven to be an effective means for MPA implementation. Conversely, the lack of clear tenure rules can undermine MPAs. In many cases, the MPA debate tends to pit conservationists and advocate natural scientists justifiably concerned about condition of the world's oceans against sceptical resource users and social scientists and natural resource management institutions concerned with economic dislocations and trade-offs. While sustainable resource use and biodiversity conservation are important goals for any management regime, there are clearly many means to attain these goals. MPAs are one of many important management tools that if implemented carefully have tremendous potential. The process will necessarily require global dialogue (due to the desire for global networks) as well as local efforts. These experiments should be carefully studied and documented to support field activities and capture lessons (in addition to developing ecological and social knowledge). Given the tight linkage of human and ecological systems, such evaluation should be multi-disciplinary suggesting that, for now, much more attention is needed on developing a rigorous and comparative understanding of governance and institutional principles.

1. INTRODUCTION

Marine protected areas (MPAs) have been established as an important tool for fisheries management, biodiversity conservation, habitat restoration and tourism development. They take many forms, but all have in common the characteristic of management interventions that are spatially organized. Likely the most widely accepted definition for an MPA is the following.

> "Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment." (Resolution 17.38 of the IUCN general assembly [1988] reaffirmed in Resolution 19.46 [1994])

The growth of interest in MPAs has been remarkable. As ocean ecosystems, and associated human communities, are stressed as a result of overexploitation and habitat degradation, MPAs have been commonly offered as an important management intervention.

This overview of governance and enforcement of MPAs will emphasize some of the challenges and opportunities associated with MPAs. It will draw from experiences around the world, but will emphasize the Philippines where both authors have worked extensively and where there are a variety of long-term MPA examples to draw from. The lessons and management approaches developed in the Philippines are widely relevant for other, especially, tropical contexts. The intent is to strike a balance between conceptual ideas and practical guidelines for MPA governance and enforcement.

2. MPAs TAKE MANY FORMS IN NAME, GOVERNANCE AND FUNCTION

MPAs take various forms around the world and the terminology is confusing. A "sanctuary" in the Philippines is strictly off limits to extractive uses, while a "national marine sanctuary" in the United States context usually allows fishing but prohibits other activities such as oil exploration. Geographic scales also vary tremendously—from 2 hectare community-based MPAs to the thousands of square kilometers of the zoned Great Barrier Reef National Marine Park. MPAs can consist of temporary or permanent closures. For the purposes of this study, MPAs will consist of a "no-take" area(s) with some type of buffer or other nearby zones within which extractive and non-extractive uses are regulated.

Governance may be conceived as "the formal and informal arrangements, institutions, and mores which determine how resources or an environment are utilized; how problems and opportunities are evaluated and analyzed, what behaviour is deemed acceptable or forbidden, and what rules and sanctions are applied to affect the pattern of resource and environmental use." (Juda 1999) Various models, including top-down, bottom-up, co-management, and traditional management regimes, are utilized to implement MPAs (Christie and White 1997). As a general premise, how these management models evolve is influenced by whether there are functional common property regimes in place or resources are open access. MPAs can, in fact, serve to reinvigorate common property regimes that had been dismantled over time. Ostrom has demonstrated, mainly through an analysis of terrestrial systems, that various design principles are associated with successful and long-term common property regimes (Ostrom 1990:90).

Ostrom's design principles illustrated by long-enduring common property regimes are as follows:

1. Clearly defined boundaries defining who has rights to withdraw resources and the boundaries of the common resource
2. Congruence between appropriation (restricting time, place, technology, etc.) and provision rules (requiring labor, material, and money) and local conditions
3. Collective-choice arrangements
4. Monitoring of conditions and behavior
5. Graduated sanctions depending on the seriousness of an offense

6. Conflict-resolution mechanisms
7. Minimal recognition by government authorities of rights of appropriators to organize
8. Nested enterprises with monitoring, enforcement and governance activities organized in multiple levels for CPRs that are part of larger systems

Various authors (Christie *et al*. 2003a; Mascia 2000) have extended Ostrom's principles to the marine realm, but comparative, empirical evidence is not yet available.

It is beyond the scope of this work to discuss examples of specific MPAs from around the world in detail. But a review of relevant research[3] and of published descriptions of MPA implementation[4] provides sufficient grounding for these summary conclusions. As a starting point, it is critical that MPA designers recognize that effective MPA governance is heavily influenced by the particular socio-political, historical, and socio-economic context of a site. The problems associated with the development of globalized management models that can be effectively exported around the world is, in fact, one of the most important lessons of a decade of research (Brechin *et al*. 2003; Christie *et al*. 2005). For example, the Philippines has been a leader in community-based and co-management MPA management. Its global influence, while significant and understandable, must be carefully assessed. Such models need to be made context-appropriate. Similarly, centralized management regimes, reliant on strong formal institutions and funding bases, are not effective in much of the developing world.

A matrix of common MPA governance systems, characteristics, and examples is presented in Table 2.1. Some of the MPAs straddle management approaches, but the characterization suggests that there is a broad diversity of strategies around the world. While the below section will attempt to elucidate general principles, there are serious limitations with the MPA governance literature which consists principally of grey literature and case studies that are influenced by particular site dynamics.

Table 2.1 MPA governance systems, characteristics, and key examples as discussed in report.

	Traditional: Based on pre-colonial management systems and traditional ecological knowledge, taboo systems	**Bottom-up: led primarily by resource users, generally small-scale, participatory**	**Co-management: Joint management by resource users and government**	**Centralized: Led by government agency, consultative with resource users**	**Private: Private sector led**
Africa			Mafia Island (Tanzania), Kenya		Chumbe Island, Tanzania
Asia		Apo Island (pre 1992), San Salvador Island (pre 1990), Philippines	Tubbataha National Marine Park, Apo Island and San Salvador Island (at present), Philippines		
Pacific Islands	Palau, America Samoa, Locally Managed Marine Areas (LMMA				

[3] Consisting primarily, but not exclusively, of a review of the leading marine policy journals: *Ocean and Coastal Management*, *Marine Policy* and *Coastal Management*.
[4] Consisting primarily of a review of MPA News (www.mpanews.org), the gray literature, and various MPA guidebooks and reviews (e.g. Salm and Clark 2000, Sobel and Dahlgren 2004, NRC 2001), and personal communications.

	network) in Western Pacific				
Latin America			Galapagos Islands, Ecuador, Brazil extractive reserves	Galapagos Islands, Ecuador	
Caribbean			Souffriere, St. Lucia		
United States				Florida Keys and Channel Islands, United States	
European Union				Italy network, Mediterranean MPAs, Britain	
Australia				Great Barrier Reef National Marine Park	
Offshore				Pelagos Whale Sanctuary in Mediterranean Sea	

Trade-offs are associated with each of these governance systems. The interplay between social and ecological goals, and a consideration of context, will suggest a particular approach.

2.1. Traditional

Traditional ocean governance became known globally through the seminal work of Robert Johannes (1981) and Kenneth Ruddle (1988, 1994). The fact that, in some societies, MPAs had existed for millennia, grounded in taboo and social norms, suggests that these governance systems are sustainable and effective in some contexts. While uncertain, many other societies (e.g. the Philippines, Indonesia) that are highly reliant on nearshore coral reef fisheries and related to Pacific Island cultures likely had similar regimes prior to the disruptions caused by colonialism. The negative effects of globalization on Palau's traditional management systems suggests that they are potentially fragile and best suited to support modest, local commercial and subsistence activities (Johannes 1981).

Recently, there has been considerable effort to strengthen such traditional management systems throughout the West Pacific Islands. The Locally Managed Marine Area network, discussed below, represents one such effort. The formal institutionalization of traditional management practices, while potentially supportive, should not reify these adaptive systems (Ruddle 1988).

2.2 Bottom-up management

In a context of weak formal institutions, or where resistance to colonialism is strong, bottom-up or community-based MPA management strategies are frequently employed. Weak formal government support may be due to a lack of financial or technical resources. In some contexts, especially in non-democratic or post-colonial states, governments may not effectively serve the public. In these contexts, that are common through much of the tropics, bottom-up governance regimes may be the only feasible option. Its relevance is not limited to the tropics however (McCay and Jentoft 1996) and is now being practiced in places such as the San Juan Islands, Washington, United States (MPA News 2000). Much of this report emphasizes the means by which to operationalize such strategies.

There are various advantages to bottom-up strategies. They tend to engage resource users more effectively than top-down strategies since they lead to a sense of trust, collaboration, and ownership among participants (Christie and White 1997; Pollnac *et al*. 2005). These strategies are also responsive

to local conditions that resource users know intimately from regular interactions (e.g. Christie *et al*. 2000; Johannes 1981). Finally, if carefully implemented, their attention to meaningful participation tends to lead to sustainable long-term management regimes, especially if the bottom-up process and participating resource users and organizations eventually engage the government (Balgos 2005; Christie 2005; Christie *et al*. 2005; White *et al*. 1994). Once a strong and self-reliant planning process is established, empowered resource users are more effective in contributing to a co-management process with government agencies (described below). Developing a sense of self-determination is a central desire in many fishing communities, and, if realized, can engender a sense of pride that attracts participation in management and inspires people to educate others in a similar situation (hence the importance of cross visits as highlighted in Section 7). In the broader sense, bottom-up management approaches represent an important means by which communities are able to reassert historic authority over resources upon which they depend. Colonialism and, now, globalization are forces that tend to erode such authority.

Establishing bottom-up processes is fraught with challenges, and unless eventually articulated with government authorities through a co-management arrangement may not be sustainable. The legacies of colonialism and dependence (globally) on government agencies and the private sector tend to remove incentives to participate in such a time-intensive process. If resource users have been disenfranchised from their resource bases and marginalized from decision making for decades or even centuries, change will likely proceed at a slow pace and will encounter many obstacles both internally and from external forces that are not in favour of change (Christie *et al*. 2000; Morris and Mueller 1992). Community-based initiatives may also be destabilized when neighbouring communities and leaders do not support MPA implementation (Aitaoto 2006). On a pragmatic level, funding horizons and non-governmental organization (NGO) planning timelines are generally not long-term. At a minimum, such processes need approximately three years of financial support and one decade of at least part-time external technical support (with conflict management, leadership development, etc.). Finally, the scaling up of bottom-up management to address large-scale processes affecting coastal environments and communities (including climate change, overfishing, and pollution) is challenging. The incentives for participating resource users or local officials to become engaged in issues outside their areas are unclear and the issues are frequently highly technical and difficult to grasp. Recent efforts to develop learning networks as highlighted below are an important first step toward effective scaling-up.

2.3 Co-management

The fundamental principle of co-management is that it involves resource users and formal policy makers (e.g. the government) in a process of joint decision-making (Christie and White 1997; Nielsen *et al*. 2004; Pinkerton 1989; Pomeroy *et al*. 2006; Pomeroy *et al*. 2001; White *et al.* 1994). It is frequently one of the outcomes of a community-based process that has matured to the point whereby resource users and policy makers (and other entities such as the private sector) have comparable influence and willingness to collaborate (Christie 1999). Co-management can also be mandated (as with tribes in Washington State, United States) and used to strengthen historically-established rights that affect the allocation of resources and implementation of MPAs (Pinto da Silva 2004).

Co-management, as a compromise between bottom-up (led by resource users in the strict sense) and centralized management, potentially represents the best of both models—engaging resource users and government officials in an equitable and transparent planning process that is formally recognized and sanctioned. Ideally, co-management efforts are able to utilize local knowledge and improve compliance by engaging resource users, while formalizing management decisions with government support. However, based on comprehensive, comparative research in Southeast Asia and Southern Africa, "the practical adaptation by governments of the co-management approach has most often been limited to involving fishing communities in the implementation process—an 'instrumental co-management' approach. Governments have generally not perceived co-management as a means to introduce more democratic principles into fisheries management, but have recognized co-management as an instrument to reach its management objectives more efficiently by involving fishing communities in the implementation process" (Nielsen *et al.* 2004:154). Experience in Tanzania,

Nicaragua, Brazil and the United States demonstrates that co-management processes that are not attendant to power dynamics and establishment of conflict resolution mechanisms run the risk of breaking down (Christie 1999; Christie *et al*. 2000; Dukes *et al*. 2001; Pinto da Silva 2004; Walley 2004). The establishment of multi-sectoral management boards is difficult unless mandates are clearly established and long-term financing available. With these challenges in mind, examples such as the Tubbataha Marine Park management council demonstrate the potential of co-management and multi-sectoral management boards to ensure balanced representation from stakeholder groups (Arquiza and White 1999; UNESCO 2006).

As with community-based approaches, co-management efforts will require future attention to developing larger-scale initiatives, reconciling local and global management agendas, balancing of local and scientific knowledge, and developing conflict resolution strategies (Christie and White 1997; Nielsen *et al*. 2004).

2.4 Centralized management

Centralized management has historically been the most common governance regime in countries with strong national governments. Colonial governments frequently replaced more decentralized, traditional governance systems as a means of efficiently extracting natural resources (Christie and White 1997; Nielsen *et al*. 2004; Robinson 1997; Walker 1997). In a globalized world in which indebted countries require hard currency, fisheries allocations for valuable resources are most frequently made by government agencies. In the global North, strong government bureaucracies and clear legal mandates frequently established fisheries (and possibly environmental management) agencies as policy makers for catch allocations and MPA design and management. For example, in the United States MPA planning tends to be rather centralized, with final policy making resting with the National Oceanographic and Atmospheric Administration National Sanctuaries program that consults with various constituencies and scientists (NOAA 2006; Scholz *et al*. 2004; Suman *et al.* 1999).

International protocols and multi-national agreements should also be considered under this management approach. Attempts are underway to utilize international agreements and protocols to establish MPAs—although linking issues such as vessel-source pollution control and MPAs is not always successful (Detjen in press). International protocols will likely determine the range of possibilities for offshore MPAs such as Pelagos Whale Sanctuary in the Mediterranean Sea (MPA News 2003a). These offshore MPAs are likely to meet some obstacles resulting from their potential impacts on fishing and navigational interests (Kaye 2004).

Centralized management is commonly perceived as having the benefit of efficiency and scientific grounding. Technical specialists who understand the theory associated with MPA planning and assessment are able to design sophisticated plans, especially with recently developed software that aids modelling and decision making (e.g. MARXAN, ECOPATH, etc.). Ecological connectivity, animal migrations, and changing climatic conditions over large areas may be taken into account when MPA designs are made. On occasion, framing resource management as mainly reliant on science is a means to centralizing management decision making in the hands of scientists and government officials. Currently, a heated debate regarding protected area management and the role of scientific and local (non-scientific) knowledge is underway (Chapin 2004; Terborgh 1999; Brechin *et al*. 2003).

The most serious limitations of centralized management are associated with how stakeholder groups will respond to policies that will affect them but for which they do not feel responsible. The recent establishment of global targets for MPAs implies, in some manner, that international bodies are willing to assert their influence—a process that some advocates of MPAs have expressed concern over since it may undermine wide commitment to ocean conservation and short circuit complex planning processes (Agardy *et al*. 2003). Recent studies question the long-term (fiscal and temporal) efficiency of centralized management compared to co-management regimes (Pomeroy in review). Experiences in the Florida Keys National Marine Sanctuary, Channel Islands, and Galapagos Islands have demonstrated that centralized management (and reticence to use human dimensions data) can foster

controversies (Helvey 2004; Scholz *et al*. 2004; Suman et al. 1999). Fishing interests in these cases have commonly felt antagonized by and distrustful of the MPA planning process. They may resist the intrusion of government agencies into a realm of resource extraction (and management) that has historic precedents (Jentoft 2000). Centralized planning may not be sensitive to localized impacts of MPAs that may result in considerable socio-economic and demographic changes as witnessed in the Mediterranean (Badalmenti *et al*. 2000; Salmona and Verardi 2001). On the other hand, national institutions may, in fact, feel threatened by co-management or bottom-up management regimes since they question government authority to manage resources.

Institutional fiscal and technical limitations represent other important limitations of centralized management. MPA planning and monitoring can be both complex and expensive. Government agencies may not be able to attend to the important details of MPA design and management, especially when budgets are limited or cut (e.g. Brazil as described by Pinto da Silva 2004 or NOAA in the United States). Furthermore, there are considerable competing societal problems such as health, economic development and education that will frequently trump MPA considerations when budget priorities are developed. Lastly, centralized management regimes over large areas may overwhelm institutional capacity especially in the absence of clear incentives and wide variability in social conditions (Christie *et al*. 2005; Jones 2006).

Centralized management can be effective. In some highly autocratic countries, such as Brunei, centralized management is the only option for establishing MPAs, and has been done so successfully from a biodiversity conservation perspective. In many countries, consultative participation is required with ultimate decision-making and fiscal allocation decisions remaining with the government (e.g. Beatley *et al*. 2002 on the United States; Day 2002 on Australia). During the recent re-zonation of the Great Barrier Reef Marine Park (GBRMP), the Australian government implemented a comprehensive consultative process that generated an unprecedented 30 000 formally submitted comments that helped with the drafting (Fernandes *et al*. 2005). Their careful use of extensive public outreach, independent expert advice, and mapping technology resulted in a comprehensive re-zonation whereby 33 percent of the GBRMP is now in no-take status.

2.5 Private management

While not commonly practiced, MPAs can either be explicitly or *de facto* privately managed. Chumbe Island, Tanzania represents one of the best know examples of the former and has demonstrated considerable resilience in the face of some criticisms that highlight the privatization of what have historically been public resources (MPA News 2003b). Private entities and government tourism operations took over management and enforcement of other MPAs, such as Twin Rocks and Balicasag Island, Philippines, after established by community and local government entities, thus representing cases of *de facto* privatization (Christie 2004; Christie *et al*. 2002).

As highlighted by Riedmiller (in Salm and Clark 2000:265-270), the private sector can act efficiently and decisively. With the correct incentives, it will pursue ecosystem friendly MPA (and tourism) development. Private MPA management may serve as an important complement to community and government-led initiatives.

As with centralized management, private management tends to generate considerable controversies. This is particularly the case if the “social contract” established by a community-based MPA process is breached in which case compliance rates are likely to decline (Christie and Pollnac in preparation; Christie *et al*. 2002). Private management may also struggle to compete with the “subsidized management” of other MPAs that benefit from grants (Riedmiller 2000).

2.6 Summary

MPA management structures vary considerably. The choice of management systems is influenced by history, cultural norms, institutional strength, faith in science, goals, and influence by individual actors

and projects. This section highlights the importance of context-appropriate management. More importantly, it suggests that each management system has associated pros and cons that must be matched with MPA goals. Careful attention to social dynamics surrounding an MPA will suggest when management strategies must change. Management scale will influence the degree to which an MPA, or network of MPAs, is able to address linked social and ecological goals. The means to effectively scale up from somewhat fragile traditional or community-based initiatives remains an area for careful exploration and documentation. There remains, however, considerable room for improving the understanding of MPA governance based on comparative field research. Most of the literature is either not peer reviewed and/or consists of individual case studies that are difficult to generalize to other contexts.

3. INTEGRATED COASTAL MANAGEMENT AND MPA EFFECTIVENESS

The goals associated with MPAs can often create conflicts among different interests, user groups, levels of government and national government agencies as seen in Belize, the Philippines and Indonesia (Cho 2005; White *et al*. 2006). Where competition for coastal resources exists, careful design and implementation of integrated coastal management (ICM) or more narrowly focused coastal resource management (CRM) schemes can help ensure continued benefits and sustainable management of coastal resources. ICM is a process aimed at guiding coastal area development in an ecologically sustainable fashion (Chua 1998; Cicin-Sain and Knecht 1998; Kay and Alder 2005; White and Chua 2004).

> "The essential elements of this management process are simultaneous integration and coordination on multiple levels, which can incorporate national and local government working together with community groups in an iterative assessment, planning, and implementation process…" (Christie and White 1997).

ICM should encompass coastal and upland areas, the uses of which can affect coastal waters and the resources therein. The ICM process tries to break down the barriers erected by traditional sectoral management of natural resources as well as the divide that exists among local government, national agencies, community groups, and NGOs (Christie and White 1997; Cicin-Sain and Knecht 1998; Courtney and White 2000; Kay and Alder 2005). ICM strives to improve and integrate the administrative, policy, and regulatory processes that affect coastal management (Figure 3.1).

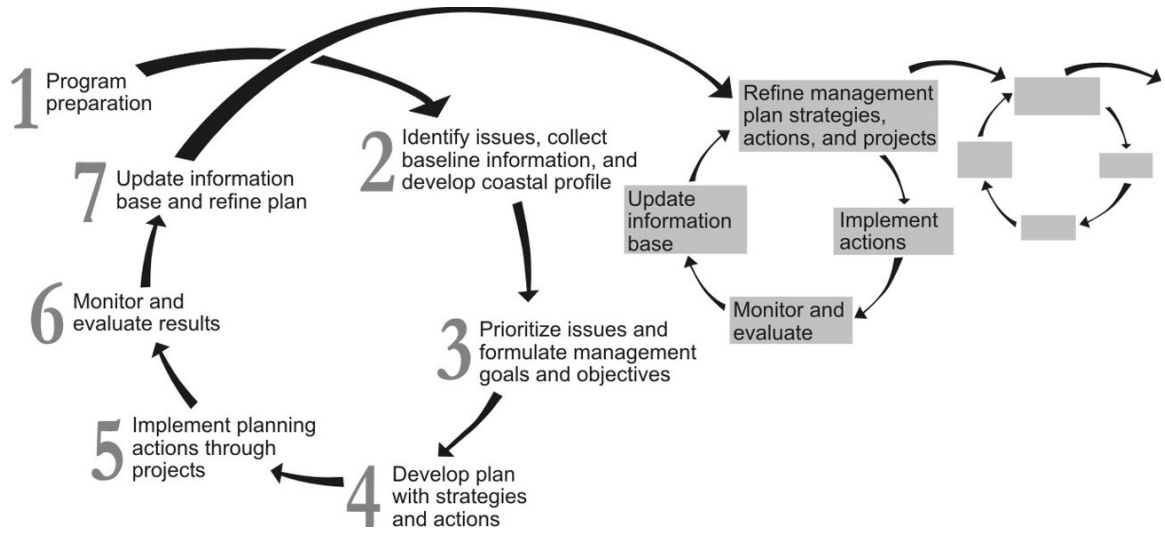

Figure 3.1 Cyclical ICM data collection, planning, implementation and monitoring process (White 1997; Olsen *et al.* 1998).

The need for ICM or CRM regimes beyond the borders of MPAs is especially important in tropical developing countries where MPAs tend to be small and implemented at the local scale, such as in

Philippines and parts of the Caribbean and South America (Balgos 2005; CRMP 2003; Salm and Clark 2000; White *et al*. 2005). In the case of the GBRMP and Belize, land-use patterns have had a considerable affect on coral reefs thus necessitating integrated management of coastal areas (Cho 2005). ICM is now widely practiced around the world, it is well established in countries like the Philippines and just beginning in Kenya and elsewhere (McClanahan *et al*. 2005). Each case demonstrates that the process of establishing ICM is a slow one requiring considerable patience, attention to process, and establishment of supportive governance frameworks (McClanahan *et al*. 2005; White *et al*. 2005).

MPAs can be one important management strategy within a larger area-wide coastal management framework with broader goals such as: maintaining essential ecological processes and life support systems, maintaining genetic diversity, ensuring sustainable utilization of species and ecosystems, watershed management and others. ICM may depend on a variety of management tools and approaches within the context of ICM as shown in Figure 3.2.

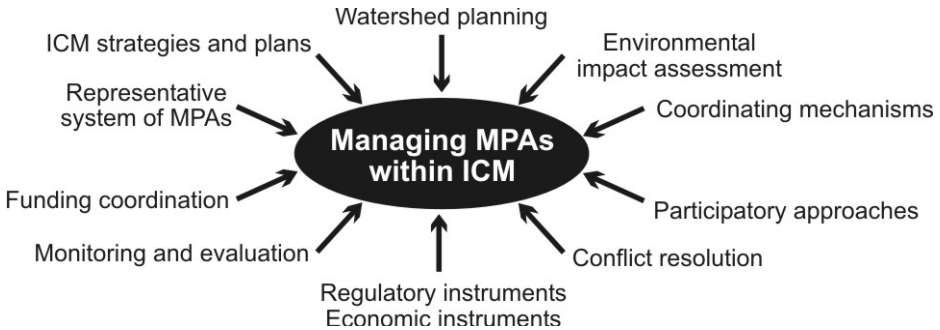

Figure 3.2 Tools to manage MPAs in the context of ICM (adapted from Belfiore *et al.* 2004)

Depending upon community needs and management concerns within the context of a larger ICM or CRM plan, MPAs can be designed and managed to accommodate various objectives and activities. Pursuing one benefit (e.g. sustaining biodiversity or fisheries production) therefore does not necessarily exclude pursuit of others such as revenue generation, tourism or other social benefits, and thus allows various management options. A typical ICM or CRM program will have a variety of interventions to address the needs of coastal and fisheries resources management as shown in Figure 3.3 (DENR *et al*. 2001).

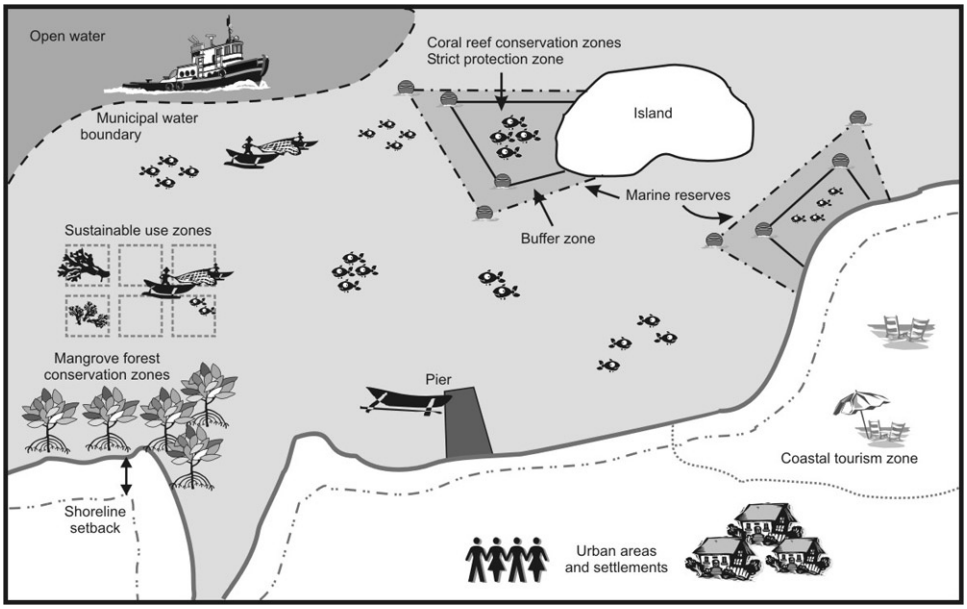

Figure 3.3 Municipal or city management area with various CRM interventions including MPAs in the Philippines (White *et al.* 2006).

The ICM program for Balayan Bay implemented by the Batangas Provincial Government in the Philippines provides useful lessons in addressing the long and short-term threats surrounding the conservation areas and sanctuaries found in the local government areas of jurisdiction within the Province. Several of the towns in the area, Mabini and Tingloy in particular, host a high diversity of coral and fish species. But the threats to marine diversity include land form changes, offsite pollution, incompatible land uses between towns, watershed impacts on coral reefs, sedimentation, foreshore developments, oil spills and destructive fishing. ICM provides for inter-municipal, inter-sector planning and coordinated actions to address these threats (Tongson 2004). It has been suggested that the effectiveness of small MPAs in the Balayan Bay area are severely compromised without being within an ICM planning and implementation process that addresses the primary issues external to the MPA management (Tongson 2004).

In addition to bringing ICM planning to a more local level, an MPA can serve as a learning area for the process. As one establishes and manages an MPA, the day-to-day conflicts of community development and natural resource protection provide opportunities to learn (White *et al*. 2002; DENR-CMMO 2003). The lessons learned are transferred to the policy debates associated with the larger ICM process. Thus the experiences gained at the local level provide feedback and reinforce the national or regional policy and planning processes.

A key lesson being learned in the Philippine context for MPAs is community involvement and ownership of the planning and implementation process as essential to success (Pollnac *et al*. 2001; White *et al.* 1994; White *et al.* 2002). The real stewards of carefully managed small areas of coral reef and shorelines are the local resource stakeholders (White 1988; Bolido and White 1997; Hermes 1998). Nevertheless, local resource stakeholders need substantial assistance and monitoring to become effective MPA managers. The process of involving communities in MPA planning and governance is described in Section 7.

In summary, the governance of MPAs cannot be isolated from the larger scale and broader management of coastal and marine resources. It is apparent in tropical developing countries such as the Philippines and Indonesia among others that small isolated MPAs will not be effective if they are not nested within broader area management programs that address external issues such as over fishing, pollution and others related to watershed management in shoreline areas (Belfiore *et al*. 2004). Research in the Visayas, Philippines in the vicinity of Bohol Island has shown that the increasing incidence of overfishing outside of MPAs is decreasing the viability of small marine sanctuaries where no fishing is allowed (Christie *et al.* 2002). This points to the need for larger scale management regimes following the principles of ICM and CRM as practiced in the Philippines and elsewhere. This also implies that nested governance structures must interface to support MPAs within the broader context of ICM. In the Philippines, where provinces and municipalities or cities are initiating ICM programs that include MPAs as a primary and more intense management tool, some of the threats external to MPAs are addressed (White *et al*. 2006).

4. EMERGING MPA NETWORKS

Two or more MPAs that complement each other form a network. It is recognized, as discussed in Section 3, that MPAs are generally more effective when implemented within the context of an ICM regime as possible through the governance system of a country. Equally, networking among individual MPAs and groups of practitioners is underway in some places. The Great Barrier Reef National Marine Park, considered a network of various zones, and the emerging networks of MPAs in Southeast Australia, the Mediterranean, the Red Sea and Gulf of Andean, Mexico, and Belize represent important examples (Badalamentei *et al*. 2000; Bezaury-Creel 2005; Cho 2005; Day 2002; Gladstone *et al.* 2003; MPA News 2003a and 2006).[5] The United States and the United Kingdom are striving to develop MPA networks, but have not made much tangible progress toward this goal (Jones 1999;

[5] While there is growing interest in MPA networks, there are almost no peer reviewed publications on these MPA networks that go beyond basic descriptive case studies to offer tested governance or institutional design principles for MPA networks.

NOAA 2006). The 33 MPAs (in 2000) in the European Union portion of the Mediterranean may represent a loose MPA network, although implementation is uneven with many MPAs not operational (Badalamenti *et al*. 2000).

The network efforts of Australia, Italy, Mexico and Belize are government-led efforts with considerable NGO assistance. All of these efforts have experienced some degree of controversy when user groups have expressed concerns over dislocation or networks that benefit certain economic groups (e.g. tourism over fishing interests in Belize described in Cho 2004). In the case of Belize or the Red Sea, it is unclear what principles or linkages justify characterization of these MPAs as a network (Cho 2004; Gladstone *et al.* 2003). Analysts of the Mexico case state that the process is necessarily a slow one that requires considerable capacity development (Bezaury-Creel 2005).

While typically designed and advocated for along ecological lines, we suggest that MPA networks can take various forms with both ecological and social goals. Botsford *et al.* (in preparation) review the ecological and fisheries aspects of such MPA networks. In addition, social MPA networks are being formed to facilitate communication of experiences and coordination of administration and planning. Both types of networks, social and ecological, should be integrated and coordinated to maximize their potential benefits (White *et al.* 2006).

The administrative and pragmatic advantages of an MPA network over MPAs that are randomly placed and not coordinated in any way might include knowing that the investment in the establishment and management of the MPA network is maximizing its potential return to local stakeholders. Also, in forming a network, an information base for the MPAs in an area is created that helps develop logical choices in how to expand MPAs effectively and how to efficiently manage them based on the network design. Finally, a network provides a rationale for individual MPA stakeholders or communities to coordinate with each other to share their experiences and to enhance efforts in managing and protecting their respective MPAs.

In developing MPA networks in the Philippines, several such social and information networks now operate in the country and are providing various benefits to the stakeholders and improving MPA management (Lavides and Tiburcio 2002). Processes that have led to good practices and scaling up governance derived from networking efforts are: (i) consensus building on common issues; (ii) information sharing and identification of core groups; (iii) institutionalizing mechanisms for administration; (iv) sustainable financing; and (v) adaptive management (e.g. performance and impact monitoring and incentive systems).

Social MPA networks are motivated by financial and administrative benefits since one of the major constraints to MPA sustainability is long-term financing. Local area networks in the Philippines are collecting user fees and receiving institutional support from their local municipality or city. Local government support also attracts private sector buy-in from tourist resorts, landowners, or others concerned about coastal protection. Recognition awards and tax deductions for contributions to MPA networks are options that can be used to stimulate network level collaboration.

Sharing of lessons learned in management through MPA information networks is another factor stimulating the formation of MPA networks, especially among practitioners who are connected through geographical proximity. Such a network operates along the shores of southern Cebu Island, Philippines, where more than 30 small MPAs are linked through information sharing, and implementation of a common monitoring database and management rating system for comparing results of their respective MPAs (Figure 4.1)[6] In this case, local communities that have endorsed the

[6] The management rating system, described further in Section 7 below, is a simple system whereby governance of an MPA is rated according to a checklist of yes-no questions that determines its general level of management implementation and sustainability and is being applied in the Philippines per agreement among government and non-government organizations that are assisting with MPAs (White et al 2004).

stewardship of their MPAs are also encouraged if they see the linkage of their village life with that of their ecosystem stewardship role at a larger scale.

The Local Marine Management Area (LMMA) network is another example of a learning network that functions at both a national and international level in Southeast Asia and the Pacific (http://www.lmmanetwork.org/). It provides a means by which members can share experiences with MPA[7] implementation and develop a collective database. This network has spread rapidly in the last few years with foundation financial support. The most notable aspects of this network are its grassroots, practical goals that are developed by partner institutions. The LMMA network's vision is: "Healthy ecosystems and communities, abundant fish and other marine resource stocks, and sustainable fisheries utilization." The network strives for:

- Protected marine biodiversity.
- Sustainable development in coastal communities.
- Understanding of what communities are doing in managing marine areas.
- Understanding of ecological and socio-economic responses to LMMA implementation.
- Global awareness of the biological and social-economic science related to LMMAs coming out of Asia-Pacific."

(www.lmmanetwork.org/Site_Page.cfm?PageID=9)

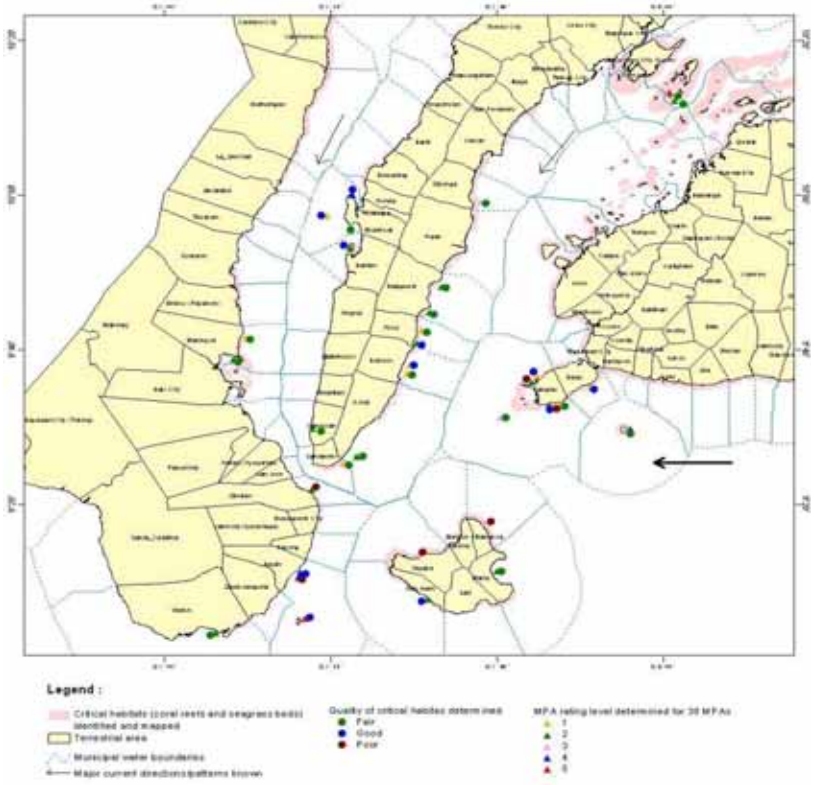

Figure 4.1 Requirements for an effective MPA network, Cebu Strait and surrounding areas (White *et al.* 2006).

The basic approach to improving the management of MPAs, identifying and planning for new MPAs and eventually forming a network of MPAs for a given planning area, as learned from experience in the Philippines and elsewhere is described in more detail in Section 7 below. In general, the sequence of information gathering, analyzing, planning, implementing, and then monitoring and evaluation is tested and effective and needs to be part of all programs. This is a general process utilized around the

[7] This network of practitioners chooses to use the term "Marine Management Area" to demonstrate that many areas in the Pacific, while not closed to fishing, are maintained and actively managed using spatial management techniques.

globe (Salm and Clark 2000). Such processes must also be done in concert with local governments and communities, depending on the legal mandate of the MPA in a particular country. In developing countries, several lessons learned that can guide assisting projects (foreign funded or otherwise) how to effectively assist with improving MPAs or forming MPA networks are (ADB 2003; White *et al.* 2005):

1. Most MPAs, once planned and operating, will need to strengthen their management body through a community level intervention that helps the management body develop and implement an MPA management plan together with the local or national government administration. This MPA plan may ultimately amend the local or national law that established the MPA with refined rules.
2. The project will need to identify partners working in the area who are assisting with MPAs or other coastal management activities and coordinate work accordingly. Assisting groups should make a strategic plan and agree on some common objectives that are consistent.
3. Each MPA that will ultimately be part of an effective network will require some level of assistance in some portion of its planning and implementation process. All successful MPAs in the Philippines have received assistance to help make them become sustainable in their own right.
4. Look at how complementation of each network partner can be facilitated to assist to their effectiveness and their biophysical contribution and potential.

4.1 Network conclusion

An MPA network, while frequently designed with ecological connectivity considerations in mind, is also a network of people managing the component MPAs, benefiting from the network and promoting the network's viability and longevity. Not just any collection of MPAs can be considered a network. An MPA network is a collection of MPAs that *interact* in some meaningful social and/or ecological manner to enhance fisheries and biodiversity conservation and associated benefits (Palumbi 2004). These networks require careful monitoring as is evolving in some contexts (MPA News 2003a).

5. LEGAL AND JURISDICTIONAL ISSUES THAT AFFECT MPAS

The legal and jurisdictional context in which an MPA functions will determine management feasibility in the long term in most cases. Consideration of the legal structures and institutional capacities should also shape the choice of MPA management framework as outlined in Section 2. Reinvigoration of traditional management rules as in the Western Pacific, allow these important traditions to survive today. The decentralized governance structure, encoded in the Philippines Constitution, 1991 Local Government Code, 1998 Fisheries Code, strongly suggests adoption of community-based and co-management frameworks. The United States federal consistency norms embedded within the United States Coastal Zone Management Act ensure each coastal state with a federally-approved coastal management plan access to federal funds for implementation *and* the assurance that the Federal Government will act in accordance with State Government plans. The United States National Marine Sanctuaries Act necessitates broad stakeholder consultation, but retains ultimate decision-making powers for the Federal Government.

Seminal works on common property (Ostrom 1990) and institutional arrangements (Sabatier and Mazmanian 1983; May and Burby 1996) suggest that principles for effective management of common property resources are discernable. Recently, attention to MPAs (e.g. Mascia 2000) has extended common property management principles to include marine resource management issues. Field research involving thousands of interviews in the Philippines, Indonesia and West Pacific Island states suggests that fair and effective law enforcement (Pollnac and Pomeroy 2005), knowledge of the law (World Bank 1999), and consistency between national and local laws and institutional goals (Lowry *et al.* 2005 and Eisma *et al.* 2005) are important to MPA effectiveness and sustainability. The differing mandates and "institutional cultures" of national governments, local governments and NGOs are not trivial matters. For example, the establishment of a National Integrated Protected Areas System

(NIPAS) in the Philippines has strengthened some protected areas, but seriously eroded management of well-known and successful MPAs such as Apo Island. The collection of divers fees that were to be used for local development projects, while potentially a strong incentive for MPA management, became controversial when national agencies failed to disburse these funds for years. Eventually, the issue was resolved, largely due to the effective lobbying by the MPA management board.

The importance of a clear legal mandate for a management board is central to success, as demonstrated in the early failures of Souffriere in St. Lucia (Siirila in Salm and Clark 2000). The subsequent clarification of the management board's roles and responsibilities and relation to agencies with formal enforcement capacity improved management. At the stage of a community-level process, the establishment of a municipal ordinance, or some similar legal instrument, is a critical step allowing for enforcement and sanctioning of violators if necessary. The clarification of the legal role of the core group, as discussed in Section 7, is essential as it may eventually come into conflict with some elected officials who may not favor MPA implementation for personal reasons (Christie *et al*. 2003a).

Well engrained, but diffuse, socio-cultural conditions affect MPA effectiveness. Impunity of influential entities that pollute the environment (Eisma *et al*. 2005) or manage destructive fishing networks can quickly undermine commitment to MPA management – an unfortunately common condition in many developing country contexts. Comparable widespread dynamics that undermine sustainable management exist in the developed world. While not illegal, unsustainable development of coastal areas in the United States (Beatley 2002; Montgomery 2003) and large-scale agriculture in Australia (MPA News 2002) threaten sensitive coastal habitats and MPAs. Stemming these intense development pressures with strong economic incentives remains a challenge largely ignored by most MPA legal frameworks. Such issues suggest, as discussed in Section 3, that MPA management must be effectively embedded within wider management systems such as integrated coastal management and ecosystem-based management.

At the national level, an executive mandate for a national MPA system (e.g. Presidential Order by President Clinton) can initiate considerable planning activity, but this momentum is lost when federal government policy and fiscal priorities change. The National Oceanic and Atmospheric Administration (NOAA) MPA Center, while tasked with facilitating a United States national MPA system, is repeatedly destabilized by fiscal cuts and lacks a strong mandate or suite of incentives to encourage policy development by other agencies. The current informal system of MPAs in the United States is disorganized involving a wide array of institutions. On the other hand, the GBRMPA has seemingly managed to balance executive authority with broad consultation in an effective re-zonation process (Day 2002; Fernandes *et al*. 2005; Kay and Alder 2005).

In summary, a few principles for effective legal and jurisdictional norms are emerging from growing MPA experience.

1. Nested institutional and legal (national to local) systems, if balanced and supportive of local initiatives, support MPA implementation. MPA management requires both upward (from local to national agency) and downward (from national to local agency) coordination and accountability (Lowry *et al*. 2005). Embedding MPA management within larger management systems designed to address larger sectoral and development processes will help address external impacts on MPAs.
2. Transparency, fairness and broad understanding of the law and enforcement support compliance and reduce conflict.
3. Clear identification of the role and responsibilities for formal and informal MPA management bodies is necessary.
4. The jurisdictional mandate should fit the institutional capacity of a management body. If necessary, there should be ongoing attention to the development of institutional capacity.
5. A consistent national mandate for MPA implementation with adequate resources for implementation can provide a supportive environment.

6. CROSS-CUTTING ISSUES AFFECTING MPAs WORLDWIDE

Emerging cross-cutting issues relevant to the themes of governance and enforcement involve matters of MPA objectives, scale, target setting and definitions of success. MPAs have multiple objectives to maintain and restore biodiversity, aesthetic, recreational, and fishery conditions. These objectives, while potentially complementary, may lead to conflict or at least trade-offs that must be carefully considered. The most commonly paired objectives are biodiversity conservation and fisheries sustainable management. Coral reef MPAs in tropical countries are frequently designed to meet both objectives. In some cases, this double objective has been met (Russ *et al*. 2005, Maypa *et al*. 2002). In other cases, objectives change, are unclear, or differ among constituency groups. Such dynamics delayed the establishment of the Florida Keys Sanctuary (Suman *et al*. 1999), complicated the California MPA network process (Helvey 2004, Scholtz *et al*. 2004), and eroded community support for small MPAs in the Philippines (Christie 2004). But maximizing fisheries and conservation benefits simultaneously with the same MPAs may, in fact, be unrealistic and result in collective action problems (Jones 2006).

Increasingly, and sometimes uncritically, arguments for larger scale interventions are made. Such arguments, while grounded in appropriate desires to maximize ecological function for MPAs, are not often realistic or grounded in careful analysis of institutional feasibility and incentives. The Large Marine Ecosystem (LME) movement, that proposes to manage systems at multi-national scales, is moving forward with little empirically-grounded understanding of what this model entails. This concern is not based on a denial of the importance of improving marine resource management, rather it is a conceptual one predicated on multidisciplinary analysis and pragmatic one based on a desire for increased MPA effectiveness. Notably, the argument for scaling up is rarely made by resource users or field personnel, who have a sense for what is possible, in developing countries. This suggests that LME or global MPA network proponents should proceed with caution or run the risk of a backlash that labels such efforts as an attempt to "lock up" resources or "edicts" from the developed world (while resource consumption continues to rise in the developed world). Finally unrealistic targets can drive a process in a manner that does not allow for thoughtful interventions (Agardy *et al*. 2003; Christie *et al*. 2005) and may result in implementation failure and eventual donor fatigue. While there is likely more than a bit of strategy associated with proclamations of MPA targets, ambitious goals will not likely be met (MPA News 2005). This is an important signal that should be carefully analyzed. The reason may not simply be that funds are lacking. In short, there is a need for more local initiatives (local and national governments) that are not dependent on targets or the driving forces of international organizations. Sustainability depends on more locally driven programs that have their own objectives and internal support systems. This will help minimize the problem of MPAs failing when outside entities and outside funding leave or decline.

With these cautionary comments in mind, some countries, like Australia and possibly the United States and European Union members, have the will, financial, and institutional capacity to embark on large-scale MPAs and should pursue their development with the standards of participation, transparency, and equity as guiding principles. The development of a United States-wide MPA network, to include large areas such as the Northwest Hawaiian Islands, is important and requires continued support in a manner that balances the interests of conservationists, fishers, and the public. Large-scale efforts should be pursued, but only with care and appropriate timelines, in developing countries.

Implementation of any MPA is a long term and complex endeavor. It requires cross-institutional collaboration in almost all cases. Technical assistance, education, and capacity development are clearly some of the cornerstones of developing effective MPA governance. In the most successful examples of MPAs (e.g. Apo Island, Tubbataha, GBRMP) long-term institutional support has been available (Arquiza and White 1999; Day 2002, Fernandes *et al*. 2005; White *et al*. 2002, 2005). Designing appropriate incentives for such long-term commitments between institutions is a particularly site-specific process. But field experience demonstrates that some factors are associated with developing such institutional commitments:

- constituency development (Olsen and Christie 2000) that can hold institutions accountable;
- long funding as with the United States Coastal Zone Management Act that provides federal funds to implementing States or development of endowment funds and user fee systems as with Tubbataha;
- acknowledgement of success and development of leadership (CRMP 2004; DENR *et al.* 2001);
- policy makers take on marine conservation and fisheries management as a serious issue through personal experience (e.g. President Fidel Ramos in the Philippines—a committed diver and supporter of MPAs)

Conflict is another cross cutting dynamic that can take many forms. The guidebooks for MPA planning generally highlight inter-resource user group conflicts that derive from competition for the same resources or spaces (Salm and Clark 2000; Sobel and Dahlgren 2004). Classic examples include conflicts between commercial and artisanal fishers or oil development and fisheries. Advocates of offshore MPAs are likely to come into conflict with distant water fishing fleets (Kaye 2004). Zonation schemes are one potential solution that has worked in locations with sufficient capacity for enforcement of detailed, spatially-explicit regulations.

Conflict can come in various, and complex, forms (Dukes and Firehock 2001). In the Philippines, conflict been tourism brokers and fishing communities has emerged after control of an MPA was usurped by powerful tourism interests (Christie 2004; Oracion *et al.* 2005). This sort of conflict may represent competition for marine resources (if divers remove resources), but also is generated from a sense among marginalized fishing communities that MPA rules are not equitable and that their traditional spaces and even MPA management efforts have been taken over by powerful interests (Trist 1999). When an MPA is established through a community-based or co-management framework, a social contract between agencies and stakeholders is created that empowers historically marginalized groups (like tropical artisanal fishers). Therefore, conflict can emerge if autocratic decision-making or selective implementation of regulations takes place (Eisma *et al*. 2005; Oracion *et al*. 2005; Neilsen *et al*. 2004). Conflict can also emerge between influential leaders. Such conflict can be particularly problematic for community-based initiatives that rely heavily on participation and buy-in from key community leaders (Christie *et al*. 2003a).

Some have suggested that conflict emerges based on ideological assumptions embedded within models such as ICM that may favour an influential and wealth sector (e.g. international tourism) over a marginalized one (e.g. reef miners) (Nichols 1999). Worldviews surrounding MPAs and appropriate goals vary between user groups (Christie *et al*. 2003b). While not empirically tested in various contexts, it is almost certain that influential donors, international NGOs, scientists advocating MPAs, and resource users have distinct worldviews and social constructions of the ocean (Steinberg 2001) that, unless accounted for in MPA planning and implementation, will likely result in conflict. Large portions of the recreational and commercial fishing industries of the United States distrust the intentions of conservationists and government regulators. They have been particularly effective with their efforts to derail MPA network establishment in California. Distrust seems to be generated from past antagonistic interactions, but also from fundamentally distinct worldviews (Scholtz *et al*. 2004).

Regardless of the source or scale of conflict, the general lack of formal conflict resolution mechanisms for most MPAs or training for managers and leaders is problematic. The LMMA network has identified this as a key issue for member MPA managers. Conflict resolution methods must be crafted to become context appropriate.

7. BEST PRACTICES IN PLANNING, GOVERNING AND ENFORCING MPAs

Planning and establishing an MPA cannot be separated from managing, governing and enforcing MPAs because the planning phase is ongoing and the establishment-phase of an MPA sets the stage

for future success or failure. The bias of the following discussion is on community-based methods for governance of MPAs derived from the Philippines, but has wide relevance to many other developing countries.

The stages in the community-based approach described below occur somewhat sequentially yet several will also run concurrently. Though each MPA site and its management measures are unique, the techniques for encouraging community support and establishing and enforcing an MPA are widely applicable. Participatory approaches to improve community support for MPAs are described elsewhere (DENR *et al*. 2001; Wells and White 1995. The importance of community organization, community participation and public education in the successful examples of MPAs worldwide is well-documented (White *et al.* 1994; Walmsley and White 2003). This section adapts the principles applied in the Philippines and as described by other authors (Christie *et al*. 2003a; White 1988; Buhat 1994; Wells and White 1995; Salm and Clark 2000). The general process and activities essential for successful MPA establishment are outlined in Table 7.1.

Table 7.1 Phases and activities for MPA establishment and management within local government jurisdictions

Phases of coastal management*	**Stages and activities for MPA establishment and management****
1. Issue identification and prioritization, and baseline assessment	Recognition of a need and program preparation Integration with the community and assessment of issues 1. Stakeholder identification and analysis 2. Community organization and mobilization 3. Conduct of baseline studies 4. Information, education, and communication
2. Plan preparation and adoption	Definition of goals and objectives: Formation of the core group and development of the management plan 1. Formation of the core group 2. Definition of goals and objectives 3. Preparation of management strategy and action plan 4. Determination of reserve boundaries and zones
3. Action plan and project implementation	Implementation: Formalization of the reserve, implementing management strategies, enforcement and community strengthening 1. Formalization of the reserve through local ordinance 2. Implementation of strategies for managing the reserve 3. Enforcement 4. Permits and user fees 5. Strengthening of community involvement
4. Monitoring and evaluation	Monitoring and evaluation Refinement of the management plan
5. Information management, education and outreach	Review of status of MPA and its benefits Refinement of education program from experience Development of outreach program as appropriate

**Described in detail in Philippine Coastal Management Guidebook Series 1 and 3 (DENR et al. 2001) as the overall phases for coastal resource management planning and implementation.*

***These stages and activities are different from those prescribed under the NIPAS Act because of the focus on MPA within local government jurisdiction.*

7.1 Phase I: Issue identification and baseline assessment

The initial steps in developing an MPA involves site selection, size, justification for site choices and others that may or may not be controlled by the local stakeholder community. This process can either be community-based or top-down depending on the context and MPA goals. It may be a national government decision to select a remote site based on ecological criteria for example. Nearshore areas used for fishing will likely require a more participatory process. Once a commitment has been made to proceed with MPA establishment, there is a need to assess issues and collect baseline information using participatory and scientific methods so that results can be measured through time. Baseline information sets the stage for a well-managed MPA of all purposes and provides a means to begin education of stakeholders from the outset. It also clarifies priority issues that need to be addressed.

Issue identification and baseline assessment, if done in a participatory manner that fully engages the majority of stakeholders, will ensure better chances for successful implementation and long-term enforcement and compliance (Pollnac *et al*. 2001). But a key factor is that the affected community(ies) fully endorse and buy into the need for and management of the MPA. Several key activities at this stage include:

7.1.1 Community organization and mobilization.

This all encompassing process at a minimum includes: fielding community education and organizing staff in the MPA area, learning more about the stakeholder community and its "authorizing environment" (the social, economic and political context which determines the decision-making process) and determining the expectations of the stakeholders that will be ultimately be engaged in management or stewardship of the area.

7.1.2 Conduct of baseline studies

This will include compiling all existing data on the area but most importantly begin to engage the people at the site level together with outside professionals who may also have a long term interest in the management area. In the Philippines, a participatory coastal resources assessment process is often used that helps train local stakeholders in both baseline assessment and monitoring methods (Deguit *et al*. 2004). This stage may also develop an environmental profile for the MPA area and its surroundings as a preliminary management plan and as a source of educational material for a wider audience (Table 7.2). This process is described elsewhere in detail (Deguit *et al.* 2004; DENR *et al.* 2001).

Table 7.2 Key chapters in a coastal environmental profile.

- Introduction of the location, description of area, history and summary of issues;
- Physical features: land area, topography, hydrology, soil, land uses and climate;
- Natural resources and trends: mineral, forest, coastal (resource maps);
- Sociopolitical setting: political/administrative boundaries, demographics, public health and sanitation, settlements, infrastructure;
- Economic sector: fisheries, aquaculture, tourism, industry, agriculture, forestry;
- Institutional and legal framework: relevant laws, local/national government, NGOs, community organizations; and
- Management issues and opportunities: environmental, economic, political/institutional.

7.1.3 Information, education and communication (IEC)

The education process occurs throughout all stages of development and implementation of an MPA. Depending on the level of awareness and involvement of the stakeholder community, the IEC process

needs to evolve and be responsive to the needs of MPA management. As an MPA matures, the topics for IEC may shift to learning the political process, funding options, management strategies, enforcement and monitoring, and then discerning lessons learned from experience. Based on various case studies, possible IEC strategies may include:

- Use non-formal methods that encourage participation, interaction, and personal contact that are gender-sensitive.
- Prepare a good map to help people relate to their areas of specific interest.
- Encourage local enthusiasm for the project by recruiting academics, divers, fishers, resort owners, and others who have personally noted changes in the quality of the habitat to share their observations and positive opinions about results.
- Organize cross-visits to successful sites for local leaders. Discussions with local leaders who have established successful MPAs are convincing.
- Use monitoring information as it becomes available to prepare education programs that describe the observed changes in ecology, biodiversity, and quality and quantity of fish stocks. Trends are very important to track over time.
- Refining knowledge of threats, use patterns in the area, and management options, is an important outcome of information and education activities of all key stakeholders.

7.2 Phase II: Plan preparation and adoption

Participatory, fair and transparent plan preparation leads to stakeholder compliance because they have a "stake" in the plan; real education takes place during this process and time is not as important as a good plan that is accepted by the stakeholders, both private and public**.** A first and crucial step is the formation of the core group. The core group should be considered as an "anchor" that is directly interested and committed to planning, implementation and management of the MPA. In countries where planning and management are strictly government functions, the core group may be less important, but can still serve an important role to link government management with the stakeholder sector that might not uniformly support the goals or existence of the MPA.

The preparation of a management plan must include definition of goals and objectives, preparation of management strategies and actions, determination of MPA boundaries and zones, determination of management procedures and many other decisions that are basic to an effectively managed MPA (Table 7.3). The key again is participation in the decision process so that enforcement over time is not an uphill battle. These guidelines are in agreement with those offered in other sources (e.g. FAO 2003).

Table 7.3 Sample outline of a site management plan in Philippines.

Chapter 1: Introduction (rationale, scope of plan, legal basis, overall goal, etc.)

Chapter 2: Profile of the MPA site or general area

A. General information
    1. Location (technical description, size, map, etc.)
    2. Facilities (physical structures present in the area)
    3. Current uses/activities in the area
    4. Policy review

B. Biophysical condition
    1. Habitat condition (condition of coral reefs, seagrasses, mangroves, etc.)
    2. Resource and resource use map (site map within larger municipal/city jurisdiction)

C. Socioeconomic condition
    1. Immediate community (all potential beneficiaries or users of area)
    2. Issues and concerns
    3. Resource value estimates

Chapter 3: Goals and objectives for MPA management

Chapter 4: Management interventions (each with strategies and activities)

A. Habitat management (required)
B. Management zones—spatial allocations and regulations (required)
C. Constituency building—community organizing and education (required)
D. Compliance and enforcement (required)
E. User fee system (optional)
F. Alternative/supplemental livelihood program (optional)
G. Shoreline or foreshore management (optional)
H. Solid waste management (optional)
I. Others

Chapter 5: Implementing structure

A. Management board, committee or council (members and positions)
B. Duties and responsibilities (specific roles and functions)
C. Organizational chart
D. Budget for each management intervention or by regular line items

Chapter 6: Monitoring and evaluation

A. What will be monitored (reef substrate cover, fish stock, socioeconomics, etc.)
B. Methods to be used
C. Institutional and scheduling arrangements (who will do it, how often, etc.)
D. Budgetary and equipment requirements
E. Reporting and feedback mechanisms (schedules, formats, to whom, etc.)

Annexes:

A. Data figures and tables, maps
B. Monitoring and evaluation forms
C. Photographs
D. Ordinance

The Philippines is probably ahead of most countries in terms of encouraging a high level of participation in the planning phase for an MPA. Although not a rapid process, it has ensured better compliance in both local government and national MPAs and minimized the need for active law enforcement in many instances. The management plan for the Tubbataha Reef National Marine Park was developed over a ten-year period. This period allowed various seemingly unsolvable resource use conflicts to be resolved so that management could proceed with a strong mandate from both the government and stakeholder community (Arquiza and White 1999; White *et al*. 2002). In fact this park now has relatively little threat from illegal fishers from within the Philippines but is still threatened occasionally by illegal foreign fishers that require enforcement surveillance that is generally beyond existing capacity and outside the influence of local stakeholders.

Much of the planning process focuses on determination of use zones within an MPA. In many countries the placement of no-take zones and their boundaries must be highly sensitive to local use patterns and stakeholder preferences to improve chances for adequate compliance. Thus much effort must be placed on determining boundaries so that they do not cause undue conflicts for potential compliance later on. In the Philippine case of many small MPAs with no-take zones, an important lesson learned is that the need for zoning and what type of zones to be implemented, should be

established before the community has agreed on the final sanctuary (no-take) boundaries and before the sanctuary is legislated through a local or national government ordinance or law. Once consensus on resource uses and guidelines for uses, zones and their boundaries is reached, a final plan and ordinance can be drafted and passed. Table 7.4 indicates compatibility and restricted used within potential zones of a typical MPA in the Philippines.

Table 7.4 Compatible and restricted activities within potential management/use zones for different types of MPA in the Philippines (White *et al*. 2006).

Type of MPA	Typical Management Zones	Activities/Uses Allowed	Activities/Uses Prohibited
Strict sanctuary[1]	No entry	None	All
Marine sanctuary[1]	No-take or "sanctuary" (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research	Fishing or extraction of any kind, anchoring, boating, dumping
Marine reserve[2]	Sanctuary, no-take (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research	Fishing and extraction of any kind, anchoring, boating, dumping
	Traditional use (buffer) zone	Same plus limited and specified traditional fishing and boating	Illegal and specified legal fishing methods, anchoring, dumping
Marine park[2]	Sanctuary, no-take (core) zone	Regulated swimming and diving, anchoring on mooring buoys, research and education	Fishing and extraction of any kind, anchoring, boating, dumping
	Traditional use (buffer) zone	Same plus limited and specified traditional fishing and boating	Illegal and specified legal fishing methods, anchoring, dumping
	Education and/or recreation (buffer) zone	Regulated swimming and diving, anchoring on mooring buoys, research, education, and/or recreation activities	Same

[1] *Typically contains only one zone where all extraction or collection is prohibited.*
[2] *Typically contains more than one use/activity zone.*

7.3 Phase III: Action plan and MPA implementation and enforcement

The action plan is crucial to long-term governance of an MPA because it contains the strategies for encouraging compliance through law enforcement, threats and sanctions as needed, ongoing education, various means of observation and monitoring among others. The development and implementation of an action plan depends on institutional capacity (e.g. presence of reliable local government, community groups, coast guard, etc.), resources for enforcement and human capacity—do law enforcers or local police know laws and how to collect evidence, for example.

Implementation refers to several key steps: formalizing the MPA, implementing management strategies, enforcement of regulations and strengthening the community by implementing the key recommendations of the management plan. The process leading up to full implementation could take 1 to 2 years or more depending on the institutional capacity of the management body. And, given that many MPAs, both large and small and local and national are not well managed, a key link to improved management is the planning and preparation process leading to implementation.

Strategies for managing an MPA that combines objectives of both fisheries management and biodiversity conservation are varied and include the following among others:

- Demarcating use zones according to use patterns and the objectives of management as noted in Table 7.4;
- Regulation and control of fishing gear inside and adjacent to an MPA and in relation to the use zones of the area as determined in the management plan (gears that are permitted in particular zones or totally banned in the Philippines are indicated by White *et al*. 2006);
- Placement of permanent mooring buoys to prevent bottom habitat damage, especially in coral reef and other fragile environments;
- Designation of boat trails or travel-ways for heavily visited areas;
- Establish regular embarkation points to control access to sanctuaries;
- Various approaches to enforcement inside and outside of the MPA such as:
    a) Development of support within stakeholder community;
    b) "Sea watch" or "bantay dagat" groups, in case of Philippines, organized and deputized for coastal law enforcement activities;
    c) Enforcement through peer group pressure and local incentives and disincentives;
    d) Use of regular government police and enforcement channels depending on their availability and ability to assist;
    e) Use of effective but appropriate penalties with law enforcement;
    f) Use of local government budgets and local police as possible;
    g) Ongoing education programs to inform stakeholders of illegal activities;
    h) Formation of support networks to reinforce good practices at local level;
    i) Provision of small incentives to local enforcers in form of insurance, stipend, equipment as appropriate for an area and institutional setting;
    j) Collection of fines that are shared with the law enforcers;[8]
- Permits and user fees for access to resource areas for tourism and/or fisheries uses under local MPA jurisdictions or government (Table 7.5);
- Strengthening community and local government involvement;[9]
- Promotion of ecotourism ventures that support MPA protection (Flores 2001);
- Providing positive feedback to management bodies through visitors and monitoring activities as discussed below; and,
- Development of partnerships with neighbouring MPA programs through networks or partnerships with long term assisting organizations such as NGOs, local or foreign donors and others.

[8] In El Nido, Palawan, Philippines, a municipal ordinance allows 50 percent of the administrative fine to be awarded to the apprehending team and 50 percent to a trust fund held under the municipal treasury but earmarked for coastal management activities.
[9] Strengthening community involvement is extensively covered by White *et al*. 2006 and Deguit *et al.* 2004.

Table 7.5 User fee system for the Tubbataha Reef National Marine Park, Philippines.

The Tubbataha Reef National Marine Park (33,200 hectares) is located off Palawan Island in the Sulu Sea. The Park is managed in accordance with the NIPAS Act, which requires the creation of a multi-sectoral governing body (or PAMB) to ensure the implementation of the site management plan. However, government funds to protect and manage the Park have always been insufficient.

Despite the premium quality and popularity of Tubbataha for scuba diving, its biodiversity value has been grossly underestimated. To enhance the Park's recreational value and at the same time maintain its ecological integrity, the Board, in cooperation with the diving community and other stakeholders and NGOs, developed a user fee system that would best capture and monetize the recreational benefits from tourism. A willingness-to-pay study in 1999 showed that an average diver was willing to pay $41 per visit. Using these results, a two-tiered pricing scheme was developed whereby local divers pay $25 and foreign pay $50 for entrance. The collection system is managed by the Tubbataha Management Office under a park superintendent and is consistent with the government's guidelines on determining fees in protected areas (DENR-DAO 2000-51).

The Park has generated a total income of Philippine Peso (PHP) 9.3 million (approximately US $186 000) from diving fees since 2000. In 2004, an income of PHP 2.5 million (approximately US $50 000) from entrance fees and fines was enough to cover 41 percent of the annual core costs of PHP 6 million to protect Tubbataha. The experience shows the importance of adopting a business approach to instituting user fee systems for long-term sustainable financing of MPAs while being careful not to compromise the long-term benefits from biodiversity.

Source: Tongson and Dygico (2004).

Strategies to improve compliance are numerous and widespread and vary with the local and national legal and institutional system, culture, current practices and more. While some models suggest that the certainty and severity of sanctions are the most important variables to determine rule compliance (reviewed in Kuperan and Suitenen 1998), empirical research demonstrates that legitimacy of regulations (partly derived from mutual respect between resource users and regulators), peer pressure, and participatory co-management processes are critical variables that also improve compliance rates (Honneland 2000; Kaplan 1998).[10] However, strict and equitable legal enforcement is needed, especially for flagrant and repeat rule violators (Kuperan and Sutinen 1998). Without consistent and fair enforcement, compliant behaviour among others is eroded. A model that is promoted in the Philippines along with more participatory approaches is that effective enforcement must be "swift", "public" and "painful" (DENR *et al.* 2001). This does not imply cruel or inappropriate punishment. This is especially important in areas where illegal fishing practices are deeply engrained into the local psyche of fishers and usual education and conciliatory approaches are not effective. In northern Bohol Island, after more than 100 arrests were made in one month and given appropriate (not long) sentences, the incidence of use of explosives for fishing declined to almost zero from a very high incidence (Christie *et al*., in press).

[10] However, enforcement agency legitimacy was not a consistent predictor of compliance in the study by Kuperan and Sutinen (1998) of Malaysian fishermen.

7.4 Phase IV: Monitoring and evaluation

MPA case studies from many countries emphasize that monitoring MPAs should be repeated at regular intervals throughout the management process (Pomeroy *et al*. 2004; Wells 2006; White *et al*. 2004). Assessing key biological and governance indicators begins with baseline studies. Increases in fisheries stocks and diversity both inside and outside of no-take reserves confirm the value of conserving the stock within the MPA. Changes in a standard list of governance indicators will also reveal how well the MPA is being managed. The results should be conveyed to the communities; positive results can be celebrated and negative results evaluated to identify management problems.

It is important to identify indicators for measuring progress toward the objectives of the MPA management plan early in the management process. Once such indicators are determined, such as changes in fish diversity, size of individual fish, percent live coral cover or another habitat or ecological indicator, it is important that these parameters are monitored using standardized methods as described in one of numerous manuals. In the Philippines, the book *Coral Reef Monitoring for Management* (Uychiaoco *et al*. 2001) and the MPA report guide (CCEF 2005) are used as a standard guide for MPA monitoring when coral reefs are the primary habitat and ecosystem of concern. Indicators for improved management and enforcement such as administrative processes, community support, marker buoys and signs in place, and others can be measured and monitored by applying the MPA management rating system that is part of the MPA report guide (shown in Table 7.6. Pomeroy *et al*. 2004) and is another international monitoring guidebook.

Table 7.6 MPA rating system for municipal/city MPAs.[11]

MANAGEMENT RATING This simple rating system is dynamic and is not a definitive statement on the status of any MPA rated. *Put a check mark ( ) in the box provided if the criterion is fully satisfied or accomplished.* Date of survey: _____		
Level 1: MPA is initiated - Passing (Year 1 since legal establishment) (1-6 points)		
1a	MPA concept accepted (MPA started through local initiative or social acceptance sought through public consultations by external groups. Consulted members of affected stakeholders: fishers, other resource users and social groups, both men and women.)	
1b	Site surveyed using standard/accepted methods with baseline assessment complete, preferably conducted in a participatory process (Reports completed on fish abundance, coral cover and profile on community and coastal management.)	
1c	Site selected (Site chosen based on baseline assessment results and public consultations.)	
1d	Education program raising awareness about MPA functions and benefits started (Conducted a series of public education activities.)	
1e	Management body membership tentatively determined (Management core group starting to conduct regular meetings with proper documentation.)	
1f	Preliminary management plan drafted	

[11] A slightly modified form is used for NIPAS declared MPAs that reflect their national status (www.coast.ph).

Level 2: MPA is established - Fair (Year 1 or 2 since legal establishment) (16 points required)		
2a	Community acceptance gained and documented (Documented through public consultation documents, e.g. community resolution and/or signature campaigns.)	
2b	Ordinance passed and approved by the local government (Ordinance should be well-drafted and enforceable and should be consistent with the concepts of sustainable use and equitable sharing of resources.)	
2c	Management body formally organized and recognized (Management group has legal mandate and is recognized by the local government)	
2d	Management plan adopted by community and local government (Management plan initially implemented and endorsed by LGU/PAMB.)	
2e	Management activities started (Conducted initial MPA activities such as: installation of enforcement support structures, patrolling and surveillance, apprehension of violators, etc.)	
2f	Biophysical monitoring includes local participation (Locals were trained to do biophysical survey using standard/accepted method.)	
2g	IEC activities conducted to raise understanding on MPA rules and regulations (MPA rules and regulations disseminated using appropriate and practical means to target all direct users and other stakeholders; initial stakeholder knowledge assessment conducted.)	
2h	Anchor buoys, marker buoys and/or boundary markers installed	
2i	MPA rules and guidelines posted at strategic locations	
2j	MPA outpost or other structures constructed (Guardhouse and/or other MPA-related structures constructed.)	
Level 3: MPA is enforced - Good (Only applies for 2 years or older) (24 points required)		
3a	Education program sustained public awareness and compliance (A long-term IEC program exists and is currently being implemented in support of enforcement and the general MPA objectives.)	
3b	Regular biophysical monitoring measuring habitat condition and changes conducted (Documented surveys conducted at least once annually using standard/accepted method.)	
3c	Collaborative patrolling and surveillance conducted by mandated enforcement group and local community volunteers (Fish wardens on rotation assigned to guard and patrol the MPA, day and night with assistance from local community volunteers.)	
3d	MPA billboard signs, boundary markers and anchor buoys maintained (Funds allocated for maintenance of enforcement support structures. May be part of the municipal CRM budget.)	
3e	Management body active (Implements the management plan; coordinates enforcement activities; members attend meetings regularly; coordinates and participates in regular monitoring activities.)	
3f	Budget from local government or from other sources allocated and is accessible for MPA management (There is a legal document by the local government or an agreement with the private sector allocating budget for MPA management.)	
3g	Fishing effectively stopped inside of sanctuary zone (No fishing-related violations/apprehensions reported in the sanctuary for the past year.)	

3h	Illegal and destructive fishing reduced outside of MPA (Violations/apprehensions reported within 500 m from the MPA boundary was reduced by 50 percent for the past year.)	
Level 4: MPA is sustained - Very good (Only applies for 3 years or older) (30 points)		
4a	MPA management plan updated in a participatory process (Management plan amended with the participation of various stakeholders: fishers, resort and diveshop operators, LGUs, other resource users, both men and women.)	
4b	Annual biophysical monitoring and feedback of results supervised by the managing body and implemented for 2 years or more (Documented surveys using standard/accepted method. Reports are available.)	
4c	Budget from government or from other sources allocated and was accessed for 2 or more consecutive years (There is a legal document made by the local government or an agreement with a funding group allocating budget for MPA operations; financial report available.)	
4d	Management body trained and capacitated to run the MPA independently (Management body supervises management activities [implementation of plans, enforcement, budgeting, monitoring and evaluation] and coordinates activities with partners.)	
4e	Enforcement system fully operational (Enforcement group with mandate and workplan; enforcement support structures maintained and patrolling activities sustained over the years.)	
4f	Illegal and destructive activities stopped inside and within the vicinity of MPA (No violations/apprehensions reported inside and within 500 m from the MPA boundary in the past year.)	
4g	Environment-friendly enterprise and/or user fees collected as a sustainable financing strategy (Sells environment-friendly products/goods to tourists; imposes collection of user-fees; etc.)	
Level 5: MPA is institutionalized - Excellent (Only applies for 4 years or older) (40 points)		
5a	Information and education program on MPAs maintained over the years (Information dissemination activities sustained according to long-term IEC program.)	
5b	Ordinance passed by the Provincial Government giving MPA stronger political support (Gives MPA institutional support to strengthen enforcement and collaboration.)	
5c	Management plan refined for adaptive management (Incorporates further refinements after gaining much experience and lessons to improve management strategies.)	
5d	Management plan incorporated in the Municipal Government development plan (MPA incorporated within the long-term LGU area-wide development plan.)	
5e	Evaluation of impacts on ecology and socioeconomics conducted and feedback of results completed (Assessment of resource status and long-term trends conducted. Analysis of change in local economy and long-term trends of user groups conducted. Reports of these studies have been completed and reported back to stakeholders.)	
5f	Revenues from enterprise and/or user fees sustained and accounted for (Existing sustainable financing mechanisms are well-managed and well-documented; financial reports easily accessible.)	

5g	Management body capacitated for financial management and fund sourcing (Management body is well-trained to manage funds effectively [facilitates proper handling, wise use and proper documentation]. The members are also trained to seek for financial assistance [formulated and submitted proposals].)	
5h	MPA emphasizes on public education and is being used as a study tour site; residents advocate for MPA (After much experience, members are ready to share lessons and impart knowledge. Presence of an identified group that conducts tours and is capable of giving talks on MPA. Paper/s written on their success stories published.)	
5i	Expansion strategies or enhancement programs initiated (MPA coverage is expanded, e.g. from a sanctuary to a park, or scope of conservation activities is heightened, e.g. coral reef restoration, re-seeding of clams, etc.)	
Total points accumulated:_____		

- Total possible points: 40
- All points are cumulative.
- Points from higher levels can be used to satisfy lower rating levels.

Name(s) of assessor, position, and affiliation:
Contact information (phone, fax, email, postal address):

The process of developing the MPA Rating System shown in Table 7.6 highlights the lessons learned from MPA governance in both community-based and national MPA models in the Philippines. Five stages of MPA governance emerged from the Rating System: initiation, establishment, enforcement, sustained management and institutionalization of the MPA. The activities or processes that must be successfully accomplished to achieve a given level came to be seen as the essential ingredients to successfully managed MPAs. But since the process of initiating, establishing and managing a given MPA will vary from one site to another for multiple reasons, the Rating System is designed to allow points to accumulate from higher levels to satisfy lower levels. Thus, the enforcement phase (level 3 requiring 24 points) can be accomplished with points from levels 4 and 5 as well as from levels 1, 2 or 3. This gives the system some flexibility to work in the field and makes it less rigid than a strictly step-by-step system that might miss variability from site to site.

Experience from hundreds of small MPAs in the Philippines suggests that assessment and monitoring include:

- What information about habitat conditions, activities, and program achievements is needed?
- When should information be collected as baseline for later comparison?
- Who needs the information and will use it?
- How will the information be used?
- Who will generate the various types of information?
- What are the procedures for collecting, storing, retrieving, and analyzing the data?
- What qualitative and quantitative information can indicate improvement in the environment, the people's awareness about their environment and the socioeconomic condition of people?

Pomeroy *et al*. (2004) is the most advanced effort to encourage widespread monitoring of MPA socioeconomic, governance and biophysical factors. This methodology has now being implemented

and tested in 18 MPAs around the world and initial results suggest that this generic guidebook should be adapted to local contexts and follow-up capacity development is necessary (Pomeroy *et al*. 2005). These monitoring and assessment tools, utilized primarily by MPA planners with resources users, are what may be considered mandate responsive tools. Their purpose is to monitor progress and assist management. Mandate independent monitoring and evaluation is also important and relies on distinct, multidisciplinary research methods such as surveys, in-depth interviewing, participant observation, and habitat and fish surveys. Mandate independent research is intended to explore the overall appropriateness of MPAs as biodiversity or fisheries management tools and explore, in a rigorous manner, the complex social and ecological dynamics associated with MPAs (Christie *et al*. 2003c). If done properly, it can provide additional feedback to resource users, practitioners, policy makers and donors.

In summary, there is always a need for a simple but effective monitoring program that involves local stakeholders. Planners, local communities, user groups, NGOs, academics and the private sector should be involved in the participatory monitoring and evaluation of a project since all will share in the responsibility for implementing the plan and reaping the benefits (White *et al*. 2006; Pomeroy *et al*. 2004). Such monitoring should also be complemented with careful, and constructive, evaluations using rigorous social and natural science methods.

7.5 Phase V: Information management, education and outreach

The monitoring and evaluation process described above should feed into the information management, education and outreach. The data collected through monitoring is often the best information to develop education materials and to provide feedback on the status of the MPA to stakeholders (Pomeroy *et al*. 2004; Scholtz *et al*. 2004; White *et al*. 2006).

Balicasag and Apo Islands MPAs in the Philippines are cases where the data from monitoring the habitat condition over a 20-year period has been relevant to management in several ways (Christie *et al*. 2002). First, the changes and improvements resulting from the management are well described and second, this data has come to be of extreme interest to the local community residents. People living on the islands want to know the outcome of their protection and management activities. The result of the monitoring and evaluation tell this story in detail and motivate improved management actions through time. In addition, once the MPA rating system for municipal and city MPAs came into effect in 2003, these MPAs not only showed high ratings but used the feedback from the rating survey to improve certain aspects of governance not addressed previously (White *et al*. 2004).

Local MPA education plans and programs can evolve from the results of monitoring and evaluation that in turn raise public awareness. Another form of education that is increasingly being used to enhance awareness among MPA managers and stakeholder communities is that of cross visits. Apo Island, Philippines, for example has been the host of hundreds of study tours from other parts of the country and also from other countries in Asia (Vogt 1997; Russ *et al*. 2004). These experiences have inspired many other similar MPAs in the Philippines and supported and challenged the management team operating on Apo Island. This management team is both comprised of local community members, the local and national government, and academe.

7.6 Summary—Best Practices

It is apparent that a well-managed MPA requires an adaptive management approach. The best way to portray the process is through the traditional planning cycle steps listed in Table 7.1 above that continue to operate through time, not ending on any of the five basic steps. The best practices of day-to-day implementation of a successful MPA cannot be easily separated from the participatory planning, implementation and enforcement process that leads directly into management and continues with periodic monitoring and evaluation. Thus, the one major “best practice” that should be gleaned is that a well-managed MPA is always refining its management through planning and testing of strategies that may or may not be appropriate, many of which are discussed briefly above.

8. RECOMMENDATIONS FOR TECHNICAL GUIDELINES ON MPA PLANNING AND MANAGEMENT TO BUILD SUSTAINABILITY

Key aspects of successful MPAs, in all their forms in the various situations noted in this overview, that are considered essential for achieving long-term implementation and benefits from MPAs are as follows. They are phrased as provocative questions given that any array of prescriptions would not likely effectively respond to the diversity of MPA contexts and objectives.

- Community preparation: Does the community of stakeholders and the local and national government sense a need for and understand the process of implementing the MPA?
- Resource assessment and mapping: Has the area been assessed and mapped so that everyone concerned knows the location and condition of resources and the potential boundaries for an MPA?
- Identification of key trade-offs and potential conflicts: Have real and potential trade-offs and conflicts been identified in an open and participatory manner?
- Stable and functional core management group: Has a functional core group that represents various stakeholder groups been formed for identified and empowered that can manage the MPA at the appropriate local level?
- Clear goals and objectives: Are the objectives for management clear to all the stakeholders and generally agreeable to the majority of the affected stakeholder community members?
- MPA boundaries and zones: Are the boundaries in accordance with the habitat assessment and are the boundaries and zones sufficient for management goals? Are the boundaries widely agreed upon by key stakeholder groups? Are the boundaries clearly marked and/or known to stakeholders?
- Management strategies for implementation: Are the strategies within the capacity of the institution responsible for implementation and reflected in the law legally supporting the MPA? Are consistent laws in place from the local to the national levels that support MPA implementation?
- Law enforcement and monitoring: Is a group assigned to watch the MPA, monitor all activities, collect fees, and assess changes in the marine environment on a regular basis? Have incentives for compliance such as user fees, peer monitoring groups, local government taxes and support, or others been incorporated into the management of the MPA?
- Distribution of economic benefits: Are mechanisms in place to ensure that benefits from the MPA equitably distributed and consider compensation to those user groups most affected by MPA establishment?
- Ongoing education: Does the education program address the needs of the community and stakeholders so that benefits and trade-offs are highlighted and that questions regarding the need for the MPA are addressed? Are appropriate education strategies used such as peer sharing, cross-visits, materials in local language that are culture sensitive?
- Co-management in place: Are the appropriate government agencies supporting the MPA together with the nearby communities and stakeholder groups in a mutually beneficial manner and in relation to the national government? Are conflict resolution mechanisms in place?
- Institutionalization: Are formal and non-formal institutional mechanisms in place that distribute MPA management across relevant organizations? Are incentive (and sanction) structures in place that encourage long-term buy-in?
- Monitoring and Evaluation occurring: Have baseline data on the condition of the habitat and the status of management, been updated and changes noted? Has this information been incorporated into a standard database for comparison in the future? Has this information been incorporated into

an education program for the community and local and national government? Have local residents been involved in monitoring and evaluation?

- Long-term planning: Does a realistic long-term plan for the institutionalization, financing, and implementation exist?

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