

## CHAPTER 7. MANAGEMENT OF COASTAL RESOURCES

PHOTO: LIVIE DEICHMANN



Without effective management of coastal resources, the considerable social and economic value of Southeast Asian coral reefs will be significantly reduced. Balancing the immediate needs of coastal communities, the desire for long-term sustainable resource use, and the maintenance of natural ecosystem processes are significant issues in most coastal areas. Together, these goals form the guiding principles for coastal management.

### APPROACHES AND STRATEGIES

Declining resources and increasing demand have necessitated the development of active management plans. The challenge is to identify and implement the right mix of management strategies for a given location so that long-term resource needs are met for a diverse group of users. The implementation of management actions can follow several different approaches. The three primary approaches in Southeast Asia are centralized, community-based, and collaborative management. In a *centralized management* scheme, power typically rests with one authority, usually the national government. *Community-based management* has a bottom-up framework in which decisions are made at the local level. *Collaborative management* shares authority among several stakeholders, typically the community, various government agencies, universities, and nongovernmental organizations. Increasingly, management practitioners recognize that no one management approach is appropriate for all places or conditions.<sup>164</sup>

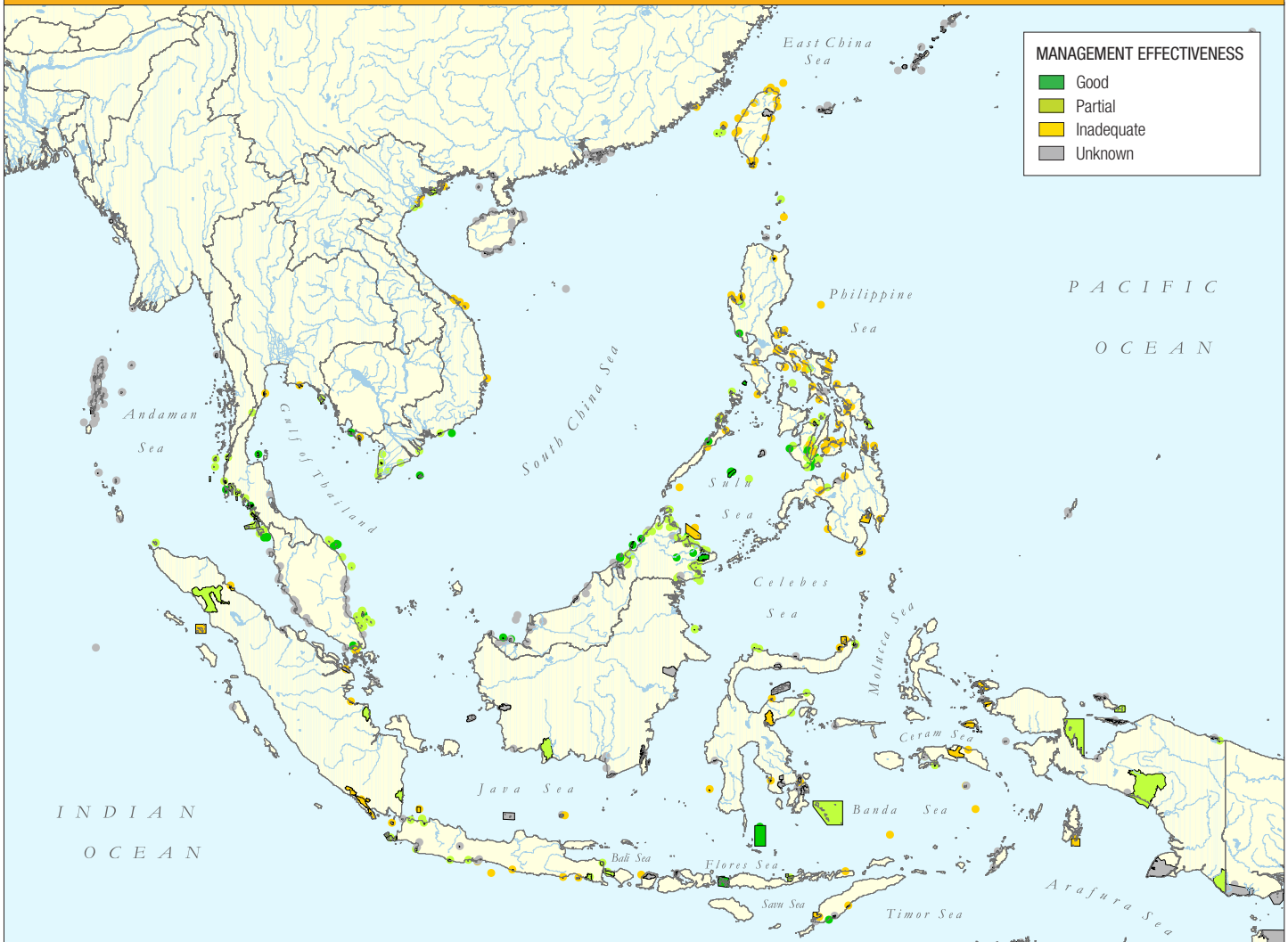
Four strategies are widely used in coastal resources management: (1) direct protection of specific areas, (2) legal regulation and policy, (3) economic incentives, and (4) education and awareness. *Direct protection* is perhaps the most widely applied

and well-known modern management strategy used to control human access and restrict activities that negatively impact natural resources. In general, direct protection is accomplished using marine protected areas, which range from multiple use management areas to fully protected marine reserves that prohibit many activities. *Legal regulations* typically include licensing, bans on certain activities or gear, seasonal harvests, and other restrictions to control activities or access to the resources so that overall fishing effort is reduced. *Economic incentives* are designed to discourage unsustainable practices. Incentives can facilitate transition to more sustainable fishing practices, help fishers exit the industry, provide alternative income sources, and assist in paying for the costs of management. *Educational strategies* are aimed at building awareness about the biology of coral reefs, their potential value, and how people impact coral reef health.



For more information on management strategies and approaches, see [www.wri.org/wri/reefsatrisk](http://www.wri.org/wri/reefsatrisk).

**MAP 16. MARINE PROTECTED AREAS RATED BY MANAGEMENT EFFECTIVENESS**



**MANAGEMENT EFFECTIVENESS IN SOUTHEAST ASIA**

Good management can minimize most threats facing coral reefs. An evaluation of management in the region is central to any threat assessment or picture of coral reef health. RRSEA focused its management assessment on MPAs because they are one of the most widely used tools and because the lack of data on the use of legal regulations, economic incentives, and educational programs prevented similar assessments of other strategies.

Marine protected areas are designated for a number of reasons, including fisheries management, tourism promotion, and the maintenance of biodiversity. Local, provincial, national, and international decrees have established hundreds of MPAs in the Southeast Asia region. Most MPAs are managed through central government programs. However, local conflicts and low enforcement capacity have made it difficult to manage MPAs in

some places, creating a situation in which hundreds of MPAs exist but only a fraction operate in ways that meet their objectives. In some countries such as the Philippines and Indonesia, governments have been moving toward community-managed MPAs to enhance local support, reduce resource conflicts, and bolster enforcement.<sup>165</sup>

In considering the effectiveness of MPAs, it is important to remember that they typically control only direct human activities, such as unsustainable fishing practices. In many MPAs, even strict enforcement of regulations cannot control the impacts of sedimentation and pollution unless the park includes areas of adjacent watersheds. Factoring other threats into the design of both protected area boundaries and wider land-use planning initiatives is essential to good management of coastal resources.

**TABLE 8. MARINE PROTECTED AREAS IN SOUTHEAST ASIA**

COUNTRY	NUMBER OF MPAs	MANAGEMENT EFFECTIVENESS RATINGS				PERCENTAGE OF A COUNTRY'S REEF AREA INSIDE MPAs
		GOOD	PARTIAL	INADEQUATE	UNKNOWN	
INDONESIA	131	3	36	35	57	9%
PHILIPPINES	110	14	31	58	7	7%
MALAYSIA	136	22	63	1	50	7%
INDIA	97	0	0	0	97	3%
JAPAN	46	0	0	0	46	20%
THAILAND	17	3	11	2	1	38%
MYANMAR	3	0	0	0	3	2%
VIETNAM	25	2	13	9	1	11%
CHINA	45	0	0	0	45	2%
TAIWAN	25	0	4	20	1	14%
BRUNEI DARUSSALAM	6	0	0	0	6	0%
SINGAPORE	4	1	2	1	0	0%
CAMBODIA	1	1	0	0	0	0%
<b>REGION</b>	<b>646</b>	<b>46</b>	<b>160</b>	<b>126</b>	<b>314</b>	<b>8%</b>

**SOURCE:**

*Reefs at Risk in Southeast Asia*, WRI, 2002.

**NOTES:**

This table reflects summary statistics on the MPA database compiled under the Reefs at Risk in Southeast Asia project.

Data were assembled by UNEP-WCMC, WRI, and many other project partners. The data may be incomplete for some countries.

Project partners were asked to rate management effectiveness based upon MPA resources, staff size, and existence of a management plan. Those ratings are summarized by country in this table, and are available by MPA within the full database, which can be found at [www.wri.org/wri/reefsatrisk](http://www.wri.org/wri/reefsatrisk).

Estimated location and boundaries of MPAs were overlaid with a data set on coral reef locations to determine the percentage of a country's coral reefs under MPA protection. These percentages should be regarded as rough estimates based upon available data.

In addition, definitions of MPAs vary. The estimated percentage of coral reefs inside MPAs in Japan is higher than previously published estimates, which only considered reefs in the Natural Park System.

The RRSEA estimate includes a broader set of MPAs, many of which do not offer comprehensive protection.

As part of the RRSEA project, local experts evaluated the effectiveness of hundreds of MPAs throughout the region. MPAs were rated based on several criteria, including staff size, management facilities, community outreach programs, and the existence of a management plan. Many “paper parks” were dropped from the full list of declared MPAs because they did not even have basic implementation. Of the remaining 646 MPAs within the RRSEA study region, the management effectiveness was unknown for nearly one half (314) of them. In reality, this lack of information probably indicates a deficiency of human and financial resources for these areas. Of the 342 MPAs that could be assessed, only 46 (14 percent) were rated as effectively managed. An additional 160 (48 percent) have partially effective management, and 126 (38 percent) have inadequate management. (See Table 8 and Map 16.)

The RRSEA project also estimated the percentage of coral reef area within MPAs across the region. The scale of the data and the degree of completeness of the MPA data set limit this analysis. Many MPAs are represented only by points, not their actual spatial boundaries, so their extent had to be approximated. Thus this analysis provides only a rough estimate based upon the best available data. Approximately 8 percent of the coral reefs in the Southeast Asia region lie within MPAs. However, just 1 percent of the region's reefs are in MPAs considered to be effectively managed, 4 percent of reefs are in MPAs with partially effective management, 2 percent are in MPAs with poor management, and 1 percent are in MPAs of unknown management effectiveness.