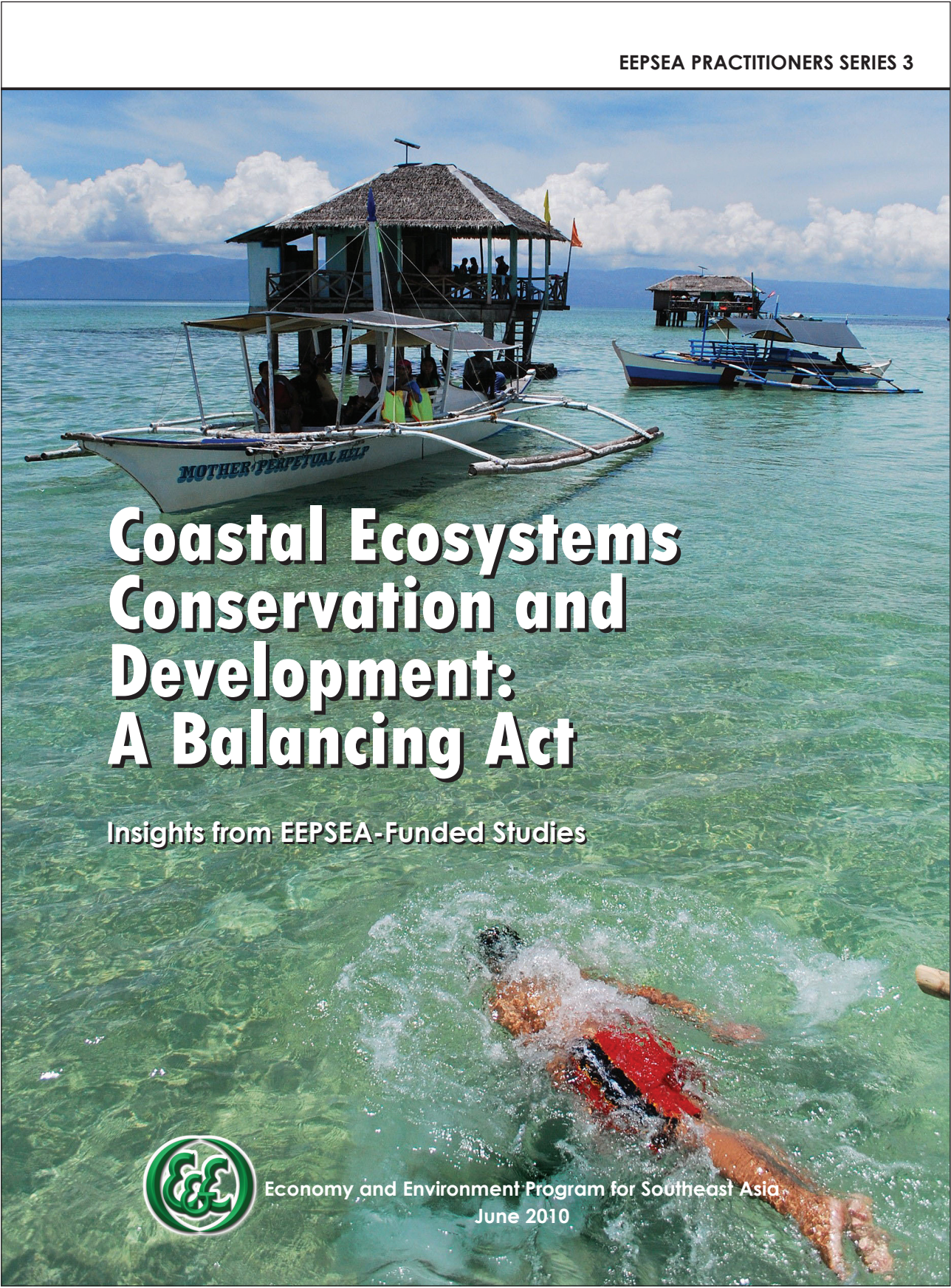


The background image is a vibrant tropical seascape. In the foreground, a person is swimming in clear, shallow turquoise water, creating a splash. In the middle ground, a traditional outrigger boat with a thatched roof and a canopy is named 'MOTHER PERPETUAL HELP'. Several people are on board. In the background, another similar boat is visible, and a thatched-roof structure stands on stilts in the water. The sky is blue with scattered white clouds, and distant mountains are visible on the horizon.

Coastal Ecosystems Conservation and Development: A Balancing Act

Insights from EEPSEA-Funded Studies



Economy and Environment Program for Southeast Asia
June 2010

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**Economy and Environment Program for Southeast Asia
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FOREWORD

This is the third monograph in the series that we at the Economy and Environment Program for Southeast Asia (EEPSEA) have started publishing way back in 2008. With distilled learnings from the studies funded by the program, it aims to provide natural resource managers and practitioners in the field with practical guidelines on dealing with issues confronting the environment and natural resources.

The content of this third series have been sourced from 10 researches conducted from 1997 to 2007 in Cambodia, Philippines, Vietnam, and Thailand on coastal resources management. Entitled 'Coastal Ecosystems and Development: A Balancing Act', this monograph explores how best to address six major issues in sustainable coastal management that have strong policy implications. Among others, these issues include: lack of and inaccurate valuation of natural and environmental resources; misguided policies and regulatory frameworks; ineffective management programs for coastal and marine resources; lack of funding to implement policies and programs at local levels; insufficient information as basis for improved coastal and marine management; and no clear role and lack of participation of local communities.

Featured in this series are strategies that are general enough to transcend different socio-economic and political settings. Specific policy reforms, institutional strengthening activities, and bio-physical interventions to control the environmental degradation brought about by man's activities in coastal areas were advanced.

As in any environmental concern, there is no single best solution. It is always a combination of approaches with socio-cultural, economic, and political dimension that work well. The strategies presented here come from studies the full text of which can be accessed at the EEPSEA website (www.eepsea.org) or through email (eepsea@idrc.org.sg).

Through our commitment in environmental economics research, we hope to be of better service and more relevance to the cause of sustainable environment and natural resource management in the region.

Herminia A. Francisco

Director, EEPSEA

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More than 60 percent of the world's population settle in coastal areas because these are accessible, ecologically rich, and full of natural resources.



INTRODUCTION

Coastal areas seem to be always on a balancing act. First, their location - they are those narrow strips of land that serve as boundary where the land and sea meet. Yet, more than 60 percent of the world's population settle in these areas because these are accessible, ecologically rich, and full of natural resources.

Coral reefs, mangroves, seagrass beds, wetlands, and estuaries and other bodies of water that make up the coasts thrive with living and non-living systems. This rich biodiversity provides sources of food (e.g., fish, salt), clothing, shelter (e.g., construction materials), and other resources (e.g., oil and gas, minerals, pharmaceuticals) for local and international consumption.

Coastal areas fuel diverse economic activities that provide livelihoods to millions of people. These provide resources for primary industries and services such as shipping and transportation, maritime trade, ports maintenance, shoreline protection, biodiversity sustenance, water quality maintenance, recreation, and coastal tourism. Not to mention other marine industries such as petrochemical manufacturing, food processing, and ship building and repair.

Hence, aside from their tangible economic, recreational, ecological, and resources values, coastal areas also carry 'intangible' values like their historical, political, educational, cultural, and aesthetic importance.

No wonder then that coastal areas are preferred sites for urbanization and people tend to congregate here. This makes the coastal areas' already dense populations grow much faster than those of inland areas. More than half of the world's population live within 60 kilometers of the shoreline, and this could rise to three quarters by the year 2020 (Agenda 21).

This population growth and economic needs make coastal areas susceptible to overexploitation of resources and environmental degradation. In fact, the coastal problems of East Asia also imperil the coastal areas of Southeast Asia. Land-based sources of

pollution; overexploitation of coastal resources; destructive fishing and aquaculture practices; resource use conflicts; oil and chemical pollution; invasive species; and uncontrolled development projects (PEMSEA, 2003) are seriously reducing the level of goods and services that the coastal ecosystem can normally generate in Southeast Asia.

Southeast Asia's coastal areas have been severely damaged. In the last 30 years, 11 percent of coral reefs collapsed, while 48 percent are in critical condition. Mangroves, on the other hand, have lost 70 percent of their cover in the last 70 years (PEMSEA, 2003).

If current trends of environmental degradation and overexploitation in coastal areas continue, at risk will be our basic food security, public health, livelihoods, environment, and biodiversity.

Coastal ecosystems actually hang in a balance. So, how far shall coastal development go?

Such a dilemma demands the careful management of all human activities and resources in the coastal areas. To get more out of the coastal ecosystems for more years to come, people need to ensure their health and sustainability. Thus, the level of exploitation of their resources must be kept well within the coastal ecosystems' carrying capacity or their capacity to generate goods and services on a sustainable basis.

ISSUES IN SUSTAINABLE COASTAL MANAGEMENT

- 1. Lack of and or inaccurate valuation of natural and environmental resources: when the 'hidden costs' can cost the most.**

The careful management of coastal resources and human activities in coastal areas requires a good baseline for decision-making. However, a number of major coastal development



Photo by AG Canubos

Coastal areas should be treated as a scarce resource to be valued.

projects in Southeast Asia have been implemented without really analyzing their environmental cost or damage. Policymakers have failed to factor in the environmental trade-offs associated with these projects.

Economic valuation of any planned coastal development program is useful in formulating strategies for implementation because its tools indicate the

cost-benefit effect of the proposed program. The concept of environmental economics is this: we should treat the environment as a scarce resource and, thus, give it a value in order to explicitly see and track down costs and benefits involved in every activity that affects it. Doing so would help us not to misallocate scarce resources and not to overexploit our coastal systems.

Economic valuation studies by EEPSEA on coastal development programs in Thailand and the Philippines show these inadequacies.

a. Environmental costs are not considered in feasibility plans of reclamation projects.

During economic valuation of projects such as coastal reclamations, the environmental costs are not taken into account, thus, understating the cost of the project. This practice is coupled with overstating the economic benefits of the project which mostly accrue to the private developer. There are social costs to be considered such as the irreversible loss and damage to the coastal and marine ecosystems. There is also the noise and dust pollution during construction as well as the added air and water pollution when humans begin inhabiting the reclaimed land.



Photo courtesy of ALL in CBNRM



Photo by AG Canibus

Reclamation projects affect people's livelihood and their environment.

Montenegro et al. (2005) studied Southeast Asia's largest proposed coastal reclamation project in the Philippine's second largest city - Cebu. The city was envisioned to adopt a "Hong Kong-style of urban development where economic growth is driven by tourism and export-based industries." The Cordova Reclamation Project in Mactan Island covers 2,707 hectares to be divided into industrial use (70%), and areas for residences and tourism (30%).

The reclamation project, however, entails forgone benefits or loss of opportunities that contribute significantly to people's livelihoods and overall coastal environmental damage.

There were three foregone benefits or loss of opportunities estimated over a 30-year period using a "without the project" scenario, Cordova would lose from on-site fishery (PhP290M), reef-flat gleanings (PhP10.9M), and recreational value (PhP1.7 billion) of affected coral areas.

Further, landfill quarrying inflicts long-term environmental impacts: noise and dust pollution; changes in ground and surface water systems; increased soil erosion and downstream sedimentation/siltation; and increased landslides.

Estimated total environmental cost comes not just from the losses due to quarrying, but also from the mitigation measures implemented to minimize the environmental impact. Implementing mitigation measures in quarry sites, excluding maintenance of sites, may reach up to PhP9.4 million. However, mitigation is not enough measure of total environmental cost as it fails to include localized impacts on nearby households and the uncertainties of the actual scale

of problems. The overall environmental cost estimated for the reclamation project based on present net value for 30 years with an 8 percent discount is about PhP 3.3 billion. This amount is the 'hidden environmental cost' of the reclamation project.

b. Coastal resources are undervalued resulting to unsustainable use.

Sathirathai (2003) did an economic valuation of mangroves in Surat Thani, South of Thailand and observed that there is a tendency to underestimate the total economic value of mangroves such as their potential in tourism. Further, non-use value is completely neglected. Because of their conversion to other uses, 6,225 hectares of mangroves are fast disappearing every year.

Mangrove swamps are targeted for shrimp farming because these are flooded with brackish water. Traditionally, mangroves are only partially cleared for shrimp farming. In fact, banana shrimps and greasy shrimps have been cultured for more than 50 years now. However, the intensive culture starting in 1974 of black tiger shrimps for export requires full conversion of mangrove areas



Photo by SB Jamias

Mangroves are rich in flora and fauna, and these shelter coastlines.

into shrimp farms. Because the country earns more than USD 1,200 million from export of frozen shrimps yearly, the government has followed a policy of promoting intensive shrimp farming.

Mangrove ecosystems are wetland systems that shelter coastlines and estuaries. These are rich in flora and fauna, and they serve as storm protection, shore stabilization, and soil erosion and flooding control. By ignoring these 'non-market' values of mangroves, communities pay the social costs. The economic valuation studies of 110 households in the Tha Po Village of Tha Thong Sub-district, Kanjanadot District, Surat Thani Province showed that shrimp farming is viable only to those who have capital (mostly outsiders); the rest of the community suffers from mangrove destruction, water pollution from the ponds, reduced fish harvest, and income inequality.

c. Measures of natural resources and environmental values using existing valuation techniques are inaccurate.

The growing concern over environmental degradation has heightened the role of environmental economics. It has also sparked interest on the valuation of natural resources as analytical tools that facilitate policy design for sustainable management. Researches of the past four decades, however, have not provided reliable methods for measuring the economic value of most non-marketable environmental assets involved in damage claims and allocation decisions (Chuenpagdee, 1998).

The growing concern over environmental degradation has enhanced the use of environmental economics for natural resources.

Photo courtesy of ALL in CBNRM



Recent researches are suggesting that our assumption of willingness to pay (WTP) and willingness to accept (WTA) being equivalent may not be valid. Studies have shown that people commonly value losses more than they do gains – a discrepancy referred to as endowment effect. Because of the problems in using these measures in contingent valuation, it may be difficult to rely on the survey results in damage assessments. Management policies or decision-making based on these estimates may be misguided and fail to promote the most efficient use of natural resources and the environment (Chuenpagdee, 1998).

2. Misguided policies and regulatory framework: conservation or conversion?

Legal and policy-based improvements can be an effective strategy for managing the coastal ecosystems in Southeast Asia. Policies and legal actions are more long-term and concrete. When policies are approved and ratified, the law provides a lasting avenue for management schemes and strategies. These strategies are backed by the law, thus, giving their implementation a solid foundation and a sure allotment of funds from the government.

Legislations may cover interagency and multisectoral arrangements, land use and sea use zoning schemes, registration, licensing and market-based instruments, as well as surveillance and enforcement mechanisms.

As can be seen in a number of EEPSEA studies reviewed for this series, the shortcomings in policies were often because policy makers have not used research results (e.g., economic valuations) as basis for decision-making. Hence, these policies have often emphasized the economic benefits at the expense of social and environmental costs in the local communities. Also, some policies developed by the national government have not been fully implemented at the local level. This may be because these failed to address the communities' needs, these were not understood or disseminated, or there were no funds and political will to implement them locally.

a. Coastal development plans favor market-based outputs over other ecological values.

The policy of converting large mangrove areas in Cambodia (Bann, 1977) and South of Thailand (Sathirathai, 2003) into shrimp ponds has had adverse effects on the local communities. Despite the higher returns from shrimp farming and the fact that this has become a major livelihood in Koh Kong province, Cambodia and in the Kanjanadit District of Surat Thani province, Thailand, it causes the following major damages:

- Loss of mangroves and their rich economically valuable biological resources (e.g., traditional medicines, *Nypa fruticans* for house construction)
- Depletion of groundwater because of pumping into ponds to dilute salt water
- Changes in soil composition (e.g., increased salt and accumulation of chemicals in ponds)
- Eutrophication through the use of antibiotics and chemicals to enhance shrimp harvest, making the water susceptible to growth of organisms and become depleted of oxygen
- Pollution of coastal waters and adjacent communities from the discharge of harmful wastes (e.g., excess lime, organic wastes, pesticides, chemicals, disease micro-organisms)

Photo courtesy of ALL in CBNRM



Photo by JC Capallungan



Uncontrolled shrimp farming can inflict environmental and economic damages on communities.

- Improper sediment disposal that increases salt content (salination) in soils and water
- Disease outbreaks and declining productivity after about a lifespan of five years that lead to abandoned ponds; investors moving to new and unspoiled locations

Further, relocating the communities outside the mangrove areas to reduce pressure on the coastal resource now puts a pressure on the local government to raise the estimated relocation cost of USD1,940 or higher per household.

The projected income also does not accrue to the local communities. Income distribution skews to favor a few gainers who are mostly 'outsiders' who can afford the initial high investment in shrimp farming compared to local farmers. This 'equity issue' inevitably leads to conflicts and unrest among the people.

b. Intensive commercial farming and export are prioritized over conservation.

In Thailand, Sathirathai (2003) pointed out that the massive conversion and subsequent destruction of mangrove areas in the South can be traced to policy failure. Exploitation comes from excessive clearances, which in turn result from ill-defined property

rights. While the law declares all mangrove areas as state properties to be guarded and protected by the Royal Forestry Department, in practice, these mangroves have become open-access to encroachers. Hence, policy failure comprises not only the problem of inappropriate property rights. It also includes conflict in policy objectives – conservation versus export-earning.

Policy failures often result from the problems of inappropriate property rights and from conflicts in policy - conservation versus export earning.

c. *Tourism and proposed development projects are unregulated.*

The tourism industry in Phang Nga Bay in Thailand showcases another failure to impose regulation policies to contain environmental degradation. Resource conservation has been traded off for tourism and industrial development. To boost tourism, some improvements in the area include two deep-sea ports, industrial estates, urban centers, highways reclamation, and modification of coastal resources. However, such activities entail foregone goods and services coming from marine and coastal resources. The improvement of such coastal resources for tourism has not been in tandem with appropriate management practices to mitigate risks of continued degradation and increased pressure on protected areas (Seenprachawong, 2001).



Photos by AG Can-

Coastal areas in Southeast Asia have traded resource conservation for lucrative tourism.

The Bay, spanning the provinces of Phuket, Phang Nga, and Krabi, has been included in the Southern Seaboard Development Project (SSDP) in the Sixth National Economic and Social Development Plan (1987-1991). The SSDP will combine the national development goals of industrial development to capitalize on domestic natural resources, attract foreign development, and decentralize economic growth.

This infrastructure development on the island is exerting pressure on the beaches and marine resources. Precious

resources are being used for craft items. Wastes are being disposed into the wetlands. Seagrass are being removed to make swimming more appealing. And visual and public access to the coast is being blocked. In effect, the area is losing its mangroves, coral reefs, and seagrass beds, the local communities' main sources of livelihood (Seenprachawong, 2001).

3. Ineffective management programs for coastal and marine resources.

The ultimate objective and direction on how to protect and manage marine and coastal environments are actually set by good policies. These policies are implemented through legislative laws, especially at the local level. Such laws legitimize coastal management programs, provide basis for enforcing compliance, and guide sustainable initiatives.

When these are not in place, problems are encountered in multi-agency and multidisciplinary coordination. Often, many coastal development programs are implemented by a single sector. This fails to consider the cross-sectoral impacts of the multiple uses of coastal resources. Further, many agencies, organizations, and entities overlap in their responsibilities on coastal and marine governance.

For instance, the sectors directly or indirectly involved in coastal and marine governance include fisheries, aquaculture, mining, forestry, tourism, industry, trade, ports and harbors, navigation, legal, environment, public health, coast guard, navy, hydrography, weather, economic development, social affairs, security, interior, science and technology, and foreign affairs.

When each of these sectors pursues its own agenda, priorities, mandates, and programs without coordinating with other sectors, funds, time, and efforts are wasted.

a. *Institutional arrangements or inter-agency cooperation is not clear.*

In Sumalde and Pedroso's (2001) study on the bay's resource management program, they found that the San Miguel Bay Management Council was formed to formulate

plans, generate funds, and carry out all its activities for co-management. The 'ideal' was for all members of the council (mayors of the seven municipalities, representatives from each of the fisherfolks' organizations, academe, NGOs, and the private sector) to actively participate in all activities from advocacy to implementation. However, the findings show that the "the sharing of responsibilities does not imply co-management in its truest sense."

Photo by AG Canubas



Inter-agency cooperation ensure more effective and sustainable conservation efforts.

In a reclamation project in the Philippines (Montenegro et al., 2005), the private developer (Malayan Integrated Industries Corporation) proposed to get landfill materials for the project by dredging the offshore seabed around Talisay City in the southern part of Metro Cebu or around the neighboring island province of Bohol. However, the Cebu Provincial Government also proposed a reclamation project which encompasses about 1,600 hectares. This led to a conflict between the provincial government and the private developer. In 1999, the Office of the President revoked its memorandum giving rights to the private developer, and it denied the provincial government's claim as well.

Javier's (2003) assessment of the performance of Marine Protected Areas (MPAs) in the Philippines showed that collaboration between the national government through the Department of Environment and Natural Resources (DENR) and the local government units (LGUs) ensures a more effective and sustainable conservation effort. Collaboration, however, could not yet be seen in three protected areas included in her study because of the very minimal involvement of the LGUs.

These clearly show conflict arising out of lack of clear-cut policies and relevant legislation at the different levels of the executive branch.

b. *Devolution has decentralized the responsibilities but not 'power' and resources.*

Another area where integration of agencies becomes a challenge is in the devolution or decentralization of programs for coastal development from a national agency to the local government.

In the Philippines, for instance, MPAs that used to be solely governed by the national government through the DENR have been devolved to the LGUs. The LGUs work with non-government organizations (NGOs), peoples' organizations (POs) or communities, and some private sectors. The role of the LGUs as direct implementors of resource conservation or management projects was brought forward as a result of RA 7160 (1991) or the Local Government Code. The Code aims to decentralize governance from the national government to the LGUs. These local governments, however, also face shortcomings such as lack of funds, manpower, ineffective leadership skills, and bureaucratic process (Javier, 2003).

Javier's (2003) study on the role of governing institutions (and their arrangements) on the performance of nine MPAs in the Philippines showed that those managed by LGU-NGO seemed to fare better than those managed by other MPAs under different governing institutions. Those MPAs managed by DENR-NGO that had a weak linkage with the LGUs resulted in conservation efforts not being fully implemented.

4. *Lack of funding to implement policies and programs at the local level.*

There is a lack of a national budget allocation for the implementation of policies or laws at the local level.

Sumalde and Pedroso (2001) cited the situation in the Philippines. The San Miguel Bay Community-Based Resource Management (CBRM) program receives insufficient fund support from the

Philippine government, both at the local and national levels. While the LGUs involved agreed to contribute yearly to the operation of the San Miguel Bay Management Council, some of the members failed to comply with this agreement.

Because of lack of funds, the Council discontinued some of its resource management initiatives; worse, it failed to start some programs at all. This is lamentable because CBRM must be sustained and cannot be completed in three or four years. For instance, while the Council provided a patrol boat to monitor artificial reefs and to control the entry of illegal trawlers, the municipal government has only limited funds to finance the boat's gasoline. Thus, people assigned were not able to patrol the Bay regularly, leading to weak monitoring and enforcement laws.

To help strengthen law enforcement, both the LGUs and Barangay Councils reportedly pledged to allot a certain amount from their general funds or Internal Revenue Allotment (IRA) for patrolling. But the pledge has yet to be fulfilled.

Javier (2003) who assessed the performance of three MPAs in the Philippines also found that financial resources have a great impact on the management of these areas. Community-based MPAs cited the lack of steady financial resources as one of their major problems, affecting their monitoring and management. However, areas with external funding such as those from international donor agencies like the World Bank did not encounter problems.

The entry of the Protected Area Management Board (PAMB) in the community-managed Apo Island Marine Sanctuary created problems about the dissemination of benefits. Unreleased Integrated Protected Area Funds from the government created uncooperative or hostile behavior from the community members against the management. This hampered the smooth implementation of conservation laws (Javier, 2003).

5. Insufficient Information as basis for coastal and marine management strategies

The lack of adequate, appropriate, and timely information to make wise decisions has also been found to adversely affect the management of coastal areas.

a. Environmental impact assessment or cost-benefit analyses are not done before dike development.



Photos courtesy of EEPSEA



Dikes contribute to wetland degradation in Vietnam's Mekong River Delta.

About 90 percent (4.9 hectares) of Vietnam's Mekong River Delta are wetlands. Hence, two types of ad hoc dikes have been built since early 1980: park dikes surrounding wetland protected areas and farm dikes surrounding villages and paddy fields. A closer study by Thang Nam Do (2007) on the dikes in Tram Chim farms and parks, showed their adverse environmental impacts.

The building of the dikes contributes to wetland degradation by a) increasing damage from flooding in other areas and imposing costs on others; b) reducing

sedimentation; c) hindering the free movement of fish between channels and wetlands during overbank flooding; d) and destroying *Eleocharis* grass, the food for the cranes that visit the areas because of prolonged inundation (Thang Nam Do, 2007).

Further, the impacts of changes in the dikes on rice values and biodiversity values, using rice production function approach and environmental choice modeling, showed that: a) conversion of park dikes from high to low systems may improve biodiversity, but this will impose cost on local farmers in the buffer zone by increasing flood duration; and b) conversion of farm dikes from low to high system may improve health of wetlands, but this will cost farmers lower rice productivity and income losses from livestock and orchards.

The cost of proposed change in dike and wetland management is equivalent to rice production losses. Rice yield will decrease by 0.03 tons per hectare per year or about 1,500 tons per year for local farmers in the buffer zone. This would also reduce income from livestock and orchards. All these impacts have not been factored in the dike development.

b. *Studies on the transaction costs related with Community-Based Coastal Resource Management (CBCRM) Programs in the Philippines were lacking.*

Transaction costs are indirect expenses other than the direct actual cost in obtaining the desired output. Sumalde and Pedroso (2001) operationally define transaction costs as "indirect costs incurred in reaching and enforcing agreements." Transaction costs are usually unaccounted in the total implementation budget.

The direct costs include the costs of inputs (e.g., seedlings), acquiring assets and maintenance (e.g., patrol boat), and/or procurement of supplies and equipment (e.g., computers). Transaction costs, on the other hand, include the value of time and effort spent by all participants in planning and implementing the program.

The two authors assessed the transaction cost in the implementation of a pilot site for a CBCRM program in San Miguel Bay in the Bicol region. While the program aimed to involve the local communities in preserving their coastal resources and in augmenting their incomes, the transaction costs of involving the community was very high.

Sumalde and Pedroso (2001) found that being multi-level and multi-sector, transaction costs are incurred in law enforcement and community organizing. The transaction cost for community organizing accounts for 37 percent of the total project cost. Activities related to law enforcement such as travel to the villages, coordination costs with stakeholders, motivation costs for workshops, etc. also take up resources, efforts, and time, hence, adding to the transaction cost.

A correlation analysis showed that as more efforts and time are put into the program, the higher the transaction cost of the project becomes, and the lower is the performance of community organizations.

c. Policies or project plans from the national level are not disseminated to the local level.

Some policies are not disseminated from the national government, which is in charge of policymaking, to the local government, which handles the implementation and enforcement of these policies and laws.

In the CBCRM program in San Miguel Bay, Philippines, the fishers should ideally be consulted by the government before introducing a regulation. In other circumstances, the fishers are free to design, implement, and enforce laws and regulations with advice and assistance from the government.

However, Sumalde and Pedroso (2001) found that most of the LGUs and people organizations were not fully aware of the provisions of the New Fisheries Code. Some villagers did not know about the 1995 municipal ordinance proclaiming an area, within 15 meters from the total municipal coastline, as a fish sanctuary or marine reserve. In fact, even the provincial Philippine National Police was not aware of the Implementing Rules and Regulations of the Philippine Fisheries Code passed in 1990s until informed in a meeting in 1998. Hence, some fishermen still violated this ordinance.

Photo by AG Canubos



Policies must flow between the national policymakers and local government units.

The implementation of policies from the national level to the local level was also constrained by the lack of funds on the part of the LGU and by inadequate information and understanding of the concept of CBCRM by community members as well as law enforcers.

d. *Monitoring and evaluation have not been used effectively for policy and decision-making.*

The absence of monitoring and evaluation of coastal development programs can result to the poor accountability of stakeholders who are to coordinate and implement such programs.

Lack of monitoring and evaluation of coastal development programs often lead to poor accountability

In the Philippines, the absence of readily available information that can be used in analyzing the financial flows and operation of the San Miguel Bay-CBCRM manifests that monitoring and evaluation (M&E) has not been effectively carried out (Sumalde and Pedroso, 2001). While there was a fixed budget for the Fisheries Sector Program, no records of the actual funds allocation for the San Miguel Bay project could be obtained from the concerned national government offices, especially after the changing of officials in 1998. Hence, planners should be made to integrate an effective M&E with emphasis on proper recording of key performance indicators of program implementation. This would enable the implementors to identify the bottlenecks so as to redirect the program.

Information on impacts of dike changes on wetland values provided by an effective M&E scheme are also considered important in decision-making. A study on this aspect by Thang Nam Do (2007) in Vietnam's Mekong Delta suggests

that more researches on feedback mechanisms should be carried out as management for farm dikes is a complex issue.

6. No clear role or low participation of the local community.

The management capabilities of the local government, the public understanding of issues, as well as the participation of various stakeholders need to be strengthened to ensure the success of coastal development programs. Citizen engagement in policy development and implementation “can help generate a heightened sense of public value about what government does” (Curtain, 2003). However, participation is constrained by factors discussed below.

a. Law does not recognize the local communities' rights.

Participation of the local community must not be undermined and ignored in terms of policy making.

In the mangrove forest conservation in Surat Thani, Thailand, the local villagers have been directly affected by the influx of shrimp farms in their mangrove areas. The benefits that they once enjoyed such as having high yields of fishes and being protected from strong winds and storms are continuously declining. Add to these losses, the local people hardly gained anything from the shrimp industry in their areas since most of the owners of these shrimp farms were rich businessmen from Bangkok or from other areas. The local people felt that they were on the losing end, so they organized themselves to protect the remaining mangrove forests. However, their rights have not been recognized by the present law (Sathirathai, 2003).

b. The community has low public awareness about the issue.

As discussed earlier, fishermen and even local authorities in the San Miguel Bay-CBCRM in the Philippines apparently have not been consulted or adequately informed about the regulations on fisheries. Hence, some fishermen encroach even in the marine reserves (Sumalde and Pedroso, 2001).

In Thailand, Seenprachawong (2002) found that among people living in and traveling to the Phang Nga Bay area, a tourist destination, there were misunderstandings and a general lack of knowledge about the activities and regulations of marine parks, particularly among the fishermen and hoteliers. Their trust on the ability of the park management authorities to effectively protect the marine environment has even waned. Phang Nga Bay, with its archipelagic islands, is rich with mangroves, coral reefs, and seagrass beds.

MANAGEMENT STRATEGIES TO MINIMIZE COST AND INCREASE VALUE OF COASTAL ECOSYSTEMS

1. Include economic valuations in any coastal development program.

Already, economic valuation studies on various coastal development programs in Cambodia, Thailand, Philippines, and Vietnam have generated some principles that could guide coastal management planners and practitioners. Some of these are the following:



Economic valuations should be integrated in any coastal development program.

Uncover the hidden costs and include them in cost-benefit analysis (CBA). A case in point is Southeast Asia's largest proposed reclamation project in the Philippines. Montenegro et al. (2005) focused on this basic question: Do the projects have positive net benefits to society as a whole?

Other than a company's investments for creating "new land" by covering bodies of water with landfill, there are other costs involved like income loss of fisher folks resulting from lost fishing grounds; or income loss of the city government from "underwater" tourism. The cost to be shouldered by the local government is also considered in case of an environmental disaster resulting from reclamation-related activities (e.g., quarrying).

Photo courtesy of ALL in CBCRM



The cost and benefit analysis of 'underground' tourism should be done.

Coastal management programs should make

allowance for transaction costs (TC). These are "indirect costs incurred in reaching and enforcing agreements." Although transaction costs are usually unaccounted in the total implementation budget, being aware of these "unaccounted expenses" is also important. This would determine whether or not the involved parties are willing to transact and be involved in the project.

This points to the need for policy makers to consider the transaction cost in designing multi-objective programs that will be implemented at the local level. Similarly, information on the extent of the transaction cost at different stages of the program's initiation and implementation would be helpful in designing and allocating budget funds for a multi-level and multi-objective program like the CBCRM program. Overall, looking at the transaction cost involved in the whole project phase and its distribution among the stakeholders could lead to sound policy-making and budget formulation/allocation.

Women should also be included in the transaction cost analysis. Sumalde and Pedroso's (2001) study into the transaction costs of a CBCRM program in San Miguel Bay, Philippines laid out five policy recommendations, including the factoring in of gender dimensions in computing the TC. The key informants' survey

revealed that women and children also had considerable direct and indirect contributions to CBCRM activities. Apparently, during the 1950s, women were actively involved in fishing activities.

Explore alternative valuation methodologies.

Realizing the growing concern for obtaining accurate measures of natural resource and environment values, and the problems with existing techniques, the damage schedule method can be an alternative approach (Chuenpagdee, 1998). This method solicits people's judgments in ranking the relative importance of different resource losses and activities that have adverse impacts on the environment, rather than just direct monetary evaluation. Hence, loss can be assessed quickly and put into action at low transaction cost.

To construct the damage schedules for losses and activities, Chuenpagdee conducted an empirical test using actual situations in two coastal areas of Thailand, namely: Ban Don Bay and Phang Nga Bay. About 200 people answered the survey in 1997. The damage schedules provide predictability and enforceability by specifying in advance the payment that will be required in case of a loss, rather than waiting until the damage has taken place.

2. Have a clear policy and legislative framework to guide coastal management programs.

Policies set the ultimate objectives and direction on how to protect and manage marine and coastal environments. Meanwhile, legislation provides legitimacy to coastal management programs; it becomes the basis for enforcing compliance, and it serves as a guide for sustaining initiatives.

Photo by BM Remoquillo



Women should be included in any transaction cost analysis.

a. Include economic valuations and environmental impact assessments in all major development proposals.

The study of Montenegro et al. (2005) on a reclamation project in Cebu, Philippines showed the need for an explicit provision in the law that requires developers of the coastal reclamation to include an assessment of possible environmental impacts. It also recommended that the Total Economic Value (TEV) approach be used since the coastal reclamation project poses total and

irreversible loss on the coastal ecosystem. This valuation of impacts will be used in setting a more accurate basis for the Environmental Guarantee Fund or EGF.



Photo by AG Canubas

One policy is to include economic valuations and environmental impact assessment in coastal development

The EGF is paid by the developer of projects which are "deemed by the DENR to pose a significant public risk." The amount is used to prevent any environmental damage through clean-up activities, environmental enhancement measures, damage prevention program, and social equity measures. In case of damages, the EGF is used to compensate the affected communities and to rehabilitate damages caused by "construction, operation, and abandonment".

Similarly, a policy was recommended in Thailand that major development proposals in Phang Nga Bay (for shrimp farming and tourism) must be accompanied by a thorough environmental impact study conducted by an independent qualified expert (Seenprachawong, 2002). In addition, the concerned government agencies should conduct further research to ascertain the precise carrying capacity of the parks - in terms of the maximum number of users and the intensity of use by various categories of users.

In an intensive shrimp farming in a mangrove ecosystem in Koh Kong province, Cambodia, the need for government policy for sustainability was also raised (Bann, 1997). This policy should include: education on environmental management; technical assistance; monitoring and enforcement; rehabilitation of abandoned ponds; strict controls on areas within the coastal zone where shrimp farming may be permitted; and a strong emphasis on community involvement.

Estimating and comparing environmental costs and benefits would allow decision makers to efficiently decide on issues involving sustainable environmental use.

b. *Implement a land zoning management system for mangroves.*

A land zoning management system was also proposed in Koh Kong Province in Cambodia (Bann, 1997). In this system, the mangrove system may be divided into two main zones. The first zone is the conservation

area that is totally protected because of its high ecological concentration. Here, shrimp farms will be prohibited but

Photo courtesy of SEARCA's Philippines-Netherlands BRP



People should be consulted in any land zoning scheme.

traditional sustainable uses, such as production of charcoal by the local communities, may be allowed.

The second zone is the multiple use area where strict management guidelines are implemented based on sustainable yields. Shrimp farms may be allowed but only in designated areas.

Bann (1997) stressed, however, that the community must be consulted in the zoning scheme. Further, the villagers must have available alternative income sources aside from the mangrove resources.

c. Regulate the impact of tourism.

Seenprachawong (2002) gave these recommendations based on the experience of Thailand's Phang Nga Bay, which is an expanding tourist spot.

1. The government should impose a moratorium on the construction of new hotels and other accommodations for seven years during which no new permits will be issued.
2. A permit should be obtained for the erection of advertisement signs and billboards, which must conform to certain specified standards. The operation of jet skis and similar high-powered marine crafts should be totally prohibited in environmentally sensitive areas.



Photo by S Velus



Photo by AG Canubas

There are globally-accepted standards for protecting and managing coastal ecosystems including those covered by tourism.

In the absence of national policies on coastal development, management, and protection, Southeast Asian countries may be guided by some international conventions or treaties. These conventions or treaties articulate policy directions or reforms in policies that provide globally-accepted standards for protecting and managing coastal ecosystems.

One example is the Convention on the Law of the Sea (UNCLOS) of 1982. Article 92 states that the protection and preservation of the marine environment is a basic obligation of a coastal nation. The United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil in 1992, produced Agenda 21, Chapter 17. The Agenda stipulates the sustainable development and protection of oceans, seas, freshwater sources, and coastal zones.

3. Adopt processes proven to promote effective management programs for coastal and marine resources.

The integration of efforts, resources, and manpower among agencies engaged in coastal and marine governance would facilitate the effective and efficient governance of coastal ecosystems. Various cases of multiple use conflict or duplication of efforts among stakeholders would also be reduced.

A vital factor is political commitment. Long-term political commitment ensures that short-term programs do not become vulnerable to political changes. Coastal management programs that have been integrated in long-term government planning and economic development programs are more sustainable.

a. Establish marine protected areas and adopt an appropriate management scheme.

In the Philippines, marine protected areas that are governed by detailed provisions, regulations, and laws including organizational structure and protocols for both government and private institutions, have been established. Hence, every stakeholder has a delineated role and responsibility in the inter-agency relationship.

Photo by AG Canubas



Marine protected areas must be established and well managed.

A rating of the performance of MPAs using selected socioeconomic, biophysical, and institutional indicators has been conducted by Javier (2003). On the institutional aspect, results showed that sites managed by LGUs together with NGOs seemed to be better managed than other MPAs under different governing institutions. A protected area that is managed effectively will result in resource conservation, ecotourism enhancement, and more effective monitoring and law enforcement. While an LGU-NGO led MPA was shown to be more effective, she said that other institutions or arrangements governing the MPA can perform. This is as long as the latter's management is efficient and effective in implementing its conservation plan, in enforcing its laws, and in sourcing of funds.

Further, Javier (2003) said that the MPA strategy may be more effective for a bigger jurisdiction in MPAs because there is a bigger pool of resources for protected area management activities. CBCRM, on the other hand, is recommended for a small area. This was concluded after looking at three levels of institutional and structured management styles: the DENR-NGO led MPAs, the LGU-NGO led MPAs, and the community-based MPAs.

Moreover, Javier said that a protected area will be more effective if coastal resources in nearby provinces and other islands are also well protected and well managed. Linking up to a network of adjacent MPAs that are actively managed is also essential. If there are no established MPAs near an already existing protected area, there is a need to encourage others to set up one. Most of the illegal fisherfolk are from nearby provinces or islands because they know that fish abounds in protected areas. An active network of adjacent MPAs can cover a larger geographic area, hence, expand the jurisdiction of law enforcers in pursuing violators who infringe on other vicinities.

Fisheries co-management, the concept of CBCRM adopted in the conceptualization of the San Miguel Bay in the Philippines, also covers various partnership arrangements, degrees of power-sharing, and integration of local and centralized management systems (Kuperan et al., 1998 in Sumalde and Pedroso, 2001). Under this scheme, the government consults fishers before introducing a regulation. In other circumstances, the fishers design, implement, and enforce laws and regulations with advice and assistance from the government.

b. *Establish a strong collaboration between the national government and LGUs for effective and sustainable conservation of MPAs.*

The roles of national vs. sub-national governments in coastal and ocean governance can be delimited by geography and by responsibilities. The national government often emphasizes policy, legislation, capacity development, and financing for coastal development programs by the local government. Local governments, on the other hand, are at the forefront of local problems and coastal management. They can also integrate local development or environmental plans in their local government plans.

Javier (2003), in her study of MPAs in the Philippines, showed that there should be a firm and strong collaboration between the national government through the DENR and the LGUs to achieve a more effective and sustainable conservation effort. LGUs impose user fees and other

charges on the use of environmental resources. They monitor the activities taking place in a coastal area under their jurisdiction as indicated in the Philippine Local Government Code.

Photo by BM Remoquillo



*Inter-agency
consultations and multi-
stakeholder partnerships
can minimize policy*

Although inter-agency conflicts cannot be totally avoided, those causing unnecessary waste of resources and conflicting policies can be minimized through regular consultations and interactions among concerned agencies.

Since institutional integration cuts across various economic sectors, government bodies, and even international agencies, one mechanism is to establish a coordination mechanism (e.g., council) among the various stakeholders of coastal management. The council may include all concerned government agencies, community groups, private sector institutions, research institutions, and NGOs -- which are then enjoined to work together toward a common vision.

c. *Implement a comprehensive integrated management plan for the area.*

As discussed earlier, an integrated management plan for mangrove areas in Cambodia was able to protect the ecosystem while allowing traditional and sustainable use of some resources by the community (Bann, 1997).

An ideal option would be to adopt the principles of integrated coastal management (ICM). The ICM concept started being adopted in Southeast Asia in 1985. But it was in 1992 that it became an integral part of Chapter 17 (on oceans and coasts) of Agenda 21, the action plan drafted from the UNCED.

The keyword in ICM is “integrated” – which means a cross-sectoral and multidisciplinary approach as against the individual sector-oriented approach to address the complex management issues in coastal areas. This is by far the ultimate goal because this management system employs an integrative, holistic approach and an interactive policymaking, planning and implementation process in coastal protection and management.

4. Ensure a sustainable financing mechanism.

People in communities often over-extract natural resources. Incoming developers also abuse their commercial rights. This is because both groups do not have to pay or compensate some sectors affected by their abuse. Since the transaction cost of their abuse almost always falls on the government as the steward of the environment, public funding is spent for such compensation.

An integrated coastal management ensures a cross-sectoral and multidisciplinary approach to address the complex issues in coastal areas.



Photo courtesy of AIL in CBNRM

Funding issues then should not just include where to source funds, but also how to ensure that the stakeholders, including the local communities, are held accountable for any environmental damage caused by their unsustainable activities.

Program planners at the national level should provide budget for programs that will be implemented at the local level.

Some funding sources for tourism include the following:

Raise money at the site level. The park manager of Mai Khao beach in Thailand can implement a 'Friends of the Sea Turtle' program. Income can come from a portion of the economic benefits derived from the marine resources in Phang Nga Bay, Thailand. One can charge: a) user fees from fishermen or water sports operators, and b) collect a part of the amount being paid for accommodations by foreign or local visitors (Seenprachawong, 2002).

Launch an adoption campaign. Alternatively, the park manager can also raise money for sea turtle protection by selling 'deeds' for 100 Baht (USD 2.50) per turtle protected. The donor will then receive a certificate that s/he or her/his group has adopted a sea turtle (Seenprachawong, 2002).



Photo by AM Castillo

Friends of the Sea Turtles program can encourage tourists to preserve coastal marine life.

Introduce a two-tier basic entrance fee. The government can introduce a two-tier basic entrance fee for marine parks in Phang Nga Bay, with different rates for residents and foreigners. Thais can pay an entrance fee of 40 Baht (USD 1) while foreigners pay 400 Baht (USD 10). A hotel room tax (40 Baht or USD 1) per bed-night) can also be implemented (Seenprachawong, 2002).

Ask for donations. Other ways by which visitors and local community people can contribute to the program may be through "volunteer work, word-of-mouth publicity, information sharing, buying of products and tickets to benefit events, and identification of potential donors".

The funds gathered through these mechanisms would help finance management activities to protect and conserve the marine ecosystem. At the same time, these can support scientific research and information campaigns.

Also, user fees increase the accountability of those managing the resource to deliver effective management.

However, property rights must be secured; the exclusive rights of those who paid must be strictly enforced; and the exclusion of those who did not pay must be implemented. Those who pay fees are licensed to use the resources exclusively. If they see that those who did not pay could also use the resources which they paid for, they would opt not to pay anymore.

Provide initial funding for local programs.

In the Philippines, initial funding should be given to programs or projects especially those being brought down to the local level. This is to minimize the transaction costs being shouldered by the local community (Sumalde and Pedroso, 2001). The

transaction cost in a CBCRM area was found to be very high in the implementation phase because of the multi-stakeholder nature of the project. Transaction cost is not just money but also the time spent in transacting activities related to the coastal resources management.

High transaction costs slow down the performance of the parties involved in the project, making it ineffective and unable to meet its objectives. Hence, there is a need for funding during the initial stage of project implementation.



Photos by AG Canubas



User fees can increase the accountability of managing coastal resources, but property rights must be secured.

5. Provide accurate, timely, and relevant information to improve decision in coastal marine management.

a. *Increase awareness of policymakers about economic valuation.*

Overemphasis on economic benefits of reclamation projects vis-à-vis environmental costs could lead to distorted “development and investment policy decisions” (Barbier, 1998 and Goulder and Kennedy, 1998 as cited by Montenegro et al., 2005).

Hence, there is a need to make policymakers and decision makers aware of the value of economic valuation tools to help justify their investments in managing and protecting coastal resources. As discussed earlier, there are many valuation tools that development workers can use to make decisions about environment costs.

b. *Enhance knowledge management and information system.*

A GIS database may also be established (Seenprachawong, 2002). This database would serve as a repository of information on the location and structure of the islands, marine community structures, location of moorings, and bottom features in certain areas of the marine parks. This system would serve as a tool to measure the effects of changing usage patterns. In addition, it would assist future management decisions, in particular, those relating to the establishment of an artificial reef, the location of additional mooring buoys, and the prohibition of diving from certain areas.

c. *Use integrated monitoring and evaluation results.*

Program planners should integrate monitoring and evaluation in the program. This component may help identify bottlenecks and may also help program planners make the necessary adjustments in implementation (Sumalde and Pedroso, 2001).

Information gathered from M&E on impacts of dike changes on wetland values in Vietnam should be used as basis in decision-making (Thang Nam Do, 2007).

6. Build local participation and capacity.

Participation in coastal and marine management is usually impeded by poor appreciation and understanding of the benefits of coastal and marine governance. In many cases, people feel that benefits of improved coastal and marine resources take a long time to be seen and enjoyed. Stakeholders, therefore, need to be convinced that their involvements in coastal and marine management are beneficial investments worthy of people's efforts and resources.

Building local capacity enables local stakeholders to actively plan and manage their own resources.

Building the local capacity enables local stakeholders to take an active role in planning and managing their own natural resources. This creates program ownership, which, in turn, ensures program sustainability. However, adequate financial resources should be allocated to strengthen local human resources and institutional capacities.

a. ***Secure the rights of the local community.***

Recognize the rights of local people to strengthen the long-term success of the local villager's initiative in protecting their mangrove forests (Sathirathai, 2003).

Local villagers will protect their forests if there are incentives for them to do so. However, the long-term success will also depend on how well organized the existing local institution is and whether or not the national legal system recognizes these rights. Further, when off-shore

Photo by BM Remoquillo



The local people's initiatives and rights to protect their coastal resources must be respected.

fisheries are well managed by local communities, the foregone benefits of mangrove in terms of support for off-shore fisheries will be even greater (Sathirathai, 2003).

Organizing MPAs in the Philippines has been shown to embody these rights: use rights, exchange rights, distribution rights, and management rights (Javier, 2003). These rights are exercised within the MPA framework, which defines control, access, and use of resources. Communities will be hostile to programs that limit their access and threaten their income, driving some residents to engage in ecologically destructive practices. Thus, policy considerations must provide mechanisms for alternative livelihood, financing, and sustaining livelihood. As Javier (2003) noted, "the community is an MPA management's strongest ally".

In the Surat Thani Province in Thailand, Sathirathai (2003) cited that a law has been proposed to the House of Representatives to allow local communities to participate in mangrove management and conservation. Also included in the bill are business activities and monitoring schemes in the area of jurisdiction. The previous law lacks implementing guidelines and monitoring mechanisms. People in the area felt that the Royal Forestry Department officers have not supported their efforts to regulate the commercial shrimp farms that were mostly owned by influential people. Hence, they mobilized and called for an efficient management system that resulted to such a proposed bill.

b. *Increase public awareness of coastal ecosystems protection and management.*

Enjoining and sustaining stakeholder support for marine and coastal governance entail strategic information, education and communication (IEC) campaigns to steer public perception, values, and practices towards the principles of environmental stewardship.

As more stakeholders are equipped with better understanding of the goals and processes of ICM, as more community members are regularly informed of the environmental issues and concerns in their communities, and as more expertise and skills are developed,

sustainability of the coastal management program is better assured.

The Phang Nga Bay in Thailand attracts many foreign and local visitors (Seenprachawong, 2002). Resorts and other establishments serving these guests line up the beach. Through communication campaigns in these resorts, guests and even the local people can become aware of issues regarding the marine resources which they are enjoying. And with their increased awareness regarding conservation measures, they can be asked to shell out funds to help in these activities and do their share in protecting the marine ecosystem.

Photo by BM Remoquillo



Communication can enhance coastal governance by changing the people's perception, values, and practices towards the principles of environmental stewardship.

c. Organize people for more active participation.

A study of the performance of nine MPAs showed that fisherfolk who are members of POs have more access to information, thus, they could better appreciate and accept the concept of protected areas than those who are not members (Javier, 2003).

In the Philippines, fisherfolk who are members of POs appreciate the concept of protected areas more than non-members.

Photo by SB Jamias



Being a member tends to foster a sense of stewardship among the community that results in a more sustainable use of the resources. This type of empowerment is essential to the success of any MPA. Cooperation from the community is essential, giving them a sense of duty that encourages easier collaboration with stakeholders. The PO chairpersons are often members of the PAMB.

d. Provide incentives for the local community as stewards or managers of their environment.

A strategy that has been proven effective in Vietnam is involving the community in the protection of the Can Gio Mangrove Forest (To Thi Thuy Hang and Nguyen Thi Ngoc An, 1999). The community members act as “stewards” or “managers” of the local mangrove resource. Households that live within the area sign a contract with the government led by the Department of Agriculture and Rural Development to manage specific forest areas. Under this scheme, households receive monthly salary (USD 5 to USD 7 a month for planted forest or USD 2.50-USD 4 a month for natural forests) depending on the number of hectares for planted forest. There is a government-household profit sharing ratio of 65:35 for a contract period of 30 years.

Though the government spends USD 80, 000 per year to support the scheme (to provide boats, financial assistance, loans for agro-fishery production, and technical assistance), it can still



Photo by BM Remoquillo

Making members of the local community as stewards of the environment serves as incentive as was done in the Can Gio Mangrove Forest in Vietnam.

be considered cost-effective. It has helped promote a sustainable mangrove resources management, which has translated into benefits estimated at USD 14 per hectare. This amount only covers the direct use values gathered from the resource. With this scheme, the mangrove forest is protected and sustained while serving as livelihood source to the residents.

This scheme was also considered for mangroves in the Koh Kong Province in Cambodia (Bann, 1997).

e. *Involve people in decisions regarding relocation.*

Relocation should be carefully and thoroughly studied (Bann, 1997). While relocation may be an option to improve the livelihoods and households located within the mangrove areas and to reduce pressures on mangrove resources, voluntary relocation can be elicited. This is done in close consultation with the local people.

Relocation should consider:

- Careful and early management of the area to avoid unsustainable exploitation practices;
- Suitability of the area for crop cultivation to assess its viability as a relocation site;
- Education of the people on forest management;
- Technical assistance and credit for buying seeds and equipment to cultivate crops in relocation sites;
- Technical assistance, e.g., construction of wells to solve water shortage problems; and
- Schools and hospitals in relocation sites.

f. Provide technical assistance

Local capability building and technical assistance are necessary for communities living in both mangrove areas and relocation sites in order to equip them with the necessary skills and knowledge in sustainably managing mangrove resources (Bann, 1997).

If they are to engage in aquaculture, especially shrimp rearing, they need to be trained to ensure sustainable production practices (Thuy Hang and Nguyen Thi Ngoc An, 1999).



CONCLUSION

Managing coastal resources is a tricky and challenging undertaking. The hidden costs so to speak can actually count the most if not handled well. Hence, potential constraints to the initiation of a coastal development program should be identified so that these can be considered in formulating the program strategies and work plan.

The success and long-term sustainability of coastal management programs, moreover, depend on clear national and local policies; effective institutional arrangements and strong local government commitment; allocation of adequate resources; and enhanced public awareness, local participation, and local capacity building.

A manager should, thus, be capable of balancing the conservation and development of coastal resources. She/he should be able to effectively coordinate and integrate a wide range of actions to facilitate a logical and synergistic strengthening of the coastal resources management program.



Photo by S. Velus



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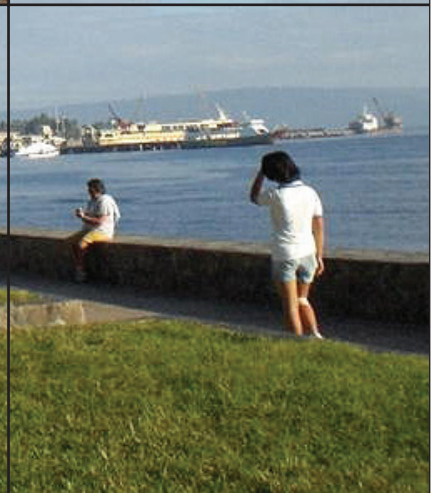
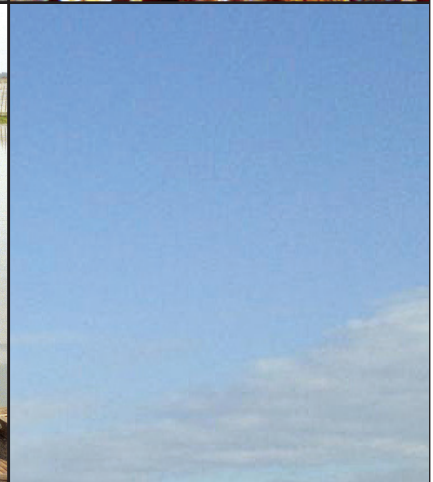


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