

Institutional Issues and Perspectives in the Management of Fisheries and Coastal Resources in Southeast Asia

Edited by
Magnus Torell
Albert M Salamanca

2001



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Foreword

The appropriate governance of the fisheries and coastal resources in Southeast Asia has always been a challenge to institutions and groups charged with responsibility for these resources and their productive exploitation. This involves principally national governments, but increasingly non-government organizations, people's organizations, bilateral/multilateral aid agencies, and regional organizations based in the region. The types and extent of resources to be managed are wide, the issues to be tackled are diverse, although often interdependent, and most of the governments in the region are simultaneously challenged by other priorities.

ICLARM-The World Fish Center, an international research organization based in the region, seeks to contribute to promoting sustainable management of fisheries and coastal resources in order to enhance the well-being of present and future generations of poor people in the developing world. One mechanism by which sustainable management can be achieved is through the development of institutional arrangements that address the underlying problems besetting the region's fisheries and coastal resources. The need is to develop rational distribution of authority for monitoring planned management and integrated action for the benefit of the resources and the people who depend upon them. In 1996-1998, ICLARM, with funding provided by the Swedish International Development Agency (Sida), implemented a study on the institutional, legal and policy perspectives of managing fisheries and coastal resources in Cambodia, Indonesia, Philippines and Thailand. This publication gathers together all the case studies undertaken in these countries into one volume and highlights the important institutional and policy challenges, demands and dilemmas in achieving sustainable management of fisheries and coastal resources. Interesting questions are raised and new recommendations are made.

We hope that this volume will help highlight the intricate roles of institutions in sustainable fisheries and coastal resources governance and provide contributions to the way forward. Furthermore, we wish that researchers, policymakers and donors would heed the demands for more studies on the important role institutions play in management.

Peter R Gardiner
Deputy Director General – Science Quality Assurance and Project Development
ICLARM – The World Fish Center

Preface and Acknowledgement

The aim of this volume is to highlight important challenges, demands and dilemmas in fisheries and coastal resources management in the countries through a case study involving four countries – Cambodia, Indonesia, Philippines and Thailand. The focus is on the fisheries sector, being a major resource sector in the coastal regions. In 1996-1998, ICLARM - The World Fish Center, in collaboration with the World Resources Institute (in the case of Indonesia and the Philippines) and national partners, conducted country studies on the institutional, legal and policy perspectives of managing fisheries and coastal resources in Cambodia, Indonesia, Philippines, and Thailand. A case study of Bangladesh was also conducted but is not included here as it belongs to another region.

A final workshop was held in Hat Yai, Southern Thailand in 1998 among all case study writers/authors to report on their progress and discuss key issues in their cases. Vietnam, through its Continental Shelf Committee, also participated in the workshop. The discussions were fruitful and informed a lot the final outcome of the case studies. In Cambodia after the case studies were completed, a workshop was held among major stakeholders comprising representatives from major government agencies, provincial governments, bilateral and multilateral donors and the NGO community. The participants decided to append the results of the workshop to the case study document in order to show the discussions, concurrence, and recommendations of the workshop participants.

The results of the case studies were originally published as working papers in order to disseminate them to a wide audience and to gather comments and feedback. These comments and feedback were incorporated in the revised versions that appear in this volume. In general, the format of the case studies is the same except for some minor differences in the approach. The case studies were then edited to make them appropriate for this volume. Except for the editing done when the case studies were first published as working papers, the editing done for the chapters in this volume was not returned to the authors for their comments due to time constraints. However, much effort was made to be as faithful as possible to the original text and nuance of the authors.

External reviewers were able to review some of the chapters, while this volume as a whole benefited from comments made by colleagues at ICLARM. That being said, the editors would like to emphasize that any editorial shortcomings that may have found their way into the final publication are entirely of the editors themselves and not someone else.

We would like to gratefully acknowledge those who read some chapters of this volume and who provided comments for their improvement. We would like to especially mention Ipat Luna, Peter Larmour, and Blake Ratner. We are indebted to Charles (Chip) Barber for assisting the case studies in Indonesia and the Philippines. Our sincere appreciation also goes to our colleagues at ICLARM for their comments and assistance during the finalization of this volume especially Kuperan Viswanathan, Mahfuz Ahmed, Bing Santos, Maximin Luna, Lorna Villafior, Rita Kapadia, and Sandra Child. The Coastal Resources Institute of the Prince of Songkhla University deserves praise for organizing the workshop in Hat Yai. Our thanks to David and Terry Clayton who provided editorial assistance. We would also like to express our gratitude to Peter R Gardiner, our Deputy Director General, for his many helpful and critical suggestions and comments which led to several drafts of the introductory chapter and to the overall structure of this publication. Finally, immense thanks is extended to the Swedish International Development Agency (Sida) for funding this publication, the case studies and several other projects at ICLARM. Sida has been ICLARM's partner in several undertakings. Above all, we thank the authors who laboured to provide the main substance of this volume.

*March 2000
Penang, Malaysia*

**Magnus Torell
Albert M. Salamanca**
Editors

Abbreviations

ACIAR	Australian Center for International Agricultural Research
ADB	Asian Development Bank
AFMA	Agriculture and Fisheries Modernization Act
AFSC	American Friends Service Committee
<i>Andon</i>	Permanent fishers
APEC	Asia-Pacific Economic Cooperation
APHEDA	Australian People for Health, Education and Development Abroad
ASEAN	Association of Southeast Asia Nations
BAS	Bureau of Agricultural Statistics
BBDP	Batangas Bay Demonstration Project
BD	<i>Bantay Dagat</i>
BFAR	Bureau of Fisheries and Aquatic Resources
BoI	Board of Investments
BoT	Bureau of Trade
CADC	Certificate of Ancestral Domain Claim
CBCRM	Community-Based Coastal Resource Management
CCU	Coastal Coordinating Unit
CDC	Council for the Development of Cambodia
CENRO	Community Environment and Natural Resources Office
CEP	Coastal Environmental Program
CFSA	Community Forest Stewardship Agreement
COBSEA	Coordinating Body on the Seas of East Asia
COP	Conference of Parties
COREMAP	Coral Reef and Environmental Management Project
CRFRD	Commission of Research and Fishery Resources Development
CRMP	Coastal Resources Management Program
DA	Department of Agriculture
DAC	Department of Agriculture and Commerce
Danida	Danish International Development Assistance
DAR	Department of Agrarian Reform
DECS	Department of Education, Culture and Sports
DENR	Department of Environment and Natural Resources
CENRO	Community Environment and Natural Resources Office
ERDB	Ecosystem Research and Development Bureau
DFA	Department of Foreign Affairs
DILG	Department of the Interior and Local Government
DILG-PNP	Department of the Interior and Local Government-Philippine National Police
DNCP	Department of Nature Conservation and Protection
DND-PCG	Department of National Defense-Philippine Coast Guard
DND-PN	Department of National Defense-Philippine Navy
DoF	Department of Fisheries
DoH	Department of Health
DoJ	Department of Justice
DoST-PCAMRD	Department of Science and Technology-Philippine Council for Aquatic and Marine Research and Development
DoT	Department of Tourism
DSR	Demand-side Resources

DSFCR	Demand-side Fisheries and Coastal Resources
ECA	Environmentally Critical Area
ECC	Environmental Clearance Certificate
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMB	Environmental Management Bureau
EMP	Environmental Management Plan
FAO	Fisheries Administrative Order
FAO	Food and Agriculture Organization
FARMC	Fisheries and Aquatic Resources Management Council
FKPPS	<i>Forum Koordinasi Pengelolaan Pemanfaatan Sumberdaya Ikan</i>
GDP	Gross Domestic Product
<i>Hak ulayat</i>	Traditional rights
<i>Hukum Adat</i>	Customary/Traditional Law
IATFCEP	Inter-Agency Task Force on Coastal Environment Protection
IDRC	International Development Research Center
IMO	International Maritime Organization
IPRA	Indigenous People's Rights Act
IUCN	World Conservation Union
KAISAKA	Kaisahan ng mga Samahan Para sa Kalikasan
LGC	Local Government Code
LGCAMP	Lingayen Gulf Coastal Area Management Plan
LMB	<i>Liga ng Mga Barangay</i>
MAFF	Ministry of Agriculture, Forestry and Fisheries
MARINA	Maritime Industry Authority of the Philippines
MARPOL	International Convention on the Prevention of Marine Pollution from Ships
MIME	Ministry of Industry, Mines and Energy
MoE	Ministry of Environment
MoT	Ministry of Tourism
MPWT	Ministry of Public Works and Transport
NACA	Network of Aquaculture Centers in Asia and the Pacific
NEAP	National Environmental Action Plan
NEDA	National Economic Development Authority
NEPC	National Environmental Protection Council
NFARMC	National Fisheries and Aquatic Resource Management Council
NIPAS	National Integrated Protected Areas System
NPCC	National Pollution Control Commission
NWRB	National Water Resources Board
NWRC	National Water Resources Council
PAB	Pollution Adjudication Board
PAFID	Philippine Federation for Intercultural Development
PAMB	Protected Area Management Board
PAWB	Protected Areas and Wildlife Bureau
PCAIFMC	Presidential Commission on Anti-Illegal Fishing and Marine Conservation
PCG	Philippines Coast Guard
PCSD	Palawan Council for Sustainable Development
<i>Pengelolaan Bersama</i>	Collective Management System
PENRO	Provincial Environment and Natural Resources Office
<i>Perusahaan Inti Rakyat</i>	Core Community Business Development
PMMR	Participatory Management of Mangrove Resources

PPA	Philippine Ports Authority
PRA	Participatory Rural Appraisal
PTA	Philippine Tourism Authority
RAMSAR	Convention on Wetlands of International Importance especially as Waterfowl Habitat
RSP	Regional Seas Programme
SAMMABI	<i>Samahan ng mga Mangingisda ng Binabalian</i>
SAMMAKA	<i>Samahan ng mga Mangingisda para sa Kalikasan ng Pilar</i>
SAPA	<i>Samahang Pangkalikasan ng Arnedo</i>
SEAPOL	South East Asian Programme in Ocean Law, Policy and Management
Sida	Swedish International Development Cooperation Agency
SNC	Supreme National Council
SSR	Supply-side Resources
SSFCR	Supply-side Fisheries and Coastal Resources
TAC	Total Allowable Catch
TMNP	Tarutao Marine National Park
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework for the Convention on Climate Change
WI	Wetlands International

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Navigating the Institutional Landscape: Introduction and Overview

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INTRODUCTION

Southeast Asia is one of the world's most productive areas in terms of fisheries and other coastal resources. These resources are important to the local, regional and national economies. Coastal areas are also the focus for tourism, harbour development, industrial and urban development. Unfortunately, the status of the fisheries and coastal resources in Southeast Asia is reported to be in various stages of degradation and overexploitation (APFIC 1996) and is generally characterized as overfished. In the near-shore areas, overfishing and habitat degradation is already approaching critical levels (Silvestre and Pauly 1997b).

More than 80 percent of the coral reefs in Southeast Asia are at risk. They are considered the most threatened in the world due, in whole or in part, to unbridled coastal development, destructive fishing practices, inland pollution and erosion, marine-based pollution and a burgeoning coastal population (Bryant et al. 1998). Approximately one half of the mangroves in the region have been lost to fish and shrimp ponds during the past 50 years. The Philippines and Thailand have the highest losses at 60-80 percent. Indonesia has lost about 50 percent of its mangroves while Malaysia has lost 30 percent. The seagrasses in the region, among the richest and most diverse in the Indo-West Pacific region, are in a similar condition (Sudara 1997).

Artisanal fisheries have been marginalized economically, socially and politically (Pauly 1997). This marginalization underlies the problems confronting fisheries and coastal resources in the region (Pomeroy and Williams 1994). Small-scale fisheries in Southeast Asia and elsewhere in the developing world are hampered by the lack of adequate infra-

structure such as post harvest facilities, roads, markets, information, and communications which are necessary for the fishing industry to thrive and to create value-added products. Physical remoteness compounds problems of data collection which is needed for more effective resource management (Silvestre and Pauly 1997a).

Poverty within the fishery sector is partly a cause and result of environmental and resource degradation. It is also associated with the lack of resources, such as land and capital. According to many studies, people in small coastal villages in the region are among the poorest (Pomeroy and Cruz-Trinidad 1996). Social and political marginalization prevents effective resource management and hampers the participation of stakeholders in the planning and management process (Pauly 1997). Where effective institutions do exist to channel stakeholder participation, enforcement of laws and regulations is sometimes lacking. Ideas, policies, and actions of influential interest groups and uncontrolled economic development have a profound impact on how the environment and its resources are used and on the relationships among the users of those resources. This makes resource management problems not only a technical problem but also a political, social and economic one (King 1998).

The authors of this volume highlight important demands and challenges in fisheries and coastal resources management through case studies in four countries – Cambodia, Indonesia, Philippines and Thailand. The main focus is on the fisheries sector, a major resource in the coastal zone. Since issues in this sector cannot be divorced from issues affecting the integrated management of coastal resources, both are addressed in the discussion. This chapter will summarize important and relevant themes

while subsequent chapters discuss the fisheries management situation vis-à-vis institutional arrangements in each of the countries. An emphasis is placed on issues that are not fully covered in the chapters in this volume.

THE ROLE AND IMPORTANCE OF INSTITUTIONS

The Fisheries Co-management Project of ICLARM and Institute of Fisheries Management and Coastal Community Development (IFM) defines institutions as “the rules of the game in a society; the humanly devised constraints that shape human interactions, and that are affected by social, cultural, economic and political factors” (ICLARM and IFM 1998). Institution and organization are words that are used interchangeably although the latter refers to “groups of individuals bound by common factors to achieve particular objectives” (ICLARM and IFM 1998). If institutions are conceived as the rules of the game in society, organizations are the players (Leach et al. 1999).

Institutions can be formal or informal. Formal institutions are framed in written legislation, administrative regulations, and court decisions (Ostrom 1990). Informal institutions exist as rules and norms by virtue of (oral) tradition, customs and indigenous belief systems which may not be sanctioned, recognized or supported by the state. The nature of enforcement helps further define formal or informal institutions. Formal institutions require exogenous enforcement by a third party organization such as the courts, while informal institutions are enforced endogenously through mutual agreements, or by relations of power and authority between among social actors involved (Leach et al. 1999).

Institutions are important in management because they define the rights and rules of resource use, determine access by groups of people, members of an organization or individuals in a community. Rights are actions that are authorized while rules refer to prescriptions that forbid, permit, or require acts performed in relation to a right (Ostrom 1990).

Analysis of the institutions underlying fisheries and coastal resources management in Southeast Asia

is important for several reasons. First, formal institutions play a significant role in the management of fisheries and coastal resources in the region to ensure the transfer (or conservation) of the present resource endowments for future generations (Garcia and Grainger 1997). Second, appropriately crafted formal institutions together with strong political support have been shown to enhance the management of common pool resources such as fisheries (Ostrom 1990). Third, interest in cooperation and interaction between governments, agencies and resource users as well as community involvement in resource management is increasing due to the benefits that accrue from sharing responsibilities and ownership (Pomeroy 1993, 1994; Pomeroy and Williams 1994). Formal institutions provide a structure for cooperation between resource users and government and for participation of local communities and various fisheries organizations as well as other private sector stakeholders in managing natural resources.

In developing countries, institutional weaknesses and constraints are pervasive in the fisheries and coastal resources management sector. Legal, policy and institutional frameworks are not crafted to suit the unique features of fisheries and other coastal resources and this has resulted in mismatches and overlaps. These features include:

- The biological renewability of fish stocks;
- The uncertainty of scientific data on the state of fish stocks; and
- The absence of secure and well-defined property rights governing access to fish stocks (Bailey and Jentoft 1990).

THE CASE STUDIES

Each of the case studies provides important insights into the challenges and demands of policy-making for effective fisheries and coastal resources management. While each is distinct, there are common themes that enable us to better understand the intricacies of fisheries and coastal resources management and options to improve the management of resources in these countries. This chapter will summarize important and relevant themes, or strands, of information discussed in succeeding chapters.

The Thailand case study, conducted by the Coastal Resources Institute (CORIN) of the Prince of Songkhla University, reviewed Thailand's legal, institutional and policy framework for managing their fisheries and coastal resources and proffered suggestions to address the problems identified. In the Indonesian case, Drs. Purwaka and Sunoto of the Center for Archipelago, Law and Development Studies selected three cases to explore institutional problems in coastal resource management. They noted that problems arise due to the poor implementation of existing laws and overlapping jurisdictions among government institutions and agencies tasked with implementing coastal and marine resources management.

The Philippine case study, written by Dr. Antonio G.M. La Viña, emphasizes conflict over control of resources, between modes of use, and among different stakeholders and interest groups. In the Cambodian case study, a working group was formed and headed by senior civil servants with representation from international organisations such as Wetlands International and IDRC. The authors returned to the villages to present the results and gather feedback. A workshop was also held for institutional players (i.e. government agencies, bilateral/multilateral development assistance organizations, NGOs and representative from local districts) to present the result of the case study and validate their findings.

COMMON TRENDS AND THEMES

Each of the case studies consists of the following components:

- Discussion of the status of the fisheries and their management issues;
- Discussion of the evolution of existing fisheries policies and laws;
- Case studies of at least three locations; and
- The role of international conventions and regional agreements in management of natural resources and the environment.

Although the layout of the information differs depending on the style and approach of the authors, common trends and themes are apparent. These are the factors that drive the nature of institutional arrangement for fisheries and coastal resources

management in Cambodia, Indonesia, Philippines and Thailand. The major points raised in the case studies are summarized in Figure 1.1 along with some of the major influences on institutional arrangements.

Design Problems

The authors raise important issues about the organizations and rules that make up the institutional framework for the management of fisheries and other coastal resources as well as their associated design problems. Design problems refer to the fit between the operational rules and the demands of the resources to be managed: either there are sufficient operational rules or there are not (Oakerson 1992). In the case studies, overlapping jurisdictions of departments, policies and laws; institutional confusion; and unclear mandates for management and the environment are important themes. These institutional problems are a legacy of past institutional arrangements where environmental concerns were ignored (Brookfield and Byron 1993). But the creation of environmental departments to address these environmental concerns did not necessarily lead to overcoming institutional confusion as more confusion and overlapping roles and responsibilities came about when mandates were unclear.

In reality, however, some functional overlap among government agencies tasked with managing certain resource sectors (e.g. tourism, mining, port, fishery etc.) is expected due to the overlapping nature of the resource sectors and their environments. When functional overlaps are properly understood and appropriate interventions are in place to manage overlapping functions, alternative approaches to management problems can be formulated and previously destructive competition can be eliminated.

Ecologically, resource sectors are not clearly bounded systems. They are interlocking and interdependent ecosystems and their existence is dependent on shared and synergistic ecological processes. Ideally, all institutions of government should be examined if the mechanisms for coastal resources management are to be effectively assessed. The example in the Philippines (Table 1.1) mirrors

the functional overlaps among government agencies in the case study countries which have, either directly or indirectly, a role to play in coastal resources management. La Viña (this volume) suggests a review of the formal institutions involved in managing these resources would be similar to reviewing the whole governmental machinery and bureaucracy.

Within the Philippine bureaucracy, there are two main agencies responsible for fisheries and coastal resources management - the Department of Environment and Natural Resources (DENR) and the Department of Agriculture (DA). Overall responsibility for coastal environmental protection and management lies within the DENR, while management, development and conservation of fishery resources is under the DA through its line agency, the Bureau of Fisheries and Aquatic Resources

Figure 1.1 Some of the Major Factors Affecting Institutional Arrangements.

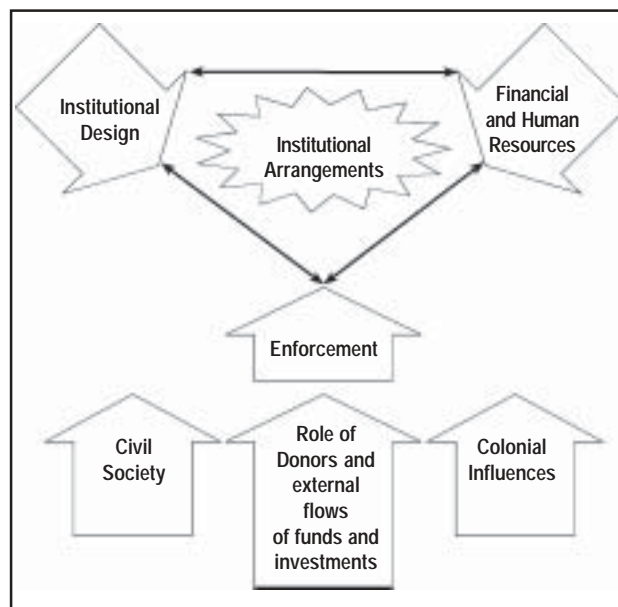


Table 1.1 Functional Overlaps among Agencies Involved in Coastal Resources Management in the Philippines (DENR et al. 1997)

CRM Concerns/ Activities	Agencies Involved
Policy formulation	LGU, FARMC, NGA, DENR
Resource assessments:	
Coastal	DA- BFAR, DENR, PCAMRD
Marine	DA- BFAR, DENR, PCAMRD
Statistics gathering and compilation:	
Fisheries	DA- BAS
Mangroves	DENR
Fishponds	DA- BFAR
Establishment of protected areas	LGU, DA- BFAR, DENR, Congress
Mangrove reforestation	LGU, DENR
Fishery licensing:	
Municipal waters	LGU
Offshore waters	DA- BFAR
Fishery law enforcement	LGU- PNP, PCG, DA- BFAR, deputies
Pollution law enforcement	LGU, PCG, DENR
Land use management	LGU, DENR
Tourism management	LGU, DoT
Reclamation	DENR (LMB and EMB), PEA
Pollution monitoring, including marine waters	LGU, DENR- EMB, PCG
Establishment of municipal/ fishing ports	PFDA, PPA, LGU
Research	DA- BFAR, DA- BAR, PCAMRD

Note: LGU= local government unit; FARMC= Fisheries and Aquatic Resources Management Councils; NGA= National Government Agency; DENR= Department of Environment and Natural Resources; DA BFAR= Department of Agriculture Bureau of Fisheries and Aquatic Resources; DA BAS= Department of Agriculture- Bureau of Agricultural Statistics; PNP= Philippine National Police; PCG= Philippine Coast Guard; PPA= Philippine Ports Authority; PFDA= Philippine Fisheries Development Authority; PCAMRD= Philippine Council for Aquatic and Marine Research and Development; LMB= Land Management Bureau; EMB= Environmental Management Bureau; BAR= Bureau of Agricultural Research; DoT= Department of Tourism.

(BFAR). National fisheries policy and fisheries administrative orders to limit entry into fishing and prohibit certain gear and fishing practices emanate from BFAR. In short, exploitation of fisheries are lodged within the DA while conservation and protection fall under the DENR. Sometimes this division blurs the roles and mandates of these two departments which results in overlaps and institutional confusion.

A review of the Asian Development Bank (ADB)-funded Fisheries Sector Program in 1996, a multi-million dollar project, described the institutional problems as “the lack of a unified, central focus for fisheries management and the institutional weaknesses of existing agencies to cope with the demands and complexities of fisheries management” (PRIMEX and ANZDEC 1996:49). This is due to:

- Fragmentation of functions and a diffusion of responsibilities among a number of departments working in the fisheries sector;
- Institutional weaknesses within BFAR as a result of its conversion from a national line agency into a staff bureau;
- Devolution of authority and responsibility for fisheries from DA-BFAR to the local government units; and
- Lack of skills and financial resources among local government units to carry their devolved functions (PRIMEX and ANZDEC 1996)

Currently, both DENR and DA-BFAR are strengthening their roles in fisheries and coastal resources management by establishing programs and other initiatives as well as making administrative changes in the way the fisheries and other coastal resources are managed. In the early 1990s, DENR established the Coastal Environment Program to broaden its role in coastal resources management. In 1998, DA-BFAR was reconstituted as a line bureau to address the growing role of fisheries and other aquatic resources in food security in an era of resource scarcity and globalized trade. Fisheries issues received increased attention under the New Fisheries Code enacted in 1998, the Agricultural and Fisheries Modernization Act in 1997, and the establishment of large projects funded by loans from multilateral development agencies such as the

Fishery Resources Management Program of DA-BFAR.

In Cambodia, unclear policies and guidelines at the ministerial levels, together with lack of resources (e.g. money and well-trained human resources), have led to difficulties for departments and local authorities at the provincial level to properly define their functions and responsibilities. These constrained the implementation of existing legal and institutional frameworks for natural resource management. The legal framework for coastal resources management and the way existing rules are enforced creates a situation that is inadequate to manage the country’s coastal resources. The Fiat Law on Fisheries Management and Administration (1987) gives a broad mandate for fisheries administration. It forms the basic legal framework for managing fisheries, other coastal resources, and the coastal environment. All wetlands and seasonally flooded areas, including forests, are considered fishing areas and are known as the “fisheries domain”. The Department of Fisheries (DoF) is mandated to manage all activities related to aquatic habitats, fish and other aquatic species, flooded forests, mangroves and swamps. But the Fiat Law together with insufficient institutional mechanisms and financial resources, for instance, is not providing a suitable framework to prevent overexploitation of the fisheries resources. Among other things, it has no provision to limit the size of harvestable marine fish or the protection of endangered species and there is no prohibition on the use of mechanized push gear which destroys the seabed ecosystem.

The relative newness of most laws has affected their implementation as they do not have the rules and regulations needed to guide their implementation, nor institutions and financial resources to actually enforce them. The political context of legal and institutional development in Cambodia is also affected by its history of political turmoil. Currently, the country is in a reconstruction phase and it will take some time before appropriate legal and institutional structures are re-established and fully operational. As Vicheth et al. (this volume) have indicated, institutional development is trying to keep pace with the demands of rapid economic development and this has led to situations where laws are drafted too quickly (mostly by foreign experts) and local commu-

nities and other user groups or the departments that are supposed to oversee their implementation have not been given adequate opportunities to participate.

In Indonesia, two levels of policy formulation is creating problems in project implementation. At the national level, the GBHN (Guidelines of State Policy) prepares Five-year Development Plans (REPELITA) that translate the principles outlined in the GBHN¹. The REPELITA provides for detailed sectoral development programs and projects which include, among others, coastal and fisheries resources management. REPELITAs can be formulated by either national or provincial governments. Problems occur when these two levels of government do not coordinate their activities. Effective project implementation is hampered when two operational plans have diverging priorities, aims and goals. Parallel to this situation is the relationship between the KANWIL (*kantor wilayah*) and DINAS. KANWILS are working units at the provincial or regional levels established by national government departments to implement their policies and programs. DINAS are implementing agencies established by provincial governments. They may work with KANWIL but the two have no formal structural ties. Each KANWIL is accountable to the national agency, but they are under the coordination of the Governors in the provinces. At the district level, there are also *kantor perwakilan* which work with national KANWIL but are under the coordination of the *bupati*, the head of the district government. The situation becomes problematic when KANWIL and DINAS do not coordinate their activities and pursue different and opposing goals.

Purwaka and Sunoto (this volume) suggest that another major institutional problem in the management of fisheries and coastal resources in Indonesia is the centralized nature of most government regulations. There are no regulations giving legal mandates to provincial and district governments to manage coastal and marine resources, except for small-scale fishing and mining. Thus, regional governments cannot enact measures to manage,

protect or conserve the resources within their jurisdictions.

Towards the last quarter of 1999, President Abdurahman Wahid created the Ministry of Marine Exploration and Fisheries to oversee the development and management of the marine environment and its resources, notably fisheries. Its main functions are: harmonization of marine research and exploration, coastal and sea use planning, coastal and marine conservation, protection and surveillance of coastal and marine environments, pollution control, coastal community empowerment, human resources, and institutional capacity building (Dahuri 1999). Whether this new agency will resolve the problems associated with overlapping jurisdictions remains to be seen. Another recent development in Indonesia is the devolution of power, particularly budget and administration, to its districts and provinces (Agence France Presse 2000). The aim is to bestow regional autonomy, but this may have serious ramifications for the use and management of natural resources.

In Thailand, the many plans and committees set up to address the issues affecting the management of natural resources such as fisheries and mangroves have also resulted in overlapping mandates and confusing lines of command. There are many plans at the various ministries, departments, provincial governments, districts, and sub-districts, but sometimes the contents are redundant if not conflicting (Nissapa et al., this volume). For example, in 1992, the Office of the National Environment Board-Ministry of Science Technology and Environment (Office of the National Environment Board-Ministry of Science Technology and Environment 1992:73) stated that:

Management of coastal resources in Thailand is not governed by a single, comprehensive law but by many laws governing the use of the various resources. They are generally purely sectoral by design and largely oriented toward resource exploitation for economic benefit. In

¹ GBHN stands for *Garis-garis Besar Haluan Negara* and is enacted by the People's General Assembly (MPR or *Majelis Permusyawaratan Rakyat*)

many cases, the laws are outdated and have become very complex due to piecemeal legislative amendments and complicated regulatory processes associated with their implementation.

The continued validity of this statement is underpinned by the study of Nissapa et al. (this volume). The nature, therefore, of the legal frameworks supporting the management of coastal resources defines the manner by which government ministries or departments relate to each other in pursuing their mandates. There are a number of ministries and departments involved in planning, managing or using the country's coastal resources. Among these are the National Economic and Social Development Board, the Office of Environmental Policy and Planning, the Ministry of Agriculture and Cooperatives, Ministry of Interior, Ministry of Science, Technology and Environment, Ministry of Mining, Ministry of Transport and Communication, and Ministry of Public Health (Pintukanokl and Boromthanasarat 1993). Furthermore, with the passage of the new Thai Constitution in 1997, each of the ministries is further challenged to seek cooperation from local resource users in planning and management of natural resources.

Enforcement

Poor enforcement of existing legislation has been shown to be a major problem, although it is also possible to have well-designed rules but poor enforcement. Wasserman (1994:15) defined enforcement as "the use of legal tools to assist in and compel compliance with environmental requirements, and in some contexts to establish liability or responsibility for harm to the public or environment from polluting activities".

Key policies and institutional arrangements have been enacted (Table 1.2) in the case study countries but enforcement is ineffective. The importance of environmental issues is often recognized and articulated as policy, but specific provisions are often incongruent, if not completely divergent, as shown in

the quest for vigorous economic growth without due regard to ecological and environmental sustainability. The environmental sustainability index² of these countries except for Cambodia is relatively low. Thailand has 45.2; Indonesia, 42.6; and Philippines, 35.7. No data is available for Cambodia (Global Leaders of Tomorrow Environment Task Force et al. 2001). All case study countries have adopted blueprints on how to attain ecologically and economically sustainable development. Each interprets Agenda 21, which the Rio Convention introduced in 1992, from national perspectives. They have developed national environmental action plans and biodiversity action plans to conserve biodiversity and use their resources sustainably. However, there are few signs indicating that the current state of the fisheries and coastal resources is improving.

Political will to carry out environmental legislation among prevailing development and social agendas determine whether fisheries and coastal resources are ecologically sustained and the problems are properly addressed. It is important that government departments coordinate plans and programs to maximize output and achieve objectives in the coastal zone where ecosystems are highly interdependent and uses are interlocking. While a weak state is likely to fail in the exercise of its main function of stewardship and management of these resources (Marriott 1997), a strong state with a poorly designed and outdated planning mechanisms can be in no better position.

Financial and Human Resources

Notwithstanding the good intentions of governments in the case study countries, lack of skills and financial resources also impose constraints on effective enforcement and management. Generally, enforcement is very costly and takes a quarter to over half of all public expenditures (Sutinen and Viswanathan 1999). All the case studies mention the shortage of skills in government departments tasked with fishery enforcement and management as a

² This is "a measure of the overall progress towards environmental sustainability developed for 122 countries... A high ESI rank indicates that a country has achieved a higher level of environmental sustainability than most of the countries; a low ESI rank signals that a country is facing substantial problems in achieving environmental sustainability along multiple dimensions" (Global Leaders of Tomorrow Environmental Task Force et al. 2001).

major issue. There are insufficient funds to hire skilled personnel and to finance routine enforcement operations in countries with such extensive coastlines.

Monitoring a long coastline requires a functioning monitoring, control and surveillance system (MCS). An MCS includes an infrastructure of high-speed vessels, fuel, radar and weapons. It can also require the periodic strengthening of legislation to eliminate loopholes. Implementing an MCS requires substantial investment and the establishment of necessary management systems to operate it. Once established, high operational and maintenance costs are expected. But MCS systems should not be established in all sector departments. Instead, resources should be concentrated in one well-equipped multipurpose monitoring entity and could be implemented jointly for fisheries, pollution control, customs and other agencies.

As a result of the many demands, bleak realities confront fisheries and coastal resource management. Coastal poverty remains widespread and population pressure is still growing (The World Bank 2000). Economic difficulties brought about by the financial crisis of 1997 affected countries throughout South-east Asia while civil and political instability continues to be a major concern for many countries. The desire to revitalize sluggish economies to create jobs and address widespread poverty dominates many political agendas. This has an impact on the ecological sustainability of fisheries and coastal number of people depend for their livelihoods.

Conflict

The problematic institutional arrangements governing fisheries and coastal resources in these countries has resulted in institutional confusion that weakens the government's ability to manage resources wisely and to respond adequately when need arises. It erodes the ability of institutional arrangements to adapt to changing circumstances and the complex nature of fisheries resources. One consequence of the general failure to enforce agreed institutional arrangements is the increasing number of conflicts. There have been violent clashes between users, and between users and other stakeholders, such as the case in Southern Thailand (Hutasingh

and Suksamran 1999; Mukem 1999). Tyler (1999:264) observed that "There is ample evidence from ... specific policies, government programs, and their implementation have generated or aggravated conflicts, even when the intention was to reduce the conflict".

Conflict occurs when users no longer cooperate or abide by established rules and conduct with respect to the use of a particular resource (Oakerson 1992). There are three kinds of conflict in the use and management of coastal resources: conflict between users within one sector, between users of different resources, and conflict between government agencies administering programs or projects related to the coast. Conflicts over natural resources can occur at many levels and have class and political dimensions (Buckles and Rusnak 1999).

In Southern Thailand, small-scale fishers attacked large-scale trawlers who were fishing in nearshore waters, where they are not allowed. On top of being trawling-free zones, these trawlers use fine mesh nets and electric lights that deplete local anchovy resources (Hutasingh and Suksamran 1999; Mukem 1999). In early 1998, *The Nation*, one of Thailand's two English language dailies, reported that six people died when Thai and Indonesian fishers clashed in the Java Strait because the Thai trawlers were fishing illegally using banned fishing gear (Harsono 1998). There has been an increase in the number of conflicts and dire predictions are made about "fish wars" unless efforts are made to stem the tide of resource depletion and scarcity (Dupont 1999). Authors of earlier studies and commentaries have already pointed out that social, civil and political anarchy will result from resource scarcity and environmental insecurity (Homer-Dixon 1991; Prins 1993; Homer-Dixon 1994; Kaplan 1994). At the level of nation-states, conflicts are likely to result from the convergence of several factors such as overlapping territorial jurisdictions, economic ambitions, competition, nationalism, militarization, superpower involvement, and environmental degradation (Valencia 1990).

In the Philippines, resource depletion and environmental degradation are largely the result of

Table 1.2 Indicative List of Major Legislation Relevant to Coastal Resources Management in the Case Study Countries.

Cambodia (Source: Vicheth et al., this volume)	Indonesia (Source: Purwaka and Sunoto, this volume Kusuma-Atmadja and Purwaka 1996)	Philippines (Source: DENR et al. 1997)	Thailand (Source: Tasneeyanond and Rubthong 1991)
Sub-decree No. 06 on River Navigation, 1986	Guidelines of State Policy (GBHN)	PD 705 - Revising Presidential Decree 389, otherwise known as the Forestry Reform Code of the Philippines	Agricultural Economics Act, 1979 (AEA)
Law on Fisheries Management and Administration, or Fisheries Law, 1987	Act No. 5 of 1967 on forestry Act No. 11 of 1967 on mining	PD 825 - Providing Penalty for Improper Disposal of Garbage and Other Forms of Uncleanliness and for Other Purposes.	Agricultural Land Management Act, 1974 (ALMA)
Law on Forestry Management, or Forestry Law, 1988	Act No. 1 of 1973 on continental shelf Act No. 5 of 1974 on the basic provisions of regional government	PD 856 - Sanitation Code of the Philippines	Agricultural Land Reform Act, 1975 (ALRA)
Sub-decree on Private Transport Services, 1991	Act No. 4 of 1982 on the Basic Provisions for the Management of the Living Environment	PD 979 - Marine Pollution Decree	Building Controls Act, 1979 (BCA)
Royal Decree on the Creation and Designation of Protected Areas, 1993	Act No. 5 of 1983 on Indonesia's EEZ Act No. 9 of 1985 on fisheries and government regulation	PD 984 - National Pollution Control Decree of 1976 PD 1067 - The Water Resources Code	EIA Law under NEQA Electricity Generating Authority of Thailand Act, 1968 (EGAT)
Law on Land Management, Urbanization and Construction, 1994	Act No. 17 of 1985 on ratification of the 1982 UNCLOS Act No. 5 of 1990 on conservation of natural resources and their ecosystems	PD 1152 - Philippine Environment Code PD 1586 - Philippine Environment Impact Assessment Act	Fisheries Act, 1947 (FISHA) Forest Act, 1941 (FOR A)
Law on Investment, 1994	Act No. 21 of 1992 on navigation Act No. 24 of 1992 on spatial planning Act No. 6 of 1996 on Indonesian waters	RA 5173 - creates the Philippines Coast Guard RA 6975 - An act establishing the Philippine National Police under a reorganized Department of Interior and Local Government, and for other purposes	Hotel Act, 1936 Industrial Estate Authority of Thailand Act, 1979 (IEATA) Industrial Works Act, 1969 (IWA) Land Code of Thailand, 1954 (LCT) Land Development Act, 1983 (LDA) Minerals Act, 1967 (MINERA) National Economic and Development Act, 1978 (NESDA)

(next page ...)

Note: PD= Presidential Decree; RA= Republic Act; EO= Executive Order.

Table 1.2 Indicative List of Major Legislation Relevant to Coastal Resources Management in the Case Study Countries (continued).

Cambodia (Source: Vicheth et al., this volume)	Indonesia (Source: Purwaka and Sunoto, this volume Kusuma-Atmadja and Purwaka 1996)	Philippines (Source: DENR et al. 1997)	Thailand (Source: Tasneeyanond and Rubthong 1991)
	Act No. 23 of 1997 on Environmental Management	RA 6969 - Toxic Substances and Hazardous and Nuclear Waste Control Act	National Environmental Quality Act, 1975 (NEQA)
	Government regulation No. 20 of 1990 on water pollution control	RA 7160 - Local Government Code of 1991	National Forest Reserves Act, 1964 (NFRA)
	Act No. 29 of 1986 on Analysis of Impact Upon the Environment	RA 7076 - An Act Creating A People's Small Scale Mining Program And For Other Purposes	National Parks Act, 1961 (NPA)
	Presidential Decree No. 32/1990	RA 7586 - National Integrated Protected Areas System Act	Navigation in Thai Waters Act, 1913 (NTWA)
		RA 7942 - The Philippine Mining Act	Petroleum Act, 1971 (PETROLA)
		RA 3931 - Pollution Control Law	Public Health Act, 1941 (PHA)
		RA 8435 - Agriculture and Fisheries Modernization Act of 1997 (AFMA)	Public Irrigation Act, 1942 (PIA)
		RA 8550 - The Philippine Fisheries Code of 1998	Real Estate Development Control (REDC) under Revolutionary Decree No. 286, 1972
		EO 114 - constitutes the Presidential Committee on Illegal Fishing and Marine Conservation	Tourism Authority of Thailand Act, 1979 (TATA)
		EO 117 - establishes the Inter-Agency Task Force for Coastal Environment Protection	Town and Country Planning Act, 1975 (TCPA)
		EO 240 (s1995) - Law creating the FARMCs	Water Quality Standards set by virtue of NE Wild Animals Protection and Reserves Act (WAPRA)
		EO 292 (s1987) - Administrative Code of 1987	Enhancement and Conservation of National Environment Quality Act 1992

Note: PD= Presidential Decree; RA= Republic Act; EO= Executive Order.

poor institutional arrangements to manage fisheries and coastal resources. Despite this, there have been a number of successful local management systems exemplified by the case of Apo Island Marine Sanctuary. This was established during a time when unsupportive national laws and legal frameworks that provide support for local initiatives in managing common pool resources were not present. The National Integrated Protected Area System (NIPAS) law and the Local Government Act were only introduced later. The same can be said of Indonesia where a confused institutional arrangement has led to a resurgence in local and traditional management systems, particularly the *sasi*. In certain coastal communities, the resilience of the *sasi* system holds the key to the successful management of coastal resources (Novacsek and Harkes 1998). But such resilience will be tested with the onslaught of globalization and other associated external pressures.

Colonial Influence

The strategic location of Southeast Asia makes it a crossroads for the exchange of goods, knowledge, religious, political and social trends. The quest for commercially valuable natural resources brought European nations to the region. Spaniards and Americans colonized the Philippines. The Portuguese set up a number of trading posts in Malakka, the Moluccas, East Timor and Macau. The Dutch were dominant in Indonesia while the French focused on Cambodia, Laos and Vietnam. The British established themselves in Malaysia, Singapore, Hong Kong and Burma.

The development of laws and structures for public administration reflected those of the colonial power. Bryant (1998:30-31) pointed out that “The colonial powers reorganised and expanded pre-colonial patterns of resource use so that by the end of colonial rule, commercial resource exploitation was central to economic life in the region”. This was manifested in several political and administrative changes. Chief among these were:

- The administration of states along functionally defined lines;
- The exercise of territorial political control, both external and internal; and
- The introduction of modern (western)

science and technology in terms of

- (i) Increased resource extraction, and
- (ii) Scientific resource management.

Thailand is a unique case in the region. Thailand was never formally colonized (Winichakul 1994:13), however the country underwent many changes as it modernized along western lines. Administrative structures were adapted in order to take part in trade and development and to withstand the threat of being colonized.

The creation of natural resource departments along functional lines, the development of public administration and the nature of resource politics as a whole had various implications for resource management during colonial times because they have enhanced efficiency in resource extraction. Efficiency was attained by the recruitment of professional staff with specialized knowledge. Specialization fostered parochialism and a lack of appreciation for the interdependence of issues affecting resource management. Soon the functional development of departments and the attitudes that developed among personnel resulted in conflicts between departments (Bryant 1998). Bryant (1998:34) noted that “such conflict was ubiquitous...and shaped not only the ways in which state policies were devised and implemented, but also the broader relationship between state and civil society”. This conflict came as a result of bureaucratic rivalry and “basic disjunction between the ways in which the colonial state organised its administrative services ... and the actual conditions of the resource base itself - that is, the ‘political/administrative world’ did not coincide with the ‘real resource world’ that it sought to administer”.

The colonial powers controlled the resources in which they were interested. Resources were catalogued, boundaries established and political control was exercised over them. Fixing the borders provided for greater control by the state and reinforced the power of ethnic majorities. Large-scale resource extraction and expedited commercial expansion was made possible by the use of modern science and technology, railways, steamboats and the telegraph. The same infrastructure aided resource extraction by ensuring that natural resources were transferred from production areas to consumers and by facilitat-

ing the movement of labour from one area to another. Aside from boosting production and extraction, the introduction of western science and technology also led to the repression and gradual demise of indigenous resource management systems (Bryant 1998) as these systems were believed to be primitive and unscientific.

Several authors (e.g. Blaikie and Brookfield 1987; Lynch and Talbott 1995; Bryant 1998) refer to these issues because of the pervasive influence of the colonial period on the development of laws and institutions related to natural resources management. The institutional changes that took place in colonial times form the backdrop by which laws and institutions developed. It is therefore important to understand history if one wishes to appreciate how these institutions evolved and how they will survive in the future. History is also a guide in understanding how current problems in fisheries and coastal resources management came about.

Role of Donors

Bilateral and multilateral assistance is an important component for the development of Cambodia, Indonesia, Philippines and Thailand (Table 1.3). Among these countries, Cambodia by far is the most aid-dependent. Bilateral and multilateral donors have important roles to play in fisheries and coastal resource management as well as in other sectors of development. Aside from providing financial assistance, guidance is also provided on how to implement programmes of national priority. Ideally, interventions by donor agencies should also help to strengthen capacity to undertake multiple resources planning and management as well as encouraging private and international investments.

In many countries, foreign assistance has resulted in the establishment of ad hoc legal and institutional structures, a lack of coordination in development and a mix of institutional cultures based on the systems and experiences of the donors and their consultants. This is particularly evident in Cambodia. Donors often have different systems and requirements for program implementation. This adds to the problems of developing a coherent structure. The laws might be well constructed but the national or local support for the law and its

provisions is absent. The institutions thus developed are alienated from traditions and the resulting patchwork of laws and institutions is not conducive to integrated management.

Another result of this patchwork development is that legal and institutional mandates do not match the scope of the projects to be implemented. For example, in Cambodia the law clearly states that all wet and flooded areas are considered fisheries domain and are under the authority of the Department of Fisheries (DoF). However, the Mekong River Commission's (MRC) Inventory and Management of Cambodian Wetlands Programme is coordinated by the Ministry of Environment, despite the fact that wetlands in general are supposed to be under the DoF according to the Fiat Law on Fishery of 1987. This indicates how existing modalities are neglected or unappreciated by donors. This adds to institutional confusion.

Role of Civil Society

The involvement of civil society, or actors outside the government structures in fisheries and coastal resources management in Southeast Asia is increasing. Non-government organizations (NGOs), in particular, together with the private sector are an important form of civil society representation especially in the development arena. Civil society encompasses "the gamut of organizations that political scientists traditionally label interest groups—not just advocacy NGOs but also labor unions, professional associations (such as those of doctors and lawyers), chambers of commerce, ethnic associations, and others. It also incorporates the many other associations that exist for purposes other than advancing specific social or political agendas, such as religious organizations, student groups, cultural organizations (from choral societies to bird-watching clubs), sports clubs, and informal community groups" (Carothers 2000).

Interest groups of various types serve in various ways as the initiators of certain institutional arrangements through their advocacies and interest-based pressure and can also be critics that exert pressure on the state to be responsible in the implementation of their policies. Or at times, they are implementors of state-supported activities, which led to the

Table 1.3 Aid Dependency (The World Bank 2000).

	Net official development assistance and official aid		Aid per capita		Aid dependency ratios							
					Aid as % of GNP		Aid as % of gross domestic investment		Aid as % of imports of goods and services		Aid as % of central government expenditures	
	\$ millions		\$									
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Cambodia	306	337	30	29	15.2	11.9	106.2	78.3	50.3	24.9	—	—
Indonesia	2,013	1,258	11	6	1.3	1.5	4.4	9.6	4.6	2.3	7.6	7.5
Philippines	1,486	607	22	8	2.7	0.9	11.4	4.5	6.6	1.4	14.8	—
Thailand	610	690	11	11	0.5	0.6	1.2	2.5	1.1	1.2	3.1	3.3

Note: **Net official development assistance** consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of DAC [development assistance committee], by multilateral institutions, and by certain Arab countries to promote economic development and welfare in recipient economies listed as developing by DAC. Loans with a grant element of at least 25 percent are included in ODA, as are technical cooperation and assistance. **Net official aid** refers to aid flows, net of repayments, from official donors to the transition economies of Eastern Europe and the former Soviet Union and to certain advanced developing countries and territories as determined by DAC. Official aid is provided under terms and conditions similar to those for ODA. **Aid per capita** includes both ODA and official aid. **Aid dependency ratios** are calculated using values in U. S. dollars converted to official exchange rates.

formulation or reformulation of institutional arrangements. In Southeast Asia, NGOs, the private sector, farmer associations, etc. supplement the activities of the state in resource management. In the fisheries sector, several resource management activities that foster community participation representing the agendas of grassroots organizations, cooperatives and other marginalized groups have been initiated by NGOs and other interest groups. Experiments in community-based coastal resources management initiatives in the region have been facilitated by NGOs, many of which have been successful. NGOs are prominently involved in development work in Thailand and the Philippines while they are increasingly playing important roles in Vietnam and Cambodia.

CONCLUDING REMARKS

History provides an interesting perspective on the development of institutions that manage fisheries and coastal resources as it shows how earlier choices and constraints have led to today's resource management problems. Long-term impact on the environment was not considered and there was little

awareness of the consequences. Only recently has environmental conservation and fisheries management taken centre-stage as a development concern especially after UNCED (see also Sorensen 1997). Despite the realization in the importance of conservation and good management, institutional problems are still encountered. Environmental concerns are a recent phenomenon in a public administration structure that is based on production and resource extraction. As the case studies illustrate, overlapping mandates, institutional confusion and conflict have become the dominant features in the administration of fisheries and other coastal resources.

But overlaps and conflicts in responsibilities, mandates and jurisdictions cannot be totally prevented as these are expected especially when government business is organized by function/purpose (e.g. enforcement, production, conservation, exploration, etc.), by territory (e.g. region, province, or municipality), by client (e.g. fishers, farmers, small business, youth etc.), or resource sector (e.g. fisheries, forestry etc.). The key is how coordinating mechanisms are crafted to reflect the on-going dynamics among various actors and the level of

political will extended so that these coordinating mechanisms can take place.

Authors of the case studies describe institutional arrangements for fisheries and coastal resources management as complex and affected by various factors, some of which are intractable and entrenched in the politics and economy of the country. There is no single solution to the institutional problems affecting fisheries and coastal resources management. Neither is there a solution that is broad based across the region. If there is a solution, it must take into consideration the capabilities of those who will be responsible for implementation and must provide for material benefits to the poor and marginalized.

REFERENCES

- Agence France Presse. 2000. Indonesia embarks on historic decentralisation plan. Agence France Presse. [Online]. Available: <http://www.icsea.or.id/sea-span/message.cfm?ID=374> [2000, 17 January].
- APFIC. 1996. Summary report of the APFIC Symposium on Environmental Aspects of Responsible Fisheries, Seoul, Republic of Korea RAP Publication 1996/42. Asia Pacific Fisheries Commission, Bangkok, Thailand.
- Bailey, C. and S. Jentoft. 1990. Hard choices in fisheries development. *Marine Policy* 14:333-344.
- Blaikie, P.M. and H.C. Brookfield. 1987. *Land degradation and society*. Methuen, London.
- Brookfield, H. and Y. Byron. 1993. *South-East Asia's environmental future: the search for sustainability*. United Nations University Press and Oxford University Press, Tokyo.
- Bryant, D.G., L. Burke, J. McManus and M. Spalding. 1998. *Reefs at risk: a map-based indicator of threats to the world's coral reefs*. World Resources Institute, Washington, D.C.
- Bryant, R.L. 1998. Resource politics in colonial South-East Asia, p. 29-50. *In* V. T. King (ed.) *Environmental Challenges in South-East Asia*. Curzon Press, Surrey.
- Buckles, D. and G. Rusnak. 1999. Conflict and collaboration in natural resource management, p. 1-9. *In* D. Buckles (ed.) *Cultivating Peace: Conflict and Collaboration in Natural Resource Management*. International Development Research Centre and World Bank Institute, Ottawa.
- Carothers, T. 2000. Think again: civil society. *Foreign Policy*. [Online]. Available: <http://www.foreignpolicy.com/articles/winter1999-2000/Thinkagain/carothers.html> [2000, 10 August].
- Dahuri, R. 1999. Experience with coastal and marine protected area planning and management in Indonesia. Paper presented at the Regional Workshop on Coastal and Marine Protected Area Planning and Management. ADB 5712-REG Coastal and Marine Environmental Management in the South China Sea, Phase 2. 6-8 March 2000, Sanya City, Hainan Province, People's Republic of China. Asian Development Bank.
- DENR, DILG, DA-BFAR and CRMP. 1997. *Legal and Jurisdictional Guidebook for Coastal Resource Management in the Philippines*. Coastal Resource Management Project, Manila.
- Dupont, A. 1999. There's a catch to world security. *The Bangkok Post*. [Online]. Available: [http://www.bkkpost.samart.co.th/news/BParchive/\[2000, 30 July\]](http://www.bkkpost.samart.co.th/news/BParchive/[2000,30July).
- Garcia, S.M. and R. Grainger. 1997. Fisheries management and sustainability: A new perspective of an old problem?, p. 631-654. *In* D. A. Hancock, D. C. Smith, A. Grant and J. Beumer. (eds.) *Developing and sustaining world fisheries resources: the state of science and management*. Second World Fisheries Congress proceedings. CSIRO Publishing, Collingwood, Victoria.
- Global Leaders of Tomorrow Environment Task Force, Yale Center for Environmental Law and Policy and Center for International Earth Science Information Network 2001. *2001 Environmental Sustainability Index*. [Online]. Available: [http://www.ciesin.columbia.edu/indicators/ESI \[2001, 12 February 2001\]](http://www.ciesin.columbia.edu/indicators/ESI[2001,12February2001).
- Harsono, A. 1998. Six dead in clash between fishermen. *The Nation*. [Online]. Available: <http://202.44.252.4/nationnews/1998/199804/19980408/24872.html> [2000, 16 April].
- Homer-Dixon, T. 1991. On the threshold: Environmental changes and causes of acute conflict. *International Security* 16:76-116.
- Homer-Dixon, T.F. 1994. Environmental scarcities and violent conflict: evidence from cases. *International Security* 19:5-40.
- Hutasingh, O. and N. Suksamran. 1999. Coastal residents blast anchovy boats. *The Bangkok Post*. [Online]. Available: [http://www.bkkpost.samart.co.th/news/BParchive/ \[1999, 14 June\]](http://www.bkkpost.samart.co.th/news/BParchive/[1999,14June).
- ICLARM and IFM. 1998. *Analysis of co-management arrangements in fisheries and related coastal resources: a research framework*. ICLARM, Manila.
- Kaplan, R.D. 1994. The Coming Anarchy. *The Atlantic Monthly* 273:44-76.
- King, V.T. 1998. Introduction: Human-environment interactions in South-East Asia, past and present, p.1-25. *In* V. T. King (ed.) *Environmental Challenges in Southeast Asia*. Curzon Press, Surrey.
- Kusuma-Atmadja, M. and T.H. Purwaka. 1996. Legal and institutional aspects of coastal zone management in Indonesia. *Marine Policy* 20(1): 63-86.

- Leach, M., R. Mearns and I. Scoones. 1999. Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development* 27:225-247.
- Lynch, O.J. and K. Talbott. 1995. *Balancing Acts: Community-Based Forest Management and National Law in Asia and the Pacific*. World Resources Institute, Washington, D.C.
- Marriott, S.P. 1997. Fisheries institutional reform in developing countries. *Marine Policy* 21:435-444.
- Mukem, E. 1999. Bid to end anchovy fishing row. *The Bangkok Post*. [Online]. Available: [http://www.bkkpost.samart.com.th/news/BParchive/\[2000, 16 April\]](http://www.bkkpost.samart.com.th/news/BParchive/[2000, 16 April]).
- Novacsek, I. and I. Harkes. 1998. *An Institutional Analysis of Sasi Laut in Maluku, Indonesia*. Working Paper No. 39. International Center for Living Aquatic Resources Management, Manila.
- Oakerson, R.J. 1992. Analyzing the commons: a framework, p. 41-59. *In* D. W. Bromley (ed.) *Making the Commons Work: Theory, Practice, and Policy*. International Center for Self-Governance, San Francisco.
- Office of the National Environment Board-Ministry of Science Technology and Environment. 1992. *The integrated management plan for Ban Don Bay and Phangnga Bay, Thailand*. ICLARM Technical Report 30.
- Ostrom, E. 1990. *Governing the commons: the evolution of institutions for collective action*. Cambridge University Press, Cambridge.
- Pauly, D. 1997. Small-scale fisheries in the tropics: Marginality, Marginalization, and some implications for fisheries management. *In* E. K. Pikitch, D. D. Huppert and M. P. Sissenwine (eds.) *Global Trends: Fisheries Management*, Vol. 20. American Fisheries Society, Bethesda, Maryland.
- Pintukanokl, A. and S. Boromthanasat. 1993. National Coastal Resources Management in Thailand, p. 677-690 *Proceedings of the World Coast Conference 1993*, Vol. 2.
- Pomeroy, R.S. 1993. A research framework for coastal fisheries co-management institutions. *NAGA, The ICLARM Quarterly* 1.
- Pomeroy, R.S. and M.J. Williams. 1994. *Fisheries co-management and small-scale fisheries: a policy brief*. Manila Philippines ICLARM 15.
- Pomeroy, R.S. and A. Cruz-Trinidad. 1996. Socioeconomic aspects of artisanal fisheries in Asia, p. 239-258. *In* S. S. de Silva (ed.) *Perspectives in Asian Fisheries: A Volume to Commemorate the 10th Anniversary of the Asian Fisheries Society*. Asian Fisheries Society, Makati City.
- Pomeroy, R.S. (ed.) 1994. *Community management and common property of coastal fisheries in Asia and the Pacific: concepts, methods and experiences*, pp. 1-189. ICLARM, Manila, Philippines.
- PRIMEX and ANZDEC. 1996. *Fisheries resource management project, Philippines (ADB TA No. 2236-PHI) Final Report*. PRIMEX and ANZDEC, Manila.
- Prins, G. 1993. *Threats without enemies: facing environmental insecurity*. Earthscan Publications, London.
- Silvestre, G. and D. Pauly. 1997a. Management of tropical coastal fisheries in Asia: an overview of key challenges and opportunities, p. 8-25. *In* G. Silvestre and D. Pauly (eds.) *Status and management of tropical coastal fisheries in Asia*. ICLARM Conference Proceedings 53. ICLARM, Manila.
- Silvestre, G. and D. Pauly, (eds.) 1997b. *Status and management of tropical coastal fisheries in Asia*. ICLARM Conference Proceedings 53, ICLARM, Manila.
- Sorensen, J. 1997. National and international efforts at integrated coastal management: Definitions, achievements, and lessons. *Coastal Management* 25:3-41.
- Sudara, S. 1997. *Marine fisheries and environment in the ASEAN region*. RAPA, Seoul, Republic of Korea.
- Sutinen, J.G. and K.K. Viswanathan. 1999. A socio-economic theory of regulatory compliance. *International Journal of Social Economics* 26:174-193.
- Tasneeyanond, P. and S. Rubthong. 1991. *Legal and institutional issues affecting the management of Thailand's coastal region: a case study of Phuket Province*. Thailand Coastal Resources Management Project, Office of the National Environment Board, The University of Rhode Island, Department of Technical and Economic Cooperation, United States Agency for International Development, Bangkok.
- The World Bank. 2000. *World development indicators 2000*. The World Bank, Washington, D.C.
- Tyler, S.R. 1999. Policy implications of natural resource conflict management, p. 263-280. *In* D. Buckles (ed.) *Cultivating Peace: Conflict and Collaboration in Natural Resource Management*. International Development Research Centre and World Bank Institute, Ottawa.
- Valencia, M.J. 1990. International conflict over marine resources in South-East Asia: trends in politization and militarization, p. 94-144. *In* M. J. Valencia and L. T. Ghee (eds.) *Conflict over Natural Resources in South-East Asia and the Pacific*. Oxford University Press, Singapore.
- Wasserman, C.E. 1994. The principles of environmental enforcement and beyond: building institutional capacity, p. 15-40. *In* J. Gerardo and C. Wasserman (eds.) *Third International Conference on Environmental Enforcement*, Vol. 1. Conference Proceedings. U.S. Environmental Protection Agency; Ministry of Housing, Spatial Planning and the Environment, The Netherlands; United Nations Environment Programme, IE/PAC; World Wildlife Fund, United States; Procuraduria Federal de Proteccion al Ambiente, SEDESOL, Mexico, Oaxaca, Mexico.
- Winichakul, T. 1994. *Siam mapped: a history of the geo-body of a nation*. University of Hawaii Press, Honolulu.

Institutional and Policy Issues in the Management of Fisheries and Coastal Resources in Cambodia

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ABSTRACT

This chapter raised several important issues on the legal, institutional and policy frameworks coastal resources and environmental management in the country. It shows that a top down approach is still the predominant mode of managing natural resources in the country. The paper also identified important constraints in policy, legal and institutional aspects of natural resource management. Available policies on natural resources management in Cambodia are too broad or too “demanding” in relation to available financial resources. There is also no specific coastal zone policy. The main constraints to the protection, conservation and management of coastal and environmental resources are the lack of implementation of policies and the unclear responsibilities among local authorities on how these policies are to be implemented.

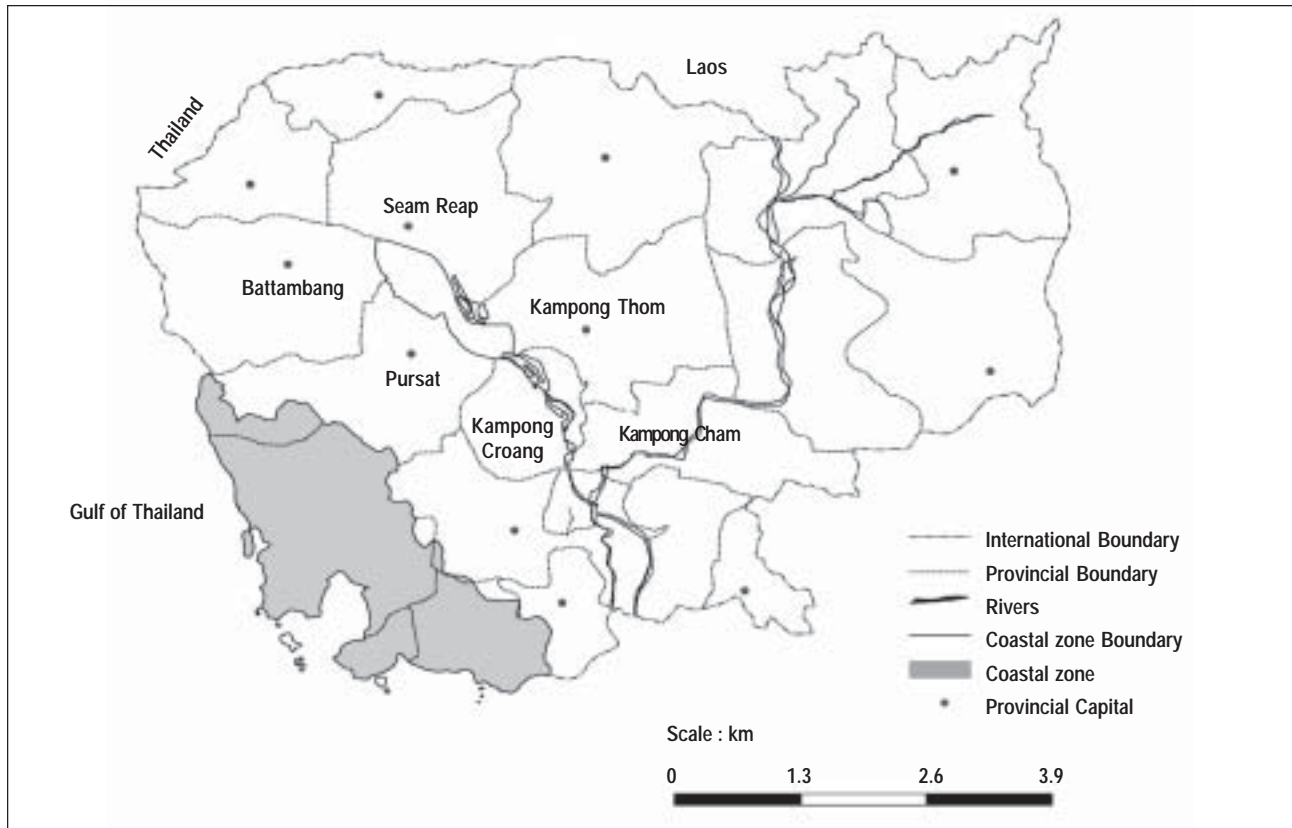
BACKGROUND

Geographical Characteristics

Cambodia covers 181 035 km² and shares its 2 428 km land border with Thailand on the north-west, Lao PDR on the northeast and Vietnam on the

east and south. On the southwest, the coastline extends for 435 km along the Gulf of Thailand (Figure 2.1). The coastal zone of Cambodia contains extensive forests and numerous bays and beaches with several offshore islands. The largest town on the coast is Sihanoukville, which has deep seaport facilities and is considered one of the economic

Figure 2.1 Administrative Map of Cambodia.



centers of Cambodia. Cambodia's coastal climate is tropical monsoon, which is typically hot and humid. The average annual temperature is around 27°C with a maximum of 35°C in April and a minimum of 19°C in December. The average annual precipitation varies from 2 000 to 4 000 mm. The rainy season is from around June to October and the dry season from around November to May.

The coastline is rocky and bordered by the rugged and largely uninhabited Cardamom-Elphant Mountains. The northern coast is protected by hard rock, but the southern coastline is eroded by strong waves during the southwest monsoon. The streams of many valleys are salty. Storms drive surges of saline water into coastal paddies increasing soil salinity in some areas. Mud irrigation is practiced where muddy floodwater can be directed onto the rice fields. The major coastline attributes are sandy shorelines, estuaries, lagoons and reefs. The coastline is characterized by waves, currents, river flows and tides depositing sediments such as sand, gold and clay. Cambodia's coastline is currently being subjected to various stresses including mangrove deforestation and sand mining. The coastal

areas lack freshwater, especially during the dry season. Accurate information regarding the ground water resource situation in these areas is lacking.

Economic Patterns

Civil disturbance greatly disrupted Cambodia's economy in the 1970s and slow growth persisted in the 1980s. Since 1989, however, the economy has seen rapid changes. Increased private sector participation is being encouraged, contributing to a marked growth in the gross domestic product (GDP). Average per capita income in 1996 was estimated at about US\$300 (Ministry of Finance 1996). The annual growth rate of GDP was about 5-7% in the mid-1990s. Cambodia made remarkable progress in its economic growth from 1.2% GDP in 1990 to 7.6% in 1995, due largely to the strong performance of the industrial sector (growing at an average of 11% a year), trade and transport (each growing at an average of 10% a year) and the service sector (growing at an average of 8% a year). Economic growth continued to be robust in early 1996 reaching 6.5%. The slight reduction in GDP growth for 1996 was due largely to severe flooding that occurred

in September and October. The flooding caused internal displacement, damaged infrastructure and reduced crop output. More than 70% of investments come from the private sector including about 37% as direct foreign investment.

Cambodia's Service Sector

The steady growth of Cambodia's service sector indicates the positive impact of the changes in the country's industrial base and increased public investment in key infrastructures. Output is increasingly driven by growth in the garment sector, small-scale enterprises and other forms of foreign investment rather than the production and export performance of traditional industries such as rubber and timber.

Services including restaurants, shops, hotels and trade related activities were the main contributors to economic growth, with the number of restaurants and hotels growing at an average of 25% a year.

The multiplier effect of increased public investment and the rehabilitation of transport and communications resulted in increased contributions to growth. Productivity problems in the agricultural sector reduced that sector's contribution to the economy. Thus, while Cambodia is still highly dependent on the performance of agriculture, the new industries and services are making an increasing contribution to the country's economic development. The positive effects of efficient public utilities and social infrastructure on service and industry emphasize the need to maintain public investment

in core areas.

Employment

In 1997, the active labor force was estimated at 4.5 million, 75% of which are employed in agriculture (farming, forestry and fishing), while 20.5% are employed in the service sector (wholesale and retail trade, hotels and restaurants, transportation, public administration and personnel services) and 4.5% are employed in the industrial sector. Employment generation is a government priority because of the need to provide jobs to about 250 000 low skilled persons of working age, consisting of the openly unemployed, disabled, refugees and the internally displaced. About 135 000 jobs have to be created each year to accommodate new entrants to the labor market, including those from the planned reductions of the armed services administration reform. The main features of the labor market are summarized in Table 2.1.

Population

In 1998, Cambodia's population was estimated at 11 million, with an annual growth rate of approximately 2.8%. Khmer constituted about 90% of the population while ethnic Chinese, Cham, Vietnamese and upland people make up the rest. About 80% of the population lived in rural areas. It is estimated that some 250 000 Cambodians have settled overseas since 1970, wherein around 175 000 are in the USA and around 40 000 are in France, while the rest are in Canada, Australia and other countries.

Table 2.1 Employment Characteristics (Ministry of Planning 1997).

Employment Queue	New Jobs Needed
Unemployed Invalids Refugees Internally displaced	3% labor force growth = 135 000 Rural areas = 100 000 Urban areas = 35 000 Retrenchment rate: 30 000 over three years Demobilization rate: 42 000 over three years
Constraints	Current Employment
Low skills High dependency ratio	75% in agriculture 60% Self-employed in Phnom Penh 40% Wage earners in Phnom Penh

About one-third of all household heads are women, who comprise 54% of the total adult population. The current average life expectancy is about 50 years, higher than previous estimates but low by international standards. Infant and child mortality rates remain high at 110 per 1 000 births. In 1990, the adult literacy rate was 48% for men and 22% for women. There remains a severe shortage of skilled labor and professionals such as engineers, masters and doctorate degree holders.

The average population density of Cambodia is 61 persons per km². Coastal areas are two to three times less populated than the average, and in Koh Kong Province, there are only nine persons per km². Figure 2.2 shows the population density in the coastal zone of Cambodia.

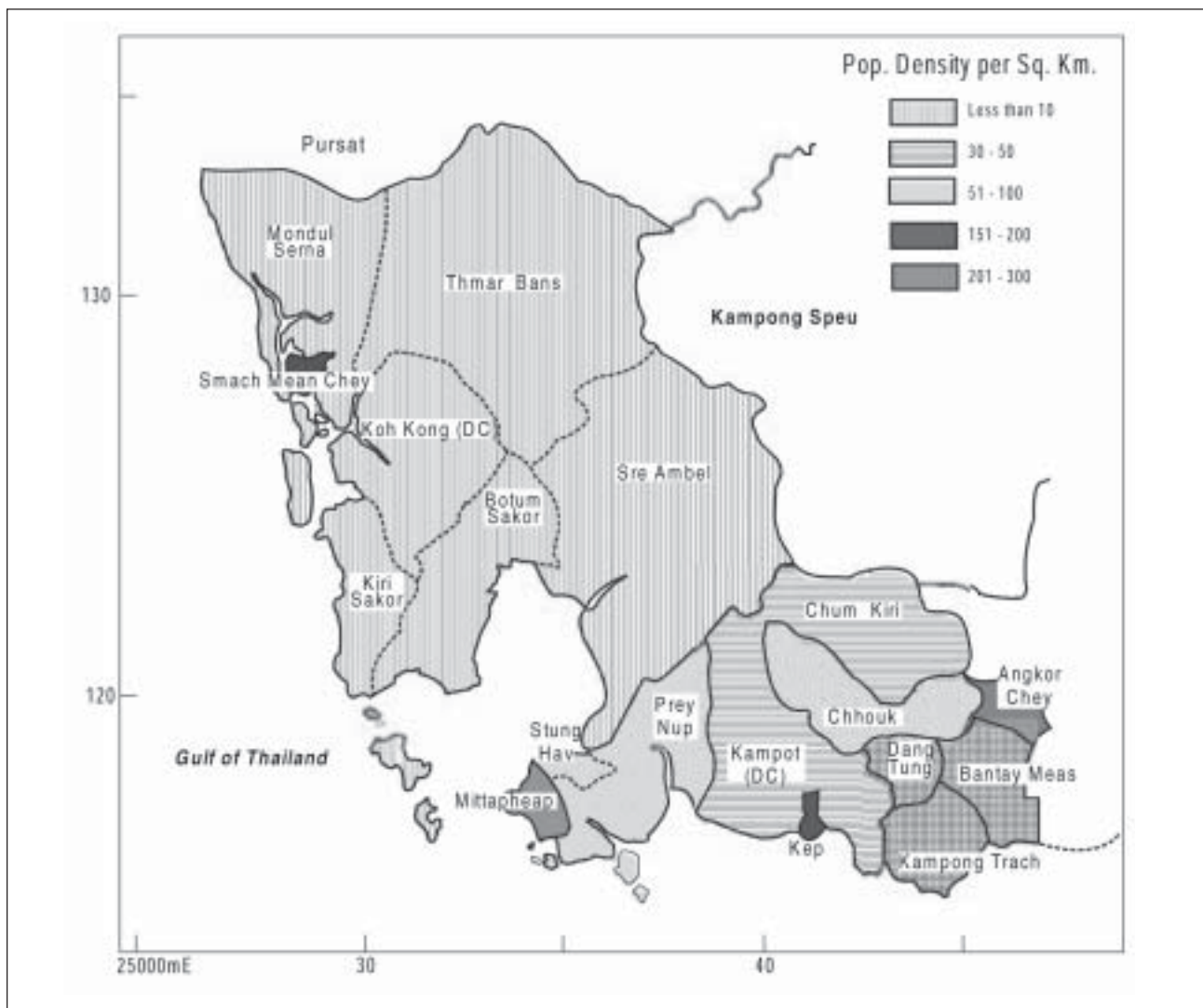
The official language is Khmer, spoken by roughly 90% of the population. Until the 1970s, French remained the second language until the arrival of English as a language widely taught in schools. The main religion is Buddhism.

RESOURCE STATUS, BENEFITS AND THREATS

Fishery Resources

Results of marine fisheries research in Cambodia's territorial seas from 1983-1986 conducted by Russian scientists show that there were 435 fish species from 97 families in offshore waters (from 20 m deep up to the outer border) with a total stock of 50 000 tons per year. The same source identified seven shrimp species, one squid species

Figure 2.2 Population Density in the Coastal Zone of Cambodia (1996-1997).



and two cuttlefish species. The latter stock was estimated at about 1 300 tons per year.

Previous studies on the species composition of inshore catches found 109 finfish species. Twenty percent of these were not identified in the research done in 1983-1986.

Research indicated that two major groups predominated, scad and mackerel, with more than 10% of the total fish stock. In the 1980s, Dr. Veravat Hongskul studied the spawning movements and seasons of migratory species in the Gulf of Thailand. He also studied the importance of these two groups of fish and indicated migratory patterns and spawning areas in the Gulf of Thailand. Knowledge on these patterns is known to local fishers in the region.

Mackerel and scad purse seining was introduced to Cambodia in around 1958. This was later followed by the introduction of trawls. Operation of purse seines at that time was mostly done inshore and vessels had an engine capacity of less than 50 hp. The total number of fishing vessels recorded before 1975 (purse seine, trawler, long line and nylon gill nets) was about a few hundred units. The rest of the fishing vessels were small non-motorized canoe using traditional fishing techniques such as fishing weirs, stack traps, beach seines and so on. Shrimp trawling was introduced after the 1970s.

Monofilament gill nets and large shrimp trawlers were heavily introduced from Thailand during the Khmer Rouge period (1975-1978) and large shrimp trawlers and mackerel purse seines were reported to have been used at the same time. Fishing was allowed only in Sihanoukville Bay and selected fisher groups settled in two areas—in Thmar Sar/Chamlang Kor, Koh Kong Province and in Tomnop Rolork of Sihanoukville. Fish catches were locally consumed and used for the production of fish sauce factories in Chamlang Kor (which is inoperative now) and Tomnup Rolork (which is still operated by private individuals), while shrimp catches were exported to Thailand. This was done through Thai middlemen in exchange for fuel, fishing nets, medicine (which was the main barter item), rice (occasionally) and others.

Catching shrimp in Koh Kong Province using

modern gear (big trawlers and monofilament gill nets) developed rapidly from 1981 due to the boom in the shrimp market. This subsequently led to a dramatic decrease in almost all purse seine fishing and the traditional fishing operations, such as those using fishing weir and stake trap. The target species for the Koh Kong fisheries are shrimp, crab, squid, tuna, Spanish mackerel and rock fish, which were in demand in the Thai market. Surpluses of scad, mackerel and other low-value fish were also exported to Thailand. In the last decade, depletion of the shrimp stock has led to a gradual change in the methods used for catching.

Shrimp trawlers have ceased operation, while shrimp gill-netters have increased. Shrimp production from gill nets, which has recorded a yield of higher than 6 000 tons per year in the 1990s, will decrease if this situation continues. Tables 2.2 and 2.3 show the current fishing and catch efforts within the area of Koh Kong Province. Table 2.4 shows an estimate of fish catch production. The estimated or recorded catches by shrimp gill net and crab gill net would probably be at least double if the amount not registered for tax purposes is considered.

The marine fishery production in Cambodia is officially estimated at 30 000 tons annually, which is about 30% of the total estimated fish production. The total estimated production (including freshwater fish) is around 110 000 tons annually. According to the National Environment Action Plan (Ministry of Environment 1998), the actual catch may be higher because the figures as shown in Table 2.4 do not include the harvests of foreign fishing fleets that land their catch out of Cambodia, illegal commercial boats and subsistence or family fishing. Some fishers do not register their catches to avoid tax.

Aquaculture

Cultivating shrimp is an important aquaculture activity in Koh Kong Province. Other cultured species such as oysters and green mussels are not as significant in terms of production and role in the economy. The main shrimp species is *Penaeus monodon*. Pond yields are reported to be up to 7-8 tons per ha for the new farms, and profit from these farms are attracting further investment. However, the shrimp industry in Koh Kong is experiencing

Table 2.2 Number of Fishing Effort of Koh Kong Province (Koh Kong Provincial Fishery Office 1997).

Fishing Gear	Targeted Resource	Capacity	Number	Fishing Ground
Purse seines	Mackerels, scad	-<50Hp	8	
	Anchovys, shrimp	->50Hp	15	Inshore
		-<50Hp	33	Inshore
		->50Hp	257	Inshore/offshore
Drift gill net	Spanish mackerel	-<5000m	28	Inshore/offshore
Set gill net	Mullet	-<5000m	141	Inshore/offshore
	Seabass		18	
	Mackerel		259	
	Crab		208	
	Shrimp		262	
Trap	Crab	-non motorized canoe	87	Inshore
	Squid	-<50Hp	80	
Stake trap	Fish	->50Hp	2	
Long liner	Shark/stingray	-<50Hp	42	Inshore/offshore/coral reef area
	Snapper/grouper		10	
Engine boat push net	Fish/shrimp	-<50Hp	34	Inshore
Portable push net		-non motorized canoe	20	Inshore
Beach seine	Fish/squid	-non motorized canoe	6	Inshore

Table 2.3 Catch-Effort (tons) (Koh Kong Provincial Fishery Office 1997).

Type of Gear	Yields
Mackerel purse seine	1 420
Anchovy purse seine	958
Shrimp trawl	1 340 + 5 897 trashfish
Shrimp gill net	1 797
Fish gill net	1 890
Crab gill net	390
Crab trap	210
Squid trap	498
Fish stake trap	210
Hook and line	295
Push net	680
Shellfish collector	123
Beach seine net	48

serious problems such as shrimp disease and pollution of culture areas. The shrimp culture generates effluents that are discharged into the adjacent areas and the sea. This creates damage to other ecosystems and subsequently disrupts economic activities.

Surveys of shrimp farming management conducted by the Network of Aquaculture Centers in Asia and the Pacific (NACA) in the early 1995 concluded that intensive shrimp farms had an average annual production of 7 545 kg per ha, valued at 42 million Riel. Although intensive shrimp farms generated a high profit, shrimp farmers faced significant environmental problems, particularly those farms located in acid sulphate soils and/or acidic sandy soils. An estimated 14.5 million Riel per year is lost due to disease. Total environment related losses are estimated at 28.6 million Riel yearly. The high financial losses require urgent measures to improve the environmental sustainability of shrimp farming in Cambodia. One concrete step that local governments and concerned ministries took involves the issuance of a moratorium on the licensing of additional shrimp farms.

Mangrove Forests

Based on Landsat data in 1992, the total mangrove area of Cambodia was 83 700 ha. Seventy-five percent of these mangroves can be found in Koh Kong, while 16% is in Sihanoukville. The remaining 9% (7 300 ha) is located in Kampot. Important mangrove forest areas are located in the large estuaries of Peam Krasob/Koh Sralao in Koh Kong Province. These are reported to be some of the most pristine mangrove forests left in the

region. There are other estuaries with mangrove flora such as Koh Por, Koh Yor, Dong Tong, Anduong Tuk and Sre Ambel, but they cover small areas.

Fishery laws promulgated in 1987 considered the exploitation of mangroves illegal for any purpose except by special license issued by the Department of Fisheries. Despite enforcement by both central and provincial fishery surveillance units, the clandestine harvesting of mangroves continued and even intensified, resulting in the serious degradation of this resource. Another cause of mangrove degradation is the establishment of intensive shrimp culture in mangrove areas.

Coral Reefs

Coral reefs are abundant around Koh Karang in Kampot Province. In fact, almost all islands have abundant coral reefs. The reefs in Cambodia are similar to those found along the coast in the nearby Thai provinces of Chantaburi and Trat.

DEVELOPMENT POTENTIAL AND OPTIONS

Cambodia is a developing country whose economy has been destroyed by two decades of civil war. Through steady rehabilitation and reconstruction efforts, Cambodia is transforming its economy to a free market system since the democratic election was held in May 1993. Since its earliest days, Cambodia has always relied on agriculture. Its importance in the economy is exemplified by the high regard the Khmer culture holds for the virtues of the farmer — initiative, hard work and self-sufficiency. However, agricultural production figures

Table 2.4 Fish Production (tons) (DoF 1997).

Year	Total Fish Production	Marine Production	Freshwater Production
1990	111 400	39 900	65 100
1991	117 800	36 400	74 700
1992	111 150	33 700	68 900
1993	108 900	33 100	67 900
1994	103 200	30 000	65 000
1995	112 510	30 500	72 500
1996	104 310	31 200	63 510
1997	103 850	28 000	75 850

indicate that this reverence for the farmer and his trade may be misplaced. Farmers have never been self-sufficient since they have always been dependent to a large extent on factors outside their control such as the weather, agricultural facilities, fertilizers and the prices they receive for their products. Agricultural infrastructure is not efficiently developed. The yield of paddy cultivation is as low as 1 ton per ha. Rubber production remains lower than 1 ton per ha.

Before the Khmer Rouge in the 1960s, industry in Cambodia was divided into two sectors. There was a flourishing private sector and a public sector experiencing problems due to high dependence on foreign aid and credit. In the construction material sector, the most important factory was the Chakrey Ting cement factory. The first stage was erected from 1960 to 1964 and produced 53 500 metric tons in 1965, 60 000 metric tons in 1966 and 155 000 metric tons in 1969. The cement was of good quality. A urea factory was planned to be erected near the petroleum refinery in Sihanoukville, but it was halted by the events of March 1970. A small fertilizer phosphate-milling factory was erected near one of two small phosphate deposits at Touk Meas, Kampot Province. The factory was inefficient due to poor management.

Another sector in the coastal zone having great potential was agricultural raw materials and agro-industries. The predominant feature in the 1960s was the small and medium scale rice mills. They produced rice of good quality and they were also able to use the by-products. Rice was exported from those mills. Many cottage industries produced food paste and fish sauce as well as traditional salted meat, vegetables and fish. In 1968, the Khmer Distillery Company erected a modern brewery at Sihanoukville with a capacity of 1 000 000 hectoliters of beer of excellent quality. Most of it was exported to Vietnam.

During 1970-1978, the economic structure in Cambodia was turned upside down due to the instability caused by the Khmer Rouge regime. As a result, the transportation system, industrial output, commerce, trade and other services were totally destroyed and the national economy went down to zero.

In late 1993, foreign firms began returning to the country. A number of businesses submitted their proposals to the Ministry of Industry, Mines and Energy (MIME) for consideration. Among those, a great number of textile and garment firms have been registered and issued with licenses. The government established a 900 ha Industrial Zone and a 260 ha Export Processing Zone in Sihanoukville (MIME 1994). Factories have been built in the coastal provinces such as phosphate fertilizer and cement factories in Kampot Province, a brewery and an oil refinery in Sihanoukville (Table 2.5).

In 1994, foreign trading companies registered with the Ministry of Commerce accounted for 1 200 establishments along with a great number of Foreign Direct Investments (FDI) in the industrial sector were registered with the MIME. At present, Cambodia has a large pool of cheap labor. There is great potential for increases in agricultural primary production as well as in the development of mineral deposits scattered all over Cambodia.

LOCAL USE AND MANAGEMENT

Access to Coastal Resources

Cambodia and other Southeast Asian countries are predominantly dependent on coastal resources. It is estimated that 30-50% of people in the coastal areas are involved in fishing. Other coastal residents are engaged in logging, trading, farming, charcoal production and harvesting non-timber forest products. Mangrove swamps serve as good habitats for fish and provide other economic benefits. Although the mangrove areas were designated as fishery domains, communities still continue to exploit the mangrove resources with little law enforcement to stop illegal activities.

Currently, management responsibility for coastal resources lies with the government as the primary decision-makers based on a top down approach. Another approach would be to have more community involvement in managing these resources in a more sustainable way. Most of the people have sold their recently cleared land to land speculators who paid a small amount to the local community members early in 1996 through an arrangement assisted by the

Table 2.5 List of Factories in Coastal Provinces (Planning Department, MIME 1997).

Number	Name	Products	Location	Status	Number of Employees
1	Food, breweries and cigarette				
a	Sun Wah Fisheries Co. Ltd	Frozen shrimps	Sihanoukville	Working	780
b	Angkor Beer Factory (Cambrew)	Beer and soft drink, Angkor and Pepsi Cola	Sihanoukville	Working	100
2	Textile, apparel and leather industries				
a	Rao Yuan Garment Corp.	Garments	Sihanoukville	Working	360
3	Manufacture of chemicals, petroleum, coal, rubber and plastic products				
a	Phosphate Fertilizer Factory	Phosphate fertilizer	Touk Meas, Kampot	Not Working	160
4	Manufacture of non-metallic mineral products, except petroleum and coal				
a	Naga Cement Factory	Cement	Chakrey Ting, Kampot	Working	319
b	Thai Bun Rong	Cement	Phnom Laang, Kampot	Under Construction	
c	Golden Dauphin	Cement	Touk Meas, Kampot	Under Construction	304

local administrative authority. An example is a land area of 700 ha which had been reportedly purchased by an outside investor from Sihanoukville for shrimp farming. However, no concrete development has been made and the local people are getting limited (or no) benefit from making canals and clearing the mangrove forests.

Forms of Local Use

Mangrove Charcoal Kiln

Coastal people have two sources of charcoal: trees from inland forests and mangroves. A 1994 estimate stated that in Koh Kong there were more than 300 charcoal kilns producing over 24 000 tons of charcoal of which about 94% was exported to Thailand. An estimated 100 000 tons of mangrove wood is needed to produce this amount of charcoal. The mangrove charcoal producers west of Bokor National Park, Sihanoukville complain that little mangroves can be cut because most of the mangrove forests (about 700 ha) is owned by a private investor who prohibits harvesting.

Fishing

Fishing operations along the coastline are generally confined to one trip per day as traditionally practiced among local fishers and to some extent due to types of fishing boats, equipment, landing ports and availability of markets. At present, most fishing vessels compete to exploit inshore rather than offshore resources. Most marine products (particularly from Koh Kong) are exported to Thailand due to the lack of local markets and transport facilities in Cambodia. Less than 20% of the total marine products are consumed locally. Fishers used to sell their catches to private middlemen, processors and retailers but the price they obtain is often low.

The income generated from fishing activities has gradually decreased during the last five years due to the following factors:

- Market constraints;
- Poor preservation technology;
- Resource depletion; and
- Security.

The increase of motorized push netters, a prohibited fishing gear, has contributed to the increased exploitation of fishery resources in the coastal areas. Detailed surveys need to be done to get reliable estimates on fish production and its value for the local communities and the nation as a whole.

Fish Processing

Fish processing also provides employment opportunities to the local communities and it is a source of employment for women. Subsequently, increased job opportunities will contribute to the upgrading of the living standards by providing extra income. Marine fish species are processed for human and animal consumption. Most processed products are consumed domestically while higher quality, higher valued products are exported mainly to other Southeast Asian markets. Principal species processed include finfish and shrimp (dried, iced and frozen), squid, octopus, crab and sea cucumber. Processing involves a range of basic preservation techniques. These techniques include sun drying, smoking and steaming. In addition, there is a significant volume of traditional processed fishery products (fermented fish, fish paste and fish sauce). Traditional processing absorbs a high volume of small fish.

Medicinal Plants

Coastal people have traditionally used mangroves and its associated fauna for medicine and other purposes. In Koh Kong, a mangrove species, *Excoecaria agallocha*, is used to treat diarrhea. A fungus called *Sam Bok Sramoch* (literally home of ant) is dried and used as a medicine for a certain lung disease. There are many more traditional uses of mangroves as have been mentioned by other authors.

Aquaculture

The techniques for shrimp farming along the coastal areas are intensive, involving high stocking densities, formulated feed, aeration and regular water exchange. This system can provide maximum annual production of up to 9-10 tons per ha. However, the aquaculture industry in Koh Kong province has increasingly started to experience the serious negative side effects of intensive shrimp

farming. These effects include economic losses due to shrimp diseases and pollution of culture areas caused by indiscriminate discharge of pond effluent. Resource use conflicts, particularly with farms located in or near mangrove areas, have also become a concern in the province.

In Kampot, 1 438.8 ha is being proposed for aquaculture development along the coastline. However, only 197 ha of aquaculture area are legal. Some shrimp farms and mangrove areas have also been converted to saltpans. Along the whole Kampot coastline, 1 079 ha has been selected and designated as fishery reserves. Certain mangrove areas are also preserved to protect the forests and the aquatic resources. The economic interest in salt is a threat, and there is a danger that saltpan development will encroach into these reserves.

Coastal Tourism

Eco-tourism is seen as a way of addressing resource conservation and economic development. In Cambodia, there are four major coastal areas which attract both local and foreign tourists—Sihanoukville and Kep beaches and two national parks, Kirirom and Bokor.

The offshore islands are presently being developed as natural resorts. These include Koh Rong, Koh Thash and Koh Rongsanlem whose coral reefs and seagrass beds are in very good condition. It is anticipated that the local communities will get the opportunity to benefit from these tourism developments by being provided with a market to sell their agricultural products and handicrafts as well as by being able to develop boat and car rental services. However, at this stage, local communities should be made aware of the importance of conserving and protecting coastal resources in order to attain local and national economic growth.

Value of Marine and Coastal Resources

No comprehensive estimates have been made on the real and potential values of Cambodia's marine and coastal resources. Present figures underestimate the levels of exploitation, the value of fish caught and the potential for tourism. This in turn leads to an undervaluation of these resources and their

potential when compared to what seems to be more profitable industrial development.

Local Management Experiences

Initiative on Coastal Resources Management

Fishery associations do not as yet exist among Cambodia's coastal communities. However, informal interaction among fishers or groups of fishers takes place in connection with the actual task of fishing or related activities on shore. Among more well off fishers, there has been an increasing use of improved communication to support each other when they are fishing. During accidents, it is reported that good cooperation exists among fishers.

In 1997, the Department of Nature Conservation and Protection (DNCP) hosted a workshop funded by the World Conservation Union (IUCN) to review the draft Management Plan of Ream National Park. Fishers, forest resource users and the commune leaders were invited to participate in the workshop. Activities such as this can encourage them to organize themselves into associations, cooperatives, or other interest groups so that they can better manage and protect their coastal resources.

Current Mangrove Management

Following the 1993 general election held under the auspices of the United Nations Transitional Authority of Cambodia (UNTAC), the country's economy opened up. As a result, there is additional pressure on the coastal resources. The capacity to manage and control the development has not kept pace with increased exploitation.

In Koh Kong Province, charcoal production was uncontrolled. The government intervened and dismantled the charcoal kilns in the mangrove areas. In 1996, the MoE's DNCP took action and destroyed the charcoal kilns built in the Ream National Park. Effective prohibition of charcoal production would reduce the threat to continued destruction of mangroves. However, the reality is that the destruction will continue as many smaller kilns are still operating inside the mangrove areas.

Impact of Current Fishing Practices

The fish catch will continue to drop as more people are engaged in fishing. The growing number of people engaged in fishing together with the use of improved fishing technology will increase pressure on existing resources. If fishing is allowed to increase, coastal areas will experience reduction of available fish stocks in the future. The present types of trawling practiced in shallow waters are reducing the resources available for small-scale fisheries. These trawling practices are continuing illegally, although according to the Fisheries Law, trawling in waters of less than 20 m depth is prohibited.

Prior to the 1970s, the mangrove areas provided good habitats for fish and other aquatic animals. There were plenty of resources and the coastal people did not have to invest large sums for fishing gear. Exploitation of mangroves for firewood and charcoal increased after 1979 and intensified in the 1990s.

Development of Salt pans

In Kampot Province, saltpan expansion since 1998 has caused the destruction of mangroves, loss of biodiversity, and reduced subsistence benefits for local communities. Saltpan expansion also reduces the natural value of coastal areas, which affects tourism as well.

The fishery resources are the main source of long-term income and livelihood for the people, especially with regards to the subsistence of poor families. The destruction of mangroves in these areas will affect the people directly with regard to fish availability and the domestic use of firewood. Apart from what has been mentioned in relation to the resources within the mangroves, the destruction of mangroves will also cause erosion and sedimentation in coastal areas and will reduce the natural ability of the ecosystem to protect itself against strong winds.

Religion and Traditional Belief

Ethnicity and Religion

Buddhism is the state religion of Cambodia.

About 90% of Cambodians are Buddhists. The remaining population is either Muslim or Christian. The majority of people in Cambodia's coastal provinces, Koh Kong and Kampong Som, are:

Khmer	90.0% in Koh Kong and 89.8% in Kampong Som;
Cham	5.6% in Koh Kong and 6.1% in Kampong Som;
Vietnamese	1.8% in Koh Kong and 1.8% in Kampong Som;
Chinese	0.2% in Koh Kong and 2.2% in Kampong Som;
Thai	2.3% in Koh Kong and no data for Kampong Som; and
Soach	(no data for Koh Kong and 0.08% in Kampong Som).

It is estimated that the number of Vietnamese should be higher in Kampot as it is the coastal province closest to Vietnam (Ministry of Environment et al. 1996). Cham and Soach are Muslims.

Muslim coastal communities are often fishing communities. The Working Group found that in the coastal villages composed of different ethnic and religious groups, such as Tropaing Ropov (Kampot Province) and Tomnop Rolork (Sihanoukville Province), the Muslims and Vietnamese are almost 100% dependent on capture fisheries. Thais and Malaysians are active in cage aquaculture and the Chinese (Chinese-Khmer) are fish collectors and/or middlemen. The ethnic Khmer are mainly involved in crop cultivation. An emerging concern is that if fish production drops, fishing dependent groups like the Soach will have to turn to something else such as logging.

Traditional Belief

There is a continuing belief by coastal villagers in the "ocean spirit". Many aspects of this tradition are concerned with good or bad luck. Fishers do not want to catch dolphins accidentally or intentionally as they believe this will bring them bad luck. If they happen to catch one, they release the dolphin back into the sea with the hope their good luck will return. It is common to invite Buddhist monks to perform ceremonies to expel bad luck. Fishers in coastal areas respect the Grand Lady known as "*Yeay*

Mao". It is believed that her hands hold the entire Gulf of Thailand and the destiny of those fishing there is in her control. Usually prayers to *Yeay Mao* are offered when fishers are threatened at sea.

Local Initiatives to Combat the Degradation of Mangroves and Other Coastal Resources

The coastal areas have not been defined or delimited in any government regulation. The wetlands and watershed areas of the coastal provinces should be set aside when boundaries or reserves are established.

A major form of degradation of coastal resources has been the clearcutting of mangroves. Although the Fisheries Law states that the mangroves should be managed based on their being a fishery domain, people are encouraged to clear mangroves to make way for shrimp farms and salt pans because it is more profitable than other ventures. In 1995, the area for shrimp farms in Koh Kong Province increased to 1 000 ha. Out of this total, about 280 ha were actually in operation while 150 ha were under construction and the remaining plots were waiting to be sold or put up as joint ventures with Thai shrimp farmers (Ministry of Environment et al. 1996).

Since 1996, one villager from Lork Village, Kampong Trach of Kampot Province has replanted a half-hectare mangrove. So far, no one from the commune has continued this initiative as they find it difficult to protect the plantation. However, there are positive signs. The local community has collaborated with the Australian People for Health, Education and Development Abroad (APHEDA) to prepare plans to replant mangroves in a 30 ha area. The provincial fishery and agricultural office have expressed willingness to participate in this effort (Kampot Fisheries Office 1998). Should the plan proceed, it would be a step towards improved interaction between villagers and government institutions in resource management.

To reduce the threats to mangroves, a series of five workshops was conducted by APHEDA for 130 participants from 26 villages in Kampot Province. They were shown guidelines on the conservation

and sustainable use of mangrove resources. The laws on fisheries domain and the establishment of protected areas provide a legal mandate to conserve and manage this coastal resource.

To address the issue of unregulated increases in the number of shrimp farms, the Fisheries Department has established the following conditions:

- Clearing of mangrove forests for shrimp farming is prohibited;
- Wastes from shrimp ponds must be treated before being discharged into the sea; and
- Shrimp ponds must be constructed at least 150 m above the shoreline.

However, these conditions are to a large extent not observed even though shrimp farmers are aware of the negative impact of their operation on the environment.

INSTITUTIONAL ARRANGEMENTS

There are several main government institutions whose activities are related to the use and management of the natural resources and the environment in the coastal zone. In addition, there are some committees and non-government organizations (NGOs) that are also key players in managing this area.

Figure 2.3 Organizational Structure of the Fisheries Department.

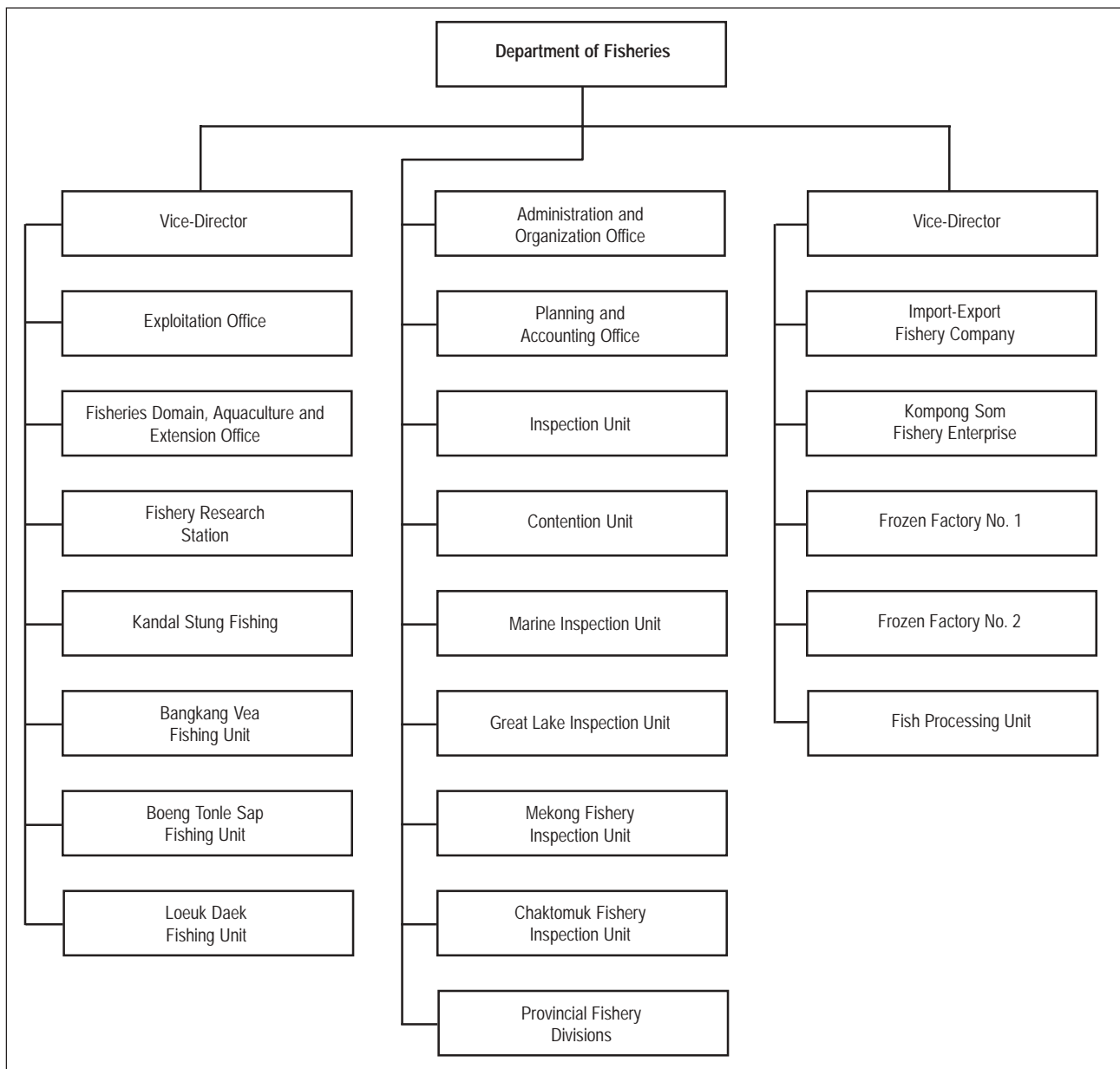
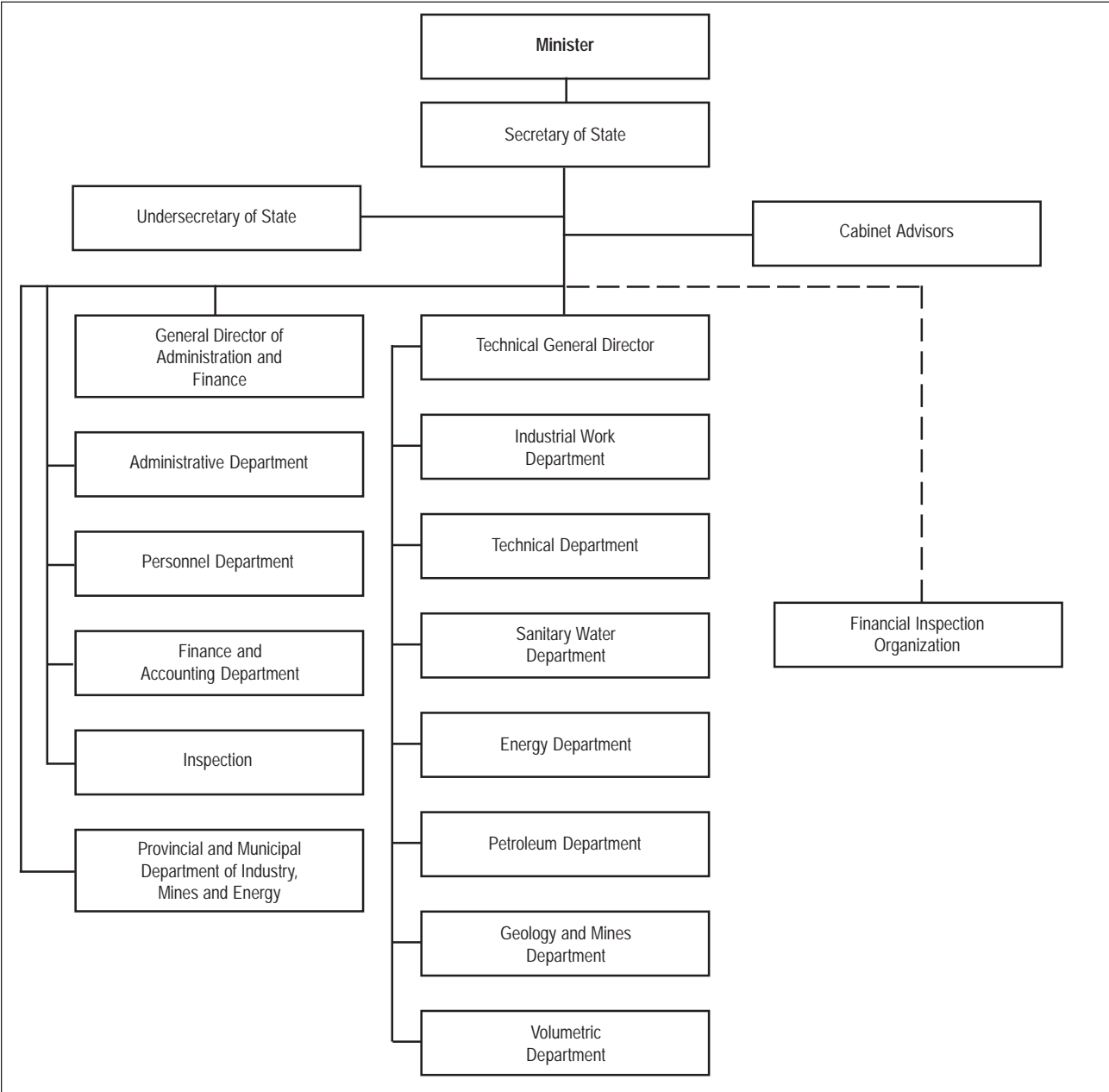


Figure 2.4 Organizational Structure of the Ministry of Industry, Mines and Energy.



Line Ministries

Ministry of Agriculture, Forestry and Fisheries

The Ministry of Agriculture, Forestry and Fisheries (MAFF) has major responsibilities in managing and controlling natural resource use in the coastal zone. It has management responsibility for environmental protection in general. The Ministry has an organized and developed administrative system at the national, provincial, district and even at the commune levels. The Department of

Fisheries (Figure 2.3) is mandated to manage activities related to water, fisheries, flooded forests, mangroves, swamps and industrial fisheries and is responsible for the management and use of Cambodia’s inland forest resources and the protection of wildlife.

Ministry of Industry, Mines and Energy

The Royal Government of Cambodia established the MIME in accordance with the Constitution. The MIME acts as one of the principal catalysts to create a conducive atmosphere for the industrial and

economic development of the Kingdom, while safeguarding the welfare of the people and the environment. This Ministry has organized and developed administrative systems at the national, provincial and district levels. The MIME has three departments—Technical, Mines, and Energy (Figure 2.4). Moreover, it has the obligation to manage and develop all projects within its mandate in an environmentally sustainable manner. The major responsibilities of the MIME related to coastal development and coastal zone management are as follows:

- To promote the economy and generate employment opportunities through the development of industrial activities, especially in the Sihanoukville region;
- To promote mining activities, hydropower development and oil and gas exploration in the coastal and marine zone of Cambodia; and
- To develop legislation, policy and plans that shall encourage the growth of these industries.

Ministry of Tourism

The MoT was established by a Royal Decree (1996) as an administrative organization (Figure 2.5) placed under the authority of the Royal Government of Cambodia assigned to direct and encourage the tourism industry.

Its main responsibilities related to the coastal zone of Cambodia are as follows:

- To work with other ministries to preserve the coastal zone;
- To develop accessible infrastructure in the coastal zone;
- To promote various coastal zone attractions of the Kingdom;
- To develop a master plan to manage the coastal zone for tourism; and
- To develop tourism legislation, policy and plans related to the coastal zone tourism sector.

Ministry of Public Works and Transport

The MPWT is responsible for the development and implementation of policies and legislation for

the transportation sector throughout the country. The MPWT (Figure 2.6) is also responsible for all transport infrastructures in the country including roads, railways, airports, ports and waterways as well as public buildings.

Ministry of Rural Development

This newly created ministry is considering models to assist in the development of the rural poor as well as appropriate administrative structures for the implementation of rural development (Figure 2.7). This Ministry should be consulted in the development of community-based projects.

Ministry of Environment

The MoE was established in 1993, soon after the UN-sponsored election. It deals with problems related to the management, conservation and protection of the environment throughout the country. The planning and management of the protected area system in the coastal zone falls under its jurisdiction. The management structure of the Ministry is divided into central and local administrations (Figure 2.8).

According to Article 3 of the Sub-decree on the Organization and Functioning of the MoE, it has the following main responsibilities:

- To develop an environmental policy based on sustainable development and to implement the National and Regional Environmental Action Plans in cooperation with other ministries;
- To prepare and implement legal instruments to ensure sustainable development;
- To institute the Environmental Impact Assessment (EIA) of all proposed and on-going projects and activities, both public and private;
- To advise relevant ministries on the conservation, development and management of natural resources as prescribed in Article 59 of the Constitution;
- To administer the National Protected Areas System following the Royal Decree on the Creation and Designation of Protected Areas and to propose new areas for the system;
- To prepare inventories on the source, nature

and amount of pollutants and to take measures to prevent, reduce and control environmental pollution;

- To prepare inspection procedures as mentioned in Article 9 of the Law on Environmental Protection and Natural Resources Management;
- To prepare and conduct education programs at all levels, including local communities, in cooperation with relevant ministries and national and international organizations;
- To compile, analyze and manage environmental data;
- To initiate and prepare proposals to the government that fulfill international agreements, conventions and memoranda of understanding related to environmental protection and to implement such international agreements;
- To promote incentives for investment projects which facilitate environmental protection and nature conservation; and

- To cooperate with national organizations, NGOs, foreign governments and local communities in order to ensure the environment is protected in the Kingdom.

Provincial Authorities

The provincial authorities are under the direct control of the Ministry of Interior. The provincial authorities are the main government authorities that oversee local government administration, promote economic development and strengthen law enforcement through coordination. The provincial authorities are divided into districts, which are then divided into communes and villages (Figure 2.9).

Apart from the roles and duties stated above, provincial governors have other administrative powers such as:

- To ensure public order, security and safety in the province;

Figure 2.5 Organizational Structure of the Ministry of Tourism.

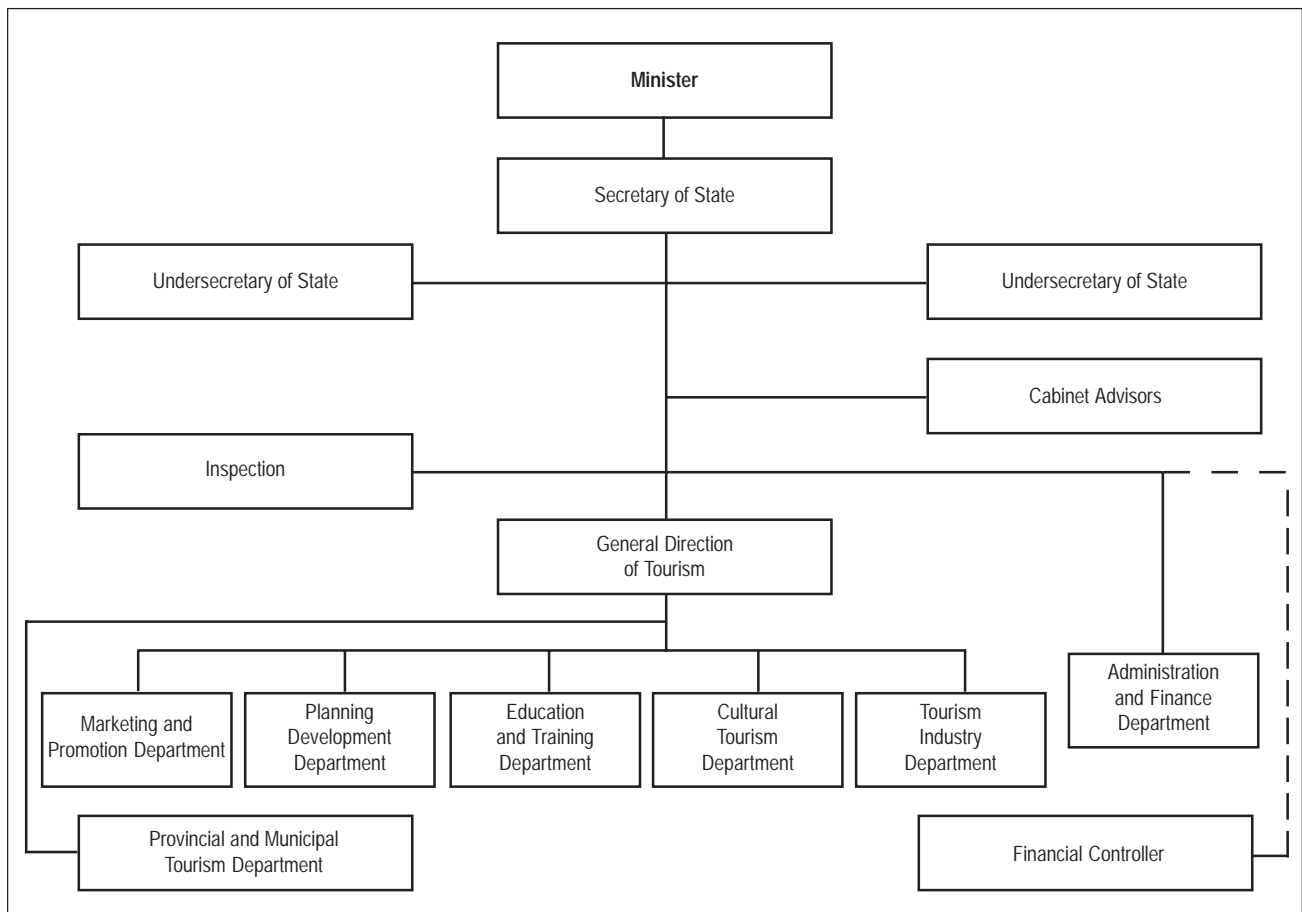
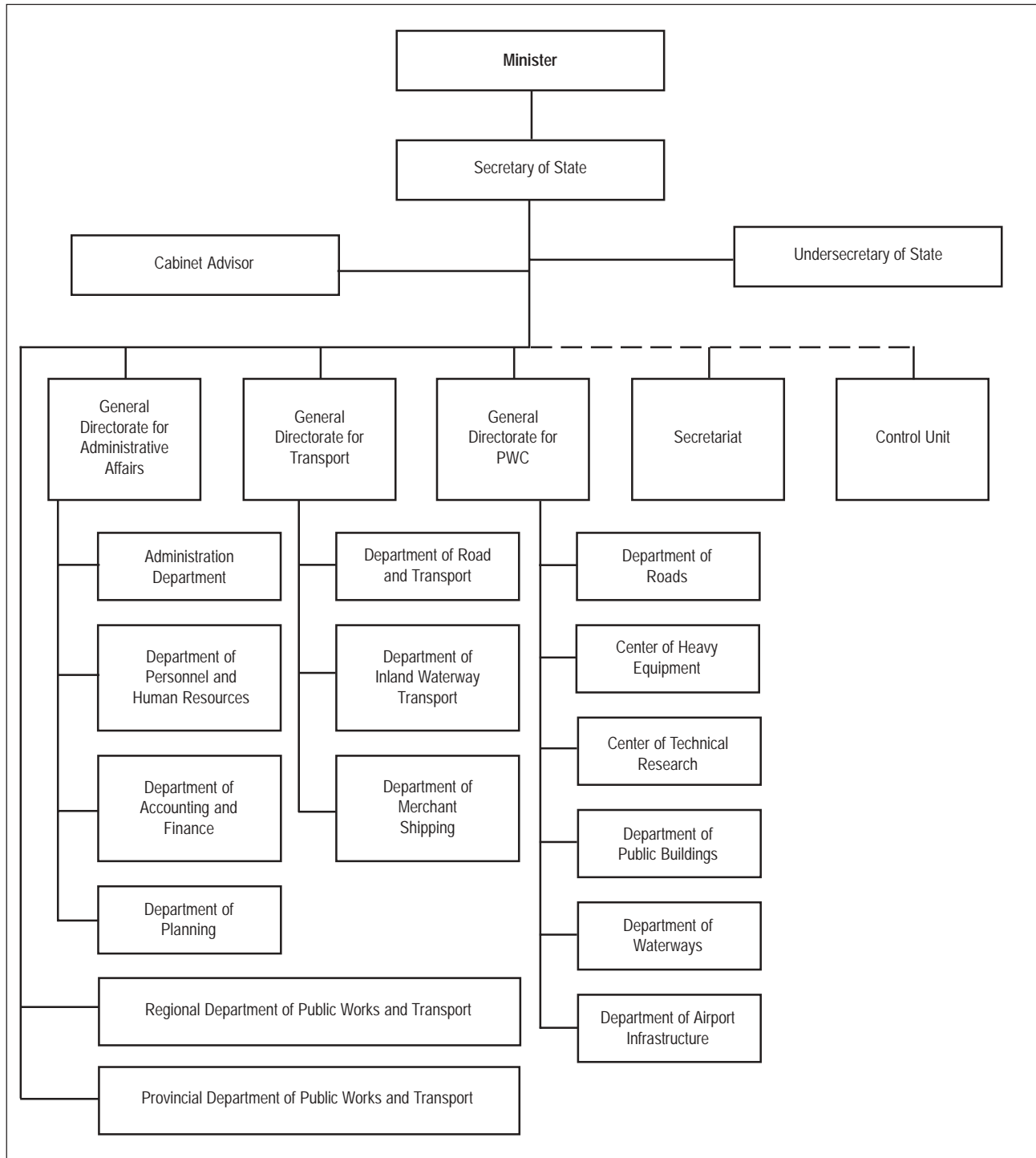


Figure 2.6 Organizational Structure of the Ministry of Public Works and Transport.

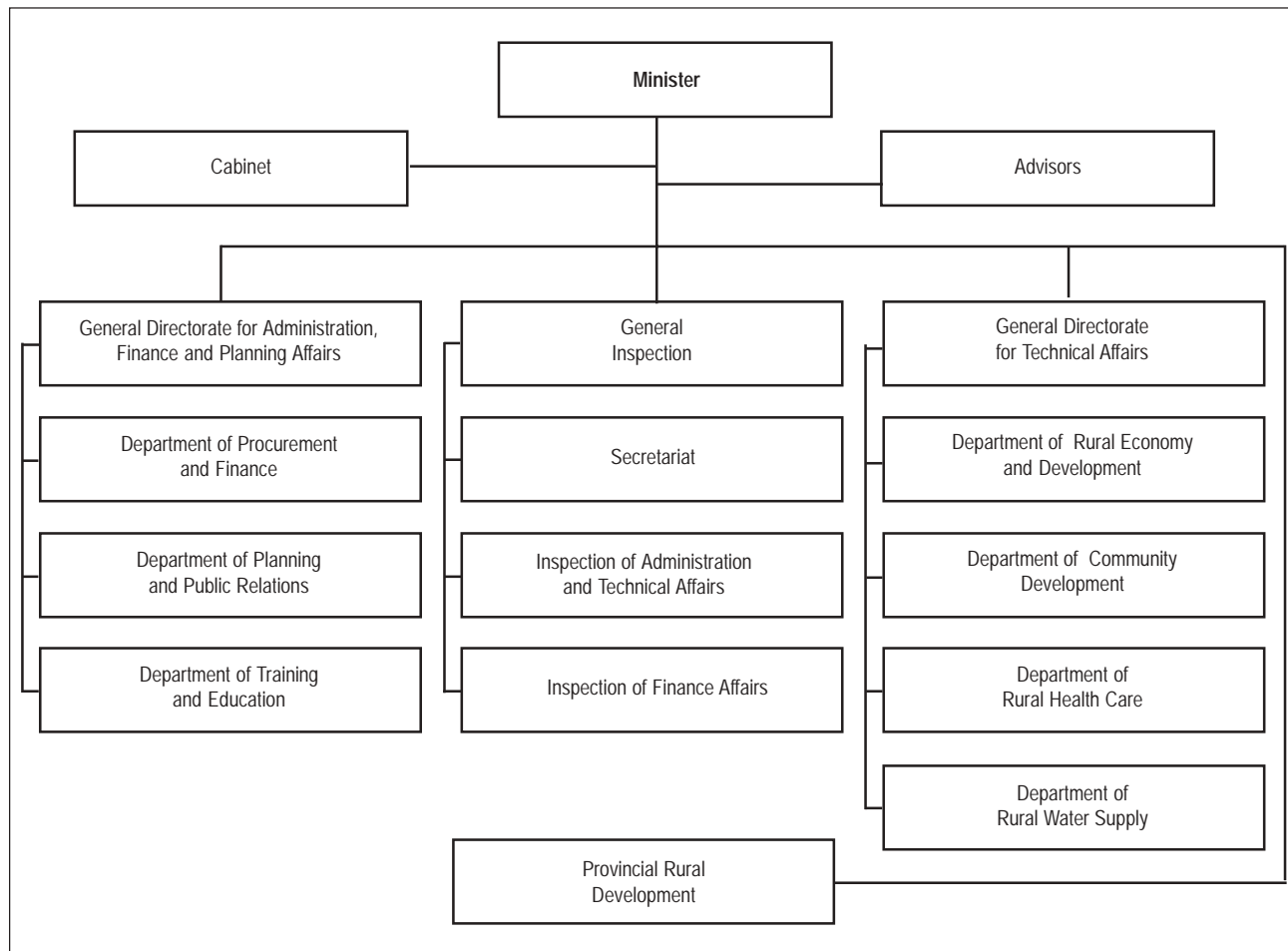


- To propose national and provincial budgets;
- To control tax collection in the province;
- To issue certificates and land titles;
- To manage and use provincial assets as defined by law;
- To take measures to protect and preserve the culture, national heritage and environment;
- To propose socioeconomic programs, which conform with national government policies

- and programs; and
- To issue licenses for trade, resource extraction and handicrafts in accordance with the law.

All provincial and municipal taxes collected are remitted to the national treasury under the Ministry of Economics and Finance, which then disburses to relevant ministries and provinces in accordance with

Figure 2.7 Organizational Structure of the Ministry of Rural Development.



the National Assembly's decision.

However, the provincial and municipal authorities have the obligation to regulate tax collection, plan and estimate the amount of tax to be collected, promote economic development and upgrade services and exploitation for the purpose of improved tax collection (Law on Financing and Property Regime in Provinces and Municipalities 1998).

Committees

National Committee for Land Management, Urbanization and Construction

The Committee was created on 18 December 1997 by the Sub-decree on the Creation and Organization of the National Committee for Land Management, Urbanization and Construction. Thereafter, Sub-committees for each of the coastal provinces were also established.

The major responsibilities of the Sub-committee are:

- To prepare land use plans, including urbanization;
- To control construction and installation works through the regulation of building licenses;
- To protect the national patrimony, environment and natural resources and ensure economic development; and
- To issue stop work orders, seize construction materials and prosecute violators.

National Coastal Steering Committee

The Committee was created in 1997 and holds regular meetings among ministries, coastal provincial governors, as well as representatives from coastal projects, NGOs and international organizations (IOs). The Committee has a Coastal Coordinating

Unit (CCU) based at the MoE serving as its secretariat. The committee membership includes:

- The Minister of Environment (Chair);
- Undersecretaries of State from: Ministry of Agriculture, Fisheries and Forestry (Vice Chair), Ministry of Tourism, Ministry of Industry, Mines and Energy, Ministry of Public Works and Transport, and Ministry of Rural Development;
- Governors of the coastal provinces;
- Representative from the Cambodian Development Council;
- Representative from the Danish Ministry of Foreign Affairs (Danida);
- Observers from coastal projects; and

- Representatives from NGOs and international organizations.

This committee is responsible for the overall direction of coastal projects and activities. All committee members should ensure the cooperation of their line ministries and provincial authorities. The committee also seeks to align the activities of coastal projects with national development priorities. The committee also provides technical advisers in preparing proposals for coastal projects. For instance, the proposal for Phase II of the Danida project on Environmental Management in the Coastal Zone of Cambodia has been reviewed by the committee. Though the committee has a secretariat within the MoE, there is still a need for office

Figure 2.8 Organizational Structure of the Ministry of Environment.

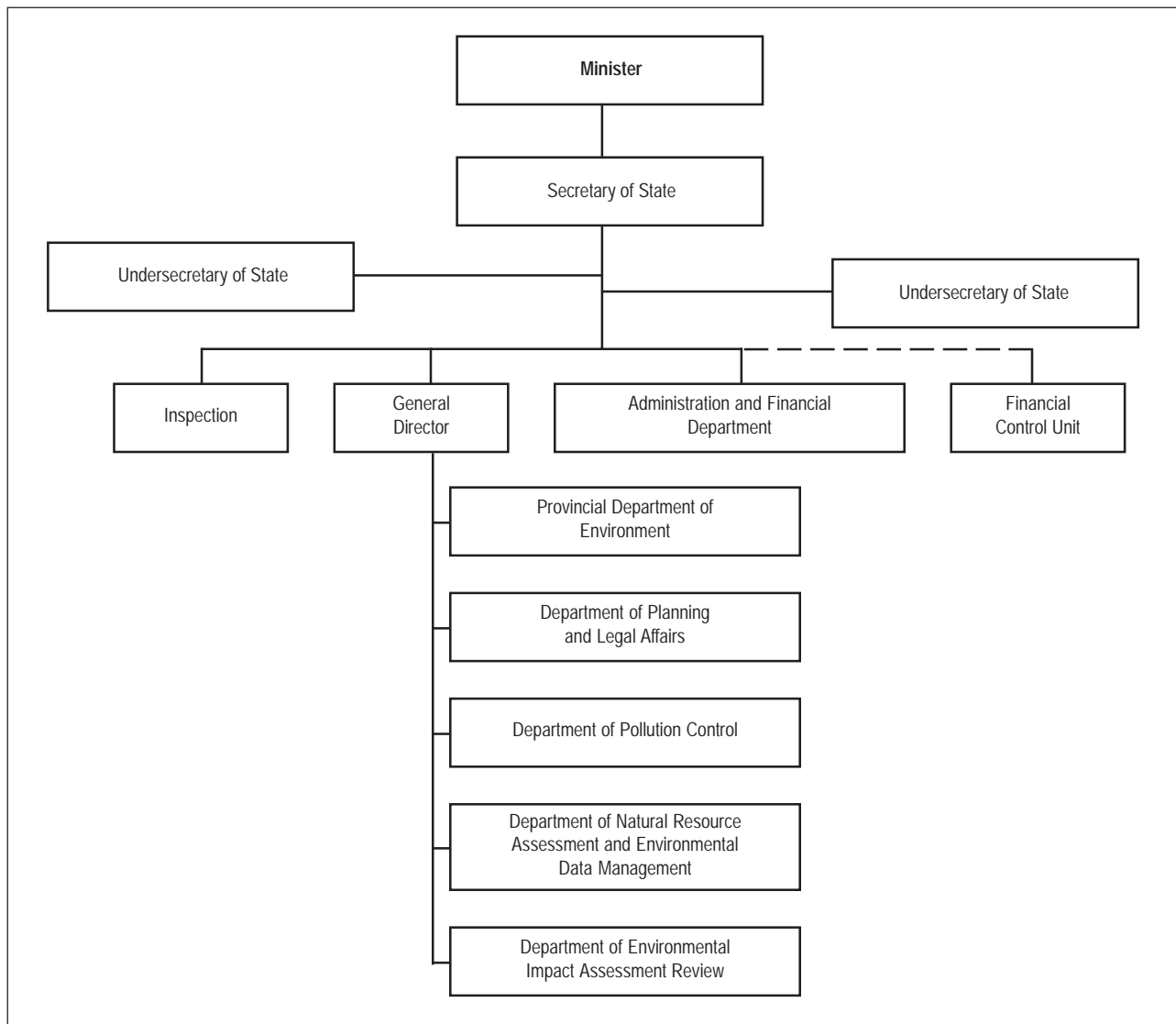
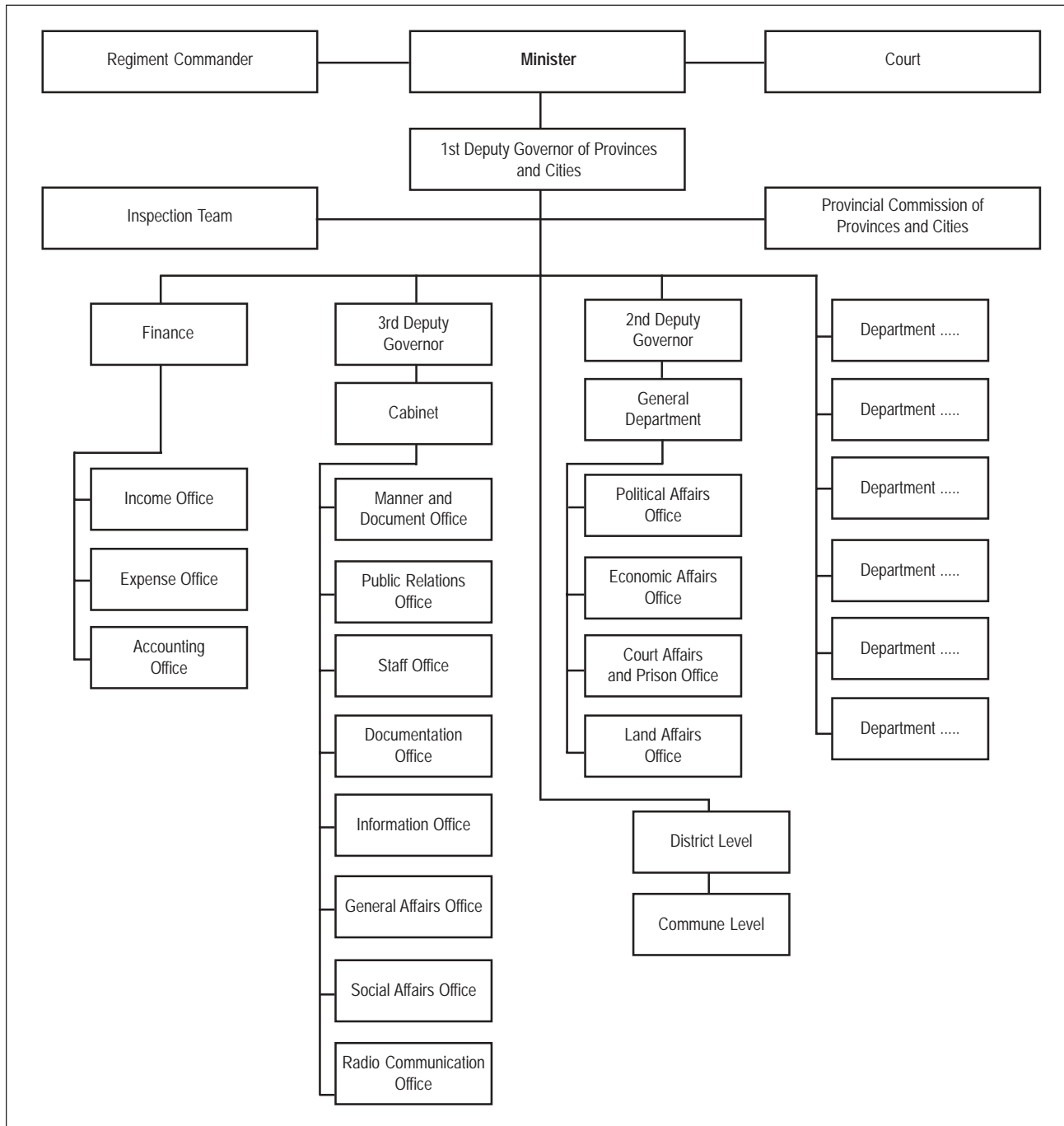


Figure 2.9 Organizational Structure of the Ministry of Provinces and Municipalities.



facilities and equipment for its operation.

The meetings of the National Coastal Steering Committee focus on exchanging ideas, consensus building as well as generating suggestions for implementing sustainable coastal projects. The following are examples of issues discussed at previous meetings:

- The sustainable development of coastal and

- marine resources;
- Proposals to prohibit and prevent all development projects that cause negative environmental impacts on the coastal zone;
- Proposals to the MoE to issue and implement the Law on Environmental Protection and Natural Resources Management. This will facilitate the participation of provinces and concerned institutions in contributing to environmental protection; and

- Requests for the establishment of coastal zone coordinating committees at the provincial level in order to improve project implementation.

Coastal Coordinating Unit

The CCU was created in 1996 as part of MoE to help coordinate activities relating to coastal and marine environmental management of the Kingdom. The Unit plays a very important role by providing secretariat assistance to the National Coastal Steering Committee during meetings and workshops. The Unit's functions are to:

- Coordinate and cooperate with international organizations, government institutions, NGOs and the private sector in coastal and marine project development;
- Promote sustainable implementation of coastal and marine projects and ensure that there are no overlaps with existing projects;
- Report directly to the Minister, Director General, and indirectly, to the Departments under the MoE on coastal activities; and
- Provide information and advice on the positive and negative environmental impacts of projects in the coastal zone.

The Unit also coordinates with other international bodies such as the Coordinating Body on the Seas of East Asia (COBSEA), South-East Asian Program on Ocean Law, Policy and Management (SEAPOL), International Maritime Organization (IMO), IDRC and others.

The CCU is now trying to build its capacity and improve its facilities and equipment for better implementation.

Other Committees and NGOs

There are other proposed committees that deal with coastal zone management. These include the National Committee for Wetland Management, the National Committee for Climate Change and the National Committee for Protected Areas and National Parks. The proposed National Committee for Wetland Management will be joining with the National Coastal Steering Committee.

There are some NGOs that assist in the management of the coastal zone of Cambodia. These include the Australian People for Health, Education and Development Abroad (APHEDA), Wetlands International (WI), the World Conservation Union (IUCN), and the American Friends Service Committee (AFSC).

National Policy

There is no national policy specifying the development, use and management of natural resources in the coastal zone. However, the National Program to Rehabilitate and Develop Cambodia has implications for development and management of the coastal zone. The Program sets out the vision of the government to establish a market economy and to facilitate the emergence of a strong private sector. The main elements of the approach include:

- Reforming the state apparatus and public service;
- Realizing political stability and economic growth;
- Establishing a legislative and regulatory framework conducive to a fair and stable investment climate;
- Providing for physical infrastructure, developing human resources, gradually integrating the country into the regional and world economy while optimizing the sustainable use of natural resources; and
- Re-establishing the country as a sovereign state within the community of nations, with people committed to the rule of law.

This national program clearly reflects a policy based on a process of legal reform, establishment of a legal framework based on democracy and a market economy. It also sets the framework for national policy and planning in all sectors related to Cambodia's coastal zone.

The First Five Year Socioeconomic Development Plan (1996-2000) considers environmental protection as an equally important element in the ambition to develop the country. This plan also stresses the need to alleviate poverty and improve the quality of life of rural communities, thus reducing pressure on the natural resources by decreasing the amount of uncontrolled resource exploitation. In

addition to the general national development policy, there are some important sectoral policies that relate to the management of fisheries, coastal resources and the coastal environment.

Fisheries Policy

The Fisheries Department has a mandate to manage the fisheries sector. The main elements related to the management of marine fisheries mentioned in this policy are:

- To create job opportunities and upgrade the livelihoods of people in local communities;
- To ensure equitable access to and distribution of fisheries benefits including export earnings;
- To extend the institutional responsibilities of fisheries management to fishing communities;
- To enhance the protection and sustainable use of fishery resources;
- To promote aquaculture and mariculture to fulfill the nutritional requirements of the people and to reduce the catch of wild resources; and
- To encourage the integration of fisheries management with overall rural development in fishing communities.

Local authorities are now working together with local communities to try to define coastal areas in terms of their importance to fisheries. One of the objectives is to designate zones that should be reserved for conservation as well as those that would be kept open for sustainable use.

Industrial Sector Policy

The policies of the industrial sector are defined as follows:

- To encourage the development of industry to ensure political, economic and social stability and to reduce the trade gap;
- To develop an industrial base to maximize the benefits of the existing natural resources, attracting greater foreign investment, promoting technology transfer and stimulating human resource development;

- To support the goals of the Ministry of Education and other agencies in developing vocational training centers to provide trained personnel for industrial development;
- To increase effectiveness, competitiveness and modernization of industry within the context of a free market economy;
- To create special economic zones that facilitate new industrial establishments;
- To support national economic and social development through effective industries, by creating added value to natural resources, sustainability of economic development, job opportunities and thereby upgrading the living standard of the people;
- To develop a Petroleum Training Institute and a training institute in the mines and geology sector; and
- To develop agro-manufacturing and food processing industries to support the agriculture sector.

Tourism Policy

With regard to the management of tourism, the MoT has set up the following tourism policy:

- To increase foreign exchange earnings;
- To increase and encourage investment in all areas of tourism;
- To create employment opportunities for local people;
- To stimulate regional development;
- To enhance and preserve the national cultural heritage; and
- To develop and conserve the physical and environmental resources in the coastal areas.

Policy of the Ministry of Public Works and Transport

Transport development includes the following policy objectives:

- To transform the Kang Keng airport into a regional airport;
- To upgrade the port facilities and infrastructure of Phnom Penh and Sihanoukville ports;
- To reconstruct the southern and northern railway branches; and

- To develop Phnom Penh and Sihanoukville ports as dry ports in order to accommodate future growths in traffic demand, especially with reference to container traffic.

The development of civil aviation and airports (particularly those at Koh Kong and Sihanoukville) is priority of the government since it provides vital transport and tourism links to and from Cambodia.

Environmental Policy

Based on the Law on Environmental Protection and Natural Resource Management and the National Program to Rehabilitate and Develop Cambodia, the objectives are:

- To implement the national policy or national programs;
- To protect the environment from the ill effects of economic development;
- To conserve the environment through the creation of protected areas;
- To ensure the development and implementation of laws and sub-decrees on environmental conservation and protection of the coastal environment;
- To prepare and implement national and regional action plans through inter-agency coordination; and
- To ensure sustainable economic development activities in order to promote economic, social and political stability.

Due to unclear policy or policy guidelines at ministerial levels, it may be difficult for departments or local authorities to define their own responsibilities or functions. The uncertain situation exists despite the fact that the National Environmental Action Plan (NEAP) was prepared by representatives from the following Ministries:

- Forestry
- Tourism
- Industry
- Fisheries
- Agriculture
- Environment
- Mines and Energy
- Rural Development

- Public Works and Transport

NATIONAL PLANNING

Apart from abiding by national programs, each ministry is also required to develop intermediate level plans in accordance with their mandates. Each ministry has to prepare short to medium term plans of its own (1-2 years and 5 years respectively), which are to be submitted to the government for final integration with the national plan.

Fisheries Plan

There are several objectives for the management and protection of marine fishery resources as follows:

- To increase fisheries production for local consumption and export;
- To create job opportunities for rural farmers;
- To upgrade aquaculture and mariculture to reduce the exploitation of natural fisheries;
- To enhance the protection and conservation of fishery resources and to ensure enforcement; and
- To ensure human resource development and capacity building in the fisheries field.

Industrial Strategy and Planning

To manage and develop the industrial sector through environmentally sound planning, the MIME has defined the following objectives:

- To promote industrial activities in order to create jobs and to attract foreign investment
- To identify four critical sectors for investment:
 - a. The fuel and energy sector as a strategic sector for the country;
 - b. Other sectors of high priority (i.e., labor intensive industries, high value added industries and wood factories);
 - c. Sectors of higher need (i.e., agro-manufacturing, factories for consumable goods); and
 - d. Small business industries.

- To create policies to promote industrial and economic development by attracting foreign and domestic investments. These policies include the formulation of investment law that will make government institutions responsive to the needs of investors; and
- To prioritize the establishment of growth centers through the development of infrastructure, industrial zoning and export processing zones in Phnom Penh and Sihanoukville.

Tourism Zoning Strategy

The MoT has proposed a tourism zoning strategy for Cambodia. The zoning strategy gives priority to eight development areas that include the coastal areas of Sihanoukville, Kep and Kampot Province. The tourism potential in these areas includes offshore islands. These islands are ideal sites for resort development owing to their attractive beaches and rich marine life.

National Environmental Action Plan

The NEAP was adopted by the Council of Ministers in December 1997. This action plan was initiated by the MoE to provide strategic guidance to public and private stakeholders in integrating environmental concerns into national and local development policies, economic decision-making and investment planning. It was prepared through a participatory process involving government and non-government stakeholders. The action plan summarizes the key thematic issues related to coastal areas such as:

- Forestry policy;
- Coastal fisheries management;
- Biodiversity and protected area management;
- Energy development and the environment; and
- Urban waste management.

The NEAP presents a pragmatic five-year program (1998 to 2002) to improve environmental management in Cambodia. Years one and two of the program focus on strengthening policy and regulatory frameworks, while years three to five would

involve the mobilization of investments needed to improve environmental management. The components presented in the NEAP should be implemented by the different ministries according to the thematic issues and existing legal framework.

National Wetland Action Plan

A draft of the National Wetland Action Plan has been circulated for comment. The Wetland Action Plan was adopted by the Government in December 1998. The action plan is the result of detailed discussions among various ministries, departments and organizations responsible for the management and sustainable use of wetlands in Cambodia.

The National Wetland Action Plan (1998) outlines the cultural and economic importance of wetlands. Over 30% of Cambodia's land area consists of wetlands, according to an internationally accepted criteria for wetland identification (as defined by the Ramsar Convention). The Action Plan states that over 20% (36 500 km²) of the country may be classified as wetlands of international importance. Cambodia ratified the Ramsar Convention in 1999. One of Cambodia's proposed Ramsar sites is located in the coastal estuaries of Koh Kapik. The Action Plan calls for a formal policy to be developed for the management of wetland areas, including coastal zone resources.

Conservation Plan

A conservation plan for coastal natural resources does not exist as a specific document. However, it is already covered essentially in both national and international laws such as the Fisheries Law, the Forestry Law, the Royal Decree on the Creation and Designation of Protected Areas, the Law on Environmental Protection and Natural Resource Management, the Ramsar Convention and so on.

LEGAL FRAMEWORK

Legislative Hierarchy

The Constitution

The Constitution is the supreme law of the Kingdom of Cambodia. All other laws must strictly

conform to the Constitution. An initiative to review or to amend the Constitution is the prerogative of the King, the Prime Minister and the Chairman of the National Assembly at the suggestion of one-fourth of all the assembly members. Revisions or amendments may be enacted by the assembly through a two-thirds vote.

Law (Chbab)

The National Assembly determines law by their vote. The law is called an organic law if it refers to the creation or the organization of a state institution and its structures. For example, Article 127 of the Constitution provides that provinces, municipalities, districts and communes shall be governed in accordance with organic law.

Kram

This is the Royal Promulgation by the King.

Royal Decree (Reach Kret)

Royal Decrees are used by the King in the exercise of his constitutional powers, i.e., power of appointments upon proposals by the Council of Ministers, or by the Supreme Council of the Magistracy.

Decree (Kret)

Decrees are signed by the King upon proposal of the Prime Minister.

Sub-Decree (Anu-Kret)

Sub-decrees are signed by the Prime Minister and countersigned by the ministers in charge of their execution after adoption by the Council of Ministers. Sub-decrees can also be issued by the Prime Minister, based on his executive regulatory power.

Declaration (Ministerial Prakas)

Declarations are used by ministries in the framework of their own regulatory powers.

Decision (Sechkdei Samrech)

Decision is an individual decision of the Prime Minister, a minister or a governor within the framework of their regulatory powers.

Circular (Sarachor)

Circulars are used in general by the Prime Minister, or by ministers as officials of the ministry either to explain or clarify the legality of regulatory measures or to provide instructions.

Arete (Provincial Deka)

Provincial *Aretes* are used by provincial governors within the geographical limit of their provinces.

Customary Law

Customary law or Khmer customs may sometimes be a basis for judicial decisions. Cambodia is an ancient country in which Buddhist and Khmer beliefs, traditions and customs influence law. Some constitutional references to Khmer tradition illustrate how Khmer custom regulates behavior and serves as a source of law. For example, the Khmer tradition of conciliation (or reconciliation) beginning at the village level remains a part of the judicial process. Many legal conflicts are taken first to a village chief, monk or justice representative for reconciliation before being heard by a court. The courts of all levels adjudicate their trials based on laws currently in force and on laws and provisions as adopted by the Supreme National Council (SNC). In civil cases when the law is explicitly silent or where the law does not stipulate any legal provisions, the cases are then tried on the bases of customs, traditions, conscience and equity.

Treaties and Conventions

International law, if considered part of Cambodian law, may also be enforced by judges in Cambodian courts. International law is a combination of the laws of individual nations, customs developed in the course of international business transactions,

treaties (agreements between two or more independent nations) and declarations and resolutions of international organizations. Cambodia may become a party to international treaties and conventions whenever they are approved by the National Assembly. According to Article 26 of the Constitution, the King is empowered to ratify an international treaty after approval by the National Assembly.

National Legal Framework

Historical Profile of the Cambodian Legal and Institutional System

In its recent history, the Cambodian legal system has undergone a series of radical changes as indicated below:

- **Pre-Colonial.** Traditional Cambodian law was non-adversarial. Traditionally, accepted figures in society mediated disputes and facilitated their resolution rather than imposing a settlement.
- **1870-1954.** The French system was progressively introduced during the protectorate and colonial period.
- **1954 - 1975.** The dual system of traditional and French laws were retained after independence.
- **1975 - 1979.** The Khmer Rouge regime abolished all laws and legal institutions and did not replace them with any new formal system.
- **1979 - 1991.** The government of the State of Cambodia did not re-institute the pre-1975 codes but developed a system of revolutionary people's courts with a strong emphasis on devolution to the provincial level.
- **1992 - 1993.** The UNTAC exercised power to implement the Paris Agreement for the establishment of a democratically elected government. UNTAC set up a limited legal framework, notably to reorganize the court system and a law of criminal procedure.
- **1993 - Present.** The constitution established the principle of the separation of powers—executive, legislative and judicial branches

of government. The monarch's power and authority were subsequently reduced.

Constitution of the Kingdom of Cambodia

The Constitution of the Kingdom of Cambodia was adopted on 22 September 1993 by the National Assembly. It is the supreme law of the land and all other legislative texts have to strictly conform to this. Article 59 of the Constitution stipulates that the Government of Cambodia must protect the environment and maintain ecological balance.

The Kingdom of Cambodia is a constitutional monarchy. The Constitution confers three levels of power — legislative, executive and judicial. Legislative power is vested in the 120 members of the National Assembly who are elected for a term of five years by universal adult suffrage. Executive power is held by the Royal Government of Cambodia. The head of the Judiciary branch is the Supreme Council of the Magistracy.

Land Law

The Constitution provides that only Cambodian citizens or entities have the right to own land. The State of Cambodia's National Assembly passed the Land Law on 10 August 1992 and it is now being enforced. This law prescribes the management of land and the system of property rights such as state or private property. Private property rights in fisheries and forest reserves, however, are not provided.

Law on Land Management, Urbanization and Construction

This Law was passed by the National Assembly and came into effect on 24 May 1994. It aims to promote the improvement of urban and rural areas in order to ensure sustainable development throughout the Kingdom.

Law on Investment

The Law on Investment governs all investment projects initiated by investors who are Cambodian

citizens and/or foreigners within the Kingdom of Cambodia. The National Assembly of the Kingdom of Cambodia adopted this law in August 1994 during the session of the first legislature.

Labor Law

This law governs all agreements between employees and employers who are Cambodian citizens and/or foreigners within the territory of the Kingdom of Cambodia. This Law was adopted by the National Assembly on January 1997 during the extraordinary session of the seventh legislature.

Fisheries Law

The Law on Fisheries Management and Administration (Fisheries Law - State Council No. 33), passed in 1987, defines fisheries and categorizes fishing areas. It states that all entities or persons who fish in either freshwater or seawater must contribute to the state, except fishing for family subsistence. Permits for fisheries exploitation and aquaculture in fishing areas must be determined by regulations.

The Fisheries Law aims at conserving and regulating the exploitation of Cambodia's freshwater and marine fisheries resources. If effectively implemented, this law could make a significant contribution to the management of freshwater and marine areas. The fisheries law includes provisions addressing access control, gear restrictions, closed seasons and the designation of fish sanctuaries. The Fisheries Law supports the management of fisheries, coastal resources and the coastal environment in Cambodia as well as resources and environment related to all types of inland waters. The basis for this is that all types of water bodies and flooded areas are considered as fishing areas (fisheries domain).

The important items of the Fisheries Law which relate to the management and administration of coastal fisheries of Cambodia are the following:

- Fishery resources are comprised of living animals and plants found in the fisheries domain (Chapter 1, Article 1). The fisheries

domain consists of:

- a) Inland fisheries domain, which includes rivers, tributaries of rivers, lakes, streams, small rivers, channels, natural ponds and holes in the ground. The last three trace their water source from rivers, tributaries of rivers, lakes, streams and small rivers; and
 - b) Marine fisheries domain extends from the coastline to the outer boundary of the EEZ. Fisheries domain is the property of the state.
- Fishery exploitation, aquaculture and processing in Cambodia's marine fisheries is allowed upon government permission except for small-scale family fishing (Chapter 3, Article 22). Small-scale family fishing gear and other fishing gear permitted in the marine fisheries domain of Cambodia must be defined by the proclamation of the Ministry of Agriculture.
 - Government fishing enterprises and groups of fishers that use fishing boats or vessels in the marine fisheries domain must have the following additional licenses: a fishing boat or vessel license allowing them to operate in the sea (to be issued by the fisheries authority after technical control), and a license from the police (for administrative control) (Chapter 3, Article 23).
 - The fishing activities of foreigners in Cambodia's marine fisheries domain must have the approval of the Council of Ministers (Chapter 3, Article 24).
 - Fishers who are permitted in the marine fisheries domain must respect the order or act mentioned on the fishing license. Records must be kept on the daily catch of fish and other organisms, and reporting this monthly to the provincial-municipal fisheries authority (Chapter 3, Article 25).
 - All kinds of fishing gear, extending across a stream, inlet or navigable channel of coastal zones, must have a free space of one-third of its width during low tide to enable the navigation of vessels (Chapter 3, Article 26).
 - Mackerel (*camon* or *pla thu*) fishing during

the spawning season from 15 January to 31 March is prohibited (Chapter 3, Article 27).

- Trawling in shallow water (less than 20 m) is prohibited, except where special permission is granted by the Department of Fisheries for scientific research (Chapter 3, Article 28).
- Fishing in Cambodia by using electric fishing gear and all kinds of explosive or modern fishing gear, which are not mentioned in the Proclamation of the Ministry of Agriculture, are absolutely prohibited (Chapter 3, Article 29).

Forestry Law

The Forestry Management Law (Forestry Law - State Council No. 35) was passed in June 1988. It defines types of forests and states that forests are divided into forest concessions and protected forests. Limitation of forest boundaries and forest uses are to be determined by a sub-decree. All sectors of society are obliged to protect the forests. Exploitation of forests without a permit is prohibited and logging operations are subject to government tax. Hunting of all species of animals is also prohibited.

Industrial Laws

Law on Mineral Exploitation and Mining

The Law on Mineral Exploitation and Mining is still a draft and relates to the management and monitoring of mineral resources and mineral exploitation. It sets provisions for the sustainable development of the mining sector with the objective of improving the national economy but prevents natural resources depletion.

The draft Mining Law stipulates the responsibilities of the government agency in issuing mining permits and controlling mineral exploration activities. All of the mining activities covered under the draft law would be subjected to environmental protection including preparation of an environmental protection plan prior to mining activities and a plan for implementation during operations.

Sub-Decree on Industrial and Handicraft Management and Monitoring

This sub-decree is still a draft and relates to the management and monitoring of handicraft industries. It intends to promote sustainable development in the industry, improve the national economy and prevent harmful industrial impacts on the environment. The sub-decree was written in 1995.

Draft Industrial Zone Act

This act provides, written in 1995, for the development of the industrial zones in the Kingdom of Cambodia. It also aims to promote economic development in the industrial sector while maintaining environmental protection.

Transport Laws

In order to ensure safety in as well as develop other modes of transport, the MPWT has issued many laws and declarations, some of which are also related to maritime transport in the coastal zone.

Sub-decree on Private Transport Services

This sub-decree, passed in July 1991 by State Council No. 13, provides the private sector the right to transport passengers and goods by roads and waterways. Among other things, this law specifies that the owners of sea-going vessels with a capacity of less than 30 tons be required to register and get an operating license in the province or city where they are based. Vessels with a capacity of more than 30 tons are required to register and get their license at the General Directorate of Transport (GDT), MPWT. Sea-going vessels with a capacity of both less and more than 30 tons that cross the border are required to register and get a license from the GDT, MPWT (Article 3).

Declaration on the Management of Vehicles and Inland Waterways Transport

Declaration No. 41 issued by the MPWT on September 1993 states that an operating license is valid only for a one year period. Two months before expiration, the owners are required to ask for an

extension from the Ministry to continue their services. Failure to apply during this period shall lead the Ministry to consider that the owners are discontinuing their businesses.

Common Circular on Overloaded Trucks, Especially Logging Trucks

Common Circular No. 461 was issued by the Ministries of Public Works and Transport, Economic, Finance and Agriculture, Forestry and Fisheries on February 1995. Among other things, the law seeks to ensure the safety of persons and vehicles on the road. It defines technical standards that include:

- Maximum load limit to 18 tons except RN4;
- RN4 is limited to 25 tons;
- Overloading is allowed in special cases;
- Maximum load on the truck's axial is limited to 10 tons; and
- MAFF is responsible for logging truck loading.

Declaration on Ship Construction

Declaration No. 549 issued by the MPWT on July 1995 concerns the reassembly of vehicles and ships. Among other things, the law states that:

- Persons who want to build sea-going vessels are required to file an application with the MPWT and attach the following necessary documents:
 - a) The construction design in 1/50 scale,
 - b) Name and address of the shipyard owner as well as the shipyard name, and
 - c) Certificate of residence of the applicant.
- Construction will start after permission from the MPWT is obtained. During the construction, the Ministry will assign one supervising engineer in order to ensure that the ship has the required safety features; and
- Following construction, a technical review together with other formalities will be completed before a license to operate is issued.

Declaration on Issuing Business Licenses for Tourist Boats

Declaration No. 224 issued by the MoT on February 1996 states that the operating license for tourist boats must be issued by the MoT. It requires the owner or manager of the boat to have the following documents:

- Boat certificate issued by the MPWT;
- Boat pilot license issued by the MPWT;
- Mechanical certificate issued by the MPWT;
- Technical control log book;
- Registration certificate; and
- Other information required by the MoT.

Sub-decree on River Navigation

Sub-decree No. 06 issued by the Council of Ministers on March 1986 is applicable to coastal navigation and is divided into seven chapters. The main provisions are related to:

- Moving aside, overtaking and berthing;
- Lights and signals;
- Use of whistle during navigation;
- Boat accidents and rights of authority; and
- Penalties.

Draft Declaration with Respect to the Act of Registration of Merchant Ships

This Declaration was prepared by the GDT, MPWT in 1995 and consists of seven sections and 60 articles. The main sections of the draft include:

- Administrative authority: appointment of Director and Deputy Director of Maritime Affairs, delegation of functions, records relating to vessels, authority to take declarations and acknowledgement, authority to issue licenses and certificates, authority to issue radio station licenses, power to suspend and revoke licenses, certificates and fees;
- Law and jurisdiction: general maritime law, general penalty, jurisdiction and appeal, liability of the Director, Deputy Director and agent respectively;

- Registration of vessels: general provisions, regulations, exemption from registry, power to waive requirements in exceptional cases, registration fees and tonnage tax, annual tonnage tax, application of registration, condition precedent to issuance of permanent certificate of registry, measurement of ship, forms of certificates and other documents, cancellation of certificate and others;
- Mortgages; and
- General provisions: specifies national colors for Cambodian ships, penalties for not showing colors, crew lists of Cambodia ships, standards of seaworthiness and other regulations.

Declaration No. 018 on Overloaded Ferries, Riverboats and Sea-going Vessels

The Declaration was issued by the MPWT in August 1995. It specifies that the owners of sea-going vessels that operate along coastal waters must strictly respect the technical conditions specified by the MPWT and Provincial or City Department of Transport. Conditions include the loading of cargo and passengers especially during the rainy season, when prevailing strong winds and high water levels can cause damage to life and property. Violators of this law will be punished and operating licenses will be canceled by the Ministry.

Tourism Laws

Royal Decree on the Establishment of the Ministry of Tourism

According to this decree, the MoT was established on 24 January 1996. Its mission is to provide direction and encourage the development of the tourism industry in the Kingdom of Cambodia.

Sub-decree on the Organization and Functioning of the Ministry of Tourism

The sub-decree was issued on 5 August 1997 by the Second Prime Minister. It defines the administrative structure of the MoT and its role and duty in tourism management. The organizational structure is

composed of central and local administrations. The main responsibilities of the Ministry especially related to coastal tourism management are:

- To define the tourism policy and strategies and to prepare plans for tourism development;
- To encourage tourism investment in accordance with the national strategies;
- To develop and manage the tourism industry;
- To direct and administer other services related to tourism;
- To direct, control and maintain natural and artificial recreational resorts, tourism areas and tourism zoning in the Kingdom;
- To study proposals for establishing, recognizing and controlling private schools and professional training for the tourism sector;
- To promote tourism locally and overseas;
- To appoint tourism representatives in various countries in cooperation with the Ministry of Foreign Affairs and International Cooperation;
- To sign contracts that relate to tourism upon government approval;
- To issue operating permits for tourism firms, agencies and guides;
- To control tourism services and other tourism-related activities; and
- To conduct tourism inspection.

With regard to issuing licenses, there are various declarations such as:

- Circular on the Licensing of Travel Agencies, 1994;
- Declaration on the Licensing of Tourist Guides, 1996;
- Declaration on the Licensing of Tourist Boats, 1996;
- Declaration on the Licensing of Tourist Vehicles, 1996;
- Declaration on the Licensing of Hotel and Guest Houses, 1996;
- Declaration on the Licensing of Resorts, 1996;
- Declaration on the Licensing of Catering Establishments, 1996; and

- Declaration on the Licensing of Massage Parlors, 1996.

Environmental Laws

Law on Environmental Protection and Natural Resource Management

The development of environmental legislation is one of the national government's priorities. Cambodia's first law specifically concerned with environmental issues is the Law on Environmental Protection and Natural Resource Management, which was adopted by the National Assembly on 24 December 1996. This law can be considered as the framework for subsequent sectoral laws, sub-decrees and regulations for environmental protection and natural resources management.

The Environmental Law does not attempt to establish specific environmental management systems or standards. Rather, it leaves these tasks to subordinate legal instruments to be prepared in the future. The main objectives of this law are to protect, manage and enhance the environment and to promote sustainable socioeconomic development. This law is a general legal framework for environmental protection and management throughout the Kingdom, including the protection, conservation and management of the coastal zone and marine resources.

The important objectives in this law related to environmental management of coastal resources of Cambodia are as follows:

- To conduct EIAs for all projects and economic activities that might affect the environment (Article 6, Chapter 3);
- To conserve, develop, manage and use natural resources sustainably (Article 8, Chapter 4);
- To protect the coastal environment through the identification of pollutants, toxic and hazardous substances (Chapter 5);
- To prepare national and regional plans for environmental protection and natural resources management (Chapter 2); and
- To suppress any acts which abuse the environment, in conformity with the "polluter pays" principle. Those who violate this

law are to be fined and/or jailed in accordance with the degree of the violation.

Sub-decree on the Organization and Functioning of the Ministry of Environment

The Sub-decree on the Organization and Functioning of the MoE was ratified by the Council of Ministers in late 1997. Accordingly, the Royal Government of Cambodia gives the Ministry the authority to supervise and manage the environment in the Kingdom.

Royal Decree on the Creation and Designation of Protected Areas

Protected area management was mandated under the Royal Decree on the Creation and Designation of Protected Areas on 1 November 1993. There are 23 protected areas designated in the country and some of these protected areas are found along the coastline of Cambodia (Table 2.8).

The MoE is currently preparing a proposal for a Sub-decree on Protected Areas Management. The purpose of this sub-decree is to implement the Law on Environmental Protection and Natural Resource Management and to implement the Royal Decree of 1 November 1993. At present, the MoE faces major management problems in the designated protected areas, especially in preventing violations such as illegal logging and hunting.

Sub-decree on Water Pollution Control

A Draft Sub-decree on Water Pollution Control is under review by the MoE. The purpose of this sub-decree is to control effluent discharge into water bodies and set standards for water quality.

Sub-decree on Environmental Impact Assessment

EIA provisions are incorporated in the Law on Environmental Protection and Natural Resource Management. The draft sub-decree specifies the following environmental review process: screening, initial EIA and full-scale EIA.

As specified in the Law on Environmental Protection and Natural Resource Management, this review process applies to proposed, existing and on-

going projects and activities by both public and private sectors. Pending the passing of the EIA Sub-decree, the MoE, through its Department of EIA, implements an informal process of EIA reporting for projects requiring government approval. This includes all projects in the coastal zone involving foreign participation. Where a foreign investor proposes a project requiring a license or permit, they submit a proposal to the Council for the Development of Cambodia (CDC). This is the central government agency that processes all proposed foreign investment. On receipt of the proposal by the proponent, the CDC will forward the proposal to the relevant ministries interested in the proposed project. This may include the MoE that will review the EIA report.

Where there is no requirement for an EIA, the Ministry will require the proponent to enter into an agreement to comply with any conditions set in the Ministry's initial evaluation as a precondition of granting any license or permit.

International and Regional Arrangements

United Nations Convention on the Law of the Sea

Cambodia is concerned about law enforcement, promotion of scientific research, conservation of living and non-living resources and the use of such resources in its marine environment. Cambodia abides by the United Nations Convention on Law of the Sea (UNCLOS), which was established in 1982 and in force since 1994. It pursues the management of the seas and oceans of the world in the spirit of international cooperation, peace, security and friendly relations among nations and in accordance with the principles of the UN Charter. Most of the articles prescribed in this law relate to sovereignty, integrity and management of the seas and oceans, which mainly belong to coastal states. Thus, the Law of the Sea provides the authority and sovereign rights to coastal states to manage their coastal and marine resources.

Since Cambodia's economy is open to the world through international sea-borne trade, shipping activities are expected to increase rapidly with various ships entering its territorial seas and international ports. As a result, pollution from ballast water

and daily ship operations (including collisions, grounding, anchoring and oil spills) may occur in its seas, causing damage to coral reefs, mangrove areas and the whole marine environment.

Cambodia, as with other coastal states, is bound by the UN Law of the Sea to manage their coastal and marine resources. This includes marine environmental protection from ship-based pollution and damage within its territorial seas and EEZ. In the territorial sea, Cambodia has the right to pursue the following tasks:

- To develop laws and regulations related to the rights of innocent passage (Article 21), which include:
 - a) The safety of navigation and the regulation of maritime traffic,
 - b) The conservation of its marine living resources,
 - c) The prevention of violation to its fisheries law,
 - d) Environmental preservation and the prevention, reduction and control of pollution from shipping activities, and
 - e) Marine scientific research and hydrographic surveys.
- To take necessary steps to prevent passage which is not innocent (Article 25).

In the EEZ, Cambodia has the sovereign rights to explore, exploit, conserve and manage the natural resources, whether living or non-living, in the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for economic development of the zone; and jurisdiction to establish and use artificial islands, installations and structures to conduct marine scientific research, and to protect and conserve the marine environment (Article 56).

For the conservation of living marine resources (Article 61), Cambodia's obligations are:

- To determine the allowable catch of the living resources in the EEZ;
- To ensure proper conservation and management measures to avoid overexploitation of living resources in the EEZ;

- To take such measures to restore populations of harvested species at levels which can promote the maximum sustainable yield; and
- To contribute and exchange available scientific information, catch and fishing effort statistics and other data relevant to the conservation of fish stocks through competent international, regional and local organizations.

For the use of living resources in the EEZ (Article 62), the law gives Cambodia the authority to:

- Promote optimum use of the living resources in its EEZ;
- Determine the capacity to harvest the living resources in its EEZ;
- Take into account all relevant factors including the significance of the living resources in the area to the economy and national interests;
- Set up measures to regulate fishing and conserve its fishery resources (Article 62). As such, Cambodia will have to establish the following:
 - a) Licensing of fishers, fishing vessels and equipment;
 - b) Determining the species which may be caught and fixing catch quotas, whether in relation to particular stocks, groups of stocks or catch per vessel;
 - c) Regulating seasons, areas of fishing as well as the types and sizes of gear and fishing vessels that may be used;
 - d) Fixing the age and size of fish and other species that may be caught;
 - e) Specifying information required of fishing vessels, including catch and effort statistics and vessel position reports;
 - f) Requiring the conduct of specified fisheries research programs;
 - g) Placing of observers or trainees on board such vessels;
 - h) Landing of all or any part of the catch by such vessels in the ports;
 - i) Terms and conditions relating to joint ventures or other cooperative arrange-

- ments;
- j) Requirements for the training and transfer of fisheries technology; and
- k) Enforcement procedures.

With regard to the implementation of UNCLOS for the purpose of sustainable natural resource use in the EEZ and territorial seas, and according to Article 73 of UNCLOS, Cambodia may take necessary measures including boarding, inspection, arrest and judicial proceedings to ensure compliance with its laws. However, penalties for violations of fishery laws and other legal instruments in the EEZ exclude imprisonment. For the management of Cambodia's coastal and marine zone, the UNCLOS further gives rights to the Government of Cambodia to determine its maritime boundaries, some parts of which overlap with the borders of Thailand and Vietnam in the Gulf of Thailand.

UNEP-Coordinating Body on the Seas of East Asia

The COBSEA was established in 1981 and the action plan for “the protection and management of the marine environment and coastal areas of the East Asian region” was adopted the same year. A revised action plan and a long-term strategy for COBSEA for the 1994 to 2000 period was developed in 1994. Cambodia became a member of COBSEA in 1995. For political and economic reasons, Cambodia has not paid the Environmental Trust Fund to COBSEA since 1997. Other COBSEA-related issues for Cambodia include the lack of development policy guidelines, action plans, capacity building, technical and financial resources support and particularly a lack of data and information concerning the problems of land-based sources of marine pollution.

Since its adoption, attempts have been made to strengthen the links and to implement the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities in East Asian Seas. The Global Programme of Action was adopted in Washington, D.C. in November 1995. This global program was designed to:

- Deal with all land-based impacts;
- Develop action programs on the basis of national priorities and strategies;

- Implement these programs;
- Cooperate to build capacities and mobilize resources for the development and implementation of such programs;
- Take immediate preventive and remedial action using existing knowledge, resources, plans and processes;
- Promote access to cleaner technologies, knowledge and expertise to address land-based activities that degrade the marine environment;
- Cooperate on a regional basis to coordinate efforts for maximum efficiency and to facilitate action at the national level;
- Encourage available external financing;
- Promote the available management tools and financing options in implementing national or regional programs of action;
- Give priority to the treatment and management of wastewater and industrial effluents; and
- Act to develop a globally, legally binding instrument for the reduction of land based marine pollution.

Association of Southeast Asian Nations

Cambodia signed the Treaty of Amity and Cooperation in Southeast Asia in 1995, and joined ASEAN in 1999. Cambodia created an ASEAN Directorate at the Ministry of Foreign Affairs to facilitate the implementation of ASEAN programs and responsibilities. Thereafter, each ministry could establish an ASEAN Department or office in accordance with its relevant duties and responsibilities. Cambodia was not permitted to become a member state of ASEAN until 1997 due to the political situation that occurred in early July 1997. Cambodia only became a full member in April 1999.

In order to promote environmentally sound economic development, ASEAN has recently called for urgent measures to combat climate change and ozone depletion, protect ocean and marine ecosystems from pollution, protect freshwater resources, ensure sustainable management of all forests and conserve biological diversity. Specifically, the most significant objective of this call is Strategy 6, which is to “promote the protection and management of coastal zones and marine resources”.

As in other ASEAN countries (except Lao PDR), the country’s coastal and marine resources have been under pressure from illegal and overfishing, shrimp farming, chronic pollution from shipping, pesticide runoff from agriculture, urbanization and industrial development. Coral reefs are also being degraded and require protection and sound management. Therefore, there is an urgent need for the protection of Cambodia’s coastal zone and marine resources. In order to achieve the goals of regional cooperation, Cambodia had established links with the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), Asian Development Bank (ADB), Global Environment Facility (GEF), and others.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, generally called CITES, was initiated in Washington in 1973 and has been in force since 1975. It has been ratified by more than 100 states. Cambodia signed the CITES Convention on 7 December 1975, but did not accede to it until 2 October 1997.

CITES establishes a lists of endangered species for which international trade is either prohibited or regulated through a permit system. The objective is to combat illegal trade and overexploitation. Inclusion of species in the most restrictive categories requires a two-thirds majority vote of the parties to the convention. A single party may make inclusions to the list, but such inclusions would fall into the least restrictive category. A conference of parties is held every two years. The convention has financed population studies of endangered flora and fauna in order to provide a basis for intervention. Records of permits granted are sent annually to the convention secretariat for review. The secretariat is provided by UNEP and is located in Geneva.

MARPOL Conventions

The International Convention on the Prevention of Marine Pollution from Ships (MARPOL) deals with various forms of pollution from ships and other vessels. Cambodia ratified the Convention on 28 November 1994. The Convention includes five

technical annexes as follows:

- Annex I: Prevention of Pollution by Oil;
- Annex II: Control of Pollution by Noxious Liquid Substances;
- Annex III: Prevention of Pollution by Harmful Substances Carried in Packaged Forms;
- Annex IV: Prevention of Pollution by Sewerage; and
- Annex V: Prevention of Pollution by Garbage.

In Cambodia's case, the implementation of MARPOL is the responsibility of the Harbor Master Office of the International Port of Sihanoukville.

Convention on Wetlands (Ramsar, Iran, 1971)

The Convention on Wetlands (Ramsar, Iran, 1971) provides for the specific protection of wetland areas and the plant and animal species that inhabit these areas. The Convention on Wetlands seeks to protect the habitats of species by identifying wetlands of international importance. It is hoped that this will both protect waterfowl and their habitats and limit the degradation, drainage and dewatering of areas of marsh, fen, peatland, etc., which are known to be very productive areas in terms of biology and wildlife.

Cambodia has nominated three sites for listing under the convention. One of these sites is at Koh Kapik while the surrounding areas in Koh Kong province are significant for its mangroves and coastal habitats for migratory water birds. Cambodia is a party to the Convention since 1999.

Convention on Biological Diversity

The Convention on Biological Diversity was adopted during the UN Conference on Environment and Development (UNCED) in June 1992 in Rio de Janeiro, Brazil. The purpose of the convention was to conserve earth's biodiversity, promote the sustainable use of its components and encourage equitable sharing in the benefits arising from the use of genetic resources. There were 157 states and other entities that signed the convention in Rio. Since its adoption, signing, ratification and enforcement, the convention has emerged as a fundamental legal document, which establishes a new regime

governing the use and conservation of biological resources. The Royal Government of Cambodia ratified the Biodiversity Convention in January 1994.

The provisions in the Convention for *in situ* conservation recognize that Cambodia's environmental resources should be locally preserved. In the provisions for *ex situ* conservation, the interest to protect biological resources is recognized. There are also other provisions of the Biodiversity Convention, such as those on research and training, public education and awareness and the need for impact assessment with respect to projects that may threaten genetic resources, species or habitats. These provisions allow for the development of a technical, social and management infrastructure conducive to better protection of the earth's biological diversity. Sharing of information and cooperation among parties to the convention are other important elements. Cambodia and other member states of the convention focus on three priority areas:

- Coastal and marine ecosystems and environmental threats;
- Biodiversity conservation and sustainable development; and
- Management strategies for conservation and sustainable development.

The marine flora and fauna obviously constitute a large part of the country's biodiversity. The marine and coastal resources of Cambodia are seriously threatened by water pollution, coastal developments, overfishing, and other forms of habitat destruction. Thus, there is a need to protect, conserve and manage such resources and in that respect Articles 56, 61, 62, 192 and 194 of the UNCLOS can be considered as complementary and supportive to the Biodiversity Convention. The management of Cambodia's coastal biodiversity will require close coordination among relevant government agencies and local communities.

UN Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 also at the UNCED in Rio de Janeiro. This marked the culmination of international initiatives that have

been ongoing since the United Nations Conference on the Human Environment (held in Stockholm, 1972). Cambodia ratified the Convention on 18 December 1995. The convention's objective is to regulate levels of greenhouse gas concentrations in the atmosphere so as to avoid global climate change to a degree that would be harmful to economic development and that would impede food production.

The convention is founded on the principles that parties should take courses of action, in respect of their economic and social activities, and with regard to the convention's requirements, which will protect the climate system for present and future generations. MoE presented a statement on climate change at the Third Session of the Conference of Parties in Kyoto, Japan, December 1997. The Cambodian Government intends to be involved in a global mechanism to deal with this critical issue.

POLICY, LEGAL AND ORGANIZATIONAL CONSTRAINTS

The implementation of sustainable resource use policies and environmental management in coastal areas of Cambodia has faced numerous setbacks due to policy, legal and institutional constraints.

Policy Constraints

National policies and sector policies seem too broad or too demanding in relation to available financial resources. There is no specific focus on coastal areas in the policies related to the environment, fisheries, industry, transport and tourism. There is, subsequently, no specific coastal zone policy, even with regard to integrated or coordinated coastal zone management.

Lack of implementation and unclear responsibilities for the implementation of these policies among local authorities are the main constraints in the protection, conservation and management of coastal and marine environmental resources. The political situation affects the development and implementation of integrated coastal zone planning and management policies and strategies. Policy implementation is also constrained by the existing legal and institutional frameworks.

Legal Constraints

One of the government's central ambitions is to develop Cambodia as a state with a functioning legal and administrative systems. Many decrees, laws, sub-decrees and other legal instruments have been issued or are being developed. The current process of lawmaking is usually carried out by a team of national and international experts. Most of these efforts are funded through international agencies.

In spite of the ambitions, several constraints in the legal framework persist. First, most laws and sub-decrees, which have been adopted, do not have supportive documents stating their rationale and objectives including guidelines for their interpretation. The result is that different interpretations are being made by different persons, even in the same region. Second, The Royal Decree on the Creation and Designation of Protected Areas (adopted on 1 November 1993) covers areas that are also covered in the fisheries and forestry laws in the context of protected areas. However, the Decree seems to give no clear responsibility to the MoE, or other specific ministry, to manage the designated protected areas. The Royal Decree does not define any measure to prosecute anyone who violates it. The penalties are to be established by laws or sub-decrees. Furthermore, the Decree does not make any reference to the determination of buffer and core zones of protected areas. The result is a situation of unclear institutional mandates and weak enforcement mechanisms. Third, many laws, sub-decrees and other legal instruments are needed to address and regulate economic development. The process of developing laws is attempting to keep pace with the rapid emergence of economic opportunities. The result is a situation where laws are drafted quickly and insufficient time is being given for consultations with communities, resource users and other stakeholders which in turn leads to difficulties in law enforcement. Fourth, the key provisions of many laws are not specified. The specifications are generally left to be defined in separate laws or sub-decrees. The result is that, due to the time needed to develop new laws and decrees, these definitions will take some time before they can be used. This will, in turn, affect the enforcement. Fifth, many laws that are presently being enforced are outdated, in whole or part, and do not reflect the current situation. For instance, the Fisheries Law of 1987 has the following constraints:

- a) no provisions to limit the size or age of harvestable marine fish or the protection of endangered species; and
- b) no prohibition in the use of mechanized push gear (for the gathering of shellfish) which destroys the seabed ecosystem.

Finally, the periods of political instability affect not only the effective enforcement of the laws but also the development of new laws and regulations.

Organizational Constraints

Government institutions are facing many constraints both at national and local levels. At the local level, there are the provincial authorities, provincial sector departments, district authorities, communal and village offices, which are all part of the government structure. In terms of constraints, they have at least two major problems in common. They are all suffering from or are hampered by the unstable political situation and they all lack financial resources.

Human Resources Constraints

The immediate constraints with regards to human resources are the inadequate knowledge, skills and experience of some staff in provincial field offices regarding coastal resources and environmental management. The needed management skills include the expertise to implement sustainable management of fisheries, forestry, industry, tourism, transportation, etc.; environmental planning and management; skills to strengthen law enforcement (including the capacity to understand the context of laws, sub-decrees and related instruments issued at both national and international levels); and the capability to promote environmental awareness to the public.

At the village level, there is a lack of awareness on the cause and effect of environmental degradation. The APHEDA workshop referred to earlier, which was intended to promote environmental consciousness, fell short of its target due to funding constraints. The difficulty in reaching the capacity building target could also be noticed in the training component for government staff within a Danida funded coastal project. There is a need for these initiatives to be continued and expanded in scope.

Law Enforcement Constraints

The main laws related to the management of coastal resources are Fisheries Law, 1987; Forestry Law, 1988; Land Law, 1992; Law on Land Management, Urbanization and Construction, 1994; Law on Environmental Protection and Natural Management, 1996; and Royal Decree on the Creation and Designation of Protected Areas, 1993.

These laws are not well implemented due to the political influence, uncontrolled development and the impact of selfish interests. These led to:

- Disorder in logging and transportation;
- Disorder in fishing where about 50% of boats do not have permits, use of illegal gear, use of bombs or grenades in some places, illegal fish transportation and depots and encroachment of mangrove areas for saltpans and shrimp farms;
- Disorder in construction, especially in the cities;
- Encroachment of forest land and mangrove areas for agriculture; and
- Lack of monitoring or control (e.g., checkpoints at roads) leading to disorder in the use of natural resources and in the transportation of natural products (checkpoints are not referred to in the Fisheries and Forestry Laws).

Aside from the above, there are also technical constraints, which include:

- Lack of qualified law enforcement officers and staff;
- Lack of monitoring equipment (e.g., patrol boats);
- Local people's unfamiliarity with the law; and
- Provincial departments do not have the power or resources to monitor the use of natural resources.

Management System Constraints

As mentioned earlier, the responsibility for coastal zone management and coastal development is shared by many ministries and departments. On occasion, their duties and responsibilities are not

consistent with laws, sub-decrees or other government decisions. In some cases, departments work independently. This leads to management overlap and conflicts. The main activities that lead to, or could lead to overlap and conflict in the coastal areas are (see also Tables 2.6 and 2.7):

- Land expansion (i.e., conversion) for agriculture, rice fields and industrial crop cultivation, saltpans and urban development;
- Mangrove deforestation for charcoal production, shrimp farming and other purposes;
- Expansion of tourism areas and activities into protected areas;
- Increase in transportation activities (maritime transport, port development and congestion in ports); and
- Increased use of pesticides and fertilizers for agriculture.

Presently, there is a trend to move from a decentralized management system to a centralized one. This process has become a constraint for provincial departments as it has created situations where the lines of authority are ambiguous.

Financial Constraints

The main income of the provinces and municipalities comes from the national budget, which are in turn derived from provincial and municipal tax collection. All provincial and municipal tax revenue is transferred to the Ministry of Economics and Finance by the provincial and municipal departments of finance. Due to this, for any expenditure mentioned in the Law on Financing and Property Regime in Provinces and Municipalities adopted in

1998 (Article 19), the provinces and municipalities should submit proposals in order to get budget allocations from the Ministry of Economics and Finance. Only a small part of the income and revenue collected can be directly used by the provinces and municipalities. They then face difficulties in collecting sufficient revenue for their requirements. The lack of funds from both internal and external sources prevents the ministries and other agencies from fulfilling their mandates. As such, bilateral and multilateral financial assistance provides important support.

RECOMMENDATIONS

The Cambodian government has no policies specific to coastal zone management. Sectoral policies for fisheries and industry, for example, are taken as applicable approaches to coastal zone management. The objectives of suggested recommendations for the development of policies for coastal zone management are as follows:

- To promote the economic growth of all productive sectors and services, which in turn will ensure political, economic and social stability;
- To enhance the administrative infrastructure of provinces through human resources development and financial support;
- To encourage the development of laws, sub-decrees, or other legal requirements relating to coastal zone management;
- To ensure compliance with laws, sub-decrees, and other requirements through capacity building; and
- To protect the natural resources and the

Table 2.6 Current and Potential Overlaps and Conflicts between Sectors.

Responsible Department/Office	In	Fo	Fi	Ag	To	Tr	Lu	Rd	En
1 Industry (In)		P	CP	P	P	P	CP		CP
2 Forestry (Fo)	P		CP	CP	P	P	CP	P	CP
3 Fisheries (Fi)	CP	CP		CP	P	CP	CP	P	CP
4 Agriculture (Ag)	P	CP	CP		CP		CP		CP
5 Tourism (To)	P	P	P	CP		P	CP		P
6 Transportation (Tr)	P	P	CP		P				CP
7 Land Use (Lu)	CP	CP	CP	CP	CP			CP	CP
8 Rural Development (Rd)		P	P				CP		CP
9 Environment (En)	CP	CP	CP	CP	P	CP	CP	CP	CP

Note: C- Current Overlaps and Conflicts, P- Potential Overlaps and Conflicts

environment of the coastal zone.

For the successful implementation of these policies, some strategic actions need to be taken.

Strategy 1: Promote economic growth in the coastal zone

- 1.1 Attract foreign investment to the coastal areas to increase employment opportunities and incomes;
- 1.2 Increase support for the following sectors:
 - a) Agricultural production, develop agricultural products for agro-industrial use, local consumption and export;
 - b) Livestock, animal husbandry, mariculture, and aquatic products;
 - c) Forest products in concession areas, reforestation; and
 - d) Manufacture of cement, fertilizer, clothing, fish sauce, canned products and salt products;
- 1.3 Develop services based on natural resources such as, eco-tourism, marine sanctuaries, sport fishing; and
- 1.4 Develop transportation infrastructure.

Strategy 2: Enhance administrative infrastructure and develop human resources

- 2.1 Strengthen the central administrative system of each ministry to ensure that decisions affecting natural resources are reviewed by all relevant authorities;

- 2.2 Improve delivery of government services to investors and the public;
- 2.3 Train officials in methods of integrated coastal zone management and sustainable development;
- 2.4 Ensure that officials appointed to positions of responsibility are qualified; and
- 2.5 Increase salaries of government officials.

Strategy 3: Develop laws on coastal zone management

- 3.1 Develop laws on coastal zone management to complement existing laws on environmental protection;
- 3.2 Formulate sub-decrees on marine pollution and solid waste;
- 3.3 Include commitments to international conventions in national laws and sub-decrees; and
- 3.4 Develop mechanisms for local community participation in the formulation of laws.

Strategy 4: Strengthen law enforcement

- 4.1 Strengthen the enforcement of existing laws;
- 4.2 Amend some of the existing laws, such as the fisheries and forestry laws;
- 4.3 Train officials to understand the content of laws, improving implementation;
- 4.4 Develop procedural guidelines to ensure communities understand and participate in the development and enforcement of laws;
- 4.5 Strengthen monitoring systems including measures for legal action against violators of laws on environmental protection;

Table 2.7 Current and Potential Overlaps and Conflicts within the Legal System.

Legal Systems	FoL	FiL	LEP	LL	LLM	RD
1	FoL - Forestry Law, 1987	CP	CP			CP
2	FiL - Fisheries Law, 1988	CP	CP			CP
3	LEP - Law on Environmental Protection and Natural Management, 1996	CP	CP			
4	LL - Land Law, 1992	P			CP	CP
5	LLM - Law on Land Management, Urbanization and Construction, 1994			CP		
6	RD - Royal Decree on the Creation and Designation of Protected Areas, 1993	CP	CP	CP		

Note: C- Current Overlaps and Conflicts, P- Potential Overlaps and Conflicts

- 4.6 Foster cooperation among authorities from the ministries to the villages, in the effort to enforce the laws; and
- 4.7 Engage the assistance of relevant NGOs in monitoring and enforcement of laws on the protection of the environment.

Strategy 5: Protect coastal resources

- 5.1 Develop a coastal zone master plan for each coastal province and municipality;
- 5.2 Promote environmental awareness at the community level through schools, media and in the process, relate to elements of indigenous belief;
- 5.3 Encourage the conduct of coastal and marine scientific research and natural resource inventories;
- 5.4 Develop a marine research center; and
- 5.5 Foster cooperation between government agencies and international organizations to facilitate the exchange of information and technical expertise and provide for extension of needed financial support to improve coastal zone management and natural resources protection.

Strategy 6: Empower local communities to manage coastal resources

- 6.1 Provide opportunities for communities to demonstrate their commitment to manage their natural resources and economic base;
- 6.2 Ensure that communities and government agencies cooperate in the management of mangrove forests and fishery resources to benefit local villages; and
- 6.3 Offer community-based training for coastal resource management.

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REFERENCES

- EVS Environment Consultants, Ltd. 1996. Coastal and marine environmental management for the Kingdom of Cambodia. Prepared by EVS Environment Consultants Ltd. Vancouver, Canada (Asian Development Bank RETA 5552: Coastal and Marine Environment in the South China Sea.) Ministry of Environment, Phnom Penh.
- Anon. 1998. ASEAN renewal, 03 July 1998: 10.
- Ban Chang Regional Development Co., Ltd. & Act Consultant Co., Ltd. 1994. Presentation Text for Feasibility Study Tasks of Sihanoukville Industrial Zone.
- Bernard, P. 1934. Le problème économique Indochinois. Bibliothèque National, Paris.
- Brunier, H. 1914. Essai d'atlas statistique de l'Indochine Française. Bibliothèque National, Paris.
- Collard, P. 1925. Le Cambodge et les Cambodgiens. Bibliothèque National, Paris.
- Csavas, I., D.J. Douman, T.O. Petr, J. Prado and L. Debas. 1994. Cambodia rehabilitation and development needs of the fisheries sector. FAO Fisheries Circular No. 837, Rome.
- Department of Fisheries. 1997. Statistic of the Department of Fisheries of Ministry of Aquaculture, Forestry and Fisheries. Unpublished.
- MoE/IDRC (Ministry of Energy/International Development Research Center). 1995. Mangrove forest resources and local communities: Phnom Penh, Cambodia.
- Dreyfus, P. 1914. Le Cambodge économique. Bibliothèque National, Paris.
- Ebihara. 1968. Svay, a Khmer village in Cambodia. Columbia University, New York. Ph.D dissertation.
- ESCAP. 1993. Atlas of mineral resources of ESCAP Region. ESCAP, Bangkok. 10(87).
- ESCAP. 1995. Towards integrated coastal zone management in Asia, development and management of non-living resources in the coastal zone of the ASIA and Pacific. United Nations. New York. Volume 1.
- Henry, Y. 1932. Economic agricole de l'Indochine. Bibliothèque National, Hanoi.
- Hou Youn. 1955. La paysannerie du Cambodge et ses projet de modernisation. Bibliothèque National, Paris.
- Hu Nim. 1965. Les services publiques économiques au Cambodge. Bibliothèque National, Phnom Penh.
- Khan Sambourn and Touch Sambath. 1995. Status and issues of the coastal zone management in Cambodia. Paper presented at the 1st Coast Plan.
- Regional Working Group Meeting/ Coordinating Committee for Coastal and Offshore Geosciences Program in East and Southeast Asia, Bangkok, Thailand.
- Long Rithirak. 1995. Seagrass. Ministry of Environment, Phnom Penh.
- Mekong Committee. 1992. Fisheries in the Lower Mekong Basin. Main Report of the Interim Committee for Coordination of Investigations of the Lower Mekong Basin. Mekong River Commission, Bangkok.
- Ministry of Environment, IDRC and EVS Environment Consultant, Ltd. 1996. Coastal zone management in Cambodia. Ministry of Environment, Phnom Penh.
- Ministry of Planning. 1997. A Poverty Profile in Cambodia.
- Ministry of Environment. 1998. National Environmental Action 1998-2002. Ministry of Environment, Phnom Penh.
- Ouk Sisovann. 1997. Inventory for coral and coral reefs in Cambodia. Ministry of Environment, Phnom Penh. Unpublished.
- PADECO Co. 1996. Regional technical assistance to the Greater Mekong Sub-region for the mitigation of non-physical barriers to cross-border movement of goods and people. Completion Report, PADECO Co., Ltd. ADB.
- Pou Sothirak. 1996. Policy Position Paper for Sectorial Investment in the Industrial, Energy and Mineral Sector.
- Sluiter, L. 1992. The Mekong currency project for ecological recovery. TERRA, Bangkok.
- SweRoad in association with Lanxang International and Mari Term. 1994. Cambodia Transport Rehabilitation Study, ADB TA 1866.CAM. Co-financed by SIDA and UNDP, Phnom Penh.
- Tana T. S., et al. 1995. Evolution of the pelagic fisheries in Cambodia. Department of Fisheries, Phnom Penh.
- Touzet, A. 1939. Le Regime monétaire de l'Indochine. Bibliothèque National, Paris.
- Vimoul, Pen SPP. 1996. Country Report: Coastal zone management in Cambodia. Hat Yai, Thailand.

APPENDIX

REPORT OF THE WORKSHOP ON THE MANAGEMENT OF FISHERIES, COASTAL RESOURCES AND THE COASTAL ENVIRONMENT IN CAMBODIA: INSTITUTIONAL, LEGAL AND POLICY PERSPECTIVES

23 JUNE 1998, MINISTRY OF ENVIRONMENT PHNOM PENH, CAMBODIA

The workshop served to bring together experts, interested and concerned institutions, central government agencies, provincial authorities, NGOs and international organizations to discuss the contents and findings of the study as presented in the report. Feedback was sought to revise, as needed, the report and its recommendations. Furthermore, by assessing the level of support of key policies/decision-makers, it was an aim to build momentum in the process of improving the framework for planning and management of coastal development.

The workshop focused on how institutions, legal frameworks, policy and planning affect the management of fisheries, coastal resources and the coastal environment. The participants raised issues and concerns regarding the state of Cambodia's coastal areas and gave suggestions on coastal zone management for sustainable development. The workshop results were used as the basis for the draft report.

The participants came from the Ministries of Environment, Agriculture (Department of Fisheries), Industry, Mine and Energy, Tourism, Public Work and Transportation and Rural Development, the PMMR Project, the Environmental Management of Coastal Zone Project, the EIA Project, the AIT Project, the AFSC Organization, USAID, UNDP, IDRC, WI, CDC, CORIN in Thailand, and the governors and officials from the provinces of Koh Kong, Kampot, Sihanoukville, Kep City. A total of 53 people attended the workshop.

Following is a summary of the discussions of the three working groups:

Group I: Institutional Setting

Question:

Who are involved in - Coastal Zone Management (functions, roles, and responsibilities)

- Law Enforcement
- Strategic Policy and Planning (i.e., lack of coordination and integration)?

Results:

1. Relations between Provincial Authority and Ministries
 - a) Provincial authority shall manage the budget provided by the government.
 - b) Provincial authority cooperates with relevant ministries to prevent illegal activities and protect coastal resources and environment.
 - c) Provincial authority manages administration of the province and encourages cooperation between itself and other relevant departments in the province.
 - d) The provincial authority has more power than the departments in the province.
 - e) There is a lack of good relations between the provincial authority and central governmental ministries.

Issues:

- a) Lack of budget.
- b) Titles to land, salt pans and shrimp farms were issued without consulting with the relevant agencies.
- c) Local authorities do not follow established plans (i.e. master plan, etc.).
- d) Some relevant institutions have been involved or consulted in decision-making at the local level.

Proposed Measures:

- a) The national committees should be aware of the problems happening in local communities and help communities to address them.
- b) Relevant institutions should inform and advise provincial authority in decision-making on projects.
- c) Issuing titles or rights to establish and use salt pans should be prohibited.

2. Law Implementation

Issues:

- a) The implementation of the law in local communities is limited.
- b) The relationship among government departments at the provincial level is not good.
- c) Local authorities are not consulting relevant departments in the implementation of their activities.
- d) Some laws are out of date.
- e) Roles and responsibilities overlap between government in as far as the implementation of the law.
- f) Land titles in the coastal areas were issued without consulting relevant agencies.
- g) Laws and regulations have not been disseminated to local communities in a good way.
- h) Laws are enforced only on people who have no power.
- i) There is a lack of facilities to implement and enforce the law.
- j) Some laws have penalties that are too lenient.
- k) The sanctions included in the law of fisheries are not appropriate.

Proposed Measures:

- a) Proposed documents or projects should be submitted to the relevant technical agencies.
- b) Clarify roles and responsibilities of relevant government agencies in coastal zone management.
- c) Provincial authority should consult with technical agencies before making decisions on investment projects and before issuing any land titles in coastal zones and national parks.
- d) Set up guidelines for local authorities to grant permissions for investment.
- e) Propose additional laws and regulations and to improve existing laws and regulations.
- f) Set up small-scale industries to attract investment.
- g) Build a hydropower station in Kamchay Mountain that could generate power for four provinces.
- h) Human resources training at the provincial, district and commune level should be encouraged, especially with regard to coastal

resource management.

- i) Build a research center for coastal resources.
- j) Set up a master plan for the management and use of coastal lands and natural resources.

Group II: Legal Framework

Question:

Who are involved in - Coastal Zone Management (functions, roles and responsibility)
- Law Enforcement
- Strategic Policy and Planning (lack of coordination and integration)?

Results/Issues:

1. Law Implementation
 - a) Difficulty in educating of the public about the law.
 - b) Lack of good cooperation.
 - c) Gaps in the legal system.
 - Discrepancies in law enforcement.
 - Overlap of roles and responsibilities between agencies
 - Lack of human resources to develop the law and legal provisions.
2. Roles and Responsibility
 - a) The responsibility of respective (technical) agencies in law enforcement and the management of human resources is not clear.
 - b) Lack of human resources
 - c) Overlapping of responsibilities
 - d) Political instability
 - e) Poverty
 - f) The new management system(s) employed by line agencies is(are) not doing well.
3. Proposed measures
 - a) Develop a master plan for the four provinces.
 - b) Development of law or sub-decrees for marine pollution.
 - c) Strengthen and improve the vertical line of management responsibilities of (technical) agencies.
 - d) Encourage the implementation of international laws and conventions such as

UNCLOS, MARPOL and Ramsar.

- e) Amend coastal related laws to improve coastal zone management.
- f) Set up an Integrated Committee for Coastal Zone Management at the provincial level.

Group III: Policy and Planning

Question:

Who are involved in - Coastal Zone Management (functions, roles, and responsibilities)
- Law Enforcement
- Strategic Policy and Planning (i.e., lack of coordination and integration)?

Results/Issues:

1. Policy
 - a) Policies should meet the needs of the people.
 - b) The policies of government agencies should follow national policy and should be appropriate to the tradition of the communities.
 - c) Identify the institutions that are responsible for the management of the coastal zone.
 - d) A clear national policy for the coastal zone should be developed in collaboration with the relevant (technical) agencies.

2. Strategic Planning
 - a) Plans should be made with complete data and information.
 - b) The management of coastal resources should involve local communities.
 - c) Develop a master plan for the coastal zone in collaboration with relevant (technical) agencies.

3. Consequences
 - a) Government's plans do not meet the people's needs.
 - b) Plan implementation is not done well because of faults in the administrative system.
 - c) The cooperation of agencies is limited.

4. Proposed Measures
 - a) Review and improve the existing laws.

On the whole, the workshop was thought to be useful. It provided an opportunity for cooperation among government ministries, provincial governments, NGOs, international organizations and other agencies and to discuss and cooperate to address crucial issues.

Coastal Resources Management in Indonesia: Legal and Institutional Aspects

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ABSTRACT

This research explores legal and institutional aspects of fisheries and coastal resources management. The analysis is based on the principles of integrated fisheries management which includes seven key management factors: (1) information systems; (2) natural resources assessment; (3) natural resources allocation; (4) natural resources utilization and protection; (5) process of production; (6) marketing; and (7) MCS (monitoring, control and surveillance) systems. This study includes three locations, namely Ameth Village (Nusa Laut Island), Sulamu Village (Kupang Bay) and Kampung Laut (Segara Anakan).

Findings indicate that fisheries and coastal resources management in Indonesia is not yet effective. Laws, regulations and policies have been issued by the Government of Indonesia as legal bases for developing marine fisheries management. The General Guidelines of State Policy (GBHN) of 1993 and 1998 provide policy guidelines of fisheries and coastal marine resources management. Since 1993, implementation and development of integrated fisheries management have been intensified in several coastal and marine areas of Indonesia. However, several problems still exist as a result of conflicting interests among stakeholders and overlapping jurisdictions over marine resources among government institutions and agencies. These problems include coastal and marine resources depletion, degradation of aquatic habitats and marine pollution.

The principles of integrated fisheries and coastal resources management have been developed, but such actions did not really address the roots of the problems, i.e., conflicts of interest and overlapping jurisdictions among stakeholders, including governments, the coastal communities and the private sector. Decentralization is not apparent. The role of provincial and district (*regional*) governments in managing coastal and marine resources is not significant yet. Even though (*de facto*) regional and local governments are engaged in several marine activities, they do not have jurisdictions (*de jure*) over marine resources. The involvement and participation of local community still needs improvement. The revitalization of environment-friendly traditional values and practices is required to improve management that promotes ecological and economic benefits for local communities and national interests.

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INTRODUCTION

Pressures on coastal and marine resources in Indonesia have increased in the past years. Erosion, pollution and sectoral and use conflicts have become major problems in most of the country's coastal zone. These problems are associated with the negative impacts of land-based activities such as, deforestation, pesticide in agriculture, and waste disposal. The situation is further aggravated by inappropriate fishing practices such as the use of dynamite, poisonous chemicals, and small mesh size gill nets. Other contributing factors include pollution from marine transportation, coral reef mining, and exploitation of mangroves by local communities and big business.

The coastal environmental problems are more severe on the west coast, particularly northern and southern Sumatra, Bali, and the Java Sea. Intensive mariculture projects, coral mining practices, and destructive fishing in these areas are causing serious damage to reefs, mangroves and fish populations. Pollution has become a major problem, particularly industrial and household waste from the densely populated islands of Sumatra and Java. In contrast, eastern Indonesian waters face less pressure from land-based activities. Most parts of this region are still in good condition. However, a number of investors have built intensive mariculture projects and exploitation of fish stock exceeds sustainable levels. Competition between big business and local communities is apparent. Community access to coastal and marine resources is threatened.

More than 60% of Indonesia's population lives in coastal areas. The population is estimated to be 251 million by 2020 with an annual growth rate of about 1.5%. The contribution of marine-based activities to the national economy has increased from 12% in 1987 to 24% in 1992 and is expected to accelerate economic growth over the next five years. The pressure on coastal and marine resources will increase significantly as marine-based activities are expanded to support development. Marine resources management is difficult because implementation of existing laws concerning coastal and marine resources is poor. The existing laws are not a sufficient legal basis for integrated coastal and marine resources management. In addition, the absence of clear mandates among institutions makes

for ineffective coastal and marine management. Each institution focuses on particular resources and deals with its own interests. Indonesia needs to develop environmental management policies that promote sustainable development through the optimum use of coastal and marine resources and effective environmental protection. Policies must satisfy both national and local interests.

Critical Issues

A number of laws concerning fisheries and other marine resources along with regulations have been established and provide some legal basis for government institutions to manage coastal and marine fisheries resources. The existing laws and regulations allow the private sector, communities and other legal entities to use coastal and marine resources. However, implementation is hampered by legal constraints, misinterpretation, conflicts of interest, and overlapping jurisdictions. The result is a climate of uncertainty and inconsistency on law enforcement. Lack of coordination and cooperation among government institutions further hampers the process of promoting integrated fisheries, coastal, and marine resources management and there is often conflict among stakeholders regarding licenses and permits. The result is over-capitalization in the industry and overexploitation of marine resources. This will accelerate the degradation of coastal and marine resources and imperil the absorptive capacity of the marine environment. The net result is likely to be depletion of stocks, aquatic habitat destruction, and widespread pollution.

Regional governments do not have a mandate to manage coastal and marine fishery resources. They cannot directly take the necessary actions to deal with problems. In reality, the regional governments do engage in coastal and marine fishery regulation, but such actions have led to legal and technical constraints. The one legal instrument used by the regional governments is Article 9 Paragraph 1 of Act No. 24, 1992 on Spatial Planning. This Article states that the regional governments do have a mandate to carry out spatial planning in marine areas. However, while the Act itself has been passed, the implementing regulations are still in preparation.

This confusion over the status of existing written

marine laws and regulations has encouraged coastal communities to apply their own unwritten traditional laws (*hukum adat* or *adat* laws). Implementation of *sasi* law in Haruku, Saparua and Nusa Laut Islands is a classic example. The *adat* laws are legally recognized by the Indonesian legal system. For example, Articles 3 and 5 of Act No. 5, 1960, explicitly recognize *adat* law and state that the existing *adat* law can be implemented in the field of *agraria* as long as it is in line with the existing written laws and regulations. While national laws and regulations promote integration of *adat* laws and try to accommodate traditional rights (*hak ulayat*) of coastal communities, they have to be adjusted to the existing written laws and regulations so their implementation does not contradict national regulations and policies.

Several recent studies on legal and institutional aspects of coastal and marine fishery resources management may have given readers the wrong understanding of unwritten *adat* laws. The application of many different *adat* laws without considering the national interest may bring about serious legal and social problems. The development of coastal communities is the responsibility of regional governments, which have tried to mobilize communities to participate in managing resources.

Poverty has forced many members of coastal communities, most of whom are small-scale fishers, fish-farmers and coastal farmers, to engage in destructive and illegal practices such as dynamite fishing, poison fishing, coral reef and sand mining, mangrove cutting, and coastal land clearing. This has led to conflicts of interest among local resource users. These conflicts involve conflicts of *adat* laws. Efforts to integrate and incorporate the traditional values and norms of *adat* laws into the national legal system is not an easy task and will require in-depth analysis of legal and institutional aspects of integrated coastal and marine resources management, including analysis of private and public interests.

Fisheries, coastal and marine resources management are frequently discussed. However, discussions tend to lack comprehensive data and information. Two crucial problems rarely discussed include overlapping jurisdictions and conflicts of interest.

The existing laws and their implementing regulations provide government agencies and institutions with a mandate to carry out certain activities related to exploration, exploitation, management and conservation of coastal and marine resources. These laws and regulations were issued in accordance with the national legal system. Unfortunately, they are not easily integrated or effective. Each party tends to see laws and regulations from a different sectoral perspective and with different interests in mind.

According to Act No. 5, 1974 on Basic Provisions of Regional Government, the regional governments do not have jurisdiction over fisheries, coastal, and marine resources. In reality, regional governments do engage in marine related activities such as issuing licenses for fishing vessels under 30 GT, coastal aquaculture, cage culture, marine tourism, mangrove protection, mitigating marine pollution, collecting fees and taxes from several marine activities, and solving socioeconomic problems of coastal communities. In this regard, the regional governments have used Article 9, Paragraph 1 of Act No. 24, 1992 on Spatial Planning as the legal basis to support their marine activities, including fisheries. This situation has created uncertainty over jurisdictions of regional governments over coastal and marine resources.

Article 9, Paragraph 1 of Act No. 24, 1992 stipulates that the regional governments have a legal right to conduct spatial planning in coastal and marine areas with outer boundaries delimited by another Act. However, the Act referred to in Article 9 has not yet been promulgated by the Ministry of Home Affairs. This Act proposes a marine management area of 12 nautical miles from the shoreline. However, this proposed limit has not yet accommodated various traditional maritime boundaries, which are determined by *adat* laws. Within these management areas, *adat* communities exercise their traditional rights (*hak ulayat*) for the purpose of fishery resources exploration, exploitation, management and conservation. Application of two different sets of laws frequently leads to conflicts. These problems could be addressed through the development of co-management arrangements.

Scope and Area of Study

The purpose of this study is to examine the development of integrated coastal resources management, focusing on co-management and community-based approaches. The study will include the following:

- Review and analysis of the legal, institutional, and policy framework;
- Review and analysis of the patterns of coastal resources management, including the use of space;
- Review and identification of the role of interested parties, including governments at the national, regional, and local levels; and
- Review and analysis of cultural aspects such as religion, traditional values, beliefs and practices.

The study was conducted in three locations: Ameth Village, Nusa Laut Island, Maluku; Sulamu Village, Kupang Bay, Nusa Tenggara Timur; and Kampung Laut, Segara Anakan, Central Java. These areas were selected based on:

- The presence of a government development program;
- The presence of a coastal resources management scheme;
- Overlapping jurisdictions and conflicts of interest;
- The existence of *adat* laws influencing community participation;
- Representation of specific coastal and marine environments;
- Availability and commitment of government officials; and
- Access and availability of communication facilities.

METHODOLOGY

The primary data gathered through field observations and interviews include all data and information regarding coastal and marine fisheries management, particularly those with legal, institutional, social and cultural aspects. The secondary data include all reports and publications on coastal and marine resources management and legal materi-

als were gathered through library studies and interviews. Field research was conducted twice in Segara Anakan, Kupang Bay and Nusa Laut Island. The field research was carried out in February and in May 1998.

The qualitative method analyzed data based on interpretations of the contents of acts and regulations, traditional laws, and legal mandates of government institutions and agencies. The descriptive method analyzed data on the implementation of acts, regulations, traditional laws and legal mandates in the field. These were reflected in the economic and cultural life of fishing communities. By comparing results of qualitative and descriptive analysis, problems and constraints of coastal and marine fisheries management could be identified and solutions recommended.

The legal approach used in this study can be described as:

- Judicial normative more qualitative than descriptive, leads to data analysis and discussion, for example, on legal principles, history, background and content of an Act and its implementing regulations; and
- Judicial empiric more descriptive than qualitative, directs data analysis and discussion to the implementation of laws and regulations in the field.

Using the legal approach, we would know how a law and its regulations should be executed and how it is actualized in the field. In this way, the gap between *das sollen* (the law as it should be) and *das sein* (the law as it is implemented) can be identified.

The institutional approach outlines the legal mandate provided by the laws and regulations. This mandate covers tasks and functions as well as competencies and responsibilities of a stakeholder managing coastal and marine resources. The approach emphasizes inter-institutional relationships, overlapping jurisdictions, and conflicts of interest that occur because of decentralization and deconcentration.

A systems approach views coastal and marine

resources management as an integrated system. To understand the application of this approach, the meaning of integrated coastal and marine resources management must be clear. In this study, the following definition is used: coastal and marine resources management is a conscious process of decision-making whereby these resources are allocated over time and space to optimize the attainment of society's stated objectives, within the framework of its science and technology, political and social institutions, legal and administrative arrangements.

CHARACTERISTICS OF MARINE RESOURCES

Mangroves

Indonesia has the largest concentration of mangrove forests in Southeast Asia with an estimated area of 3.8 million ha. Mangroves are mostly found in Irian Jaya, Sumatra, Maluku, Kalimantan, Sulawesi, Java, and Nusa Tenggara.

There are at least 89 species dominated by the genera *Rhizophora*, *Avicenia*, *Sonneratia*, *Bruguiera*, *Xylocarpus*, *Ceriops*, and *Exoecaria*. Mangrove forests grow well in the estuaries and deltas of large rivers forming the main supporting ecosystem for marine and coastal areas. These forests function as breeding areas for numerous fish species and invertebrates. The long submerged roots of mangrove trees help prevent erosion and coastal damage. The forests are a source of income from fishing, firewood, timber and medicinal extracts for local communities. Unfortunately, illegal harvesting of trees, particularly for firewood and building materials, has significantly decreased forest cover. The degradation is also caused by intensive mariculture, which has expanded rapidly in the past few years. In 1982, mangrove forest cover was estimated at 4 251 011 ha. In 1987, it was 3 235 700 ha which represents a 30% loss. Only a small part of Indonesia's mangrove is considered to be in excellent condition (Moosa et al. 1996). The degradation of mangrove forests has accelerated due to the increase in timber exports and the extension of mangrove production concessions to small and large-scale businesses.

Coral Reefs

Coral reefs abound in Indonesian waters, particularly in shallow and calm waters. There is an

estimated 75 000 km² of coral reefs including fringing reefs, barrier reefs, and atolls. Coral reef ecosystems have high organic productivity. Unfortunately, most coral reef ecosystems are threatened by practices such as coral mining, dynamiting and poison fishing, pollution from industrial and household areas, and sedimentation from land-based activities. In 1996, 73% of reefs in Indonesia were considered damaged. Only 22% were considered to be in good condition while only 5% were excellent. The heaviest damage occurred in the Seribu, Bali, and Morotai Islands.

Seaweeds and Seagrasses

There are at least 7 families and 13 species of seaweeds found in Indonesian waters. They cover the coastal areas of Sumatera, Java, Bali, Kalimantan, Sulawesi, Maluku, Nusa Tenggara and Irian Jaya. Seagrass fields are also found in most coastal areas. These areas are highly productive and host to various organisms. They are an important food source and their dense root systems stabilize the bottom. They act as nursery grounds for several commercially important species.

Fisheries

In the 1980s, potential fish production was estimated at around 6.6 million tons per year, consisting of 4.5 million tons per year from territorial waters and 2.1 million tons per year from the exclusive economic zone (EEZ). According to the Research Institute for Marine Fisheries (RIMF) and Directorate General of Fisheries (DGoF) (Moosa et al. 1983, 1996), the annual potential fish production per year in 1982 included:

- Demersals (2.5 million tons)
- Small Pelagics (3.5 million tons)
- Large Pelagics (441.0 thousand tons)
- Skipjacks (275.0 thousand tons)
- Tuna (161.0 thousand tons)
- Penaeid (69.0 thousand tons)
- Other crustaceans (25.0 thousand tons)
- Coral reef fish (48 thousand tons)

In 1983, fish production in EEZ waters was 250 500 tons or about 25% of total potential production. According to Moosa et al. (1996), total fisheries production was around 40% of maximum sustain-

able yield. However, overfishing has occurred in some regions, mostly along the west coast and overexploitation of shrimp fishing is apparent in the Arafura Sea.

In order to conserve endangered species, Indonesia has taken measures to protect a number of marine animals, including mammals, birds, and reptiles.

Marine Transportation

Marine transportation is vital in an archipelago. Loading and unloading tonnage measures the amount of marine transportation. The highest concentration is in Riau, loading 56 618 800 tons and unloading 14 059 000 tons. Marine transportation potentially creates pollution that threatens marine and coastal ecosystems. Marine transportation may not relate directly to fish production, but pollution can damage fish habitats, particularly coral reefs and their ecosystems. Therefore, fish production is obviously influenced by the way marine and coastal environments are managed (CBS 1995).

Social Aspects

In 1992, the population of Indonesia was 179 322 million. This figure increased to 200 000 million in 1998. The growth rate during that period was 1.7% annually. Population density in 1992 was 93 per square kilometer and this increased to 102 persons per square kilometer in 1995. However, the population is not equally distributed. About 58% of the population live on Java which constitutes only 7% of the territory. With a population of 114 987 million, the density in Java is 870 persons per square kilometer. In Irian Jaya, which is 22% of the area, the population density is only 5 persons per square kilometer (CBS 1995).

CBS indicated that life expectancy was 61.5 years with a mortality rate of 68 per 1 000. Those with access to potable water was 42%, health treatment 43% and sanitation 44%. The literacy rate was 61%. Sixteen percent of those over 5 years of age never attended school (CBS 1995). Livelihoods were based on farming and fishing (54%), services (38%), and industry (8%). Income per capita is US\$ 560

with a Gini Index of 0.31. There were 1 889 542 marine fishers in Indonesia in 1995. The north coast of Java has the highest number of fishers and East Java has more than other provinces (CBS 1995).

PATTERNS OF RESOURCE MANAGEMENT

Fishery Resource Management

Traditionally, fishing has been carried out by coastal communities equipped using small boats. The use of larger vessels (20-30GT) was adopted recently and has increased fish production in the past few years. It has also extended fishing areas across national waters. Extension is also stimulated by the practice of fishers to fish on a seasonal basis. With increased mobility in larger vessels, the potential for conflict between local communities and fishers from different areas increases. Starting in 1992, DGoF produced a fisheries management plan based on seven management zones. These zones include:

- Malaka Straits;
- Natuna Sea and South China Sea;
- Java Sea;
- Flores and Malaka Straits;
- Maluku Sea, Halmahera Sea, and Tomini Bay waters, Banda Sea and Arafura Sea;
- Sulawesi Sea and Pacific Ocean; and
- Indian Ocean.

The fisheries resources management plan applied by the DGoF is called *Pengelolaan Bersama* (Collective Management System). Implementation is carried out by the Forum of Coordination for Fisheries Resources Use, also known as *Forum Koordinasi Pengelolaan Pemanfaatan Sumberdaya Ikan* (FKPPS). The forum consists of representatives from national and local governments, the private sector and local fishers. The main activity of the forum is to organize fisheries use for the mutual benefit of all stakeholders and monitor the implementation of action plans established by the FKPPS. The plans are based on regular meetings conducted by FKPPS. FKPPS involves institutions such as the DGoF, local fishery agencies, scientific commissions, companies, and communities. Problems faced by an area or sector may be put forward during a FKPPS meeting

and collectively, members try to find the best solution. Technical meetings address some of the following issues:

- Estimates of fishery resources, fish types, and their distribution;
- Allocation of fishery resources and quotas;
- Preparation of resource allocation plans;
- Monitoring *andon* and migrating fishers;
- Agreements on fish aggregating devices;
- Agreements on conservation areas;
- Protecting fisheries resources;
- Resource access; and
- Management constraints.

Estimates of Fishery Resources, Fish Types and Their Distribution

Estimates of fishery resources, including fish types and distribution, are provided by the Commission of Research and Fishery Resources Development (CRFRD) in order to assist fisheries management. Information provided by CRFRD is used by FKPPS and other organizations established by CRFRD to determine and assess fisheries resources.

Allocation of Fisheries Resources and Quotas

Allocation of fisheries resources is determined by FKPPS through a meeting that involves all members including local fishery agencies and fishing companies. Agreements usually provide data and information on the potential resources, catch, total production, and further development plans. This information helps determine the allocation of resources.

Preparation of Resource Allocation Plans

Distribution of fishers and catching activities are not equal, resulting in an imbalance between the capacity of certain areas and actual fish production. Some locations are intensively exploited while others are not. In order to maintain a balance harvest, the government encourages fishing companies and local fishers to fish in under-exploited waters. To encourage partnerships, Decree No. 509, 1995 from the Minister of Agriculture concerning Core Community Business Development (*Perusahaan Inti Rakyat*) was

issued to develop partnership in fisheries management between big businesses and small-scale fishers.

Monitoring *Andon* and Migrating Fishers

The development of marine fishing activities has created two types of fishers: migrating and *andon* or permanent fishers. Migrating fishers are those who use relatively large vessels and fish in other provinces then return to their ports of origin. *Andon* use smaller vessels (5-10GT) and work from temporary bases.

Agreements between migrating and *andon* fishers are usually approved by the Collective Management Board and an FKPPS meeting. In order to formulate an agreement, the following steps are usually undertaken:

- The migrating fishers must bring a letter of recommendation from the local fishery agency (LFA) nearest their home port to the LFA nearest their intended catching area; and
- *Andon* fishers must bring a letter of recommendation from the LFA nearest their home port.

Andon fishers then report to the LFA official or local government official in the area they intend to fish and the local government official issues a letter of recommendation. The system provides for maximum production as well as equity. Unfortunately, it is not effectively implemented because local fishers tend to ignore these administrative systems.

Agreements on Fish Aggregating Devices (*rumpon*)

The use of fish aggregating devices (FAD) (*rumpon*¹) among fishers has increased in the past few years, a trend that may cause environmental damage and conflict in the years ahead. In order to control the *rumpon*, the Ministry of Agricultural issued Decree No. 51, 1997 on its installation and use. The decree regulates the licensing system of *rumpon* installation and use by fishing companies and fishers. This regulation is not well imple-

¹ A *rumpon* is a fish aggregating device made up of a line with coconut leaves tied at the end.

mented. Findings indicate that local fishers still practice illegal fishing by using *rumpon* in the waters near their village. This threatens local community interests.

Agreements on Conservation Areas

Certain commercial fishing regulations are designed for areas with limited resources and areas where use of fishery resources is prohibited in order to protect them. Unfortunately, in the absence of effective law enforcement, illegal fishing of endangered species continues.

Protecting Fisheries Resources

Policies on fishery resource use is intended to lead to effective law enforcement. DGoF and the Navy have established joint programs. The Department of Agriculture (DA) assigns Coast Guards, but the control system is ineffective. The use of destructive fishing methods such as dynamites, poison, and prohibited nets has increased. Illegal fishing by foreign fishers is also a serious threat.

Legal issues are addressed in FKPPS technical meetings, particularly in relation to the following laws and decrees:

- Law No. 9/1985 on Fisheries;
- Law No. 5/1990 on Conservation and Ecosystem of Natural Resources;
- Government Regulation No. 15/1984:
 - a) Management on Fisheries Resources in Indonesia's EEZ,
 - b) Cooperation with foreign companies and issuance of licenses for resource use,
 - c) Ministry of Agriculture established TAC, fishing allocation, numbers of fishing vessels and fishing gear, and
 - d) Fishing Fees;
- Government Regulation No. 15/1990 on Fisheries Licensing: Central and Local Government;
- Ministry of Agriculture Decree No. 01/1975;
- Ministry of Agriculture Decree No. 607/1976 concerning fish zoning;

- Ministry of Agriculture Decree No. 509/1995 concerning Core Community Business Development;
- Ministry of Agriculture Decree No. 51/1997 concerning *payou* use and installations; and
- Ministry of Agriculture Decree No. 8056/1995 concerning the use of fish transport vessels.

Resource Access

In order to protect the interests of fishers, especially small-scale fishers, the government has established the following policies:

- Ministry of Agriculture Decree No. 607/1976 on fishing grounds. This regulation is intended to protect the fishing grounds of small-scale fishers. Large-scale fishers are prohibited from entering the fishing grounds of small-scale fishers, while small-scale fishers are allowed to enter those of large-scale fishers;
- Ministry of Agriculture Decree No. 509/1975 on partnership fisheries management. These regulations deal with management principles that promote small-scale fishers' interests;
- Ministry of Agriculture Decree No. 51/1997 on FAD installation and use;
- Simplifying the licensing so that the fishers can operate directly in the area benefiting them
- Establishment of fishers organizations (HNSI and Fishery Cooperatives); and
- Training conducted by DGoF and Local Fishery Agencies to enhance fishers' skills.

Management Constraints

Differences in traditional laws (*adat* law) between areas create conflicts among fishers. An application of *adat* law can give advantages to the fishers of one area but to the disadvantage of another. To expand the number of small-scale fishers and improve their income, the government has established training programs, technology packages, pilot projects, loans, and developed partnership activities using a PIR (*Perusahaan Inti Rakyat*) pattern and others.

CASE STUDIES

Sulamu Village, Kupang Bay

Kupang Bay is in Nusa Tenggara Timur waters. Nusa Tenggara Timur is divided into two regions. The first includes Kupang Bay and Semau Island. The second comprises Rote Island. According to Ministry of Agriculture Decree No. 18/KPTS/II/93, Kupang Bay is designated as a Marine Park. Kupang Bay is also proposed by the Coral Reef and Environmental Management Project (COREMAP) as a pilot project for coral reef rehabilitation. This project includes: Sulamu, Semau, Northwest Rote, and Southwest Rote.

Sulamu is part of Sulamu District, Kupang Regency, Nusa Tenggara Timur. The community consists of two migrant groups. Timors, the original inhabitants, are gradually leaving the island. Immigrants from Rote depend on a land-based economy, while the Bajos rely on a marine-based economy.

In 1997, Sulamu village had 3 556 inhabitants. Two-thirds work as fishers and the rest are farmers or breeders. The level of education is low due to the custom of employing school-age children to help in the fishery. Health and sanitation in farmer communities tends to be of higher quality than in fishing communities. The economic condition of the farmers and breeders is much better than the fishers.

Among the fishers themselves, lifestyles are different. Fishers who own boats and fishing gear have higher incomes than other fishers. Among the boat-owning fishers, different economic levels also exist. For example, motorized boat owners have higher incomes than non-motorized boat owners. Average monthly income per capita is Rp. 92 773.00 (US\$10), while fishers with boats and/or gear have monthly incomes ranging from Rp. 300 000.00 (US\$32) to Rp. 3 000 000.00 (US\$317).

Natural Resources

The coral reefs in Kupang Bay are located mostly 500 to 1000 meters along the northern shore of the bay. Coral reefs have been degraded by increased nutrients, sedimentation, and from explosive devices. The reefs are dominated by *Acropora* and

Montipora. There were 160 species of hard corals in Kupang Bay. Hard corals cover 45 to 59% of the reef area.

Demersal species and ornamental fishes are generally abundant. Shellfish harvest has declined during the past five years in Kupang Bay due to inappropriate fishing techniques. COREMAP reported that there were no large serranids recorded during their 20-hour dive. Kupang Bay has potential resources such as: *napoleon wrasse*, *kerapu*, *gargaheng*, *kabaak*, *lorak*, *lobster*, *kombong*, *tongkol*, *nipi*, *tembang*, *mano*, *kepala batu*, *hidung muda* and *peperék*. There are other marine resources such as *batu laga*, *batu lola*, sea cucumber and seaweed.

Mangroves grow well on the north and east coasts of Kupang Bay. The COREMAP team recorded 17 species of mangroves in certain locations of the bay. Mangroves in this area have decreased drastically due to increased use for firewood and building materials. Remaining mangrove forests are usually found away from populated villages.

Social Aspects

More than 300 000 people live around Kupang Bay. Semau Island, which comprises six small regions, is inhabited by 9 000 people. The 1990 census in seven locations indicated that Sulamu is the most populated region.

Portuguese monks succeeded in establishing a mission here in the sixteenth century. Since then, people from many islands have come to live around Concordia. In the eighteenth century, the Dutch encouraged Helong groups from Timor to move to Semau Island. Large-scale migration occurred in the nineteenth century from Rote Island to Kupang Bay. In addition, large numbers of Bajo, Buton, and Bugis fishers and traders migrated to Kupang Bay. The Rote, Bajo, Buton, and Bugis tribes have used the resources of the Bay in various ways.

A number of ethnic groups live in this area. Migrants from Rote Island are mostly Christians, while Bajo, Buton, and Bugis are Muslims. Educational levels in this area are relatively low. In 1995, the Research Institute (PSL) of the University of Cendana found that 66% of the population in 12

villages in Kupang Bay had graduated from elementary school, 8% passed secondary school while 6% passed high school. There was a 20% drop out rate. People in the local communities do not seem to be interested in completing formal education or training in fishing techniques. They believe that traditional practices are satisfactory. Health facilities are reasonably good, particularly in areas near Kupang.

Management Patterns

Resource Access

The main economic resources for the Rote communities are coconut plants, excavation of mountain rocks for building material, and planting *turi* trees (*Sesbania grandiflora*) for cows. The dry season, which lasts for eight months from April to November, makes it difficult to manage land resources. Some Rote family heads become fishers, but only to supplement their income.

In contrast, the Bajos are highly dependent on marine resources. The Bajos are well known as itinerant fishers and for sailing long distances from their native villages. Fresh catches are usually sold at Oeba Market in Kupang instead of being processed. There is no market in Sulamu. In addition, there is no fish processing capacity at the household, medium or large-scale levels. Fish drying and smoking are done for daily consumption. This does not provide opportunities for a value added industry.

The bargaining power of the fishers is weak resulting in the selling price being determined by the buyers. The fishers normally refrain from sailing during the west monsoon and use this time to rest and mend their fishing gear. During this period there is almost no activity related to fishing.

Compared to the fishers, farmers have more secure access to their fields through ownership rights. Land ownership for farmers is normally clear, while most fisher communities have no written law on land ownership. Fishers are generally unconcerned about land ownership since they spend most of their life at sea. Fishers build their own boats and make other gear. A boat building business was established to supply local and other village fishers.

A 20 meter boat costs Rp. 7 million (US\$739).

According to Rahardjo et al. (1997), Sulamu fishers were using 38 rowing boats on loan from the fishery services, 22 tree-trunk canoes, and 29 motorized boats. Almost all non-motorized boats (98%) are owned, but only half the motorized boat users own their boats. From the same research, 31% of fishers use fishing nets, 41% use hooks, 28% use other gear, and 1% use fish traps (*bubu*). Fishing net owners consist of:

- 60 gill net monofilament;
- 60 *pukat anyo*;
- 20 *lampara*;
- 20 gill nets;
- 10 long lines;
- 60 *binca-binca*;
- 15 *tonda-tonda*; and
- 15 *pancing buang*.

Access to Kupang Bay is open to members of Sulamu community and other nearby villages. There are no rules granting special authorization or limiting community rights to use coastal and marine resources. Any member of the community has the right to use the coastal and marine resources without responsibility to protect it or be concerned with other parties' interests. There is no requirement for fishers or small-scale fishing businesses to obtain a license. A license is required for medium and large scale fishing businesses and is given by authorized institutions, i.e. Ministry of Agriculture Fishery Service. Kupang Bay is under the authority of the Ministry of Forestry because Kupang Bay has been determined as a marine and tourism area.

Coastal resource management and law enforcement is not effective. Kupang Bay is threatened by the widespread use of poison and dynamites for fishing. These destructive activities have damaged the coral reef ecosystems. Coral mining is also practiced by communities around the Bay. Degradation of coral reefs is compounded by poor water quality due to the increase of household wastes from residential areas.

Government institutions are unable to prevent destructive practices and there is little the commu-

nity can do by itself. In some cases, the use of dynamite has been reported to the police, but violators are seldom prosecuted. Communities practice dynamite fishing in their area to such an extent that Kupang Bay is known as “the center of dynamite fishing”. This has not attracted the attention of law enforcement agencies and there seems to be no effective way to solve the problem.

Bajo fishers in Sulamu normally fish far offshore near the Maluku Islands and are not as affected by the damage to coral reef ecosystem in Kupang Bay. The Bajo community in Sulamu recognizes a religious prohibition (*dirarangan*) that prevents Bajo fishers sailing on Fridays, particularly from morning to 1400 in the afternoon. As good Muslims, they expect everyone to attend Friday prayers from 1100 to 1330, but this prohibition is becoming less stringent. Sulamu community members, both Bajos and Rotes, are less inclined to recognize religious principles as ways of managing and controlling coastal and marine natural resources. Fishers, especially the Bajos, consider the sea an open asset that can be used by everyone. The sea is not considered something that requires attention and special treatment to guarantee the security and sustainability of its resources.

Prevention and prohibition of destructive activities in coastal areas are considered the responsibility of the government. In the mixed communities around Kupang Bay, it is difficult to call upon any common traditional values with regard to marine resources management that bind the community in some concerted action to protect the natural resources. Some public figures of Bajo and Rote origins tried to formulate an agreement to control the fishing between certain hours and with specific gear, however, the agreement did not work well and had lapsed by the 1980s (Rahardjo et al. 1997). They agreed that Rotes be allowed to use *dai sasoro* while the Bajos were allowed to use *pukat senar* and *bubu*. The agreement did not last long because outside fishers using bigger boats and better gear came. The introduction of boats and fishing gear on a loan program through the cooperative also worked against the agreement. Another problem that hampered the agreement was unclear borders allowing local communities and outside fishers to arrange fish catching with the fishers in Sulamu.

There is a negative view in the Rote community about the Bajos. They are considered “less clean”. There is also a perception that Bajos are outsiders. Although the Rotes are also immigrants, they regard themselves as native people because they came earlier and Rote Island is located near Sulamu. There is also an opinion in the non-fishing communities that fishing is a less respected job. Religious differences are also an issue between the groups. There is always potential for conflict, but open conflict is rare. Conflicts between Sulamu fishers and outside fishers are few, since Sulamu fishers don’t use the natural resources in Kupang Bay. The habit of Bajo fishers to sail far into Australian waters does not encourage them to defend their fishing areas around Sulamu from outside threats.

Constraints

Punggawa are local businessmen operating in or living around Sulamu. They usually provide capital for *sawi* (fishers) in the form of loans to purchase or hire boats and fishing gear. The *punggawa* also handle direct marketing to consumers. *Punggawa* have created an exploitative work system for the fishers using loans to get cheap prices. They often determine the price by manipulating the quality standard and do not give fishers the opportunity to fully repay their liabilities.

A *juragan* is a manager of a group of fishers in a fishing expedition. He owns a boat and fishing gear and leads the operation. *Sawi* are hired fishers and work for the *juragan*. *Sawi* are usually paid a percentage share of the catch. Some fishers use a union system where there is no difference between *juragan* and *sawi*. In this way, all the fishers in a union have the same shares. In some cases, *juragan* and *sawi* work without a *punggawa*, but in most cases the *juragan* and *sawi* work for *punggawa*. For most of the fishers, the patron-client system of *punggawa*, *juragan* and *sawi* is not profitable and creates competition between groups of fishers. Every group is competing to reach the target determined by the *punggawa*. The competition is generally aimed at having the *punggawa* distribute capital to highly productive groups of fishers. In some cases, this system induces the fishers to work hard, but it also encourages selfishness. The competition can also increase the conflict among fishers, particularly

among subsistent fishers and fishers owning higher capacity motorized boats and better gear.

A *papalele* is a middlemen trading between a *punggawa* or between a *punggawa* and consumers, particularly household consumers. In some cases, the *papalele* practices price manipulation by delaying the purchase of fresh fish for several hours after the boats land in the morning in order to get a lower price, particularly from small-scale fishers. The *papalele* often buy second quality fish as the premium quality is purchased by big companies and restaurants. Fishers are forced to sell cheaply since they do not have refrigeration equipment.

Enormous collector ships often come to Kupang Bay and this creates more problems for fish management. Collector ships owned by large national companies act as receiving stations. They make transactions in the middle of the sea under collector ship prices. They can often buy fish for less than 50% of the landed price because small fishers have ity for the fishers is shark fins (Rahardjo et al. 1997). (Table 3.1).

Opportunities

Sulamu fishers, the Bajos in particular, are a hard working, seafaring people. Their skills could help expand fishery sector development in Indonesia. They need training, capital, and appropriate fishing technology in order to increase their income. Development should not only focus on the catch, but also on postharvest. Attention should be paid to economic and trading relationships between fishers and those funding the industry.

Local government and NGO support in recent years have helped the fishers in Sulamu. The local government has provided loans and training. NGOs, such as Yayasan Alfa Omega provided education and training. However, this aid did not create any fundamental change in the local community structures.

Ameth Village (Nusa Laut, Lease Islands)

Ameth village, in Saparua subdistrict, is one of the small villages in Nusa Laut Island in the Lease Island. The Lease Islands are part of Maluku

Table 3.1 Fish Production (Rahardjo et al. 1997).

Marine Living Resources	Trend of Production	Trend of Demand	Price Trend	Pricing Determination Process
Shark's fin	Decrease	Increase	12 500 to 300 000 kg	Buyer
Batu Laga	Decrease	Increase	50 000/kg	Seller
Kerapu fish	Increase	Increase	15 000/piece	Seller
Batu Lola	Decrease	Increase	12 500/kg	Seller
Sea Cucumber	Decrease	Increase	12 500/kg	Seller
Napoleon fish	Decrease	Decrease	10 000/piece	Seller
Lobster	Fix	Decrease	5 000/piece	Seller
Seaweeds	Decrease	Fix	250/kg	Local buyer
Gergaheng fish	Fix	Fix	7 500/piece	Buyer
Kombong fish	Fix	Fix	1 000/piece	Buyer
Tongkol fish	Fix	Fix	1 000/piece	Buyer
Red fish	Fix	Fix	1 000/piece	Buyer
Red Kakap	Fix	Fix	1 000/piece	Buyer
Nipi fish	Fix	Fix	1 500/piece	Buyer
Tembang fish	Fix	Fix	1 000/6 pieces	Buyer
Mano fish	Fix	Fix	1 000/8 pieces	Buyer
Kabaak fish	Fix	Fix	1 000/4 pieces	Buyer
Dusu fish	Fix	Fix	1 000/piece	Buyer
Lorak fish	Fix	Decrease	1 000/piece	Buyer
Stone Head fish	Fix	Fix	1 000/3 pieces	Buyer
Young Nose fish	Fix	Fix	1 000/piece	Buyer
Peperek fish	Fix	Fix	1 000/4 pieces	Buyer

Province. This province has the largest area of water in Indonesia (765.27 km² or 90% of the total). The Lease Islands consist of Pombo Island, Haruku Island, Saparua Island, Maulana Island, and Nusa Laut Island. The islands are part of Central Maluku Regency and are located east of Ambon which has two sub-districts: Haruku and Saparua Islands. The topography of the Lease Islands is generally sloping with some hills rising to 50 meters. The coastal area is the center of economic life for residents. A small part of the hilly area has a rough topography with cliffs at the edge of the shores.

From October to February, the monsoon blows from the west, northwest, and north and carries relatively low rainfall. In this season, the water is calm and the wind is weak, therefore the fishers have little difficulty with the weather. From April to August, the monsoon blows from the east and southeast with high rainfall (3 000 mm). From May to August, strong winds cause high waves (4 meters) and conditions are unsafe for fishing. The transition period occurs around March and September when wind direction and wave action are uncertain.

Natural Resources

Lease Islands has a wide area of coral reefs with high levels of biodiversity. The reef ecosystem is very sensitive to physical and chemical disturbances. The condition of the reefs in this area is considered good, but damage occurs in some locations due to the use of dynamites, tunnel nets, and boat traffic. Disturbance from sedimentation and chemical waste remains at tolerable levels.

In term of its mangrove resources, it has quite a high index (0.66). The level of mangrove diversity is around 0.51 with genera *Rhizophora* and *Avicenia* dominating the coastal area. Mangroves have several uses for coastal communities; however, the continued

use of mangroves for firewood threatens their existence in this region.

Seagrasses grow in its shallow waters and function as nursery and feeding areas for numerous fish species and other organisms such as sea cucumbers. There are two types of seagrasses in the Lease Islands: *Thalassia hemprichii* and *Enhalus acoroides*, with a density of 100 to 400 grasses/m². The condition of seagrasses in this area is good and is evenly spread along the coast.

Social Aspects

The Lease Islands consist of three populated islands: Haruku, Saparua, and Nusa Laut. Basic demographic characteristics are shown in Table 3.2.

Most people living on the Lease Islands are farmers, fishers, traders, and government officials. In 1975, 75% of Haruku residents were farmers. Secondary crop cultivation such as corn, peanuts, tubers, coconuts, coffee, and cloves are the main commodities. Livestock breeding and raising chickens are supplementary activities for income or family consumption. The coastal and marine resources are not used extensively by local communities. The fishers use traditional methods and fish in reefs and mangrove areas.

Ameth Village represents the physical and social characteristics of the Islands. The area covers 6 000 km² and has a population of 1 580 people. Population growth from 1991 to 1995 was 2.9% annually. Migrants have come to Ameth in the past few years, being encouraged by the prosperity of the village and the construction of education facilities, specifically a secondary and high school. The dependency ratio is 23 per 100 person of productive age. The largest age group is 15-19 year olds. Like other villages in Maluku, education levels in Ameth are

Table 3.2 Demographic Characteristics.

Island	Area in km ²	Population	Density
1. Haruku**	479	24 651	51
2. Saparua*	243	37 114	179
3. Nusa Laut	36	6 087	174
Total	758	67 852	

Note: **1996 *1994

low. Forty percent graduated from elementary school, 27% secondary school, 26% high school, and 5% university. The dropout rate is 2%.

The main livelihoods in the village are farming (43%) and fishing (36%). The average income of the two sectors is almost the same, about Rp. 74 000 (US\$8) per month. Other community members work in trade, transportation, and government services. The contribution of these activities to the community economy is larger than fishing and farming. The economy of Ameth is relatively poor with a per capita income of Rp. 14 707.

The education and health care facilities are better than other villages on Nusa Laut. There is a playgroup school, two elementary schools, and a secondary and high school. There is a public health center and three family planning centers. The village medical staff includes one physician, five nurses, two midwives, and three trained traditional medicine men. The good schools and health care facilities attract villagers from the surrounding area. The housing and sanitation is good. One hundred and forty-seven of 231 houses are permanent (63%), 63 houses semi-permanent (27%) and 21 non-permanent houses (9%). The most effective transportation in Ameth is by sea.

Management Patterns

Resource Access

Farming and fishing are done alternately according to the season and weather conditions. Until recently, fishing did not contribute much to the income of the local community as compared to the service sector. According to a COREMAP research (1996/1997), income from the fishery sector averaged about Rp. 73 500 (US\$8) monthly or Rp. 883 300 (US\$93) annually, an amount only slightly less than the agriculture sector. In contrast, the service sector averages Rp. 283 500 (US\$30) monthly or Rp. 3 402 000 (US\$360) annually.

The early inhabitants came from Seram Island. During the Dutch colonial period, migrations were ordered as part of a policy to move inland communities to coastal areas. Gradually, marine resources provide a secondary source of income after clove,

sago trees, and other crops. The economic pattern remained land-based, especially after cloves became an important commodity. The shift to a sea-oriented life was a long process starting from the fall of clove prices in world markets. Economics forced the local community to turn to the sea for their livelihoods.

About 50% of the population has graduated from primary school. With low levels of formal education, insufficient skills and low technology, fishers are unable to harvest the full potential that their fishery resources offer. Each household has two *rumpon*, a third of the households own one or two nets and fishing rods, only 2% own one or two *bubu*. Boats owned by fishers are traditional non-motorized boats. Such traditional equipment can be used only when the winds are relatively light restricting how much fishing can be done. In addition, post-harvest facilities are also lacking.

Ameth Village and the capital city of Saparua District can only be reached by sea. In Ameth, there is only one motorized longboat with a capacity of 40 passengers and 5 tons of goods. The long boat operates only on market days in Saparua, i.e. Wednesdays and Saturdays. This is not sufficient for exchanging goods and services with surrounding villages. Fishers need daily access to markets to sell their catch.

Constraints

Ameth has a traditional natural resources management system known as *sasi*. To implement, the community establishes a *kewang* - a person or group of people responsible for maintenance and enforcement. So far, *sasi* is only applied to land-based natural resources as the community depends very little on the sea. Attention to coastal and marine resources was only made in early 1990s when the price of clove — the island's main commodity — dropped. Plants specifically protected by this system include coconut, nutmeg, and clove, but in execution is applied to other plants such as tubers, bananas, and *Colocasia antiquorum*. Prior to the execution of *sasi*, *matakan* was applied. *Matakan* is a prohibition sign to notify villagers not to damage or to pick plants believing that anybody who deliberately or otherwise violates the rules will fall into disgrace or have an accident.

Traditionally, the village head controls *sasi*. In practice, he delegates his authority to his assistant or *kewang*. The tradition depends on the values passing on to the next generation. It also depends on the charisma and authority of the leaders. *Sasi* may be an effective way to control the use of certain resources, but it lacks clear management systems. In addition, it is not applicable to marine and coastal resources management, which requires institutions and rules recognized by both local communities and outsiders.

There is one rule for the community of Ameth Village related to marine living resources management, particularly mangrove forests. This rule fines those who take from or damage the mangrove forests. The usual fine is the delivery of 3 m³ (or more) of building stones. Enforcement is not effective even though the stones are used for village development. Another system in the community is *pela*. This is a rule bridging the diversity in the local community through *adat* alliance. *Pela* is still maintained through a *panas pela* ceremony held once in 5 or 20 years depending on a collective decision. The ceremony is aimed at reminding people of the alliance between the existing villages. Villages with *pela* are not bound by religion. Many Muslim villages have *pela* with Christian villages. The *adat* alliance is reflected in activities such as building places of worship and helping communities suffering from disaster. As with *sasi*, there are no formal rules or traditions relating to marine living resources.

Like other villages in the area, Ameth bases its management on traditional rights (*hak ulayat*) and traditional marine rights (*hak ulayat laut*). The community has the right to use the management area for village development. Usually, the local community uses it with activities such as *bameti*, *sosoki*, fishing rods, and other gear. Areas beyond the edge of the *tubir* (slope) are considered high seas and may be used by anyone. In the case of *hak ulayat* limitation, there is no boundary line that prohibits other villagers from fishing. There are no fines for violating *ulayat* areas.

Although Ameth already has several *adat* laws relating to natural resources management on the land, there are few such laws for marine resources. The community has little capacity to use marine resources effectively. The boundaries of an *ulayat* area are not set, so when violations occur, there are

no defined or consistent sanctions. The shift from land to sea-oriented resource use is hampered by the community's lack of capital and knowledge of marine resources management. A related issue is the lack of definitive national laws that the community can rely on. The local community cannot prevent exploitation of marine resources if someone has a permit issued by a national agency.

Furthermore, other than being unwritten, the existence of *adat* law depends on how it is being transferred through generations and as well as on the leadership of the *adat* leader enforcing the said rule. It seems that it is ineffective to make this rule as a pattern in natural resources management and marine living resources. The sustainability of marine living resources cannot be guaranteed only by unwritten formal rule but also requires rule and legal institutions which can be used as basis for natural resources development.

Opportunities

Although *sasi* is not an *adat* law regulating marine resources, it does provide an opportunity to manage resources in keeping with local cultural traditions. The *adat* head is a key figure who can influence people. The *kewang* is an institution enforcing community rules. *Pela* is another form of inter-village cooperation. The advantage of *pela* is it can bridge the differences among local communities and conflicts of interest between groups may be solved. *Pela panas* ceremonies could be a model for cooperation in marine resources management. *Hak ulayat* also helps in inter-area cooperation. Each village can manage the resources in their own area according to their own potential.

Another advantage is that strong emotional ties make it easier to agree on and enforce rules and institutions due to the relatively homogeneous ethnicity and religion in the Ameth community, *adat* laws and institutions relating to natural resources management are a powerful tool for sustainable natural resources use.

Kampung Laut, Segara Anakan

Segara Anakan is part of Cilacap District, Central Java. It consists of estuaries and rivers including the Citanduy, Cikonde, Cibeureum, and

Ujung Alang Rivers. According to Napitupulu and Ramu (1980), Segara Anakan consists of 28% forests and plants, 15% uplands, 12% settlements and plantations, 24% farmlands, and 33% mangroves and lagoons. Segara Anakan is surrounded by 96 000 ha of wetlands and has undergone ecological change, particularly due to the increase in farming and settlement. Segara Anakan is known as a unique estuary with a rich biological diversity and provides an important habitat for local and migratory birds. The lagoon is threatened by increase sedimentation every year from escalating destructive land-based activities. In 1903, the lagoon was about 6 450 ha. It has decreased to 1 800 ha by 1992. This reduction changed the pattern of marine use as well as the social and economic activities of local fishers. The national and local governments have struggled to protect and rehabilitate Segara Anakan in order to maintain its function with respect to both ecological and economic interests by establishing a Segara Anakan Rehabilitation Mega-Project.

Natural Resources

The mangrove forests in Segara Anakan is the largest in Java. It has decreased significantly during the past few years from 15 551 ha in 1974 to 8 957 ha in 1994. About 25% or 2 457 ha of mangroves are damaged. The decrease is caused by the use of mangroves for firewood and building materials, both by local and neighboring communities. In addition, massive extension of shrimp ponds has accelerated the damage. According to Pudjorianto (1982), about 23 species from 14 families of mangroves grow in this area, dominated by *Rhizophora apiculata*, *Rhizophora mucronata*, and *Bruguiera gymnorhiza*.

In terms of fisheries, there are about 45 species of fish in the area with 17 of them migratory. The migratory species include freshwater and marine fish species entering the lagoon to feed. The pres-

ence of migratory fish in this area is due to the many small rivers and canals connecting the lagoon to the Indian Ocean. A number of fish that consume plankton and micro-carnivorous, such as *Crossorhombus azureus*, *Mugil cephalus*, and *Mugil buchanan* are found around the lagoon including some detritivorous species such as *Rataboura bicolor* and *Cynoglossus lingua*. The exploitation rate of fish is about 36%. Fishing in the Indian Ocean, particularly in Cilacap waters, is usually done in 3-100 m depths about 25 km from shore. The average stock density in these waters is 9.1 ton per km² within an area of approximately 12 800 km². The potential stocks in this area are estimated at 52 680 tons and the potential maximum sustainable yield is 31 716 tons. According to DGoF, the production of fish and shrimp has increased by 36% from 13 765 tons in 1995 to 18 719 tons in 1996 (Table 3.3).

Social Aspects

Segara Anakan is surrounded by 14 villages. Three of these villages are located by the (marine village) lagoon: Ujung Gagak, Ujung Alang, and Panikel. These three villages are known as *Kampung Laut*. Most fishers in Segara Anakan live in *Kampung Laut*. In 1995, the population of Segara Anakan was 38 452 in an area of 265 km². The growth rate is relatively low (0.51%). The population of *Kampung Laut* is a small part of the population with the lowest population density (Table 3.4).

Most villagers in *Kampung Laut* work as farmers and fishers and the rest are employed in the private sector or civil service (Statistik Kabupaten Cilacap 1995).

The level of education in *Kampung Laut* is low. The highest level attained by more than 75% of population is elementary education. This serious social constraint hampers development in the area.

Table 3.3 Potential Coastal and High Seas Fisheries in Cilacap, 1996 (DGoF 1996).

Fish	Stock Density (ton/km ²)	Size of Catching Area (km ²)	Natural Potential	Potential (MSY)
Large Pelagic	0.7	12 800	9 000	5 500
Small Pelagic	2.5	5 200	13 000	7 800
Demersal Fish	4.3	5 200	22 360	13 416
Shrimp	1.6	5 200	8 320	5 000
Total	9.1	-	52 680	31 716

Table 3.4 Population and Density Rate in Kampung Laut (Statistik Kabupaten Cilacap 1995).

Village	Area (km ²)	Total Population	Population Density/km ²
Ujung Gagak	21.32	2 909	136
Ujung Alang	95.17	4 343	46
Panikel	29.65	9 931	122
Total	146.14	7 183	

Due to a lack of potable water, the state of health is also very low.

The economy is dominated by agriculture. Rice is the main commodity in most villages in Segara Anakan with about 5 254 ha under cultivation. Other crops include coconuts, coffee, and cloves. Small-scale cattle breeding is another activity supporting the local economy. Small-scale household industries account for about 2% of the economic activity.

Management Patterns

Resource Access

Segara Anakan is considered a unique ecosystem. It is a large lagoon surrounded by mangrove forests. In Segara Anakan, natural resource use is carried out by traditional practices using low levels of technology. The local community and other surrounding villagers use mangroves for firewood and building materials. This has caused serious degradation of mangrove forests. Findings indicate that the condition has declined to the state where only 32% is in very good condition while the rest are in various stages of degradation.

Fish and shrimp pond development has rapidly increased in the past years. Many migrants have come to look for business opportunities in the fisheries sectors. Investors have developed massive shrimp farms. These investors come to Segara Anakan and take control of ponds owned by the local community. New fishponds have been established in mangrove forest areas. As a result, there are serious damage to the environment across most of Segara Anakan. Another serious problem faced by the local community is sedimentation from three large rivers. This lagoon has progressively decreased in size from 6 450 ha in 1903, 3 270 ha in 1984, 2 700 ha in 1986, and 1 800 ha in 1992. The lagoon has de-

creased by at least 70%. Sedimentation has caused the emergence of new land in the lagoon. This causes an ecologically vulnerable environment and brings about cultural and economic changes. Many fishers have shifted to land-based activities, mainly agriculture. There are a number of fishers from this area fishing in the Indian Ocean.

Constraints

The exploitation of fish and other marine resources in Segara Anakan is traditionally carried out by capture and mariculture. Capture fishers usually fish in the Indian Ocean and the Segara Anakan lagoon. Mariculture fishers depend mainly on resources within the lagoon. A few fishers are equipped with small-scale motorized boats. Most do not own boats. They use small fish traps made from bamboo and homemade nets. Mariculture fishers have created their own fishponds with limited resources and technology. Small-scale fishponds owned by local fishers are located mostly in areas within mangrove forests. The legal status of the lands used for fishponds is unclear because most lands are claimed by the state and managed by sectoral agencies such as the Department of Forestry (DoF).

New land that emerges due to sedimentation is also claimed by the national government. Disagreements among national agencies, local governments and communities over these lands lead to unclear management authority. Outside investors have taken advantage of this and built massive fishponds with support from village heads (*lurah*) and government institutions at the *kecamatan* and *kabupaten* (district) levels. Thus, illegal trading of new land has created unclear property rights and complicated jurisdiction issues. This situation puts the local fishers at a disadvantage as the presence of outsiders also lead to stiff competition in the use of resources, notwith-

standing the practice of these investors to hire outsiders to work in their ponds.

Illegal exploitation of mangroves and the extension of ownership claims to new lands have occurred for years with no effective resolution. The emergence of new lands due to sedimentation is forcing local people to move from marine-based to land-based activities. This has placed fishers in a difficult situation since this kind of change also brings along a change in fishers' culture. Those who stick with their existing jobs as fishers must also struggle to compete with others who possess more advanced tools and technologies. Unfortunately, local governments and agencies are unable to resolve the problems. The conflicts of interest between government agencies and the unclear authority of local governments over the lagoon and its natural resources have worsened in past years.

Segara Anakan fishers have no traditional practices in managing fisheries and other marine resources. It seems that everyone has an equal right of access to all kinds of marine resources. One of the traditional methods used by local fishers is floating nets. Every fisher freely locates their net in the lagoon along with a personalized marker. Local people will not violate the unwritten rules concerning the property of others. They believe that marine resources belong to 'the Queen of the Indian Ocean', a traditional and powerful metaphysical figure. In order to have protection from 'the Queen', fishers carry out a ceremony on the beach whenever they plan to go fishing. However, this belief system has lapsed due to cultural change. Intensive exploitation of marine resources by outsiders has brought about tough competition that is forcing local people to ignore their traditional values.

Opportunities

Until the beginning of the 20th century, Segara Anakan was in good condition both ecologically and economically. The population was small and fully able to maintain the sustainable use of natural resources. Currently, intensive exploitation of natural resources and sedimentation is preventing local fishers from improving their livelihoods. In order to protect Segara Anakan while improving its

economy, the government has established an integrated action plan. The action plan proposes to rehabilitate and maintain Segara Anakan's estuary. This plan provides a framework that promotes development predicated on community-based lagoon management. The plan addresses rehabilitation, management, and protection of the environment as well as community development. However, rapid population growth and competition between the local community and migrants are still major problems that hamper development.

Many efforts have been made to develop the local economy, but they are unable to resolve the main problems, which include sedimentation and the control of outsiders over natural resources. Human resources development and infrastructure are largely ignored and this prevents local fishers from improving their own socioeconomic conditions. The empowerment of local fishers needs to focus on developing their capacity to manage their resources wisely.

LEGAL AND INSTITUTIONAL ARRANGEMENTS

Legal Aspects

The Written Laws

Indonesian sovereignty over its internal waters, archipelagic waters, and territorial seas is based on UNCLOS, which was ratified by the Government of Indonesia through the establishment of Act No. 17, 1985. Under international law, Indonesia has sovereign rights to carry out exploration, exploitation and development of its EEZ. This is manifested through a number of regulations and government policies including:

- The Constitution of Indonesia, 1945;
- Guidelines of State Policy (GBHN), 1998;
- Act No. 1, 1973 on the Continental Shelf;
- Act No. 5, 1983 on Indonesia's EEZ;
- Act No. 9, 1985 on Fisheries;
- Act No. 17, 1985 on Ratification of the 1982 UNCLOS;
- Act No. 5, 1990 on Conservation of Natural Resources and Ecosystems;
- Act No. 21, 1992 on Navigation;

- Act No. 24, 1992 on Spatial Planning;
- Act No. 6, 1996 on Indonesian Waters; and
- Act No. 23, 1997 on Environmental Management.

Other related laws and regulations include:

- Act No. 5, 1960 on Basic Agrarian Law;
- Act No. 5, 1967 on Forestry;
- Act No. 11, 1967 on Mining; and
- Act No. 5, 1974 on Basic Provisions of Regional Government.

These laws and state policies provide the legal basis for coastal and marine resources management and mandate a number of government institutions to manage these resources.

Most laws and policies are concerned with economic matters. A number of laws and regulations on fisheries, forestry, mining, marine transportation, tourism, spatial planning, and environmental management include articles with provisions for coastal and marine resources and environmental protection. However, these regulations do not promote natural resources effectively or provide environmental protection.

Another major issue of coastal and marine resources management is the allocation of resources, especially related to national, regional and local interests. The 1945 Constitution of Indonesia puts land, water, and natural resources under the authority of the state to be used for the prosperity of the people. This provision is frequently used as a basic principle for policy-making, particularly with reference to natural resources management and development.

The other legal instrument used to establish government policy is the Guidelines of State Policy (GBHN: *Garis-Garis Besar Haluan Negara*). The Guidelines are established every five years by the House of Peoples' Representatives (MPR: *Majelis Permusyawaratan Rakyat*) and emphasize natural resources management for improving the prosperity of the community. GBHN includes all strategic resources management, including fisheries and other coastal and marine resources. Environmental considerations are an integral part of the GBHN.

The GBHN is usually translated into operational policies, called Five Year Development Plans (REPELITA), which provide much more detail. They are used by the government to plan and implement activities at sectoral and regional levels. Unfortunately, integration between national and regional REPELITA is difficult because they are implemented by their respective government institutions. Lack of coordination between the two levels of government has caused many projects to fail.

The management of coastal and marine resources involves regulations and sector agencies with different responsibilities and interests. Act No. 9, 1985 concerning fisheries provides a legal basis for management of fish that promotes both economic and environmental interests. According to this law, anyone have access to coastal and marine resources. In order to protect the interests of small-scale fisheries, the government tries to protect coastal areas from large-scale fishing and practices that threaten coastal ecosystems.

The Act is not a sufficient basis for overall marine and coastal management. The existing Articles cover only the harvest area, fish catching methods, and protection from pollution and damages. There is no recourse in the Act should damage occur in mangroves or coral reefs. Jurisdiction and authority of fishing resources is, in practice, under the Agriculture Department and the Forestry Department.

Another relevant regulation is Act No. 5, 1967 concerning forests. This law deals also with coastal and marine resources within protected areas, including coral reefs. This law is not applicable in most cases since the establishment of a protected area is under land-based jurisdictions. Only a small number of coastal and marine protected areas have been established and agencies responsible for managing forests have little interest in non-protected coral reefs and mangroves. Unclear jurisdiction and weak institutional capacity makes for ineffective implementation. In addition, forestry laws may not prevent damage to coastal and marine environments from sedimentation and coastal erosion caused by inappropriate practices within the forest areas. There is no single regulation or policy available to deal with these issues.

Delegation of authority from central to local governments (Articles 12 and 14) offers local government opportunities to manage and protect forests in their areas. Article 15 focuses on protecting forests from damage by economic activities or natural disasters. This Article also concerns social participation in forest protection and traditional law relating to management and ownership rights. Based on the existing Articles, this Act may be used as the basis for forestry management including mangrove area conservation, coral reefs, and other protected areas relating to tourism. Since this Act is for general forest management, its use may require additional Articles.

To identify weaknesses, it would be necessary to establish coordinated department policy for Forestry, Interior, Post, Telecommunication, Tourism, Mining, and State Ministries. Together with the Home Affairs Department, these ministries could help prepare local governments to accept the authority being delegated (to manage forestry resources) from the central government.

A regulation closely related to forestry and natural resources conservation is Act No. 5, 1990 concerning Conservation of Natural Resources and their Ecosystems. This Act deals with the conservation of biodiversity. Even though the regulation does not specifically mention coastal and marine resources, it provides a potential legal basis.

This Act does not specify any natural resources conservation policy for coral reefs, mangrove forests, protected fish or other animal species, or national marine park zoning. Nor does it regulate implementation of conservation practices as stated in Article 4. Article 16 states that management is approved by the government, but stakeholder responsibility is not clear.

Mining is an important issue related to managing coastal and marine resources, including the exploitation of minerals, oil and natural gas. Unfortunately, Act No. 11, 1967 does not include coastal and marine environmental considerations. It does include some articles that prevent coral reefs from destructive activities related to mining, but it does not provide comprehensive regulations for coral reef protection. There are several regulations related to mining, such as Act No. 1, 1973. This Act gives the

government a mandate to protect the environment from destructive mining activities on the seabed. Government Decree No. 17, 1974 concerns Supervision of Exploration and Exploitation of offshore oil and gas and requires all exploration activities to protect the environment.

Act No. 23, 1997 on Environmental Management provides a legal basis for integrated management and is expected to be the umbrella for the development policies on sustainable use of natural resources. This Act deals with land-based pollution. However, the implementation is not effective and its impact is uncertain.

Article 9 (Act No. 23) provides cross-sectoral opportunities in management planning. Article 12 provides opportunities for regional governments to manage an area according to its characteristics. This Act requires environmental impact analyses for major undertakings in the region.

Another regulation affecting coastal and marine resources is Act No. 9, 1990 on tourism. The growth of marine-based tourism has been significant in the past few years and coastal communities in many locations are reaping benefits. However, there are conflicts between investors and local communities. Tourism policy is within the jurisdiction of the national government and there is little participation by provincial or district governments. The absence of such participation in developing marine-based tourism has spawned ignorance and created serious environmental consequences.

The principles of sustainable use have been incorporated into the Guidelines of State Policy (GBHN). GBHN 1998 requires the exploitation of coastal and marine resources to maintain ecological life support systems and protect marine environments from pollution and destruction through the development of effective law enforcement and control systems. It confirms that the use of natural resources, including coastal and marine resources, is for the benefit of the people. In order to achieve this policy, the government included coastal and marine issues in the Five Year Development Plan (REPELITA) for 1993-1998. In practice, the implementation of this policy has been ineffective and the overexploitation of coastal and marine resources continues.

Most regulations on coastal and marine resources management are established by the national government and implemented by national government agencies at the regional level. With the exception of small-scale fishing and mining, there are no regulations that provide a legal mandate to provincial and district governments to manage coastal and marine resources.

The absence of integrated coastal and marine resources management has caused uncertainty, including unclear responsibilities and authority among national and regional government agencies.

The Unwritten Laws

Adat law is a set of customs that regulate the rights and duties of traditional communities toward land and water resources. The rights of the community are called *hak ulayat* or traditional community rights. Traditional community rights consist of the right to explore, exploit, manage, and conserve fishing resources and their environments. This is implicitly recognized in the 1945 Constitution of Indonesia. Article 1 Paragraph 2 of the Constitution stipulates that sovereignty of the state shall be in the hands of the people and shall be exercised in full by the People's General Assembly (MPR). The MPR shall determine the general guidelines of state policy (GBHN: *Garis-Garis Besar Haluan Negara*; Article 3). The GBHN provides guidelines to the State in the formulation and implementation of policies, including Article 33, Paragraph 3 which stipulates that land, water, and resources contained therein shall be controlled by the State and shall be made for the best use of the people.

Adat law is also recognized by Act No. 5, 1960 on Basic Agrarian Law (Agrarian Act). Article 5 states explicitly that the applicable law for land, water, and air-space is *adat* law, providing the law does not conflict with national interests or disrupt the unity of the nation. Therefore, implementation of traditional community rights have to be in agreement with national interests and in accordance with the written laws and regulations (Article 2, Paragraph 4, and Article 3).

According to Soepomo 1993, various *adat* laws exist in 19 regions of Indonesia:

- Aceh;
- Tasnah Gayo-Alas, Batak, and Nias;
- Minangkabau and Mentawai;
- South Sumatra;
- Melayu (Riau);
- Bangka and Belitung;
- Kalimantan (Dayak);
- Minahasa;
- Toraja;
- South Sulawesi;
- Ternate Islands;
- Moluccas;
- Irian;
- Timor Islands;
- Bali, Lombok, and Sumbawa;
- Central Java, East Java, and Madura;
- North Sulawesi;
- Surakarta and Yogyakarta; and
- West Java.

All *adat* laws within these regions are integrated into a national concept called *Bhineka Tunggal Ika* (unity in diversity). The laws are considered national assets in the development of national unity and every law is treated equally.

Adat law in Segara Anakan is applied in Central Java, East Java, and Madura. The *Adat* law in Segara Anakan is part of *Banyamas Adat* which is influenced by the Yogyakarta *adat* laws. The law recognizes that marine resources in the lagoon, the Indian Ocean, and Nusa Kambangan Island are controlled by 'the Queen of the Indian Ocean' called *Nyai Loro Kidul*. According to traditional belief, anyone seeking to exploit resources should obtain permission from the Queen. Permits will be granted to fishers and other resource users through a mediator called a *pawang*. The *pawang* functions as a regulator to ensure exploitation does not exceed the carrying capacity of the resource.

These traditional norms gradually lapsed when the Dutch introduced and applied the concept of open prisons on Nusa Kambangan Island in 1901. The development of open prisons stamped out the myth of the Queen's control over natural resources on Nusa Kambangan Island. Immigration to Segara Anakan has also changed *adat* law. Fishers no longer have to ask permission from the *pawang* when they want to catch fish, develop aquaculture, cut mangroves, or use other natural resources. Assistance from

the *pawang* is still sought when people encounter natural phenomena beyond their understanding, such as exceptionally strong winds, waves, and currents.

Adat law in Segara Anakan will disappear completely if it cannot protect traditional community rights. One cause for existing problems is sedimentation. Sedimentation occurs annually and has created new land and narrowed the lagoon. Consequently, the fishing grounds have diminished and the catch has declined. Many fishers have switched to agriculture. The new land has also created delimitation problems resulting in overlapping claims on new lands and overlapping jurisdiction among government institutions. This has led to uncontrolled use of fisheries, mangroves, land, and other resources that worsen the damage to the environment so much so *adat* law in Segara Anakan is no longer working well.

Sasi is the applicable *adat* law concerning the use of natural living resources on Nusa Laut Island and on other islands of Maluku. *Sasi* is also intended to resolve conflicts of interest and to guarantee a proportional distribution of resources among members of the community (Imami 1996). According to Kissya (1995), *sasi* applied in Haruku Island consists of *sasi laut* (marine), *sasi kali* (river), *sasi hutan* (forest), and *sasi dalam negeri* (village). On Nusa Laut Island, however, *sasi laut* is not applied since the activities of these island people are land-based. Spices such as cloves, cinnamon, and nutmeg are some of the resources available. Three years after the collapse of clove prices in 1995, the people turned their attention to the fisheries (Rahardjo et al. 1997). Since people view natural living resources differently, they apply various *sasi* to achieve a number of purposes. The various *sasi* have similarities in terms of rules, prohibitions, and sanctions. Thus, *sasi*, like the *adat* law in Segara Anakan, focuses more on resource use and exploitation than management activities.

In the Lease Islands, *sasi adat* is used to regulate land-based activity and was modified into *sasi gereja* (church) by Christian Moluccans and into *sasi lelang* (auction) by Muslim migrants from Bajo, Bugis, and Makasar. From a legal review and analysis standpoint, it appears that the Christian Moluccans

transformed *sasi adat* into *sasi gereja* as Christian values are more effective than *adat* norms in providing the people with conflict resolution skills.

Sasi adat refers to a traditional *sasi* that is imposed and controlled by a *kewang*, a person or a group of individuals assigned representing traditional institution. *Sasi gereja* means church *sasi*, a system imposed and controlled by the church. In this system, the church has rights to control certain resources and, in turn, the community must share harvested resources with the church. *Sasi lelang* is a system based on "contract." This is applied only in Moslem communities. In this system, the community sells their rights to harvest resources to local traders or outsiders. The trader employs a person or a group of people as *kewang* to guard resources under his authority and impose his rules.

In order to impose the rules, *sasi* systems mandate that anyone who violates *sasi* will be fined and will be subjected to public humiliation. A punishment is usually carried out by traditional leaders or village administrators. Punishment systems vary from one community to another because these are established based on agreements among leaders, certain value systems and cultural experience.

Most *sasi* systems deal with land-based resources, while some are related to coastal resources. The latter type deals with a certain type of fish (resources) or some resources in the same area and time or in the same area at different time. The implementation of most *sasi* on coastal resources is problematic because of unclear boundaries between the coastline and the open sea, and between one village to another.

The Muslim migrants who lived for years on Nusa Laut, Haruku, and Saparua Islands have adopted the traditional values of *sasi adat* and have transformed *sasi adat* into *sasi lelang*. By so doing, they became accepted members of the local community. They in turn have introduced some of their traditional values that are more marine-based and business-oriented. Since the Muslim migrants are more interested in marine-based activities, they sell their rights over land resources through auctions. Because they want to show they comply with the local *adat* law, they submit the auction process to the *musyawarah desa* (village community forum). After the

auction, traders who purchased land will hire workers as *kewang* for a certain period as agreed.

In Kupang Bay, *adat* law on marine resources use is supported by both local people and migrants, i.e. Bajo, Bugis, Buton, Makasar, and Madura. The local people are mostly Christian Rotenese and are land-oriented, while the Muslim migrants are marine oriented. The Rotenese have little interest in the preservation of the marine environment. The Bugis, Buton, Makasar, and Madura pass through Rote Island waters on their way to Australian fishing grounds. The Bajos have agreed to certain rules being applied in their fishing grounds. These rules protect the marine environment from such activities as waste dumping and blast fishing. In 1980, the Rotenese and Bajos agreed on the use of certain types of fishing gear. The agreement, which involved four villages, was in effect for only two years. Many outsiders also engaged in fishing in the Bay and did not follow the rules.

Management activities are only implicitly regulated by *adat* law. Since *adat* law is unwritten and there is a high degree of variation among villages, it is subject to change over time. The conventions create uncertainty so that it is unlikely to be used as legal basis for business transactions between local people and outsiders. However, the integration of customs and principles into written laws would be highly valuable.

Institutional Aspects

Institutional Arrangements at the National Level

The existing laws and regulations provide government institutions with legal mandates to carry out coastal and marine resources management. A number of government institutions have been involved in managing coastal and marine resources with varying degrees of authority and levels of resources. The leading government institutions authorized to manage coastal and marine resources include (see Box 3.1):

- Department of Agriculture;
- Department of Mining and Energy;
- Department of Forestry;
- Department of Tourism, Arts, and Culture;

and

- Department of Communication.

Fisheries

Fisheries management is under the jurisdiction of the Department of Agriculture with implementation through the General Directorate of Fisheries. According to the Fisheries Law, management includes policy formulation, planning, organizing, implementing, and control. The DA deals with fish, shellfish, seagrasses, and other resources related to coastal and marine-based food production. This Department is responsible for issuing licenses for any activity dealing with the exploitation of fish and other resources related to food production in internal waters, territorial waters, and the EEZ. In addition, this Department is authorized to develop fish production systems to support development. This would include resource allocation, stock assessment, exploitation, marketing, and protection of fish from improper actions. The effectiveness of the control system is not certain, even though the system is equipped with sufficient technical facilities and human resources. Management control needs improvement. Since fisheries management involves various government institutions such as the Navy and Departments of Forestry, Communication, and Mining and Energy, coordination is essential. Provincial governments are involved as they are authorized to regulate small-scale fishing and the use of vessels less than 30 GT. The provincial governments are expected to prevent improper practices that threaten the interest of small-scale fishing and local communities.

Mangroves

Mangrove management involves the Departments of Forestry, Agriculture, Tourism, and Home Affairs. Other institutions expected to make significant contributions include the State Ministry for Environment and Environmental Impact Management Agency (BAPEDAL), particularly in dealing with environmental protection issues. These institutions pay little attention to the protection of mangroves since their focus is on land-based activities. The role of the Department of Forestry in managing mangroves is crucial since this Department is legally authorized to protect mangroves. However, the role of the Department is effective only within

STATE MINISTRY FOR ENVIRONMENT

The State Ministry for Environment is responsible for the management of the living environment and prepares policies based on Act No. 23, 1997 concerning environmental management. Since this institution has no implementing agency, coordination with other institutions is necessary to ensure control over the execution of policies. This institution has jurisdiction over marine and coastal resources for their sustainability.

BAPEDAL (ENVIRONMENTAL IMPACT MANAGEMENT AGENCY)

Since this institution was established as a complement to the State Ministry for Environment, it has been responsible for the management of marine and coastal resources including environmental rehabilitation and pollution control. BAPEDAL has two deputies, one each for pollution management and environmental impact control. BAPEDAL has three regional offices: West Region in Pekanbaru, Central Region in Bali, and East Region in Ujungpandang. Each regional office monitors development of central policies, pollution conditions, and environmental impact assessments.

BAPEDAL is responsible for monitoring pollution and environmental degradation caused by land-based activities. In this case, its activities are directly related to the Spatial Planning Act No. 24 of 1992. Even though in the execution of the Act, the role of BAPEDAL has not been fully articulated, there is the potential to increase its participation in marine and coastal management.

DEPARTMENT OF FORESTRY

The Department of Forestry is responsible for general forestry management, including exploitation and conservation. Regarding marine and coastal resources, the Department is interested in conservation. The Department is the responsibility of the Directorate General Forest Control and Natural Resources Conservation. This institution has sufficient jurisdiction under the law to enforce regulations. The policies on environmental management are most effective for forest management, however, BAPEDAL has a responsibility to manage coral reefs and mangrove forests. BAPEDAL is also responsible for developing national parks and conservation areas to prevent erosion and environmental damage.

DEPARTMENT OF AGRICULTURE

The DA is directly involved in the execution of marine and coastal management but damage to fish habitats is considered beyond its jurisdiction. To prevent damage by tunnel nets, dynamite fishing and fishing using chemicals, the Department has to coordinate with the Forestry Department and State Ministry for Environment.

DEPARTMENT OF COMMUNICATION

The Department of Communication has responsibility over all forms of transportation. Act No. 21, 1992 regulates the transportation of pollutants by sea, which gives this department some responsibility for marine and coastal management. It is directly responsible for the sustainability of marine and coastal ecosystems by way of pollution prevention. It also participates in marine

and coastal environment law enforcement. These responsibilities may be performed by cooperating with institutions concerned with protection and use of marine and coastal resources.

DEPARTMENT OF MINING AND ENERGY

The Department of Mining and Energy is responsible for environmental impact assessment of mining and energy activities and the sustainable use of mining and energy resources. It is responsible for preventing environmental damage from mining activities, but has to cooperate with Forestry and Agriculture for implementation. The Department executes only large-scale environmental impact policy. Small-scale mining is still a regional government responsibility.

DEPARTMENT OF HOME AFFAIRS

The Department of Home Affairs is responsible for central and regional government environmental affairs. It is an implementing institution for environmental management policy with units in both central and regional jurisdictions. The Department is responsible for coordination between central and regional governments to avoid overlap in marine and coastal management. It is also responsible for quality of life development in local communities.

protected areas because it has no authority to deal with resources outside these areas. The interest of the Department of Forestry in mangroves is also related to the preservation of endangered species that depend on mangroves. The DA plays an important role in the management of mangroves in all coastal zones. The exploitation of mangroves or mangrove areas for fish production or mariculture is also the responsibility of the DA. The attention this Department pays to mangrove conservation is very important in order to maintain the habitats of fish and other organisms. The role of the Department of Tourism (DoT) is to regulate coastal areas (frequently within mangrove areas) for tourism and natural resources conservation to maintain and protect the quality of natural resources from destructive tourism activities. The Department of Home Affairs is indirectly responsible for protecting mangroves. The main focus of this department is to improve the quality of life in coastal communities. Any management system that involves institutions with different interests has the potential for a conflict of interest.

Coral Reefs

Coral reef protection is a priority in the years to come. The COREMAP is one of the strategic projects expected to promote integrated coral reef

management. This project aims to develop a comprehensive approach to coral reef management using principles of integration (economic and ecological) for the benefit of local communities. The approach requires institutional support from government agencies, social institutions and the private sector. Coral reef management is dispersed among a number of government institutions including the Departments of Forestry, Agriculture, Mining and Energy, and Communication. These Departments deal mainly with the exploitation of resources and do not necessarily include management. The Department of Forestry is responsible for the management of protected areas and plays a role in protection, however, some coral reefs extend beyond protected areas.

The DA is mandated to protect coral reefs from destructive activities, however, eliminating destructive fishing does not necessarily lead to effective protection. The DA is unable to impose measures for protection since they have no authority to develop a strategic coral reef management systems. The Department of Mining and Energy has the same restraint. There are no regulations that give it a legal mandate to manage reefs and protect them from destructive mining practices. The Department of Tourism has a potential role in managing and maintaining the quality of coral reefs. The Depart-

ment is interested in maintaining the reefs for tourism, but they work only in tourism areas. The Department of Communication is assigned to prevent marine environments from pollution and all negative impacts of marine-based transportation, however, there is no specific mandate on coral reef management. The Environmental Impact Management Agency (BAPEDAL) and the State Ministry of Environment are also expected to take part in protecting coral reefs, but these institutions are not ready. The State Ministry of Environment is not an implementing agency while BAPEDAL is relatively new and pays little attention to coastal and marine issues.

Institutional Arrangements at the Regional Level

The implementation of policies on coastal and marine resources management is under the jurisdiction of the national government through its various departments and institutions. Each department has established working units (*kantor wilayah* or KANWIL) at the provincial level. Each KANWIL represents its own department at the national level. They are under the coordination of provincial governors, but are not responsible to them. At the district level, each department is represented by *kantor perwakilan*. This unit works with KANWIL and is under the coordination of a *bupati*, the head of a district government.

Provincial governments have established implementing agencies called DINAS to implement provincial government policies and carry out development programs formulated by the provincial government. DINAS might work with KANWIL, but these units have no structural link. DINAS focus on the sectors designated by the national government. This means that within the same province, there are two institutions with similar responsibilities. Such complex institutional arrangements result in overlapping administrative systems that hinder policy implementation. KANWIL and *kantor perwakilan* have played a crucial role in the use of resources and management processes including planning, organizing, implementing, and control. Nonetheless, coastal and marine resources management is not effectively implemented.

Institutional Arrangements at the Village Level

Coastal and marine resources management is traditionally controlled by local communities based on customary laws. These laws exist mainly in East Indonesia (Irian Jaya, Maluku, and some regions in Nusa Tenggara Timur). Even though there are similarities in traditional values and practices, each community has its own norms and practices for managing natural resources.

The Haruku community in the Lease Islands has successfully applied *sasi* for *ikan lomp* (*Trissina baelama*) in the estuary area and extends 200 m from the shore. The *kewang* prevents any form of fishing until the fish are ready for harvest. The community harvests the fish by sweeping the river using large nets that enable anyone to catch all available fish in just a half day. This practice is ecologically questionable. The implementation of *sasi* for coastal and marine resources management tends to be ineffective because it is often unrecognized by outsiders, even those from neighboring villages. The effectiveness is further threatened by cultural changes among younger generations who have higher levels of education. Education and different cultural experiences are changing their views on traditional value systems. *Sasi* is also less effective within a community that is culturally heterogeneous, especially in villages with large numbers of recent immigrants.

Customary laws have been applied in other regions such as Nusa Tenggara Timur. A number of local communities have traditional practices called *buka* (open). Community members are only allowed to harvest natural resources (mostly fish) during a *buka* period. Even though community members believe that *buka* is useful, they are skeptical that such a tradition is still relevant. Vague boundaries and cultural change are two major problems lessening the impact of *buka* systems. Customary laws and traditional practices for dealing with coastal and marine resources management do not exist in most communities on the west coast. For example, the communities in Segara Anakan, Cilacap and Java have no tradition of managing coastal and marine resources. The integration of traditional values and practices into national or written laws could help

encourage better management systems and community empowerment.

ASSESSMENT OF MARINE RESOURCES MANAGEMENT

Patterns

Management of fisheries includes legal, institutional, social and cultural aspects. Policy frameworks and stakeholder roles must also be taken into consideration. In this chapter, the management issues discussed in previous chapters will be considered as part of an integrated management matrix. (Figure 3.1). Management activities are defined as:

- Planning and organizing,
- Actuating, and
- Controlling.

Implementing these activities is a process of interaction among legal, institutional, social, and cultural aspects of marine fisheries management. Derived from this interaction, management activities can be viewed as linear synergic interactions or responsive synergic interactions.

Each group of marine fisheries management activities can be analyzed using resource-based, community-based, and market-based approaches (Figures 3.2, 3.3 and 3.4). These approaches will

identify strengths and weaknesses in marine fisheries management. Efforts to integrate *adat* law principles will be by the use of legal and institutional frameworks (Figures 3.5 and 3.6). These frameworks can be used to facilitate the development of community-based management.

The processes commonly used in fisheries management include planning, organizing, actuating and controlling activities (POAC). These activities require data and information (DI) from a fisheries database. POAC activities themselves produce inputs to the database. Interaction between DI and each activity of fisheries management creates a responsive synergic relationship (Figure 3.1).

In practice, the planning and organizing activities cover stock assessment (SA), determination of absorptive capacity of the marine environment (AC), carrying capacity of fishery resources and resources allocation (RA). The actuating activities include resources utilization (RU), process of production (PP) and marketing of fisheries products (MP). The controlling activities include monitoring, controlling and surveillance (MCS). As a sequential process, interaction among these activities creates a linear synergic relationship (Figure 3.1). In this respect, MCS plays an important role in preventing RU, PP and MP from inconsistency with AC, RA and existing laws and regulations. MCS also protects fisheries from illegal activities.

Figure 3.1 Integrated Fisheries Management Matrix (Purwaka 1997).

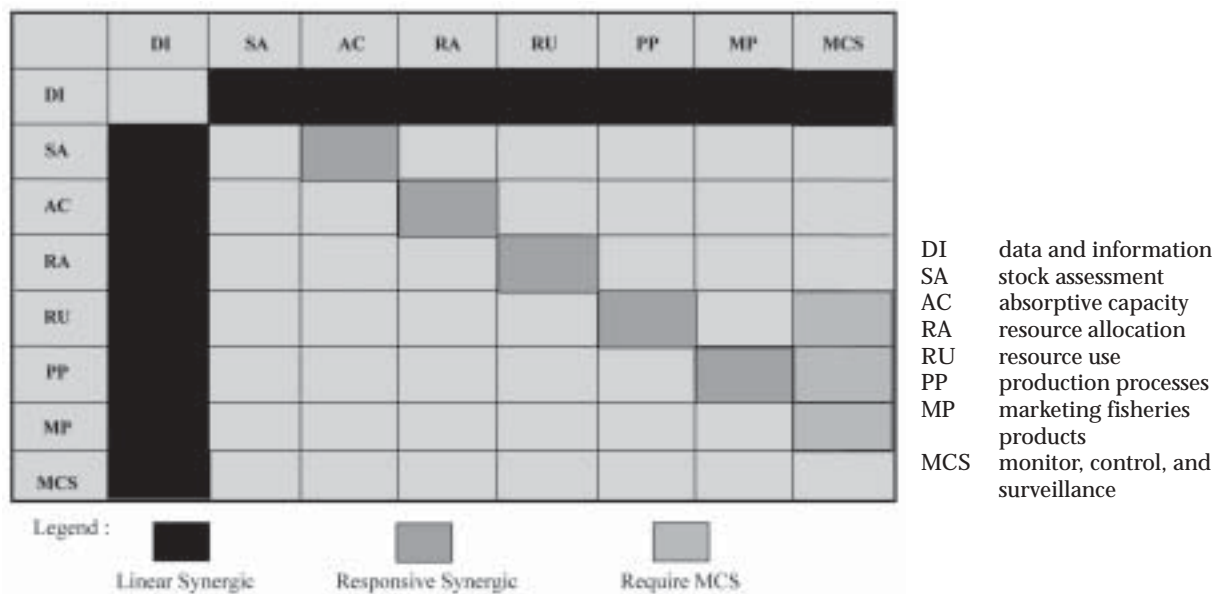




Figure 3.2 Resource-Based Management Approach (Purwaka 1997).



Figure 3.4 Market-Based Management Approach (Purwaka 1997).

Integrating fisheries management, legal, institutional, social and cultural aspects in the three study areas will be explored by the use of compatibility principles:

- Complete compatibility exists when two or more activities can be carried out at the same time and place without creating a conflict;
- Partial compatibility exists when two or more activities can be conducted at the same place, but not at the same time;
- Complete incompatibility exists when an activity cannot be executed with another activity at the same place, even at a different time.

Integrated fisheries management can be illustrated by using resource-based, community-based and market-based management approaches. This system facilitates integrated relationships among fishery resources, human resources and cultural resources (Figure 3.2).

Community-based management facilitates awareness and participation (Figure 3.3). Resource and community-based management exploit the fisheries on the basis of competition. To achieve a sustainable competitive advantage in the fisheries, resource and community-based fisheries management should be combined with market-based management. Market-based fisheries management facilitates competition by indicating how and where to compete (Figure 3.4).



Figure 3.3 Community-Based Management Approach (Purwaka 1997 modified from Ferrer 1992).

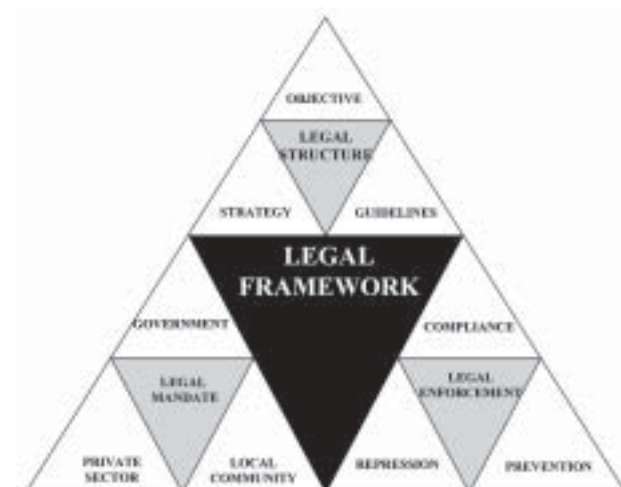


Figure 3.5 Legal Framework (Purwaka 1997).

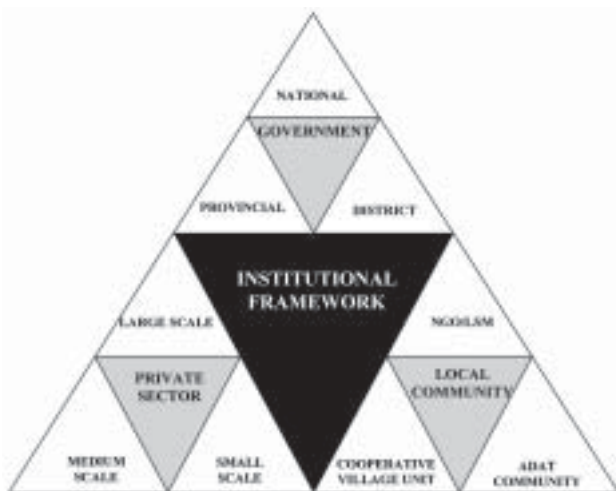


Figure 3.6 Institutional Framework (Purwaka 1997).

This management system is incorporated into the integrated management matrix (Figure 3.1). Activities within each cell of the matrix are carried out at specific times and places in accordance with the Spatial Planning Act No. 24, 1992. Interactions between activities within the matrix indicate overlapping jurisdictions and conflicts among stakeholders. Analysis of linear and responsive synergic interactions among fisheries management activities in the matrix will contribute to the development of community-based fisheries through the integration of legal (Figure 3.5) and institutional frameworks for fisheries management (Figure 3.6).

Planning and Organizing

Planning and organizing include the use of data and information for:

- Stock assessment;
- Resource allocation; and
- Determining the absorptive capacity and carrying capacity of living resources.

Data and information includes relevant facts from the integrated management matrix, the resource/community/market-based approaches, and the legal and institutional frameworks. Data and information at the national level are not complete. This has led to problems with planning as stock assessment, absorptive capacity, and resource use are likely to focus on fisheries. Human resources, community and market-based approaches are not

considered in the planning and organizing process.

Local communities in the study areas have limited ability to plan as they do not have the capacity to undertake studies in stock assessment and absorptive capacity. If institutions at the national level want to incorporate the resource-based management approach, they will need to assist the local communities in working on these elements.

Actuating

Actuating is implementation of fisheries planning and consists of:

- Resource use;
- Production processes; and
- Marketing.

Planning at the national, local, and village levels stresses resource use. Community participation and institutional partnership arrangements in resource use, production, and marketing require a resource/community/market-based management approach. Interaction is required between fisheries issues and the law, institutions and society, and between fishers and other stakeholders. This is not currently taking place.

At the local and village levels, resource allocation and use is regulated by *adat* law and implemented for specific resources at a certain time and place. The *adat* law is transformed into a set of rules such as *sasi* and applied through a scheme of zones. These rules do not include regulations for production and marketing because for the most part they contain prohibitions and sanctions.

Controlling

Controlling activities are carried out through a system known as monitoring, control and surveillance (MCS):

- Monitoring focuses on changing patterns of fishing intensity so that overexploitation and resource degradation can be avoided;
- Controlling focuses on administrative relationships to distinguish between legal

and illegal fishing;

- Surveillance focuses on changes in activity, i.e., the movement of fishing vessels and pollution detection.

Since MCS is an integrated system, the three components should be carried out simultaneously.

The implementation of MCS will involve several institutions having this capability. At the national level, MCS in fisheries is still insufficient. Institutional cooperation, coordination, and integration are not yet well developed. Ameth Village of Nusa Laut Island has applied a traditional form of marine surveillance to avoid illegal activity in their territory. From the view point of an MCS program, it can be regarded as an example that could be integrated into the national system.

Integrating Efforts

Legal and institutional frameworks are capable of facilitating efforts to integrate the *adat* laws into the national legal system and to develop community-based marine fisheries management. However, these integrating efforts will take time and may be costly (Pomeroy and Williams 1994).

CONCLUSION

Integrated Coastal and Marine Resources Management

Responsibility for coastal and marine resources management in Indonesia is dispersed among various national government agencies. There is no single regulation that provides for a legal basis for promoting an integrated management system. Conflict between economic interests and environmental considerations has created problems in policy implementation. Each institution tends to focus on economic interests with less focus on principles of sustainable use. Even though environmental issues are considered, implementation of most policy tends to center on partial environmental protection. In order to maintain the principles of sustainable development, Indonesia needs to establish an integrated coastal and marine resources management system that promotes optimum sustainable use and environmental protection.

Establishing Integrated Policy

Indonesia needs to establish national laws integrating coastal and marine resources management. The principles of integration would confirm that coastal and marine resources be considered an integral part of the environment. Coastal and marine resources cannot be seen only from the perspective of economics. The exploitation of natural resources that focuses solely on economic interests will cause serious problems threatening sustainability. An integrated approach maintains resource availability for the benefit of the people and long-term economic development. This is crucial in light of the recent prediction that the Indonesian economy will remain dependent on natural resources for some time. The intense competition between local and international interests for natural resources will place local interests in a poor position because they lack capital, knowledge and technology. The competition between economic and environmental interests will lead to resource depletion and future generations will not have natural resources to support their livelihoods.

The principle of interdependence is based on a partnership approach. Coastal and marine resources management policy must be designed and implemented to encourage active participation of all stakeholders. This approach is extremely important in order for each stakeholder to make significant contributions in promoting sustainable development.

Decentralization

Decentralization is required to provide provincial and district governments with authority over coastal and marine resources management. Decentralization would ensure the interests of local communities are considered in the planning and implementation of policy. The management of coastal and marine resources is an integral part of regional development.

Improving Management Systems

Improved management is crucial because exploitation of coastal and marine resources has caused environmental degradation. Coastal and

marine resources are also threatened by negative impacts of land-based activities. The improvement of management systems needs to consider at least seven management issues:

- Data and information;
- Natural resources assessment;
- Natural resources allocation;
- Natural resources use and protection;
- Production process;
- Marketing; and
- Monitoring, control, and surveillance.

These issues need to be based on legal and institutional frameworks and have to include principles of integrated development.

Empowering Local Communities

Since more than 60% of the population live in coastal areas, local communities need to take an active role in protecting coastal and marine resources. Local communities have a legal right to use their resources and empowering them will ensure benefits accrue to their economy. The empowerment of local communities can be achieved by promoting community-based MCS based on traditional values.

REFERENCES

- Central Board of Statistics (CBS). 1995. Statistical Yearbook of Indonesia 1992. CBS, Jakarta.
- DGoF. 1996. Fisheries Statistics. Directorate General of Fisheries. Indonesia.
- Ferrer, E.M. 1992. Learning and Working Together: Towards a Community-based Coastal Resource Management. Research and Extension for Development Office, College of Social Work and Community Development, University of the Philippines, Quezon City.
- Imami, A.A.D. 1996. Sasi sebagai Norma Adat di Maluku. Unpublished paper.
- Kissya, E. 1995. Sasi Aman Haru-ukui. Traditional Management of Sustainable Natural Resources in Haruku. Document Treasures of Local Cultures, No. 2. SEJATI Foundation, Jakarta.
- Kusuma-Atmadja and T.H.Purwaka. 1996. Legal and Institutional Aspects of Coastal Zone Management in Indonesia. *Marine Policy* 20(1):63-86.
- Moosa, M.K, R. Dahuri, M. Hutomo, I.S. Suwelo and S. Salim. Editors. 1996. Indonesian Country Study on Integrated Coastal and Marine Biodiversity Management. Ministry of State for Environment Republic of Indonesia in cooperation with Directorate for Nature Management, Kingdom of Norway, Jakarta.
- Napitupulu, M. and K.L.V. Ramu. 1980. Development of the Segara Anakan area of Central Java, p.66-82. *In* Proceedings of the Workshop on Coastal Resources Management in the Cilacap Region, 20-24 August 1980. Gadjah Mada University, Yogyakarta. Indonesian Institute of Sciences and United Nations University, Jakarta, Indonesia.
- Pudjorianto, A. 1982. The invasion of newly formed land in Segara Anakan area by mangrove species. Paper presented at the Workshop on Coastal Resources Management in Cilacap Region, 20-24 August 1980. Gadjah Mada University, Yogyakarta.
- Purwaka, T.H. 1995. Sistem Hukum dan Kelembagaan dalam Pengelolaan Sumberdaya Wilayah Pesisir dan Lautan. Centre for Archipelago, Law, and Development Studies, Bandung.
- Purwaka, T.H. 1995. Aspek Hukum Pengusahaan Perikanan di perairan Pantai. Centre for Archipelago, Law, and Development Studies, Bandung.
- Purwaka, T.H. 1997. Metodologi Penelitian Aspek Hukum dan Kelembagaan dalam Pengelolaan Sumber Daya Wilayah Pesisir. Centre for Archipelago, Law, and Development Studies, Bandung.
- Purwaka, T.H. 1998. Use Conflicts in the South China Sea. Centre for Archipelago, Law, and Development Studies, Bandung.
- Pomeroy, R. and M.J. Williams. 1994. Fisheries Co-management and Small-Scale Fisheries: A Policy Brief. International Center for Living Aquatic Resources Management, Philippines.
- Rahardjo, Y. et al. 1997. Laporan Hasil Survei Baseline Sosial Ekonomi Program Rehabilitasi dan Pengelolaan Terumbu Karang (COREMAP) Propinsi Maluku, Lembaga Ilmu Pengetahuan Indonesia, Jakarta.
- Soepomo. 1993. Hukum Adat Indonesia. Sinar Grafika, Jakarta.

Community-Based Approaches to Marine and Coastal Resources Management in the Philippines: A Policy Perspective

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ABSTRACT

This is a study undertaken to ascertain the elements and trends at the local and national levels, which define the rights and rules that provide the management framework for the implementation of different types of locally based resources management systems in marine and coastal areas. The study showed that the existing institutional set-up is not only complex, confusing and “sectoralized”, but more importantly, it is fragmented, thus, causing the major systemic hindrance to more effective management of the marine and coastal resources. Hence, there is a strong and urgent need for sectoral integration and coordination.

Four case studies, which depict community-based systems of management, were presented to illustrate even more effective modes of administration of the coastal environment than the purely legal system though each had distinct characteristics than the others. These revealed that even in the face of inconsistency with the national legal system, community-based management can survive. However, conflict in the use of coastal and marine resources remains a characteristic in the studies. Hence, partnership among different sectors is imperative for sustainability. Local governments must support community initiatives, the national government must ensure that community efforts are supported. Since local communities have the greatest interest in the conservation and sustainable use of coastal resources, they should have incentives, resources and capacity for marine and coastal ecosystem conservation.

INTRODUCTION

This paper is an overview of the policy, legal and institutional framework for the management of fisheries, coastal resources and the coastal environment in the Philippines. The objective of this study is to look into the elements and trends at the local and national levels which define the rights and rules (laws, customs, traditions etc.) that provide the management framework for the implementation of different types of locally based resource management systems in marine and coastal areas such as co-

management, community-based management and integrated coastal zone management. In identifying these elements and trends, a historical perspective is provided focusing on both the development of law and policy as well as practices on the ground. Case studies of community-based practices in coastal management are also presented to further illustrate these elements. In both the historical analysis and the case studies presented, the author gives particular focus to identifying and understanding the role of stakeholders and interest groups in the use of fisheries and other coastal and marine resources. The

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reality is that conflict in the use of marine and coastal space is frequently the context under which the management framework for fisheries, coastal resources and the coastal environment operates.

Competition among resource users is a significant issue in the coastal zone. Industrial and real estate developments, which require extensive lands in the most scenic or productive areas of the coastal zone, compete with other uses, particularly agriculture and conservation. Tourism and recreation activities, which require high environmental amenities and access to infrastructure (roads, water and waste disposal), have adversely affected amenities that should have been allocated to coastal communities. There is also degradation of the landscape as a result of infrastructure developments. The urbanization of the coast has been disastrous to small-scale municipal fishers because of the devastation of wetlands and the pollution of waterways that threaten important cultural, historic and anthropological sites in the coastal zone. Mariculture and aquaculture developments located in nearshore waters and which require high water quality have affected other uses that diminish water quality, such as agriculture. They also compete with fishing, conservation and ecotourism which have similar requirements.

Emphasis on the conflict over control of resources, between modes of use and among stakeholders and interest groups is the focus of this paper. This context of conflict makes it possible to find solutions to problems of environmental degradation and social inequity, which also characterizes the use of marine and coastal resources. The author explores solutions, some of which are now bearing fruit from recent efforts in the Philippines, to ensure the sustainable development of marine and coastal resources. Efforts in the Philippines are also examined in the context of global and regional cooperation and the role of international and regional agreements and arrangements.

METHODOLOGY

Data for this paper were taken from secondary sources, mainly from government statistical offices and published works of experts in the field. For the case studies, interviews were conducted with key stakeholders in order to supplement the secondary

information. The analysis, many of the conclusions, and some of the data were products of numerous meetings and consultations that were done while the author was Undersecretary for Legal and Legislative Affairs of the Department of Environment and Natural Resources (DENR).

USES OF COASTAL RESOURCES

The Philippines is situated in the center of marine biodiversity brought about by various geological and evolutionary processes. Rich and diverse natural ecosystems like coral reefs, mangrove swamps, estuaries, seagrasses, sandy beaches, embayments and sheltered coves abound. These areas contain natural resources of socioeconomic, cultural and aesthetic value.

The importance of marine and coastal zones to the Philippines is readily apparent. Sixty percent of the country's 73 provinces and municipalities are located in the coastal zone. In 1997, the Coastal Environment Program (CEP) reported that more than 60% of the 60 million population resides in some 10 000 coastal *barangays* (smallest political unit) and major urban centers.

The uses of coastal resources may be classified as extractive and non-extractive. The former may be further classified according to the resource being extracted, which may be either living (e.g., fisheries, forest products) or non-living (e.g., minerals). Non-extractive uses include tourism, recreation and designation as protected areas. Other major activities in the coastal zone that impact on coastal resources include shipping and ports development, industrial and urban development, waste disposal, security and military activities.

Fishing and Aquaculture

Fish is a vital part of the Filipino diet and the cheapest source of protein. The per capita consumption of fish is among the highest in Southeast Asia at 36 kg per yr (FAO 1997). A significant number of people living in coastal areas depend on fishing for their livelihoods either through subsistence fishing, employment in fish trading and processing, operation of fish ports and markets and other support industries such as rope and net making, gear manu-

facture, boat building and repair. About 1 million people are engaged in fishing or about 5% of the labor force. Another 300 000 are engaged in the processing and manufacturing of fishery products.

There has been a marked decrease in the number of fishers in the past two decades. In 1975, there were about 1.26 million fishers and fish farmers, but in 1994, there were only about 1 million. The decrease was among both full-time fishers involved in marine capture fisheries and part-time fishers. This may have been due to the drastic decline in the abundance of fishery resources in the municipal waters of the country, discouraging small-scale fishers from continuing their activities (Menasveta 1997).

In 1990, there were about 430 000 vessels in the fishing fleet, mostly open craft. About 3 300 were officially classified as commercial vessels with a tonnage of 155 GT (Labon 1991). About 85% of the municipal waters (up to 15 km from the shore) are considered overfished. This is supported by data that show a steady decline in the contribution of municipal fisheries to overall fish production (Figure 4.1).

Aquaculture posted a significant share in fish production since the 1980s. This has grown steadily due to its increased productivity and economic viability. By 1994, aquaculture contributed 30% to the total fish production (Figure 4.1).

Aside from fish, coastal waters provide a wide variety of edible invertebrates, such as mollusks, sea cucumbers, sea urchins and jellyfish. The gathering

of seaweeds is also common. The culture of seaweed for extraction of carageenan is extensive in the Visayas and Mindanao. Seaweed farming is very lucrative, bringing in about PhP 1.6 billion in revenue in 1996 (BAS 1997).

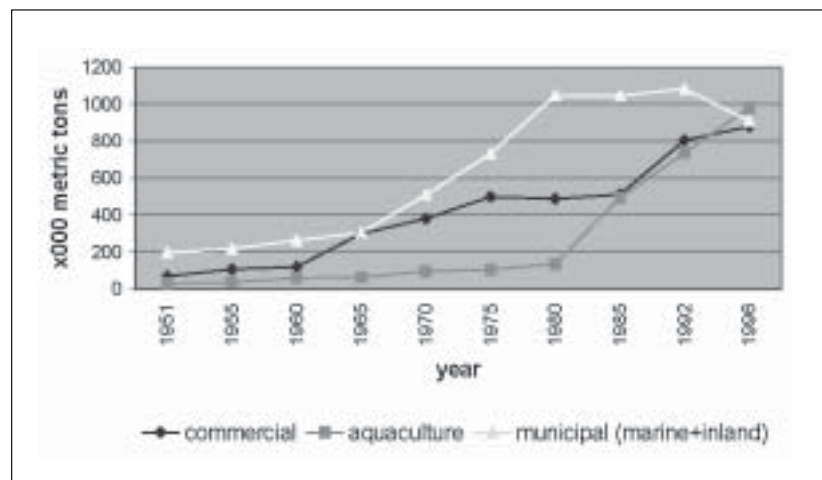
Marine products are also harvested for medicinal, commercial and industrial uses. There are several ongoing studies on bioactive compounds found in sponges and tunicates for anti-cancer properties. Despite an existing ban, corals are harvested for sale as decorative items or as construction materials. There is also a growing market for aquarium fishes which spurs fishers to gather them in large quantities, often through destructive means.

Agriculture and Forestry

The islands composing the Philippines are typically mountainous or hilly in the central area, with fertile flatlands extending to the sea. The width of flatlands best suited for agriculture varies. Except for the large islands of Luzon, Mindanao, Palawan and the larger Visayan islands, the agricultural areas do not extend far inland. For this reason, most agricultural lands would be considered coastal lands wherein coastal agriculture mainly involves growing cereals (e.g., rice, corn). Agricultural lands are being lost to urbanization at an increasing rate.

Mangrove forests are also threatened. The reduction of the mangrove forests in the country is largely a result of conversion to fish ponds. It is estimated that there were approximately 500 000 ha of mangroves in 1918. The area of the Philippine mangrove forest has decreased at an alarming rate. In 1984, only about half remained. A decade later, 60% of the original cover had been lost. Mangrove fish pond conversion almost tripled from 1952 (> 88 000 ha) to 1988 (224 000 ha). Figure 4.2 clearly shows the link between mangrove loss and fish pond expansion (Aliño 1997). Between the years 1952 and 1987, fish pond coverage increased at an average rate of 3 600 ha per yr. Other factors which have contributed to the depletion are conversion to

Figure 4.1 Fish catch by sector (BAS 1997).



industrial and urban uses and exploitation for forest products such as timber, firewood, charcoal, tannins, tanbark, *nipa* sap and shingles.

Mining

Mining in the coastal zone generally involves quarrying of sand, stone and rock used in the construction sector. White sand and silica are extensively gathered, the former to beautify resort areas which do not have natural white sand cover. Marble mining is also significant. Quarrying continues in spite of serious problems (erosion, siltation) and mine tailings from the more sophisticated mining operations inland have considerable adverse impacts on the coastal environment.

As of 1994, there were 8 large scale gold and silver mines, 20 small scale gold and silver mines, 9 large scale base metal mines, 3 small manganese operations, 3 large chromite operations, and 21 small-scale chromite mines. For non-metallics, there were 45 limestone quarries, 14 marble quarries, 36 silica, 4 dolomitic, 16 rock phosphate, 6 feldspar and 36 clay mines (EMB 1996).

Mine wastes and tailings present the greatest pollution threats from the mining industry. Natural calamities such as typhoons and earthquakes cause impounded materials to be washed away or carried to bodies of water, ultimately to the sea. Mine wastes peaked in 1991 at 47.44 million t. Mine tailings that year reached 42.7 million t. However, mine wastes

and tailings decreased an average of 14% from 1990-1994 except for 1991 (EMB 1996). This is largely due to the closure of several large mining operations as a combined result of economic and technical factors.

Protected Areas

There is a full range of protected areas in the coastal zone. There are at least 15 major areas under the National Integrated Protected Areas System (NIPAS), covering an area of more than 1 million ha of both land and sea (PAWB 1998). In addition, there are numerous small fish sanctuaries and reserves established by the Bureau of Fisheries and Aquatic Resources (BFAR), local governments, people's organizations and NGOs.

Tourism

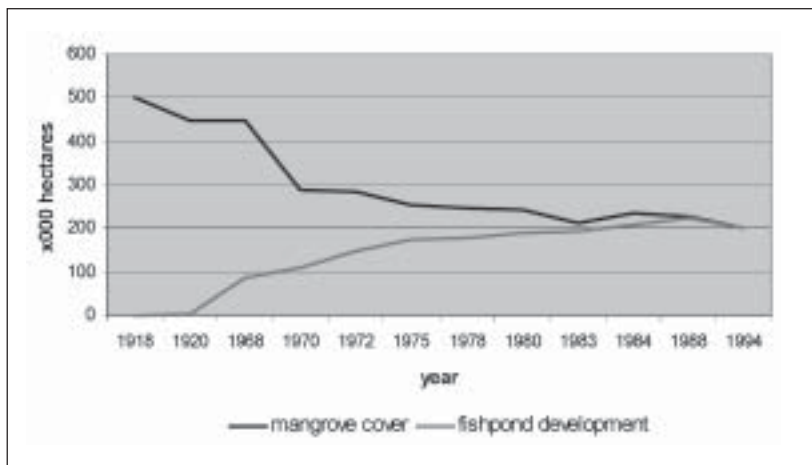
Tourist attractions in the Philippines have been identified by the Department of Tourism (DoT) and are classified as social and cultural attractions, natural attractions and scientific and artificial attractions. In most cases, these attractions are located in coastal areas.

Eighteen of the top 25 tourist destinations are coastal. Natural attractions in the coastal zone include white sandy beaches, submarine gardens, diving grounds and the like. Of these, about 246 or 70% are beaches, 77 or 22% are islands and the remaining 30 or 8% are fishing and diving grounds, submarine gardens and bays (EMB 1996). These areas are visited for their scenic beauty and because of the recreational activities they offer. Tourist arrivals in the country has reached almost two million per year.

Shipping and Ports Development

In 1995, the Philippines had a total of 10 072 vessels classified as merchant or fishing vessels. The merchant fleet included passenger ferries, cargo containers, and

Figure 4.2 Mangrove cover vs. fishpond development (BAS 1997).



barges. These comprised 50% of the total number of domestic vessels. A larger percentage of the remaining half consists of fishing vessels (MARINA 1986). The data do not take into account the more than 400 000 small open boats.

Berthing and storage facilities mainly serve domestic vessels engaged in fishing and coastal commerce. There are 233 enterprises engaged in shipbuilding, ship repair, afloat repair, boat building and ship-breaking activities licensed by the Maritime Industry Authority of the Philippines (MARINA) as of December 1996. Of this number, 21% or 82 were small shipyards, 10 were medium shipyards and 14 were large shipyards (MARINA 1986).

Industry

The coastal zone has attracted industrial and commercial establishments because of its accessibility to raw materials and its proximity to population centers. There are five types of industries which thrive in coastal areas:

- Industries that benefit from a location near low cost water transportation and inland transportation systems;
- Industries that derive power from or use water for processing or cooling;
- Industries that are beneficially located near centers of population but do not have direct dependence on, or need for water or water access;
- Marine transportation industries; and
- Industries that depend directly on the marine environment for raw materials.

In 1983, industrial development density is a minimum of five industries per 1 000 km². Approximately the same proportion applies in the coastal areas (EMB 1996).

Urban Development

Settlement includes shelter and all other necessary infrastructures such as roads, water supply, energy sources, transportation, community buildings and other facilities. To date, population density has increased tremendously from 64.1 in 1948 to 228.7 in 1995 (NSCB 1996). Over 60% of the total popula-

tion resides in some 10 000 coastal *barangays*, including some larger urban centers (CEP 1997).

A number of subdivisions are situated in coastal zones. Some foreshore areas are being reclaimed to house residential, commercial and industrial establishments in order to address the increasing demands of urbanization. A recent development is the practice of building resorts, factories and buildings right on the shore, even abutting the sea, in clear violation of mandatory easement rules. Together with the increase in the number of coastal communities is the need for transportation facilities. Natural landforms influence the major road networks of the country's coastal provinces. Roads run along the coastlines which branch out as minor arteries leading inland.

Waste Disposal

The problem of waste disposal is especially acute in urban areas. In Metro Manila alone, the per capita waste generated is about 0.66 kg in 1995. Considering that the metropolis is home to about 10 million people, the total waste generated is more than 6 000 t per day. This is expected to increase to 13 300 t per day by the year 2014. The current collection efficiency in Metro Manila is 85%. Fifteen percent or 900 t of wastes is burned, thrown in canals and *esteros* or deposited in rivers that flow to the sea (EMB 1996).

In 1992, about 76% of the population had access to sanitary toilets. The rest of the population relies mostly on onsite disposal or septic tanks that drain directly into existing rivers and creeks (EMB 1996). Untreated domestic sewage is the major source of water pollution.

MANAGEMENT ISSUES IN THE COASTAL ZONE

In the Philippines and elsewhere in Southeast Asia, the coastal zone serves as the base for human settlement and accommodates major industrial, commercial, social and recreational activities. High population density in coastal areas is not unusual because of the wealth of opportunities that coastal and marine environments offer. Families depend on coastal and offshore waters for their livelihoods.

However, driven by purposes other than subsistence and survival, various types of activities now flourish there, many are unregulated. Such development is not without its consequences. The unabated increases in urbanization, industrialization and population have severely affected the state of coastal and marine resources. Constant and heavy exposure to numerous artificial and natural pressures have taken their toll on the ecosystem.

These pressures have caused the rapid depletion of mangroves, destruction of coral reefs and drastic declines in fisheries yield. All the major bays in the country have now been overfished. Destructive fishing practices like dynamite fishing, *muro-ami*, use of cyanide and the like, have resulted in the degradation of marine and coastal ecosystems. Moreover, upland deforestation, industrial and domestic waste generation, mining and shoreline development, and uncontrolled tourism have been identified as the culprits in the continued degradation of the coastal and marine environment. More than 400 km of the country's coastal areas are now heavily eroded, silted and sedimented.

Pollution increase is a major concern. Point sources include industrial effluents, water runoff from urban areas and sewage discharges. Non-point sources arise from activities such as land clearance, livestock production and agricultural activities, including the use of fertilizers and pesticides. The effects are the loss of seagrass beds from coastal lagoons, bays and estuaries and the recurrence of algal blooms. In Manila Bay, total fecal coliform counts were shown to be over the standards set by the DENR.

Industrial wastes were also detected at alarming levels (EMB 1996). Red tides occur with regularity especially around the Manila Bay area. In 1992, the greatest number of red tide occurrences (269) and deaths (11) were reported. While the figures decreased in 1993 and 1994, they increased again in 1995. At a national level, 758 cases of red tide poisoning were reported and 49 deaths were noted. Red tide tends to occur at the onset of the rainy season after a warm dry period and is caused by high organic loading from the rivers draining into the bay (EMB 1996).

Marine based pollution is also significant. Some of the sources include oil spills, release of sediments from mining, and organic compounds (e.g., anti-fouling paints, ballast water discharges and sewage from vessels). Three oil spills were reported from 1973 to 1975. One of these was a result of the sinking of the LUSTEVECO barge in August 1975. From 1978 to 1980, four more oil spills were reported. During 1990-1995, 75 oil spill incidents were noted. Of these, 71% were caused by accidents such as sinking, collision, and grounding. The remaining 29% were due to cargo handling operations such as loading, bunkering and discharging (EMB 1996).

Mining is one cause of soil erosion and sedimentation of coastal waters. The adverse effect of mining on the coastal environment may be from *in situ* mining operations on the beach zone or from direct or indirect disposal of mine wastes or tailings into marine waters. Sedimentation from mining activities covers wide areas of corals as was the case involving the Atlas Mining and Marcopper Mining Corporation which directly dumped mine tailings into the sea. A large volume of tailings has been discharged into the sea particularly in Calancan Bay, Marinduque and at Iba, Toledo City in Cebu, resulting in fish kills and the destruction of fish habitats.

Poverty in the coastal areas has likewise been indicated as a source of ecosystem degradation. About 80% of the municipal fishing families in the country are estimated to live below the poverty line. These families are dependent on the coastal ecosystem for their livelihoods. Increased pressure and competition have forced small-scale fishers to resort to more destructive fishing methods. Lack of alternative livelihoods aggravates the situation and the cycle of resource destruction and depletion continues.

Based on the number of water rights permits granted by the National Water Resources Board, a generally increasing trend in groundwater and surface water use is noted. There was an increase of 11.4% over a six-year period from 129 777.75 million m³ in 1990 to 144 622.50 million m³ in 1995. In terms of water usage by sector, only 0.3% and 0.03% are attributed to fisheries and recre-

ational purposes, with power generation as the biggest user of water followed by the agricultural, domestic and industrial sectors (EMB 1996).

Philippine marine, coastal resources and environment are at risk. Foreshore areas are being reclaimed for residential, commercial and recreational uses. Ports and other similar structures are built near these areas to support the transportation system and to promote trade. Continued use at the current rate and scale may create irreversible impacts.

OVERVIEW OF THE LEGAL AND POLICY FRAMEWORK

In this section, the existing legal and policy framework formulated and enforced by the government and changes over time are discussed. This section does not include the rules developed and practiced by some local communities which are not part of the formal legal system. Local norms are considered in the next section which deals with community-based management.

The Philippine government has always relied on regulatory mechanisms to manage the marine and coastal zones, particularly to control activities, allocate resources among users and potential users and resolve conflicts. These regulatory mechanisms can be classified into two broad categories: those used to regulate access to and use of public resources such as fisheries, mineral deposits, forestry, flora and fauna and public lands; and those used for environmental protection such as the Environmental Impact Statement (EIS) System, NIPAS and pollution control.

Historical Perspective

In earlier times, the *barangays* (villages) had jurisdiction over coastal resources (Kalagayan 1990). The *barangays* defined their own fishery limits that were exclusive of other *barangays*. The traditional rights of *barangays* over their fishing grounds were eroded during the Spanish period when all fisheries and natural resources were held for the Crown (known as the *jura regalia* or Regalian Doctrine).

Rights to exploit and manage the resources were transferred from the community to the central government.

This system of state ownership was introduced to the Philippines as an extension of the Spanish legal system and continued in force throughout the period of Castilian domination (Noblejas and Noblejas 1992). The Regalian Doctrine has been adopted as the norm. The 1987 Constitution of the Republic of the Philippines claims full control and supervision over all aspects of use and protection of marine and coastal resources.

In practice, some aspects of control over the resources have been devolved to local governments. During the American period, municipalities were given the authority to grant fishery privileges within their jurisdictions (Kalagayan 1990). Still, policy formulation and general management remained with the central government. Since then, policy formulation and regulation has remained centralized, top-down and non-participatory (Sajise 1995). Control over the resources is a central issue because the laws governing activities in the coastal zone invariably involve maximizing exploitation of the resources. Those who have control get the most benefit.

Over the years, the laws and policies not only evolved as a centralized system, but also a sectional one. Specific laws were passed to address particular issues and the use of coastal resources and activities is governed by separate, often conflicting laws. For instance, aquaculture was regulated under the fishery laws, but mangroves were considered forests and governed by forestry laws that were administered by a different agency.

There have been attempts to solve these problems through a holistic approach by recognizing the interconnection of the various component ecosystems. Major laws were enacted in the 1990s that moved towards integrated management, decentralization of control and recognition of the rights of local communities to directly manage the resources or actively participate in the decision-making processes.

In 1991, Congress passed the Republic Act (RA) 7160, also known as the Local Government Code of 1991 (LGC). The law gave back to local government units (LGUs) the primary control over marine and coastal resources. In the meantime, community-based efforts to revive and protect the resources were initiated both by government and non-government organization (NGO) sectors. The devolution of certain management and allocation decisions to the community may be more effective than the management efforts provided by distant, understaffed and underfunded agencies (Carlos and Pomeroy 1995). In 1998, Congress passed two significant laws: the new Fisheries Code (RA 8550) and the Agriculture and Fisheries Modernization Act or AFMA (RA 8435) which incorporate measures to curb overexploitation and manage resources sustainably.

Fisheries and Coastal Resources Management

The evolution of the present regulations governing fisheries can be traced as far back as the Spanish Law on Waters in 1866, which recognized the right of the public to fish from the shore and granted rights to Spanish registered seafarers and merchant sailors to fish from boats in maritime coastal zones. The Spanish Law on Waters was extended to the Philippines by a Royal Decree in 1866 (Peña 1997). The decree declared that the shores, coasts and coastal seas were part of the national domain, though open to public use. As early as 1598, Antonio de Morga demanded that a regulation size net be prescribed for use and complained that fishing with too closely-knit nets was killing small fry (de Morga 1971). Fisheries regulation remained relatively unchanged during the Spanish period.

During the American occupation starting in 1932, a comprehensive fisheries law (Act No. 4003) was enacted by the Philippine Assembly. The Fisheries Law of 1932 contained provisions for the protection and conservation of resources such as the declaration of open and closed seasons, protection of fry or fish eggs, prohibition on the use of noxious or poisonous substances and explosives in fishing and prevention of water pollution. The law also contained special provisions for gathering mollusks, sponges and hawksbill turtles. The main regulatory

or management strategy implemented was the selective granting of licenses or permits to qualified persons. The license was coupled with limits on access to the resource such as setting minimum sizes for fish, shellfish or turtles that could be caught or restricting certain fishing practices to certain places or times of year.

Goodman (1983) noted that the Fisheries Law of 1932 was meant to curb the domination of Japanese capital in the fishing industry. The Japanese had moved successfully into the Philippine fishing industry before 1930. Four hundred Japanese fishers were operating 64 powerful fishing boats in Manila Bay and 36 deep sea vessels in the Gulf of Davao. They had brought into the Philippines such innovations as swift powered fishing vessels, the beam trawl, the trap net, as well as scientific survey ships that pinpointed from year to year the richest fishing grounds.

The 1932 Fisheries Law provided that commercial fishing vessels of more than 3 t must be licensed only to Filipinos or Americans, and aliens could participate only by investing in corporations 61% owned by Filipinos or Americans. The law was not effective in controlling Japanese domination because the Japanese merely used Filipino dummies who owned the boats in name only. The impetus for the passage of the law was for some people to profit by serving as fronts (Goodman 1983).

In the ensuing years, Japanese interests in Philippine fisheries were further reinforced by the signing of a secret treaty between Philippine President Manuel Roxas and General Douglas MacArthur representing the Japanese Board of Trade. By virtue of this treaty, the Philippine-Japan Treaty of Amity, Commerce and Navigation was drawn up in 1960. However, it was only in 1973 that the Philippines ratified the treaty because of local opposition. Under this treaty, the Philippines supplied Japan with tuna, shrimp and other marine commodities, while Japan exported canned mackerel and sardines to the Philippines.

In 1947¹, Congress created the Bureau of Fisheries (BoF) under the Department of Agriculture (DA) and Commerce (DAC) to promote further

¹ Originally, fisheries management began under the Division of Fisheries in the Bureau of Science in 1907.

development of the fishing industry (BFAR 1987). The office was granted broad powers to issue licenses and permits, conduct studies, supervise and control the demarcation, protection, management, development, reproduction, occupancy and use of all public fishery reserves and national and municipal fisheries and fishery reservations (RA 177, Section 4). The bureau was abolished in 1963 and replaced with the Philippine Fisheries Commission (PFC) under RA 3512. The commission exercised even broader powers than its predecessor. These added powers pertained mainly to increasing fish production by encouraging more fishing activities and increasing efficiency through better technology. The commission was a collegial body with representatives from the private sector.

Development of fishery resources was accelerated further upon the promulgation of the Fishery Industry Development Decree (Presidential Decree [PD] 43) in 1972. The government sought to promote, encourage and hasten the organization and integration of the activities of all persons engaged in the industry so that the country could achieve self-sufficiency in fishery products. The government committed to help by providing financing, training and extension services towards this goal. By this time, the BoF had been restored and the PFC replaced with the Fishery Industry Development Council, which included among its members representatives from government banks and the head of the Board of Investments. This emphasized further the goal of maximizing the exploitation of the country's vast fishery resources.

In 1975, PD 704 (Fisheries Code) was issued because of an urgent need to revise and consolidate all laws and decrees affecting fishery resources that have remained largely untapped due to unnecessary constraints by existing laws and regulations and by a failure to provide an integrated development program for the industry. In the declaration of policy, the acceleration of development of the fishing industry is tempered with the policy of keeping the fishery resources in optimum productive condition through conservation and protection as expressed in the provisions on establishment of fish sanctuaries and prohibitions of destructive fishing methods.

A more significant impact of the Fisheries Code of 1975 was on foreign involvement in Philippine capture fisheries. The code paved the way for the reintroduction of Japanese investment and Japan became the dominant partner in joint fishery ventures.

Fishery laws in the Philippines did not change until the Congress enacted the Fisheries Code of 1998. While it contains more specific provisions on sustainable development of resources, it has not changed the orientation of the law in emphasizing exploitation.

The new code emphasizes food security, prioritization of local fishers in the allocation of privileges and benefits and sustainable development, among others. It provides for limiting access to resources through quotas, closed seasons, restrictions on the use of destructive fishing gear, and designating fishery reserves and sanctuaries. A significant change in the new code is the devolution of management to local governments. Municipal waters, extending up to 15 km offshore, are under the control of municipal and city governments. The national government retains control of waters beyond the municipal jurisdictions. This is in line with the general principle of devolution under the LGC, which was passed seven years earlier. The LGC transferred to local governments broad powers of environmental protection, but especially control over the coastal areas within their jurisdictions. The LGC, however, focused on permits and fiscal matters. Now, with the Fisheries Code, general management and development powers are given to the local governments. A few months before the enactment of the new Fisheries Code, Congress passed the AFMA, which focuses on food security and global competitiveness in the agriculture and fisheries sector and ensures the equitable sharing of benefits among stakeholders. The act aims to provide financial and technical support to the agro-fisheries industry in its modernization effort.

Management of the Coastal Environment

Regulations relating to the management of the coastal zone are generally incorporated in broad environmental laws, such as the environmental

impact assessment (EIA) and pollution control laws.

Environmental Impact Assessment System

An important legal mechanism for environmental management in coastal and marine zones is the law on EIA. In the Philippines, an EIA system was first adopted in 1977 when the National Environmental Protection Council (NEPC) was created and given the power “to review environmental impact assessments of projects submitted by government agencies”².

Under PD 1586, environmental impact statements were required only for undertakings or areas that were declared by the President as environmentally critical. However, the NEPC was authorized to require non-critical projects or undertakings to provide additional environmental safeguards as it may deem necessary³.

In 1981, Presidential Proclamation 2146 was issued, identifying environmentally critical projects as heavy industries, resource extractive industries, as well as infrastructure projects. The environmentally critical areas (ECAs) were also defined, including all declared protected areas, critical habitats of wildlife, prime agricultural lands, mangrove areas and coral reefs, areas of significant historical, cultural or aesthetic value and areas often hit by natural calamities. The most important features of the Philippine EIA system are:

- The distinction made between environmentally critical projects and projects in ECAs;
- The decentralization of EIA system decisions to regional offices for non-critical projects in environmentally sensitive areas;
- The incorporation of the principles of environmental risk assessment in the system; and
- The inclusion of social acceptability in the criteria in the issuance of an environmental compliance certificate (ECC).

By requiring an ECC for all projects in all environmentally sensitive areas, most activities in

marine and coastal areas require an ECC. Indeed, the history of the implementation of the EIA system would reveal a continuing process of addition to the list of projects requiring an ECC. Operation of a ferry system in Laguna de Bay and the dumping of wastewater in the sea are two recent examples of new activities that have been added to this list. By decentralizing these decisions to the regional offices of the DENR, a more efficient implementation of the EIA system is possible.

The inclusion of environmental risk assessment and social acceptability in the EIA system is a potent tool for decision makers. Lack of environmental risk assessment was perceived to be one of the reasons that resulted in the mining disaster that occurred in Marinduque in 1996, resulting in extensive damage to the Boac River and outlying coastal areas. The inclusion of environmental risk assessment in the EIA system is a step towards avoiding a repetition of such a disaster. As for social acceptability, its inclusion in the criteria for the issuance of an ECC is a result of many experiences by the DENR of controversial projects that generated serious concern, in many cases outright opposition, among affected communities. By requiring social acceptability⁴, the expectation is that most negative environmental consequences of a project are avoided or, at the very least, mitigated.

In sum, the EIA system in the Philippines provides an important tool for effective environmental management of marine and coastal areas. In one project involving a proposal to build a cement plant in a coastal area, the DENR denied the ECC. The DENR cited its failure to fulfill the requirement of social acceptability as one of the reasons for not allowing the project to operate.

As a rule, environmental pollution is regulated by the DENR. The DENR, through the Environmental Management Bureau (EMB), sets ambient, emission and effluent standards to control the discharge of pollutants into the air, land and waters. In 1987, the DENR absorbed the powers of the National Pollution Control Commission (NPCC) created under the Pollution Control Law, when the

² PD 1121, Section 2(e).

³ PD 1586, Section 5.

⁴ DAO 96-37, Section 3 (cc).

department was reorganized under Executive Order (EO) 192.

Pollution Control

Both air and water pollution have significant impacts on the coastal environment. Pollution in general is governed by PD 984. Under that law, the NPCC formulated the policy, set pollution control standards, adjudicated violations and performed other regulatory functions. When the DENR was reorganized, the regulatory functions were transferred to the regional offices, the policy formulation and standard setting were assigned to the EMB, while the quasi-judicial functions were given to the Pollution Adjudication Board.

Marine pollution is regulated by the Philippine Coast Guard (PCG). Under PD 600, “it shall be unlawful to throw, discharge, or deposit, or cause, suffer, or procure to be thrown, discharged, or deposited either from or out of any ship, barge, or other floating craft of any kind, or from the shore, wharf, manufacturing establishment, or mill of any kind, any refuse matter of any kind or whatever description other than that flowing from streets and sewers.” The discharge of oil and other noxious substances is also prohibited. In cases of oil pollution, the polluter is liable for the clean up in addition to criminal fines and imprisonment.

In PD 984 and PD 600, there is an apparent overlap. Both laws address the issue of discharge of pollutants into the waters and seas, whether from a land-based or ship-based source. PD 600 was amended by PD 979 to delineate the functions of the concerned agencies, while retaining essentially the same prohibitions. In line with the goal of avoiding duplication and conflict in functions, the DENR and PCG entered into an agreement whereby the DENR regulates land-based sources and PCG monitors and regulates ship-based pollution sources.

Institutional Arrangements

An exhaustive review of all government agencies involved in coastal and marine resources management would require a review of the entire governmental machinery since almost every aspect of the

bureaucracy has some direct or indirect participation, from budget management, finance and economic planning to tourism, agriculture, agrarian reform and even national defense, foreign affairs, education and labor.

Assessment of Agencies Involved in Coastal Management

To simplify the distinction between different government agencies with marine and coastal management functions, four categories may be considered:

- Policy-making and general management
 - (a) The DENR which has overall responsibility for environmental protection and management of both marine and coastal environment;
 - (b) The Department of Agriculture (DA) which has jurisdiction over the conservation and proper use of agricultural and fishery resources. Under its Fisheries Sector Program (FSP), now Fishery Resources Management Program, the DA has implemented a management system known as Coastal Resources Management Project (CRMP) that was pilot tested in 12 priority bays; the LGUs, by virtue of the devolved functions under the LGC of 1991, had been given the exclusive authority to grant fishery privileges in the municipal waters. The more important power is the expansion of their jurisdiction over municipal waters up to 15 km; autonomous regions which under the Organic Act of Muslim Mindanao (RA 6734), the regional government has been given full control over natural resources management, except for some strategic resources; and
 - (c) The National Economic Development Authority (NEDA) coordinates various social and economic plans, policies, programs and projects on a national and sector basis.

- Scientific Research
 - (a) The Department of Science and Technology-Philippine Council for Aquatic and Marine Resources Development (DoST-PCAMRD), which is a policy formulating and coordinating body for aquatic and marine science and technology development;
 - (b) The DA-BFAR, which is the main coordinating body for research conducted by the DA;
 - (c) The DENR-Ecosystem Research and Development Bureau (ERDB), which is DENR's research coordinating unit; and
 - (d) The University of the Philippines-Marine Science Institute (UP-MSI), which is the national center of excellence in the marine sciences.

- Law enforcement and coordinating functions
 - (a) The Department of the Interior and Local Government-Philippine National Police (DILG-PNP), which has the responsibility of crime prevention and the apprehension of violators;
 - (b) The Department of National Defense (DND)-PCG, which has the primary role in the prevention and control of marine pollution;
 - (c) The Presidential Commission on Anti-Illegal Fishing and Marine Conservation (PCAIFMC) or the *Bantay Dagat* Committee (BDC), which is the main law enforcement agency in coastal waters;
 - (d) The Inter-Agency Task Force on Coastal Environment Protection (IATFCEP), which coordinates the departments and agencies enforcing coastal environment protection; and
 - (e) The Department of Foreign Affairs (DFA), which heads the Cabinet Committee on Marine Affairs which addresses the various concerns on the implementation of the United Nations Convention on the Law of the Sea (UNCLOS).

There are other national agencies involved in the management of specific resources, like the BFAR, which is the lead agency in fisheries management; the Department of Health (DoH), which is involved in marine and coastal resources management issues that have a bearing on public health; the National Water Resources Council (NWRC), which governs the ownership, appropriation, use, exploitation, development, conservation, and protection of water resources whether subterranean, surface or atmospheric, fresh or sea water; the Philippine Ports Authority (PPA), which is involved in ports development.

The DENR has, in its past and present organizational structure, been recognized as the agency with the mandate over natural resources use and management, including marine and coastal resources. The department has the mandate to design and implement a program that covers the entire spectrum of coastal resources management: from wildlife protection, protected areas management, to pollution control, forests/mangroves conservation, land use, mining regulations, and others.

The management and exploitation of marine and coastal resources traditionally went hand-in-hand with environmental protection under the Department of Natural Resources (DNR). As far back as the Fisheries Act or Act 4003 (1934), fisheries were under the jurisdiction of the DNR. This was the system until 1984 when the BFAR was removed from the Ministry of Natural Resources (MNR) and transferred to the food production group of the Ministry of Agriculture and Food by virtue of EO 967. Interestingly, the management of coastal and marine habitats was retained in the MNR. The split between use functions on the one hand and conservation/protection functions on the other has remained to this day.

Programs of the DENR have serious and substantial impacts on coastal zone management. Through its forestry programs, the department has control over mangrove and watershed resources. The department also supervises the NIPAS that can propose the establishment of coastal and marine protected areas. Wildlife conservation is a major concern of the department. While it does not take

the lead role in the protection of marine wildlife, the department has programs specifically aimed at the conservation of marine species such as turtles and marine mammals. The DA, through BFAR, leads in the protection of marine wildlife.

Through its environment programs, the department regulates the discharge of wastes and other pollutants into the seas. Activities in critical coastal areas are subject to the EIA system. Environment programs address environmental impacts brought about by industrial activities. The EIA system, being supervised and implemented by the DENR, ensures that development projects do not become environmental threats. Projects which pose serious threats are denied environmental clearance. Proponents are required to submit an Environmental Management Plan (EMP) to prevent, minimize, mitigate and monitor environmental impacts. Monitoring and regulation functions in relation to the implementation of the EIA system contribute to the overall program of protecting coastal resources.

The organizational structure of the DENR directs the implementation of programs to the regional offices. Policymaking and research functions are performed by staff bureaus. In 1993, the DENR launched the Coastal Environment Program (CEP) that takes an integrated approach to coastal resource management. The CEP's mandate includes the promotion of the use of environment-friendly coastal technologies, expansion of livelihood opportunities in, and assures equal access to, coastal resources and upgrading the capabilities of all DENR personnel in the management of coastal environments⁵.

Fisheries, marine and aquatic resources were not included in the jurisdiction of the DENR under the department reorganization in 1986 (EO 192). However, under EO 292 (Administrative Code of 1987), which was promulgated a month after EO 192 was issued, fisheries, marine and aquatic resources were added to DENR's concerns. Some view this development as a source of confusion and conflict of jurisdictions, but the DENR has taken advantage of this expanded mandate to undertake the CEP.

Under the Administrative Code of 1987, the DA is mandated to promulgate and enforce all laws, rules and regulations governing the conservation and proper use of agricultural and fishery resources as well as conduct, coordinate and disseminate research studies on appropriate technologies for the improvement and development of agricultural crops, fisheries and other allied commodities.

The fragmentation of fisheries administration between various agencies of the DA and other departments is considered the root cause of its weakness. This is obvious when considering the history of the BFAR. The bureau started out as the Division of Fisheries under the Bureau of Science in 1907. In 1933, it was transferred to the Ministry of Agriculture and Commerce as the Fisheries and Game Administration. Later, it was reorganized as the Bureau of Fisheries in 1947 pursuant to RA 177. In 1963, it became the PFC. In 1972, it reverted back to the Bureau of Fisheries. In 1974, it took the name BFAR and was placed under the MNR. A decade later, it was transferred to the Ministry of Food and Agriculture (BFAR 1987).

Throughout its history, BFAR has moved from a science office focusing on research to a commerce office focusing on trade, to a natural resources office dealing with conservation, to an agriculture office focusing on food production, not to mention its stint as an independent commission. In every transfer, its focus changed as influenced by the mandate of its parent office.

Under the present system, the DA, through BFAR, its regional offices and specialized agencies, has jurisdiction over fisheries resources only. The department coordinates with the DENR when activities call for integration of other resources.

In an attempt to create a holistic approach to coastal resources management, the DA spearheaded a new management system under its FSP, now known as Fisheries Resources Management Program, that was being pilot tested in 12 priority bays. The program aims to integrate and coordinate the efforts of national agencies and local governments in the management of coastal resources. The department's

⁵ DAO 93-19.

control of the fishery was seriously eroded with the enactment of the LGC. The code provides for the devolution of the control over fishery resources within municipal waters to the municipalities. With the enactment of the New Fisheries Code (NFC), the BFAR has been strengthened as an institution, but its powers are still limited because the code has given to local governments the power over the conservation and development of the fishery.

Devolution to Local Governments

While LGUs have limited jurisdictions individually, their collective impacts have national implications. Local governments play a major role in coastal resources management by virtue of the devolution of functions under the LGC of 1991 (RA 7160).

The LGUs have considerable control in matters related to environmental protection. The LGC provides that national government agencies must consult the LGUs prior to the implementation of any project or program. The need to consult is especially enjoined when the project has significant environmental impact.

Local governments have the capacity or the potential to develop a total approach to coastal resource management within their jurisdictions. While the laws do not provide for comprehensive or detailed provisions on coastal resources management, the general provisions can serve as basis for formulating a complete municipal CRMP (La Viña 1997). However, it is the common observation that local governments are ill-prepared to take on the responsibilities. Both expertise and logistics have long been concentrated with central government agencies. Few LGUs are equipped with the financial and technical capabilities to carry on a sustainable program of coastal resources management.

To be effective, environmental management programs must manage ecosystems that seldom correspond to political boundaries making it imperative that local governments jointly manage

common resources. The LGC has provided for instances where LGUs may cooperate to achieve common goals⁶.

Institutional Integration

The case of the Batangas Bay Region (BBR) is a good example. In theory, each municipality can opt to initiate programs for resources within its jurisdiction. However, it was determined that an integrated approach would be more appropriate considering that the Bay has a huge potential as an alternative international port. The benefits of having a port would not accrue if the development plans are not designed in an integrated manner with the support of all local governments having jurisdiction over the shared resource.

In most cases, it would be ideal for the province to initiate and implement an integrated program because its territorial jurisdiction adequately covers whole ecosystems. However, while it has supervisory powers over component municipalities, the real powers are often exercised by the municipalities. For example, the province cannot devise an integrated fisheries program. The problem is complicated further when the resource is also shared by a highly urbanized city that is independent of the province. In such cases where no local management institution can implement an integrated program, a multilateral body has to be created with representations from the concerned local governments.

A multilateral body need not be composed only of local government representatives. In order to be more responsive, it should also include representations from key stakeholders making it a multi-sector body. Such a body can serve as the policymaking forum where all stakeholders can participate.

In the case of the BBR, it was determined the most feasible organizational structure would be a council created through a provincial ordinance with participation from local governments, private sector stakeholders and representatives from national

⁶ Section 3 (f) provides: "Local governments may group themselves, consolidate or coordinate their efforts, services and resources for purposes commonly beneficial to them". A procedure in Section 33 which states that LGUs "may, through appropriate ordinances, group themselves, consolidate or coordinate their efforts, services and resources for purposes commonly beneficial to them. In support of sound undertakings, the local government units involved may, upon approval by the sanggunian concerned after a public hearing conducted for the purposes, contribute funds, real estate, equipment, and other kinds of property and appoint or assign personnel under such terms and conditions as may be agreed upon by the participating local government units through memoranda of agreement".

government agencies. The participation of national government agencies is essential in order to coordinate efforts of the local council with national plans and programs. A high-level council would not be appropriate body to effectively carry out the programs and actions that have been decided. The council is there only to guide or set the direction. Day-to-day activities have to be delegated to a full-time implementing arm. In the case of Batangas, an office called the Provincial Government-Environment and Natural Resources Office (PG-ENRO) was created to serve as the secretariat of the council as well as its designated implementing arm.

The creation of a multisectoral council and its implementing arm requires legislation. Policies following the integrated approach also need to be translated to action plans that likewise require legislation in order to be implemented. As the policies are translated into action, resources have to be allotted by the participating local governments as well as the other government agencies.

At the national level, there have been attempts to create multisectoral agencies to manage coastal resources. The PCAIFMC or BDC was formed in 1989 and is chaired by the secretary of the DA with members consisting of the secretaries of the Department of Justice (DoJ), Department of Education Culture and Sports (DECS), DND, DILG, DoT, DENR, Press Secretary and the general manager of the Philippine Tourism Authority (PTA). This was created in response to the “urgent need to coordinate the efforts of national and local government agencies, civic organizations, and the residents of fishing communities for a total and simultaneous campaign to stop and reverse this destructive trend, and manage our fishery resources to maintain their productivity.”

The activities of the committee have mainly focused on law enforcement. The committee has distributed patrol boats to LGUs to be used for apprehending illegal fishing activities. Much of the funding has come from the Fisheries Sector Program (FSP) of the DA.

In 1993, another agency, the IATFCEP was formed by virtue of EO 117 at the initiative of the DENR. This was an extension of the CEP launched

by the department in the early part of the same year. The creation of the task force was intended for cooperation and coordination among the departments and agencies enforcing coastal environment protection to strengthen and sustain law enforcement systems throughout the country. However, it appears that the task force only focuses on law enforcement and not on the other aspects of coastal and marine resources management. This is apparent in the initial designation of the DND-Philippine Navy (PN) as lead agency, which will be replaced by the DILG-PNP after a year.

Both IATFCEP and PCAIFMC started with lofty ideals. Neither has come up with a comprehensive program to manage coastal and marine resources, not even a program to coordinate and rationalize existing efforts. Both bodies focus mainly on law enforcement. However, other aspects of management have to be coordinated. For instance, research efforts on the status and sustainability of use of the resources must be a combined effort of national agencies and local governments. Few resources are limited to a single municipal jurisdiction.

Public Participation

Community participation in policy and program formulation was institutionalized with the promulgation of EO 240 (1995) which mandates the formation of Fisheries and Aquatic Resources Management Committees (FARMCs) in coastal *barangays*, cities and municipalities. The executive issuance was met with much support from fishers and proved promising. The FARMC concept has been institutionalized and integrated into the new Fisheries Code.

Community participation is crucial to the success of any regulatory program. There is a higher probability of success when the community is involved at the earliest stages of developing the regime. The shaping of the regulations should take into account existing practices and inputs from the community.

In Bolinao, Pangasinan (discussed in the case study in the next section), the community itself worked to develop the management program for their coastal zone. The scientists and community

organizers provided the guidance to ensure that the management plan had a sound scientific basis. The community then lobbied for the adoption of the plan by the local government.

Summary

Though regulatory mechanisms have their specific functions, sole reliance on them has proven to be ineffective in abating the degradation and depletion of marine and coastal resources. There are telling examples of past and present management failures. A considerable amount of legislation has been passed, many regulatory mechanisms have been used, institutions have been reformed, and new ones have been created. However, these current arrangements do not adequately deal with the mounting problems in the marine and coastal zones.

The use of strategies that would move away from command and control approaches to community-based and market-based strategies needs to be explored. These strategies may prove practicable and effective in guiding resource uses in the marine and coastal zones and in raising revenue for use in the management of the resources. The existing institutional set-up is complex, confusing, sectoralized and fragmented. Fragmentation is the major systemic hindrance to more effective management. There is an urgent need for sectoral integration and coordination.

COMMUNITY-BASED RESOURCE MANAGEMENT: FOUR CASE STUDIES

Despite the intricate legal system set up for managing the coastal environment, other modes of administration have grown and become more attractive. These include community-based systems of management.

Historical Perspective

Before the arrival of the Spanish, landowning was communal in character, with the actual title vested in the *barangay*. Wealth was determined by how many dependents a chieftain could muster to cultivate the communally owned lands (Phelan 1959). In the maritime sector, endeavors reflective of this communal tradition survived into the Spanish

period. In some villages, the leaders united to build a vessel — a pirogue — in which they shipped their produce under the conduct of a few persons who went to navigate and sell the cargo. After the produce was traded at the port of destination, the returns were distributed to all according to their share. Festivities were then held to thank the saints for their kindness, and invoke blessings for another year. After this cooperative undertaking, the vessel was taken to pieces and distributed among the owners to be preserved for the next season (De la Costa 1965).

Throughout the Spanish and American colonial periods, conflicts between state regulation and community-based practices over the use of coastal resources played a secondary role in the peasant's struggle for reform in the agricultural sector. This was mainly because the Filipinos were always farmers as well as fishers. In the provinces, it was rare to see a Filipino who was engaged in only one occupation (Wright 1907).

A common tactic of resistance by the peasant class in Philippine society is the intentional disregard of state regulations that is both non-confrontational and can be resorted to most of the time with the least repercussions because the government was never strong enough to enforce absolute compliance. Thus, non-compliance may become a social norm. There are also instances of vocal resistance by local communities to state regulation of coastal resources when the latter clash with traditional community resource use. In 1975, measures were passed banning the gathering of migratory species in Naujan Lake, Oriental Mindoro in order to cater to the fingerling demands of the fish pen industry. Two fishers were caught fishing in the prohibited area by the park warden. The two fishers hacked the warden to death when he refused to allow them to continue (Bautista and Anigan 1978).

Rationale for Community-based Resource Management

Historically, community management developed independent of and even preceded governmental regulations and persisted even after formal regulatory norms were set in place. Years of experience in community-based resource management (CBRM),

from forestry to fisheries, show the common reasons why such approaches are desirable. Batongbacal (1991) summarizes these in the context of coastal resource management as:

- The communities' dependence on the coastal zone;
- Inadequacy of traditional systems of centralized government management;
- Greater efficiency in planning and implementation;
- Democratization of access to resources;
- More prospects of success; and
- Failure of previous cooperative activities.

CBRM is intended as an integrated approach to area development. It is holistic in the sense that it responds to resolving conflicts over multiple resource use and attempts to integrate the sociopolitical and the economic aspects with the biophysical elements of resource management. CBRM emphasizes that environmental problems have both social and technical aspects. Therefore, CBRM is about letting people make their own rules and decisions and enforce them. The state's responsibility is to provide the necessary technical and administrative support to enable the group to carry out these functions, and to ensure the legitimization or recognition of the group's policies outside of the group so that their measures remain effective even in the face of interference from nonmembers. The general concept of CBRM was born out of political struggle; the control of natural resources was a direct manifestation of the distribution of power and wealth in society. Since the issue of environmental management thereby became an issue of equity, the philosophy and approaches that developed in the Philippines for the application of a new environmental agenda emphasized community-based models of resource management

(Batongbacal 1991). The initial successes of these models in community-based forestry projects were applied to marine resources.

In this paper, four case studies are presented covering the range of experiences in the Philippines of CBRM. The Coron Island case involves indigenous peoples. The Apo Island experience is the classic example of a community-based approach in fisheries and coral reef management. The Bolinao case study looks into the interface of traditional fisheries and coral reef management issues with questions brought about by modernization and industrialization. Finally, the Batangas Bay experiment illustrates options as the pressures of modernization and industrialization begin to prevail.

Coron Island, Palawan⁷

Coron Island is home to the *Tagbanuas*, an indigenous group of some 283 families, all of whom are presently members of the *Tagbanua* Foundation of Coron Island (TFCI). The island has two settlements, one in Cabugao and the other in Banwang-Daan, where most of the town's *Tagbanuas* congregate. The official population data of the Coron Municipal Planning and Development Office (CMPDO) shows 4 888 *Tagbanuas* (18% of total municipal population) living in the municipality⁸. The *Tagbanuas* have been on the island since time immemorial and consider the land and a portion of the sea as their ancestral domain⁹. The *Tagbanuas* exercise indigenous resources management practices anchored mainly in their culture and beliefs.

Environmental Profile

Coron Island is part of the Calamianes Island Group located in Northern Palawan. The island is

⁷ The information used here was from an unpublished study conducted by Philippine Association for Intercultural Development, Inc. (PAFID) between 1997 and 1998 and funded by the Legal Rights and Natural Resources Center, which documents the experience of PAFID and SARAGPUNTA, a federation of Tagbanua community organizations in Northern Palawan in the delineation of the latter's ancestral domain claim. The study is currently under review and is due for publication soon.

⁸ The PAFID study notes the significant difference between the 1998 population tally of the Coron MPDO and the 1996 population figure of the Institute of Philippine Culture, which was culled from the MPDO records. PAFID suggested that the Tagbanuas' might have suffered great mortality or there was a sudden surge of non-indigenous immigration in the Tagbanua barangays.

⁹ The time immemorial possession of the land and a portion of Coron waters has been recognized by the Philippine government with the issuance of the Tagbanuas' Certificate of Ancestral Domain Claim. Former Undersecretary Antonio La Viña, in his memorandum for the DENR Secretary dated 02 June 1998 recommending the issuance of the CADC to TFCI, recognized the important contribution of the groups indigenous management system in the sustainable use of their ancestral waters and the natural resources found therein.

about 5 km from the town center of Coron on Busuanga Island and has a total land area of approximately 7 700 ha. Coron Island is blessed with natural resources and a natural landscape that makes it very attractive for tourism related development activities. There are eight brackish lakes and three smaller ones located on the island, the largest being Lake Abayok which is 20 km long and 30 fathoms deep. Lake Kayangan is 12.5 ha in extent. Underground connections to the sea have allowed the entry of giant barracudas and octopuses, giving one of the lakes its name "Barracuda Lake." Climate is dry from December to April and monsoonal the rest of the year¹⁰.

About 5 000 ha of the total land area of the island are made up of rocky cliffs, which is why the *Tagbanuas* do not depend primarily on agriculture for their subsistence (IPC 1996). For their livelihood, they depend on fish and other aquatic resources such as *tekbeken* (small octopus), *balat* (sea cucumber), *latuk* (edible seaweed); and edible birds' nests or *luray* for those who own clan caves. The outer rim of the island, forming fissures and caves are home to the swiftlets (*balinsasayaw*) which construct edible bird's nest that the *Tagbanuas* gather and sell to local Chinese traders.

In terms of agricultural production, only a few families cultivate *kuma* (swidden farms), which are mostly planted with upland rice and corn. A typical *kuma* is good for one harvest of rice which is barely enough to tide over a typical *Tagbanua* household to the next harvest. To supplement income and food supply, most families plant cashew trees in backyard lots and the nuts are sold in exchange for rice¹¹. The jagged terrain and scrub-like vegetation discourage vegetation clearing. Hence, the undisturbed vegetative cover provides protection for wildlife, acts as a watershed and provides natural nutrients to the hills and small plains below. Some of the water conserved by this mantle of vegetation is stored in the lake.

The island has three vegetation types: forest covered limestone, beach forest and mangrove. The island fauna includes the Philippine macaque, wild

pigs, porcupines, anteaters, lizards, Palawan hornbill and various parrot species. Marine turtles nest on some of the beaches and dugongs are also seen along the coast.

Indigenous Use and Management of the Coastal and Aquatic/Fishery Resources

The *Tagbanuas* harvest more from the sea than from the forest. They vigorously fought for government recognition of their claim over ancestral waters as an integral part of their ancestral domain claim. Both land and sea are vital for the daily subsistence of the *Tagbanuas* and for the preservation of their way of life. While the *Tagbanuas* consider the marine resources as part of their ancestral domain, they do not think this is for their exclusive use. They believe that the sea is a communal property. They "allow" access by outsiders as long as the fishing methods are legal and are not done in sacred areas.

The *Tagbanuas'* resource use and management system is operational within the context of the *panyaan* and the *amlaran* (sacred areas at sea and on land, respectively, which are considered restricted areas), the observance of customary laws governing resource access and use, and the role of the clan elders in the observance of traditional laws, especially the imposition of sanctions and penalties as a means of control or discipline.

The *panyaan* are marine areas traditionally avoided by the *Tagbanuas* because of a belief that these are inhabited or under the influence of sensitive spirits that bring harm on anyone who trespass the area. The same belief governs the *amlaran* and the *amuyuk* (sacred lakes), which the *Tagbanuas* believe to be inhabited by spirits in the form of octopuses. Access and use of resources found in the sacred areas may only be given to a *Tagbanua* by the elders and the community *albularyo* (medicine man). When in the restricted zones, the individual must strictly observe certain behaviors, silence or limiting one's speech or using an entirely different language so as not to disturb or offend the spirits. Failure to do so would surely bring misfortune, even death, to

¹⁰ This portion was based largely on an unpublished baseline study conducted by PAFID in 1995, which was an attached document to the TFCCI's application for CADCI originally submitted in 1993.

¹¹ Taken from PAFID's unpublished study, 1997-1998, p.16. The information was validated in an interview with Rodolfo Aguilar, Chair of TFCCI, in October 1997.

the individual. In such a situation, the only way to appease the spirits is for the *albularyo* to perform traditional rituals. The reason why the *Tagbanuas* prohibit fishing or gathering of resources in the *panyaan* or sacred areas for both *Tagbanuas* and non-*Tagbanuas* is also for the welfare of the people. The prohibition is to protect them from the wrath of the spirits inhabiting the sacred areas¹². Their Certificate of Ancestral Domain Claim (CADC) application calls for the respect of all these sacred areas.

The *panyaan* may be likened to the modern day marine reserves or marine sanctuaries while the *amuyuk*, the sacred lakes, are a crucial part of the island's watershed and shelter the swiftlets' caves. For the *Tagbanuas*, these sacred areas are considered crucial to the sustainability of their natural resources, their ancestral domain, and the survival of both the present and future generations of their people.

The resource management also covers the cliffs of the island down to the valleys and traverses the lakes and rivers as well as the mangroves and the sea. Forest resources are communally owned. No individual is allowed to own even a portion of the forests. Everyone in the community is allowed access to these resources for as long as these rights are not abused.

In an interview with Rodolfo Aguilar, the chair of TFCI, he said that the *Tagbanuas* have a set of rules for the caves located on the cliffs of the island. The individual who discovers the cave is supposed to have exclusive rights to harvest swiftlets' nests in that cave and such rights are respected by other nest collectors. Almost all able-bodied persons on the island participate in the *balinsasayaw* season. This practice has been handed down from generation to generation and it has been traced back to the coming of the Chinese traders before Magellan. The collec-

tion methods of the *Tagbanuas* have always been governed by an open and closed season in order not to adversely affect the population of the swiftlets¹³. The season for nest gathering could vary yearly. In Banwang-Daan, it could start as early as December and end in April while in Cabugao collecting begins in January and lasts until April as well (IPC 1996).

Others seek a livelihood elsewhere through fishing or diving. The *Tagbanuas* traditionally use the waters around the island for subsistence fishing, swidden farming, and other land-based livelihood activities. The amount of resources they extract is limited to their own sustenance. They do not engage in commercial harvests. Their fish catch usually consists of reef fishes such as groupers, snappers, rabbitfishes, parrotfishes, (*lapu-lapu*, *maya-maya*, *samaral*, and *molmol* respectively). Other marine life gathered are seaweeds (*lato*), shellfish, lobsters (*banagan*), eels (*indong*), mackerels (*tanguigue*), and anchovies. Seaweed farming has been recently introduced to the *Tagbanuas*.

Interviews¹⁴ with officials of the TFCI and respected elders of the community revealed that the *Tagbanuas* have in the past used traditional fishing gear such as spears (*sibat*), bow and arrow (*pana*), hook and line (*kawil*) and other less invasive and non-destructive fishing gear. The *Tagbanuas* attribute the diminution of their fish catch and the destruction of their traditional fishing grounds to modern and more invasive fishing methods used by outsiders, which yield more catch and sometimes are over efficient. They have created rules enumerating prohibited fishing methods within their ancestral domain. These rules are also based on the legal regime prohibiting certain fishing practices. The *Tagbanuas* call these prohibited fishing practices illegal and these include blast fishing, the use of

¹² Based on PAFID unpublished study on mapping of ancestral lands and waters, 1997-1998, sponsored by LRC, p.26. The information was verified by statements of Mr. Rodolfo Aguilar and other leaders as well as community members interviewed for this case study during a field research undertaken in October 1997.

¹³ Mr. Aguilar, however, admitted that on rare occasions some *Tagbanuas* violate the community's rule on nest gathering. That is, they collect nests even before the eggs have been hatched just like what non-*Tagbanua* gatherers would do. Such behavior is dealt with accordingly by the community leaders.

¹⁴ Interview with Mr. Aguilar, Mr. Renato Dacullos and Brgy. Captain Macoy Veloso, October 1997. Mr. Aguilar and Brgy. Capt. Veloso are officials of TFCI and at the same time respected elders of the community.

cyanide, Danish Seine (*hulbot-hulbot*) and the use of compressors. They believe these kinds of fishing practices deplete the fishing stock and destroy the environment.

The *Tagbanuas* consider the entry of commercial fishing vessels within ancestral domain areas as wrongful because they consider the very large fish catch of these vessels as unsustainable and deplete the resources rapidly. According to Aguilar and Veloso, TFCI Chair and *barangay* captain respectively, they also consider *muro-ami* and other illegal fishing methods as wrongful. For them, these kinds of fishing practices deplete the fishing stock and destroy the environment.

Seaweed farming has been recently introduced to the *Tagbanuas*. Women are mostly engaged in this activity. Their harvest of seaweeds is only to the extent that the seaweeds can still regenerate.

The *Tagbanuas* have traditionally practiced swidden farming. Part of the hilly land of the island has been cleared by swidden farming to grow food crops. Traditionally, these lands have been left to fallow and recover fertility. Unfortunately, this stable practice was jeopardized when migrants gained control of some of the prime farmlands, which displaced the *Tagbanuas* to move to higher, steeper slopes and to expand the scope and frequency of swidden methods beyond what is traditionally practiced. There used to be land erosion due to excessive *kaingin* or swidden farming. However, after the *Tagbanuas* entered the stewardship agreement with the government, they have avoided the practice of swidden farming. The *Tagbanuas* recognize property rights in favor of persons who clear an area through swidden farming. Persons can only return to areas they previously cleared.

The prime farmlands comprise about 350 ha. The major crops are coconut, cashew, cassava, sweet potato, pigeon beans (*kadios*), rice and millet. A number of the root crops growing in the forests have been domesticated and are now planted on level lands.

In general, annual crops are planted by tradi-

tional swidden methods even on level lands. Several *Tagbanua* farmers have started using more productive methods such as tillage and dikes to trap rainwater for *palay*. These are not sanctioned and there are strong taboos against disturbing the earth.

Cutting trees near streams, springs, wells and the coast is prohibited. The *Tagbanuas* recognize the value of these resources as watersheds which ensure irrigation of their crops and prevent soil erosion. *Tagbanuas* recognize the value of the mangrove ecosystem to their marine environment. They know these are fish breeding areas and have to be protected. Hence, as a rule mangrove trees cannot be cut unless there is consent from the council. Specific products including medicinal plants, root crops, trees and other edible resources may be gathered from the forests. The wildlife is sustainably protected by a policy prohibiting hunting except for mature pigs.

Based on unpublished research done by PAFID between 1997 and 1998, ancestral lands are passed on through the women since they are often the ones charged to manage the family's *kuma* and *taranuman* (swiddens and fields). Hence, they are not expected to just leave the land. In this respect, the women in the community are crucial to the continuity of occupation of the ancestral lands and the community's claim over the resources therein. Even male members of the community acknowledge the effectiveness of such an arrangement in preventing the loss of portions of the ancestral domain through deceit. There have been a number of instances in the past when a parcel of land within the *Tagbanua* territory has been signed away to non-*Tagbanuas* after the men who have been entrusted with them were lured to sign waivers of rights or other instruments, at times after a good round of gin or in exchange for paltry sums.

Officers of TCFI said another benefit from the stewardship of women of the group's ancestral lands is preservation of the boundaries of the lands often marked by the source of tubers and other rootcrops usually managed by the women. When gathering tubers and other rootcrops, the rule is to leave behind the roots in order for the plant to regener-

ate. The *Tagbanuas* have a concept of succession incorporated with the concept of ownership and private property¹⁵.

Issues in Resource Use and Management

Conflict over access, use and management of natural resources in Coron Island, especially coastal and aquatic resources, is a matter that has constantly plagued the *Tagbanuas* of the island. The struggle became more intense once TFCI applied for a CADC for their ancestral lands and waters. The struggle for control over the resources of the island involved the municipal government, the indigenous people, and private vested rights (individuals, families and business entities). The *Tagbanuas* scored their initial victory when in July 1990 the local DENR-Community Environment and Natural Resources Office (CENRO) awarded a Community Forest Stewardship Agreement (CFSA) to TFCI covering the entire island and a portion of Delian Island (7 748 ha). The CFSA, however, does not secure the *Tagbanuas'* traditional fishing grounds and the resources therein.

With the issuance of their CADC and government's recognition of their rights over their ancestral domain, the challenge for TFCI is to develop an ancestral domain management plan that will govern both conservation and development activities within the area. While it has secured their rights over the area, the issuance of the CADC did not remove the obstacles and threats posed by private claims over portions of lands within the domain. Sadly, the local government including the local DENR has been instrumental in perpetuating this situation each time they issue permits for resource use or extraction, or recognize private claims based on tax declarations (municipal government) in the *Tagbanuas'* ancestral domain.

The problems are not confined to the terrestrial aspect of the *Tagbanuas'* claim. Pearl farming has been allowed to operate in the surrounding waters of the island without prior notice to the *Tagbanuas*. The municipal council even issued a resolution, Resolution Number 14, Series of 1997, which allowed the mayor to enter into a memorandum of agreement with a private corporation (Hikari SSP Corporation) for the latter's lease in the area for the operation of a pearl farm.

To date, the municipal government remains opposed, albeit discreetly, to DENR recognition of the *Tagbanuas'* ancestral waters. The concept of ancestral waters does not coincide with the government's plan to promote Coron, especially Coron Island as a world-class tourism area. Under Proclamation Number 219, the PTA has jurisdiction over Coron Island and the implementation of the Tourism Management Plan (TMP) for the Calamianes area. More recently, the DoT has identified Kayangan Lake as a potential tourist area without consulting the *Tagbanuas*. Meanwhile, leaders of the TFCI have alleged that the CENRO, the local DENR office tasked to receive and process CADC applications issued certain licenses and permits such as pasture lease agreements within ancestral domain claims. Such actions contradict and undermine its decision to endorse for approval the CADC application of TFCI and the still existing CFSA that was issued by the same office.

Interviews with TFCI officials, *Tagbanua* elders, local NGOs and others also revealed that private investors and the local elite have been able to secure title over areas which are allegedly forest lands and within ancestral domain claims. Illegal fishing operators are allegedly able to influence municipal leaders and to evade arrest and prosecution¹⁶.

¹⁵ According to the PAFID study, some *Tagbanua* communities allow private ownership of smaller coral reefs and portions of the forests by families or clans. In such cases, only family or clan members can fish on those reefs and gather rattan firewood or timber from so called clan forests. Such arrangements, however, do not exist in the *Tagbanua* communities in Coron Island. This system was abandoned after the Japanese occupation, by which time rattan and timber supply in clan forests began to diminish. The study also noted that the reefs started to be used communally after conflicts in use rights were referred to the municipal government, which resolved that, henceforth, coral reefs are communally owned and could not be owned by just one family or clan.

¹⁶ These allegations have figured consistently in the interviews with the TFCI officials, *Tagbanua* elders, local NGOs like *Kawil Amianan*, International Marinelifelife Alliance, members of local law enforcement units, and private individuals, who all requested that their identity be kept in confidence.

Managing Conflicts and Decision-Making Processes

The *Tagbanua* communities on Coron Island are collectively governed by a council of elders responsible for the observance of indigenous laws and the enforcement of customary laws, including imposition of penalties and sanctions for infractions. In the past, the system of *panglaw*, or corporal punishment was used against *Tagbanuas* who willfully committed serious crimes. Over time, the use of *panglaw* has diminished as the roles of mediators (*mepet*) and keepers of traditional laws were slowly replaced by the *barangay* structure. The *barangay* organization and the community council of elders add a modicum of structure. A number of *Tagbanuas* serve as *barangay* leaders as well.

There is an interface of formal and informal structures where the legal system is beginning to recognize the non-formal management structures of the *Tagbanuas*. The *Tagbanua* community recognizes the laws and policies at the *barangay*, municipal and national laws.

With the advent of the *barangay*, the *Tagbanuas* put in writing the rules of their community with corresponding fines and sanctions. They impose fines for illegal fishing, cutting mangroves, and violation of local norms on swidden farming. The fines are graduated and a higher fine is often imposed for non-*Tagbanuas*.

In the recent past, the elders started to exercise control over resources. They had the right to appropriate the resources to the members of the community. Everyone was free to find their own place, however, they were not allowed to sell it. Non-*Tagbanuas*, on the other hand, did not have any proprietary rights to resources found within the traditional ancestral domains of the *Tagbanuas*. The elders also had to ensure the resources would continue to sustain the next generation. Ensuring that the resources were safeguarded for the use of all community members was a cardinal rule in *Tagbanua* society. The elders had the authority to punish wrongdoers.

Although it may seem that traditional laws and the laws governing the *barangay* structure have begun to overlap with the participation of some

Tagbanua leaders in the *barangay* political process, the elders and the officials of TFCI continue to uphold their traditional laws, culture, belief system and have chosen to maintain a non-commercial approach in using their resources. The elders said in interviews that they believe that it is precisely this way of life that has sustained them as a people, nurtured by their ecologically intact and resource-rich ancestral domain (Aguilar and Dacullos, personal communications).

The Interface Between the National Legal System and the Management System of the Tagbanuas in Coron Island

In 1977, President Ferdinand Marcos declared the entire province of Palawan a game refuge and bird sanctuary and the small islands of Palawan as national reserves closed to exploitation and settlement. In 1978, Coron Island was declared a tourist zone and marine reserve under the control of the PTA.

In 1992, RA 7611 or the Strategic Environment Plan (SEP) for Palawan Act was passed. This provides a “framework for the sustainable development of Palawan and shall serve as a guide to the local governments of Palawan and the local government agencies in the formulation of plans, programs, and projects affecting the province” (Section 5). The law provides a graded system of protecting natural resources in the whole of Palawan including areas traditionally occupied by cultural communities. The law mandates the following:

- Forest conservation through the imposition of a total commercial logging ban in areas of maximum protection and other restricted use;
- Protection of watersheds;
- Preservation of biological diversity;
- Protection of tribal people and their culture;
- Maintenance of maximum sustainable yield;
- Protection of rare and endangered species and their habitats;
- Provision of areas for environmental and ecological research, education, and training; and
- Provision of areas for tourism and recreation.

It is important to note that the SEP law recognizes “tribal areas in land and sea” and shall apply the same graded system upon proper consultation with the tribe. The *Tagbanuas* have a management system to ensure that all the above considerations are met.

The Implementing Rules Regulations (IRR) of RA 7611 enumerates areas for maximum protection and buffer zones. Certain categories coincide with the sacred areas of the *Tagbanuas*. These areas are rich in biodiversity. Thus, the goal of protecting a resource is achieved in different ways.

The IRR also considers areas of outstanding cultural value such as sacred and burial sites as areas for maximum protection. The Municipality of Coron, in Resolution Number 20, Series of 1995, also adopted the guidelines of the Environmental Critical Network contained in RA 7611 and adopted by the Palawan Council for Sustainable Development (PCSD). The coastal core zone in the IRR also coincides with areas where *Tagbanuas* restrict access and use. These are selected coral reefs, seagrass, and mangrove ecosystems.

The municipal government has also enacted several municipal resolutions relating to the protection of coastal and marine resources. Most of them, however, are replicas of national laws and policies. They are as follows:

- Ordinance Number 5, Series of 1993 - Prohibits the throwing of garbage in canals, vacant lots, and into the sea. The PCG, PNP and PPA, including all *barangay* officials, are empowered to implement the ordinance;
- Ordinance Number 4, Series of 1994 - Requires the registration of compressors used for fishing and other underwater activities operating in municipal waters;
- Ordinance Number 7, Series of 1994 - Banning *hulbot-hulbot*, *lintig*, *baby muro-ami*, *norway*, and other destructive fishing methods within the municipal waters of Coron, Palawan;
- Ordinance Number 3, Series of 1995 - Requires all fishing operators engaged in the live fish trade to accredit with the community fisheries board or its duly authorized representative in the municipal-

ity; and

- Ordinance Number 6, Series of 1996 - Makes it unlawful for any person to construct houses and other structures for the purpose of dwelling within 10 m from the high water level of mangroves, swamps, lakes and other seaside areas unless intended for development such as markets, ports and the like. Tourism related establishments are also exempt from the rule.

The recognition of the traditions of the *Tagbanuas* was further strengthened when Congress passed the Indigenous Peoples’ Rights Act (IPRA), which recognizes the right of indigenous peoples to manage their ancestral domain. The IPRA has yet to be fully implemented; but in mid-1998, the DENR issued a CADC recognizing the *Tagbanuas*’ claim to the island of Coron and the surrounding waters.

The *Tagbanuas*’ indigenous management system was a great factor in the preservation of the coastal and marine environment in Coron Island. Their indigenous concept is a precursor of the present concept of sustainable management of resources. However, there are numerous threats to their environment and to their way of life. Tenure to the land and waters, which the *Tagbanuas* and their ancestors consider their home since time immemorial, is threatened by current legal regimes and external actors. Until now, their ancestral domain rights had not been recognized by the government. Their indigenous management system is now the subject of incursions by external forces such as the local government and the tourism and fishing industries.

Elders and the leaders of the TFCI explained in interviews that coastal management is all about finding a balance among the different users of the resources. They claimed they have never excluded other users from their ancestral domain claim. Other users, however, must learn to respect their indigenous ways and management system, which is about using the resource in a sustainable manner.

Apo Island, Negros Oriental

Environmental Profile

Apo Island is a 74 ha volcanic island located at

the southern coast of Negros Oriental in the middle of the Mindanao Sea. The island is under the political jurisdiction of the Municipality of Dauin, Negros Oriental.

The highest peak is approximately 200 m high on the northern side while a low-lying hill dominates the southern half of the island. The rest of the island is generally flat to sloping. Two small shallow lagoons overgrown with mangroves can also be found on the southeastern side. Little of the original vegetation remains except in some steep, rocky areas. About one-third of the island has rich soil and is flat enough for cultivation. A narrow but diverse fringing coral reef surrounds the island.

The coastline consists of steep rocky cliffs and small white sandy beaches. Two principal beaches are located on the southwestern and southeastern shores. Live corals are extensive on the eastern and southeastern portions of the reef with much of its growth supported by volcanic rock boulders. The reef is characterized by steep drop-offs and gradually sloping drops of 20-40° decline.

Northeast (*amihan*) and southwest (*habagat*) monsoons affect wave action and fishing activities around Apo Island. The *amihan* occurs from November to March or April and inhibits fishing on the favored northeast reef. The *habagat* occurs from May to September and October and provides calm seas and favorable conditions for fishing. The current is predominantly wind driven, strong, non-reversing and consistently flows in a southwest direction at both ebb and flood tides. Current direction rarely changes throughout the year. Water visibility is excellent usually reaching more than 100 ft (Calumpang 1997; DENR-CENRO Dumaguete 1995; Silliman University Marine Laboratory Site Description Report, n.d.).

Resource Status and Demographics

The most significant coastal resource of the island is its beautiful and abundant fringing coral reefs. About 1.78 ha have been established as a fish sanctuary earlier, before the whole island was declared a protected area by the national government in 1993. The area has 127 species of reef fish belonging to 25 families, 7 species of mangroves, 5

species of seagrasses and 23 species of seaweeds. Seagrasses and mangroves are very sparse and occur only in small patches (Silliman University Marine Laboratory Site Description Report, n.d.).

The reef condition on the sanctuary side changed significantly over a 13-year period with a total coral cover of 68% in 1983 to 78% in 1995. From 1992 to 1995, hard coral cover increased from 41.3% to 53% while total sediment decreased from 32% to 16%. The total coral cover of Apo Island increased from 64% in 1983 to 70% in 1995. The percentage of coral rubble is insignificant. One hundred percent of Apo's coral cover is in good condition (Silliman University Marine Laboratory Site Description Report, n.d.).

The sanctuary also showed a significant increase in fish species diversity and abundance from 1985 to 1992. The increase in numbers of all target species resulted mostly from the lack of fishing pressure. Large marine life such as groupers, surgeonfishes, parrotfishes and jacks were found in abundant numbers. Twenty-two species of butterfly fish were recorded. In terms of fish yield, 16.8 t per km² per yr was recorded in 1981. During 1985-1986, the fish yield for reef fishes was 31.8 t per km² per yr and 4.9 t per km² per yr for non-reef fishes. In 1995, the total catch recorded was 273.99 t per km² per yr indicating an almost eight fold increase from 1985-1986 levels (Silliman University Marine Laboratory Site Description Report, n.d.).

Land use in the island includes approximately 4 ha for residential use, 4 ha for agricultural or multiple use, and about 46 ha as a restoration zone. Total land area is 73 ha (DENR-CENRO Dumaguete 1995).

About 77% of the population of Apo Island is fishing full time, 21% part time, and 2% fish occasionally. Others engage in retail businesses. Average monthly income per household is PhP 1 450 or US \$33. About 38% of the population has a secondary income such as vending, hollow block making and hat/mat-weaving. Fishing involves the use of outrigger canoes or motorized pump boats. The most common fishing method is the hook and line. Other methods are gill netting and spearfishing while a few use fish traps and beach seine nets.

Farming is also practiced by 70% of the households. Since there is a lack of arable land, crops such as corn, sweet potatoes, cassava, beans, coconut, vegetables, other fruit trees and ipil-ipil are cultivated in small farm plots. Livestock is also raised. One of the mangrove lagoons was converted into a milkfish pond by a group of local fishers in July 1995 (Silliman University Marine Laboratory Site Description Report, n.d. DENR-CENRO Dumaguete 1995). Apo Island has become a significant dive tourism destination.

The island has approximately 250 households with an average family size of seven. Most of the parents have only an elementary education. Sixteen percent of fathers and 11% of mothers went to high school. Four percent of the mothers went to college. Illiteracy among adults is about 4%. Among the children, 60% have gone through or are undergoing elementary education, 20% in secondary, 7% in tertiary and 13% are not enrolled in classes. All the residents are Roman Catholics. The small size of the island and salinity of the water do not attract migration from other places so the Apo Island community is a close-knit traditional fishing community (Silliman University Marine Laboratory Site Description Report, n.d.; DENR-CENRO Dumaguete 1995).

Educational facilities in the area are limited to two elementary school buildings. There are privately owned beach resort facilities developed for visiting tourists. A lighthouse operated by the PCG is found on the highest point of the island.

Resource Use

Illegal fishing methods such as dynamite fishing and *muro-ami* were observed in 1977. Dynamite use was introduced by outsiders from Cebu. Dynamite fishing by outsiders in the southwest reef was stopped in 1985, but *muro-ami* still occurred occasionally (Calumpang 1997).

Between 1979 and 1980, Silliman University (SU) extension workers conducted informal marine conservation and educational programs with the Apo Island residents. In 1982, an agreement was reached between the island village, SU and the Dauin municipal council regarding the guidelines of

the marine reserve. Minimal management and protection was implemented the next year.

In 1984, the Marine Conservation and Development Program (MCDP) of Silliman University implemented a comprehensive marine reserve on the island in collaboration with the residents and the LGU. The entire marine habitat surrounding Apo Island to 500 m offshore was declared a municipal reserve. The marine sanctuary was established on the southeast side covering an area of 11.2 ha to 250 m offshore or 284 ha to 500 m offshore and bordering 450 m of shoreline. The sanctuary was marked with buoys. In 1985, the community education center was established. It provided a venue for community meetings, workshops, seminars and lectures, and a tourist shelter. A core group called the Marine Management Committee, responsible for the upkeep and enforcement of the marine reserve, was also formed. In 1986, the consumers' cooperative was started (Calumpang 1997; Silliman University Marine Laboratory Site Description Report, n.d.).

Apo Island was declared a Protected Landscape and Seascape under Presidential Proclamation Number 438 making it part of the NIPAS. The island is now under the administration of the PAMB, which is composed of representatives from the DENR and other government agencies, LGU, the academe and the community.

Community-Based Resource Management

The Apo Island experience was one of the first coastal management initiatives in the country that used the community-based approach. Although initially the major agent in this experience, Silliman University (SU) in Dumaguete City, intended to conduct purely academic research at their project site, their involvement in the island's management of its resources eventually took a radical turn. According to Mr Dado Suan, a *barangay* official, at the very start the university's extension workers laid down a basic information campaign that would eventually pave the way for the establishment of a marine reserve. Workshops and meetings were held using a variety of non-formal techniques to cultivate environmental awareness.

Opposition to the establishment of the sanctuary came from the community itself. They were told the sanctuary could be disestablished if it did not benefit the community. Information and education activities were held to make the community aware of the benefits of establishing the sanctuary. The local government was supportive of the project from the start because of the technical knowledge brought to the area by the university. The project was later to serve as the model for other CBRM projects of the local government (Calumpung 1997).

With the establishment of the marine reserve, the need for an organized community to sustain the management efforts coincided with the initiation of the MCDP of the university. This program aimed to strengthen the Apo Island Marine Reserve by empowering the community to take responsibility for managing the natural resources of the whole island. Two community workers were assigned to Apo. They were responsible for organizing and sustaining community participation. By developing relationships and strengthening local institutions, they built trust in the community, introduced new ideas, and increased the capacity of the people to make management decisions (Suan and Briones, personal communication).

According to interviews with staff of Silliman University Marine Laboratory (SUML) and Silliman University-Legal Enforcement and Action Program (SU-LEAP), the program sought to identify a group that would be responsible for enforcing the regulations of the reserve. This core group grew out of some of the activities of the program such as the building of a community center. Eventually, a general election was held to formalize the core group. Officials were chosen and the new group was called the Marine Management Committee (MMC). This committee, aside from being responsible for the upkeep and policing of the marine reserve, proposed resolutions to the municipal council for the improvement of the reserve and the island's management.

A final component of the project was assistance in alternative livelihoods. Training was held on the establishment of a cooperative. Mat weaving and agroforestry were strengthened and organizations formed. A women's weaving group called Apo Weaving Association enabled the women to earn

extra income by selling woven mats to tourists in the island or by bringing them to the weekly market at Malatapay. A consumer's cooperative was formed in 1986 initially with 46 members. It now has 80 members and runs a retail store (Omilig, personal communication).

The Resource Management Division (RMD) of the province also entered into a memorandum of agreement with the DECS with regard to the making of lesson plans on environment and natural resources protection for school children. In the seminars of the RMD, a priest is tasked to deliver a lecture on stewardship and uses biblical teachings to increase the environmental awareness of the community. There are also attempts at integrating resource management efforts by including upland *barangay* officials in resource management seminars where they are informed how their activities affect the coastal area.

The MMC is responsible for the upkeep of the sanctuary as well as collecting donations from those using the facilities. Enforcement is carried out by the MMC. A 10-member *barangay tanod* team and a 26-member *Bantay Dagat* team conduct the policing and monitoring. Violators are approached, given a warning, and assessed a fine. Community support and successful enforcement over a 10-year period resulted in very few incidents of violation according to *Bantay Dagat* members.

According to Omilig and Suan, the local government of the Municipality of Dauin and the *barangay* council are supportive of the community efforts. The RMD of the province sends technical assistance. Line agencies of the national government have been involved in the efforts to manage the coastal and marine resources and environment. One of DENR's more important projects was its reforestation program that contributed to the desalination of the water supply in the island. The people of Apo Island previously brought their drinking water from the mainland at a significant cost. Now their water is potable (Omilig and Suan, personal communication).

The Legal Framework

Local and national laws contributed to the protection of the coral reefs and fishery resources in

Apo Island. In 1985, the entire marine habitat surrounding Apo Island was declared a municipal reserve. Apo Island was also previously declared a marine reserve and tourist zone under Proclamation Number 1801. Finally, in 1994, the island and its vicinity (1.5 km of sea) was declared a protected landscape and seascape by Proclamation Number 438 pursuant to the NIPAS Law.

The ordinance declaring the municipal reserve consisted of two major parts. The first part prohibited several fishing methods within 300 m of the high tide mark. The prohibited activities were already covered by national laws e.g., dynamite fishing, *muro-ami* and cyanide fishing. Only hook and line, bamboo traps, gill nets, spearfishing without scuba, and traditional gleaning are allowed. The second part of the ordinance established a core zone in the southeast corner of the island, which was to be known as the sanctuary. No fishing or collecting activities are allowed in this sanctuary. The anchoring of boats is allowed so long as the corals are not destroyed. This ordinance recognized the intersectoral initiative in establishing the reserve as well as the central role of the community in its management.

Proclamation Number 438 (issued on 9 August 1994) established 691.45 ha of marine area around and including the island into a protected landscape and seascape. This placed the area under the administration and control of the DENR in coordination with the local government of Dauin pursuant to the NIPAS Law. Sustainable development of the area is addressed in order to respond to the social and economic needs of the local community without causing adverse impact to the environment. Destruction of the coral reef or other activities that would disturb or destroy the ecosystem was prohibited.

As of 1997, there were still no PAMB regulations that would provide guidelines for the different uses allowed inside the protected area. With regard to diving activities, divers are required to register with the *Bantay Dagat* but it has been pointed out that they seldom do. The proposal is to limit the number of divers in the sanctuary to 10 at any given time.

Suan said a legal question that confronts the community of Apo Island is security of tenure over the land. The existing regime of land ownership on

the island is described as traditional rather than formal. People inherit land from their ancestors and it can be tilled by others if the owner is not capable of tilling the inherited property.

There have been efforts to title their properties but they were advised it is not worth the effort because the whole procedure would be costly. Land can be sold but as much as possible such transactions are limited to island residents. During the term of Secretary Angel Alcala in the DENR, a moratorium on the transfer of land was declared to prevent the further development of resorts. At present, there are no efforts in the PAMB to recognize the tenurial claims of the community through legal instruments.

Management Issues and Constraints

Probably the biggest problem confronting the Apo Island protected area at present is dive tourism. Because of its excellent coral cover relative to the rest of the country, Apo has become an increasingly popular destination for scuba diving. The large number of tourists and dive boats has become a threat to reef quality. The problem began to attract attention in 1993 when about 200 divers visited the island in November and December (Vogt 1996).

The role of the foreign-owned tourist diving school and shop on the island is being examined given the status of the area as a protected landscape and seascape. Ironically, the diving school was granted an ECC by the DENR although allegedly for a different purpose. Student divers are especially prone to cause damage to the corals because of ignorance, negligence and inexperience. The conduct of such activities is highly consequential to the environmental well-being of the island given its small size and fragile ecosystem (Vogt 1996).

The community and LGU, through the PAMB are developing regulations and guidelines for scuba diving at Apo to ensure that the community benefits from the activity and that it can be maintained at a sustainable level. The financial benefits of transporting tourists to the island are substantial. In the resort and dive shop, jobs have been provided to four members of the local community (Vogt 1996).

However, it is the dive resort owner and dive tour operators who benefit most from tourism on the

island. As was the case in commodity resource extraction, fishpond development, and export oriented fisheries development, the community was always the last to benefit. With this latest pattern of resource exploitation, the dive resort and tour operators exploit a resource largely owned by the community. According to Omilig, they get well paid by the tourists yet pay only token fees to the community, PhP 100 per day for big pump boats, PhP 50 per day for *bancas*, and PhP 50 per tourist. Suan said that another issue which has tested the patience of Apo residents is the larger lagoon on the island being acquired by an outsider through a fishpond lease agreement with the DA. Aside from depriving access to the whole community, the fishpond owner has also cut mangroves replanted by residents under a DENR program. Some members of the community have been arrested for illegally harvesting from the lagoon, which was formerly community property.

Another management constraint is the lack of financial resources. Since the budget is limited, the community adjusts its management strategies to the available funds. Once the regulations from the PAMB are implemented, there is also a question of where collected fees will go since the law provides that a portion go to the national government for the NIPAS administration, and another portion to the PAMB for disbursement to the protected area superintendent. There is no provision in the law that states that collected fees can go to local POs or NGOs, even if these organizations have been responsible for the establishment and sustainability of the reserve long before the government came in to share in its success.

With regard to the *Bantay Dagat*, some members are not as diligent in their duties because they do not receive any allowances or remuneration for their work. They claim the job is purely voluntary and the volunteers still have to earn a living.

Omilig (personal communication) pointed out that some alternative livelihood projects suffer setbacks. The objectives of the agroforestry projects are not on schedule because of late disbursement of funds by the DENR. The reason is that the DENR runs out of money and the salary for laborers of the reforestation program are not paid. The hog-raising project of the DENR-CEP was not successful because

the hogs died of disease, temporarily suspending the project.

The influx of government interventions also created confusion about the roles and responsibilities of stakeholders in relation to the community-based management structure. The latest of these government interventions is the PAMB, which is mandated under national law to be the administrative body in charge of the protected area. However, the real powers are vested in the DENR secretary and the local Protected Areas and Wildlife Division (PAWD) of the DENR.

Even with its tradition of community-based decisionmaking, the coastal resource management regime in Apo Island is legally tenuous in the absence of clear laws giving the community real powers of management and policymaking. The NIPAS law provides the DENR Secretary with the power to adopt a program of gradual resettlement off the island of the tenured community, the exercise of which is largely discretionary. Though the exercise of such a power is doubtful, given the crucial role the community plays in the care and protection of the island's ecosystem, the present set-up still brings to the fore the lack of legal mechanisms to strengthen community-based resource management institution.

At present, the role of the community under the law is limited to participating in the decisionmaking of the PAMB. The law does not distinguish between the major role they play and the supporting role of the other represented sectors in the PAMB. The present PAMB is reactive in the conduct of its management functions. They respond to problems instead of establishing guidelines to head off problems.

Vice-mayor Briones of Dauin, Negros Oriental, said that there are also coordination problems between the municipal government and the RMD of the provincial government. As has been observed by the municipal government, the RMD sometimes goes directly to the community without coordinating its activities with the municipal government. The municipal government also lacks equipment and resources to conduct monitoring. Capability building initiatives consist of seminars on environmental

protection and coastal resources management. Their extension service to Apo Island consists of a municipal health employee. They have not been able to provide assistance in the community's livelihood programs.

At the provincial level, the resource management division of the provincial government was initiated during the incumbency of Governor Socrates. The problem of institutionalizing resource management remains an issue because the present staff are population officers from the defunct population program of the national government. With the change in governor, the RMD might be absorbed by the Provincial Agriculture Office (PAO) that deals with production rather than conservation and resource management. Another layer was added with the recent creation of the Provincial Environment and Natural Resources Office (PENRO). The effect of the creation of this office with existing functions of the RMD is still unstudied. It is feared that its functions will overlap with those of the existing RMD.

The enforcement of national laws and the lack of policy on territorial use rights are a concern. Outside fishers are the major users of destructive fishing practices. Even in a small island community such as Apo, local politics still causes disunity and resource management problems because the islanders support different politicians or have different political godfathers.

Bolinao, Pangasinan

On 6 August 1999, the DENR denied "with finality", the application for an ECC of the Pangasinan Cement Corporation (PCC) for its proposed cement plant complex to be located in the town of Bolinao in Pangasinan. It was a decision that spelled victory for the environment and advocates of sustainable development. To the project proponent, DENR's decision was seen as anti-development. But the public saw it as a reaffirmation and advancement of the power of civil society, particularly local POs, to meaningfully participate and influence decisions on matters that have far-reaching implications on the sustainability of life and the resource base.

Environmental Profile

The town of Bolinao is located on a cape at the northwestern tip of Pangasinan, bounded on the north and west by the South China Sea, on the east by the town of Anda and Caquiputan Channel, and the town of Bani on the south. The town has a total land area of 23 320 ha. The town is 365 km away from Manila by land via Dagupan City (Ferrer et al. 1996).

Agriculturally productive land is 47% of the total land area. This is made up of irrigated, rainfed and upland or hilly lands. The rest of the area is classified either as built up (470 ha), pasture, forestland, institutional or infrastructure (2 529 ha), fish pond (641 ha), open range (1 888 ha), or rivers and creeks (430 ha). Farmlands are mostly planted to rice, with some corn, cassava and other root crops, coconut, fruit trees, fuel wood and others (Yambao and Salmo 1997).

The town of Bolinao is composed of 30 *barangays*, with 22 located along the coast. The topography of the town is characterized by rocky and hilly terrain. About 40% (9 099 ha) of the area is flat while the rest is sloping. Limestone is abundant and phosphate is common in the area.

Bolinao has the most extensive coral reef formation in the Province of Pangasinan. The reef stretches to the islands of Santiago and Dewey, and along the northwestern coast of the mainland, a total area of about 8 000 ha. The reef consists primarily of slopes and flats separated by a wave breaking reef crest. The average coral cover on the slope is approximately 20-30%. The Bolinao reef system serves as a critical support system for the associated shelf systems in Pangasinan and La Union. Substantial amounts of invertebrates, seaweed and fish are found in reef flats. The extensive reef cover of Bolinao accounts for about 270 of the more than 350 different species of finfish, shells, seaweed and other edible marine organisms that can be found in the local markets around Bolinao (McManus and Chua 1990).

In 1986, a survey by scientists from the UP-MSI revealed that 60% of the coral reef is already dead

largely due to blast fishing and the use of sodium cyanide. The condition of the coral reef is further reflected in the small number of adult fish and the decline in average fish catch. According to data from the Lingayen port, the Bolinao reef fishery used to yield an average of 430 t of finfish and 30% of the country's aquarium fish exports (LGCAMC 1996).

Seagrasses are dominant in 27 km² of the reef flat, interspersed with a few square kilometers of inter-tidal sand flats. Rabbitfishes and cardinalfishes abound in these areas. Cardinalfishes are known to depend on corals for cover during the day. Substantial change in the seagrass fish community is expected if the coral cover of the area continues to deteriorate.

In the 1960s, mangrove trees covered a large part of the town's riverbanks. The coverage started to dwindle when fishponds were opened in the 1970s. The rapid loss of mangrove cover contributed to the rapid decline of bangus fry already imperiled by rampant blast fishing.

Bolinao had a total population of 52 701 (1992) or 9 944 households, composed of Bolinaoans, Ilocanos and Bisayans. About 3 000 of the local population are small-scale fishers who depend on the highly diverse coral reef fishery. Analysts project that the population could double in the next 30 years (Juinio-Menez et al. 1995) which may potentially lead to increase pressures on coastal resources as opportunities in agriculture and industry remain limited (McManus et al. 1992). Without a comprehensive response, this trend could lead to an acceleration of the environmental degradation of the area.

Incomes in Bolinao fall below the poverty level. Based on 1990 data from the DAR (Bolinao office), 49% of the population engaged in farming and 31% worked in the fishery. The rest of the population engaged in trade and industry (4%), commerce (3%), or services (11%). It was observed that with the poor performance of agriculture in generating significant income more households are expected to turn to the fishery in order to supplement family income. By itself, fishing provides the lowest average monthly income at PhP 1 830. This

is substantially below the 1990 poverty level (PhP 2 650) set by the DA (McManus et al. 1992).

In 1992, the combined production from offshore fishing activities by motorized and non-motorized boats totaled 1 595 t, mostly tuna. In the same year, inland fishponds, which are spread over 642 ha, had a harvest of 1 339 t. Taken together, these generated 2 934 t which, at PhP 50/kilo, is a gross sale of PhP 146 700 000. Despite these figures, there is an occupational immobility among the local marginal population.

One-third (35%) of the local population did not go to school while 7% received training beyond high school. Given the poor condition of existing educational facilities or their complete absence, there is little incentive for a family to send their children to school. Employing their children in the gathering of marketable reef organisms supplements family income.

Nearshore, fishing is another popular fish gathering activity and it is undertaken all year round. Fishers usually use bamboo rafts or non-motorized outrigger boats. The average fish catch is 2 kg, which is sold to neighbors or fish vendors at the local wet market. Deep-sea fish also abound in the market and these are especially popular with tourists. Fish catch includes yellowfin tuna, skipjack, *tanguigue* and blue marlin. These fish are highly profitable and are readily shipped to Manila by fish dealers.

Bangus fry gathering is also another source of livelihood for coastal residents. Gathering is done from March to August. Fry gatherers sell their catch to concessionaires who dictate the price per 1 000 pieces of fry. Thirty percent of the price goes to the concessionaire. At one time, the price per 1 000 fry was PhP 900 but was reduced to PhP 700. Gatherers have opted not to harvest during months when prices are relatively low (McManus et al. 1992).

The shellcraft business is the most lucrative, among the fishery-related activities, providing PhP 1 350/month (Juinio-Menez et al. 1995). Most of those engaged in this activity are women. Fish, seaweed and various invertebrates are harvested by

women and children at low tide since these marine products are part of the traditional diet of local subsistence communities. Sea urchins also abound in Bolinao. The growing local demand for sea urchin roe has led to greater harvesting and improvisations in harvesting gear.

A study conducted by the UP-MSI revealed the reefs of Bolinao were overexploited and deteriorating because of destructive fishing methods and other causes. Blast fishing was observed on both the reef slopes and the reef flats (McManus et al. 1992). This was widely used by fishers in the reef areas in order to facilitate harvest of schools of pelagic fish. This and the use of sodium cyanide in aquarium fish gathering contribute to the degradation of Bolinao's coastal and marine ecosystem and the rapid depletion of resources. This situation is now taking its toll on the livelihoods of the local people, threatening the sustainability of the community. Against this background, three development-oriented organizations undertook various initiatives. Initially working independently from each other, they eventually forged a tripartite partnership to undertake a community-based coastal resources management project. The project was undertaken in partnership with the local communities and in close coordination with the municipal government of Bolinao.

The Bolinao Community-Based Coastal Resources Management Project

The Community-Based Coastal Resources Management (CB-CRM) project in Bolinao has the combined expertise of the UP-MSI (physical sciences), the UP-College of Social Work and Community Development (social sciences) and the Haribon Foundation (community organizing).

In 1976, UP-MSI began its systematic survey of the status of coral reefs in the country. This initiative has already assessed more than 600 sites. In 1985, this initiative expanded and included seagrass and mangrove ecosystems. Their involvement in the Lingayen Gulf began in 1986 when they decided to broaden their research interests to include resource management of the gulf. Specifically, the project focused on the coral reefs located on the Bolinao-Anda shelf. With funds from Australian Center for International Agricultural Research (ACIAR), UP-MSI

began a project on the biology and culture of giant clams. A hatchery and an ocean-based nursery were established.

In 1987, UP-MSI launched its seaweed project to transfer seaweed culture technology to local fishers. UP-MSI and International Development Research Center (IDRC) also saw the project as an opportunity for members of the local communities to be involved in the management of those resources using the technology established through UP-MSI's scientific studies. However, the project was met with apathy by local fishers. This was perhaps due to the lack of community involvement in the planning and initial implementation of the project. The limited success of the two projects made UP-MSI realize the need for people's support for project implementation. UP-MSI felt a socioeconomic study would be helpful in finding the best way to proceed with the resource management project.

In 1992, UP-MSI, together with a team from CSWCD, put together a proposal to undertake participatory action research on CB-CRM. The proposal obtained funding from IDRC of Canada. The main objective of the research project was "to develop a participatory process of generating knowledge and understanding of the communities' resources and social system" in a manner that will draw in community participation in all aspects and at different levels of the project's implementation" (Ferrer et al. 1996). The project was initially implemented in four coastal *barangays* of Bolinao, namely Arnedo and Balingasay on the mainland and Pilar and Binabalian on Santiago Island.

Formation of Community Organizations

The CSWCD team, using the participatory approach, gathered information on the social and resource management system prevailing in the selected sites. Together, the project staff and members of the community identified critical issues confronting the community and formulated possible solutions to those problems. Using Participatory Rural Appraisal (PRA), the research team made an in-depth examination of the cultural, legal/institutional and marketing/technology aspects of local coastal resource management. The team was able to identify the best way to organize the community was

to introduce concepts in environmental education, skills community members must learn for livelihood development, skills for resource management, and skills that will help build up the community, establish, and strengthen its links to like-minded groups. Based on the results of the PRA and its subsequent validation by community members, UP-MSI and CSWCD saw the need to engage the expertise of the Haribon Foundation for the community-organizing component of the project. Haribon officially joined the team in October 1993. The team set out to form core groups in the selected sites.

The core groups were formed from those who showed interest in the initial activities of the project. In *Barangay* Arnedo, the core group was formed into a “techno livelihood cell” for the seaweed farming project started earlier by MSI. This project was envisioned as an economically viable and self-sustaining supplemental livelihood activity. To ensure the success of the project, the cell members went through leadership development sessions and technical training so they could participate in the future management of the resource. It failed to flourish due to technical, economic and social shortcomings in the project’s design.

Guided by lessons learned from the seaweed project, the team made the shift from primarily an aquaculture program to a community wide CRMP. Beginning in *Barangay* Arnedo, the team used the initial core groups as springboards for the transition. This time the principal goal was the formation of a local organization of fishers that would take the lead in resource management. Based on the concept “resource user manager,” the project began to focus on the *sitios* (communities smaller than *barangay*), where most of the fishers reside, in the middle of 1994.

Through continuous environmental education, training in livelihood development, resource management and basic leadership courses, the core group was finally ready to formally establish their local organization. On 25 June 1995, the first local environmental organization in Bolinao was born. The *Samahang Pangkalikasan ng Arnedo* (SAPA) began with 64 individuals. Local organizations were likewise formed in the rest of the sites—*Samahan ng mga Mangingisda ng Binabalian* (SAMMABI),

Samahan ng mga Mangingisda at Mamamayan ng Balingasay (SAMMABAL) and the *Samahan ng mga Mangingisda at Mamamayan para sa Kalikasan ng Pilar* (SAMMAKA). By October 1996, these four POs decided to form themselves into a federation and was initially named Federation of Fishers of Bolinao (FFB). Later the group adopted the name *Kaisahan ng mga Samahan para sa Kalikasan* (KAISAKA). These POs were instrumental in the formulation of the MCDP of Bolinao. The resource use maps they prepared (with the aid of the CB-CRM project technical staff) became the bedrock of the proposed coastal development plan that was eventually approved by the Bolinao municipal government.

During the time the project team was facilitating the formation of local organizations, a major environmental issue confronted the town. An international consortium submitted a proposal to the Philippine government to build a cement plant complex in Bolinao. The PCC submitted its EIS to DENR to address the potential environmental impacts of the proposed project. On 2 November 1995, the DENR denied PCC’s application for an ECC due to lack of information on three important issues in their EIS. The PCC made an additional submission to EMB addressing the concerns raised by the EIA review committee.

The news spread quickly and soon an informal group was formed to oppose the project. Everything the local fishers learned from the environmental education courses became very important in sustaining the campaign and the people’s commitment. The local opposition addressed all the major claims that were made in the EIS submitted by PCC. This was the first time for such advocacy before the EIA system.

On 6 August 1996, the DENR denied “with finality” PCC’s application for an ECC. Among the reasons cited by DENR for denying the ECC application was land and resource use conflicts. In his letter to Mr. Andrew Wang (6 August 1996), PCC General Manager, DENR Secretary Victor O. Ramos ruled that the cement project will “seriously compete with existing and articulated land, marine and water usage in the area”. Based on the Lingayen Gulf Coastal Area Management Plan (LGCAMP), the preferred activities in the Lingayen Gulf, which

includes the town of Bolinao, are fishing and ecotourism. To allow the project to proceed would add to resource use conflict, as the project would have to compete for locally available resources such as non-saline water and limited land availability. Moreover, as far as the DENR is concerned, to issue an ECC for the cement project will be a violation of the principles of integrated coastal management. The DENR made the decision as an “ultimate precautionary measure” since the PCC, even with the additional information that it submitted, failed to satisfactorily address the threat of serious environmental damage posed by the project.

The project team considered the decision on the cement plant as a breakthrough in their CB-CRM efforts. As early as 1994, the idea of formulating a zoning plan for Bolinao was already on the agenda. The project was focused on the organization of local communities and enhancement of their capability to directly manage their resources within the framework of sustainable community development. Progress in putting together a coastal zoning plan was very slow and participation in the formulation of a proposed plan had been limited to the groups involved in the project. The local government did not see the need for such a plan until the cement plant proposal. One of the positive things that happened as a result of the cement plant issue was the hastening of the process that eventually led to the adoption by the local government of the MCDP for Bolinao. What is even more significant about this experience is that the MCDP was formulated through the CB-CRM approach and managed to make the shift and adopt the ICM approach which was particularly crucial to the plan’s institutionalization and its implementation.

The Bolinao Municipal Coastal Development Plan (MCDP): From CB-CRM to ICM

Draft reports prepared by UP-MSI in 1997 show that the idea to develop a zoning plan for Bolinao began in 1994. But it was the cement plant issue that hastened the process of formulation. Banking on the results of its earlier work coupled with their knowledge and acquired skill in coastal zoning, the CB-CRM project team offered technical assistance to the municipal government for the preparation of the

plan (Yambao, personal communications). The initial inputs came from the “ad hoc thematic team” formed earlier (March 1996) by the CB-CRM project team. Their consolidated output included the conceptual and operational framework that guided the formulation of the plan.

In order to influence the formulation of the plan, the CB-CRM project staff enhanced their knowledge and skills in coastal zoning through a seminar conducted in April 1996. The same seminar was given (May 1996) to the officers and members of local community organizations. As with the first group, the participants produced resource use maps that were specifically oriented to the marine protected areas in the municipal waters of the *barangays* the Arnedo, Balingasay and Binabalian and the mangrove rehabilitation area in Pilar and Victory. These maps were refined and later revalidated through a series of inter-PO consultations and consolidated into one map which was further refined by the project team and packaged as a proposed coastal development plan (PCDP).

In the meantime, the CB-CRM was carrying on with their coastal development planning process. Members of the project team had already begun to orient key individuals in the municipal government about CDP and the significant role local governments play in leading the process. The municipal government was informed about KAISAKA’s initiative and how that initiative could be transformed into a collaborative effort between the LGU and the local groups. The municipal mayor took up the idea and gave his support to the local people’s initiative. A pre-consultation meeting was convened (November 1996) wherein KAISAKA’s version of the CDP was presented, validated and refined. This meeting was attended by representatives of the municipal government, local groups and concerned individuals. During the same meeting, the preliminary results of a study on land evaluation were presented and some portions were integrated into the proposed CDP. The consolidated version resulting from this exercise became the PCDP that was endorsed by the Bolinao municipal government and KAISAKA. This consolidated version was presented during the multi-sector consultation that was held on 5 and 10 December 1996.

According to Alex Yambao, CB-CRM staff, the multi-sectoral consultation was the first large gathering of local officials, community, and PO leaders that took place after the decision on the controversial proposed cement plant project. The consultation was attended by *barangay* leaders, heads of *barangay*-based organizations, members of the local media, representatives of the provincial government, members of other local government agencies and concerned individuals. This had the support of the LGCAM Committee (LGCAMC), the regional office of NEDA and the DA, the Provincial Planning Development Office of the province of Pangasinan, and the support of Congressman Hernani Braganza.

From this consultation, a multi-sector committee was formed with the principal task of formulating a CDP for the town. To secure this gain and strengthen its mandate, the municipal mayor signed EO 6, Series of 1996, which institutionalized the multi-sector committee on the CDP. In addition to formulating the MCDP, it was also mandated to provide the offices of the mayor and the Municipal Development Council (MDC) information needed for policy decisions. The committee was composed of 21 representatives from the municipal government, the *Liga ng mga Barangay*, the religious sector, commercial fishers, small fishers, business, tourism, fish pond operators, fish dealers, fish pen operators, ferry boat operators, and environmental advocates. The four POs that formed KAISAKA were also represented on the committee. The CB-CRM Project Team provided technical assistance to the committee, the office of the MPDC provided logistical support, and the mayor set up a fund to support the committee.

The committee (later known as the CDP-Technical Working Group) formulated its own vision-mission-goal statement. Several amendments and revisions were made to the draft based on the documentation from consultations and meetings conducted with the stakeholders. After editing and packaging by the CB-CRM Project Team, the PCDP was approved by the CDP-TWG on 25 October 1997. It was formally submitted to the municipal government on 8 November 1997.

Copies of the proposed plan were subsequently given to the mayor and the *Sangguniang Bayan* (SB) for appropriate action. Copies of the proposed CDP were given to other government institutions in the region that expressed interest. Among them were the LGCAMC, DA, DENR and NEDA. The first step was to get approval and endorsement from the MDC. This was a crucial stage as the MDC reviews and approves all proposed local development plans and endorses them for legislative action to the SB.

On 6 December 1997, the MDC passed MDC Resolution Number 2, Series of 1997, approving the plan and endorsing its legislation by the SB. The SB set a meeting 13 December 1997 to discuss the proposed plan and address some contentious provisions. That meeting was attended by members of the CDP-TWG and the CB-CRM Project. The SB raised concerns about fish pens, fish cages, the MPAs, and the powers and functions of the proposed Bolinao Coastal Development Council (BCDC). The TWG and the CB-CRM Project Team tackled the issues raised. All three parties agreed that issues and modifications to the plan could be tackled during the preparation of its IRR. The plan was officially adopted on 19 January 1998 with the passage of SB Resolution Number 6, Series of 1998. The SB started working on the enabling ordinance. The *Sangguniang Panlalawigan* (SP) of Pangasinan has also approved the resolution passed by the SB of Bolinao.

Local Management Arrangement in Bolinao

When the CB-CRM Project began in 1992, resource use conflict was one of the issues that plagued the fisheries sector and the coastal zone of Bolinao. Fish pen and fish cage operations are the predominant activities in the municipal waters. Others are *siganids* and bangus fry concessionaires. In 1997, the municipal government earned PhP 4 million from these activities in the form of local taxes, fees, permits and licenses. This figure reflects the heavy reliance of the town's economy on its fisheries. There are also non-formal resource use activities including subsistence fishers who fish to meet the family's daily nutritional needs and for supplemental income. Within this sub-sector, women and children are significant members of the workforce.

Yambao and Salmo (1997) recalled that in order to regulate harvesting and sustain the availability of commercially important fisheries resources, the municipal government designated closed seasons for fishery activities. However, municipal control over resource use has been very limited. Licensing, the imposition of fees and the granting of permits are other means used by the LGU to control resource use. These have shown limited impact in terms of changing the behavior of resource users.

The enactment of the enabling ordinance of the CDP gave the municipal government greater “flexibility” and a clearer direction in its exercise of its devolved functions of coastal and fisheries resources management. The municipal government, in spite of the long presence of the UP-MSI laboratory, had earlier failed to avail of the latter’s expertise in coming up with a “socially appropriate and scientifically sound” comprehensive management response, according to Yambao. This situation was what the CB-CRM program aimed to address when it started in 1993.

The Bolinao Coastal Development Plan: Strengths and Opportunities

The Bolinao Coastal Development Plan (BCDP) is perhaps the first municipal development plan to have been formulated in a highly participatory manner and with particular focus on sustainable and equitable coastal resource development and participatory environmental management. The plan makes a bold attempt at striking a balance between privilege and responsibility. The plan gives preferential advantage to small and marginal fishers in the use and management of local fishery resources even as it upholds the rights of other user groups. The plan also expects local resource users to achieve certain skills and knowledge in order to meet the demand for enhanced capacity in carrying out the task of keeping both resources and environment healthy and sustainable.

The plan is replete with provisions on people’s participation and emphasizes the value of traditional knowledge and technologies in sustainable management, development and conservation of coastal and fishery resources. It also promotes the formation of local POs and cooperatives and their

participation in the tasks of managing, protecting and developing local coastal and fishery resources. Under the BCDP, the municipal waters of Bolinao are designated into four zones:

- Zone 1 for Eco-tourism;
- Zone 2 for Multiple Use;
- Zone 3 for Fishery Management; and
- Zone 4 for Trade and Navigation.

This prioritization of use does not preclude the conduct and management of other activities as appropriate within these priority zones (Section 20, BCDP). The plan specifies the boundaries of each zone, identifies particular areas within each of those that have been designated for special uses or activities, and provides regulations and management systems for those activities. For instance, within the Eco-tourism Zone, there is a designated bangus fry gathering. Access to this area is limited to duly registered and accredited groups, i.e. cooperatives of municipal fishers and local POs, and that the grant of exclusive gathering privileges is exercised by the SB.

The plan is a comprehensive document that tackles the many issues surrounding the coastal environment and fishery resources of Bolinao. It deals with equity issues, user rights and privileges as well as user responsibilities. It also provides guidelines for specific activities in areas that have been designated for special purposes as well as prohibited acts. While the task of implementing the plan falls largely on the municipal government, the plan clearly provides for an active and direct community involvement in its implementation. There is an implied recognition in the way the plan has been drafted with the participation of local fisher groups, organizations in allied activities, communities, and scientists helping to achieve its aims.

The mechanism provided in the plan that facilitates consultation and coordination in its implementation is embodied in the proposed Bolinao Coastal Development and Management Council (BCDMC). A careful study of this body reveals that in almost all aspects of the plan, partnership between the LGU and local community is strongly encouraged. There are as many seats for non-government representatives as there are for

representatives of local government offices. Although BCDMC does not have regulatory powers, it is a recommendatory body tasked to coordinate with concerned LGU and local groups on matters concerning law enforcement, dispute resolution, and other activities that promote the plan. The plan offers many opportunities for innovation in local sustainable resource use. The challenge is to make this partnership work effectively for the environment as well as for building confidence in this newly forged partnership.

Batangas Bay, Batangas

The Batangas Bay Region (BBR) is located in the southern portion of the Province of Batangas, which occupies the southwestern part of Luzon Island. This is one of three demonstration sites of the GEF/UNDP/IMO¹⁷ Regional Program for the Prevention and Management of Marine Pollution in the East Asian Seas (MPP-EAS) established in 1993.

Environmental Profile¹⁸

The region has a total land area of 1 460.7 km² and a coastline of 470 km. This extends to the Municipality of Tingloy in Maricaban Island in the south, while the north, south and west boundaries are delineated by the watersheds that drain into the Batangas Bay. The region has 14 coastal and inland municipalities, including the cities of Lipa and Batangas and portions of Lobo and Verde Island. The bay itself forms a semi-enclosed body of water with an average depth of about 200 m making it ideal for international port and harbor development. This bay has a water area of about 220 km².

The entire BBR is essentially an agricultural area. In 1985, about 60% of its total land area was planted with sugarcane, rice, corn, coconut and fruits. Secondary forest occupies only 9% and is almost nonexistent in the coastal areas. Settlement areas constitute less than 5%. Commercial raising of livestock, especially poultry and pigs, is a growing industry making BBR a primary supplier of poultry and meat products in the Southern Tagalog Region

and Metro Manila. Livestock growing has grown such that it has encroached on some ricefields and coastal lands. Fish ponds cover about 100 ha, mainly in Batangas City. This is about a quarter of the area devoted to aquaculture a decade ago. Some fishponds have been converted to commercial, industrial and residential use.

Batangas Bay is a growing industrial area. The coastline is dotted with companies engaged in oil refining, chemicals, textile manufacturing and food processing. All of these companies generate effluents or wastes that need treatment. Batangas City is an alternative port to Manila. Between 1985 and 1990, the total number of vessels entering the bay rose from 5 052 to 6 776. In 1995, an estimated 15 870 ships docked at the port. This raises three interrelated issues for the management of the bay resources — the congestion in sea vessel traffic, the potential for oil spills and ship collision, and marine pollution.

The Batangas Bay supports varied intensive activities including municipal fishing, shipping, and port development, causing intense competition among these sectors and endangering the marine environment. For municipal fishing alone, the ratio of fishing area to fishing boats in the bay stands at 0.08 km² of fishing area per fishing boat. The actual number of municipal fishers is estimated to be 8 965.

Overfishing in the bay is a growing concern. Seventy percent of municipal fishers are dependent solely on small-scale fishing. The remaining 30% supplement their incomes with seasonal employment such as carpentry and masonry. Compared to the total coastal population in 1994 of about 360 000, 7% of the coastal residents are dependent on subsistence fishing. The density of fishers in the bay is 41 persons per km² of fishing ground. At present, there are no available data to assess the impact of such resource use conflicts on fishery resources. Inventory of fish stock and other marine resources in the bay is limited.

¹⁷ Global Environmental Facility/United Nations Development Programme/International Maritime Organization.

¹⁸ The MPP-EAS published a Coastal Environmental Profile of the Batangas Bay Region (CEP-BBR) in 1996, which provides a synthesis of all available information gathered from the government and other sources. The study gives a comprehensive description of the region including its natural resources, resource use patterns and socio-economic profile. This also identifies the management issues that need to be resolved.

Urban development and industrialization have also brought serious pollution problems. The volume of domestic wastes as well as industrial refuse and effluents are considerable. Households generate more than 100 000 t of wastes every year. This is projected to increase to 120 000 t by the year 2000. At present, only about 60% of domestic waste is collected by the LGU. The remaining waste is burned or dumped indiscriminately in backyards, streets, and waterways.

Industrial and commercial pollution is a critical problem. Sources of pollution include oil refineries, power plants, shipyards, chemical manufacturing plants, alcohol distilleries, food processing plants, livestock farms, hospitals and others. These sources contribute pathogenic wastes, nutrients, oil sludge, heavy metals, and others. An inventory in 1995 showed that of the 352 485 t of solid wastes generated by industries, 17% came from oil refineries, 78% from chemical companies, and 4% from shipyards.

In addition to domestic and industrial wastes, oil spills from increased vessel traffic are of concern. From May 1986 to September 1993, 11 oil spills were recorded by the PCG. The increasing occurrence of these incidents is alarming from an average of one per year (1986 to 1990), two in 1991 and 1992, and four occurrences in 1993. In the case of Filipinas Shell Corporation, these incidents have been attributed to structural defects and inadequate internal inspection.

Legal and Policy Framework

Direct management of the resources in the region follows the sectoral management approach of the national government. The DENR takes charge of the use and conservation of land based resources such as forests, foreshore lands, mangroves, mining and quarrying. Pollution control from industries is also regulated by the DENR through the EMB and the DENR field offices. The PCG, through its Marine Environment Protection Office of the 5th Coast Guard District, is responsible for the enforcement of pollution laws in the bay area, both from ships and industries along the coasts. The PPA manages the international port in Batangas City as well as the numerous private ports belonging to the major industrial establishments. The MARINA

regulates the shipping industry.

The provincial, city, and municipal governments have taken an active role in the management of the coastal zone by virtue of the powers granted under the LGC. In 1993, the provincial government initiated a program of environmental awareness focusing on elementary school children. They passed an ordinance in 1994 providing for a program of maintaining tree nurseries and planting trees. Municipal governments also enacted several ordinances dealing with fishery conservation, anti-littering and solid waste management, and land use and zoning.

Despite the number of national and local laws and numerous regulations issued by specialized agencies, the region's terrestrial and aquatic environment continues to deteriorate. The general observation is that government agencies have not been expeditious and effective in performing their roles. Critical factors that contributed to this problem are the lack of coordination among agencies performing related functions and the lack of participation by local communities and the private sector in planning and management.

A study sponsored by the Batangas Bay Demonstration Project (BBDP) showed that a multi-sectoral body might be the appropriate mechanism for the integrated management of the region (La Viña 1995). As a result of this study, the *Sangguniang Panlalawigan* passed an ordinance creating the Batangas Bay Region Environmental Protection Council. The council is composed of the local chief executives, representatives of the national government agencies, industry and fisherfolk representatives. The council is tasked to develop policies and programs to ensure and promote the sustainable development of the natural resources of the region. More importantly, the council serves as the forum where the sector concerns of the national agencies as well as the industry, fishers and other economic interests are heard and discussed. The idea is to have an assessment of each issue raised by the stakeholders and a concerted plan of action adopted by the council, which includes the coordinated activities of each participating agency or organization. In order to facilitate and coordinate the day-to-day implemen-

tation and monitoring of the council's activities, the provincial government created the PG-ENRO, which also serves as the secretariat of the council.

The Integrated Coastal Management Framework

The BBR was chosen as a demonstration project because it is an area of rapid economic growth brought about by competing activities, which are directly or indirectly dependent on the coastal zone. Two key conditions also helped in the choice of the site. First, the enactment of the LGC opened an opportunity for LGUs to implement an integrated management framework and second, there is an active involvement by stakeholders in environmental management concerns.

As part of the program for the BBDP, a Strategic Environmental Management Plan (SEMP) was prepared and adopted by the council, which laid down the major management issues and plan of action, which aims to address these issues. The SEMP identified the following major management issues:

- Improper solid waste collection and disposal;
- Water and air pollution;
- Declining fish harvest;
- Improper mining and quarrying operations;
- Expanding shipping and port development activities;
- Deteriorating socioeconomic conditions of people in the coastal areas; and
- Lack of multi-sectoral participation in environmental management.

After extensive consultations with stakeholders, an action plan was drafted consisting of six specific components:

- Legal and institutional mechanisms;
- Integrated policy and planning systems;
- Integrated management systems and technical interventions;
- Management and technical capability building;
- Improvement of information base; and
- Sustainable financing.

The first component has been partly met by the creation of the council and PG-ENRO. These bodies are still in their infancy. At present, the roles and responsibilities of the members in the council are not yet optimally played. Perhaps because it is a novel creation, the council has yet to define the extent of its powers and roles *vis-à-vis* the individual local governments and the participating national agencies. In pollution control for example, the ideal situation is for the council to adopt a policy and devise a plan of action where the municipalities, the DENR and PCG would have complementary roles. However, at least one municipality passed an ordinance for inspection and monitoring of pollution in industries without consulting the council. The functions of the local government provided in the ordinance duplicate the regular functions of the DENR.

The problem of defining the role and powers of the council stem from its frail legal foundation. The council was created by a provincial ordinance, which cannot modify the mandates of the national agencies and local governments that have been set by national laws. The council depends on the cooperation of the member agencies and LGUs, but it cannot demand strict adherence to its policies because the agencies and LGUs possess the power to fulfill their own exclusive mandates. The component on integrated policy and planning systems aims to make sure that the SEMP fits into the broader socioeconomic and development plans, not only of the region, but the country as a whole. Batangas is fast becoming a major player in national development, as it is the alternative hub for shipping. In addition, it is a major supplier of electricity for the rest of Luzon. The challenge to the council is to see beyond local concerns and integrate its planning with the national planning framework. There is an existing mechanism where local concerns are taken up in Regional Development Council (RDC) meetings. Much depends on the cooperation within the Batangas council to prepare and adopt the plans. The planning process may also suffer from the weakness of fragmentation discussed above.

The third component on management and technical interventions aims to generate options for solving critical problems such as municipal wastes and pollution. The key to completing this component is providing the participating local governments

with the tools for addressing these problems such as the development of an integrated waste management system, oil spill contingency planning, establishment of sewage treatment facilities, and development of control measures for pollution discharge at point source.

The fourth component aims to develop the management and technical capability of key players and stakeholders through training programs, community organizing and information dissemination. The objective is to have a common understanding of the issues and the various interests of the stakeholders.

The fifth component aims to support the existing data gathering initiatives and generate previously lacking information that is critical in making decisions. Through the demonstration project, a management information system is being established which would collate and sort the data. Finally, the last component aims to develop options to finance the other components. The usual excuse of government for its ineffectiveness is the lack of money to implement or enforce policies and laws. Financial mechanisms, such as market-based instruments, are explored as alternatives to taxation and direct appropriation.

“Community-Based” Management

The management of coastal resources in the BBR is not, in the common notion, community-based. The initiative for establishing the norms for use and management came from the local government. However, the experience in Batangas is unique because there is a conscious effort on the part of government to reach out to the stakeholders and involve them directly in the decisionmaking process. In effect, the council serves as the forum where the larger community of stakeholders, including government, make the plans for the sustainable management of the region. In this sense, it is “community-based”.

Proponents of Integrated Coastal Management (ICM) argue that traditional community-based management, where the people themselves take a direct hand in managing the resources, is not appropriate for a complex system such as Batangas

Bay because there are so many conflicting and competing interests involved. The BBR, for example, is a major port and shipping center. The management of these sectors need special skills and clear legal mandates, especially as they involve not only local but also national and international regulatory measures on shipping routes, maritime safety, and pollution control. The needed skills may not be available in the community and the needed powers cannot be delegated to the community.

Summary of Lessons Learned

The four case studies presented in this section are examples of the many experiences and initiatives that have been and are currently being undertaken in the Philippines. They were chosen because they represent the range of community-based options available given a particular set of circumstances. The lessons learned from these experiences should therefore be seen in their specific contexts.

The Coron Island experience is that of an indigenous people struggling to maintain their traditional management system in the face of challenges from migrants and interventions of the LGU and the national government. The Apo Island case study illustrates an island community’s efforts, in partnership with academic institutions and government programs, to protect its fisheries and coral reef resources. The Bolinao experience appears to be much more sophisticated given the set of challenges that face the local ecosystem and the community. Finally, the Batangas Bay initiative is noteworthy given the complexity of the issues which accompany rapid industrialization and urbanization. A few general themes can be identified as running through all these experiences.

First, whether national law provides for it or not, community-based systems exist. As the Coron and Apo Island experiences show, community-based management can survive in the face of inconsistency with the national legal system. Second, the reality of conflict in the use of coastal and marine resources, in economic interests, and in political power, is a dominant characteristic in all the case studies. How this conflict is managed, not necessarily resolved, by the different stakeholders is important in determining the success of a community-based approach to

coastal management. Third, an imperative for the sustainability of a community-based system is a partnership among different sectors within a community, including academic institutions, non-government organizations and government agencies. Fourth, the role of local governments is crucial in community-based resource management. A non-supportive LGU can doom community initiatives. Finally, the quality of the interventions of the national government play a central role in ensuring that community efforts are supported in order to succeed and be sustained. These interventions are influenced by external factors including global and regional developments.

ROLE OF INTERNATIONAL AND REGIONAL AGREEMENTS

This section examines the impact on the policy, legal and institutional frameworks for the management of fisheries, coastal resources, and the coastal environment in the Philippines due to a growing body of international principles and norms governing the global environment in general and the marine environment in particular. Regional agreements and arrangements are also included in this examination.

The Rio Declaration and Agenda 21

The best summary of general principles of international environmental law is found in the Rio Declaration of 1992 and, with respect to the marine environment, Agenda 21. Both documents were adopted during the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992. While non-binding instruments, the Rio Declaration and Agenda 21 constitute “soft law”. These documents do not impose obligations on states, but they will certainly have the effect of legitimizing and encouraging initiatives and set the agenda for further development of international law.

The Rio Declaration on Environment and Development is a non-binding statement of 27

broad principles for guiding environmental policy that emphasizes protecting the environment as part of economic development, safeguarding the ecological systems of other nations and giving priority to the needs of developing countries, the most environmentally vulnerable. While the original intention was to draw up an Earth Charter, at the insistence of developing nations, negotiations were directed toward development concerns. The final product is largely a political and economic document centered almost exclusively on human concerns.

Among others, the Rio Declaration establishes the right of human beings, “who are at the center of concerns for sustainable development”, “to a healthy and productive life in harmony with nature.” The call is for states and people to “cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this declaration and in the further development of international law in the field of sustainable development.”

The Rio Declaration confirms the sovereign right of states to exploit their own resources pursuant to their own environmental and developmental policies, which must be fulfilled to equitably meet the needs of present and future generations¹⁹. Likewise, it recognizes the key role of stakeholders in the decision-making processes, especially indigenous peoples²⁰. In addition, it encourages states to develop national legislation regarding compensation for victims of pollution and other environmental damage, the use of economic instruments to take into account the polluter-pays principle²¹. Furthermore, it stresses the importance of EIA as a tool for planning as well as the adherence to the precautionary approach in deciding on and devising measures to prevent environmental degradation²².

Agenda 21 is a program also approved at the Rio summit, listing 40 actions that are designed to promote sustainable development on earth. The agenda raises the need for making changes in all economic activities with a view to improving standards of living and conserving natural resources. This is a non-binding 800-page blueprint to clean up

¹⁹ Principles 2 and 3, Rio Declaration.

²⁰ Principles 10 and 20, Rio Declaration

²¹ Principles 13 and 16, Rio Declaration.

²² Principles 15 and 17, Rio Declaration.

the global environment and encourage development in an environmentally sound manner. Among others, Agenda 21 seeks to ensure the protection of oceans, seas, freshwater sources and coastal zones through a rational use of living resources and their habitats.

For the marine environment, Agenda 21 is especially relevant. In particular, Chapter 17 entitled “Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas and coastal areas and the protection, rational use and development of their living resources”, occupies an important place. The most significant element in Chapter 17 is its call for the adoption of “new approaches to marine and coastal management and development at the national, sub-regional, regional and global levels, approaches that are integrated in content and are precautionary and anticipatory in ambit”.

Chapter 17 calls for initiatives under several program areas:

- Integrated management and sustainable development of coastal areas, including exclusive economic zones and marine environmental protection;
- Sustainable use and conservation of marine living resources in the high seas and areas under national jurisdiction;
- Critical uncertainties for the management of the marine environment and climate change;
- The institutional framework for strengthening international, including regional, cooperation and coordination; and
- Sustainable development of small islands, calls for state cooperation (as appropriate) in the preparation of national guidelines for integrated coastal zone management and development, drawing on existing experience.

Agenda 21 has become a major influence in the development of marine environmental law. It has resulted in global conferences on Coastal Zone Management (November 1993) and Sustainable Development of Small Island States (1993). This has been influential in the United Nations sponsored Agreement on Straddling and Highly Migratory Fish Stocks (concluded August 1995) and the UNEP-sponsored Global Programme of Action on Protec-

tion of the Marine Environment from Land-based Activities (now in the final stages of preparation).

In the Philippines, Agenda 21 is being implemented through Philippine Agenda 21, which, among others identifies issues and concerns affecting the coastal and marine ecosystems, and proposes strategies to deal with such issues and concerns, including specific targets and timetables. Philippine environmental laws have adopted the precautionary principle and the polluter pays principle in their provisions. The EIA system has been in place for two decades and is continually being strengthened through more stringent enforcement, while at the same time, clarifying and simplifying procedures in order to facilitate compliance.

The UN Law of the Sea Convention

UNCLOS, signed in 1982 and came into effect in 1994, is the international framework agreement that regulates all aspects of the various uses of the world's oceans, including rights of navigation, fisheries conservation and management, marine scientific research, and the regulation of pollution from all sources. With respect to the marine environment, UNCLOS provides the legal basis to pursue the protection and sustainable development of the marine and coastal resources.

Although the obligation to protect and preserve the marine environment is global, the UNCLOS divides the ocean into a variety of jurisdictional zones based on distance from the baseline, generally the low-tide line. These include internal waters; the 12 mile territorial sea; the 200-mile EEZ; and the High Seas. While the UNCLOS grants coastal states sovereign rights over the natural resources of their EEZ, a coastal state's competence to prescribe and enforce marine environmental pollution standards diminishes with distance from shore. Thus, the marine jurisdictional zones recognized by UNCLOS make arbitrary divisions in ocean ecosystems thereby hampering a holistic approach to management. This is an important limitation to bear in mind regarding protection of the marine environment from sea-based activities and pollution.

While UNCLOS states that the conservation of marine resources is a fundamental obligation,

fisheries conservation and management measures within the territorial waters of the coastal state are entirely the responsibility of that state. Under UNCLOS, coastal states must ensure, through proper conservation and management measures, that the resources in the EEZ are not endangered by overexploitation. States are further obligated to cooperate with each other for the conservation and management of the living resources of the high seas.

Within the EEZ, the coastal state is to ensure the conservation and optimum use of fishery resources. To this end, the coastal state is to adopt conservation measures and determine the total allowable catch (TAC) for each stock. The TAC for each stock is to take into account fishing patterns and the interdependence of stocks, as well as the impacts on associated or dependent species with a view to maintaining or restoring the population of such species above the level where their reproduction may become seriously threatened.

The coastal state can determine the quantity it will allow to be accessed and to whom it will provide access. The coastal state is the main judge of the conservation measures required. The state also has the legal authority to introduce conservation measures that provide explicitly for the protection of marine ecosystems or species biodiversity within the EEZ. With respect to transboundary fishery resources, coastal and fishing states are to cooperate on the exploitation of transboundary and associated stocks in two or more EEZ and in EEZ and adjacent high seas areas. The states are also obligated to cooperate with respect to highly migratory species, marine mammals, anadromous stocks and catadromous species.

UNCLOS calls on states to adopt laws and regulations to prevent, reduce and control land-based pollution by taking into account internationally agreed rules, standards, and recommended practices and procedures. The convention obliges all states to minimize, to the fullest possible extent, the release of toxic, harmful or noxious substances, especially those that are persistent, from land-based sources, from or through the atmosphere or by dumping. Likewise, UNCLOS imposes an important obligation to protect from pollution rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms

of marine life. It also requires states to take all necessary measures to prevent the intentional or accidental introduction of species, alien or new, into the marine environment that may cause significant and harmful changes.

Moreover, UNCLOS calls on states to take action, at the international level, to establish rules and standards to prevent, control and reduce pollution and to promote the use of routing systems designed to minimize the threat of accidents that might cause pollution. The vessel's state of registry (i.e. the flag state) is charged with primary responsibility for implementing and enforcing such rules and standards. A coastal state's competence to take unilateral measures to regulate foreign vessels for environmental purposes (e.g. vessel discharges, routing) is, however, limited by foreign vessels' right to innocent passage and freedom of navigation. Port states may, on the other hand, impose and enforce unilateral requirements, including design, construction, manning and equipment standards, as a condition of entry into its ports, provided it gives due publicity to such requirements. With regard to pollution from offshore structures, states are required to adopt measures designed to minimize pollution that are no less effective than international rules, standards and recommended practices and procedures.

Furthermore, UNCLOS allows states to adopt laws affecting the preservation of the environment and prevention of pollution in their 12 mile territorial sea provided such laws do not have the practical effect of denying or impairing the right of innocent passage. Within the 200 mile EEZ, coastal states may only adopt laws and standards conforming to and giving effect to generally accepted international rules and standards established through the competent international organization or diplomatic conference. The "competent international organization" is generally understood in this context to mean the International Maritime Organization (IMO).

The Philippines has ratified UNCLOS and is implementing it through a Cabinet Committee on the Law of the Sea. However, the work of this committee has tended to focus on political issues (i.e. boundary delimitation) and not much attention has been given to marine resource and environmental issues.

IMO Conventions

A number of IMO conventions are relevant to the use and protection of the marine environment. These include:

- International Convention for the Safety of Life at Sea (SOLAS), 1974;
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LDC), 1972 and Protocol, 1996;
- International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78);
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969 and Protocol, 1973;
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990;
- International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969 and Protocols 1976 and 1992;
- International Convention on the Establishment of an International Fund of Compensation for Oil Pollution Damage (FUND), 1971 and Protocols 1976 and 1992; and
- Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Materials (NUCLEAR), 1971.

The Philippines is a party to most of these conventions. Noteworthy among those conventions not ratified by the Philippines, is MARPOL, although ratification is expected in the near future. Despite being a party to many IMO Conventions, implementation is frequently inconsistent and requires extensive effort and attention.

The Convention on Biological Diversity

The Convention on Biological Diversity (CBD) was signed in 1992 and came into force 29 December 1994. The strength of this convention lies in its comprehensive approach to species and ecosystems, promoting both conservation and sustainable use. The CBD applies to waters within national jurisdiction, including the EEZ. This also applies to activities that are carried out under national jurisdiction

or control. Thus, CBD extends to fishing and polluting activities occurring on the high seas. States are required to implement the provisions of the CBD consistently with the rights and obligations of states under the UNCLOS. The CBD is potentially a powerful instrument to deal with environmental issues because of its comprehensive approach (i.e., terrestrial and marine ecosystems are given equal importance). Indeed, the first conference of the parties of the CBD has prioritized actions to deal with threats to biodiversity. The Philippines is a party to the CBD and has begun implementing its provisions. Emphasis has been given to marine protected areas such as the Turtle Islands, Coron Island, Apo Island and Tubbataha Reef.

Other Agreements

The Convention on Wetlands (Ramsar, Iran, 1971) obligates contracting parties to designate for conservation at least one wetland of international importance, and to use wisely all wetlands resources under their jurisdiction. Wetlands as defined under the convention may include areas of marine water the depth of which at low tide does not exceed 6 m. If deeper marine water lies within the wetlands, they may also be included. In addition, islands, riparian and coastal zones adjacent to wetlands may be incorporated. As of 30 September 1999, the 116 contracting parties have designated 1 005 sites, which covers more than 71.7 million ha (Ramsar Convention Bureau 1999). At least 270 of these sites have coastal and marine components. Although initially focusing on wetlands of importance for waterfowl, the criteria for listed sites have been expanded to include other features of significance to the marine and coastal environment. This now includes sites of special value for maintaining the genetic and ecological diversity of a region, or as the habitat of plants or animals at a critical stage in their biological cycle.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is important with respect to movement of hazardous wastes. A system of permits is used to regulate the transport of hazardous materials to and from a contracting state. The Philippines is a party to both the Ramsar and Basel Conventions. This has enacted the RA 6969 to implement the latter.

Regional Agreements

International conventions often set the global framework for action for environmental management. However, regional initiatives provide a more concrete basis for cooperative action between member countries. Indeed, the UN Secretary General has recognized the importance of setting regional bases of cooperation in the protection of the environment. "A comprehensive and coordinated approach at the global level must be complemented by comprehensive and integrated strategies at the regional and national levels. Regional goals which concentrate on key stresses can encourage harmonized rules and standards at the regional level for individual sources of stress..." (United Nations 1997). Furthermore, Article 197 of UNCLOS provides that "states shall cooperate on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this convention, for the protection and preservation of the marine environment, taking into account characteristic regional features." In addition, UNCLOS encourages states bordering enclosed or semi-enclosed seas to cooperate on a regional basis regarding the management and conservation of marine living resources, and the protection and preservation of the marine environment. Regional conventions and associated action plans have since been developed in 12 regions, at least two are in development, and one has failed to progress beyond the action plan phase. Most of these Regional Seas Programs were developed under the auspices of UNEP. Other than the Mediterranean, however, these regional initiatives have not progressed to the stage where they develop common regulatory or other implementing measures. This is also true for Southeast Asia.

In the Association of Southeast Asian Nations (ASEAN) region, the importance of cooperation is borne by the fact that they are enjoying the use of a shared resource. The adjacency of ASEAN member countries around a semi-enclosed sea and their extension of maritime jurisdictions dictate that some of actual or potential coastal resources management issues will be transnational, as will their resolution. Such transnational issues include transboundary

pollution effects from land-based sources, spills from oil wells, and oil and hazardous cargo spills from vessels; sealane siting; transboundary pollution control-harmonization policies and regulations; transboundary fisheries management of migratory species, shared stocks and illegal foreign fishing; conservation-coordination of national and regional conservation schemes; cooperation or harmonization of monitoring, surveillance and enforcement; and management of islands and marine areas of uncertain jurisdiction.

The maritime states of the East Asian region have one-third of the world's population and its coastal zones are heavily populated with more than half concentrated along coastal areas. These coastal areas are also characterized by diversified economic activities. The natural resources in these coastal areas are vast and varied consisting of productive ecosystems such as coral reefs, seagrass beds and mangroves with numerous coastal landforms such as estuaries, beaches, deltas, tidal flats, embayments and islands. Economic activities to meet the growing demand for food, employment and shelter have resulted in enormous pressures on the region's coastal and marine environments. Diversification and intensification of these activities, among others, have resulted in pollution, which, in turn, has degraded valuable and productive ecosystems.

Marine pollution is only one of the consequences of economic and development pressures. The coastal waters, including estuaries, bays, gulfs and congested straits and semi-enclosed sub-regional seas in the region are relatively polluted compared to open seas and oceans. Among others, the coastal waters of the region are contaminated by untreated sewage, garbage, sediments, oil, pesticides and hazardous wastes from land-based and sea-based activities. While the open seas and oceans are, by comparison, cleaner, increasing maritime activities such as offshore exploration and production activities, make these waters vulnerable to pollution, especially oil and chemical spills and discharges.

Growing awareness of the state of the marine environment, coupled with the realization that pollution has severe effects on the sustainability of economic development, have convinced many maritime states in the East Asian region to pay

closer attention to the management of their coastal and marine resources and invest in their protection and conservation. For example, there are efforts in China and the ASEAN states to develop and implement Integrated Coastal Zone Management (ICZM) programs. On the legal side, most nations have enacted the necessary laws and regulations to control or prevent discharges into the marine environment. A number of countries have also established the regulatory and organizational structures to implement these rules.

Unfortunately, due to a lack of financial resources, an inadequate technical capacity, and political sovereignty issues such as boundary disputes, many countries in the region remain unable to adequately address marine pollution problems within their territorial jurisdiction. The lack of resources frequently makes it impossible to formulate and install environmental programs to manage and mitigate marine pollution. For example, many countries have not yet established effective pollution assessment and monitoring stations, although ad hoc surveys and studies have been undertaken in some coastal waters. On the international side, only a few countries in the region have ratified and are implementing the relevant IMO conventions and other marine pollution agreements.

While there is a seeming lack of regional conventions on the protection of the marine environment in the region, this should not be taken to mean that there is little regional cooperation. Countries in the region prefer guidelines of action instead of mandatory obligations imposed by conventional law. This is less intrusive to the sovereignty of member countries but also compatible with the preference for subtlety. This preference against the possibility of a model statute on the marine environment is borne out “by the diversity of the ASEAN member nations and the past success of coordination policies”.

Various initiatives have been undertaken in the region. Some are purely regional in nature. Others are joint undertakings between the region and another country or between the region and an international organization.

In the early 1980s, ASEAN recognized that there was continued depletion and degradation of the environment through the misuse and indiscriminate exploitation of resources. Hence, ASEAN came up with the integrated and coordinated ASEAN Environment Program (ASEP). ASEP sought to achieve ecological, technological, and sanitary security in the region. The program was designed to view the ecological system in a holistic and comprehensive way rather than to treat resources as separate and distinct. This approach to environmental management and use was believed to be the key to sustainable development.

In 1981, member-states identified a number of priority actions to be implemented under the ASEP, including sub-programs for sustained development and protection of marine environments and coastal areas involving pollution control, resource management, institutional management, information exchange and training; integration of environmental management with development planning using EIA; and nature conservation and protection of the natural resources.

In 1985, ASEAN adopted the ASEAN Agreement on the Conservation of Nature and Natural Resources. The agreement provided a framework for the protection of the environment as well as specific obligations such as the prohibition of the taking of the listed endangered species. In 1990, the fourth ASEAN ministerial meeting on the environment, held in Malaysia, adopted the Kuala Lumpur Declaration on Environment and Development and a common ASEAN stand on global environmental issues. The ASEAN environment ministers agreed to initiate efforts on environmental management including: the formulation of an ASEAN strategy for sustainable development and a corresponding action program; the harmonization of environmental quality standards; the harmonization of transboundary pollution prevention and abatement practices; the initiation of efforts leading towards concrete steps pertaining to natural resource management, including the harmonization of approaches in natural resource assessments and the development of joint natural resources management programs.

In 1993, the Asia-Pacific Memorandum of Understanding on Port State Control was signed by 18 states. It set up a system to ensure that foreign ships comply with the regulations of MARPOL (73/78), the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (1978), the Convention on International Regulations for Preventing Collisions at Sea (1972) and the ILO -Minimum Standards for Merchant Ships (1976). A Traffic Separation Scheme (TSS) was also developed in the Straits of Malacca and Singapore to reduce accidents in the area.

International organizations also initiate the development of regional schemes. The GEF/UNDP/IMO Regional Program for the Prevention and Management of Marine Pollution in the East Asian Seas has been very active in encouraging cooperation in the region for coastal and marine resources management. Among others, the development and establishment of regional networks for environmental management is a goal of the regional program. The network approach is justified so that there is cross-fertilization of disciplines, concepts and experiences as well as the formulation and adoption of regional legal and policy initiatives, where appropriate, such as harmonization of standards. Under the program, four interlinked regional networks are established. These are:

- *The Network of Local Governments for ICZM Demonstration Sites*: Composed of participating local governments and intended to ensure political commitments and promote institutional and organizational arrangements for the planning and implementation of ICZM programs;
- *The Network of Research/Academic Institutions*: Provides technical inputs for policy, management and technological interventions;
- *The Pollution Monitoring and Information Management Network*: Ensures regular monitoring of environmental changes as well as efficient use of information for management interventions; and
- *The Network of Legal Experts on Marine Pollution*: Serves as a catalyst to country and regional efforts to develop, enact and implement national and international laws on marine pollution.

Other regional initiatives include:

- ASEAN Committee on Science and Technology (COST) with Canada, US, EU, and Japan developing a program to manage regional pollution;
- The ASEAN Expert Group on Environment has projects dealing with oil pollution and health. They initiated an oil spill contingency plan in 1970;
- ASEAN-Australian Marine Science Project deals with ocean dynamics and living resources;
- ASEAN-Canada Marine Pollution Project to determine the criteria for the protection of marine resources and monitoring pollution;
- ASEAN-US Coastal Resources Management Project aims to develop a multidisciplinary coastal area management plan;
- APEC has working groups concerning marine environmental issues;
- UNEP-Regional Seas Program set up the Coordinating Body on the Seas of East Asia (COBSEA), which is developing pollution prevention programs;
- ASEAN Council on Petroleum (ASCOPE), which was created to address environmental issues, related to oil and natural gas exploration;
- ASEAN Senior Officials in the Environment (ASOEN) formed in 1990 to ensure a regional oil spill contingency plan is developed and implemented; and
- Oil Spill Response Plan (OSPAR) initiated with Japan to provide technical assistance and equipment to ASEAN to combat oil spills.

The ongoing territorial disputes in the region have initiated the creation of the South China Sea Workshop on Conflict Resolution. The workshop is divided into four technical working groups of varying official nature:

- Legal;
- Safety of navigation;
- Marine research study; and
- Marine environment protection.

While initially it has been seen as a mechanism to settle territorial issues, the scope of concern of the group has widened to include areas of cooperation in marine environment protection. For example, there is currently a proposal for a project on ecosystem monitoring in the region.

Summary

The threat of environmental degradation to the vitality and biodiversity of the coastal zones of the region cannot be overstated. At present, many of the estuaries, lagoons and bays in the region have been proclaimed biologically dead or severely depleted of aquatic life. Ensuring a cleaner and safer coastal and marine environment in the future is one of the most difficult of the challenges facing states and policymakers in the region.

While there are numerous initiatives being implemented, it remains to be seen whether these will be effective and whether they can be sustained. For example, a review of the impact of these initiatives on the Philippines does not, except in a few instances such as the Batangas Bay project and some bilateral initiatives such as the Philippines-Malaysia project on the Turtle Islands, appear to have much of an impact on the ground. Perhaps it is too early to evaluate the success of these initiatives but clearly more efforts are needed.

With respect to the role of CBRM, there is a clear recognition of this principle in the more recent international environmental and agreements such as the Rio Declaration and Agenda 21. However, this is not reflected in most of the regional initiatives that, with a few exceptions, are centered mostly in the role of national governments. A few do emphasize local government participation but clearly, this is not enough. In this sense, regional initiatives and programs, if they do not incorporate the experiences of community-based approaches in their design and implementation, may result in adverse consequences leading to further inequity and environmental degradation in the marine and coastal zones of the region. This is certainly true for the Philippines.

INTEGRATING COMMUNITY-BASED RESOURCE MANAGEMENT: THE STATE OF PLAY IN THE PHILIPPINES

The strategy of CBRM has been proposed as a better alternative to command and control or free market approaches to environmental regulation. The strategy is based on the insight that, contrary to the widely held belief that all communally held resources are doomed to suffer, it is now known that a wide variety of sustainable community resource management systems do exist. The recent rediscovery of communal institutions as an effective solution to the commons dilemma is significant in a variety of ways. These institutions may have a valuable role to play in sustainable use planning but have usually been overlooked or underused in the planning process. This has happened because of overemphasis on the kinds of resource management practices dominant in the Western industrialized world in which the significance of common property institutions has declined over time.

CBRM systems can range from the right of the community to be consulted before any development project is imposed to actually recognizing community control and management of natural resources. Recognizing these systems would also mean developing and accepting common property regimes in international and national legal regimes by recognizing communal title to lands, ceding the control and management of rainforests to the communities that occupy them, protecting the intellectual property rights of indigenous and local communities to their traditional knowledge, and in institutionalizing community participation in environmental risk and impact assessment.

From a policy point of view, with respect to the letter of the law, one finds enough text to justify that the Philippines gives due consideration and emphasis to the principle of CBRM, indeed not only in the management of coastal and marine resources but of all natural resources. The Philippine law on protected areas, the policy which enshrines community-based forestry as the strategy for forest management, the concept of social acceptability in environmental impact assessment, the principle of prior

informed consent in bioprospecting and mining, and the recently enacted law on the rights of indigenous peoples are all examples of the acceptance of this principle. With respect to marine and coastal areas, two important policy texts also reflect acceptance of CBRM—Philippine Agenda 21 (PA 21) and the new Fisheries Code.

At the outset, PA 21 recognizes that basic sectors can serve as managers and controllers of community resources. This acknowledges that communities residing within or most proximate to an ecosystem of a bio-geographic region will be the ones to most directly and immediately feel the negative impacts of environmental degradation and should, therefore, be given prior claim to the development decisions affecting their ecosystem, including management of the resources. Thus, PA 21 has called for the following:

- The passage of a fisheries code that recognizes the primacy of fishing communities in the management and access to marine resources;
- The preparation of a coastal management plan at the national, regional and local levels with genuine participation of communities;
- The development of mechanisms to provide equity to coastal resources;
- The promotion of the active participation of all sectors in planning for the management of coastal resources and ecosystems; and
- Capacity building and information support that would enable communities to participate in the management of the coastal and marine ecosystem.

The Philippine Fisheries Code of 1998 adopts as a state policy the protection of the rights of fishers, especially of the local communities with priority to municipal fishers, in the preferential use of the municipal waters. In access to fishery resources, preference is given to resource users in the local communities adjacent or nearest to the municipal waters. According to Section 68 of the code, fishers and their organizations residing within the geographical jurisdiction of the *barangays*, municipalities or cities with the concerned local government units shall develop the fishery and aquatic resources

in municipal waters and bays. The provision of support to municipal fishers through appropriate technology and research, credit, production and marketing assistance, etc. is mandated by the code. Incentives for municipal and small-scale fishers are also provided.

The most significant community-based mechanism in the Fisheries Code is the creation of FARMCs. These shall be established at the national level and in all municipalities and cities abutting municipal waters and shall be formed by fishers organizations and cooperatives, NGOs in the locality and be assisted by the LGUs and other government entities. Before organizing FARMCs, the LGUs, NGOs, fishers and other concerned organizations shall undergo consultation and orientation on the formation of FARMCs. At the national level, a National Fisheries and Aquatic Resources Management Council (NFARMC) is created while *barangay*, lakewide, municipal and city FARMCs shall be created at the local level. Essentially, the local FARMCs perform advisory and assisting roles to government bodies in the preparation of fishery development plans, the enactment of legislative measures and the enforcement of fishery laws, rules and regulations.

While the new fisheries law clearly recognizes community-based approaches in fisheries management, it represents in many ways the continuing inadequacies of national law and policy.

First, and this is true for many other policy issuances, there are, within the same law or policy, inconsistencies between what is articulated as policy and the details of specific provisions. For example, under Section 18 of the Code, all fishery related activities in municipal waters, defined generally as 15 km from the coastline, are supposed to be used solely by municipal fishers and their organizations. However, under the same section, the law also provides that the municipal or city government may, through its local chief executive and acting pursuant to an appropriate ordinance, authorize or permit small and medium commercial fishing vessels to operate within the 10.1 to 15 km area from the shoreline in municipal waters under certain conditions. This exception, which was a compromise between those who wanted exclusive access for small

fishers and those who wanted unrestricted entry by the commercial fishing industry, may effectively destroy the preferential rights given to small fishers.

A second inadequacy of national law and policy is its failure to fulfill the promise of its policy rhetoric. While the creation of FARMCs can be considered a progressive step, for many advocates, this new mechanism does not go far enough in ensuring community-based resource management. After all, the FARMCs are merely advisory and recommendatory. The real powers are still lodged in the local and national government agencies. On the other hand, as many experiences in the Philippines would attest, the FARMCs, under certain conditions, may acquire “lives of their own” and may yet prove to be good starting points for effective and sustainable CBRM. The challenge is for communities to maximize the opportunities provided for by this mechanism.

Another inadequacy is the continuing sectoralization and lack of integration. While the Fisheries Code contains some provisions on the prevention of marine pollution and the protection of marine biodiversity, the approach that it takes is centered mainly on fisheries. In this sense, the new law is a step backward as it does not incorporate the principle of integrated coastal management.

Finally, it remains to be seen whether national law and policy can and will be implemented in a manner consistent with its spirit and intention. The reality is that it will take time before one can conclude that CBRM has been truly integrated into the policy, legal and institutional framework of managing the fisheries, marine resources and coastal environments of the Philippines.

CONCLUSION

The Philippines has done pioneering work in establishing community-based management. This people centered approach relies on indigenous knowledge and expertise in the development of management strategies. The aim is to ensure wise and equitable use of resources on a sustainable basis through proper exploitation and protection. It requires maximum participation of coastal communities to ensure that benefits will accrue to the majority of the people.

The premise of CBRM is that local communities have the greatest interest in the conservation and sustainable use of coastal resources and thus should have incentives, resources and capacity for marine and coastal ecosystems conservation. The CBRM calls for:

- Community empowerment;
- Provision of environmentally sound technologies and financing;
- Recognition and enforcement of community property rights over local fishing grounds and other resources; and
- The reform of national policy and legal framework.

The range of experiences of community-based systems in the Philippines illustrates that no one community-based approach can be a model for all communities. The role of communities changes depending on the state and condition of the ecosystem, the characteristics of the marine and coastal resources, the profiles of the stakeholders and the nature of the relationships among the key players. Thus, national law should provide only for a legal and institutional framework in the management of marine and coastal resources. Such a framework should include principles of use and management (such as sustainable development, ICM and recognition of community-based systems). The framework should also establish democratic and participatory processes for policymaking and conflict resolution.

An important insight is that community-based approaches are applicable to not only small-scale coastal resources and traditional artisanal communities but can play an important role as industrialization and urbanization sets in. On the other hand, as society changes rapidly and pressures mount and become more complex, ICM becomes imperative. Under such circumstances, traditional management systems, even community-based ones, are no longer adequate. The danger — and potential tragedy — is to disregard completely the community-based approaches and rely completely on command and control or market based strategies. The challenge is how to build on local experiences and integrate them into the national management framework as it evolves through time and circumstances. Developing a community-based ICM is therefore imperative.

The CBRM assumes that the solution to the common problems start with:

- control over access to the resource;
- increasing production from a common property resource depends on the conservation of the resource base;
- the sustainable use of a resource is closely connected to the use of simple and appropriate technology for the harvest of that resource; and
- local level management through community organization improves prospects for the sustainable use of a common resource.

Thus, democratization of access to the resources lies at the core of an effective CBRM approach. A truly effective management framework for fisheries and coastal environment management must be consistent with this underlying philosophy and should not be grounded merely on the improvement of management of resources by reinforcing control and enforcement mechanisms through greater participation. Above all, it should be remembered that the rationale for CBRM is equity and justice. So that it can be supported and sustained, CBRM should be understood in the context of the socioeconomic and political development of societies. Ensuring equity and justice do not necessarily result in environmental sustainability, but at least in the Philippines, these are necessary conditions for its attainment.

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REFERENCES

- Aliño, P.M. 1997. Implementation plan for national programs on the marine environment. A synoptic review on the marine resources and environment. Unpublished.
- BAS. 1997. Fisheries Statistics of the Philippines, 1992-1996. Bureau of Agricultural Statistics, Department of Agriculture, Quezon City.
- Batongbacal, J. 1991. The coastal environment and the small-scale fishers: advocacy for community-based coastal zone management. *Philippine Law Journal* 66:149-245.
- Bautista, F. and J. Anigan. 1978. The Japanese and Philippine fisheries: perpetuating the lopsided partnership. *Impact* 13: 10.
- BFAR. 1987. Profile of the different divisions of the BFAR. Bureau of Fisheries and Aquatic Resources, Department of Agriculture, Quezon City.
- BFAR. 1994. Philippine fisheries management and development strategies for the year 2000. A paper submitted to the Conference on Fisheries Management and Development Strategies for the ASEAN Region for the year 2000, 26-29 July 1994. ASEAN/CONF/POLICY/4. Bangkok, Thailand.
- Calumpong, H.P. 1997. Write-up on Apo Island, adopt a reef program. Unpublished.
- Carlos, M. and R. Pomeroy. 1995. Review and evaluation of community-based coastal resources management in the Philippines, 1984-94. Research Report. International Center for Living Aquatic Resources Management, Makati City.
- CEP. 1997. 1997 Annual Report. Coastal Environmental Program, Department of Environment and Natural Resources, Quezon City, Philippines. Unpublished.
- De la Costa, H. 1965. Readings in Philippine history. Ateneo de Manila University Press, Manila.
- De Morga, A. 1971. Sucesos de las islas Filipinas. Trans. J.S. Cummings. Hakluyt Society edition. Cambridge Press, UK.
- DENR-CENRO Dumaguete. 1995. Initial protected area plan of Apo Island. Unpublished.
- EMB. 1996. Philippine environmental quality report 1990-1995. Environmental Management Bureau, Department of Environment and Natural Resources, Philippines. Quezon City, Philippines.
- FAO. 1997. Fishery Statistics Yearbook 1995. Food and Agriculture Organization, Rome. 81 p.
- Ferrer, E., L.P de la Cruz, M.A. Domingo. 1996. Seeds of hope: a collection of case studies on CB-CRM in the Philippines. CSWCD, University of the Philippines/NGO Technical Working Group for Fisheries Reform and Advocacy. Quezon City, Philippines.
- GEF/UNDP/IMO MPP-EAS. 1996. Coastal environmental profile of the Batangas Bay Region. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas Technical Report No. 5. Quezon City, Philippines.
- Gomez, E.D., P.M. Alino, H.T. Yap and W.Y. Licuanan. 1994. A review of the status of Philippine reefs. *Marine Pollution Bulletin* 29(1-3): 62-68.
- Goodman, G. 1983. America's permissive colonialism: Japanese business in the Philippines, 1899-1941. *In* N.G. Owen (ed.) *The Philippine economy and the United States: studies in past and present interactions*. The University of Michigan, Center for South and Southeast Asian Studies, Ann Arbor. 208 p.
- IBON. 1996. The Philippine profile. IBON. Quezon City, Philippines.
- IPC. 1996. Tagbanuas in Coron. Institute of Philippine Culture. Ateneo de Manila University Press, Manila.
- Juinio-Menez, M.A., N.N.D. Macawaris and H.G.P. Bangi. 1995. Potentials of sea urchin culture as a resource management strategy, p. 219-227. *In* M.A. Juinio-Menez and G.F. Newkirk (eds.) *Philippine coastal resources under stress*. Coastal Resources Research Network, Halifax and Marine Science Institute, Quezon City.
- Kalagayan, B.N.V. 1990. Institutional and legal framework. p. 44-62. *In* L.T. McManus and T. E. Chua (eds.) *The Coastal Environmental Profile of Lingayen Gulf, Philippines*. ICLARM, Manila, Philippines.
- La Viña, A. 1995. Determining the appropriate organizational structure with the responsibility and authority to undertake and implement the environmental management plans for the Batangas Bay Region and strengthening of the Batangas Coastal Resources Management Foundation. Regional Programme for the Management and Prevention of Marine Pollution in the East Asian Seas (MPP-EAS), Case Study No. 2. Quezon City, Philippines.
- La Viña, A. 1997. The role of local government in environmental management: focus on coastal management in the Batangas Bay Region. *In* Proceedings of the workshop on the Implementation of the Local Government Code in relation to Integrated Coastal Management in the Batangas Bay Region. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in -the East Asian Seas (MPP-EAS). Quezon City, Philippines.
- Labon, A.L. 1991. Executive summary-draft final report for institutional strengthening of the Philippine fisheries sector. RDA International Inc./PRIMEX. Unpublished.
- LGCAMC. 1996. Annual report of the Lingayen Gulf Coastal Area Management Commission. LGCAMC, Pangasinan.
- MARINA. 1996. Unpublished data. Maritime Industry Authority of the Philippines.

- McManus, L.T. and T.H. Chua (Editors). 1990. The coastal environmental profile of Lingayen Gulf, Philippines. ICLARM Technical Reports 22. International Center for Living Aquatic Resources Management, Manila. 69 p.
- McManus, J.W., C.L. Nanola, R.B. Reyes, and K.N. Reyes. 1992. The Bolinao Coral Reef Systems, pp. 193-204. *In* M.A. Juinio-Menez and G.F. Newkirk (eds.) Philippine Coastal Resources under Stress. Coastal Resources Research Network, Halifax and Marine Science Institute.
- Menasveta, D. 1997. Fisheries management frameworks of the countries bordering the South China Sea. FAO Regional Office for Asia and the Pacific, Bangkok. RAP Publication 1997/33: 94-111.
- Noblejas, A.H. and E.H. Noblejas. 1992. Registration of land titles and deeds. 1992 Revised Edition. Rex Bookstore, Manila.
- NSCB. 1996. Philippine statistical yearbook. National Statistical Coordination Board, Manila.
- PAFID 1998. Mapping the ancestral waters of the Calamian Tagbanwa. Philippine Federation for Intercultural Development, Manila. Unpublished.
- PAWB. 1998. The first Philippine national report to the Convention on Biological Diversity. Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources, Philippines. Quezon City, Philippines.
- Peña, N. 1997. Philippine law on natural resources. 1997 Revised Edition. Rex Bookstore. Manila.
- PG-ENRO Batangas. 1996. Strategic environmental management plan for the Batangas Bay region. GEF/UNDP/IMO Regional Programme for the Prevention and Management of Marine Pollution in the East Asian Seas Technical Report No. 3. Quezon City, Philippines.
- Phelan, J.L. 1959. The hispanization of the Philippines: Spanish aims and Filipino responses, 1565-1700. University of Wisconsin Press. Madison, Wisconsin.
- Ramsar Convention Bureau. 1999. The Ramsar convention on wetlands. 30 September 1999. Available: <http://www.iucn.org/themes/ramsar/index.html> [1999, October 01].
- Reyes, A.B., R.B. de Sagun and J.C. Munoz. 1994. Fishing effort restriction policies: the Philippine situation. *In* Proceedings of the IPFC Symposium in conjunction with the 24th Session of the IPFC, 23-26 November 1993, Bangkok, Thailand. FAO Regional Office for Asia and the Pacific, Bangkok. RAP Publication 1994/8: 191-205.
- Sajise, P. 1995. Ecology in the Philippine setting: issues and challenges. Philippine Geographical Journal 19(2): 99-104.
- Silliman University Marine Laboratory-Site Description Report. n.d. Apo Island, Dauin, Negros Oriental: Site Description Report. Unpublished.
- United Nations. 1997. Report of the UN Secretary-General on Oceans and the Law of the Sea, 20 October 1997, A/52/487. United Nations, New York.
- Vogt, H.P. 1996. The economic benefits of tourism in the marine reserve of Apo Island, Philippines. Sea Wind: Bulletin of Ocean Voice International 10:4.
- Wright, H. 1907. A handbook of the Philippines. AC McClurg and Co., Chicago.
- Yambao, A. and S. Salmo III. 1997. A preliminary assessment of the coastal development planning in the municipal waters of Bolinao, Pangasinan. CB-CRM Project Report.

Institutional and Policy Perspectives in the Management of Fisheries and Coastal Resources in Thailand

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ABSTRACT

Important fishery and coastal resources in Thailand are already being degraded or threatened by various anthropogenic factors. These factors include a rapidly growing coastal population, bureaucratic or administrative problems, overexploitation and pollution. This chapter shows how the government at the national and local levels addresses the problem. Laws, policies and plans are laid out both to counter resource degradation and to manage the resources. Yet, the problems are still around and success appears hard to come by due to implementation problems, lack of necessary financial resources to implement programs and projects, and inherent weakness of the laws, policies and plans, to name a few.

While the situation appears to be bleak, significant inroads in certain areas are made by local communities and their local authorities to manage the resources within the local context. Various laws and policies provided opportunities for the involvement of local communities and the local authorities in resources management. For example, significant recognition of the role of local communities in the management of resources and the environment is found in the 1997 Constitution. On local administration, there are, among others, the Public Administration Act of 1991, Sub-district Council and Sub-district Administration Organization Act of 1994 and the Provincial Administration Organization Act of 1997.

This paper further discusses the intricate linkage and cyclical relationship of policies and plans at the three different levels of administration—local, national and regional—in Thailand. It is hoped that this will lead to better understanding of the institutional issues associated with fishery and coastal resources management in the country.

INTRODUCTION

With more than 2 600 km of coastline, about 70% of Thailand's population is concentrated in and around the coastal area. Twenty-four of 76

provinces (including Bangkok) are considered coastal provinces or highly dependent on the coastal area. Development along the coast has damaged mangrove forests, swamps, and intertidal zones. At present, there are no formal fisheries and

coastal resources management laws in Thailand. However, there exist informal forms of fisheries and coastal area management where traditional practices are common. The recent decentralization of the Thai public administration and its subsequent laws has led to expectations for effective and participatory management of the fisheries and coastal resources. In addition, international involvement has played an increasing role as Thailand has committed itself to the world community in terms of legal, social, economic and environmental cooperation. This local and international involvement can have enormous influence on the national policies for the effective management of fisheries, coastal resources and coastal environment in Thailand. In light of the current status of fisheries and coastal resource law, existing national policies, local initiatives and traditional management practices, a research has been carried out to investigate the management processes related to the historical evolution of public administration, laws and policies; to demonstrate the relationships of local, national and international involvement in designing effective fisheries and coastal resource management plans; and to suggest a desirable management practice that takes into consideration synthesized findings on the institutional, legal and policy framework.

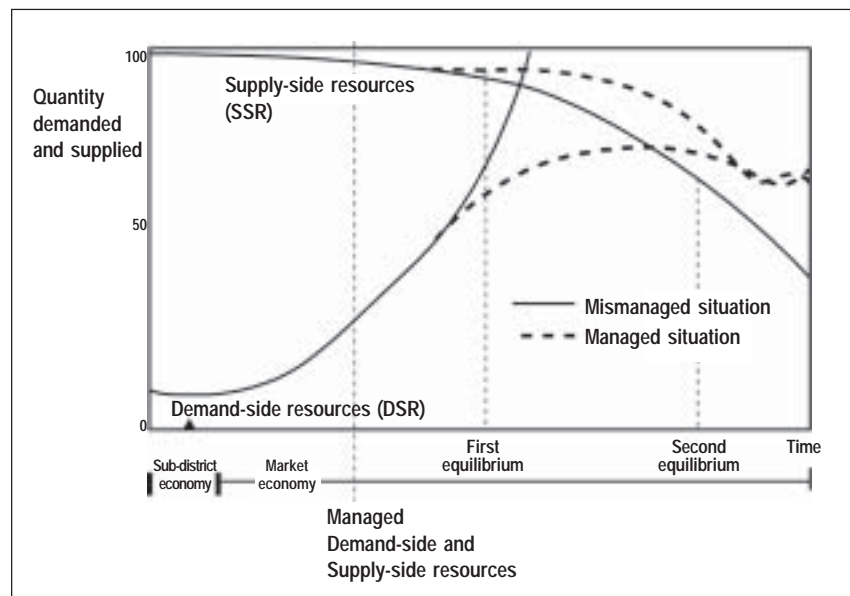
METHODOLOGY

A Supply and Demand Paradigm

A simple economic paradigm of supply and demand can be adapted for resource management purposes when all resources are classified into supply and demand sides. Even though the supply and demand sides of fisheries and coastal resources cannot be entirely distinguished from each other, such clear distinction is assumed for analytical convenience. Resources have their own value when analyzed in the supply and demand framework, but the prices of these resources may not be evaluated with precision, especially when the resources involve social and environmental aspects.

1. Demand-side resources (DSR). The classification DSR is based on resource components that require people to obtain supply-side resources (SSR) for their livelihood or pleasure. At a point when SSR are exhausted, they may turn into DSR. Therefore, both DSR and SSR are interchangeable. Examples of DSR are several groups of human activities that demand fisheries and coastal resources for the fulfillment of their objectives, and the natural resources that require rehabilitation and inputs for their recovery after being exploited by DSR.
2. Supply-side resources (SSR). SSR are resources which exist to fulfill requirements of the DSR. Examples of SSR are fishery products, mangrove resources, seabed and coastal minerals, tourism resources such as water, beaches, coral reefs, ports and infrastructure, and cultural heritage. These SSR are interchangeable with DSR, and at one point in time when SSR are used beyond their maximum point, they become DSR.

Figure 5.1 A Demand-Supply Paradigm.



As shown in Figure 5.1, there is a dynamic between DSR and SSR. Under a mismanaged situation, DSR remain constant during a subsistence economy and they are expected to rise during a market economy. They are influenced by several factors including population growth, changes in

social values, changes in consumption and modern technologies.

On the other hand, SSR are increasingly exploited as the DSR change from subsistence to market economies. At the first equilibrium point, DSR and SSR are equal. However, this point does not remain fixed for long as DSR exponentially increase. The gap between DSR and SSR grows and at some point SSR change to become DSR which further widens the gap. Under a managed situation, the management arrangements are expected to change both DSR and SSR forms so that the DSR and SSR increase at a slower rate and in the long run adjust themselves to a more sustained equilibrium.

In conclusion, the ultimate objective of fisheries and coastal resource management using the supply and demand paradigm is that desirable management strategies are able to bring together supply and demand to the point where they approach an equilibrium and remain there as long as possible.

The Thai Political Economy System

The historical development of the Thai economy from absolute to constitutional monarchy has impacted the social and economic structures of the country. The social and economic pattern is a result of the changing relationship from a patron-client relationship to a capitalist system. This patron-client relationship created extensive group divisions and remains, to some extent, the basis of Thai politics.

The capitalist system believes in productive capability. Competitiveness in the production of goods and services is the main driving force that leads to maximum social benefit. Inevitably, such competitiveness generates an individualistic culture in which private property rights are greatly respected. The democratic revolution in 1932 created a mixture of the Thai political and economic systems (see Table 5.1). The political economy of a country evolves through time. With increasing international involvement, Thailand's political and economic systems have evolved to a democratic capitalist system. The patron-client system is moving toward a democratic-capitalist system, while the authoritarian-capitalist system and the democratic-patron-client system acted as transitional systems.

Table 5.1. The Thai Political Economy (Thanapornpun 1995).

	Authoritarian	Democracy
Patron-Client Relationship	Authoritarian-patron-client system	Democracy-patron-client system
Capitalism	Authoritarian-capitalism system	Democracy-capitalism system

However, the time period of these movements is uncertain (Thanapornpun 1995). The democratic revolution in 1932 changed the face of Thailand through several revolutions in order to attain democracy, with the King as the symbolic representation of unity. Along the path to a democratic-capitalist system, the Thai political economy is still in a stage of flux and if not managed well, could result in the dramatic exploitation of resources including fisheries and coastal resources. There is some evidence that the Thai political economic system is in a transitional period. This claim comes in the form of intrusion by politically influential investors into the commons such as mangroves and terrestrial forest reserves or marine national parks.

A Matrix Approach

A matrix approach is used to analyze the data. It is based on the idea that fisheries and coastal resource management are multidisciplinary in nature. There are several issues of conflicting uses of fisheries and coastal resources that the matrix method is able to handle. The main feature of the matrix method is that it is able to relate the effects of the fisheries and coastal resources sectors on themselves and on other sectors. Such effects are explained by the use of multipliers if the quantitative data are available.

Logical Framework Approach (LFA)

The LFA can be used to organize and analyze fisheries and coastal resource management problems in a systematic way so that problems can be arranged in terms of cause and effect relationships. An analysis of the relationship results in the identification of problems, issues, and priorities in relation to fisheries and coastal resource management. These techniques are common and widely used in similar research in this field.

Data Collection

This research employs desk studies, consultative meetings, interviews and case studies. The desk study involves compilation of relevant laws and regulations, administrative arrangements and policies and plans on fisheries, coastal resources and coastal environment protection. It also includes a review of literature.

The consultative meetings involve coordination with other relevant organizations and stakeholders through group discussions and small participatory workshops that employ the LFA to build problem relationships and analysis of problem trees.

Interviews

In the interview, the research team met with key informants and stakeholders. Both personal and structural interviews were held. Personal interviews were used in situations where the group interview resulted in false or distorted information.

Several case studies representing different key issues are analyzed based on the DSR and SSR matrix analysis. Four case studies with different analytical themes were selected to reflect the overall framework of the research.

- Case study 1 illustrates the enforcement of laws, policies and plans in Laem Talumpuk in Pak Phanang District, Nakhon Si Thammarat Province;
- Case study 2 illustrates wastewater management from shrimp aquaculture in Ban Kwian Huk in Khlung District, Chantaburi Province;
- Case study 3 illustrates local initiatives in Ban Laem Makham in Sikao District, Trang Province; and
- Case study 4 illustrates international involvement in Tarutao Marine National Park (TMNP) in Muang Satun District, Satun Province.

RESOURCE STATUS AND ISSUES

Demand-side Fisheries and Coastal Resources (DSFCR)

DSFCR are resources that need supply-side resources. Human activities and natural resources and their functions are major examples of DSFCR. With respect to human activities, the demands are highly influenced by population growth, changes in social and economic values, changes in consumption patterns and commitments to regional and international regimes. These human needs for fisheries and coastal resources have made the management of DSFCR a truly difficult task. Despite attempts through formal legislation, the fisheries and coastal resources are still being degraded at an alarming rate.

With respect to natural resources, demands are influenced by conditions of the resources. If the resources are used beyond their maximum carrying capacity, they can turn out to be highly aggressive DSFCR. Therefore, the use of the resources and the ability of these resources to support and assimilate changes in their conditions are the major influential factors.

Human Demand

In Thailand, there are about 46 851 marine fishery households, 16 501 coastal aquaculture households, and 1 552 households doing both marine fishery and coastal aquaculture. Most of these households are considered small-scale whose main livelihoods depend largely on the abundance of fish and coastal resources. Legislation to control the use of these resources can have enormous effects on their livelihoods. On the other hand, if the resources are degraded by these households or other large-scale investors, this can have similar impacts on their way of life. Though some supply-side fisheries and coastal resources such as tourism can provide alternative sources of income, the scale of tourism resources are yet to be determined. In many instances, local initiatives for fisheries and coastal resources management have shown some favorable signs that are

expected to be a role model for other communities. However, external forces together with changes in social values, conspicuous consumption, loopholes in laws and regulations, insufficient knowledge and information, and insufficient law enforcement have been major threats to local management.

An example is the Ko Samet National Park in Rayong Province on the east coast where the local people would like to expand tourism for employment and income. This initiative, if managed properly, should be supported as it is in the people's interest. However, the state saw it differently and refused the expansion citing environmental damage already done by existing establishments. It went on to say that any new tourism operation would worsen the already degraded environment in the National Park. From another perspective, if this local initiative had sufficient scientific and engineering back-up, productive consultation with park officials, and public participation, then the Ko Samet National Park would have been a role model for coastal tourism.

The DSFCR management strategies in Thailand are not implemented in a way that resource owners are guaranteed their ownership rights. Further analysis suggests that the national legislation system has focused its attention on the exploitation of fisheries and coastal resources for macroeconomic growth rather than for the improved well-being of individuals.

In 1997, tourists visiting coastal provinces generated high profits. However, more than 70 percent of spending was in larger cities like Bangkok, Phuket and Chantaburi. The largest share of earnings were by a few large entrepreneurs while individuals, whose livelihoods depend on tourism resources, got a smaller share. In addition, the aesthetic value of the unspoiled islands and towns that the local residence once enjoyed has been degraded as a result of quick and poorly planned construction.

Similarly, as in the case of coastal aquaculture, the export demands from wealthier countries have influenced the extraction of coastal resources while social and environmental costs are left for the locals.

The export values do not show the real losses that the community and the environment have to absorb.

The positive side of these DSFCR is in the quality of human resources. Measures through formal legislation and informal rules have been put into effect. Thailand has to manage its own DSR and to control and monitor the SSR and external forces so that the fisheries and coastal resources management strategies can be brought to a point of balance between DSFCR and SSFCR. While demands and pressures on natural resources continue to increase, Thailand's effort to control population growth are making some headway. Changes in consumption patterns have tremendous effects on natural resources exploitation offsetting the human demands as a result of population growth.

Natural Resources Demand

Natural resources provide for human needs. However, as demand increases, natural resources are used up. Expenditure to bring degraded natural resources back to their original condition would be costly. The supply-demand paradigm in Chapter 1 explains clearly the management and mismanagement scenarios.

There are issues relevant to the natural resources demand as follows:

- Though equilibrium is ideal, there are ways to manage the natural resources to fluctuate around the equilibrium point; and
- Monitoring of fisheries and coastal resources conditions is necessary.

Coastal Aquaculture

Coastal aquaculture, which includes the culture of fish, crab, prawn and shellfish, are increasingly important alternatives to the declining marine capture fisheries. Among all species cultured, tiger prawn (*Penaeus monodon*) is the most popular and occupies a large area of coastal zone. Foreign exchange earnings, employment and associated industrial development have expanded during the past 10 years. The positive contribution of tiger

prawn aquaculture has complemented the impressive economic growth of Thailand. However, negative consequences of tiger prawn aquaculture have also been noted. Environmental costs are not considered. This is misleading but the substantial foreign exchange earnings have prompted the Thai government to encourage the tiger prawn aquaculture industry.

The present slowdown of tiger prawn aquaculture is largely due to the use of unsuitable land (rice fields, fruit orchards, rubber plantations), infestations of pests, disease, and water pollution, mangrove deforestation, increased prices of inputs (feed, fingerling, labor, chemicals), and scarcity of tiger prawn parent stocks. It is also believed that the slowdown in this industry was one of the contributing causes of overall macroeconomic downturn and the financial crisis that hit Thailand in 1997.

A case study in Khlung District, Chantaburi Province, illustrates that the major problem facing the industry has been the changing coastal environment. This resulted from pollution, improper wastewater treatment, improper sludge disposal, uncontrolled industry expansion and weak enforcement of laws and regulations. Apart from environmental problems, the tiger prawn industry is now facing international interventions such as trade restrictions, quality assurance and environmental policy controls by importing countries.

SUPPLY-SIDE FISHERIES AND COASTAL RESOURCES (SSFCR)

The SSFCR are marine capture fisheries, deep-sea fishery, mangrove resources, seabed and coastal minerals, and coastal tourism resources. The following subsections present analyses of SSFCR status and identify predominant issues associated with the SSFCR.

Marine Capture Fisheries

Marine capture fisheries are fishing activities in the sea starting from the mangroves and intertidal zones to Thailand's 200-mile EEZ. Deep-sea fisheries in international waters will be considered in the following subsections.

Marine capture fisheries in the EEZ involve different types of fishing gear, different boat sizes, different species caught and all other fishing activity within the national boundary as provided for by UNCLOS. In it, Thailand gained 60 percent more in sovereign waters but lost about 300 000 square miles on the high seas after it was declared part of the neighboring countries' EEZ.

Even though the sovereign waters of Thailand increased, fishery abundance is questionable, as most of the Thai waters have been heavily exploited. There has been visible evidence indicating that the quantity and quality of Thailand's fisheries have been degraded to the point close to or exceeding the estimated maximum carrying capacities. In addition, the catch of high priced fish has decreased resulting in additional efforts to compensate for higher fishing costs. Consequently, incidents of Thai fishing boats caught encroaching the waters of neighboring countries are increasingly being reported. Within Thailand, trawlers intrude into the prohibited 3 000 m zone which is preserved for small-scale coastal fishers and into protected areas.

Recently, there was a proposal for an expansion of the conservation zone in Phangnga Bay, which would take in waters off Phuket, Krabi and Ranong. Inshore fishers demanded that the Fisheries Department extend the conservation zone from 259 square miles to 773 square miles to allow a greater area for the rehabilitation of fish stocks. The Phuket Fishery Association representing commercial trawlers initially proposed the conservation area be expanded to 401 square miles but the meeting opted for 649 square miles as suggested by fishery biologists.

An agreement of sorts was reached. A committee was set up to study the appropriate area and report within three months. It agreed that the current protected area is the basis for further discussion but enforcement would only continue in the original 259 square miles zone for the time being. There are several issues associated with the marine capture fisheries as follows:

- The qualitative and quantitative abundance of fishery resources has decreased;

- Increasing competition to enter protected zones;
- Attempts to reach agreements on joint ventures with neighboring countries;
- Attempts by the government and concerned institutions to enforce existing laws and regulations and issue new regulations;
- Attempts by small-scale fishers to protect fish spawning grounds and to extend current areas under conservation; and
- The private sector has expressed its desire to fish in international waters.

Deep-Sea Fisheries

The deep-sea fisheries open a new frontier for the Thai fishing industry as a result of the Chulabhorn research conducted jointly with Burma during November 1989 to January 1990. The amount of catch and the costs involved appear to entice boat operators. However, the deep-sea fishery in Thailand is still at an initial stage of research on feasibility, preparation for equipment and modern fishing technology, legal and policy perspectives and joint-venture possibility. Countries like Japan, Taiwan and China have had much experience in deep-sea fisheries, from which Thai fishers can learn. Joint fishery ventures seem to be the best alternative to move Thailand's stagnant fishing industry forward. However, joint-venture deals sometimes involve unfair benefit distribution and breaking of the joint-venture rules and regulations. All parties involved in joint fishery ventures have to play an appropriate role to implement the agreements; otherwise benefits will not accrue to all. There are several issues identified in the present research as follows:

- There is deep-sea fishery potential on the western coast of Phuket and around the 90 East Ridge. Some attempts by the Department of Fisheries in conjunction with Phuket Fisheries Association and Burma have shown favorable economic returns;
- There are a few fish species such as yellow-fin tuna (*Thunnus albacares*), tuna (*Thunnus tonggol*), eastern little tuna (*Euthynnus affinis*), and skipjack (*Katsuwonus pelamis*) to be caught for commercial purposes;
- Need for training to enhance fishers' experi-

ences have been indicated;

- Modern fishing gear and technologies and supporting storage facilities are needed. These involve high initial investments;
- Supporting onshore facilities have been developed along with the air transportation of fish catch to markets, mainly to Japan; and
- Joint-venture development is necessary.

Mangroves

Mangrove timber and wood products are in high demand. Mangroves are cut for charcoal, while hardwood from several remote islands has been heavily logged for timber. During the period 1961 to 1993, mangrove forests have been reduced by more than 54 percent. However, in 1996, the mangrove area gained 13% due to the proposed ban on mangrove concessions and a 1996 cabinet resolution that prohibits all new mangrove concessions. The ban was triggered by problems in the tiger prawn industry and a relative loss of international competitiveness of Thai prawns to neighboring countries. Other reasons that contributed to this ban are the changing attitudes of the population toward mangrove conservation, the roles of the non-government organizations' (NGOs) mangrove rehabilitation programs and the natural regeneration of mangrove forests.

Increased mangrove cover is both a quantitative and quality consideration. Mangrove quality refers to the composition of mangrove tree species, its aquatic life and the local community which it supports. According to reports and observations, biodiversity of mangrove forests has changed. Many mangrove forest species have been lost forever. Some of the main factors responsible for this reduction in quality are activities such as direct use of mangrove timber, wastewater drainage and sludge from shrimp farming and global climate change. The local communities living in and around the mangrove forests are also affected due to the loss of their means of livelihood. Their economic, social and cultural characteristics have been altered to the point that some areas of indigenous knowledge has quickly disappeared. Issues concerning the management and use of mangroves are:

- Mangrove resources are highly dependent on domestic and international forces such as government policies to encourage group management of shrimp farm operation in line with mangrove existence and shrimp prices in the international market. These factors have dramatic effects on both mangrove quantity and quality;
 - Although there is a positive trend in mangrove management, there is still uncertainty whether this trend can be maintained;
 - The recovery rate of natural or rehabilitated mangroves is slower than the use rate; and
 - Mangrove forests can be educational sites where eco-tourism can be promoted.
- Some disputed areas are under joint development; and
 - The transportation of petroleum products by pipeline is controversial as their construction requires cutting trees as well as disrupting local communities and historic sites.

Coastal Minerals

Minerals found in the coastal zone have been heavily mined. For example, there are no longer any tin deposits which can be commercially mined. Sand mining is another issue which has received much public attention. There are domestic and regional demands for white sand either for house and road construction or for beach nourishment. Exploration of mineral deposits along the coastline is more difficult. During the survey and exploration for minerals, it is inevitable that mangrove trees are cut.

Other important seabed minerals are petroleum products such as crude oil, condensate and natural gas that are found scattered in the Gulf of Thailand, the Andaman Sea and in some disputed areas near Cambodia and Malaysia. Oil and gas exploration is well developed in the Gulf of Thailand while the feasibility for similar development in the Andaman Sea is still being studied. In terms of sand, seabed and coastal minerals, several issues have been identified:

- Many mineral deposits in Thailand, especially tin, have been mined to exhaustion;
 - Sand mining is being practiced despite being illegal. This is a dangerous practice as several negative consequences follow such as coastal erosion and loss of esthetic values;
 - Petroleum exploration in the Gulf of Thailand is well developed, while the Andaman Sea is still at an early stage of development;
- Coastal tourism sites have been developed following similar development patterns;
 - Several coastal developments have benefited a few large developers while the local people get a smaller share;
 - The traditional way of life in communities

Coastal Tourism

Coastal tourism resources include 3S-1C (sun, sand, sea, and culture). Thailand is fortunate to have sunshine throughout the year with monsoons affecting both sides of the coast alternately every six months. Tourism is favorable year round. Clean beaches, white sands and appropriate beach slopes are the main attractions. In Thailand, sand mining is a new phenomenon. Sand is sold for beach nourishment and used for landfill and road construction. The sea is another important component involving clear and clean water, colorful and unspoiled coral reefs and fish, moderate wave movement free from stinging jellyfish. Again, Thailand is considered fortunate to have these qualities on both coasts (i.e., Phuket, Krabi, Trang on the west coast, and Chanthaburi, Prachubkirikhan, Chumphon, Surathani, Songkhla on the east coast).

These three components of coastal tourism are attributes of nature which, if left untouched, are dependent only on natural functions. However, activities such as marine capture fisheries, coastal aquaculture, tourism, infrastructure development, industrial waste and household sewage and other activities are also competing with these resources used for tourism. These activities can be considered as a form of culture, which can degrade and/or enhance the quality of coastal tourism resources. Culture includes tradition, art forms, architecture, infrastructure, transportation, communication, laws and regulations. These are major components of culture that are significant for the existence of tourism resources in the natural system. There are several issues related to coastal tourism resources:

- Coastal tourism sites have been developed following similar development patterns;
- Several coastal developments have benefited a few large developers while the local people get a smaller share;
- The traditional way of life in communities

- continues to change, even in remote areas;
- Fisheries and coastal resources continue to be degraded because of exploitation from both sea-based and land-based activities including wastes;
- Some coastal tourism sites are learning from past mistakes. They are moving toward more local participation and environment-friendly approaches; and
- Increasing competition to access new tourist sites such as marine national parks.

Case Study: Shrimp Wastewater Co-Management in Ban Kwian Huk, Chantaburi Province

Ban Kwian Huk is managed under the Kwian Huk Sub-district Administration Organization, Khlung District, Chantaburi Province (see map in Figure 5.2). The coastal area has been used for shrimp aquaculture for some time. Chantaburi was one of the pioneers of the shrimp farming industry. Coastal resource problems occurred as shrimp farms became increasingly susceptible to diseases. The infestation resulted in the collapse of the shrimp industry in this province. One of the main causes was the improper management of wastewater and sludge drained from shrimp farms into common waterways. This polluted wastewater and sludge was later pumped into the ponds unintentionally or unknowingly.

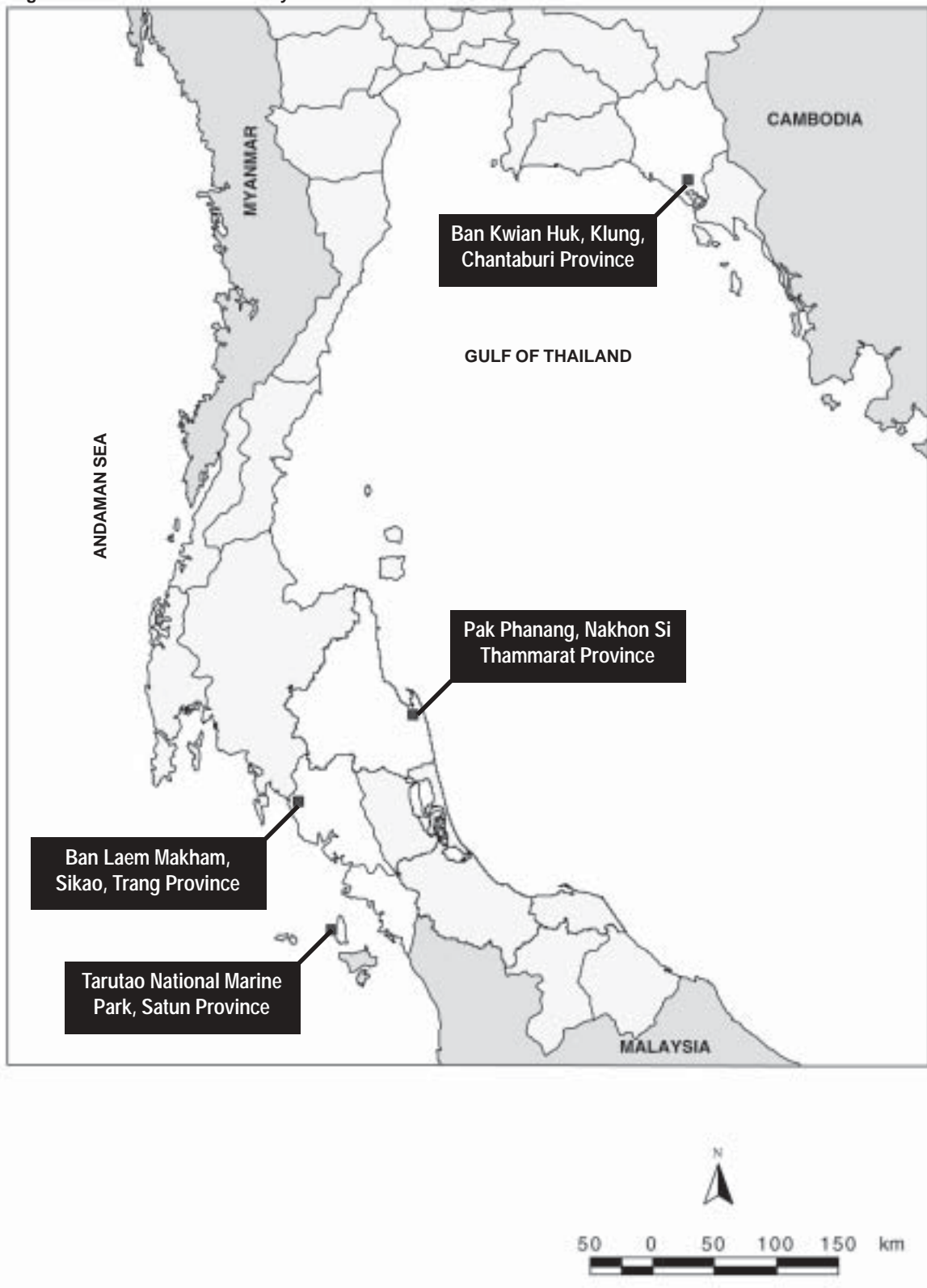
The implementation of measures to regulate shrimp production and control wastewater quality requires the development of an effective management plan. Techniques such as co-management can be used to overcome environmental problems caused by contaminated water supplies, shrimp diseases and the open-access nature of the resources used for shrimp aquaculture. The rationale for co-management employed within the Integrated Coastal Zone Management (ICZM) framework is a process for producing effective management plans based on an ecosystem approach and local community participation.

This case study focuses on identifying the stakeholders in Ban Kwian Huk. The stakeholders in turn identify key issues to be addressed. Through this process, the community has focused its effort on

capacity building of the shrimp farmers as partners with the local government officials in the development of a local community-based action plan. A need for education was clearly identified and addressed through a series of training courses, education campaigns, cross-site visits, seminars and workshops led by the shrimp farmers and local officials. The steps in the formulation of the co-management approach, using the present wastewater problem and sludge disposal as starting point, are as follows:

- Step 1: Define the problems and opportunities, existing policies and work plans of the government at both national and provincial levels. The conflicting policies and plans are identified and will be updated. A planning team composed of shrimp farmers and the public is created to work to identify management and sustainable development options and to decide on the planning approach.
- Step 2: Some necessary data are identified and collected by a collaborative team of shrimp farmers and government officials. The team analyzes the current situation and considers options including zoning of land and water use.
- Step 3: Plans and options are prepared and presented for public discussions. They are then revised taking into account the plans of the government and budget.
- Step 4: Formulation of actions for implementation are undertaken to include as much cooperation as possible from concerned institutions. Some training may be required with major emphasis on project proposal development. It is important that in many stages of developing the project proposal as identified in Step 3, the Kwian Huk Sub-district Administration Organization has to involve concerned government agencies so that the proposed budget will be approved. The projects and action programs should be monitored and evaluated to adjust to changing environments.

Figure 5.2 Location of Case Study Sites.



The integrated coastal area management (ICAM) approach resulted in the formation of a local Shrimp Farmers Group. This was later transformed into the newly decentralized organization, the Kwian Huk Sub-District Administration Organization. This planning process enhances the shrimp farmers capability to identify problems, explore solutions, and formulate action plans to integrate them into the provincial integrated master plan. The experience demonstrated that sustainable farm development can be initiated by a process of organized management arrangements at the local level under the ICZM framework. It has shown that shrimp farmers, who were once blamed for much of the degradation, can be effective coastal zone managers.

Co-management Approaches for the Management of Shrimp Wastes

Co-management strategies are described in this section to provide opportunities for the Shrimp Farmers Group to improve production through minimized self-pollution problems and other poor production factors, including outbreaks of disease. The rationale for co-management practices employing the Integrated Coastal Management (ICM) framework for the promotion of shrimp production and wastewater management is a promising model. The model is expected to adjust the DSR (aquaculture operations) and the SSR (natural function) to equilibrium by having the stakeholders and supporting institutions working together. The local shrimp farmers expressed their eagerness to form a group in order to create collective power for management, seek government support and request external funds. Initially, the group has to encourage the local community to become active participants. The Government officials have the academic knowledge whereas the shrimp farmers have their extensive experience. Working in cooperation will eventually generate benefits to all parties.

The co-management strategies of farm water supply in shrimp farming are presented as follows:

Strategy One:

Prepare procedures to eliminate existing sources of sludge, sediment and other pollutants entering the water channels.

Rationale:

Sludge from shrimp farms is a major source of pollution. Elimination of this pollution is the first step in improving water quality in the water channels. This involves including as many shrimp farmers as possible in the Shrimp Farmers Group. Farmers are strongly urged to begin considering innovative ways to use portions of their pond area for use as a water reservoir and develop separate intakes and outlets.

Objective:

To identify all existing sources of sludge and sediment entering the water channels and to develop procedures to deal with pollution.

Action:

1. Identify where sludge and sediment enter the water channels;
2. Identify seasonality of sludge and sediment entry;
3. Identify methods to be used to eliminate sludge and sediment sources; and
4. Collect baseline water and soil data from several locations from the main water channels.

Strategy Two:

Legislate rules to prevent sludge and sediment from entering water channels.

Rationale:

Once the Shrimp Farmers Group is able to eliminate pollution from farms, the Group must establish rules to prevent the same problems from reoccurring. It is important for non-members to realize the importance of group action against common problems.

Objective:

To develop rules to control sludge and sediment disposal into common water channels and to seek agreement with non-members to discuss future protocols.

Action:

1. Identify methods and community rules to control future sludge and sediment sources and their entry into the water channels;
2. Identify how sludge and sediment from non-member sources will be prevented from entering the water channels;
3. Identify how the Shrimp Farmers Group rules will be monitored and enforced; and
4. Prepare protocols to be discussed with the non-members.

Strategy Three:

Conduct problem/solution workshops to identify long-term solutions.

Rationale:

It is important to circulate the Shrimp Farmers Group findings and activities to a wider audience. This will facilitate future cooperation. Experiences from other stakeholders in the same or different areas are beneficial to the Shrimp Farmers Group to learn and design management strategies.

Objective:

To seek other people's knowledge and experience for mutual benefits. It is also a public relations campaign to increase the credibility of the Group.

Action:

1. Prepare relevant documents and locate resource people to conduct the workshop;
2. Identify participants;
3. Review information; and
4. Formulate solutions based on the results of the workshop.

Strategy Four:

Plant mangroves along the inner edges of the water channels.

Rationale:

Mangrove trees play an important role in water quality control. They aid in the reduction of organic

materials draining into the water channels and help remove excess dissolved nutrients from the routine release of water.

Objective:

To initiate the use of mangrove trees as a natural method of water quality improvement in the canals and water channels.

Action:

1. Identify locations for mangrove tree planting;
2. Mangrove planting at demonstration sites near the Shrimp Farmers Group farms;
3. Use Shrimp Farmers Group farm locations for water quality sampling and testing; and
4. Use planting activities as a participation tool for neighboring shrimp farmers, students, local scholars, and the public.

Strategy Five:

Conduct farm production trials.

Rationale:

The Shrimp Farmers Group members participate in farm production trials. These farms have to demonstrate current financial viability and agree to use a reservoir for preconditioning water and follow recommended farm management procedures for at least two crop cycles.

Objective:

To demonstrate that implementation of sustainable production measures using improved water supply strategies and renewed operating practices improve profitability.

Action:

1. Select five to ten Shrimp Farmers Group members who are willing to participate in the farm production trials;
2. Monitor and evaluate all stages of production; and
3. Provide production guidance to participating farms.

Strategy Six:

Remove sludge.

Rationale:

The existing accumulated sludge should be physically removed. The physical removal of sludge and its preventive control are beneficial to shrimp farming success.

Objective:

To prevent pollution from entering the shrimp ponds, exhibiting one of the important factors for successful shrimp farming.

Action:

1. Undertake the development of sludge removal plans including the sourcing of equipment, materials, and techniques; and
2. Provide labor and operating costs for sludge removal programs for exhibition farms.

NATIONAL POLICIES, PLANS, LAWS AND INSTITUTIONS

Historical Development of Policies, Plans, Laws and Institutions

When the Thai script was invented in 1283 by King Ramkhamhaeng written laws were based on Hindu scriptures. Important policies of the period included free trade, irrigation systems development and water supply systems. As the social and economic arrangements were based on an agrarian system, the policies were largely related to agricultural production. There was no direct policy, plan, law and institution aimed at managing the fisheries and coastal resources, and coastal environment as abundant supply made this unnecessary.

During the Sukhothai period (1235-1350), a paternal government existed. The state was a large family comprised of parents and children. The head of the family, who was often the father, had an absolute authority to govern the family. The family represents the capital city and other inner-ringed cities. The public administration was decentralized so that the outer-ringed cities have their own

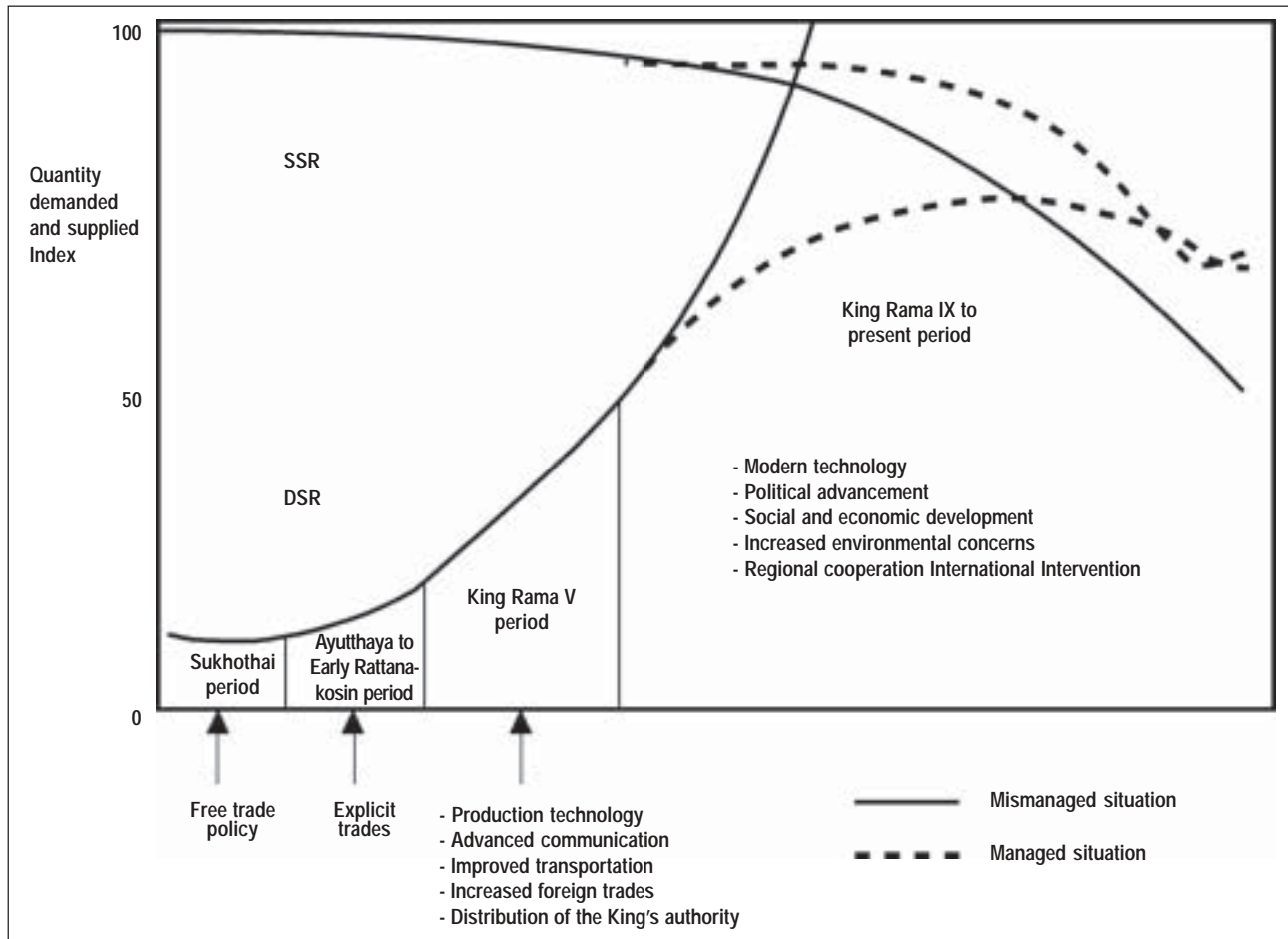
paternal governments who were dependent on the government in the capital city.

In the Ayutthaya period (1350-1767), the status of the King changed from a father figure to a presumed god. This affected the public administration system, changing it from a paternal government to absolute monarchy. Administration was based on the Four Pillars Ministerial System which was derived from the Khmer and Indian civilizations. These were the four main ministries necessary for the government to control and promote the prosperity of the state and the people. These were: interior, palace, finance and agriculture, which dealt with governance led by the King, taxation and revenue for the King and government officials, and food production. The structure of the public administration system was not complicated compared with later developments. It was considered sufficient, as the supply of resources was still abundant. This structure was practiced until the reign of King Rama V of the Rattanakosin era (1868-1910). The laws were classified into three categories: laws enabling the King to have absolute power and maintain the morals of the King; laws prescribing the regulation for civil servants, land laws and social status of the governed civilians and other laws addressing other governance issues. It can be seen that prosperity and peace relied heavily on the morals of the King. Administration was aimed at the well-being of the King and his monarchy, while the well-being of the people depended on the King's morals in relation to religious beliefs.

During the reign of King Rama V, Thailand increased its international involvement, as there were trading affairs with many western countries, so the public administration, laws and policy become more internationalized. In this era, the King's power was reduced by the establishment of central, provincial and local administrations. The first laws concerning fisheries appeared in the era of King Rama III in the form of water revenue laws. These laws were revised later during the reign of King Rama V and called the Water Revenue Act (Rattanakosin Year 120), which described the revenue that was collected from water usage, especially from the fishers.

The main policies during the reign of King Rama stressed on five main aspects:

Figure 5.3 A Demand-Supply Paradigm with Historical Development in Thailand.



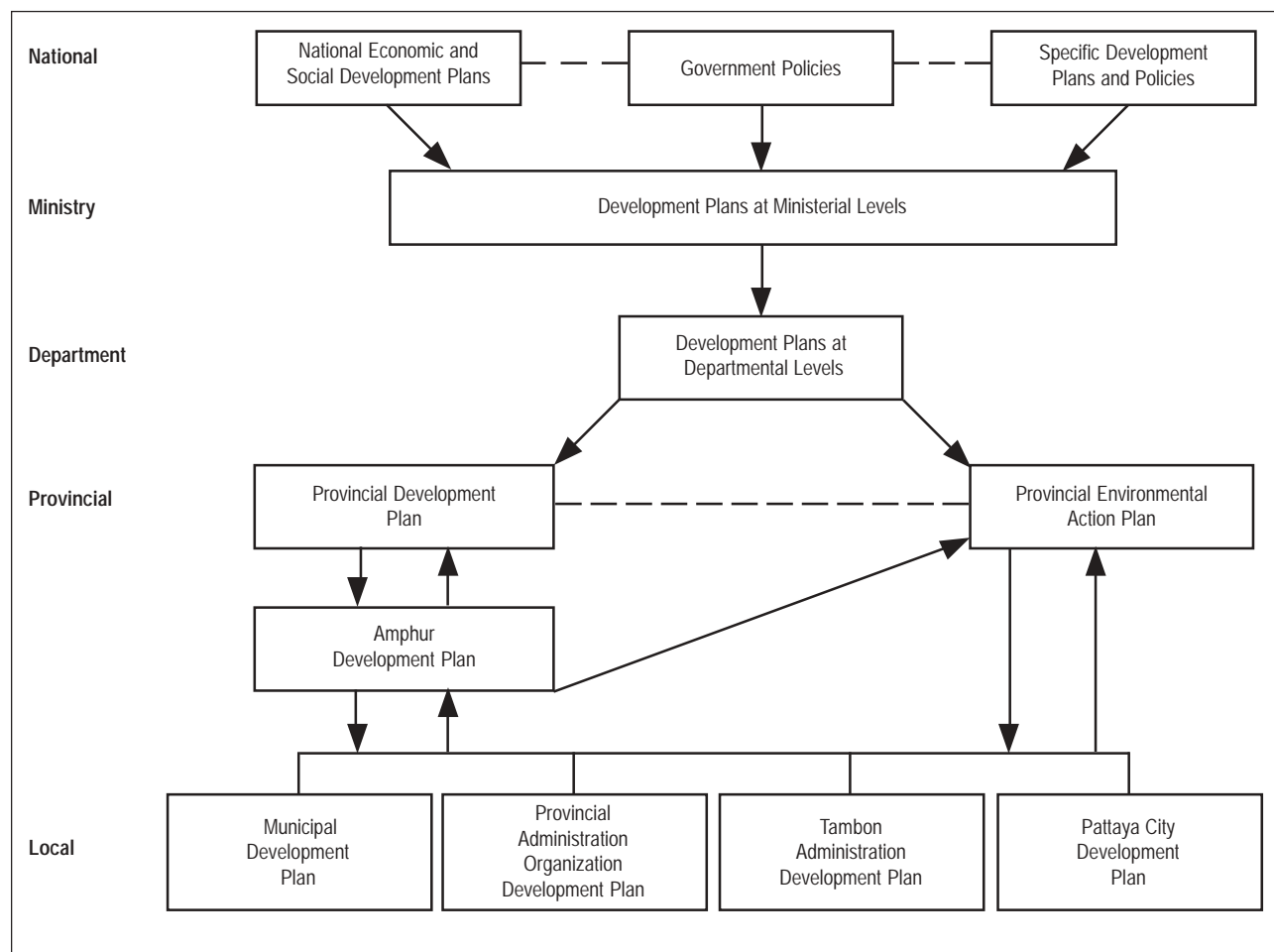
- Uniting Thailand through control over all states;
- Strengthening the public administration system to prevent colonization from the west;
- Facilitating improved livelihood opportunities for civilians so that the tax collected could be used for infrastructure improvement as well as avoid western colonization.
- Central administration has controls over outer-ringed cities; and
- Fair treatment for all under-governed civilians.

A dramatic change in Thailand's political system took place during the reign of King Rama VII (1932) when absolute monarchy was superseded by democratic reforms and the status of the King was transformed from being a presumed god to a symbolic leader. The public administration system remained

the same as in the reign of King Rama V. Only some new local organizations were allowed to be established. There still existed a top-down administration that enabled the central administration to pool authorities and resources within its hands.

From the graphical representation of DSR and SSR movements shown in Figure 5.3, the Sukhothai period shows a constant demand as a subsistence economy prevailed. Increased foreign trade is evidenced during the Ayutthaya to early Rattanakosin periods, and dramatic increases during the reign of King Rama V when production, communication, transportation and foreign trade were improved. During the reign of King Rama IX, Thailand opened its economy to international markets and associated Thailand with the international community.

Figure 5.4 Policy Formulation and Planning Processes at Different Levels of Administration.



Public Administration Systems and National Policies

National policies are formulated by the central administration and then given to the provincial and local administration for implementation. The public administration structure involving central, provincial and local administration is shown in Figure 5.4. This process has been under heavy criticism as it has created many undesirable consequences resulting in the degradation of fisheries, coastal resources and the coastal environment. The general public does not have true participation in managing their resources. Majority of the benefits generated from this form of administration fall into the hands of politicians, their clients, capitalists and high-ranking government officials. For the past 15-20 years, there has been some movement among intellectuals, white-collar workers, non-government organizations and grassroots organizations to push for political and bureaucratic changes and local management. In

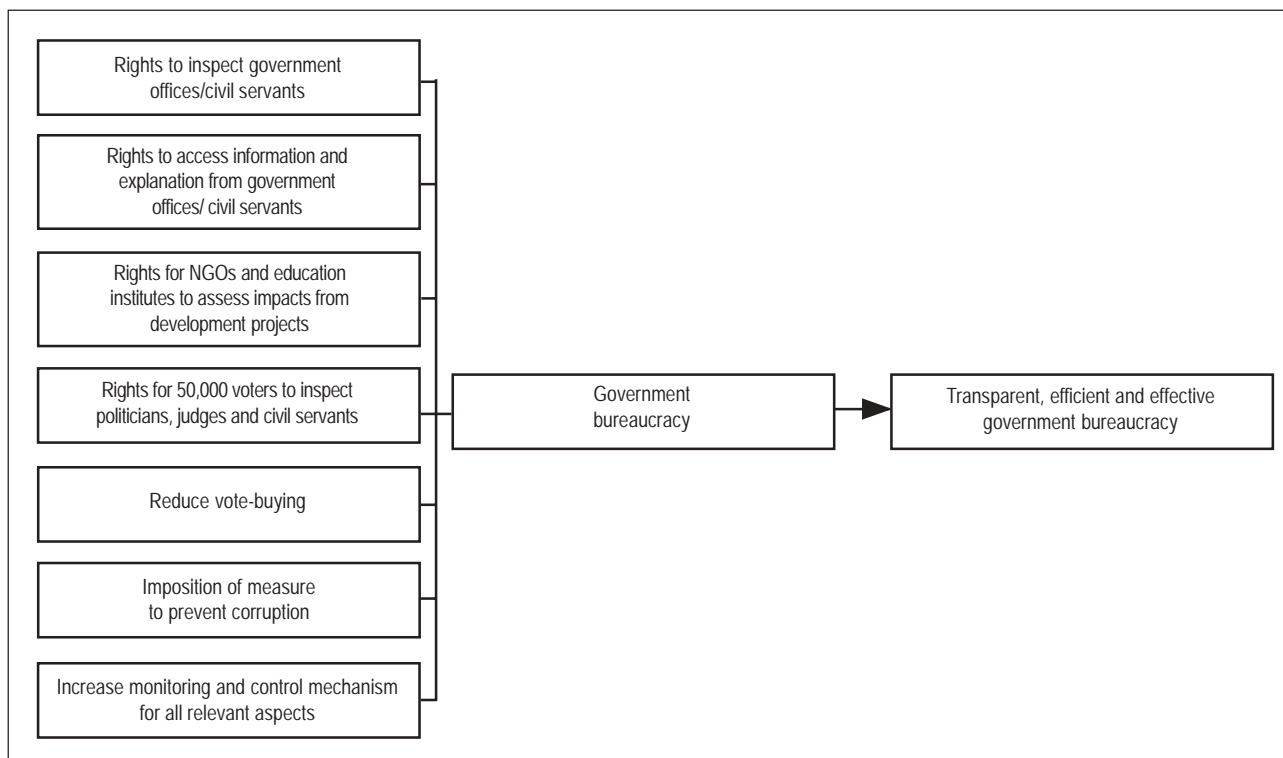
addition, globalization requires a less centralized form of administration. The New 1997 Constitution and other laws revolutionized how Thailand is governed especially in resource and environmental management.

As shown in Figure 5.5, there are at least seven measures supported by the New Constitution to enable a more transparent, efficient and effective political and bureaucratic system for the management of fisheries, coastal resources and coastal environments.

National Policies

Centralized public administration prevails in most resource management policies in Thailand. This includes fishery and coastal resources. A majority of national policies shows unclear roles and responsibilities of the concerned institutions. Current government policies emphasize the sustain-

Figure 5.5 Measures to Enable Government to Become More Transparent, Efficient and Effective.



able use of the fisheries and coastal resources. Some key policies are the National Forest Reserves policy (1964), the Non-Hunting Area policy (1984), and the Fishery Protection Zone (1972). These policies are considered appropriate for the physical characteristics and sustainable use of the fisheries and coastal resources.

Many coastal zones are covered by mangrove forests. They act as buffers preventing coastal erosion and are nurseries for aquatic animals. The preservation policy is expected to conserve this intricate and interdependent ecosystem. A fertile mangrove forest supports fisheries, recreation and tourism.

Settlement in the coastal zone should be avoided as it is susceptible to natural calamities such as typhoons, coastal erosion and floods. However, there have been several cases of encroachment of mangrove forests, beaches and saltwater swamps for settlement.

The objective of the fish protection zone is to conserve the fertile spawning and nursing grounds of aquatic animals. In addition, it protects the small-scale fishers from the destructive fishing practices of large-scale commercial fishing operations.

Though well intentioned, the policies are not fully implemented. Among the reasons are insufficient decentralization, unclear boundaries of mangrove forest reserves, imposed boundary overlaps with private lands as well as the inefficiency and ineffectiveness of the relevant institutions. Flexible approaches in solving conflicts concerning settlement in protected forest reserves is another reason. This problem is intractable due to frequent changes in government and the tendency of politicians to use the Land Code as a bargaining chip to maintain their position as land right is the most crucial issue in Thai politics.

Land increasingly becomes a major factor in government planning because of previous policies on promoting population growth, agricultural export-oriented policies, and policies on unlimited land holdings. The first two policies have created demand for land. Consequently, people encroach the national forest reserves, converting them into settlements and farms for their livelihood. The last policy has resulted in a few landlords with large landholdings, many small landholders and numerous landless people.

At present, the population growth policy has been effectively replaced by population control while the agriculture export orientation and unlimited landholding policies are still in effect. There have been serious efforts put into community forestry policies to solve the problem of encroachment in national forest reserves. The rationale is that man and forest can coexist. This policy has been well received by the public. It is still at the stage of public hearings and undergoing formal procedures.

National Plans

In Thailand, relevant national plans for fisheries and coastal resources management can be classified into two main groups, the National Economic and Social Development Plans and Specific Development Plans.

- The National Economic and Social Development Plans. These plans play a crucial role in the development direction of Thailand. There have been seven plans so far and at present, the eighth plan is in effect. The former plans focused mainly on infrastructure development, exports and a rush to become an industrialized country ignoring environmental protection. However, the eighth plan focuses on human resource development and public participation in designing the development direction. With regard to fisheries and coastal resources management, the contents of the plan involve:
 1. rehabilitation of the fisheries and coastal resources by promoting alternative use; and
 2. participation of communities in planning and implementing the use of these resources and the importance of information for decision-making and planning.
- Specific Development Plans. These plans aim at developing a specific area, topic or target population. These are extensive and involve many aspects. There are many committees nominated or elected to implement the plans. The many plans and committees have created problems of

overlap, confused lines of command and insufficient coordination.

Apart from these plans, there are other plans at the ministry, department, provincial, district, sub-district and local levels. Most deal with the well-being of the people and treat the environment as a separate concern. Many plans continue to focus on construction of facilities, which generally involve high capital investment and often are not fully and efficiently used for the designed purposes.

National Laws, Regulations, and Institutions

National laws, regulations and institutions are closely related in that the government's institutions implement and enforce laws and regulations with the primary purpose of peace and order. In a market economy, the national laws and regulations attempt to control the exploitation of scarce natural resources. Institutions involve attempts to implement laws and regulations and maintain the integrity of the natural resources.

There are direct laws regarding coastal resources and coastal environmental management and laws similar to those that originated during the reigns of King Rama III and King Rama V in the form of the Water Revenue Act. Today, there are at least 37 related laws, among them:

- Forest Act, 1941;
- Forest Reserves Act, 1992;
- Local Administration Act, 1914;
- Public Administration Act, 1991;
- Fisheries Act, 1947 amended in 1985;
- Wild Animal Protection and Reserves Act, 1992;
- Provincial Administration Organization Act, 1997;
- Sub-district Council and Sub-district Administration Organization Act, 1994;
- Enhancement and Conservation of National Environmental Quality Act, 1992;
- Land Code, 1954;
- Civil and Commercial Code;
- Navigation in Thai Waters Act, 1913; and
- The 1997 Constitution of the Kingdom of Thailand.

There are also several cabinet resolutions and ministerial notifications allowing sufficient flexibility in the implementation and enforcement of these laws and regulations.

There are a considerable number of laws and regulations concerning natural resource management, but several problems hindering such activities exist. These include:

- Loopholes;
- Light penalties;
- Repetition and conflicting content;
- Difficulties in implementation and enforcement; and
- Centralized and complicated procedures for law enforcement.

The following matrix (Table 5.3) shows the relationship between roles and responsibilities of concerned institutions for fisheries and coastal resource management.

Case Study: Law Enforcement in Fisheries and Coastal Resources in Laem Talumpuk

Laem Talumpuk (see map in Figure 5.2) is a classic case study of insufficient laws and poor enforcement of regulations. It represents conflicting uses of resources, such as marine fisheries and mangroves. In addition, shrimp aquaculture has been developed in vast areas and encroaches into the mangrove forests where local people derive their livelihoods. The problems occurring in this area are complex and are affecting the local people and institutions.

Geographically, Laem Talumpuk is situated in an elongated hook of Pak Phanang Bay surrounded by mangrove forests. The hook serves as a catchment causing the sediments to deposit. This has resulted in the extension of the Pak Phanang Bay shoreline creating shallows, which allow mangrove forests to colonize. The newly formed mudplain is a natural phenomenon creating new un-owned land that government instruments are unable to manage. There have been disputes between the local people and urban areas whose interests are conflicting. The local people want the new land to be covered with man-

grove forests so that it will protect the village from strong winds, storms and typhoons while others want this land for future development such as shrimp farming.

The main livelihood of the people in Laem Talumpuk is fishing. However, the sea is increasingly being subjected to exploitation by large trawlers encroaching the protected zone. Mangrove forests are converted into shrimp ponds or lose their characteristics by sedimentation and dry-out. The local people are exercising their resource use rights with limited support from legal instruments and insufficient attention from concerned institutions. However, the establishment of the Sub-district Administration Organization in 1994, and with strong local leaders, has encouraged the local people to attempt to protect their rights and to request for more local government support. These initiatives appear to work but there are still loopholes wherein the local people and the resources are further exploited.

With relatively weak village cohesion and limited attention from the local government, Laem Talumpuk continues to be an area of conflict and intensive competition for resource use among stakeholders. Problem issues identified in the present research are outlined as follows:

- Trawlers and large-scale push netters encroach the prohibited 3 000 m zone displacing small-scale fishers from their traditional fishing grounds;
- Mangrove forest destruction and illegal claims on mangrove lands brought about by the open access regime of property rights in mangroves;
- Susceptibility to natural disasters such as heavy monsoons and tropical typhoons which limits tourism development and capital investment;
- Insufficient local government attention to help the local people exercise their rights to use and protect the fisheries and coastal resources;
- The local people have weak cohesion and attachment to their local organization brought about by the seasonal migration of fishers in search of better fishing grounds; and

Table 5.2 Interrelationship Matrix Between Roles and Responsibilities of Fisheries and Coastal Resources Management Institution.

	Soil Management	Water Management	Aquaculture	Fishery	Agriculture	Forestry	Transport & Communication	Industrial	Mining	Urban Development	Tourism	Natural Disaster Management	Environmental Management	Land Use and Planning
1. Office of the Prime Minister														
1.1 Office of the National Economic and Social Development Board	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM	RFM
1.2 The Bureau of Budget	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
1.3 The Tourism Authority of Thailand	-	-	-	-	-	-	-	-	-	S	RP	-	S	S
2. Ministry of Finance														
2.1 Bank for Agriculture and Agricultural Cooperatives	-	-	B	B	B	B	-	-	-	-	-	-	-	-
3. Ministry of Agriculture and Cooperatives														
3.1 Department of Fisheries	-	RP	RPE	RP	-	S	-	S	-	-	-	-	-	-
3.2 Royal Forest Department	-	-	-	E	-	RPE	-	S	-	-	S	-	S	RPE
3.3 Land Development Department	RP	S	-	-	S	-	-	-	-	-	-	-	S	S
3.4 The Royal Irrigation Department	-	RPE	-	-	S	-	-	-	-	-	-	-	-	S
3.5 Department of Agriculture Extension	-	-	S	-	P	S	-	-	-	-	-	-	S	-
3.6 Agricultural Land Reform Office	PE	S	S	S	S	-	S	-	-	-	-	-	-	PE
3.7 The Cooperatives Promotion Department	S	-	S	-	S	-	-	-	-	-	-	-	-	-
3.8 Department of Agriculture	R	R	-	S	R	-	-	-	-	-	-	-	-	-
3.9 The Forestry Industry Organization	-	-	-	-	-	S	-	RP	-	-	S	-	-	-
3.10 Fishery Marketing Organization	-	-	S	-	-	-	-	S	-	-	-	-	-	-
4. Ministry of Science, Technology and Environment														
4.1 Office of Environmental Policy and Planning	FM	FM	-	-	-	-	-	-	-	-	-	-	FM	-
4.2 Department of Environment Quality Promotion	P	P	-	-	-	-	-	-	-	-	-	-	P	-
4.3 Pollution Control Department	PE	PE	-	-	-	-	-	-	-	-	-	-	PE	-
4.4 The National Research Council of Thailand	R	R	R	R	-	R	R	R	R	R	R	R	R	R
4.5 Wastewater Control Organization	-	-	P	-	R	-	-	-	-	-	-	-	-	-

Table 5.3 Interrelationship Matrix Between Roles and Responsibilities of Fisheries and Coastal Resources Management Institutions. (continued)

		Soil Management	Water Management	Aquaculture	Fishery	Agriculture	Forestry	Transport & Communication	Industrial	Mining	Urban Development	Tourism	Natural Disaster Management	Environmental Management	Land Use and Planning
5.	Ministry of Public Health														
5.1	Office of the Permanent Secretary for Public Health	-	S	-	-	-	-	-	-	-	-	-	S	S	-
5.2	Department of Health	-	S	-	-	-	-	-	-	-	-	-	S	S	-
5.3	Department of Medical Services	-	S	-	-	-	-	-	-	-	-	-	-	S	-
5.4	The Food and Drug Administration	-	S	-	-	-	-	-	-	-	-	-	-	SE	-
6.	Ministry of Interior														
6.1	Department of Land	PE	-	-	-	-	-	-	-	-	-	-	-	-	PE
6.2	Public Works Department	-	P	-	-	-	-	P	-	-	P	S	P	P	-
6.3	Department of Town and Country Planning	-	-	-	-	-	-	S	S	-	PE	-	-	S	PE
6.4.	Department of Local Administration	E	P	S	SE	S	SE	-	-	P	S	S	P	E	-
6.5	The Royal Thai Police Department	E	E	E	E	E	E	E	E	E	-	S	S	E	E
6.6	The Community Development Department	-	-	S	S	-	-	-	S	-	-	S	-	S	-
6.7	The Office of Accelerated Rural Development Agricultural Cooperatives	-	P	S	S	-	-	P	-	-	-	S	-	-	-
7.	Ministry of Industry														
7.1	Office of the Permanent Secretary for Industry	-	S	-	-	-	-	-	PE	-	-	-	-	E	-
7.2	Department of Industrial Works	-	S	-	-	-	-	-	PE	-	-	-	-	E	-
7.3	Department of Mineral Resources	-	S	-	-	-	-	-	-	PE	-	-	-	E	-
7.4	Offshore Mining Organization	-	-	-	-	-	-	-	-	P	-	-	-	-	-
7.5	Petroleum Authority of Thailand	-	-	-	-	-	S	-	P	-	-	-	-	-	-
8.	Ministry of Transport and Communications														
8.1	The Harbor Department	-	-	-	-	-	-	P	S	-	-	S	-	P	-
8.2	The Meteorological Department	-	S	-	S	S	-	S	-	-	-	-	S	-	-
8.3	Port Authority of Thailand	-	-	-	S	-	-	P	-	-	-	-	-	-	-
9.	Ministry of Defense														
9.1	Royal Thai Navy	-	S	S	-	S	S	-	S	S	-	S	S	S	-
10.	Ministry of University Affairs	R	R	R	R	R	R	R	R	R	R	R	R	R	R

Note: B= Budget; R= Research; F= Plan Formulation; M= Monitoring; I= Implementation; P= F+ I+ M= Planning; E= Enforcement; S= Supplement.

- Illegal and ecologically unsustainable activities are increasingly evident in the coastal zone such as sand mining, shrimp wastewater discharge, sludge drained into the mangrove forests, cutting of mangroves, hunting of protected animals and intrusion into the mangrove forests for settlement.

It has been shown that fisheries and coastal resources use conflict is mainly due to poor law enforcement. Hence, the following are suggested steps for effective fisheries and coastal resources management in Laem Talumpuk:

- Step 1: Use of information technology such as Geographical Information System (GIS) to establish clear boundary for mangrove forest reserves encompassing the newly formed mudplain. This boundary has to be made known to all stakeholders.
- Step 2: Revision of land right titles in many previous land regulations under the Land Code of Thailand. The priority for such revision is to ensure that local benefits are protected. It is important to encourage all stakeholders to participate in the revision.
- Step 3: Local government institutions and the Sub-District Administrative Organization should work together to enforce laws and regulations concerning the national forest reserves, fisheries resources and shoreline. Clear responsibilities should be established with the aim of strengthening the Sub-district Administration Organization.
- Step 4: Enhancement of management skills of the local people and stakeholders. It is important to enhance awareness of the local people, public and responsible government officials to wisely use the resources as well as to prohibit exploitation.
- Step 5: Establishment of local surveillance units to monitor compliance of the law. These units are to be independent of political influence. Representatives from all stakeholders are to be included.

Law Enforcement Strategies for the Fisheries and Coastal Resource Management

There are at least 37 laws and regulations regarding fisheries and coastal resources management in Thailand. Enforcement of laws and regulations differs from one locality to another depending on government policies, local activities and their environmental impacts, and local administrative structure.

Laws and regulations which regulate the policies on local fisheries and coastal resources are as follows:

- Forest Reserves Act, 1992;
- Wild Animals Protection and Reserves Act, 1992; and
- Ministry of Agriculture and Agricultural Cooperative (MAAC) Notification on 2 July, 1972 prohibiting the use of push nets and trawls within 3 000 m of the coastline.

Laws and regulations that regulate human activity and their environmental impacts are:

- Fishery Act, 1947;
- Land Code of Thailand, 1954;
- Navigation in Thai Waters Act, 1913;
- Civil and Commercial Code of Thailand, 1935;
- Town Cleanliness and Tidiness Act, 1992; and
- Enhancement and Conservation of National Environmental Quality Act, 1992.

Laws and regulations on local administration are as follows:

- Sub-district Council and Sub-district Administration Organization Act, 1994;
- Provincial Administration Organization Act, 1997;
- Local Administration Act, 1914;
- Public Administration Act, 1991; and
- Constitution of the Kingdom of Thailand, 1997.

Table 5.3 shows certain activities that have violated laws and regulations in Laem Talumpuk.

In a legal perspective, violations of the existing laws and regulations are subject to fine and punishment. However, in reality these activities still exist in Laem Talumpuk. Persistent violations are caused by a variety of factors such as:

- Fines and punishments are less severe compared with returns from the violation;
- Loopholes in laws and regulations allowing violators to go unpunished;
- Centralized law enforcement with insufficient cooperation among law enforcement agencies;
- Lack of dedicated personnel, budget and equipment;
- Cohesion among violators forcing officials to back down; and
- Government policies are relaxed to avoid protests.

A recent example of community efforts to enforce the law occurred on 26 July 1998 when 300 small-scale fishers blocked Songkhla Bay in order to prevent cargo ships leaving port. The protesting fishers demanded the authorities prohibit large anchovy purse seines from fishing in provincial

waters. Local officials were unable to negotiate, which led the Agriculture Minister to intervene. The Minister finally approved the Department of Fisheries' proposal to impose a ban on anchovy boats and those using gill nets from fishing in Songkhla waters.

Strategy One:

Support cooperation among stakeholders.

Rationale:

The centralization of Thailand's public administration system is inefficient in enforcing laws and regulations. It has also created confusion through a complicated hierarchy and lines of authority that in turn lead to insufficient cooperation among local and central institutions. The local people and institutions are not considered sufficiently qualified to manage their fisheries and coastal resources.

Objective:

To encourage local stakeholders and administration to identify, plan and cooperate in the manage-

Table 5.3 Violations of Laws and Regulations in Laem Talumpuk Arising from Human Activities.

	Land Code, 1954	Civil and Commercial Code	Forest Reserves Act, 1992	Wild Animal Protection and Reserves Act, 1992	MAAC Notification on 2 July 1972	Enhancement and Conservation Act, 1992
1. Drainage of sludge from prawn aquaculture into non-hunting areas				Violation of Articles 54 and 57		
2. Prawn farms in the mangrove forests under forest reserves			Violation of Articles 14 and 31			
3. Mangrove timber harvesting			Violation of Articles 14 and 31			
4. Hunting protected animals in mangrove forests				Violation of Articles 16 and 47		
5. Sand mining in public beaches						
6. Sand mining in private beaches	Violation of Articles 9108 and 108					
7. Human settlement in mangrove reserves		Violation of Article 1337				
8. Trawling within 3 000 m from the coastline			Violation of Articles 14 and 31			Violation

ment of their inherited resources.

Action:

1. Identify local fisheries and coastal resources;
2. Identify local stakeholders;
3. Draft management plans;
4. Conduct public hearings, obtain consensus; and
5. Specify roles and responsibilities.

Strategy Two:

Provide information on resource status, policies, plans, laws and regulations and make them available to the public.

Rationale:

The 1997 Constitution of the Kingdom of Thailand has guaranteed rights to the public to access to information. The information can be used for making local management plans and revising the plans when resource status changes.

Objective:

To provide information as a necessary component for publicly accountable decisions. Each decision made should be accepted by the majority of the people.

Action:

1. Improve people's knowledge about their constitutional rights through the media, distribution of printed materials and local government offices; and
2. Establish local networks for disseminating information and analyze knowledge via existing local administrative offices such as Sub-district Councils or Sub-district Administration Organization.

Strategy Three:

Establish a feedback system.

Rationale:

Patron-client relationships are a dominant feature

in Thailand's political economic system. This has resulted in a passive local administration which needs to be revised. Supervision will help reduce patron-client relationships. Efficiency and effectiveness of the public administration system is expected to improve.

Objective:

To enable proper supervision of government officials by the people.

Action:

1. Design a process of mutual supervision that is accepted by government officials and the public, and
2. Integrate the process in the daily work by means of reports, group discussions and collective decisions.

Strategy Four:

Accelerate the process of issuing legislation in accordance with the New Constitution of the Kingdom of Thailand.

Rationale:

There are several measures in the New Constitution that support local administration. The Constitution also provides for the rights of the local administration to issue local legislation. It encourages the local administration to play a role in conserving its culture and traditions, planning its education system and managing its natural resources and environment; otherwise, local people may lose their rights to manage their resources under the present laws and regulations.

Objective:

To accelerate the process of issuing legislation in accordance with the New Constitution

Action:

1. Draft a local master plan;
2. Identify the local resources and their ability to support local prospects; and

3. Integrate the local master plans into the national plan to influence national legislation.

LOCAL USE AND MANAGEMENT OF FISHERIES AND COASTAL RESOURCES

Local communities in Thailand's coastal areas are dependent on fisheries and coastal resources. There are some potential conflicts between the state and the local management practices, i.e., the state uses centralized laws and regulations while the locals rely on their indigenous knowledge. There are beliefs and social cooperation mechanisms which exist among local coastal communities. These factors have played a dominant role in some localities where state interventions are supportive. However, most coastal communities are still in a confused state of management. There are some positive trends of encouraging these local beliefs and social cooperation to play increasing roles in managing fisheries and coastal resources. These are endorsed in the 1997 New Constitution and its subsequent laws and regulations. The decentralization process will take some time to be adopted formally by local administrators.

Local Ownership and Resource Use Rights Regimes

The relationship between local communities and natural resources forms an important subject in studies related to coastal resources management. This is because, at the local level, communities have always been interacting with their surrounding environment. Such interaction can be viewed in two dimensions. One, people live off the resources and the environment by exploiting them to serve their needs. Two, people fear that the surrounding resources and the environment will be exploited, and will eventually affect their dependence on the environment in the future. In the absence of state or outside interventions, the condition of the environment depends largely on the balance between exploitation and protection levels of future uses. This people-resource interaction forms the main core in the development of local and indigenous use and management regimes, which differ between communities. These differences occur because of their ability to define ownership rights and use customary rules developed by the communities (the state and outside interven-

tions play important roles in a later stage of governance).

The understanding of ownership rights and customary rules of coastal communities is important in the analysis of access to the fisheries and coastal resources. Various fisheries and coastal resources have different forms of ownership and resource use rights and are affected by population pressure and changes in patterns of resource use over time. This implies that the types of ownership and rights to resources change over time.

The main economically important coastal resources in Thailand are fishery resources aquaculture resources, mangroves, land, water, coastal tourism, minerals, and cultural heritage. Considerable emphasis is given to these resources in the analysis here.

Fishery Resources and Aquaculture

Marine flora and fauna were considered open access resources in earlier times when population and use patterns were still minimal and subsistent. There were no restrictions on access to fishery resources.

Population growth together with the market and cash economy began to affect fishing communities about 30-40 years ago through the introduction of motorized craft, modern gear and ice storage. Types of ownership and resource use rights took different forms. Increased competition for the resources led to the need for resource reserves for each community. Different degrees of restrictions were introduced in order to limit access to fishery resources by other fishing communities. The fisheries have become common property resources which a community member could access but subject to the community's customary rules. By itself, the nature of common property resources is subject to exploitation. The situation worsens when outsiders intrude into the delineated community boundary. Outsiders usually have better gear and technologies that allow them to extract more of the common resources.

Interactions between local people and outsiders resulted in the loss of local communities' absolute

sovereignty of their common resources. This in turn led to state intervention. Through the state legislation process, zones were imposed but it failed in many fishing communities as the state was unable to enforce the rules effectively.

Most local communities are confused about how to exercise their rights due to the interference of outsiders and the state into their original rights. Identification of rights, acknowledgment of local ownership rights, customary rules, and the state's formal rules should be shared in order to effectively manage these resources. Aquaculture in a marine water body around coastal communities (cage, raft, mud plain aquaculture, except prawn aquaculture in ponds) is generally localized for community members. Since private property rights do not apply to any public water bodies in Thailand, the arrangements for aquaculture are based on the customary rules set by the community or acknowledged by the neighbors. This is one case where outsiders are minimally involved as aquaculture activities involve low priced species and low export demand. State intervention is in the form of supporting aquaculture technologies.

Mangrove Forests

Mangrove forests are considered state property and are crucial to the coastal ecosystem. As with fishery resources, the property rights have changed over time. However, state intervention appears to have had a positive impact on the status of mangroves by issuing laws and regulations concerning mangrove forest zones, cancellation of new charcoal production, supporting mangrove rehabilitation programs and providing information on mangrove rehabilitation. After the boom and bust of prawn aquaculture, the public has increasingly realized that the exploitation of mangrove resources for prawn production has resulted in an almost total collapse of the prawn industry. This has shown that local management practices proved to be more sustainable. This statement, although arguable, is supported by some non-government organizations and local governments.

There have been many studies and reports about the causes of mangrove destruction. However, practical solutions are still ambiguous as the man-

agement of mangrove resources involves many stakeholders and the complicated nature of the resources itself. Competition for mangrove resources is stiff as local communities, state and private enterprises are uncertain on the level of compromise. Mangrove resources were used by local communities for many years before the state imposed formal laws and regulations. There should be a mechanism to allow access for the local people, however, this generosity may lead to loopholes that would allow for further exploitation of these resources.

Coastal Lands

The Land Law Code of Thailand legally allows the use of coastal lands for tourism, aquaculture or other infrastructure development. The legal status of coastal lands is more complicated than farmlands. Many fishing communities are located in mangrove areas and intertidal zones. Access rights are granted by the local committee, despite the illegal nature. However, there are cases when the state gives special permits to the local people to build houses. This seldom occurs due to the high cost of land in certain situations such as when the land has potential for tourism and other industrial development. The ownership rights of coastal lands are site specific and most often local people are refused access to state-owned lands, such as beaches, situated between privately-owned lands. In some cases, conflicts emerge between local occupants and influential outsiders as land that has long been settled by local occupants is claimed by outsiders. Resolving these conflicts is costly and time consuming.

It appears that the local people settling in mangrove forests and disputed lands are losing their rights based on formal land laws. High costs and lengthy rights claims are the main obstacles for the local people whose rights are not protected by the state.

Water Resources

Water resource problems in the coastal area can be classified into two types: water pollution and water shortage. The first problem can be found in saltwater, brackishwater and freshwater, whereas the

second type of problems is related to freshwater. The use of water resources, particularly freshwater, is highly competitive in coastal areas. Being an open access resource, the rights of the local people to control the allocation of the resource and to prevent it from being polluted are limited.

Some coastal communities are reluctant to claim their rights to unpolluted water, as they themselves have contributed to the pollution through their household wastes. However, in the case of industrial wastewater, it is a right and is guaranteed by legislation that the coastal communities should not be affected by the wastes that cause high mortality in fish aquaculture. In theory, the legislation to control and prohibit the effluents from industries seems to be sufficient. However, in practice, enforcement is a problem.

In the case of water shortage, the local people have limited control as water depends largely on natural climatic conditions and on the policy of the central government (dam or water regulatory management). The normal practice is for urban people and industries to be given a higher priority to access the freshwater supply.

Coastal Tourism

Tourism is a major industry in Thailand generating foreign exchange earnings and employment. However, tourism also has social and environmental costs. Despite the preponderance of new tourism approaches such as nature or eco-tourism, their practical applications are still obscure. Coastal tourism in Thailand has inevitably fallen into using this jargon without any clear understanding of definitions and their practical implementation.

Coastal tourism involves diverse kinds of coastal resources such as coral reefs, clear water, sandy beaches, forests, aquatic organisms, and indigenous people and cultural heritage. These resources should be protected due to their significant contribution to the whole ecosystem. However, the equilibrium between supply and demand of these resources is still undetermined. One reason is the improper determination of prices. Several attempts to solve these non-market attributes have been reported, but no satisfactory outcome has been made.

Coastal tourism resource rights classification remains obscure. However, from the local point of view, safeguards for the coastal resources are vital and initiatives have been undertaken through local beliefs and social cooperation. Pressure to share coastal tourism resources comes from the demand for new tourist sites developed with minimal regard on the importance of such resources to the local people. Formerly well-defined rights of local people have been altered by means of outside involvement with a supporting hand from the state legal system. Locals are lured by promises of quick income and disregard the associated social, economic and environmental costs. The rights of the local people are expected to improve with the implementation of the 1997 New Constitution. It will take time before people realize what their rights and responsibilities are provided for in the Constitution.

Coastal Minerals

Coastal minerals found in the seabed and in coastal areas include oil and gas, tin, antimony, manganese, lignite and columbite-tantalite. Mining these minerals is made through concessions granted by the state. Most concessionaires do not come from local communities. Local residents are involved mainly as workers. The complication of concession arrangements limits access of the local people to these resources which go mainly to urban-based or foreign-based companies.

Cultural Heritage

The local cultural heritage is, to a certain extent, promoted through tourism development. Local prices are affected by the artificial demand on goods services brought about by tourism rather than by natural supply and demand. Ownership rights of local people seem to be insufficiently acknowledged in an attempt by influential tourism developers to seek new tourist attractions. These rights are guaranteed by the New Constitution. If necessary, laws and regulations enabling fair use of the local people's cultural resources need to be drafted so that local heritage can be protected and preserved. It is Thailand's most difficult task to identify and guarantee the coastal cultural heritage, as these resources are highly abstract. It depends largely on the cohesion and knowledge of the local people to

perform and protect their cultural heritage so that these are respected by the state and outsiders.

Local Approaches with State Involvement in Fisheries and Coastal Resources Management

The mobile characteristic of certain coastal resources especially fisheries poses problems in defining boundaries and rights of access. Most coastal resources are shared by individuals, either within a community or between different communities. The attempts of local people to draw resource use boundaries are limited by their capability to control the resources. In these cases, disputes and conflicts over resource use are inevitable both among members of the same community and between different communities.

When disputes occur between local communities, social institutions play important roles in resolving the problems or requesting involvement by the state. At the village level, two main institutions affect the social behavior of village members: the formal village and state influenced committee and the informal village council. The formal committee is led by an elected village headman and is composed of several elected members. The village council coexists as an informal institution that has a looser organizational structure. This village council is generally composed of a few village elders and other influential figures. The village council does not have a fixed council leader as its leadership may change according to its concern.

In 1994, the parliament passed a new law enabling the establishment of a new sub-district administrative organization. This is a formal inter-village institution. It is tasked to deal with sub-district development activities. This institution is allowed by law to collect its own taxes within the sub-district. Along with this new decentralized sub-district administrative institution is an old bureaucratic sub-district council which is expected to dissolve in due time. This institution has the task of helping resolve disputes and conflicts. Dispute resolution is mainly undertaken through meetings.

Disputes between sub-districts or provinces are more complicated if the conflicting parties do not have close social relations. Local leaders tend to use their personal connections as a first attempt to find solutions. Formal ways of resolving disputes are less preferred by locals. Many rural communities in Thailand are highly self-reliant, both in economic and political terms. Legal actions against the local people are usually brought by outsiders when they are involved in disputes over fishery and coastal resources. Formal laws and regulations are used only when it is unavoidable.

Belief systems also play some roles in natural resources management especially as it reflects to social cooperation. The life of the local Thai people is generally tied to a belief in the supernatural. This belief is rooted mainly in Buddhism and also to some extent Hinduism, as it was influential prior to the arrival of Buddhism. Belief in the supernatural is an important factor behind many customary practices. Some practices connected with these types of belief are applicable for enhancing the protection of coastal resources from exploitation. These include the releasing of marine life such as fish and turtles into natural habitats, ordination of trees, and sacred sites. Social cooperation is an important aspect of Thai societies, particularly at the community level. The concept of social cooperation is found to apply in various activities concerning community self-reliance and collective actions to solve problems facing natural resource management.

Case Study: Local Initiatives in Fisheries and Coastal Resource Management in Ban Laem Makham, Trang Province

Ban Laem Makham is a fishing village in Khao Mai Kaew sub-district, Sikao District, Trang Province (map in Figure 5.2). The local management initiatives are being supported by a local non-government organization (the Yadfon Association) and local government agencies. These initiatives are successfully managing fisheries and coastal resources. The people in Ban Laem Makham faced several resources management problems as outlined below:

- Intrusion of large, modern commercial trawlers and push netters whose interest is making profits, whereas small-scale fishers

aim for basic livelihoods;

- Exploitation of mangrove forests for commercial charcoal production by large outside concessionaires and by the local people; and
- Negligence of local government in protecting the rights of the local people.

It was the local people who initiated the project to protect and use their resources as they have the customary ownership rights over these resources.

It is an important factor that the local resource owners are able to identify and exercise their own rights to use and protect the resources vital to their livelihood. Another feature of their success is the capability of village leaders (both formal and informal). These two characteristics can be made sustainable with the support of government agencies. In Ban Laem Makham, the support of a non-governmental organization (Yadfon Association) and some concerned private enterprises are necessary. The strategy of the Ban Laem Makham community is to symbolize their unique resources (e.g., turtles) and promote their protection through some powerful media (i.e., TV, newspaper, radio) so that the population is made aware of their importance. The steps of success in Ban Laem Makham are as follows:

- Step 1: Local people face problems with resources depletion due to aggressive exploitation by outsiders. The local people asserted their rights of ownership over these resources and the role of the state in protecting them.
- Step 2: Local leaders and people conducted several informal meetings to plan strategies to protect their resources and exercise their use and ownership rights. The local leaders are farsighted, active and sincere.
- Step 3: Involvement of government organizations and non-government organizations is necessary. Local initiatives can be shared by both organizations but efficiency may be more with NGOs.
- Step 4: By trial and error, the local communities, through several formal and informal meetings, brainstorming and stakeholder participation, are able to identify unique, achievable and effective management

strategies.

- Step 5: The government is involved particularly in dispute resolution by virtue of their authority through laws and regulations.
- Step 6: Establishment of groups associated with occupational interests so that the bargaining power could be increased and solidified to counterbalance external forces. In addition, the groups are able to set customary rules through meetings of members and other stakeholders involved in a dispute.
- Step 7: Awareness raising through popular media to share ideas with other communities, as well as open the idea to the public.

There are several key beliefs that are contributing factors in successful local management. Religion (Islam) is a major attribute creating a cohesive bond among the Ban Laem Makham people. The religious practices facilitate consultation via meetings and consensus on management strategies. The role of women may be passive in the meeting places but this role becomes dominant when such management affects households and children's well-being.

In summary, the experiences from Ban Laem Makham show the efforts of the local people to protect their ownership rights to fisheries and coastal resources. The strategies taken to implement local initiatives have been through a participatory approach involving many stakeholders. GOs and NGOs have been active and supportive. They enhanced the local people's power to protect their resources for present and future generations. The local communities also employed their beliefs and social cooperation as tools to strengthen the power within the community while the popular media was enlisted to generate support from the public. The levels of integration of several well-defined resource issues and stakeholders appear to work.

Co-management Approaches for the Management of Fisheries and Resources Under the Present Decentralization Process

Co-management encourages involvement of all six groups of stakeholders:

1. The state;
2. The media;
3. NGOs;
4. The local community;
5. The private sector; and
6. Academe.

In Thailand, local initiatives have been started mainly by the NGOs while the state, private sector and other stakeholders act as supporters in terms of campaigns, personnel, facilities and funds. The strong point of the NGOs is that they are able to cooperate with other stakeholders, especially the community and media. They are also independently administered which allows for quick implementation. However, they do have weaknesses such as the lack of financial resources to support long-term projects, sensitive responses to criticism and limits to their ability to ensure that other stakeholders cooperate.

One of the purposes of co-management is to coordinate all related parties to work together on an equal footing. The ultimate goal of this management approach is to harmoniously use and conserve precious coastal resources in such a way that they are safeguarded for the present and future generations. The co-management approach is supported and encouraged by the Constitution of Thailand through at least two provisions:

Section 56.

The right of a person to give to the State and communities participation in the preservation and exploitation of natural resources and biological diversity and in the protection, promotion and preservation of the quality of the environment for usual and consistent survival in the environment which is not hazardous to his or her health and sanitary condition, welfare or quality of life, shall be protected, as provided by law.

Any project or activity which may seriously affect the quality of the environment shall not be permitted, unless its impacts on the quality of the environment have been studied and evaluated and opinions of an independent organisation, consisting of representatives from private environmental organisations and from higher education institutions providing studies in the environmental field, have

been obtained prior to the operation of such project or activity, as provided by law.

The right of a person to sue a State agency, State enterprise, local government organisation or other State authority to perform the duties as provided by law under paragraph one and paragraph two shall be protected.

Section 290.

For the purpose of promoting and maintaining the quality of the environment, a local government organisation has powers and duties as provided by law.

The law under paragraph one shall at least contain the following matters as its substance:

- (1) *the management, preservation and exploitation of the natural resources and environment in the area of the locality;*
- (2) *the participation in the preservation of natural resources and environment outside the area of the locality only in the case where the living of the inhabitants in the area may be affected;*
- (3) *the participation in considering the initiation of any project or activity outside the area of the locality which may affect the quality of the environment, health or sanitary conditions of the inhabitant in the area (The Council of State of Thailand 2001).*

In order to ensure the participation of local communities, as enshrined in the Constitution, several strategies are in order. These are:

Strategy One:

Encourage the adoption and use of local initiatives by means of indigenous knowledge and social cooperation.

Rationale:

Local initiatives based on indigenous knowledge and social cooperation are vital tools for the management of fisheries and coastal resources as these indigenous practices and values have been developed and polished through time. They must be adapted to

fit with the rapidly changing ways of resource use. It has been widely accepted that local people are entitled to have access rights to use and manage their resources with support from the state and civil society.

Objective:

- To identify several existing forms of local initiatives;
- To document local initiatives in a practical and adaptable form for implementation; and
- To exhibit local ways of managing their resources.

Action:

1. Identify local initiatives through research conducted by educational institutions, government and non-governmental organizations, (i.e. Yadfon Association, Andaman Project for Participatory Restoration of Natural Resources), local and grassroots organizations (i.e., Provincial and sub-district administration organizations) in cooperation with the leaders and the community;
2. Identify leaders who can work together to upgrade the community's well-being;
3. Identify a resource for management and conservation; and
4. Demonstrate local initiatives leading to improved economic well-being.

Strategy Two:

Establish a network to share experiences on implementing local initiatives to manage fisheries and coastal resources.

Rationale:

The successful application of local initiatives should be shared so that they can be applied in other similar cases. The local community with support from concerned institutions takes a dominant role in the establishment of a local network.

Objective:

To share experiences learned from successful and unsuccessful projects. Several strategies to deal with the implementation of local initiatives should be discussed and revised to fit with the socioeconomic characteristics of the communities and adapted to the demands of a globalized market economy.

Action:

1. Grassroots institutions provide opportunity for local communities to meet through field visits, demonstration projects, agricultural exhibition fairs;
2. Provide training and education for local people to meet, discuss and adapt lessons learned from different management initiatives; and
3. When local communities have sufficient cohesion with one another, with government agencies, with local administration organizations, with NGOs and with the private sector, encourage the establishment of a network involving a number of local communities working with concerned institutions.

Strategy Three:

Disseminate information.

Rationale:

There is a lot of information on fisheries and coastal resource management collected by the government and the private sector. This information is useful for local communities to learn from and adapt to their situations. This knowledge can be a framework for making decisions, to invest or start new local projects. In addition, local communities should also know the initiatives of the private sector. Local communities need details of proposed development projects in order to carry out actions to prevent or mitigate possible negative impacts.

Objective:

To support local initiatives by giving local people information on government policies, plans, laws and regulations.

Action:

1. Through local administrative organizations, local people are encouraged and given explicit rights to access the requested information with full support from concerned institutions;
2. The local people are to be trained to exercise their rights in a proper manner;
3. Using the information, the local leaders are able to write local project proposals as well as manage their own projects; and
4. Database systems should be made available for public access and they should be in both interactive and assisted systems.

INTERNATIONAL INVOLVEMENT

Thailand cannot manage its fisheries and coastal resources in isolation. In a global world, countries interact on economic, financial, political, social and environmental issues. The recent financial crisis, which hit most Asian countries, has shown the importance of international involvement. Through their international networks, countries in need of financial assistance were able to obtain grants from multilateral funding institutions such as the World Bank and the International Monetary Fund (IMF). The extent of the impact depends to a large degree on the economic development and preparedness of a country. In solving a country's economic crisis or other disputes such as genetic patents or intellectual property rights, all countries need to cooperate. ASEAN can perhaps act as an example of such cooperation in the region.

Fisheries and coastal resources management schemes are part of the interwoven relationship among countries, especially countries that share common maritime borders. Thailand shares its borders with Cambodia, Indonesia, Malaysia and Myanmar. A policy to use the marine resources of one country inevitably affects others. In addition,

there are conventions and agreements created in the international arena that affect a countries' behavior in using the world's largest common property (international waters) and in solving possible maritime conflicts among neighboring countries.

Types of International Involvement

Thailand is committed to several international agreements on the conservation and management of fisheries and coastal resources. The most important development in the international scene affecting Thailand's marine fisheries is the proclamation of 200-mile EEZ by neighboring countries. There are also some projects and joint ventures that have come into effect as a result of this proclamation. Other types of international involvement that directly or indirectly influence Thailand's fisheries and coastal resources management programs are also discussed later in this section.

UNCLOS and the Coastal Zone

The advent of UNCLOS led Thailand to declare its EEZ and define its territorial waters. Under the Convention, Thailand gained 60 percent more in sovereign waters but lost about 300 000 square miles of high seas (international waters) to neighboring countries. Following the depletion of marine resources in the Gulf of Thailand and the enactment of the 200-mile EEZ, Thai fishing fleets were forced to enter the waters of Malaysia, Myanmar, Indonesia, India, Cambodia, Bangladesh and Australia.

One of the implications of the 200-mile EEZ is the continued struggle of Thai fishing boats to find more productive fishing grounds. A joint fishing venture arrangement with neighboring countries, where fishing grounds are still productive, is one of the solutions adopted. Occasionally, Thai fishing companies do not enter into joint-venture arrangements with other countries. Instead, they poach in other countries' fishing grounds. There have been several incidents in the past of illegal entry by Thai trawlers in the no-fishing zones of Myanmar, Malaysia, Cambodia, and Vietnam. Many Thai fishing boats and crewmen have been detained in these countries.

While neighboring countries have ratified the UNCLOS, Thailand is still reluctant. Despite this, Thailand is negotiating joint-venture arrangements and bilateral or multilateral cooperation schemes in areas including financial support; fishing technologies; fish handling and storage facilities; public and private investment cooperation; training in terms of technology, partner countries' cultural and legal system knowledge and registration of Thai crewmen for legal protection of their rights.

Thailand has other obligations under a number of conventions on fisheries, biodiversity and pollution. These obligations have existed for some time now. They include:

- Convention on Wetlands (Ramsar, Iran 1971);
- The Convention on Biological Diversity;
- The Convention of the World Meteorological Organization;
- The United Nations Framework Convention on Climate Change;
- The Convention on the Protection of World Culture and Natural Heritage; and
- The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

In addition, there are other recent international initiatives which establish a legally non-binding principle for the protection and sustainable use of marine resources. The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and the UNCED Agenda 21 are two important ones. Thailand is also involved in a number of regional initiatives and programs on coastal and marine issues in cooperation with ASEAN members such as:

1. ASEAN Cooperation Project under Environmental Programme; and
2. United Nations Environmental Programme - Regional Seas Programme; and
3. Asia Pacific Economic Cooperation (APEC) Marine Resources Conservation Working Group.

Joint Ventures

Thai-Myanmar joint fishing ventures began almost a quarter century before the establishment of the EEZ. According to the Fisheries Department, Myanmar granted a fishing concession to Thai companies in 1975 and this ended five years later as both parties had insufficient experiences for such an operation. In 1989, Myanmar authorities granted a fishing concession to Thailand once again, and by 1990, the Thai Fisheries Department had set up the Thai-Burma Fisheries Co. Ltd. Fifty percent of the total shares were owned by the company, 22.5% by businessmen and 22.5% by industrialists. Eventually, fishing by the Thai private sector in Myanmar ended in 1993.

In 1995, Myanmar again granted fishing concessions to Thai fishers, this time in the form of joint investments. Each Thai company had to invest in supplementary fishery-related businesses in at least three out of five alternatives: ice making, fish meal production, cold storage, fish canning or shrimp farming. Unfortunately, six Myanmar crewmen were killed by Thai crewmen on board a Thai fishing trawler. This incident prompted Myanmar authorities to cancel the fishing concessions. It is estimated that 500 Thai trawlers are illegally fishing in Myanmar waters, supposedly with unofficial passes from local Myanmar officers or minorities who oppose the regime.

In January 1998, the Thai Minister of Agriculture and Agricultural Cooperatives and the Army Commander-in-Chief discussed fishery ventures in Myanmar and other issues involving Thai fishers detained by Myanmar authorities. Thailand requested that Thai fishers caught poaching be treated in a humane and friendly manner. After a meeting and a visit of the Thai Army Commander-in-Chief, 98 out of more than 100 Thai prisoners were released.

The problems with the fishing ventures in Myanmar were largely due to Thai fishers working in no fishing zones, breaking promises and contracts, using radio communication gear without permission, and committing violence against Myanmar crewmen. According to a Thai businessman, some countries

have a different way of handling the business. Thai fishing crews are confused by various regulations in Myanmar. Some have been charged for violating Myanmar laws while others have been stopped and their fishing boats and gear confiscated.

Some joint-venture deals with Malaysia have suffered a similar fate. Deals were ceased, negotiated and restarted and so on. However, private sector stakeholders of the two countries have created different kinds of fishing deals such as special permits for Thai-Malaysian registered fishing boats to fish in Thai waters off the coast of Satun Province. In addition, many small-scale Thai fishing boats prefer to sell their catches to Malaysian markets in Perlis or Langkawi as they offer better prices. Many of them offered contractual support. This type of bilateral agreement has been carried out quite a long time with minimal interference from institutions from the Thai side.

The most successful joint-venture fishery arrangement may be the one with Bangladesh. Nevertheless, there have been reported violations, arrests of Thai crewmen and other problems but they have been peacefully resolved through the full cooperation of the two countries. The major factors contributing to the success of these joint-venture arrangements are promises, respect of cultural differences and strict implementation of agreed rules.

Deep-Sea Fisheries

From November 1989 to January 1990, the Chulabhorn research vessel conducted a joint marine survey with Myanmar in the Andaman Sea off the western coast of Thailand. The scientists concluded that a sustainable rate of catch in Myanmar waters would be between 1.39 million and 1.75 million tons per year. The survey also found that the catch would include 0.9 million tons of high value shrimp. Attention has been given to deep-sea fisheries for tuna species in international waters. Several infrastructure facilities have been built such as ports, cold storage, transportation systems and air cargo facilities to serve the Japanese tuna market. High investments

in modern fishing vessels and a limited capability for deep-sea fishing appear to be the major constraints for Thai fishers to venture into international waters. The Thai government and the private sector in Phuket have cooperated to develop the deep-sea fisheries in 900 East Ridge by establishing commercial cooperatives, conducting research, training and conferences to help interested investors.

Regional and International Tourism

Thailand receives significant foreign exchange annually through regional and international tourism. Thailand has gained a good tourism reputation throughout the world due to its unique culture, well developed tourism facilities and beautiful natural resources. However, an important issue that needs to be considered is at what costs Thailand has incurred to achieve this reputation.

The coastal ecosystem has been depleted to serve the demands of the tourism industry. There is evidence of stained beaches, unplanned hotel and resort construction, coral reef destruction, pollution and loss of culture and local traditions. These costs should be included in national accounting to reflect the negative impacts of tourism. The Visit Thailand Year and the recent Amazing Thailand campaigns may be contributing to these undesirable consequences of tourism.

Thailand's current policy on tourism focuses on sustainability such as eco-tourism, nature and cultural tourism. However, there has not been a real or extensive practical application of these tourism concepts possibly because these forms of tourism, considered simple and self-sufficient, are contrary to the large capital investments of conventional tourism. A recent discussion facilitated by the National Economic and Social Development Board discussed the development of Phuket as an international city. This so-called international city will inevitably involve a large investment to cater to all sorts of tourist. With Phuket planning for such a large-scale project, the neighboring provinces of Phangnga, Krabi, Trang and Ranong will also be developed to serve tourism and affiliated industries.

Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT) Development Project

Due to stiff global economic competition and increasing trade protectionism, three of the ten member countries of ASEAN have proposed special cooperation areas encompassing Northern Sumatra province of Indonesia, the four northwestern states of Malaysia (Perak, Penang, Kedah and Perlis) and five provinces of Southern Thailand (Narathiwat, Pattani, Yala, Songkhla and Satun).

Located between Sumatra and Langkawi in Malaysia, TMNP is likely to become a regional strategic area for an IMT-GT development project, especially in the tourism aspects of economic cooperation. The project also intends to confer preferential domestic status on any investors from the member countries seeking to invest anywhere in the Triangle. The most important forces, which will influence the realization of a regional economic cooperation within the IMT-GT, are a shared common race, religion and culture.

The objectives of the IMT-GT development projects are to increase trilateral trade cooperation and minimize trade barriers such as tariffs, taxes, and trade regulations. It also emphasizes investment promotion, human resource development, technology transfer and relaxation of labor migration among the member countries. In terms of agriculture and fisheries, it promotes joint fishery ventures, agriculture production and agro-industrial development. Regarding tourism, the joint investment on communication and transportation networks on land, water and air will connect tourist destinations. Another important aspect is the joint protection and management of the environment, especially in the Straits of Malacca where Tarutao, Langkawi and Northern Sumatra are located.

Recently, Malaysia proposed a custom office in Tarutao so that tourists from Malaysia's Langkawi need not undergo customs processing in the mainland of Satun. Tourists need to travel only 4.5 km from Langkawi directly to Tarutao instead of some 25 km to Satun and then 22 km to Tarutao. The Langkawi Development Authority (LADA) realized that Langkawi is ideally located to take advantage of future

developments in Tarutao. The building of a new road linking Satun and Bukit Puteh in Kuala Perlis, Malaysia would be the latest gateway to Tarutao and Langkawi. The Satun Provincial Governor has also expressed his eagerness to develop Satun and its tourist attractions (Tarutao, Adang, Rawi and Lepe islands, and other nearby islands and national parks) aiming for an estimated income of 50 million baht per month during the Amazing Thailand years (1998-1999). The development needed for these tourist destinations is mainly infrastructure development (i.e., port development and road construction). The province, with support of 40 million baht from the Tourism Authority of Thailand (TAT), will develop a road linking Pantai Melaka to Taloh Wow Bay on the Tarutao Island, a distance of 12 km. It is expected to be completed by the end of 1998. For long-term tourism development, the province is expected to obtain some 400 million baht from TAT, Royal Forestry Department and Southern Border Province Administrative Center (Sor-Or-Bor-Tor) for the period of four years until the year 2001.

Joint Development Area (JDA)

There are some concerns about the oil and gas joint exploration project in Thailand-Malaysia JDA. The agreement was reached between the two countries' Prime Ministers in May 1998. On the Thai side, environmental impact assessments of pipeline routes are underway. It is expected there will be disputes over benefits. However, the project will go ahead and problems will be solved as various sectors realize the importance of oil and gas development for the progress of the Southern Seaboard Program.

On the upper Gulf of Thailand, there is also a Thailand-Cambodia JDA for oil and gas exploration. The oil and gas will primarily serve the Eastern Seaboard Program. There has been a proposal to explore oil and gas deposits in the Andaman Sea within Thai waters. It is reported that the exploration and development of any oil and gas network would minimally affect fisheries and coastal resources. However, when the proposal is implemented some negative consequences may occur. At this stage, a majority of the fishers and the public has a positive reaction to this development as they expect to share the benefits.

World Trade Organization (WTO) and Trade Restrictions

There are several forms of trade restrictions imposed by developed nations. For example, Thai prawn exports have been restricted by the United States for environmental reasons. Quotas and a General System of Preferences (GSP) on Thai export products have been considered (and reconsidered) for lifting. Many times, trade restrictions are imposed based on claims to protect the global environment. These trade restrictions are a barrier to entry thus discouraging free trade. This type of restriction raises the cost of Thai export products which consequently has an enormous effect on attempts to extract more of the existing resources. Fisheries and coastal resources are unavoidably being subjected to further exploitation.

The WTO plays a major role in free trade policy. Thailand has attempted to find a solution to the Thai prawn trade with the United States but long court processes and indecisive judgments are discouraging.

There are many international regimes that directly or indirectly affect fisheries and coastal resources management in Thailand. In summary, some important issues relevant to international regimes are:

- International regimes forces Thailand to limit its capability to independently manage its fisheries and coastal resources.
- Use of fisheries and coastal resources is intensified due to a rush to extract these resources to fulfill requirements imposed by international organizations and international markets.
- Regionalization will be further developed to counterbalance international interventions in the region especially in terms of economic and legal cooperation.
- Cooperation is sought by neighboring countries requesting a share of Thailand's fisheries and coastal resources such as the National Marine Park needs to relax its rules to facilitate private investments (both domestic and foreign) for regional and international tourists.

- Some advanced tourist destinations such as Pattaya and Phuket require comprehensive development plans to deal with increasing environmental problems.
- Deep sea fisheries are to be promoted to encourage Thai fishing vessels to fish in international waters as fish stocks in nearshore areas are already depleted beyond maximum sustainable yield.
- Infrastructures for a deep-sea fishery have been developed.
- There are internal and external forces affecting fisheries and coastal resources management policies and plans. In addition, local plans are increasingly accepted.
- With local domestic and regional self-sufficiency, new concepts of economic development have become a popular approach to solve the current financial and economic crisis.
- Integrated fisheries and coastal resources management should be promoted.

Case Study: International Involvement in Fisheries and Coastal Resources Management in Tarutao Marine National Park, Satun Province

TMNP has a water area of 1 264 km² and is located in the Andaman Sea off the southwest coast of Satun Province (map Figure 5.2). The park is administered by the Royal Forestry Department in Bangkok. The department is the sole proprietor of the park and has full authority to manage the park in such a way that it fulfills the Department's objectives. Apart from the Royal Forestry Department offices and stations on Tarutao and Adang Islands, the TMNP is occupied by local indigenous people, Chao Ley or Sea Gypsies, on Lepe and Adang islands. The livelihood of the Chao Ley depends largely on the marine resources of the TMNP and their contracts with middlemen from Satun and Perlis.

Suggested steps for successful management of the TMNP are:

- Step 1: Identification of existing TMNP resources and stakeholders using both ground survey and remote sensing. It is

important to identify all related parties and their existing problems.

- Step 2: Through the Royal Forestry Department and Provincial and Sub-district Administration Organizations, the information and problems obtained in Step 1 are circulated. The LFA can be used to organize the meeting.
- Step 3: The private sector, in cooperation with Langkawi Development Authority and Perlis government, is encouraged to form joint development projects. Similar moves have been made in Northern Sumatra, Indonesia.
- Step 4: Multilateral cooperation among Thailand-Malaysia-Indonesia and the private sector from these countries is initiated under the umbrella of the IMT-Growth Triangle Development Project.
- Step 5: On the Thai side, preparation of infrastructure, personnel and budget is initiated in a transparent and participatory process. Special attention should be made for the involvement of the indigenous Chao Ley people.

Management Approach for Tarutao Marine National Park

A primary consideration of the synthesis made here is not to suggest dramatic changes to the current management schemes of the Royal Forestry Department. The TMNP is under pressure from national, regional, local and international stakeholders. The TMNP may be considered as the last resource rich area in the west coast of Thailand. Based on the problem tree (Figure 5.6) developed from the workshop with TMNP stakeholders, several strategies are attempted in this research to suggest a sustainable method of fishery and coastal resources management with international involvement. The TMNP is situated near the island of Langkawi in Malaysia. There has been an attempt by the Malaysian authorities to establish an immigration and custom checkpoint in Tarutao. The request is pending as the TMNP development is not focused on tourism, especially international tourism. Capture fisheries in TMNP is illegal under fishery and forestry legislations. Thai-Malaysian registered fishing boats fish mainly in the Thai waters of the

TMNP. Fish caught is sold mainly in Phuket or Malaysian markets. However, fish caught by small-scale fishers, or the Chao Ley, is sold mainly in Perlis market as they have special contracts. As discussed, there is evidence that TMNP is being increasingly subjected to overexploitation, despite its legal status as a national park. Despite many legal barriers, illegal fishing is still rampant.

Strategy One:

Collect and compile all existing information from several ongoing projects and international cooperation.

Rationale:

The status of resources, their stakeholders and ongoing resource use are important if the policies and plans are to be implemented in the TMNP. There are many legal and illegal activities happening, therefore a clear understanding of the resources is crucial. The stakeholders include all local and domestic individuals or groups and also those from neighboring countries.

Objective:

To understand the resource status of the TMNP, its stakeholders and ongoing resource use.

Action:

1. Use ground survey, GIS and remote sensing techniques to identify resources status, TMNP stakeholders and resource use activities; and
2. Compile information about physical, socio-economic and cultural inheritance of the joint counterparts.

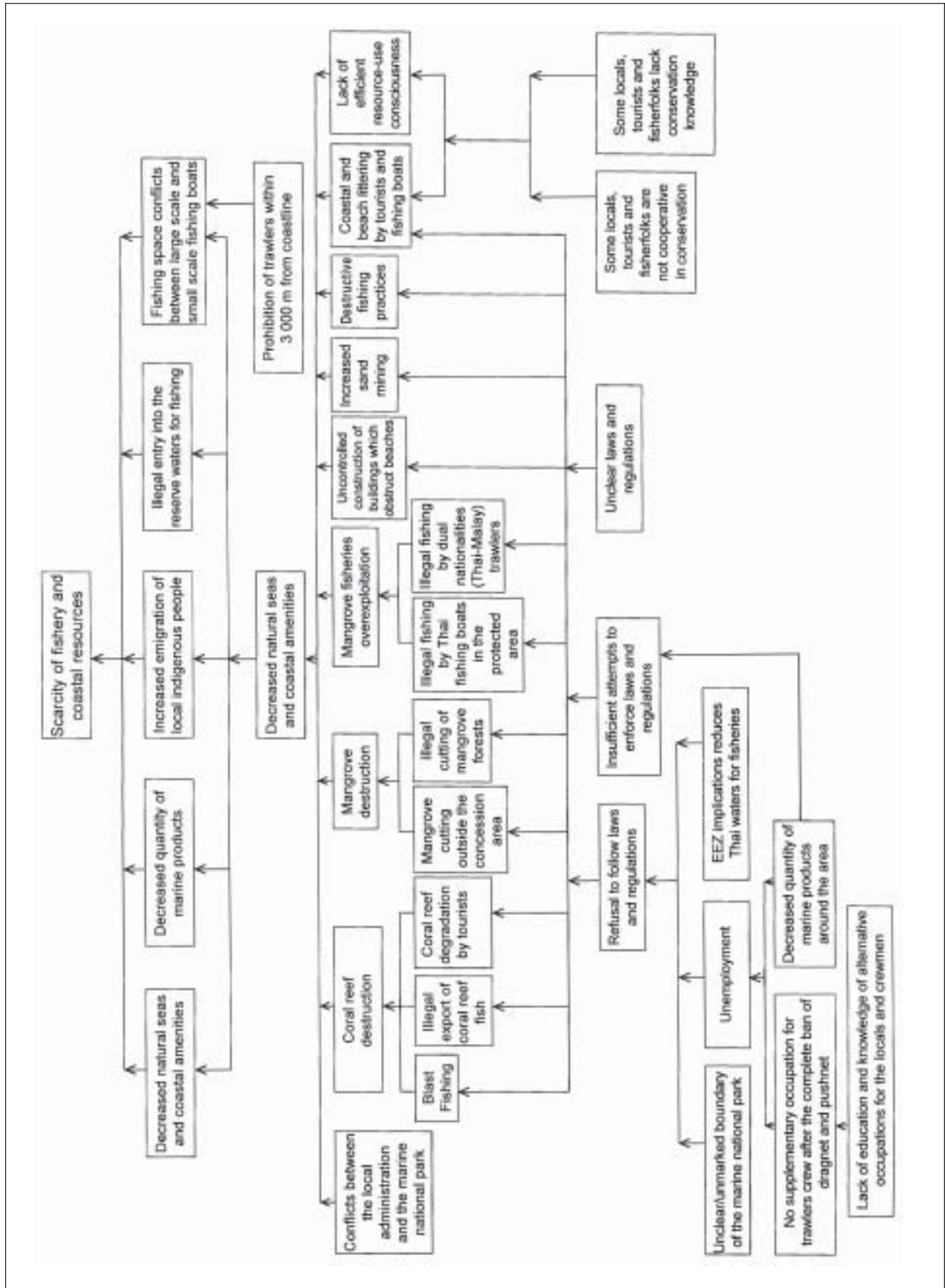
Strategy Two:

Strengthen the local administration to be able to work with central line agencies in Thailand and the Malaysian local government.

Rationale:

Thailand is going through a decentralization process. The local administrative organizations are to handle all the administration and resource

Figure 5.6 Problem Tree of the TMNP's Fisheries and Coastal Management.



management concerns. The ability of these organizations to deal with a highly competitive world is crucial.

Objective:

To manage negotiations and monitor business deals with other organizations both inside and outside Thailand.

Action:

1. Conduct a preliminary study on training needs of the local administrative organizations; and
2. Through training, coordinate officials from the concerned institutions, especially those from the Royal Forestry Department, to jointly develop good working cooperation.

Strategy Three:

Design a joint development plan for the short, medium and long terms.

Rationale:

The TMNP will have to be developed to cater for the needs of its various stakeholders. The most important consideration will be the development direction and benefits distribution. Appropriate and well-accepted joint development plans are needed.

Objective:

To use public participation to design joint development plans for various timeframes.

Action:

1. Through existing agreements (i.e., IMT-GT, JDA, joint-venture deals and others), draft a joint development plan within the framework;
2. Establish a committee to deal with the joint development plan and possible conflicts; and
3. Member parties sign a memorandum on agreements and implementation of the joint development plan.

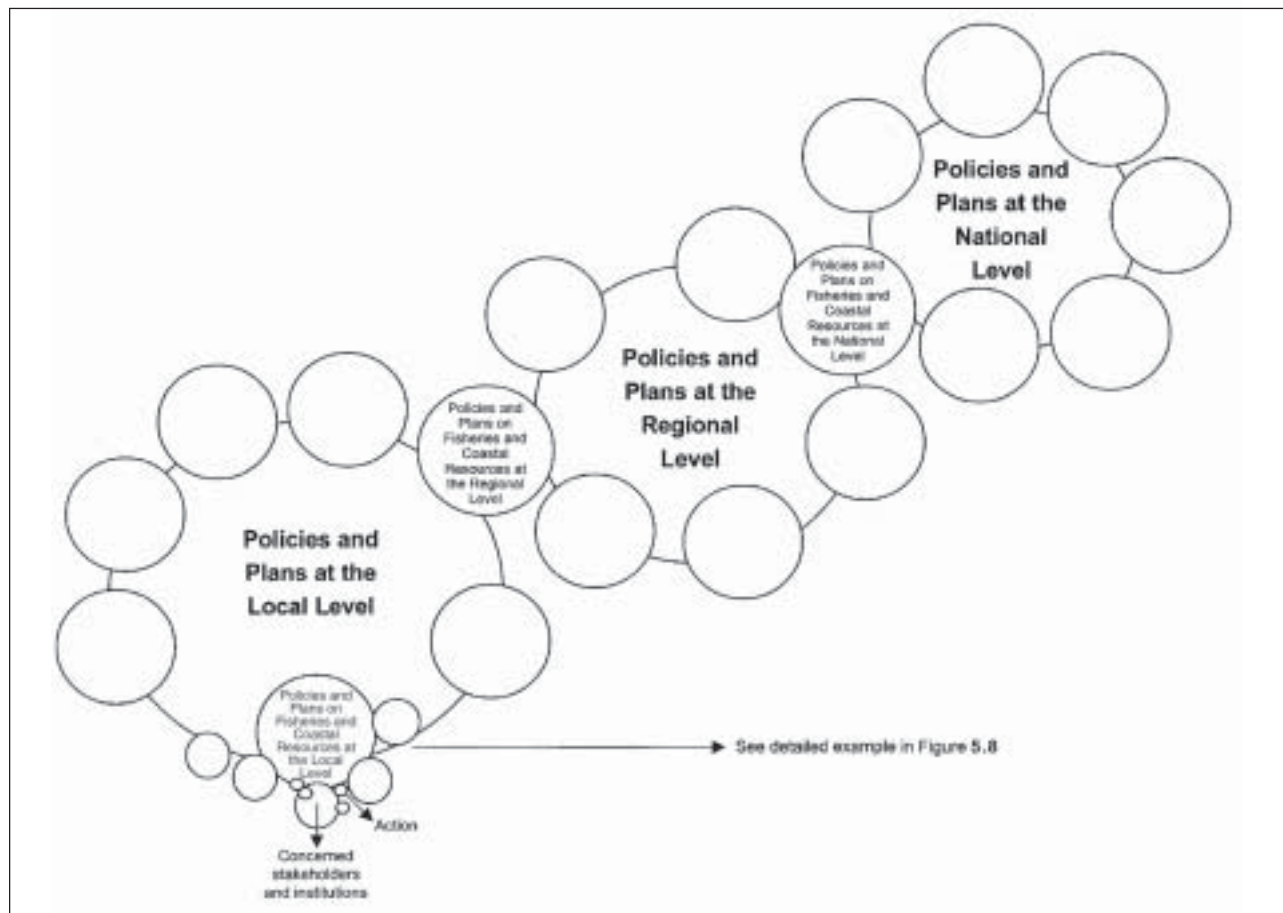
TOWARDS BETTER MANAGEMENT OF FISHERIES AND COASTAL RESOURCES

Although the fisheries and coastal resources in Thailand have been heavily exploited by domestic and international stakeholders, their condition can be improved through better management programs. Under the New Constitution of the Kingdom of Thailand, management policies and plans are going to work through a more decentralized structure. The Constitution guarantees resource use rights for those who are directly using the resources. Capacity building of the local administrative organizations and the local people is an important step in management initiatives.

In Thailand, there are different levels of national, regional and local administration. Conventional policy formulation and planning processes are handed down from the national level to be implemented at the regional and local levels. This has gradually changed since 1994 when decentralization began. At present, the policy formulation and planning process still take both forms. However, the level of compromise is still uncertain. As shown in Figure 5.7, this process of formulation and planning consists of three cycles. The smallest element in the cycle are management issues composed of strategies with identified issues, stakeholders, objectives and actions.

Figure 5.8 shows detailed examples of policies and plans of fisheries and coastal resource management at the local level. The figure depicts how the strategies formulated using several case studies can be related in the framework of administration. It is important to note, however, that this recommendation is based on selected case studies only.

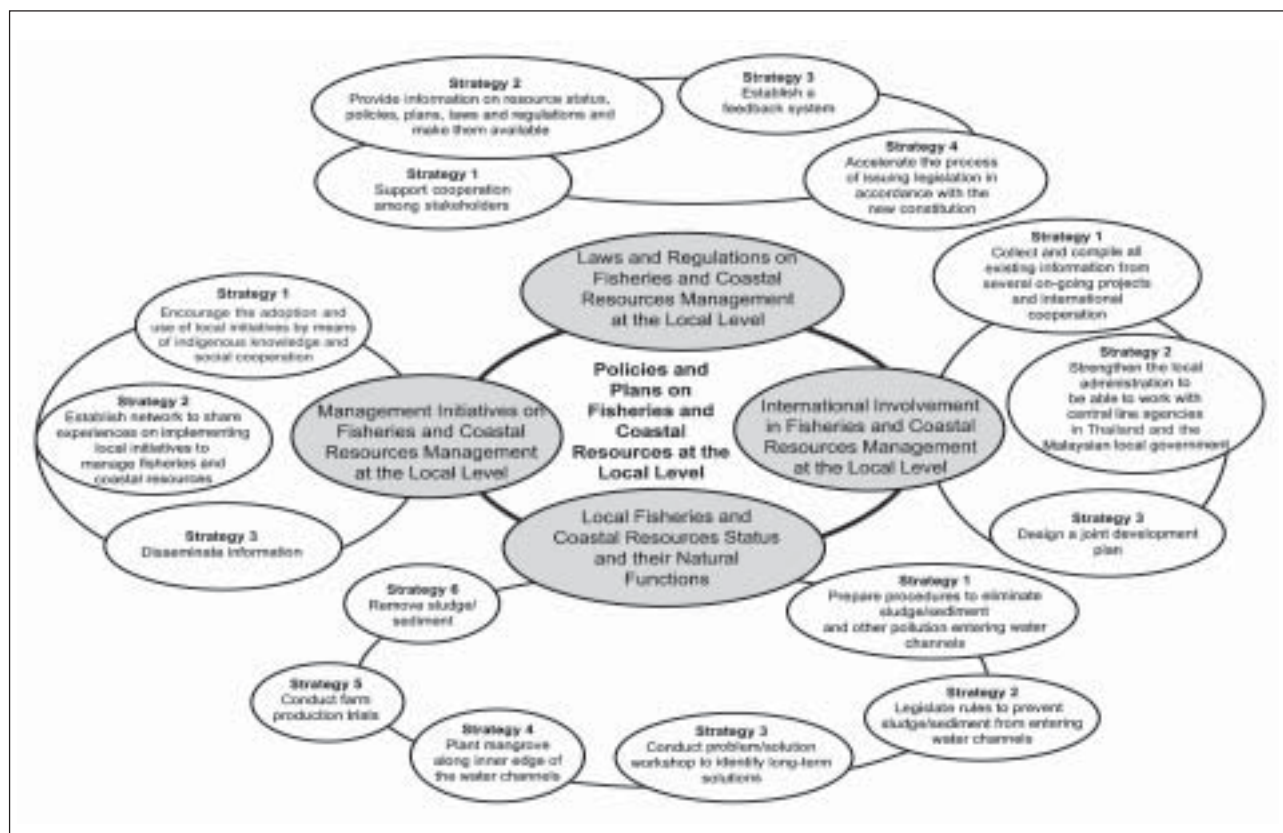
Figure 5.7 Diagram of Interwoven Cyclical Relationships of Policies and Plans Concerning Fisheries and Coastal Resources Management at Three Levels of Administration (1998).



REFERENCES

- Anon. 1998. Open a door to southern mangrove forest. Wetland International Newsletter, 10 May-June 1998. (in Thai).
- Anon. 1998. Welcoming new members of the Ramsar Convention. Wetland International Newsletter (in Malay).
- Boonprakarn, K. 1998. Management of Natural Resources and the Environment of NGO: A case study of Yadfon Association, Trang Province. Prince of Songkhla University, Hat Yai, Thailand. M.S. Thesis. 241 p.
- Chintana C. and N. Sitthiraj. 1998. Traditional and present uses of mangrove forest in Southern Thailand (in Thai).
- Keoraks, S. 1998. Community power and socioeconomic aspect of coastal resources management: A case of Ban Laem Makhaam, Sikao District, Trang Province. Prince of Songkhla University, Hat Yai, Thailand. B.S. Thesis. 68 p.
- Wetlands International. 1998. Mangrove, Pattani Bay Community Newsletter 10. Wetlands International, Prince of Songkhla University, Pattani.
- Masae, A., A. Nissapa, and S. Boromthanarat. 1998. An analysis of co-management arrangement: A case of fishing community in Southern Thailand. Research Report. Coastal Resources Institute, Hat Yai, Thailand. 84 p.
- Masae, A. 1996. Community organization in fishing villages in Southern Thailand: The role of Phu Yai Ban in local resources management. University of Bath. Ph.D. dissertation. 341 p.
- Mitraprasaet, M. 1996. The establishment of people's organization and the empowerment of local people: A case of small-scale fishing communities in Sikao District, Trang Province. Chulalongkorn University. M.A. Thesis. 125 p.
- Nartsupha, C. and P. Chanikornpradit. 1997. Village Economics of Eastern Coast of Southern Thailand in the Past. Sarngsun, Bangkok, 144 p. (in Thai)
- Nissapa, A. 1985. An economic analysis of shrimp aquaculture in Nakhon Si Thammarat Province in Southern Thailand. Tamil Nadu Agricultural University, Coimbatore, India. 145 p. M.S. Thesis.
- Nissapa, A. 1992. Planning for aquaculture development in Songkhla Lake of Southern Thailand. University of New England, Armidale, Australia. Ph.D. Dissertation. 420 p.
- Nissapa, A. 1996. A Rapid socioeconomic impact assessment on offshore fisheries from proposed gas and oil development in the Andaman Sea, Thailand. Research Report, Coastal Resources Institute, Prince of Songkhla University, Hat Yai, Thailand. 24 p.

Figure 5.8 Detailed Diagram of Policies and Plans on Fisheries and Coastal Resources at the Local Level (1998).



Nissapa, A., and S. Charoenchiratrakul. 1995. Institutional and political implications of integrated mangrove-shrimp farming-environment (M-S-E) management in Laem Talumpuk, Nakorn Sri Thammanat Province, Coastal Resources Institute, Prince of Songkhla University, Hat Yai, Thailand. 30 p.

Nualsri, Boo. 1998. Personal communication with elders of Ban Laem Makhaam.

Office of Environmental Policy and Planning (OEPP). 1997. Cabinet resolutions and laws relevant to coastal resources management, OEPP Publication, Bangkok, 48 p. (in Thai)

Ridmontri, C. and A. Chuenniran. 1998. Fishers clash over wider ban on trawlers. Bangkok Post, 25 June 1998.

Rittibhobhunn, N. P. Chansnoh, S. Thongrak and R. Suwannatchote. 1993. Community-based mangrove rehabilitation and management: A case study in Sikao District, Trang Province, Southern Thailand. Regional Development Dialogue 14(1): Community Development Institute.

Saisoonthorn, C. 1991. Concise law of the sea: Law system, state and sovereignty boundary. Thammasart University, Bangkok, Thailand. 79 p. (in Thai)

Saraya, T. 1996. Local history: History in relation with human community, Muangboran, Bangkok, (in Thai) Sayaka, A. and P. L. A. Erfemeijer. 1998. Towards better mangrove management in southern Thailand: Summary report of two workshops on mangrove forest management in Southern Thailand, 29-30 September and 27 November

1997, Hat Yai, Thailand. Publication No. 4. PSU/Wetlands International Thailand Programme, Hat Yai, Thailand. 208 p.

Tasneeyanond, P. and S. Pubthong. 1991. Legal and institutional issues affecting the management of Thailand's coastal region. Office of the National Environment Board, Bangkok, 46 p.

Thanapornpun, R. 1995. International economic order and trade war, Kobfai, Bangkok, 225 p. (in Thai)

The Council of State of Thailand. 2001. Constitution of the Kingdom of Thailand (Translated into English). [Online]. Available: <http://www.krisdika.go.th/law/text/lawpub/e11102540/text40.htm#50> [2001, November 15].

Wong, P.P. 1991. Coastal tourism in Southeast Asia. ICLARM Education Series 13, International Center for Living Aquatic Resources Management, Manila, Philippines. 40 p.

Yadfon Association. 1993. Community organization and coastal resources management for sustainable development. In V. Khatthammanitya (ed.) Community rights: Decentralization of natural resources management. Local Community Development Institute, Bangkok, Thailand. 253-299 p.

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