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**EVALUATION AND ITS ROLE IN THE DEVELOPMENT
OF A NATIONAL COASTAL POLICY STATEMENT:
A PHILIPPINE CASE STUDY**

**A thesis presented in partial fulfilment of the requirements for the degree of
Master of Philosophy: Resource and Environmental Planning
at Massey University, Palmerston North
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ABSTRACT

The purpose of this study is to formulate a National Coastal Policy Statement for the Philippines whose unsustainable management methods and practices over the years have increasingly degraded the coastal environment in a way which is likely to prevent future generations from having the same opportunities as the present. The practices in the Philippines, have exceeded the carrying capacities of resources, reduced the diversity of species, and contributed to the extinction of significant and endangered species. These actions and impacts are all attributed to the economic situation in the Philippines: poverty of coastal residents, and the rate of population increase. Both sectors: socio-economic and ecological, in addition to institutional sector, need reconciliation in order for people to live in harmony with nature and coastal resources. Thus, it is envisaged that the Philippines should have an integrated coastal policy statement at the national level. This move is according to IUCN recommendation and is the answer to emerging issues on the coastal zone: impacts of human activities on coastal resources, issues arising from hazard occurrence, issues on developmental needs and their likely impacts, and organizational process problems.

In order to develop a NCPS for the Philippines, nine criteria for the coast are developed: water quality (including prevention of pollution at source, species diversity), carrying capacity, equity (including intrinsic values), coastal protection from hazards, cooperation, financial criteria, administrative efficacy and systems approach in planning. These are used in evaluating the effectiveness of various coastal policy statements at different levels, using a framework developed for the purpose.

The developed NCPS for the Philippines is aimed at addressing all coastal issues, and is based on: the IUCN principles, the Philippine principles, and some of the policies of Hawaii and New Zealand. It is envisaged that the implementation of the Philippine NCPS will lead to the achievement of sustainable development of coastal resources, including a sustainable living which hopes to alleviate poverty.

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TABLE OF CONTENTS

	PAGE
Abstract	i
Acknowledgments	ii
Table of Contents	iii
List of Figures	ix
List of Tables	ix
Acronyms	x
Glossary	xiii
 CHAPTER ONE INTRODUCTION	1
1.1 The Coastal Zone	1
1.1.1 The Need for a National Coastal Policy	8
1.1.2 National and Regional Coastal Policy Statements and their Roles	11
1.2 Coastal Zone Management (CZM) in the Philippines	13
1.2.1 Background	13
1.2.2 Issues and Problems	16
1.2.2.1 <i>Impact Issues</i>	17
1.2.2.2 <i>Hazards</i>	22
1.2.2.3 <i>Developmental Issues</i>	23
1.2.2.4 <i>Organizational Process Problems</i>	24
1.2.3 Philippine Strategy for Sustainability	25
1.2.4 Need for a National Coastal Policy	26
1.2.5 Possibility of Integration	27
1.3 Study Methodology	28
1.3.1 Aim and Objectives	28
1.3.2 Limitations	29
1.3.3 Research Plan	30
1.4 Conclusion	32

CHAPTER TWO	REVIEW OF LITERATURE CONCERNING	
	INDIVIDUAL ISSUES	34
2.1	Introduction	34
2.2	Coastal Issues	35
2.2.1	Impact Issues	36
2.2.2	Hazard Issues	39
2.2.3	Developmental Issues	41
2.2.4	Organizational Process Problems	42
2.3	Development of Criteria for the Coast	44
2.3.1	Water Quality Criteria	45
2.3.1.1	<i>Prevention of Pollution at Source</i>	50
2.3.1.2	<i>Species Diversity</i>	50
2.3.2	Carrying Capacity	52
2.3.3	Equity	56
2.3.4	Coastal Protection	59
2.3.5	Economic Efficiency	61
2.3.6	Financial Criteria	62
2.3.7	Cooperation	63
2.3.8	Administrative Efficacy	66
2.3.9	Systems Approach	67
2.4	Conclusion	71
CHAPTER THREE	REVIEW OF EVALUATION METHODS	73
3.1	Introduction	73
3.2	Ideal Characteristics of Evaluation Methods	76
3.2.1	Systematic	77
3.2.2	Rational	77
3.2.3	Comprehensive	77
3.2.4	Integrative	78
3.2.5	Flexible	78
3.2.6	Simple	78
3.2.7	Quick	79

3.2.8 Inexpensive	79
3.2.9 Legally Acceptable	79
3.2.10 Open-ended	80
3.3 Choosing an Evaluation Framework	80
3.4 Critique of Evaluation Methods	81
3.4.1 Minimum Requirements Approach	81
3.4.2 Topic Evaluation	83
3.4.3 Composite Evaluation	83
3.4.4 Social Cost Benefit Analysis	84
3.4.5 Planning Balance Sheet Analysis	85
3.4.6 Goals-Achievement Matrix	86
3.5 The Conceptual Evaluation Framework	88
3.5.1 Identification of Goals	90
3.5.1.1 <i>Socio-economic</i>	91
3.5.1.2 <i>Ecological</i>	91
3.5.1.3 <i>Organizational/Institutional</i>	92
3.5.2 Evaluation Criteria	93
3.5.3 Design Strategy	93
3.5.3.1 <i>Socio-economic</i>	93
3.5.3.2 <i>Ecological</i>	94
3.5.3.3 <i>Organizational/Institutional</i>	95
3.5.4 Synthesis and Evaluation	95
3.5.5 Decision	96
3.5.6 Implementation and Monitoring	97
3.5.7 Public Participation	98
3.6 Conclusion	102
 CHAPTER FOUR ANALYSIS OF COASTAL POLICY STATEMENTS	 103
4.1 Introduction	104
4.2 Analysis of Coastal Policy Statements	105
4.2.1 New Zealand	105

4.2.1.1 <i>Water Quality</i>	107
4.2.1.1.1 Prevention of Pollution at Source	108
4.2.1.1.2 Species Diversity	108
4.2.1.2 <i>Carrying Capacity</i>	109
4.2.1.3 <i>Equity</i>	109
4.2.1.3.1 Intrinsic Values	110
4.2.1.4 <i>Coastal Protection</i>	110
4.2.1.5 <i>Economic Efficiency</i>	111
4.2.1.6 <i>Financial Criteria</i>	111
4.2.1.7 <i>Cooperation</i>	111
4.2.1.8 <i>Administrative Efficacy</i>	112
4.2.1.9 <i>Systems Approach</i>	112
4.2.2 Hawaii	112
4.2.2.1 <i>Water Quality</i>	114
4.2.2.1.1 Prevention of Pollution at Source	114
4.2.2.1.2 Species Diversity	115
4.2.2.2 <i>Carrying Capacity</i>	115
4.2.2.3 <i>Equity</i>	116
4.2.2.3.1 Intrinsic Values	116
4.2.2.4 <i>Coastal Protection</i>	116
4.2.2.5 <i>Economic Efficiency</i>	117
4.2.2.6 <i>Financial Criteria</i>	117
4.2.2.7 <i>Cooperation</i>	117
4.2.2.8 <i>Administrative Efficacy</i>	118
4.2.2.9 <i>Systems Approach</i>	118
4.2.3 Thailand	118
4.2.4 Canada	119
4.2.5 Philippines	120
4.2.6 Lingayen Gulf	122
4.3 Comparison of CPSs	122
4.4 Conclusion	125

CHAPTER FIVE	PROPOSED NATIONAL COASTAL	
	POLICY STATEMENT FOR THE PHILIPPINES	126
5.1	Introduction	126
5.2	Institutional Arrangements	127
5.3	Structure of the PNCPS	130
5.4	The Proposed Philippine National Coastal Policy Statement	132
5.5	Implications for Implementation	161
5.6	Conclusion	162
 CHAPTER SIX	 CONCLUSION	 164
6.1	Outcomes	164
6.2	Implementation	169
6.3	Implications for Research	169
6.4	Conclusion	170
 BIBLIOGRAPHY		 172
 APPENDICES		 179
 A . .	Agencies responsible for CZM in the Philippines	 180
B . .	Local Government Units (LGUs) of the Philippines	
	and their roles in development	184
C . .	The Local Development Councils (LDCs) of the	
	Philippines and their functions	187
D . .	Relationships of LGUs to the national government	
	(The Philippines)	189
E . .	List of issues of socio-economic and ecological	
	concern in various countries	190
F . .	Current rules and regulations concerning the	
	Philippine coastal zone	194
G . .	IUCN (1991) recommendations concerning CZM	
	at a regional level	201

H . . New Zealand Resource Management Act 1991,	
Water Quality Classes - Third Schedule	202
I . . Range of Evaluation Methods	205
J . . New Zealand Resource Management Act 1991,	
Purpose and principles	213
K . . New Zealand Resource Management Act 1991, Section 32	216
L . . IUCN (1991) Principles of a sustainable society	219
M . . Shoreline Management Principles - Canada 1978	224
N . . Hawaii Coastal Policies	227

LIST OF FIGURES

Figure 1.1 IUCN (1991) Requirements for National Policies	7
Figure 1.2 The Philippines	14
Figure 1.3 Lingayen Gulf	18
Figure 1.4 Bacuit Bay	20
Figure 1.5 Relationship of logging versus fisheries in the Philippines	21
Figure 1.6 Thesis Plan	31
Figure 2.1 Evaluation Criteria for the Coast	46
Figure 3.1 Framework for evaluation of policies/plans (FEP)	89
Figure 5.1 BCZM and its relationship with LGUs and other agencies	128

Appendix

Figure C.1 The development councils of the Philippines (organizational structure)	188
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LIST OF TABLES

Table 3.1 Choosing an appropriate evaluation method with respect to a set of characteristics	82
Table 4.1 Summary of analysis of national/state/regional coastal policy statements with respect to developed criteria	106

Appendix

Table E.1 List of issues having impacts of socio-economic and ecological concern in various countries	191
Table I.1 The Planning Balance Sheet Analysis	210
Table I.2 The Goals-Achievement Matrix	212

ACRONYMS

ACEC	Australian Committee on Environment and Conservation
ASEAN	Association of South East Asian Nations
CFCs	ChloroFlouroCarbons
CMT	Customary Marine Tenure
CZMA	Coastal Zone Management Act
DENR	Department of Environment and Natural Resources
DoC	Department of Conservation
EEZ	Exclusive Economic Zone
FC	Faecal Coliform
FEPA	Format for Environmental Policy Analysis
GAM	Goals-Achievement Matrix
GOCC	Government Owned and/or Controlled Corporations
HCZMP	Hawaii Coastal Zone Management Program
HOMRC	Hawaii Ocean and Marine Resources Council
HORMP	Hawaii Ocean Resources Management Plan
ICLARM	International Center for Living Aquatic Resources Management
IUCN	International Union for the Conservation of Nature and Natural Resources
LAC	Limits of Acceptable Change
LDC	Local Development Council
LGC	Local Government Code
LGCAMP	Lingayen Gulf Coastal Area Management Program

LOI	Letter of Instruction
mg/l	milligram per liter
M has	Million hectares
ml	milliliter
MPN	Most Probable Number
NCPS	National Coastal Policy Statements
NEDA	National Economic Development Authority
NEPC	National Environmental Protection Council
NGA	National Government Agency
NGOs	Non-government Organizations
nm	Nautical mile
NPCC	National Pollution Control Commission
OSP	Office of State Planning
PBSA	Planning Balance Sheet Analysis
PD	Presidential Decree
PEC	Primary Environmental Care
ppm	Parts per million
PSSD	Philippine Strategy for Sustainable Development
RA	Republic Act
RDC	Regional Development Council
RMA	Resource Management Act
SB	Sangguniang Bayan
SCBA/CBA	Social Cost Benefit Analysis/ Cost Benefit Analysis
SP	Sangguniang Panglungsod

UET	Ultimate Environmental Threshold Analysis
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency

GLOSSARY

AUTOPOIESIS - this concept refers to the essential feature of living systems as they continuously strive to produce and sustain their own organizational activity and structure.

CHLOROFLOUROCARBONS - man-made chemical compounds of chloride, flouride and carbon used in a wide variety of applications including refrigerators and aerosols.

CONSERVATION - the management of human use of organisms or ecosystems to ensure such use is sustainable. Besides sustainable use, conservation includes protection, maintenance, rehabilitation, restoration and enhancement of populations and ecosystems.

CUSTOMARY MARINE TENURE - *customary* refers to a system that emerges from traditional roots, constituting part of what is often termed "customary law", which has continuous links with local history as it adapts to changing circumstances; *marine* refers to the system as dealing with reefs, lagoons, coasts and open sea including islands and islets contained in the overall seaspace; *tenure* refers to a social process of interacting activities concerning control over territory and access to resources.

DEGRADED ECOSYSTEM - an ecosystem whose diversity and productivity have been so reduced that they are unlikely to recover without rehabilitation or restoration measures.

DEVELOPMENT - increasing the capacity to meet human needs and improve the quality of human life.

DISCOUNTING the costs and benefits means putting a computed monetary value to a cost or benefit taking into account the rate of inflation, from the principle that the goods bought today for one dollar will be worth more than the goods bought for one dollar in a year's time, or at some time in the future.

ECOSYSTEM - a system of plants, animals and other organisms together with the non-living components of their environment.

GREENHOUSE EFFECT - the raising of global temperatures by a blanket of gases around the earth reflecting infra-red radiation back to the earth's surface.

GREENHOUSE GASES - gases which re-radiate infra-red radiation from the earth's surface creating the greenhouse effect, include such gases as water vapour, carbon dioxide, methane, nitrous oxides and chloroflourocarbons.

LOCAL GOVERNMENT CODE - law governing and justifying the actions of local governments and their elected officials in the Philippines. It lays down the policies that seek to institutionalize democracy at the local level. It hopes to complete the initial process of empowering the Filipino people through direct participation in the affairs of government through decentralization, or by allowing them the widest possible space to decide initiate and innovate.

NON-GOVERNMENTAL ORGANIZATION (NGO) - any organization that is not a part of federal, provincial, territorial, or municipal government. Unless otherwise indicated, includes private voluntary organizations, corporations, educational institutions, and labour unions.

PRIMARY ENVIRONMENTAL CARE (PEC) - the process by which communities organize themselves, strengthen their capabilities for environmental care and apply them in ways that satisfy their social and economic needs.

RA 7160 - a Republic Act of the Philippines providing the rules and regulations implementing the Local Government Code of the Philippines.

RESOURCE - anything that is used directly by people. A renewable resource can renew itself (or be renewed) at a constant level, either because it recycles quite rapidly (water), or because it is alive and can propagate itself or be propagated (organisms and ecosystems). A non-renewable resource is one whose consumption necessarily involves its depletion.

RESOURCE MANAGEMENT ACT - is a New Zealand legislation in 1991, the purpose of which is to promote the sustainable management of natural and physical resources (see Appendix J).

SANGGUNIAN - a term for a legislative body in Philippine Local Government Units (such as province or "lalawigan", city or "lungsod", municipality/towns or "bayan", and villages or "barangay"). Sanggunian comes from the Tagalog word "sangguni" which means refer. It is used with the local LGU term at the appropriate level to form the legislative body of each LGU concerned. For example, the legislative body of the province is the "Sangguniang Panlalawigan", the city is "Sangguniang Panglungsod", the municipality is "Sangguniang Bayan", and the village is "Sangguniang Pambarangay".

TANGATA WHENUA - the Maori guardians of natural resources.

UNCLOS - the first comprehensive, enforceable international environmental law, covering all forms of marine pollution (land-based, atmospheric, ship-borne, and originating from activities on the sea bed). It takes an ecosystem approach to all uses of the oceans, and provides an advanced institutional framework for international environmental, scientific and technological cooperation. It is the only convention that provides for a comprehensive, binding system for the peaceful settlement of disputes.

WAAHI TAPU - to the Maori, their kin relationship with all entities within the environment is sacred, and being **tapu** must be treated with respect following appropriate traditional rituals.

CHAPTER ONE

INTRODUCTION

This chapter confirms the present degraded status of the global coastal environment and introduces evaluation of coastal policies as another technique to remedy the relevant problems and issues. Various views about the need to define coastal zone boundaries are considered essential in determining policy and the importance of having a national coastal policy is discussed together with the roles of national and regional coastal policy statements (Section 1.1). The issues and problems associated with existing coastal zone management in the Philippines are described together with the reasons for proposing a national coastal policy (Section 1.2). The aims and objectives of this study and the methodology are discussed, including a brief description of the following chapters (Section 1.3).

1.1 The Coastal Zone

This is the 20th century's last decade. The natural environment, including the coastal zone, is degraded in many countries (Carter 1991, Chua 1991, IUCN 1991, Tadifa 1991, Gubbay 1990, Hodgson *et al.* 1989, Sorensen *et al.* 1989, Yong 1989, Cronin 1988, Hildebrand 1988, Pearce *et al.* 1986, Kato *et al.* 1985). So many human activities resulting in the destruction of the world's resources have already been discussed. People are now aware of the problems and through the International Union for the Conservation of Nature and Natural Resources (IUCN) and other international organizations such as the World Wide Fund for Nature (WWF), the Food and Agriculture Organization of the United Nations (FAO), and the United Nations Environment Program (UNEP) are attempting to plan for development and sustainable management of the coastal zones.

There are a number of concerns relating to the boundaries of the coastal zone, coastal problems and the possibility for integrated coastal zone management. The following

paragraphs discuss a variety of coastal zone boundary definitions formulated by authors and various governments. An integrated approach to managing the coast is also discussed.

One initial requirement in coastal planning is to identify the boundaries of the coastal zone (Carter 1991, Sorensen *et al.* 1984, Clark 1977), enabling plans to be more specific about laws and regulations governing its use. Various authors define the coastal zone in a variety of ways. Each has a different justification for the definition.

Normally, the coastal zone is that interface or transitional space where land, coastal water and air meet (Carter, 1991). McCreary and Sorensen (1989) present Ketchum's (1972) definition of the coastal zone combining demographic, ecologic, functional and geographical considerations:

The coastal zone is the band of dry land and adjacent ocean space (water and submerged land) in which land ecology and use directly affect ocean space and vice versa. The coastal zone is a band of variable width which borders the continents, the inland seas and the Great Lakes. Functionally, it is the broad interface between land and water where production, consumption, and exchange processes occur at high rates of intensity. Ecologically, it is an area of dynamic biogeochemical activity but with limited capacity for supporting various forms of human use. Geographically, the landward boundary of the coastal zone is necessarily vague. The oceans may affect climate far inland from the sea. Ocean salt penetrates estuaries to various extent, depending largely upon geometry of the estuary and river flow, and the ocean tides may extend even farther upstream than the salt penetration. Pollutants added even to the freshwater part of a river ultimately reach the sea after passing through the estuary. (Ketchum 1972 in Sorensen et al. 1989, p 6)

Joliffe and Pattman (1985), on the other hand, provide clearly delineated boundaries which may reduce potential for conflict but not necessarily facilitate ecological problem solving. This delineation of boundaries is important for management purposes. According to these authors, some of the principal elements of the coastal zone are: upstream dam or barrage; lacustrine reclamation; National Park/countryside conservation; effluent discharge; de-afforestation; flood-labile area; coastal industry/power stations; estuarine urbanisation; drainage/irrigation; transport links; redundant docks; coastal

airport; wetland conservation/nature reserve; estuarine reclamation; mariculture; fishing harbour; caravan park; coastal settlement; eroding cliff; marina; dune conservation area; inland water body (e.g. flooded water pit); hoverport; dredged approach channel; sand banks; multiple waterspace use; scientific interest; buoys (e.g. water skiing); artificial reef (e.g. fishing); marina breakwaters; artificial beach; hotel/apartment development; groyne field; bulk tanker terminal; bench mining; buoys; coastal trade; long-sea outfall; aggregate extraction; artificial island; lighthouse; cross-channel ferries; floating or submerged storage tanks; shipwreck; spoil dumping; offshore navigation; offshore oil/gas rig and undersea pipelines; international sea trade; dumping of toxic wastes; and military activities (e.g. air-to-sea firing range).

Developing countries like the Philippines, Thailand, Indonesia, Malaysia and Taiwan have claimed the entire suite of maritime zones consisting of a 12 nm territorial sea, a 200 nm exclusive economic zone and a continental shelf (Kato *et al.*, 1985). Others consider the coastal zone as extending seaward to the limits of national jurisdiction (Valencia, 1985).

Having a variable width, which may change in time,

...the coastal zone is that space in which terrestrial environments influence marine or lacustrine environments and vice versa...Delimitation of zonal boundaries is not normally possible, more often such limits are marked by an environmental gradient or transition. At any one locality the coastal zone may be characterized according to physical, biological or cultural criteria. These need not, and in fact rarely do coincide. (Carter 1991, p 1)

The US Coastal Zone Management Act of 1972 specifically defines the zone as the

...coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelands of the general coastal states, and includes transitional and intertidal areas, salt marshes, wetlands and beaches (Clark 1977, p 1)

Similarly, Australia's Committee on Environment and Conservation (1980) include estuaries, their associated wetlands and catchments, shallow bays and shallow inshore

waters in addition to the nation's three-approach (linear, administrative and biophysical) definition.

Hawaii's coastal zone includes the waters from the shoreline to the seaward limit of the state's jurisdiction. It clearly states that the zone includes all lands except the lands designated as forest reserves of the state. Australia, however, includes all land encompassed by setback lines to avoid erosion and degradation and all land on which activities may adversely affect coastal areas and modify coastal processes.

The Resource Management Act (RMA) of New Zealand defines the coastal marine area as:

...the area of the foreshore and seabed-

(a) of which the seaward boundary is the outer limits of the territorial sea;

(b) of which the landward boundary is the line of mean high water springs, except that where that line crosses a river, the landward boundary at that point shall be whichever is the lesser of-

(i) 1 km upstream from the mouth of the river; or

(ii) the point upstream that is calculated by multiplying the width of the river mouth by 5. (RMA 1991, p 9)

Coastal water on the other hand means-

...seawater within the outer limits of the territorial sea and includes-

(a) seawater with a substantial freshwater component; and

(b) seawater in estuaries, fiords, inlets, harbours, or embayment. (RMA 1991, p 9)

While most governments define their coastal zones using horizontal boundaries, other groups or organizations, such as the Australian Conservation Foundation, specify that the coastal zone should include coastal waters to a depth of 200 meters, which is a vertical boundary (ACEC 1980).

It is important to understand that, internationally, there are many variations to boundaries of the coastal zone. However, at the national level it is administratively essential to have a consensus as to what should be the coastal limits and boundaries, so individual regions can develop their own coastal management regimes. Hildebrand (1988) suggests the extent of the zone should vary according to the nature of the problem, and, like the Australian Committee (1980), believes that any policy on the management of the coastal zone should consider the definition in its broadest sense: that is, extending as far inland and seaward as necessary to achieve the objectives of the management program. This is mainly because all the coastal environments are part of one interconnected system which includes not only the water and the seabed but the associated flora and fauna as well.

Such debates are also relevant in developing countries. For example, the Philippines, through its National Environmental Protection Council (NEPC), defines the coastal zone as follows:

The outermost limit is the 200 m (100 fathom) isobars at the mouth of the bay, gulf or cone is extended across. In cases where the 200-m isobars is less than three kilometres from the shoreline, the 3 kilometre distance will be adopted. The internal waters are considered part of the coastal zone.

The innermost boundary is 1 kilometre from the shoreline except at places where recognizable indicators for marine influence exist like mangroves, nipa swamps, beach vegetation, sand dunes, salt beds, marshlands, bayous of recent marine deposits, beach sand deposits and deltaic deposits. At such places the 1 kilometre distance shall be recognized from the innermost edges of such features. (McManus and Chua 1990, p 1)

While most of the causes of its coastal problems are attributed to activities in the land, and due to the reasons mentioned above, it is important in this study to take the broadest possible definition of the coastal zone.

The pioneers in coastal planning are developed countries like the USA, Great Britain, Canada and Australia. While they have experienced both success and failure (Curley 1990, Gubbay 1990, Hildebrand 1989, ACEC 1980), the IUCN (1991) recommends similar strategies be essential in developing countries such as the Asian nations who have recently investigated the development of coastal plans. Figure 1.1 provides the 1991 IUCN national policy requirements regarding the coast. Thailand has a national policy but the focus is only on coral reefs (USAID-ONEB-URI 1991). On the other hand, in 1992 the Philippines completed coastal policies addressing relevant issues at a regional level (NEDA 1992). Nationally, the Philippines has existing laws and policies on the coastal environment, but they are implemented and administered in a fragmented manner by different agencies (DENR 1990, Kalagayan 1990, Talavera 1985). This potential for inter-agency conflict calls for an integrated approach to managing the coastal zone. Because the coastal zone is composed of complex processes and activities of various coastal ecosystems which are interconnected, it is also important to deal with this in an integrated fashion: integrated management for sustainable development. Integration for a more effective management has also been recommended by IUCN. Hildebrand (1988) in his review of Canada's experience in coastal management, notes that integration in management is lacking and it is, in fact, one of the causes of failure of planning at a national level.

In developing countries, organizations such as the International Centre for Living Aquatic Resource Management (ICLARM) in Manila (Philippines) have also introduced integrated area development policies for coastal zones, the Philippines, Thailand, Brunei, Malaysia among others (Chua 1991). This is based on the theory that the coastal zone does not exist in isolation, but is composed of many interconnected ecosystems belonging to a larger group which is the natural environment. All systems belonging to

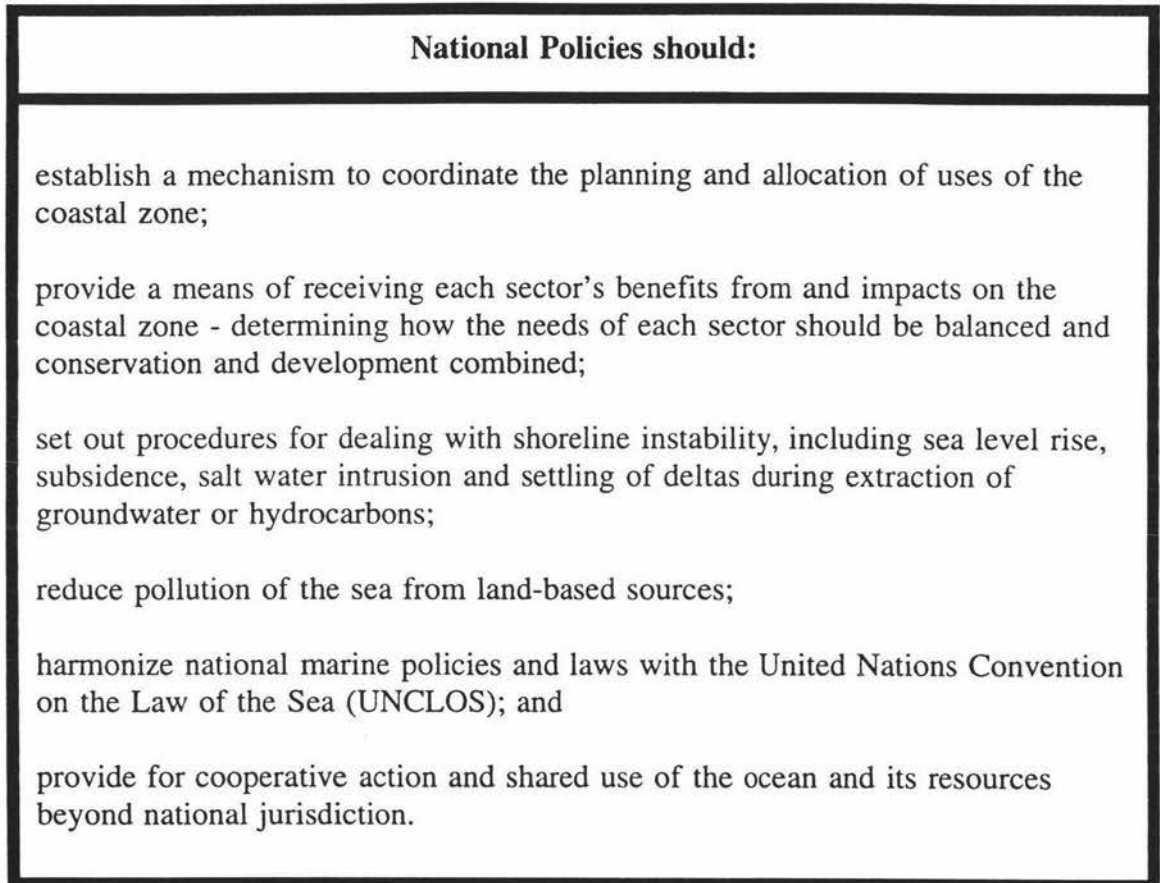


Figure 1.1

National Policy Requirements on the Coast

(Source: IUCN 1991, p 154)

the natural environment are interdependent as well. One example is a source of marine pollution, where activities such as development and maintenance of industries in the upperlands and urban areas contribute polluting substances, along with changes of activity or processes in lower areas, which drain into coastal waters. In turn, flora and fauna are affected and the livelihood of coastal communities, depending on the coast, are also disadvantaged making their quality of life even lower.

1.1.1 The Need for a National Coastal Policy

The IUCN (1991) believes that national policy targets should have the scope to deal with coastal processes. This is strengthened by the present coastal resource degradation and species extinction in addition to the poverty of developing nations. Since it is evident that the coastal zone provides a wide range of economic uses for coastal nations, it is imperative for all coastal nations (or nations having coastal environments) to develop national coastal policy statements (NCPS). Recognizing the importance of the coastal zone to the economy of each nation, NCPS should be one document which is distinct from any other environmental policy.

Sorensen (1989) notes that the value nations give to coastal resources is directly related to the contribution of such resources to the nation's economy. This contribution to the national economy is expressed in four main indicators:

...monetary value of coastal resource production;

...export earnings of coastal resource production;

...number of people employed directly or indirectly by coastal resource uses; and

...the cultural value of the coastal resource to serve dietary, religious or social needs (Sorensen and McCreary 1989, p 21)

Various countries recognize several reasons why a national coastal policy or coastal policies at the national level are necessary in coastal zone management. New Zealand, Thailand and the United Kingdom recognize the importance to the national economy of coastal resources (DoC 1992, Allan 1991, USAID 1991, Gubbay 1990). New Zealand concedes the importance of the coast not just in terms of its economic value but as well as its cultural, spiritual and recreational values while permitting the use, development and protection of the coastal environment. Coastal resources, such as coral reefs in Thailand, are important to the national economy, in the maintenance of local lifestyles and as an essential part of South-East Asia's natural heritage. In the United Kingdom, the coast and its resources play important roles contributing to the national economy (Gubbay 1990): industries are ideally situated along the coasts; the coast is a traditional focus for settlement; as in all other coastal nations, the coast is in demand for recreational use; living and non-living resources are taken from the coastal zone; and waste disposal, which is the most prominent and abused use in coastal nations.

Other reasons enumerate why there is a need for a national coastal policy/strategy (aside from being important to the national economy):

- 1) The accelerating rate of deterioration of coastal resources. Coastal resources such as coral reefs and mangroves are degenerating in Thailand, the Philippines and other coastal nations (USAID 1991, DENR 1990). Since these resources are vital in supporting the lives of peoples, it is a felt need that there be policies at the national level to take care of such concerns.

New Zealand, on the other hand, feels that there are matters of national importance which need to be dealt with in NCPS (DoC 1992), among them:

- protection of significant plants and habitats;
- maintaining access to beaches and rivers for the public; and

- recognizing Maori relationships with nature and natural resources.

- 2) Responsibilities of the nation concerning coastal matters are required in a variety of policy areas (ACEC 1980) such as defence, transport, national heritage, national disaster relief assistance, environmental legislation, territorial seas, water resource policies, flood control and a range of research into the marine and coastal environments.

Generally, these concerns are present in coastal nations where there is a need for a central agency at the national level (Sorensen 1989) to take charge of policies on coastal matters of concern to the national government. Integration is also another concept which needs to be considered. Lastly, a strong national commitment and a management strategy (e.g. integrated area management) are needed to ensure that coordinated and effective national, as well as local actions, are taken to encourage the sustainable use of coastal resources/ecosystems.

- 3) The national governments of coastal nations own a number of properties in the coastal zone (ACEC 1980). This requires a stronger national concern.

There is also a need for national governments to ensure that international treaty provisions are adhered to (e.g. the 200 mile exclusive economic zone declarations).

- 4) A national policy statement is vital in expressing national interests in the coastal zone and in explicitly stating national objectives. This will give other levels of government (i.e. regional, provincial, municipal and barangay/county) a clearer understanding of national concerns, and, therefore, can reduce conflicts. The developed policies, too, will provide clearer guidelines for lower level governments with respect to coastal planning.

- 5) Some nations have few policies, laws or programs recognizing the importance of coastal resources. This is particularly true to Thailand's coral reef resources, hence the development of a national coral reef policy statement.

1.1.2 National and Regional Coastal Policy Statements and their Roles

National coastal policy statements are policies at the highest level of government regarding the management and utilization of coastal resources including conservation and development in the coastal zone. Regional coastal policy statements on the other hand, are statements of policies and/or principles concerning the coastal jurisdictions of specific regions. They are the lower level policies but in agreement (i.e. they cannot be inconsistent with the NCPS) with the policies at the national level. The first sub-section of Section 1.1 justifies the need of such statements at the national level. This sub-section will identify the expected roles of coastal policy statements both at the national level and at the regional level.

The draft NCPS of New Zealand defines, in general terms, the national interest in coastal management. The document provides a clear description of the outcomes which the government wants to achieve in managing the coast. It provides detailed guidance particularly on the requirements of the Resource Management Act (RMA) and of government policy decisions, through the policy and planning instruments of regional and district councils, to ensure management decisions are appropriate.

Hildebrand (1988) identifies the following national government roles:

- providing technical assistance to local levels;
- identifying research needs;
- liaising between the regional programs; and
- serving as a national conduit of coastal zone management information.

While national objectives and national interests are inherent to national coastal policy statements, it is vital that these national goals and objectives are accommodated at the lower levels of government such as the regional level. A framework for this purpose is then established in regional coastal policy statements (Allan 1991, Hildebrand 1988). Where regional priorities will guide the process, and local needs and administrative systems will dictate the form and pace of implementation.

The national governments of the USA and Canada provide encouragement and guidance for coastal zone management but allow local authorities flexibility and discretion when it comes to actual implementation (Hildebrand 1988). In Canada, developed regional initiatives have improved the management of limited sections of the Canadian coastal zone. Hildebrand notes that without some form of federal government leadership, coastal zone management will continue to be little more than a collection of isolated programs. In the USA, a partnership between the federal government and the states exists whereby the latter depend on the former for overall direction, funding and review (a decentralized form of implementation is practised). While there exists a national coastal zone management framework in the USA, the real work of CZM is done at state and local levels (Hildebrand 1988).

The Australian Commonwealth Government agency coordinates planning in the coastal zone (Rosier 1990). It is felt by the Australian authorities, that the Commonwealth is needed to develop policies which would provide guidelines for state initiatives in coastal planning (ACEC 1980).

The above discussions generally state the need of a coastal policy statement at the national level, and their role in coastal zone management as experienced by various countries. The following section discusses the Philippine case in coastal zone management and why it needs a national coastal policy statement.

1.2 Coastal Zone Management (CZM) in the Philippines

The following subsections discuss present management of the Philippine coastal zone, a brief background of Philippine CZM, the issues and problems that presently haunt the Philippine coastal zone and related matters, the Philippine strategy for sustainable development, the need for a Philippine National Coastal Policy Statement, and the possibility for integration in managing the Philippine coastal zone.

Coastal zone management in the Philippines started in 1977, following the directive of the President to the National Environmental Protection Council (NEPC), to organize and coordinate an inter-agency task force that would conduct research on valuable ecosystems such as the coastal zone (Kalagayan 1990). An initial 8-member Coastal Zone Management Committee was formed, and eventually a Philippine definition of the coastal zone evolved out of the evidence of scientific experts of various disciplines and an inter-agency legal committee.

Because of the vast array of resources and subjects covered in the coastal zone, a Coastal Zone Management Committee comprised of 22 government agencies has subsequently been formed to coordinate all activities on coastal zone management, and to enforce all policies and guidelines referring to the coast (Kalagayan 1990). Appendix A lists the specific functions of agencies having direct involvement in the management of coastal areas.

1.2.1 Background

Located in South-East Asia, the Philippines (see Figure 1.2) is an archipelago of 7,107 islands with more than 34,400 km of coastline, containing a great extent of mountainous areas and narrow coastal plains. These features contribute to the shaping of economic, social, cultural and organizational/ institutional structures with settlements located near the coastal waters where fishing is one of the major sources of protein requirements of the people (Kalagayan 1990).

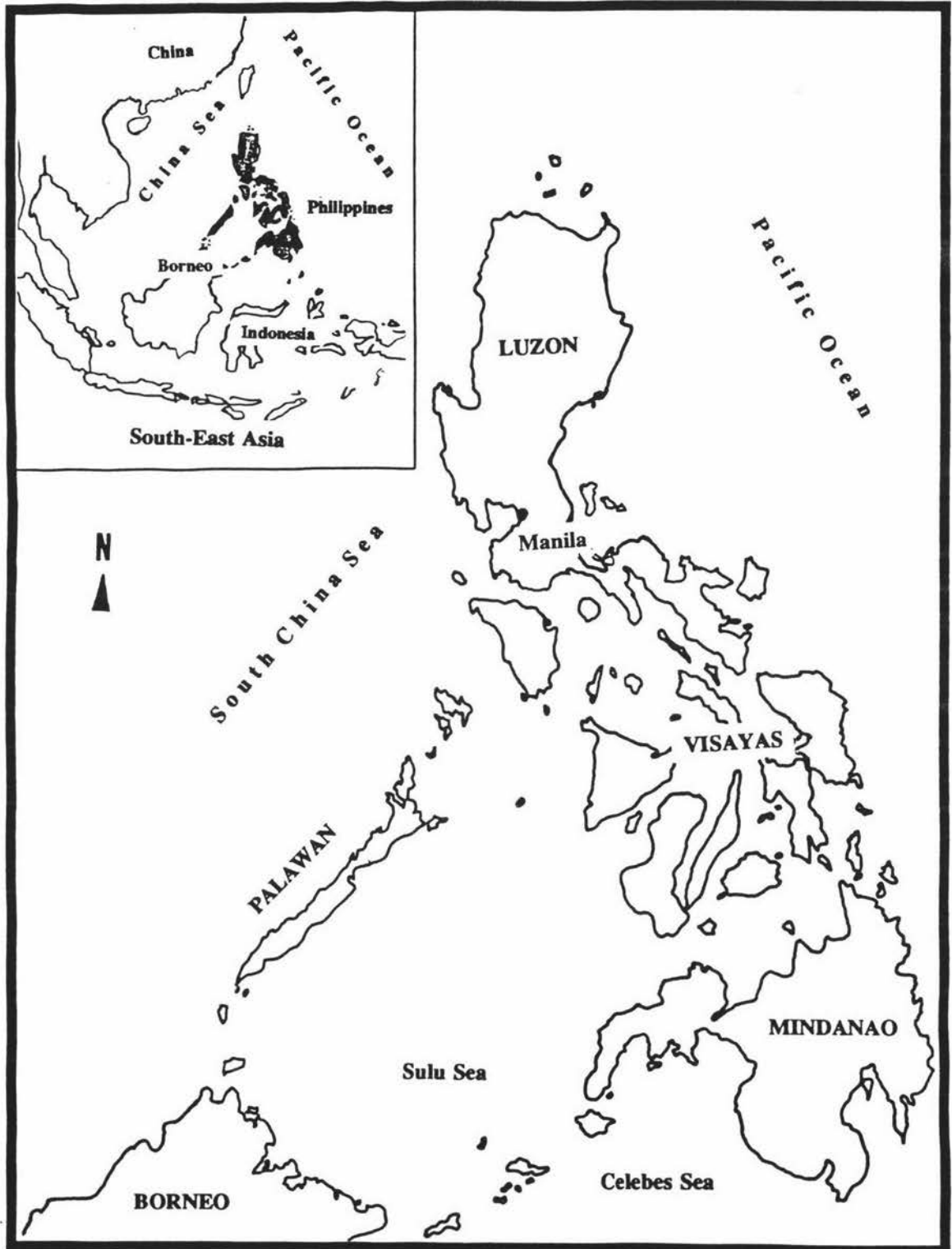


Figure 1.2

The Philippines

The Philippine archipelago is composed of 15 regions which are politically and geographically divided into Local Government Units (LGUs): provinces, cities, municipalities and barangays (villages). Appendix B defines the LGUs and their roles (through respective chief executives) with regard to development planning and environmental protection.

At each level of the political hierarchy, the Local Government Code (LGC) of the Philippines empowers the political leaders to enact local laws and ordinances to enable them to attain their fullest development as self-reliant communities making them more effective partners in the attainment of national goals. In line with this, the LGUs are provided with a more responsive and accountable local government structure through a system of decentralization whereby LGUs are given more power, authority, responsibility and resources.

Each political level is mandated by the LGC to organize a special body, the Local Development Council (LDC), which initiates preparation of a comprehensive multisectoral development plan which is approved by the legislative bodies concerned or *Sanggunians*. Appendix C lists the functions of such development councils.

Similarly, the Regional Development Council (RDC) provides the forum where problems unique to a region can be addressed. Strategies and programs can be formulated by the council which is composed of governors and mayors of constituent provinces and municipalities/cities, and directors of government agencies and NGOs operating in the region. A region can then shape and determine its own development direction (Kalagayan 1990).

National agencies in the Philippines are required to conduct periodic consultations with LGUs, non-governmental organizations and other concerned sectors, regarding project/program implementation. Appendix D lists the provisions in the LGC concerning the relationships of LGUs with the national

government on project/program planning and implementation of project/program including environmental restrictions.

1.2.2 Issues and Problems

Numerical figures from the Department of Environment and Natural Resources (DENR) (1990) reveal that the Philippine coast is a vast region of coastal resources such as mangroves and coral reefs. However, industrial development and population growth have adverse ecological impacts, such as fishery resource depletion and species extinction leading to a threat to the Philippine economy. In 1989, the growth rate is marked at 2.3% (DENR 1990) with a projected population of 65.82 million in 1993. This figure is proof that the available resources cannot cater to the whole populace needs. The pressures from the tremendous increase in population and the industrialization boom are the main causes of the exploitation of the Philippine coastal resources, which eventually will result in resource depletion and destruction (DENR 1990, Tobin 1989, Yong 1989). Relative to this is the poverty of people living in the coastal areas who are forced to exploit the fragile coastal ecosystems beyond sustainable limits. The preceding discussion confirms that coastal community poverty, as a result of over population, and coastal ecosystem degradation are major considerations in developing a national coastal policy statement.

In the following sections, socio-economic, ecological and management issues and problems that affect the Philippines are discussed. (See Appendix E for list of issues). These are grouped into:

1. Impact Issues;
2. Hazard Issues;
3. Developmental Needs; and
4. Organizational Process Problems.

A literature review for the four issues is provided in Chapter Two. It can be observed in that chapter that the four issues are basically the problems experienced by any country engaged in coastal resource use and management.

1.2.2.1 Impact Issues

As more waste from human activities on land are flushed into the sea along rivers and into ground water, water quality along the Philippine coastline will decline rapidly. River systems in major cities, like the Pasig River in Metro Manila, are biologically dead due to domestic and industrial sewage and waste disposal (DENR 1990). This problem is also true of coastal areas such as Manila Bay, Laguna Bay, Lingayen Gulf, etc. (NEDA 1992, Tadifa 1991, Vusse 1991). It is stated that 70% of pollution comes from domestic sources, and 30% from industrial waste (DENR 1990). The disposal to the marine environment makes estuaries and other river systems polluted resulting in decreased fish yields.

Overfishing is very common, especially with the use of dynamite, cyanide and fine meshed nets (Vusse 1991, Yong 1989), leading to a decline in fish catch and more conflicts among users such as commercial and subsistence fishermen. This issue is very significant in Lingayen Gulf, an area in north-western Luzon, one of the Philippine's most productive fishing grounds (see Figure 1.3).

The destructive fishing practices, and other activities, eventually destroy coral reefs; more than half of the Philippine reefs are severely damaged. Only 30% of live coral cover is in good condition (Yong 1989) and 6% in excellent condition (DENR 1990). Competitive use of mangrove resources for human settlement, agriculture, tin mining and local livelihood, such as logging and aquaculture, are decreasing the species vegetation. Problems associated with logging are particularly acute in

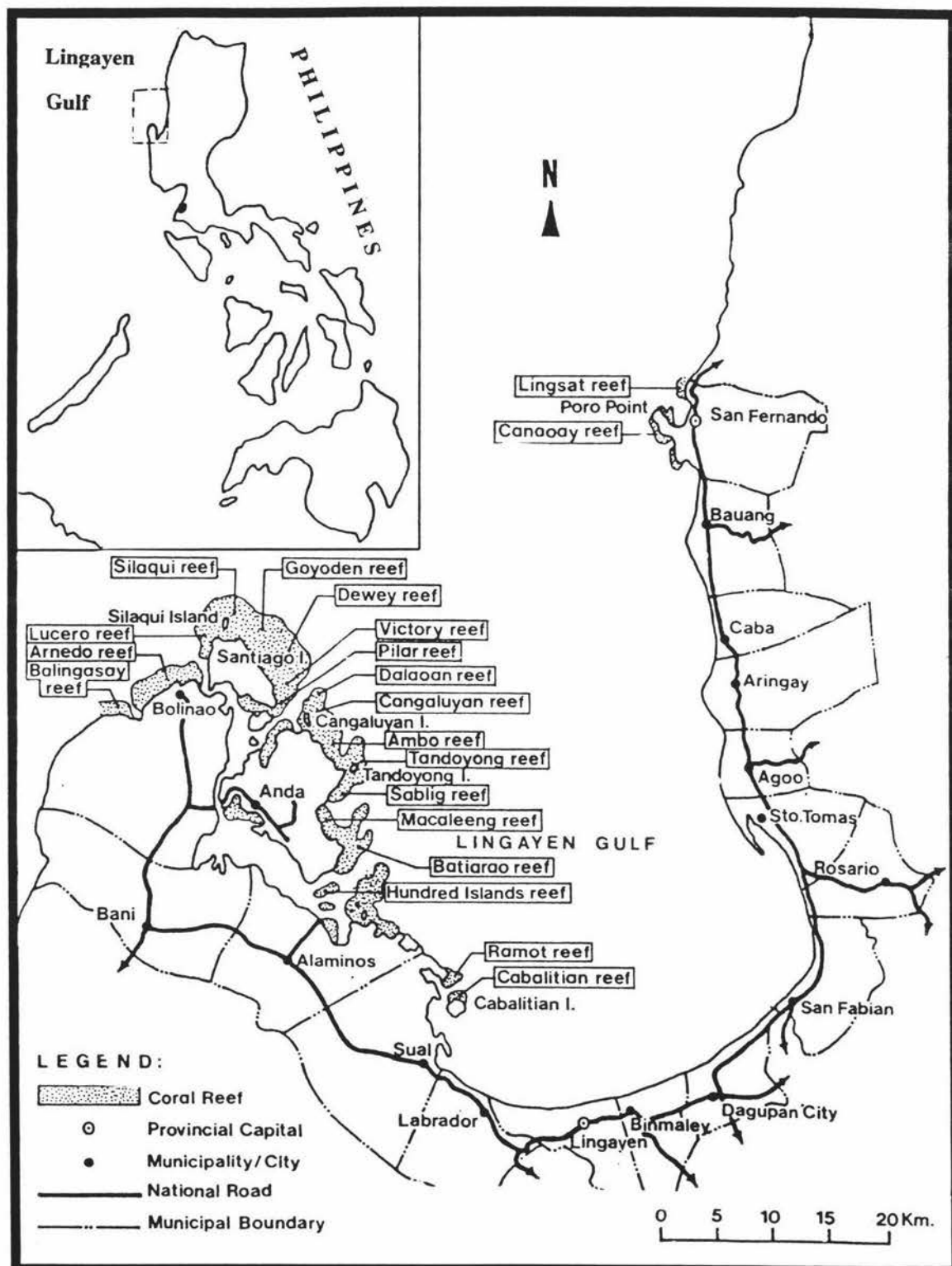


Figure 1.3

The Lingayen Gulf, Philippines

Bacuit Bay in Palawan, an area which is an important zone for three foreign exchange earning industries - logging, tourism and marine fisheries (see Figure 1.4). Figure 1.5 shows the analysis of ecological changes in coral and fish population versus logging in Palawan. The DENR (1990) estimates 21% of the Philippines' 30 million hectares total land area as the remaining forested area, excluding brushlands. It is established that the country is losing 14 hectares per hour of forests due to illegal logging, forest fires and slash and burn agriculture.

About 75% of the 450,000 hectares of mangroves are destroyed, two thirds of this accounting for fishpond conversion (DENR 1990, Yong 1989). According to DENR, recent satellite study reveals the following areas:

Mangroves and Similar0.1494 M has
Marshy Areas.0.1035 M has
Coral Reefs0.3527 M has

Drainage of mine tailings, improper agriculture techniques and upland deforestation contribute to the dumping of large amounts of silt into the marine environment which decreases ecosystem productivity, cause deterioration of coastal waters and smothers of coral reefs. Mining industries in Benguet Province (such as Philex Mines, Balatoc Mines, etc.) discharge tailings from impounding ponds which contain toxic by-products, causing adverse ecological effects in the Lingayen Gulf area and adjacent municipalities. Active mining firms in the Philippines discharge at least 140,000 tons of mine tailings daily into rivers (DENR 1990).

Despite nationwide pollution control measures, only about one fourth (1/4) of the industrial firms comply with water pollution control (DENR 1990). In addition to land-based pollution, pollution from ships and oil

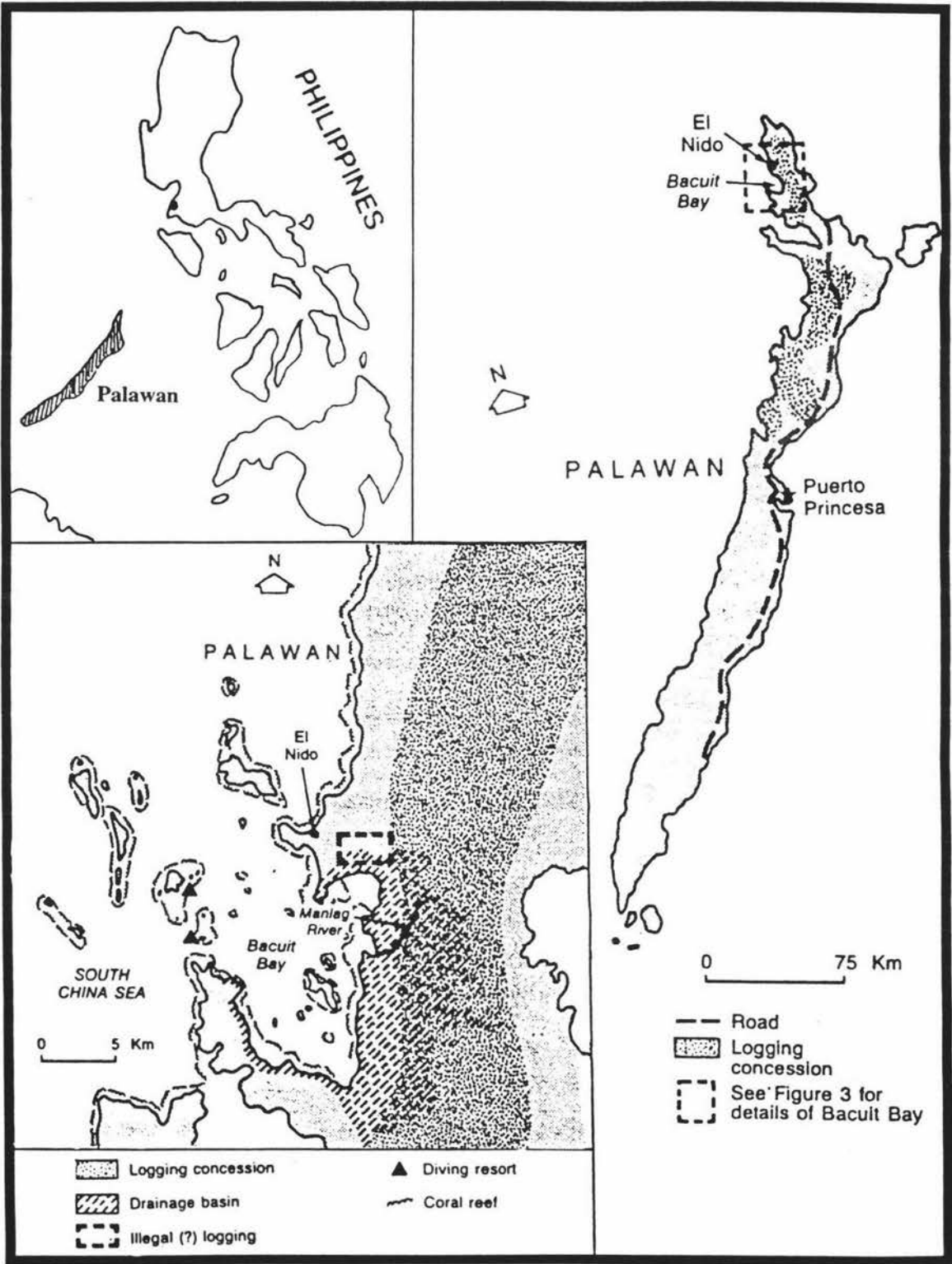


Figure 1.4

Bacuit Bay, Philippines

Analysis of changes measured in Bacuit Bay coral and fish populations during 1986 as a result of sedimentation caused by logging in Palawan, Philippines.

- * Annual decrease in coral cover of one percent for every additional 400 tonnes per square kilometre of annual sediment deposition in Bacuit Bay.
- * Annual decrease of one coral species (extinction) per increase of 100 tonnes per square kilometre annual sediment deposition in Bacuit Bay.
- * For each one percent annual decrease in coral cover, fish biomass is decreased by 2.4 per cent.
- * For each annual decrease of one coral species associated with coral cover loss, fish biomass is decreased by 0.8 per cent.

Figure 1.5

Relationships of logging versus fisheries
in the Philippines

(Source: Hodgson and Dixon 1989, p. 142)

spillage are common (Tadifa 1991, DENR 1990, Vusse 1989, Yong 1989). Adverse effects of marine pollution include decrease in fish species diversity and fish habitats, unsafe coastal waters for recreation and shellfish gathering, and a decrease in the aesthetic value of coastal resources.

1.2.2.2 Hazards

Natural hazards such as storms and floods are common in the Philippines especially during the months June to November. These phenomena cause damage to beaches, shoreline erosion, while flooded rivers allow more silt, etc. to accumulate causing coastal resources to die. Although this is a perennial occurrence, it seems that the Filipinos have become accustomed to The Philippines' "stormy season". This is evident in the PSSD and other publications not providing measures to protect the coastal resources from such hazards. But flood control measures are undertaken by the Department of Public Works and Highways to protect human lives and public infrastructure.

In 1991, large quantities of *lahar*, emitted by Mt. Pinatubo in Zambales Province, found its way to adjacent river systems reaching as far as the Lingayen Gulf. This posed a threat to aquaculture and inshore fisheries (NEDA 1992).

Another important fact established by the DENR(1990) is that the mean sea level of Manila Bay has risen by about half a meter during the last 80 years. DENR also notes saltwater intrusion as a threat to the coastal zone.

1.2.2.3 Developmental Needs

One of the Philippines' biggest problems today is poverty resulting from the rapid increase in rate of population growth. It is seen that poverty inevitably leads to resource depletion and degradation, as the poor people are forced to endanger the natural resource base in order to meet their basic (short-term) needs for food and fuel (FAO 1992).

Obviously, the main issue here is the continued survival of the people and regeneration of ecosystems to meet the needs of future generations. To date, ICLARM plans recommend the development of projects such as cottage industries and aquaculture to increase the income of impoverished families. Other natural areas are protected by establishing protected areas for conservation and tourism purposes (Tadifa 1991). The tourism industry is one of the main contributors to the Philippine economy. However, possible adverse effects from this industry include the depletion of species (such as corals and fish taken by souvenir collectors), trampling of coral reefs (by diver and snorkeler tourists), and pollution of nearby shores (by wastes from tourist developments and oil spillage from ships and pleasure craft).

Development needs such as those enumerated in Chapter Two are essential considerations. The Philippines is one of many nations that practice sectoral planning catering developmental needs of the nation (Sorensen and McCreary 1989). Prawn aquaculture is one of recent developments and is placed as one alternative to fishery exploitation. Unfortunately, Filipinos have become deeply engrossed with this newly introduced development at the expense of caring for other coastal resources. For example, mangroves are converted into aquaculture development sites (Sorensen and McCreary 1989).

1.2.2.4 Organizational Process Problems

Conservation and law enforcement are categorized into socio-economic, political, cultural, and organizational/institutional problems. The most serious are the organizational/ institutional problems (Tadifa 1991, Vusse 1991, Kalagayan 1990, Tobin 1989) because law enforcement agencies either lack personnel, equipment, or technical skills or there is rampant graft and corruption (Joya 1987 in Kalagayan 1990). The same situation is common in local governments. Among the effects of corruption are non-achievement of goals and objectives as a result of malversation and improper use of project funds; decreased self-esteem of LGUs resulting from traditional reliance of LGUs to influential elected officials in the congress and senate in terms of project identification, etc.; continued poverty of the people, and unsustainable use of resources.

As delineation of duties and responsibilities at all levels of government are not clear, duplication of functions among involved agencies/ organizations is common. These entail conflicts among the users and law enforcers as well as officials. Furthermore, coordination is rarely achieved which causes reluctance of citizens and other groups to participate in activities serving the national welfare. While there is an existing agreement among the agencies involved, there is no guarantee of the effective implementation of the laws provided, which could threaten the viability of integrated coastal management.

In Chapter Two, thirteen issues are presented, five of which are identified by developing countries, such as the Philippines, as major obstacles to program development. These are:

- lack of coordination among public agencies;
- insufficient data base and lack of information for decision-making;
- lack of clearly stated goals;

complex, conflicting and confusing laws; and
 lack of properly trained and educated management personnel.

Another problem confusing managers, administrators and users of the coast is the vast array of legislation issued by different agencies which are found in different directives. Appendix F lists the existing rules and regulations concerning the Philippine coastal zone.

The preceding discussion and presentation of existing laws are evidence of the above issues. It is hoped that with the new Local Government Code (1991), specifying the relationship between national and local government among other new measures, organizational problems will avoid or minimize past failures, specifying a workable relationship between national and local governments.

1.2.3 Philippine Strategy for Sustainability

The preceding section deals with issues and problems which are non-sustainable to both humans and coastal ecosystems. From the discussions above, it can be concluded that there is a desperate need for a strategy which calls for sustainable living. This situation does not only occur in the Philippines but also in various nations; hence, IUCN (1991) recommends the same thing.

In line with the present socio-economic situation and ecological degradation of Philippine natural resources, the DENR, which is the lead agency on the country's environment and natural resource concerns, suggests a strategy in order to assure a sustainable future. The general strategies include the following (DENR 1991):

integration of environmental considerations and decision-making;
 proper pricing of natural resources;

property rights reform;

establishment of an integrated protected areas system;

rehabilitation of degraded ecosystems;

strengthening of residuals management in industries (pollution control);

integration of population concerns and social welfare in development planning;

inducing growth in rural areas;

promotion of environmental education; and

strengthening of citizen participation and constituency building.

1.2.4 Need for a National Coastal Policy

While the DENR is the principal agency for environmental concerns, there are a number of other agencies involved in making decisions about activities in coastal environment (see Appendix A). Other ecosystems in the Philippine coastal zone are the concern of various agencies. For example, fisheries is the concern of the Bureau of Fisheries and Aquatic Resources (BFAR) of the Department of Agriculture (DA); mangroves are the concern of the Bureau of Forest Development (BFD) and the Ecosystems Research and Development Bureau (ERDB), and the general protection of natural resources is the concern of the National Environmental Protection Council (NEPC).

The IUCN (1991) recommends a number of requirements in order to live in a sustainable fashion and in harmony with the coastal ecosystems. It also requires maintenance and sustainable use of the natural wealth of coastal zones and the oceans. Figure 1.1 provides IUCN recommendation for policies at the national level while Appendix G provides the IUCN recommendations concerning management and use of the coastal zone at the regional level.

In view of the reasons enumerated in Section 1.1.1 about the generally degraded condition of the Philippine coastal environment; about the fragmented management including the presence of multiple agencies/organizations; the presence of multiple directives from a number of government agencies including the nation's constitution, and the recently produced strategy for sustainable living, IUCN (1991), it is imperative that the Philippines develop a national coastal policy.

1.2.5 Possibility of Integration

It is seen from the preceding discussion that there is a possibility of integration concerning coastal resource management. First, the overall goal of sustainable development can only be achieved if the socio-economic and environmental aspects are given due consideration (Fallon and Chua 1990). An integrated approach, which is multifacet, can best achieve this perspective by addressing key factors which influence progress toward sustainability. Second, the issues and problems regarding resource use conflict, and management in the coastal zone is complex. It is envisioned that an integrated, multisectoral and interdisciplinary management for their resolution is required (Chua 1988 in Tadifa 1990); *integrated* meaning that the interconnections of ecosystems is considered, *multisectoral* meaning various sectoral user groups contribute to resource use conflicts hence they need to be included, and *interdisciplinary* meaning all disciplines (such as planners, managers, administrators, engineers, scientists, politicians, etc.), whose activities affect the use and management of coastal resources, need to be considered in resolving conflicts in the coastal zone.

As presented in the previous discussion, an integrated coastal management is needed, integrated in such a manner that systems analysis approach is employed to recognize the interconnections among coastal ecosystems. Integrated coastal area management also requires a governance arrangement (Sorensen 1991) to

establish the policies for making allocation decisions. Sorensen suggests that the governance is catered for by a department or inter-ministerial council.

Integrated coastal resource management involves:

...the regulation of development activities having direct and indirect impacts (socio-economic and ecological impacts) on ecosystems in the coastal zone. In order to maintain a healthy sustainable natural resource base, it is required to sustain any coastal development activity that is dependent on them;

...the incorporation of the concepts of sustained utilisation along with obtaining the greatest yield from the best multiple uses of the resource within a planning framework for both long-term and multisectoral uses. These concepts ensure that resource management schemes meet their intended goals, while minimising the possibilities of creating a secondary effect on an adjacent system which causes costly economic, social, or political problems; and

...the development of management optionsbased on sound socio-economic and ecological considerations. (Tadifa 1990, p 70-71)

1.3 Study Methodology

The following subsections discuss the methodology used in this study. The aims and objectives are stated, followed by the limitations of the study and, finally, the research plan is discussed.

1.3.1 Aim and Objectives

The general aim of this study was to use an integrated approach to develop a national coastal policy statement for the Philippines that ensures alleviation of poverty and the sustainable use and management of coastal ecosystems. In so doing, a number of objectives were to be achieved:

to evaluate the requirements of the IUCN regarding appropriate procedural and substantive issues to be included in the role of a national coastal policy in an integrated approach to coastal management;

to select an appropriate method and a suitable technique for evaluation of new (unimplemented) plans/policies;

to develop criteria to be used in the evaluation of various national coastal policies for their suitability in developing a national coastal policy statement;

to derive a conceptual framework to be used in the evaluation and analysis of coastal plans and policies; and

to develop a national coastal policy statement for the Philippines adopting appropriate policies from various coastal policy statements.

1.3.2 Limitations

This study is concerned with the evaluation of coastal plans with the use of theoretically developed criteria to gauge their effectiveness. The criteria developed in Chapter Two are those which seem appropriate and essential given the issues of the Philippine coastal environment. It does not follow that these criteria are the only things that need to be considered in evaluating effectiveness of policies and plans. Further sets of criteria may be developed when different groups are surveyed about their different concerns/problems for individual coastal areas. In a conventional situation, many groups may be consulted to determine criteria.

References regarding the Philippines were obtained from the Department of Environment and Natural Resources (Manila), and the National Economic and

Development Council (San Fernando, La Union). Information regarding coastal fisheries were obtained from the MAF Fisheries, Wellington, New Zealand.

1.3.3 Research Plan

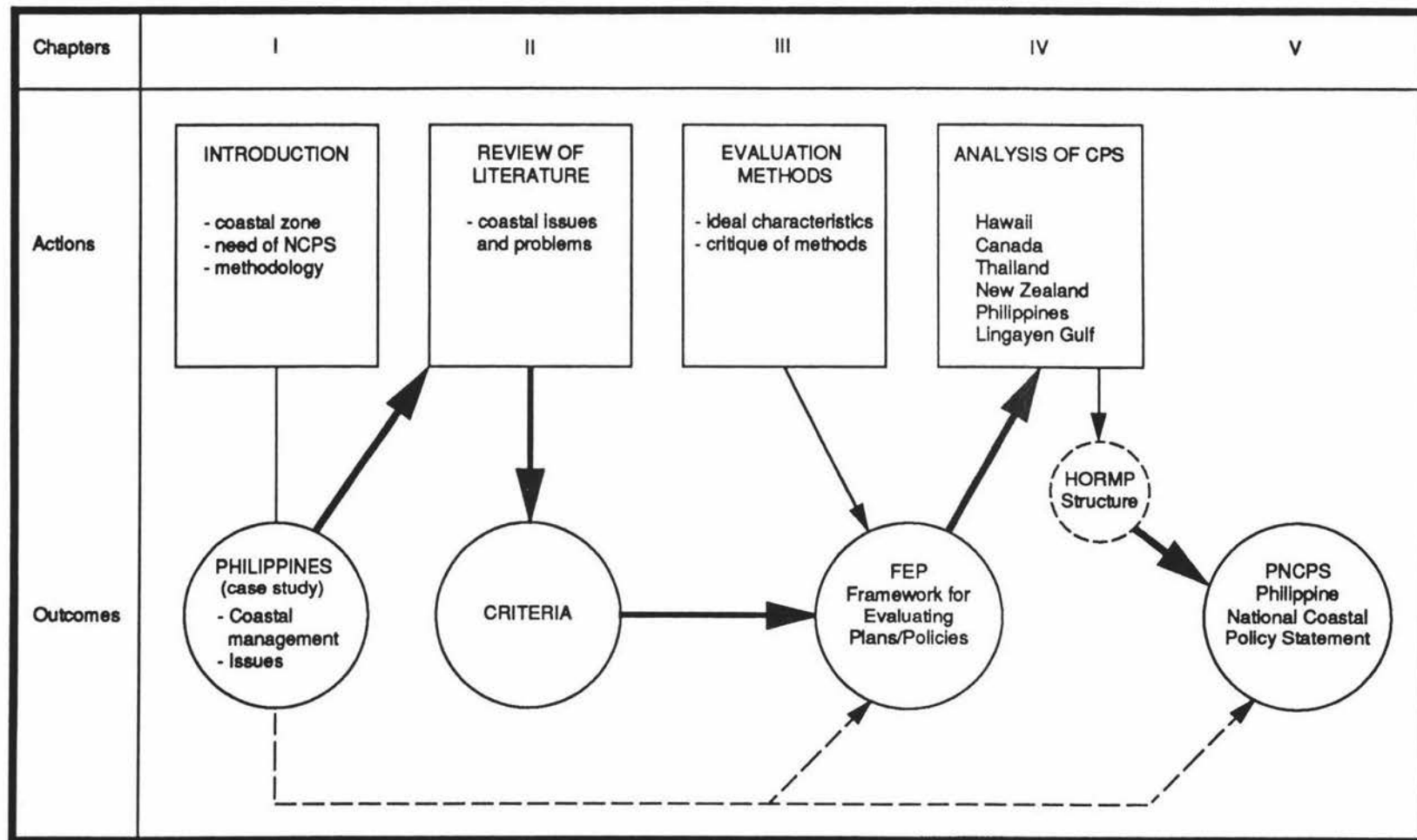
This study concentrates mainly on a theoretical research. Figure 1.6 presents the plan of the study where activities undertaken are framed in boxes and circles to indicate what the outcome of each chapter is expected to be.

The first part of Chapter One discusses the general concept of a coastal zone, following which the Philippine case study is introduced and the need of developing a national coastal policy statement is justified. Here, the possibility of considering an integrated approach in the development of an NCPS is also discussed. The last part of the chapter deals with the study methodology.

Chapter Two includes a literature review concerning issues and problems that most commonly affect the coastal zone. From these emerging issues and problems, a set of criteria is developed which form the bases in evaluating coastal plans in Chapter Four. These criteria are different from the set of characteristics developed in choosing the best evaluation method in Chapter Three. The same criteria are used in the development of a NCPS for the Philippines in Chapter Five.

Chapter Three studies the critiques of six evaluation methods (three informal evaluation methods and three formal evaluation methods) of evaluating plans/policies while also presenting the importance of the evaluation process in planning activities. In order to choose the best method, there is a need for the evaluation team to develop ideal characteristics which an evaluation method should possess. Thus, this chapter develops a set of ten characteristics to be used in assessing the most appropriate evaluation method. However, these are different from the criteria developed in Chapter Two.

Figure 1.6



The outcome of Chapter Three is the development of an evaluation framework, which may be used by planners in undergoing evaluation of coastal plans/policies before their implementation. The same framework may also be used in developing a national coastal policy statement in Chapter Five. The criteria developed in Chapter Two are used in the framework.

While it is true that the Philippines has no national coastal policy of its own at the moment, various coastal policies (i.e. Hawaii, New Zealand, Thailand, Canada, etc.) are evaluated so that their effective policies will be adopted for the Philippines. A comparative analysis of these policies is presented in Chapter Four using the framework developed in Chapter Three along with the criteria developed in Chapter Two. The chapter proposes that some relevant format/policies, from among the countries analyzed, be adopted by the Philippines in the development of its national coastal policy statement.

Having established an ideal set of criteria for the Philippines, Chapter Five proposes a new national coastal policy statement which is product of the NCPSSs, previously analyzed, and of the recommendations of the IUCN and the PSSD.

Chapter Six summarises the main conclusions of the study and presents potential issues for future research.

1.4 Conclusion

The key issues to be considered in managing the coastal zone are the impacts of socio-economic concerns as well as ecological concerns and organizational/institutional concerns. Due to the complexity of these issues concerning the Philippine coastal environment, an integrated coastal management is recommended which is based on a systems view in planning. Catering to economic needs of impoverished coastal residents is a major concern, together with the aim of enhancing and not exceeding carrying capacities of ecosystems. These entail a coordinated effort on the part of national

government agencies as well as the cooperation of the public. Installation of information systems is also an important consideration.

It is obvious that the end results of the IUCN recommendations are best achieved through an area-based integrated coastal management strategy. Though this is the ideal, there are still strong moves to have a national coastal policy to provide a voice for the strong national concern for coastal resource ecosystems and the people who depend on them for survival. It is then possible to generate area-based coastal management which follows the IUCN (1991) recommendations and other international recommendations, in so far as they apply to the Philippine situation.

CHAPTER TWO

REVIEW OF LITERATURE CONCERNING INDIVIDUAL ISSUES

The aim of this chapter is to review various coastal issues which eventually become bases for developing criteria for use in carrying out a topic evaluation of coastal policies to determine their suitability for use in a National Coastal Policy Statement for the Philippines. While these criteria differ from those derived in Chapter Three (which are aimed at assessing the applicability of evaluation methods for analysing policies/plans), they are the issues that coastal plans/policies must address in order to achieve a sustainable future. These too, are the criteria to be used in the evaluation framework (proposed in Chapter Three) to analyze coastal policies and plans (Chapter Four).

2.1 Introduction

Most of the world's population live in the coastal zones, areas where the highest biological productivity on earth occurs, and where more than 80% of the world's fish are caught (IUCN 1992). The highly productive ecosystems found in these areas support a wide range of economic activities. The increasing populations, and economic and social development, place heavy demands on the coastal resources and often result in depletion of resources, conflicts over their use and environmental degradation (Chua 1991, Saenger 1990, Kato *et al.* 1985). Environmentalists have made their point in proving that due to the vital role of the coastal zone and due to the unending abuse it receives, the coastal and marine ecosystems are continuously deteriorating in an accelerated manner. Normally, the causes of these problems are the same in both developed and developing nations, but there may be varied reasons (e.g. overfishing: in developed countries, the reason maybe recreation purposes, while in developing and other poorer countries, the reason is a basic need - for survival or sustenance of life). Most problems are due to poor management of resource use and allocation, but may also

be due to poor planning (Tadifa 1991). A variety of coastal resource problems stem from over exploitation, and if not properly attended to, future opportunities for the present and the next generation will be limited and unsustainable.

The following section presents, in detail, the problems that concern the coast: impacts on coastal ecosystems issues, hazard issues, developmental needs and organizational process problems. Addressing these four main problem areas ensures the success of coastal plans.

2.2 Coastal Issues

The coastal issues referred to here are resource use conflicts, and disputes among different users and between users and ecosystems. These issues motivate planners to design coastal plans and arrive at policies which are likely to appear as coastal criteria. In general, Sorensen (1989) notes that if a problem or opportunity arises from the use of a coastal resource, it is an issue in the area of coastal zone management. While international organizations like the IUCN and UNEP recognize/address these issues, there is no attempt to construct a global index of issues, thus, Sorensen recommends an international indexing system to better organize the field of coastal management. He confirms that such a system is possible because of existing categorized issues constructed in some nations and regions such as the East African Region, the Caribbean, Australia, and Ecuador. According to Sorensen, four main types of issues are identified:

- I. **Impacts** of one coastal area activity (e.g. tourism development or filling wetland) on others (e.g. decreased commercial fishing yields);
- II. **Coastal hazards** or impacts of natural forces (e.g. shore erosion, river flooding, ocean born storms) on coast use activities;

III. **Developmental needs** or sectoral planning (e.g. fisheries development plan);
and

IV. **Organizational process problems** such as an inadequate data base or lack
of coordination.

2.2.1 Impact Issues

An issue becomes a problem when there occurs an impact on ecological and social values. The following cluster of impact issues are enumerated by various authors (Carter 1991, Chua 1991, Tadifa 1991, Alabanza 1990, DENR 1990, Gubbay 1990, Saenger 1990, Sorensen 1989, Yong 1989, Kato *et al.* 1985, etc.):

estuary, harbour and nearshore water quality impacts (waste disposal into coastal environment, etc.);

groundwater quality and quantity;

filling of wetland (including mangroves and estuary reclamation);

mangrove impacts;

coral reef and atoll impacts;

beach, dune and delta impacts;

fishing effort;

access to the shoreline and subtidal area;

visual quality (tourism); and

employment;

Primarily, it can be seen that the adverse impacts relate to issues on water quality, pollution and ecosystem types. In the ASEAN region, which consists mostly of developing countries, the primary development and conservation issues

include maintenance of water quality, destructive overfishing, habitat destruction of mangroves for aquaculture and other uses, upland land management which affects the health of downstream marine ecosystems, and conservation of endangered marine animals (Yong 1989).

Tourist developments generally generate increased numbers of tourists and tourist activities, bringing economic benefits to a locality including: creation of local employment, enhancement of local economies, foreign exchange generation, stimulation of improvements to local transportation infrastructure and the creation of recreational facilities (Saenger 1990). While these benefits generally improve a locality's economic situation, developments such as parks, ports, marinas, etc., all result in considerable adverse effects on coastal ecosystems, both directly and indirectly.

Tourist activities may destroy corals by trampling, inflicting flipper damage and by anchor damage from large cruise ships and other vessels (USAID 1991, Saenger 1990). Recreational fishing (e.g. bottom fishing, spear fishing, snorkelling, trolling, diving, and fish and marine life photography) may deplete or disturb fauna and other species and change the pattern of consumption of intertidal marine food resources (Saenger 1990). The mere presence of people may also disturb fauna such as nesting seabirds and tortoises. Activities such as trampling, four wheel drives, souvenir collecting, vandalism and littering degrade the environment and reduce visual amenities, resulting in ecological damage and a loss of amenity to those people seeking solace and a wilderness experience. There may be recreational satisfaction on the part of the tourists but at the expense of coastal resources and coastal residents. Sewage discharge from tourist developments may enhance eutrophication effects causing decline in local water quality. Anti-fouling paints on recreational boats also leach heavy metals such as mercury and lead into the marine environment (Salm 1986).

Overfishing is one issue which is a root cause of low stock densities especially in easily accessible areas. It has also resulted in low catch rates and, therefore,

low income levels for fishermen. Local fishing practices such as blastfishing with dynamite, and cyanide fishing for aquarium purposes contribute to the depletion of fish stock affecting fishery regeneration. The absence of zoned fishery policies also results in conflict between local fishermen and commercial fishermen (Tadifa 1991, Sorensen 1989).

Increases in population often place huge demands on utilities and services traditionally associated with urbanization in the coastal zone. Due to budget problems and other constraints, drainage and sewerage systems are often inadequately provided for (Chua 1991, Tadifa 1991, Yong 1989, Kato *et al.* 1985), and wastes are usually fed to the river systems polluting them and resulting in downstream effects near or on the coast. Farmers adopting intensified farming methods with the use of chemical sprays to increase production also adversely affect the water quality and salinity levels in the coastal zone (Tadifa 1991, Alabanza 1989).

Mining, shipping and other industries produce spills and discharges containing a range of contaminants among them sediment, organic matter, nitrogenous matter, lead, zinc, copper, bacteria, hydrocarbons, debris and litter (Kato *et al.* 1985, Clark 1977). While it is true, worldwide, that the coast has been the favourite site for various discharges and dumping (Carter 1991, Horsley 1991, Tadifa 1991, Gubbay 1990, Kato *et al.* 1985, Talavera 1985, etc.), only a few countries had taken notice of local constraints of coastal waters to digest wastes being fed into the shores from domestic and industrial sources. Many species are now endangered, and pollution has affected people who depend on marine animals for food (Chua 1991, Tadifa 1991, Kato *et al.* 1985). Water quality deserves special attention because of its implications for affecting the public health and quality of life, and for the continued survival of endangered species, as well as assurance of species diversity. In the evaluation of coastal plans, therefore, it is very important to take into account the assessment of policies relating to the water quality with particular concern to waste management.

2.2.2 Hazard Issues

A clearer set of concerns are evident here, unlike the broader impact issues. Five hazards are enumerated by coastal nations (Carter 1991, DENR 1990, Sorensen 1989):

- coastal erosion and its control;
- coastal river flooding;
- ocean born storm mitigation;
- tsunamis;
- migrating dunes;
- rise in sea level; and
- salt water intrusion.

Normally, these are naturally occurring phenomena, and sometimes coastal erosion, coastal river flooding and migrating dunes may be caused solely by development activities, etc. Though hazards are natural phenomena, they can be exacerbated by human use activities. These forces of nature, such as storms, contribute to water quality problems in the form of stormwater and surface run-offs.

Activities such as urbanization in the uplands, clearing of forests by logging industries and agricultural clearing may accelerate erosion changing sediment transport patterns to and along the coast. High sediment loads are detrimental to fish and other aquatic life. Sediment particles may entirely cover stream bottoms smothering benthic organisms. These increased sediment loads can destroy spawning areas, juvenile species and food supply, reducing habitat, species diversity and abundance (Saenger 1990, The Ecologist 1989) in the coastal marine area. At times permanent extinction is possible. Where habitat loss is not a problem, habitat values may be diminished.

Run-off from urban settlement carries another variety of sediment to the coast, as building construction and other developments result in erosion affecting species which are unable to adjust to sudden change (Saenger 1990). Re-stabilization of habitats disturbed by acute erosion in the cities takes years. (On the other hand, effective preventive measures are applied to stop environmental degradation caused by agricultural erosion.) In some instances, the impact from erosion caused by construction and other developments is so severe that fish populations can become permanently lost in urban streams (The Ecologist 1989). There are also heavy metals and contaminants associated with high vehicular use, being discharged into streams in a variety of ways.

In addition to natural hazards, coastal scientists (Ackroyd *et al.* 1991, Carter 1991, Hains 1985) have expressed their concern about the projected sea-level rise. It is feared that global sea-level rise may reach as much as one metre by the year 2050. If this is so, many low lying and populated coasts are threatened by increases in storm and flood damage, including loss of wetland. One factor causing this is the increasing proportion of greenhouse gases which include carbon dioxide (produced by burning fossil fuels such as wood, coal and oil), methane, nitrous oxide (both by-products of agriculture) and chloroflourocarbons (CFCs) (Tree of Knowledge 1991). This leads to increased heat absorption which is popularly known as the greenhouse effect (Ackroyd *et al.* 1991).

Clearly, with all these potential dangers there is a need for integrated coastal planning not only to reduce risk but to offset these risks. For example, planners must ensure that adequate policies be formulated for low lying coastal lands in preparation for the threat posed by the possible increase in the rate of sea level rise (Hains 1985).

2.2.3 Developmental Issues

Developmental needs are expressions of sectoral planning interest in response to one or more problems or opportunities identified by the coastal nation (Sorensen 1989), and should, therefore, be included in an information system which is based on coastal issues. The following types of development needs are vital (Carter 1991, Sorensen 1989):

- fisheries;
- natural area protection systems (new approaches to coastal protection);
- water supply;
- recreation development (despoliation and destabilization of coasts);
- tourism development;
- port development;
- energy development (exploitation);
- oil or toxic spillage contingency planning (as a component of water pollution control plan);
- industrial siting;
- agricultural development;
- aquaculture development; and
- sustaining productivity and diversity in coastal ecosystems.

Floating structures such as pontoons, marinas or hotels can shade significant areas of the sea bottom thereby inducing significant ecological changes. Similarly, underwater noise and vibration may cause behavioural changes among resident and migratory species (Saenger 1990). Here, it is clear that tourist development often interferes with natural coastal processes. In developing

countries, wetland, swamps and fish ponds are converted to accommodate urban development, aquaculture, etc.(Yong 1989). This results to the decline of spawning and breeding grounds of various species which leads to a decline in productivity. Provision of livelihood for residents to lessen exploitation is being encouraged in the Philippines (ICLARM 1992). One area is aquaculture, but this entails the conversion of mangroves which is contradictory to the policy of conservation and sustainable development (DENR 1990).

It is seen, then, that developmental needs may be solutions to the impact issues and problems enumerated. Obviously, too, sectoral planning and accommodation of such developmental needs are contributory to the economy of a nation. On the other hand, these developmental needs, once accommodated, may bring about adverse or beneficial effects both to humans and to coastal resources (environment).

Development cannot be reasonably constrained in developing countries. This is one reason why it can be argued that sustainable development should be practised, e.g. allowing development or exploitation such as the development needs enumerated above, without sacrificing the capacity of resources to renew themselves (PSSD 1990, Kato *et al.* 1985). A weighting or value judgment is crucial in this endeavour. Policies, at all levels of government, should allow for the development needs of the region without taking advantage of coastal resources.

2.2.4 Organizational Process Problems

Sorensen(1989) defines organizational process problems as procedures that inhibit an organization from attaining its goals and objectives. Five critical organizational problems are identified resulting in an analysis of issues that motivated passage of the US Coastal Zone Management Program (Englander 1977 in Sorensen 1989 and Australian House of Representatives ACEC 1980):

lack of coordination among public agencies;
 insufficient planning and regulatory authority;
 insufficient data base and lack of information for decision-making;
 little understanding or knowledge about coastal ecosystems; and
 resource decisions made primarily on the basis of economic
 considerations to the exclusion of ecological considerations.

Secondary issues are:

lack of clearly stated goals;
 lack of state and local government funds to manage the coastal zone
 adequately;
 primitive analytical tools and predictive methodologies;
 dominance of short-term management over long-range planning;
 complex, conflicting and confusing laws;
 little awareness of or concern with coastal problems;
 lack of properly trained and educated management personnel; and
 limited public participation in decision-making.

It is clear that in a number of countries problems such as lack of coordination
 among public agencies; insufficient data base and lack of information for
 decision-making; lack of clearly stated goals; complex, conflicting and
 confusing laws; and lack of properly trained and educated management personnel
 are all obstacles to program development. Only few countries address such
 problems. As a result of survey questionnaires in the United Kingdom, the major
 issues of concern are nature conservation, fisheries and aquaculture, recreation,
 navigation and communication, coastal engineering, waste disposal and pollution
 control, and mineral and energy extraction, in which, the lack of a planning

regime for areas of the sea and the lack of a national policy or strategy for the use of coastal zone are dominant problems (Gubbay 1990).

In developing countries, like the Philippines, Thailand, and Indonesia, there is limited public awareness of the local government role in coastal resource management (Chua 1990, Yong 1989, Kato *et al.* 1985). This results in limited support being extended to activities related to the preservation/conservation of coastal resources. Though there are existing laws and measures regarding fishing activities and pollution control, etc., implementation is a major problem. Different agencies, sharing the same interests in some resources, have different programs which are often overlapping and uncoordinated, causing additional government expenditure, and often resulting in failure to evaluate policy. The policies formed may be the best plans but organizational processes should be in line with them in order to achieve success.

2.3 Development of Criteria for the Coast

The main goal of coastal zone management is to maintain natural coastal processes to cater for existing and future generations with equal opportunities in coastal resource utilization while protecting important natural values. However, this role cannot be carried out properly without standards or indicators which eventually are the ideal end results against which current activities are evaluated. The aim of providing equal opportunities between generations, therefore, maybe visibly met only if an assessment or evaluation framework for examining certain programs, plans and policies is established.

In the assessment of program/project implementation or in the evaluation of policies to determine success, a list of evaluative criteria are essential, representing policy values which are positively or negatively affected by a program or its elements (Lowry Jr. 1980 in Meister and Rosier 1992). Meister and Rosier quote a variety of criteria which can be used in evaluating policies at various levels of implementation: program logic

criteria, compliance criteria, process criteria, goal achievement criteria and impact criteria.

The ideal coastal environment is one which can cater for the opportunities and for the consumption of the present generation without compromising the same opportunities for future generations. Having enumerated the issues commonly observed in the coastal environment of developing nations, it is appropriate to relate the same set of issues to a set of criteria. Based on the issues (i.e. impacts, hazards, development needs and organizational problems), a list of criteria useful for determining a desirable end-state for the coast is presented below (also see Figure 2.1). The criteria considered are: water quality (including prevention of pollution at source and species diversity); carrying capacity; equity (including intrinsic values); coastal protection from hazards; economic efficiency; financial criteria; cooperation; administrative efficacy; and systems approach in planning.

2.3.1 Water Quality Criteria

It is seen in Section 2.2.1 that impact issues refer to the quality of coastal waters caused by pollution, etc. and to impacts on ecosystem types.

The desired end-state here is water quality which enables human use while maintaining marine ecosystem quality. An example would be a beach ecosystem which is fit for public bathing and at the same time can cater to the natural processes of other ecosystems (like shellfish, etc.) within the coast. However, to make sure that natural processes are maintained, three important factors are needed (Clark 1977): a diagnosis of the present ecosystem condition; identification of the sources of adverse and beneficial impacts; and measurement of the disturbances that the ecosystems are subjected. Tests conducted by ecologists and other experts to determine the present condition of the ecosystems are then used to relate to past conditions and practices. Results of such tests may serve as bases in formulating control measures regarding activities likely to cause

SECTOR	ECOLOGICAL		SOCIO-ECONOMIC	ORGANIZATIONAL/ INSTITUTIONAL
ISSUES	Impacts	Hazards	Developmental Issues	Organizational Process Problems
CRITERIA	Water Quality	Coastal Protection		Administrative Efficacy
	* prevention of pollution at source	Equity		Cooperation
	* species diversity	* intrinsic values	Economic Efficiency	
	Carrying Capacity		Financial Criteria	
SYSTEMS APPROACH				

Figure 2.1

Evaluation criteria for the coast

adverse effects in the future. However, the tests and diagnosis cannot be carried out without a formulation of criteria which will serve as guide for the evaluation team, hence a water quality criteria is essential.

Water quality criteria is defined as a:

...designated concentration of a constituent that when not exceeded will protect an organism, an organism community or a prescribed water use or quality with an adequate degree of safety (Johnson 1979, p 143).

The US Environmental Protection Agency set guidelines and/or standards in monitoring ecosystem conditions and in establishing performance standards. These provide an index of success for local coastal zone management parallel to pollution control. US EPA formulated both quantitative (numerical) standards and qualitative (non-numerical) criteria in the diagnosis of ecosystem conditions. Water quality standards maybe set for a typical estuarine zone, coastal water quality criteria for toxic substances other than biocides, recommended maximum concentrations of biocides in unfiltered water sampled at any time and any place, etc. There are also US EPA standards for pathogenic organisms in swimming waters and in non-swimming waters (200 faecal coliform per 100 millilitres of water; 2000 per 100 millilitres respectively). A normal minimum for a healthy ecosystem should have dissolved oxygen concentrations maintained at 6 ppm or higher. Artificially induced increases in temperature limit should not be more than 1.5° Fahrenheit in summer nor more than 4° Fahrenheit during the rest of the year (Clark 1977).

On the other hand, the Resource Management Act (1991) of New Zealand prescribes water quality standards according to each water class/use: Class AE water for aquatic ecosystem purposes; Class F water for fishery purposes; Class FS water for fish spawning purposes; Class SG water for the gathering/cultivation of shellfish for human consumption; Class CR water for contact recreation purposes; etc.. In the first four classes, it is not allowed to change the

natural temperature of the water by more than 3° Celsius. Other restrictions are provided in the Third Schedule of the Act in accordance with each water class (see Appendix H for the Third Schedule).

Because the RMA (1991) states narrative requirements on microbiological water quality of Class CR (McBride 1992), the New Zealand Department of Health provides provisional microbiological water quality guidelines to protect some NZ waters from recreational use, and for shellfish gathering for human consumption. Numerical limits on the faecal coliform organisms have formed the basis for standard in New Zealand. For marine waters, the requirement states that the median bacterial content of samples, taken over a bathing season, should not exceed 35 enterococci per 100 millilitres. The recommended upper limit is related to the level of recreational use:

Upper limit per 100 ml . . . enterococci	
Designated Bathing Beach	104
Moderate Use	153
Light Use	275
Infrequent Use	500

For shellfish gathering waters, the requirement states that the median faecal coliform content of samples collected over the gathering season should not exceed 14 MPN (Most Probable Number) per 100 ml, nor should more than 10% of samples exceed 43 MPN per 100 ml.

Similarly, the National Pollution Control Commission of the Philippines provides guidelines for acceptable water quality as follows (Maaliw 1990, McManus 1990):

Dissolved Oxygen	5 mg/l
Lead (Pb).	0.05 ppm
Cadmium.	0.01 ppm

Mercury in sediments. . . . 0.0002 ppm

Coliform Level. . . . 1,000 MPN/100ml

Like the other countries above, Malaysia recognizes the need for water quality criteria for coastal waters used for primary contact recreational purposes (bathing/ swimming) in order to protect the health of users. The proposed criterion for bathing waters is that the faecal coliform (FC) bacteria level should not exceed a log mean of 200 MPN/100 ml, as based on a minimum of five samples over a period of one month (Lim and Leong 1991). This criterion is further based on the recommendation of the US EPA in 1976 together with the other water quality criteria for aquaculture use of coastal waters. Aquatic species like shellfish require a high water quality criteria to be safe for human consumption, and the criterion level is set at 14 MPN/100 ml or less for medium FC bacterial concentration.

Apart from numerical standards, there are also some general non-quantified water quality criteria which are useful: nutrients, turbidity, circulation, salinity, sedimentation, productivity, habitat, biota and indicator species (Clark 1977). These are used where there is not sufficient basis for numerical standards. For these criteria, there are no established standards available to evaluate the effects of **nutrients** that cause eutrophication, or to estimate tolerable losses of **habitat**, etc. (Clark 1977). In the absence of national standards, descriptive restrictions are available: no discharge of substances is allowed that will result in **turbidity** levels deleterious to biota; no alteration in channels, basin geometry or freshwater inflow is allowed that would cause a permanent change of more than 10 per cent greater or lesser in **salinity** than the existing natural level; any detectable **sediment** in a water body is cause for concern because of adverse effects it brings to ecosystems; any significant reduction in the abundance and diversity of species (**biota**) is adverse; etc.

Water quality criteria for various countries, as illustrated in the above discussion, are usually numerical standards. On the other hand, qualitative water quality

criteria may be used in addition to numerical standards. They may be grouped into prevention of pollution at source, and species diversity.

2.3.1.1 Prevention of Pollution at Source

The issues related to the quality of coastal waters are so immense that they have not escaped the attention of international organizations (Chua 1991, IUCN 1991, Tadifa 1990, Viessman 1990). Clearly, then, this should be of concern at the national level. Coastal marine pollution is specially serious in developing countries, such as the Philippines, where the rapidly increasing population depends heavily on marine fisheries to meet protein requirements. The administrative boundaries of local governments make it more appropriate to require a national policy regarding pollution prevention at national government level.

Because eutrophication is evidence of ecological harm, the effects of nutrients causing it, and releases causing enrichment should be prevented. Turbidity levels need also be watched, as the changes in water circulation adversely affect ecosystems. Inflows that would cause 10% more than the natural saline level are considered unacceptable as so is any sign of sedimentation. Effects of soil discharge, dredging, land erosion, etc. in the form of silt and sediment are normally adverse.

2.3.1.2 Species Diversity

The variety of species in an ecosystem is an indication of sustainability. Any significant reduction in the abundance and diversity of species is adverse, just as is any loss of habitat and any loss or reduction of productivity. Thus, it is important that policies for coastal resource use and management should take into account the preservation, protection,

and enhancement of the diversity of species. The national level of government may develop policies pertaining to species diversity for species unique to the nation and other species of national importance. Likewise, species diversity may also be effectively considered at the regional level because some species may inhabit one region but not in another region.

If the right equipment is available, quantitative standards/criteria are easier to detect, hence, easier to implement. Qualitative criteria, on the other hand, may be just as useful, but without established standards it is difficult to detect the presence of contaminants, etc. Restrictive laws are preventatives which are impossible at this age especially with poor countries. Since one cannot stop abruptly an activity which is already a "tradition" or "in the system" of a country's people, it is practical to always have standards on which to base present status. Numerical standards/criteria provide easier calculations and sometimes nearly exact figures are produced which equip scientists/researchers/planners with data/information useful to present and future studies. While it is obvious that quantitative criteria are favourable, one cannot do away with the qualitative criteria. In cases where numerical standards are lacking or not specific, descriptive criteria can often be depended upon. It is, therefore, handy to use both types of criteria to carry out implementation of policies and programs successfully.

Summary 1:

Among the qualitative criteria mentioned above, nutrients, turbidity, circulation, salinity and sedimentation contribute to pollution, while productivity, habitat, biota and indicator species relate to species diversity. It is appropriate, then, to group water quality into prevention of pollution at source, and species diversity. Taking into consideration both numerical and qualitative water quality criteria, the following questions may be useful in the evaluation of coastal plans and policies:

- 1) Are there numerical water quality standards for fish habitats and recreation purposes (bathing, swimming, etc.)? Are these standards in accordance with international requirements or are they exclusively developed for the area?
- 2) Are qualitative water quality criteria considered? How are these addressed in policies and plans?
- 3) Are there measures (including economic instruments) provided for pollution prevention? Are sources of pollution (land-based and marine-based) required of control specifications (e.g. conduct of EIA and EIS)?
- 4) Are there laws provided to preserve diversity of species? What are the instruments used to detect reduction of species and productivity of species?
- 5) How are the needs of the population catered for while considering question 4? What measures are there for population control as a major cause of resource exploitation and pollution?

2.3.2. Carrying Capacity

Humans need to recognize that every ecosystem has a certain limit or range of limits, which, if exceeded, result in adverse effects or consequences affecting themselves. Coupled with this is recognition of the actions that will eventually increase the carrying capacities of ecosystems - in this case, the coastal ecosystems.

The IUCN (1991) recognizes the finite limits of the carrying capacity of the earth's ecosystems, and with its aim to allow development which is people-centred and conservation-based in a sustainable manner, recommends to all

nations to keep within the earth's carrying capacity. Normally, US EPA (1974) defines carrying capacity as the capacity of natural and human environments to accommodate or absorb change without experiencing conditions of instability and attendant degradation. Lindsay (1986) further defines carrying capacity as a function of the quantity of the ecosystem's resources, the tolerance of the resources, the number of users, the type of use, the design and management of the facilities involved, and the attitude and behaviour of the users and managers. These are all factors in determining an ecosystem's **elasticity** - how much an ecosystem can be manipulated without major change; **stress limits** - within which the system will still return to its original condition; and **resilience** - the ability of the system to withstand shock or perturbations.

Like all other natural resources, the coastal ecosystem has a certain carrying capacity. The issues in the first part of this chapter reveal that the most widespread problem encountered in the coast is water pollution through untreated and/or inadequately treated effluent discharge, run-off, sedimentation, oil spillage, etc., and resource depletion and degradation through illegitimate human intervention. In actual fact, the ability of the coastal environment to sustain particular levels of activity may already have been exceeded, especially in developing countries, where the end results relate to the socio-economic problems of coastal communities like poverty, low income, existing resources insufficient for the growing population, unhealthy environment, etc..

Pearce and Kirk (1986) enumerate three types of carrying capacity for coastal tourism: **environmental**, **physical**, and **social/perceptual**. The first is the level of tourist development or recreational activity beyond which the environment is degraded. The natural environment has the capacity to produce a certain output of products and assimilate a certain input of wastes. These two processes can take place without disruption of the integrity of the environment provided limits are not exceeded. An example would be the discharge into the coast of effluent from coastal communities and tailings from industries other than sewage from tourist facilities. It is vital to note that coastal waters have only a certain capacity

to absorb such discharges before adverse environmental effects may occur. The second type, physical, deals with the saturation of physical structures (hotels, marinas, etc.) along the coast and what number of these should be built before reaching saturation and creation of other severe environmental problems. The third type, social, deals with the diminished enjoyment of users/visitors (visual amenities). This may include the density/congestion, quality, cleanliness of surroundings, diversity of resources in the area, etc. depending on the attitude and behaviour of such users.

In addition to the three above, **resource** carrying capacity and **cultural** carrying capacity are also important, and may be included in the environmental carrying capacity, according to Pearce and Kirk's distinction. But, it seems appropriate to segregate the resources (i.e. reefs, mangroves, fisheries) from the environment in general, which is a much broader term. Resource carrying capacity would refer to how many users and consequent damage resources sustain without being damaged to the point where they become of least worth, or no worth at all. In addition to this, the carrying capacity of coral reefs (from tourism) will include "how much visual contact with other divers and snorkelers can the tourists tolerate without becoming dissatisfied" (Salm 1986). These two parameters for coral reefs can also be classified into environmental for the former and social for the latter. It is then easier to use resource carrying capacity for each resource whereby the three types may become parameters for any resource.

Another carrying capacity may be described as **cultural**. Different cultures have different beliefs and practices/traditions unique in their own way. Cultural carrying capacity would then refer to how much disturbance the areas/resources be allowed before indigenous people (and other cultures with strong beliefs of cultural tradition) believed an activity or the effects of that activity were interfering with their traditional and/or spiritual beliefs. An example would be the consequence of water quality problems which affect spiritual and food (mana) values for Maori in New Zealand. While cultural issues are not generally discussed in developing countries (primary focus is on poverty and its alleviation

in coastal communities), it is important that this carrying capacity is not overlooked because so many indigenous people depend on traditional practices in developing countries, especially in South-East Asia. Studies also reveal that the simple technologies of rural people in developing countries possess a fund of information that effectively enables them to manage their environment in ways that are sustainable over the long-term (Redclift 1991). While few publications have included them in current problem identification, they will be of greater concern in the future.

Another aim of the carrying capacity criterion is to increase the carrying capacities of ecosystems (the coast, the beach, the reefs, the fisheries, etc.). This aim can be achieved by applying measures which will diminish, if not prevent, human interactions reaching the carrying capacity (resilience, elastic and stress limits) of coastal ecosystems. These measures may include increasing public awareness, applying regulatory measures, creating alternatives and establishing protected marine areas (Salm 1986). Taking the coral reef as an example, Salm observes that educational tours (like waterproof booklet guides for underwater tourists) help redirect interests away from exploitation to appreciation and thus increase the carrying capacity of coral reefs. Low carrying capacities can also be augmented with the use of laws banning and/or controlling harmful activities such as spear fishing, souvenir collecting, etc. with appropriate penalties. Alternatives to injurious activities should be introduced to remove pressure and eliminate damage of the reefs. Lastly, Salm indicates that the establishment of marine protected areas is the best means of managing coral reefs with carrying capacity as a working objective. Here, implementing a zoning system is best suited, where the levels of use are controlled at acceptable levels by prohibiting or restricting access allowing only approved forms of activity such as research. It is recommended that application of zoning levels include classification according to the Recreation Opportunity Spectrum/ Recreation Opportunity Guide - ROS/ROG (Clark and Stankey 1979) and Limits of Acceptable Change - LAC (Stankey *et al.* 1985).

Summary 2:

Carrying capacity is a very vital criterion to gauge the sustainability of coastal resource management. The resilience/elasticity/stress limits of coastal resources should be made known to users through information systems so that effective preventive and/or remedial measures are developed. The following questions may be used:

- 1) Are there laws that consider carrying capacities of ecosystems? What are these?
- 2) Relating to question 1:
 - a) what provisions are there for considering environmental carrying capacity?
 - b) what provisions are there for considering physical carrying capacity?
 - c) what provisions are there for considering social carrying capacity?
 - d) what provisions are there for considering resource carrying capacity?
 - e) what provisions are there for considering cultural carrying capacity?
- 3) Is information on the carrying capacity limits of coastal resources included in the information systems of the government?
- 4) In the absence of an information system, how is the population educated/informed of the carrying capacity of the earth in general particularly the coastal ecosystems, and the role of humans in maintaining and not going beyond these carrying capacities?
- 5) Are indigenous people in the region given importance? What considerations are made with regard to their beliefs about the coastal environment and activities therein? Are these provided for in the laws at present?

2.3.3 Equity

The aim of this criterion is to provide equal opportunities to impoverished coastal residents without sacrificing the rights of ecosystems to live sustainably, and that ecological intrinsic values be recognized in support of the sustainable development of these.

Globally, equity is a major problem. Economically, developed nations do not have to be rich and powerful at the expense of poorer ones. People in rich

countries live luxuriously and carelessly while those in poor countries tend to suffer the consequences. There appears to be little reason behind Japan's intact forests while developing nations are being denuded to provide Japan with timber. It is necessary, therefore, to analyze factors contributing to imbalance and inequity.

While equity is ideal, it should be accepted that it is impossible to attain total equality between nations at the international level. However, nationally, development can trickle down to undeveloped local governments in an equal manner. This is attainable in rich countries, but not in developing nations. In these poorer nations, which are totally indebted to the World Bank and do not have funds for development or for social welfare, the main goal is survival, that is, alleviating poverty.

Relative to the conflicting uses of coastal resources, there has to be a policy to ensure that livelihood programs will not interfere with recreational and visual amenities as well as with other resource uses. Zoning and permit systems are ideal at the regional level for more effective compliance and results, i.e. fishing activities.

While equality is a concern among governments (local or national) and among humanity, rights of ecosystems have always been neglected. As human interaction with nature has led to the depletion and extinction of ecosystems, it is time that humans recognize a land ethic (Leopold 1979) which changes their role from conqueror to citizen. Such a land ethic would affirm the rights of ecosystems to continued existence in a natural state indicating balance of nature and ecojustice (justice for all).

The utilisation and modification of natural coastal communities to feed man's famished needs threaten the ecosystem on which everyone depend for survival. This globally felt deterioration of the coastal environment is attributed to human-interference (Horsley 1991, Lim and Leong 1991, Valencia 1991, Vande Vusse

1991, Kalagayan 1990, Tadifa 1990, Alabanza 1989, Tobin 1989, Yong 1989, Cronin 1988, etc.). In order that future generations can have the opportunity of consuming and enjoying the benefits from these ecosystems, two things are vital: the need to change management concepts and the perception or recognition of the intrinsic values of these ecosystems.

Firstly, Cronin (1988) confirms that management refers not much to managing ecosystems but focusing on managing the human interaction with ecosystems and the rate of utilization. This is an expression of the concept of sustainability which refers to the maintenance of the physical and biological systems which, in turn, support human activities. Secondly, the recognition of intrinsic values of coastal ecosystems regardless of what value they are to humans who must recognize that they are just members of the environment, similar to all other members, and interdependent with other species in order to live, every species, therefore, have a right to exist.

Intrinsic value theory considers, as criteria, life and autopoiesis (Fox 1990). It is not enough that one must possess interests and be alive in order to have economic values and be included in the planning framework of the environment. A value cannot often be placed on the ecosystems' amenity values for economic analysis, but they are values, nevertheless, in their own right (Horsley 1991). These intrinsic values must then be considered and integrated into the framework. Autopoiesis is a crucial criterion, suggesting all process-structures that continuously strive to regenerate their own organisational activity and structure included in the class of living systems (Fox 1990). Therefore, plants, animal species and other ecosystems are considered entities in their own right. Only the recognition of the intrinsic values of resources other than humans will give proper weighting in the whole ecosystem - that is ecobalance. Any human interference with the ecosystem must be justified - that is, an ethical obligation of man towards nature, or other resources, is essential.

Summary 3:

When considering equity criteria it is important to consider the provision of equal opportunities for all, i.e., humans and resources. In developing countries, an end for equity is to alleviate poverty. On the other hand, it is equally important to include the intrinsic values of resources. Both considerations are essential in obtaining sustainable development. The following questions may help assess equity considerations:

- 1) Is poverty an issue in the area considered? Is there an impact to coastal ecosystems resulting from poverty? What are these?
- 2) Are there government programs to alleviate human poverty? What are these?
- 3) In the attempt to provide equal opportunities for the people, what trade-offs are made? Are these in favour or at the expense of ecosystems?
- 4) Are intrinsic values of ecosystems considered in the provision of regulations?
- 5) How is information relayed to the people? Are the people informed of the importance of intrinsic values and the need to change attitudes and malpractice towards coastal ecosystems?

2.3.4 Coastal Protection

Here, the primary aim is to protect the coast and human resources from the coastal hazards enumerated in the preceding section (Hazard Issues). Relative to this, Sorensen and McCreary (1989) propose the implementation of critical area protection programs where areas are designated critical. In this regard, development is restricted in established critical areas to avoid harmful consequences to people and infrastructure (e.g. urbanization in flood plains, and agriculture on steep erodible slopes).

Hazards such as coastal erosion and river flooding are the result of the destruction of **dune systems**, functions of which are (Pearce and Kirk 1986): to accumulate reservoirs of sand in fair weather yielding it to the sea through scour during storms, offsetting and limiting the extent of erosion - the buffer role, and to prevent inland penetration of storm wave runup. Threats to these systems

may come from nature (such as storms, tsunamis, high energy winds and wave action) or from human induced conditions (like gravel extraction, depriving beaches of natural sand nourishment or destruction of natural barriers; and building structures such as houses, wharves, etc. which when destroyed by wave action, may add to the impact and erosive force of waves upon back lands) (Dixon and Sherman 1990, Clark 1977). **Coastal wetland** among others, serves as a storm barrier and shore stabilizer for the ecosystem. Likewise, **coral reefs** provide a natural barrier to protect the tropical shoreland from storms including wave damage.

It is clear that coastal ecosystems such as dunes, wetland and coral reefs have a role to play in the maintenance of natural coastal processes. Destruction of these will result in more serious environmental degradation. It is, therefore, appropriate to establish protection and prevention policies at the national level. Human intervention may be restricted to prevent hazards from affecting the ecosystems. Flood and erosion prevention measures are usually dependent on the geographical location of an area, the type of resources, the extent of degradation, the type of uses/users, etc. and, therefore, require regional administration.

Global hazards, of national concern, are the projected sea-level rise and resulting salt water intrusion. National leaders should see that effective measures be implemented in conjunction with international organizations and other nations.

Summary 4:

Coastal nations have serious problems regarding damage and other adverse impacts caused by hazards. The following questions are essential in developing coastal policy statements. Protecting coastal ecosystems from hazards, criteria may include questions such as:

- 1) Are there erosion prevention measures?
- 2) Are there structures or natural buffers to protect coastal ecosystems from hazards (floods, tsunamis, heavy winds, storms, etc.)?
- 3) Are there structures or natural buffers to protect coastal communities from hazards (floods, tsunamis, heavy winds, storms, etc.)?
- 4) What measures are present regarding sea level-rise and salt water intrusion?
- 5) Are zoning areas (critical areas) established for protection of properties and coastal ecosystems?

2.3.5 Economic Efficiency

Economic efficiency, a criterion that excludes wasteful solutions (Randall 1987), aims to attain objectives with the least cost, requiring that the marginal benefits of an activity exceed marginal costs. A cost effectiveness analysis is helpful in this regard (Meister and Rosier 1992) or a mere evaluation employing the CBA method. While this criterion provides for the cheapest means in the achievement of objectives, it does not distinguish between policies resulting in economic injury for some and policies resulting in economic injury for no one. Under economic efficiency criterion alone, "it is irrelevant whose ox is gored" (Randall 1987:138). This leads to a consideration of the **Pareto-safety criterion**.

As a policy rule, the *pareto-safety criterion* protects individuals from being made less well-off by actions imposed on them by government. Any change that would make resource users better off without making coastal resources worse off is a pareto improvement. Efficiency alone denotes that there is an optimal bracket

whereby a policy improvement moves; any movement beyond that bracket will make economic injury to either of the two recipients.

Summary 5:

Value judgments and trade-offs are necessary in undergoing relevant questions that involve efficiency. Taking into consideration, the impact issues (number 1 in Figure [Appendix] E.1) as an example, the following are relevant questions in the analysis of coastal policies:

- 1) With the new water quality (standard) policy, who are the beneficiaries (direct and indirect)?
- 2) Concerning polluters, what costs are incurred in relation to question 1?
- 3) What are the goods/things given up and/or regulated by industries/households to increase fish yields?
- 4) Are there zoning regulations, etc. with regard to question 3?
- 5) What degree of uncertainty is there on the part of users/beneficiaries, polluters as well as resources regarding adverse and beneficial impacts?

2.3.6 Financial Criteria

Funds are needed for a wide variety of activities as no policy or plan can ever be conceived or implemented without fund allocation. Every step taken requires an equivalent funding. Lack of funds is the most common constraint for effectively carrying out a program or an activity (Dixon and Sherman 1990). Redclift (1991) confirms that financial criteria are determinants in the inception of a project, the disbursement of funds being considered of great importance and usually assigned to development agencies. Generally, national government funding is a matter of public interest and people expect transparency from the

administration regarding the budget. The transparency of fund allocation is explicitly revealed in public documents such as plans and programs.

Summary 6:

Some relevant questions regarding the financial criterion are:

- 1) Is there adequate funding from the government to implement policy?
- 2) If there is lack of funds, what other sources are available (i.e. private financing, foreign loan, international assistance, revenues from activities in protected areas, etc.)?
- 3) Where funding is scarce, what is the prioritization scheme employed?
- 4) Are activities prioritized where they are expected to yield the highest rate of return for every dollar spent?
- 5) On issues of fund allocation, what considerations are taken?

2.3.7 Cooperation

The aim of this criterion is to encourage all people to play a role in the sustainable management of coastal resources and to instill in them their worth as guardians and members of the symbiotic society.

IUCN (1991) supports the maintenance and sustainable use of the natural wealth of coastal zones and the oceans and requires cooperative action as a national policy. Supporting this, the IUCN proposes greater involvement on the part of local communities (e.g. subsistence fishermen, ethnic groups, land owners, social classes) in the management of marine resources, encouraging them to care for their own environment (Primary Environmental Care). These same communities are said to be the less organized groups in coastal management (Sorensen and McCreary 1989) and their cooperation/participation alone in sustainable

environmental activities is not a guarantee for effectiveness and/or success. Sorensen and McCreary enumerate other key personnel who are more organized to coordinate with the communities: elected officials, political parties, national and sub-national agencies with sectoral responsibilities, state-owned enterprises and semi-government corporations, private industries, multinational corporations, international assistance organizations, scientific researchers, conservation organizations and other non-governmental organizations. IUCN (1991) recommends that all interest groups should be full partners with central government in decisions on policies, programs and projects that directly affect them, their environments and the resources on which they depend. Where possible, and especially for projects that do not significantly affect the national interest, communities and organizations should make the decisions themselves. Jolliffe and Pattman (1985) also reiterate the need for cooperation among government agencies having management responsibilities of the same ecosystems, and argue that overlapping functional and spatial jurisdictions are undesirable because of the rise of more unpredictable conflicts.

In response to the above recommendations, several countries adhere to cooperation and public participation. In the Philippines, legislation states that NGOs have vital roles in the community, representing different sectors and required to participate in the planning processes from inception to implementation to monitoring and evaluation. NGOs also serve as mediators for all local government activities, often serving the interests of the majority (especially the less privileged) better than the elected representatives/officials. While many countries recognize the participation of communities in the planning process, they do not specify the roles of NGOs in their plans.

The cooperation and participation of ethnic groups in coastal management are well documented in other legislation such as the draft New Zealand Coastal Policy Statement. In the Solomon Islands, the practice of customary marine tenure (fishing) is recognized by government as one solution to fish resource

depletion (Hviding 1991). A number of Pacific Island nations do recognize customs and traditions because these practices have proven sustainable.

Because full participation of every individual in the community is not enough to achieve desired objectives, there needs to be education (formal and informal), information dissemination (organizational meetings and media), recognition of an ethic for sustainable living as well as value reformation from all interest groups. Information is rarely passed on to remote areas, and often, ethnic groups, subsistence dwellers and other coastal communities lack awareness regarding the degradation of their environment. It is on these areas that dissemination of information and informal education should be focused, to explain national and/or local policies.

Summary 7:

Cooperation is an essential ingredient to success. It is easy to consider because it concerns only discipline and the willingness to change adverse practices and inconsiderate values towards resource use. In order to achieve sustainable living, cooperation among resource users is necessary. Social classes and other groups of coastal resource users (including land users) should be informed of the IUCN requirements such as changing of personal attitudes and practices which result in adverse impacts to the coastal environment; respecting and caring for the community for life; keeping within the earth's carrying capacity; etc. Some helpful questions are:

- 1) What schemes are there to ensure that communities and other interest groups participate and cooperate in government activities re conservation of resources?
- 2) How are the policies absorbed by the users? What are the reactions of these towards international, national, regional and local policies?
- 3) Are roles of user groups and administrators implementing the CPS defined and specific?
- 4) How does central government grant coastal communities management of their own affairs and decide for themselves what is good for their environment?
- 5) What uncertainties exist with regards to the other questions?

2.3.8 Administrative Efficacy

The aim of including administrative efficiency in the list of criteria for effective coastal policy analysis is to have improved and simplified planning and management.

The productivity of policies is dependent on the administration of government (local and national). It is observed, though, that efficacy is apparent in the long-term, for Hildebrand (1988) notes that, in the USA, improvements under state and local programs were evident for 16 years after the passing of the coastal zone management scheme which permitted processes leading to greater administrative efficiency and reduced project costs.

The demand for technology and skills for administrators are important considerations, basic to solving the increasing range of complex and difficult coastal problems. Coral reef destruction may be resolved by introducing simple technologies such as the creation of artificial reefs by dumping tires and ship hulks which create marine habitats for certain marine species. This may provide new opportunities for fishing (commercial and recreational) in the long-term. The technology of artificial wetland in solving domestic sewage/wastes, and other land-based pollution source problems is an example of technology introduced to trap sediment and other dangerous pollutants before flowing to the coast.

Summary 8:

While technology is vital, decisions to adopt management measures are dependent on the policies and schemes of administrators as approved by decision-makers. Thus, efficacy is based on the actions taken by coastal managers. The following questions are ideal considerations:

- 1) Does the area under consideration observe an integrated coastal management system?
- 2) Are managers and administrators of the coast equipped with the necessary skills and technology to forego with their duties and responsibilities? Do they attend training to learn the latest applicable technology?
- 3) What are the measures undertaken by government to achieve administrative efficacy?
- 4) Is there adequate support (financial and legislative approval) from government with regard to adoption of new schemes for the betterment of coastal zone condition?
- 5) Are the policies aimed at achieving efficiency strictly observed? How is graft and corruption controlled? Do politicians interfere in the implementation of management schemes?

2.3.9 Systems Approach

The coastal zone is composed of a variety of ecosystems which include processes and elements such as fauna and flora. The complex coastal ecological processes, make fragmental analysis of the plans/policies for the coastal zone insufficient and impractical. In addressing coastal pollution problems, both the land-based and water-based causes of pollution (i.e. including indirect or secondary sources) must be considered, together with the integration of agencies having administrative management responsibilities. A systems approach, therefore, is the most appropriate when dealing with complex coastal ecosystems.

A system is composed of various elements called subsystems, where each element is necessary for existence for each action done to one element affects the whole system, the degree of degradation and/or benefit varied, and sometimes arbitrary, depending on the amount of pressure imposed. A systems approach then, enables the inter-relationships between and among attributes of certain phenomena to be covered.

Relevant data, gathered in the evaluation of the coastal zone, needs to be organized in order to provide structured and systematic insight. This calls for an information system, defined by Nijkamp and Rietveld (1989) as any kind of systematic and coherent analytic decision-support system for planners and policy makers.

Generally, information systems increase knowledge about all systems and the interdependencies of people and coastal ecosystems. Eventually, there is a decrease in uncertainty, bringing order to a complex dynamic environment.

Transformation of data into information entails operations such as capturing, verifying, classifying, arranging, summarizing, calculating, forecasting, simulating, sorting, retrieving and communicating. Clearly, this system will achieve additional desired objectives from an established data base.

Many previous problems centred on inadequate information, which lead to policy and program failures. An information system, with the operations mentioned above, will ensure that all needed information (at least, the known information at the time) is available and can be relied on. Though developed countries have already established their own information systems, it will take time for developing nations - considering the funding and technology involved - to develop the most appropriate starting level. However, regional levels often use the bottom-up approach in gathering information, i.e., data is sent to regional authorities by the LGUs. The role of the national level will be the collation of

all regional inputs, and thus a national information system will establish links both horizontally (within) and vertically (international).

Whether analysing coastal management as a whole or by sectors (fisheries or mangroves), it is desirable to have reliable information about the opportunities and consequences of coastal development. While Sorensen and McCreary (1989) agree, they also confirm that several analysts have commented on the importance and the difficulty of achieving a sound technical data base for coastal management. Maclean (1989) refutes this in regard to the fisheries sector in developing nations, for there exists in this sector an abundance of sources and resources from different agencies providing relevant information.

With the establishment of regional networks, the SEAFIS (South-East Asian Fisheries Information System) recommends a guideline especially for developing countries with scarce or limited resources:

- 1) In order to minimize if not eliminate unnecessary duplication of efforts in the development of information systems owing to the limited regional resources, cooperation and coordination among the various information agencies/systems should be realized. To achieve this, a coordinating committee to take charge of the development of fisheries and aquaculture information systems and services in the region should be established.
- 2) The terms of reference of the coordinating committee should be to develop a regional cooperative program for training, research on needs and impact, development of products and services, to act as a regional monitoring and review body, and as a catalyst to mobilize resources within and beyond the region.
- 3) In order to strengthen the national information systems, national ministries should allocate adequate resources for the development of

appropriate products and services until such time as they become essentially self-supporting.

- 4) To achieve standardization in data processing suitable software will be continually evaluated.
- 5) To ensure the effective use of library resource utilization, journal subscriptions should be regularly assessed. Libraries of national institutions should be encouraged to develop cooperative programs to share limited resources available.
- 6) A standard methodology should be employed to facilitate exchange of information among countries. International institutions with the facilities and the capability to conduct training should be used with assistance from FAO.

Sorensen and McCreary (1989) cite several cases of plan and program failure due to lack of data; some because of lack of information about natural systems which hindered the implementation of the Washington Shoreline Management Act; the lack of adequate data and maps for environmental assessment and policy making in developing countries; and the lack of good technical information which weakened the Californian Coastal Plan Commission's ability to defend its jurisdictional boundary.

Summary 9:

A very important consideration in the study of coastal ecosystems is a systems view. Systems approach to planning for ecosystems in a complex environment is necessary in order to cover all affected areas and entities. This enables planners, users and interest groups to avoid overlooking the interconnections of essential systems.

Consideration of a systems approach includes the integration of management and the development of an information system. These are vital factors in order to avoid program/policy/plan failure. Among the important questions to be asked are:

- 1) Is management planning of the coast based on a systems approach? Are policies such that interconnections of ecosystems and the people/resource users considered?
- 2) Are policies for resource use and management of the coast formulated on an integrated approach?
- 3) Is there an information system installed at the national level, regional level and local level? Are these maintained in a network?
- 4) Does the information system provide for the participation of the public, the NGOs and other organizations/institutions? How is information transferred to the people?
- 5) How does the information system work with regard to:
 - a) aiding integrated multi-disciplinary analysis?
 - b) making a contribution to operational and empirically-oriented scientific research?
 - c) increasing the effectiveness of policy making and planning?
 - d) contributing to building, testing and using practical models?
 - e) rationalizing conflicting interests between groups or decision agencies?

2.4 Conclusion

The preceding sections identify major issues having social and ecological as well as economic impacts commonly experienced by coastal nations. In response to these problems, a list of criteria are enumerated which will serve as guides in the analysis

and/or evaluation of the effectiveness of national and state coastal policy statements (Chapter Four). Based on the general principle of sustainable development and with reference to the literature and the IUCN requirements among others, the developed criteria are expected to help policy makers discover problems and positive outcomes in present policies, enabling them to formulate more effective and efficient ones in the future. The set of criteria appropriate for evaluating coastal policy statements is presented in Figure 2.1.

The following chapter presents an evaluation framework for analysing coastal plans/policies/programs. The set of criteria developed in this chapter are the inputs to the framework's second phase.

CHAPTER THREE

REVIEW OF EVALUATION METHODS

The purpose of this chapter is to select an appropriate evaluation method for evaluating coastal policy statements, based on the most appropriate set of ideal characteristics. This chapter also aims to reinforce the role of evaluation in developing plans, policy statements and programs, and to develop a framework for the evaluation of coastal plans (or any plan) using the criteria developed in Chapter Two, which is later used to evaluate various coastal policy statements discussed in Chapter Four.

3.1 Introduction

The era of the 1980s presented a shift from urban planning into environmental planning with a focus on combining conservation with development in a sustainable fashion. Emphasis was also made on the responsibilities and policies which were to emanate from all levels of government: national, regional, local. Eventually, many states would adopt this hierarchy of policy. However, there is a need to test the effectiveness of such policies at a national level, in evaluating areas for improvement, to achieve the goals and objectives to benefit humans and ecosystems.

Evaluation is concerned with the assessment of particular consequences of planning proposals for the individuals or groups of individuals in a community or any system/subsystem that one is planning:

With regard to policies, evaluation can be said to be the assessment of a policy's relevance, performance, efficiency and impact in the context of its stated objectives (Meister and Rosier 1992, p 14)

Normally, the purpose of evaluation is to assess the advantages and disadvantages of a given plan/program and to make comparisons across competing alternatives. The social

benefits of a program are assessed along with an analysis of program benefits and costs, as advantages and disadvantages can only be judged in relation to specific criteria (Lichfield, *et al.* 1975). The process of evaluation assists designers in producing new and better alternatives for policies and plans.

The evaluation process needs to be administered along a continuum in order to assess the outcome of certain plans and policies and to analyze the extent of goal-achievement; the preference of implementation results by consumers or affected parties, and the acceptability of the plan by those concerned including natural ecosystems which can be interpreted by environmentalists and other disciplines.

The evaluation phase is the step in the planning process which makes it cyclic in nature, using the results as inputs to the next cycle. The results of evaluation, too, are used in forming more sound alternatives, apart from being guides in aiding decision-makers arrive at a decision regarding plans and/or policies.

McAllister (1986) argues that there are two phases in evaluation: analysis and synthesis. Here, a proposed policy is analyzed according to the disaggregation of the various impacts of the action/policy. Though it is necessary to analyze the many consequences individually to gain a more detailed understanding, there occurs a dilemma in the achievement of their coherence. This is an objective type of analysis since it is systematic, and the correctness of the results is verifiable. To solve the dilemma of achieving coherence, the second phase is applied. Synthesis brings together the impacts into an integrated view arriving at a judgement which either accepts or rejects. The result of this phase, though, is subject to the values of different people making the decisions.

Nachmias (1979) asserts that there are two types of research that evaluation should have in order to be comprehensive, process evaluation and impact evaluation. The former is concerned with the extent to which a particular policy is implemented according to its stated guidelines. The latter is concerned with the extent to which a policy causes a change in the intended direction. Similarly, many planners advocate the conduct of *ex-*

ante, *in-process* and *ex-post* evaluations. Hill (1980) attests that each type is equally important as the other. Both groups (Nachmias and Hill), are trying to determine whether policy changes are consistent with the intended outcomes, or otherwise.

The *in-process* evaluation, as the term implies, has something to do with evaluating the effect of the plan while it is under implementation. This term may also be used with the evaluation in the other stages of the rational planning process, and for aiding decisions periodically (Hill 1980). The last kind is the *ex-post* evaluation. Here, it is implicitly clear that this is used to aid decisions based on the impact of the plan; therefore, it is carried out after the plan or portions of the plan have been implemented. Here, it determines whether the actual impact of the plan is favourable to the affected population, and *ex-post* evaluation results serve as important inputs in the next planning cycle.

Ex-ante evaluation of alternatives, at one point in time, is carried out as part of a planning process which concentrates on the preparation of a plan (Voogd 1983, Hill 1980). Unlike *ex-post* evaluation, *ex-ante* evaluation has a forward looking nature because it is carried out before implementation of the adopted plan or before the plan is submitted for approval by decision-makers or by parliament. *Ex-ante* evaluation looks at the internal consistency of the plan, ideally, determining the extent to which the programs and projects can achieve the planned targets or stipulated goals and objectives. This type of evaluation also determines whether the plan will produce the most desirable resource allocation pattern during the plan period (Chatterjee and Nijkamp 1983). In the case studies to be evaluated, only the *ex-ante* evaluation will be applied, as it is too premature to conduct an investigation into the other two.

Evaluation, according to Hill, is necessary not only for future policy decisions but also for aiding periodic decisions in urban and regional development. Therefore, evaluation should be carried out before and during implementation and after a period of implementation. Carried out singularly, each type of evaluation is not adequate for the planning of any system, including coastal systems, because of continuous changes in the environment.

Results of evaluation provide a guide to making better sound decisions but are not decisions themselves. The conclusions are just one source of information which is taken into account by decision-makers when adopting policies/plans/programs. All information has to compete with political values and ideologies, and the vested interests of policy makers. However, this should not discourage planners from deriving optimum solutions to problems. They need to justify their recommendations to policy makers and also to the general public. Traditionally, planners serve as the technical advisors to decision-makers, their recommendation often deemed to be the best choice and thereby carries a greater weight than the other factors, according to persons outside the planning team. It is, therefore, essential to carefully choose an evaluation method according to a set of criteria to ensure that the bias of the evaluation team is minimised to achieve better end results as well as fairer decisions.

The aim of this chapter is to present the criteria suggested by various theorists to assess the suitability of evaluation methods in various situations, and to critique a number of evaluation methods for their relevance in analyzing the suitability of policies in national coastal policy statements for their applicability in the Philippines' coastal planning regime. Finally, a conceptual evaluation framework will be developed to analyze Coastal Policy Statements from various countries and states.

3.2 Ideal Characteristics of Evaluation Methods

In the selection of the most appropriate method for a particular problem situation, it is initially important to examine what sort of end-product is needed, what are the existing situations, possibilities, etc. before concluding if an *ex-ante*, *in-process* or *ex-post* evaluation is to be employed. Then, with all the existing information, it is necessary to note if a formal or informal evaluation method is to be applied in the process.

McAllister (1986) present six criteria for assessing evaluation methods: systematic, comprehensive, simple, quick, cheap and legally acceptable. Evaluation methods are selected and judged in accordance with the six characteristics which serve as guides to

the evaluation team. Along with McAllister's ideal criteria, the following is a list of characteristics necessary in assessing evaluation methods: systematic, rational, comprehensive, integrative, flexible, simple, quick, inexpensive, legally acceptable, and open-ended.

3.2.1 Systematic

Evaluation of plans/policies should be systematic, scientifically sound and should achieve rationality. Analysis of alternative plans should be reviewed systematically. A thorough systematic analysis is essential to define problems so that opportunities for improvement are pointed out. Steps in the evaluation process should be made in order, so that other individuals will not have difficulty in following the procedures and obtain similar results (McAllister 1986).

3.2.2 Rational

The evaluation method/technique to be selected should be rational. That is, it should be sensible to the needs of the different people affected by the policy. In cases where a trade-off or weighting is needed, a sense of pragmatism may be employed.

3.2.3 Comprehensive

Planners should ensure that the evaluation method/technique they select is comprehensive and is designed to fit the requirements of a particular situation. The selected method/technique should be capable of taking into account all of the factors relevant to the decision it is intended to aid (McAllister 1986). They should take note of the limitations, advantages as well as disadvantages of each towards the differently affected disciplines in order that the problem at hand will

be dealt with by that technique or combination of methods which is deemed most suited for it.

3.2.4 Integrative

An integrated systems view of analysis should be a guiding principle (see Systems Approach in Chapter Two). Where there are a number of agencies involved in management, where there are different groups of people and ecosystems affected, and where there are a number of sectors benefitting or adversely affected, integration is an essential consideration. An integrated approach is the answer to the burgeoning management and rapid degradation that the coastal environment is subjected to at present.

3.2.5 Flexible

The method should take into account all of the factors relevant to the intended decision because decisions are a focal point in evaluation. Despite a correct decision to undertake a policy/plan, a realization of failure may occur due to unforeseeable developments or uncertainties during implementation. The beneficial effects that the method/technique is intended to give may turn out to be adverse due to some externalities. Therefore, it is essential to include flexibility, because flexibility enables decision-makers to consider or allow contingencies in times of crisis.

3.2.6 Simple

Simplicity is one characteristic any evaluation method should have so all groups can easily understand the results. The evaluation method/technique should not

be so complicated that only few people are able to use it, or comprehend the results (McAllister 1986).

3.2.7 Quick

The treatment of time preference is a vital variable in the application of an evaluation technique. Valuations should cater to sensitive estimates as the plans are usually long-term. People who use the method/technique should be able to generate solutions to issues and problems within a reasonable length of time.

3.2.8 Inexpensive

The results in using the appropriate method/technique should generate information requiring an inexpensive budget. The expenses incurred should be reasonably within the planned evaluation budget. The costs should not only include monies but also the potential savings in resources, time and energy.

3.2.9 Legally Acceptable

The method/technique should conform to the various legal and administrative requirements to which it is subject (McAllister 1986). It should be acceptable to the population socially and legally, and within the carrying capacity for the coastal resources. Acceptability on the part of all sectors enhances administrative cooperation of the people concerned (such as the administrators, managers, the public, agencies, and organizations) which is an essential criterion for effectiveness. With regard to the coastal environment, what is acceptable to the population, generally, is acceptable to the ecosystems.

3.2.10 Open-ended

To allow for impromptu innovations and refinements, which result in a more superior alternative, the process should be open-ended, indicating a cyclical process. This means that there is always room for improvement.

Other considerations in the selection of an appropriate method for evaluating coastal plans are reference points and boundaries of the problem area. There should be a baseline or a conventional reference point that is established before weighting information on the consequences or impacts of alternatives. The limits of geographical boundaries, for the study area, must be established in relation to the impacts expected to occur beyond the defined study area.

3.3 Choosing an Evaluation Method

The range of evaluation methods available is presented in Appendix I. They usually fall into one of two groupings: informal and formal (Meister and Rosier, 1992; Hill, 1980). Informal evaluation examines the effectiveness from very little information. Among these are the minimum requirements approach, topic evaluation and composite evaluation. Formal evaluation methods have a well-defined structure and criteria to evaluate strategies for the future. Cost Benefit Analysis/Social Cost Benefit Analysis (CBA/SCBA), Planning Balance Sheet/ Planning Balance Sheet Analysis (PBS/PBSA), Goals-Achievement Matrix (GAM) and Multi-criteria Analysis (MCA) are examples of these. The majority of these methods focus attention on optimizing principles. In policy practice, however, evaluation is often used as a means of justifying policy decisions.

3.4 Critique of Evaluation Methods

In this section, a series of evaluation methods is assessed with respect to a number of ideal characteristics in order to have the most appropriate evaluation method for evaluating plans under certain conditions.

Table 3.1 presents the informal and formal evaluation methods assessed with respect to characteristics outlined in the previous section. The first column lists the evaluation method considered in the assessment. The major characteristics which methods should have are indicated in columns 2-11. The last column shows the key attributes of each method, and these are the principal functions that a method is known for. The symbol * indicates that a particular method possesses a characteristic to a high degree, while the symbol @ denotes that the method does not share that characteristic. The following summary highlights the advantages and disadvantages of each of the methods assessed (see Appendix I).

3.4.1 Minimum Requirements Approach

Because it is basic and has little need for generating sophisticated information, the Minimum Requirements Approach (MRA) can readily guide people into following its procedure, hence evaluation results are comprehensible, making this approach systematic. Trying to arrive at a compromise to satisfy nearly all affected parties includes ecosystems, MRA is a rational method. MRA also encompasses all requirements of interest groups having multiple objectives, hence is comprehensive and integrative. Since MRA tries to satisfy all affected groups, obviously it will not be hard for people to accept its use legally, and socially, its procedure of conducting dialogues is acceptable. Surely this method is open-ended because it allows sharing of information and because it tries to arrive at a compromise with the satisfaction of all participants. Clearly then, flexibility is not a problem. Because trying to meet all requirements of various groups with multiple objectives may be a complicated task MRA can become

Table 3.1

Choosing an appropriate evaluation method
with respect to a set of characteristics

EVALUATION METHOD/ TECHNIQUE	C R I T E R I A	S Y S T E M A T I C	R A T I O N A L	C O M P R E H E N S I V E	I N T E G R A T I V E	F L E X I B L E	S I M P L E	Q U I C K	I N E X P E N S I V E	A C C E P T A B L E	O P E N - E N D E D	KEY ATTRIBUTE
A. INFORMAL EVALUATION												
1. Minimum Requirements Approach	*	*	*	*	*	*	@	@	@	*	*	-participatory planning -conflict resolution *
2. Topic Evaluation	*	@	@	@	*	*	*	*	*	*	*	-best with minimal information
3. Composite Evaluation	*	@	*	*	*	*	@	@	@	*	*	-considers all characteristics of policies
B. FORMAL EVALUATION												
1. Social Cost Benefit Analysis	*	@	@	@	@	@	*	*	@	*	@	-reflects values of all people -purely economic -measurement units understood
2. Planning Balance Sheet Analysis	*	@	*	@	*	@	@	@	@	*	*	-includes intangibles and externalities but different objectives
3. Goals-Achievement Matrix	@	*	*	*	*	*	@	@	@	*	*	-compares costs and benefits (monetary/non-monetary/qualitative) of the same objective

complicated, and complex applications of the method may be time consuming and costly.

3.4.2 Topic Evaluation

Topic evaluation is a very simple method which can be used even with minimal information. However, topic evaluation is criticized as having too many shortcomings such as lack of rationality, simplistic methodology and marginal consideration of cost. This, then, can limit the comprehensiveness of any application and means that there is a lack of integration of objectives. Little information is needed in topic evaluation to complete the evaluation process which is cyclic (see Section 3.5). With consideration of uncertainty and externalities, new information may be gathered and fed in the process before results are even known. The cyclic nature of the evaluation process developed makes topic evaluation flexible. It may also be said that this type of evaluation is open-ended and systematic. Since topic evaluation is simple, inexpensive, not time consuming to implement, and can generate results quickly, it will be acceptable to various sectors.

3.4.3 Composite Evaluation

The main difference between topic evaluation and composite evaluation is the degree of scrutiny applied. Hence, this method has a more systematic way of obtaining results. Like topic evaluation, it is lacking in rationality but as it considers all characteristics of policies it may be referred to as comprehensive. While it is integrative in the sense that it relates goals with performance and compares costs and benefits from each opted policy, this makes it complicated and the time required for the evaluation is longer, and costs will be higher. Economically it may not be so acceptable. Its comprehensiveness and integrative

attributes, however, are socially acceptable. As this method is flexible and open-ended, it is similar to topic evaluation.

3.4.4 Social Cost Benefit Analysis

The CBA/SCBA is the most widely used evaluation method because it has been in use for years and its measurement units are easily understood. While it is systematic in this sense, criticisms such as discounting are many. The length of time CBA/SCBA has been in use makes it simple for people to implement and follow, and, therefore, it is quicker to do. This method used to be acceptable legally and socially although some experts like Hill and Lichfield still have something to say against it (see Sections 3.4.5 and 3.4.6). It is easy to use, and not necessarily costly. CBA/SCBA is not comprehensive and not integrative, not including uncertainty and externalities. Its concern is putting monetary values to benefits and costs including aesthetics and intangibles. The inaccuracy here, and the discounting method done are signs of irrationality. Also, the fact that its main objective is purely economic is not rational at all. Obviously, because of the critiques seen with this method, it may not be flexible and open-ended.

Major criticisms of this method are on the measurement of costs and benefits, the establishment of discount rates, the account of risk and uncertainty, the valuation of intangibles and externalities and the attention given to distributional equity, among others. The issue of the accuracy of the measurement of costs and benefits is an important point of CBA/SCBA's critics. If there is no accurate monetary valuation for goods lacking in exchange markets (Shefer and Kaess 1990), how can evaluation teams quantify intangibles such as welfare/happiness and aesthetics? Indeed, there is a high degree of uncertainty in measuring these. Another problem seen with CBA/SCBA is the use of discount rates and the various ways of calculating discounted values. Discounting is concerned with assumptions on future profits and losses from private and public sector projects and their effects on the national and international investments. It is seen, then,

that accuracy in discounting the future rate depends on the accuracy of the inflation rate prediction. Accounting for risk and uncertainty effects, as claimed by CBA/SCBA critics, is usually ignored and if otherwise, cannot be calculated. To this Bohm and Henry (1979) argue that if applied with its proper framework, CBA/SCBA can be a valuable tool for minimizing the uncertainty of environmental decisions, especially those involving large projects with irreversible consequences.

Intangibles and externalities raise questions regarding the transferability of monetary quantification and the utility of CBA/SCBA in environmental and other development issues (Shefer and Voogd 1990, p 101)

Hill (1968) also argues that CBA/SCBA does not properly deal with allocational and political issues which are often major issues in the ultimate success of projects and programs. Lastly, there is a problem of distributional equity with the CBA/SCBA method. This refers to unavoidable biases in the line of welfare economics with regard to the full beneficiaries, partial beneficiaries and sometimes non-beneficiaries. Furthermore, the choice of monetary values can lead consciously or unconsciously to undesirable equity conditions.

3.4.5 Planning Balance Sheet Analysis

PBS/PBSA is a variation of CBA/SCBA, so its procedure and evaluation results can be easily understood by users and all affected sectors. This method includes aesthetics and intangibles/externalities in its computation of cost and benefits, and serves the interests of all affected people having various objectives. Many people advocate PBS/PBSA use because of its comprehensiveness and integration, although PBS/PBSA is not a simple method. The assignment of different units/measures in cost and benefit valuation in different objectives makes it difficult to aggregate, which requires ample time and considerable cost. The aggregation is left to the value judgment of the evaluation team, hence the

evaluation team's role requires flexibility and open-endedness. As with CBA/SCBA, PBS/PBSA is criticized as lacking in rationality.

Since PBS/PBSA is a variation of CBA/SCBA, both possess similar advantages and disadvantages. McAllister (1986) in his review of the method noted two important disadvantages. First, the procedures for PBS/PBSA require that the evaluator select the impact categories on the basis of transactions. Certain types of environmental, social and political impacts may be overlooked or neglected if transactions such as financial ones dominate the selection. Second, the evaluator using PBS/PBSA is permitted to make major value judgements in the determination of the most advantageous plan for each sector. It is important to note that personal value judgments should not be formally inserted in the evaluation process. Contrary to PBS/PBSA, CBA/SCBA does not formally permit this, although there is no avoidance of it occurring by informal means. Another major critique of PBS/PBSA is that

monetary measures, quantitative measures and qualitative judgements are superimposed one upon the other in a somewhat confusing array (Peters 1973 in Shefer and Voogd 1990, p 81)

Clearly, with these results, it is impossible to aggregate each measure having different units of measurement. The question is, how can one combine the different measures, which refer to different objectives? According to Hill (1968), it is only meaningful to add or compare costs and benefits if they are a common objective.

3.4.6 Goals-Achievement Matrix

Seen as an extension of PBS/PBSA, which is also a refinement of CBA/SCBA, the GAM is concerned of giving weights to multiple objectives from various sectors. This is the controversial part of this method. Aside from being complicated it requires much time to apply and is expensive as well. Though

it has a system of its own, it takes time for lay persons to follow. However, Hill (1968) claims that his method is a rational method considering multiple goals/objectives including unquantifiables. GAM is also seen as comprehensive and integrates the weighting of objectives, activities, locations and the sectors concerned. GAM is likewise acceptable because it shows and confirms the achievement of goals which is the main reason for having policies in the first place. As Shefer and Kaess (1990) observe, GAM is an open framework allowing planners to broaden their advisory skills, making it flexible.

The weighting component attached to GAM brought about the method's major criticism. Chadwick summarized weighting as:

...a process which is not only unlikely, but theoretically impossible, unless some kind of process of registering choice and agreement to the emendation of choice is available. And how might interest groups agree to a weighting which placed their own weight lower than others in ranking? (Chadwick 1971, p 269)

GAM outlines a more explicit role of goals during evaluation while also taking awareness of community objectives enumerated by decision-makers or politicians or sectoral groups. This led the critics of the method to feeling that GAM over emphasizes the influence of goals. Later Hill attempted to introduce more concrete measures to sharpen his approach, and working with different planners tried to combine GAM with other methods such as linear programming and the Boolean method. Hill also developed a procedure for conflict resolution. Shefer and Kaess (1990) note that GAM is a more open framework and encourages the planner to take a more advisory role in the planning process. They observed that

Hill did not discount the technical aspects of evaluation, yet his concern with the deliberate inclusion of citizen's groups and decision-makers in studies went well beyond that of PBS (Shefer and Kaess 1990, p 103)

Thus it is clear that any conceptual evaluation framework derived for use in coastal planning should require little information to be generated about the

coastal environment, and the effects of human activities and needs to be simple so that users of the framework (including those who are not familiar with the planning jargon) are able to follow the procedures involved. The method which is the most suitable as a basis for the conceptual evaluation framework is Topic Evaluation. The following section illustrates how the Topic Evaluation method is adapted for use in analysing the existing Coastal Policy Statements.

3.5 The Conceptual Evaluation Framework

The conceptual evaluation framework developed for use in the evaluation of coastal plans/policies is called Format for Evaluating Plans/Policies (FEP) as illustrated in Figure 3.1.

As proposed in the preceding sections, topic evaluation will be used in the conduct of *ex-ante* evaluation using the FEP framework. FEP will be used to analyze various coastal policies in different levels of government (see Chapter Four).

In the evaluation of any plan, policy or program, it is vital to identify the goals and objectives of both the evaluated plan/program/policy and the evaluation team. After having a clear set of objectives, all criteria deemed to be necessary in the evaluation should be presented in detail, including the weighting of each, if there are any. Having established the criteria, a design strategy may be formed to be used in whatever type of evaluation (*ex-ante*, *in-process* or *ex-post*) to be conducted. The results of the evaluation are analyzed and a decision reached if a policy/plan needs a revision or is not worthwhile. After the changes have been made, the revised policy/plan can be evaluated (with *ex-post* evaluation if the plan is already implemented). This time, additional criteria maybe defined according to the situation at hand. Similarly, a revised strategy maybe employed and another evaluation can be conducted, and so on.

It may be noted from Figure 3.1 that the illustration is not represented by boxes as is usually seen in other process diagrams. The small frustums (i.e. the lower half of a

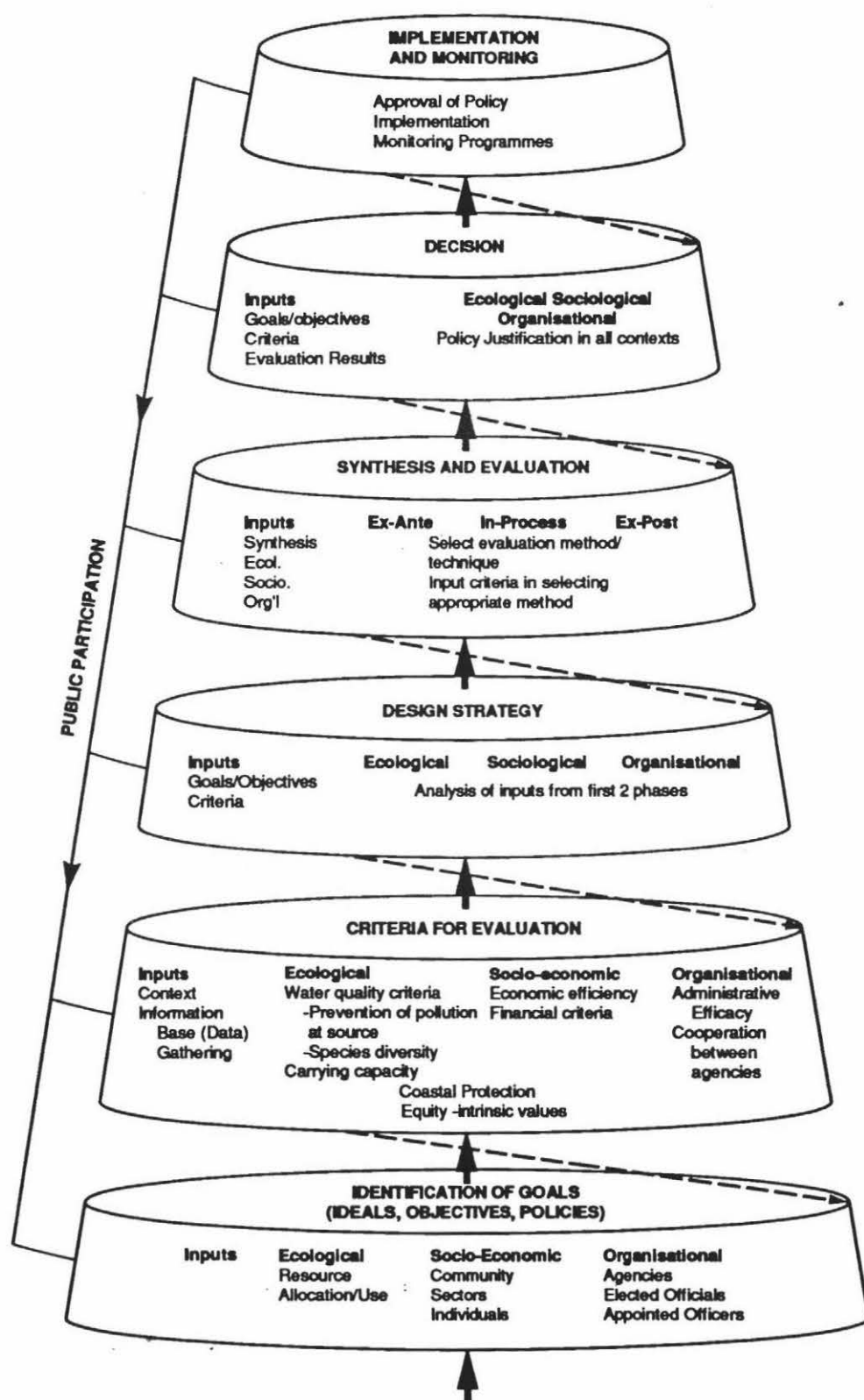


Figure 3.1

Framework for Evaluation of Plans/Policies (FEP)

cone) in which the phases are indicated are specially chosen, because the smoothness of each perimeter denotes flexibility. It is important that the planner should be flexible enough to return to the initial phase, if necessary. This is analogous to the coil of a spring, which is denoted by the figure, allowing the top to be pressed down to where one wants return, then letting go if one wants to proceed to the next process. The figure, a frustum, denotes open-endedness as well as being cyclic, and therefore, allows feedforward and feedback links in every stage. The base of the frustum denotes the increased degree of uncertainty and unexpected externalities. Moving from the base to the next phase, other uncertainties are eliminated and thus the size of the base is reduced. It is observed that the figure does not reach pinnacle because uncertainty is not really eliminated after implementation of the optimum solution/policy. Public participation should be encouraged in every phase of the evaluation framework.

The evaluation framework builds on the basic methodology of topic evaluation and consists of the following phases:

- identification of goals and objectives;
- definition of evaluation criteria;
- formation of a design strategy;
- synthesis and evaluation;
- decision; and
- implementation and monitoring.

3.5.1 Phase 1: Identification of Goals

The first phase in this evaluation framework is the identification and enumeration of the goals intended for evaluation. It is important to note that these goals differ from the plan goals, although the plan goals should be vital considerations in the process in order to assess achievement. It is indicated that there are three levels of detail planners may use: ideals, objectives, and policies. Hill (1968) compares ideals with the horizon which can never be reached; it just serves as a model to

achieve something nearing perfection. Objectives are somewhat measurable versions of the ideals and policies, for policies are the actions needed in order to implement the objectives. The three are arranged in descending order. But before one can identify these goals, there is a need to have data about current issues and problems concerning the different ecosystems, and the goals of the plan. At least the planner should attempt to identify and resolve the issues. Conflicts among users and uses should be identified and considered between day-to-day management and the future, along with environmental and human values. The clients may be grouped into three major sectors: socio-economic, ecological and organizational/institutional, and are essential in this type of undertaking (Rosier 1990).

3.5.1.1 Socio-economic

Most of the world's population depends on the coast and its resources for their socio-economic life. Thus, any impact on the coastal zone from hazards or human activities greatly affects the social and economic lives of communities and individuals. Therefore it is vital to identify goals related to these clients, either individually, by groups, or by sectors. All opportunities that are feared lost in any way should be included: employment, livelihood, amenities, aesthetics, etc.

3.5.1.2 Ecological

Determining goals relating to coastal ecosystems are very important and are relatively to the same degree of importance as the goals for the people. This consideration is apparent in the IUCN (1991) requirement for sustainable living (it may be noted that the approach of the IUCN is ecocentric as well as anthropocentric).

Identification of goals relative to the ecological group should focus on how coastal resources are to be used and allocated to individual users such as subsistence fishers, and user groups such as commercial fishers and tourists.

3.5.1.3 Organizational/Institutional

Other considerations in the identification of goals are the different individual goals of elected officials, appointed officers in various departments who may contrast to or conform with goals of involved agencies. These institutions and political groups have goals and objectives of their own for their respective clients. These goals and objectives result in impacts that are adverse to some and beneficial to others and are often anthropocentric. Hence, there is a need for consultations and public hearings involving all groups (i.e. the public, the management and other institutions including politicians and organizations representing the coastal environment) in order for the planning and evaluation teams to rightfully identify meaningful goals that cater to all affected parties.

Normally, because of uncertainty, some important objectives may not be identified. The issues omitted in this phase may be introduced at any of the later phases and are reconsidered (in the forthcoming cycles) with feedback from the public or the NGOs, etc. Considerations on integration of coastal zone science into the broader land-use and rational comprehensive planning is needed. Goals formulated should apply both to short-term and long-term and would also relate to aspirations of user groups, individuals/sectors/ community, etc. From these goals, measurable multiple objectives should be formulated according to ecological, socio-economic and organizational carrying capacity limits. The planner should take into consideration the clients affected by the plan, and which values are the priorities.

Public participation is a vital consideration in this phase and in the succeeding phases. Because of its importance, it is discussed in a separate section.

3.5.2 Phase 2: Evaluation Criteria

The following criteria are those developed in Chapter Two based on common issues in the coastal environment: impacts, hazards, developmental and organizational issues. Impacts and hazards relate to ecological criteria, developmental social criteria and organizational institutional criteria (see Figure 2.1).

3.5.3 Phase 3: Design Strategy

This phase entails a thorough analysis of outputs from the first two phases which provide input to the current stage of the framework, with respect to institutional/organizational, ecological and socio-economic fields. Resultant to the analysis done in this phase, a relevant design strategy is arrived at on how to evaluate using the criteria, with the hope of achieving the preconceived plan objectives.

3.5.3.1 Socio-economic

The major consideration here are the objectives already defined in Phase 1 (e.g. poverty alleviation, income generation, structural development, etc.) which are derived from problems of the nations/states/localities regarding the economic situation in relation to coastal resources. These are all integrated with the ecological and organizational considerations to form an evaluation design strategy which is tailor-made to a particular situation.

The concept of carrying capacity will provide information about the assessment of the interrelationships between users as a result of changing opportunities. It also establishes a measure of standards consistent with the kinds of experiences associated with each opportunity. A budgetary allocation must be wisely utilized in compiling a list of priorities (which is within the budget).

The analyst is expected to produce a statement about which parts of the coast are suitable for specific kinds of opportunities/activities and to what extent, analyzing past and present demands in relation to future demands for a variety of uses such as research and proposed developments and the possible effects both to the environment and to society.

3.5.3.2 Ecological

The data inputs from previous phases may best be analyzed using the Ultimate Environmental Threshold (UET) method (Kozlowski *et al.* 1986). The method also establishes the extent to which any coastal environment can take any more modification (e.g. how much developmental activity can an ecosystem accommodate at the same time ensuring that the biodiversity of species is protected from degradation/ extinction).

Stress limits may also be established beyond which a given ecosystem becomes incapable of returning to its original condition and balance. Analysis on uniqueness, resistance and transformation should be conducted for every environmental element. This information is sufficient in defining the location of exclusion zones. Later on, it may be useful to determine interrelationships between the diversity, size, type and spatial distribution of exclusion zones or nodes (Noss 1983, 1987). In addition to these nodes, identification of buffer zones are important to species in

spending several stages in their life-cycles within the coastal environment.

3.5.3.3 Organizational/Institutional

A very important set of principles set by the IUCN (1991) serves as major guidelines in this respect (see Appendix L). It is also helpful to analyze various coastal policies (see Chapter Four) to discover the successes and difficulties of each. Chapter Two presents issues regarding organizational process problems which are causes of policy/plan failures. These are major issues to consider in completing a design strategy. The roles of various people such as government agencies, developers, environmentalists, the public, non-governmental organizations and concerned citizens should be addressed and properly delineated and defined to avoid conflict.

3.5.4 Phase 4: Synthesis and Evaluation

This phase requires all outputs (e.g. impacts, advantages, disadvantages, etc.) from previous phases and information or discussion to be aggregated to test effects on the community and the whole environment. The appropriate type of evaluation, using the available information, is employed here (i.e. *ex-ante*, *in-process* or *ex-post*) and the suitable evaluation method - topic evaluation - using the available information. With the use of criteria and other important considerations in arriving at a design strategy an evaluation technique suited to a particular coastal plan situation may be formulated.

Planners, such as Hill (1980), assert that *ex-ante* evaluation alone is inadequate. It is important to introduce the *in-process* as well as the *ex-post* evaluation to increase the achievement rate of policies and plans and to evaluate their likely

effects on the beneficiaries and/or non-beneficiaries. It is proposed that an *ex-ante* topic evaluation be formulated in the policy analysis.

The plan/policy shall be evaluated in terms of a set of derived criteria (see Phase 2 and Chapter Two). This consideration should be focused on established principles of national documents (Resource Management Act, Local Government Code, etc.) as well as international requirements such as the IUCN, to obtain sustainable resource use. Derived alternatives should be carefully evaluated/assessed especially at points where there are conflicting uses for different opportunities.

To ensure that nothing is left out, it is convenient to list objectives and strategies/policies for each end-product in the process. High performance standards are recommended and should be obtainable. Constraints placed upon obtaining these end-products should also be identified. End-products include: day-to-day management, development of a good information base, research, monitoring, active participation and acceptance of the plan by all users, political implications, sustainable water quality for all opportunities, development that is ecologically sensitive, etc.

The evaluation of coastal policy statements in Chapter Four uses this phase.

3.5.5 Phase 5: Decision

The main factors in this phase are the attitudes and values of decision-makers such as the legislators. It is pointed out in Chapter Two that some of the failures of coastal policies/programs are due to organizational process problems. Therefore, it is essential for decision-makers to be honest, impartial and adhere to sustainable living.

After the evaluation of each alternative plan, the planner presents the results, accompanied by their justification, to decision-makers. Based on the results, an initial decision on the preferred solution may be given. It may be the first draft of the coastal policy statement, copies of which are made available to the public and other groups/organizations for submissions/reactions regarding the new document, and a hearing may be set to discuss issues raised. It is always essential to include the public in such a hearing. Environmental groups, such as the Forest and Bird Society, tangata whenua, etc. and non-government organizations should be invited to take part in discussions. Results may be published for the anticipated comments and suggestions of beneficiaries and the disadvantaged. Other means of information dissemination may be adopted, so long as it still is within budget.

In a democratic society, public hearings and submissions are very helpful in the finalization of a coastal policy statement (e.g. there may be overlooked sectors/issues in the draft statement). On the other hand, in a society where politics has a relatively high influence, discussions/hearings are futile. Here, it is not surprising if the legislative body incorporates different criteria (internally) in their selection of the most appropriate solution. They may consider the community's goals as a whole, they may be specifically concerned with the environmental degradation, or they may have vested interests. If decision-makers decide using value judgments alone, phase two will not serve its purpose, and more issues/problems will occur. Despite the seriousness of politics in some countries, the planner's presentation and justification of results and recommendations should be valid and strong. If the planner is convincing and shows little bias, there is a greater chance of support from different sectors.

3.5.6 Phase 6: Implementation and Monitoring

Decision-makers are expected to select a solution which is not only rational but comprehensive. After the legislative bodies' approval, the preferred solution/

alternative/policy is then ready for implementation. However, action must not stop with the implementation as there is a need to assess the preferred action to the extent of its effects on the community and the environment. Therefore, it is necessary to develop monitoring schemes and programmes. It should be noted that the planners cannot readily overcome uncertainty and externalities in their estimates - there will always be the problem of uncertainty, one reason why a development project can cease in the middle of implementation. This will also minimize costly mistakes.

The resulting impacts of the preferred plan, whether of advantage to beneficiaries or not, will serve as vital inputs to the development of refined policies in the future. Monitoring programs will indicate when and where flexibility of FEP is needed, that is, alternative actions will be employed when one action fails to achieve desired effectiveness. Monitoring also provides information as to where weakness or inadequacy has occurred in the evaluation process. Thus, periodic review is necessary. How often and how to go about monitoring will depend on what policy is being assessed, the impacts and the level of government. This may be decided upon by decision-makers with the recommendation of the planner. Inputs to monitoring activities are the outputs of the previous phases.

3.5.7 Public Participation

Public participation in all phases of the framework is very important. It is discussed separately because of its vital role in the process and because a planner's principal aim is to protect public goods. Coastal ecosystems cannot participate in a strict sense but their representatives are also individuals/groups who are members of the community and must be heard. All who are to be affected, whether greatly or slightly, should participate, especially those who will be adversely affected by the policies. Even before the conception of a plan, these voices should be heard and their needs and priorities understood. More often than not, those who will be adversely affected end up the losers because their

expectations are not met. People tend to forget that their priorities are not always the priorities of politicians. The only safe means, therefore, of having their side considered is through their participation in the planning process, the extent of participation varying depending on the issue/problem involved (e.g. impact issues, hazards, development needs, organizational process problems).

Chapter Two provides a list of issues brought about by human activities, and causing adverse impact on coastal ecosystems (see Appendix E). Obviously, malpractice in using resources degrades the environment. One of the most effective actions to overcome the environmental degradation is to change personal attitudes and practices (IUCN 1991). This is a major expectation for all individuals, that is, without their participation (e.g. caring for their own environment), opportunities for future generations are lost.

In a strict sense, one may say that people cannot control the occurrence of natural hazards. While this may be true, surely humans can help prevent damage to and rehabilitate ecosystems. Again, human activities are seen to accelerate hazards such as coastal erosion and river flooding. As with the issues on adverse impacts to ecosystems, change in personal attitudes and practices as well as values is imperative. This may be reinforced by laws and regulations at all levels of government. Compliance to such legislations is the least participation needed of each individual.

Development needs enumerated in Chapter Two are vital to the Philippine economy. Aquaculture development is one sectoral need which is an answer to exploitation of fisheries. ICLARM also recommends the provision of other livelihood projects (such as construction of fishponds, salt making, etc.) for the same purpose (Chua 1991, Tadifa 1991). Changing (or having an alternative) means of livelihood from fishing to aquaculture is a major decision that subsistent fishermen have to make. Their participation, therefore, is important in the sustainable development of coastal ecosystems.

Organizational process problems are not caused by the general public but by managers and leaders who deal with these issues. However, the public, knowing that three problems exist, may raise these problems in hearings and forums at the inception of plans. The public needs to become involved in the planning phases as well as in the evaluation phases because they are the main clients of plans/programs/projects/policies. Therefore, their voice is an important input to the planning cycle.

It may be noted that people and how they use resources are the key factors in all types of issues. IUCN (1991) notes that it is the malpractice of people which degrades the whole environment. Hence, their participation in government programs to correct these malpractices is a major move to attain sustainable development. The willingness and dedication of individuals to accept and implement the changes required of them in attitudes and ways is vital.

One factor to reinforce public participation is education, as a greater rate of public participation ensures if individuals are informed. Educating people in the community will help them to be informed of what is happening to their environment - that their coastal waters are polluted and fish resources are depleted and nearing extinction, that the diversity of resources is descending, that without a sustainable development future options are at stake, and so on. Televisions, radios and movies need programs which discuss the environment and ecosystem and their actual worth/interrelationships to everyone. Immediate inclusion in school curricula is advisable to instill conservation awareness and consciousness in youngsters who are following the steps of abusive and aggressive oppressors of the environment. These measures will have lasting impact on the people. In developing countries like the Philippines, the people are not aware of the degradation of national resources caused by past policies of elected officials as well as the present elites. They were not informed, until lately, that the cause of poverty is mainly due to this problem. With the inclusion of the subject in the elementary curriculum, it is hoped that the values

of people towards their environment will change from a carefree attitude to a "greener" perspective.

Second, there is a need for people to organize a community alliance, allowing concerned groups, including non-governmental organizations (NGOs), representation at public hearings. These two proposals are very important considerations in order to have a strong and active participation from the community. Without these, even the best of plans is worthless.

Inclusion of the public from the inception of the process is imperative. Tailored to the people's needs, the plans/policies should be made so that they are not at the expense of natural resources. The role of the people in implementation may include: the rendering of labour requirements in the case of development projects and abiding by policies with regard to non-infrastructure projects. It would also be wise to include people as members of monitoring. As a matter of interest, a number of projects in the USA have used "citizen judgment" methodology as an evaluation tool (McAllister, 1986). In the conduct of public hearing, there should be ample specified ample time for various sectoral groups, unions, etc. to render submissions before finalization and approval of the proposal. The citizen participation would be even stronger if their role is spelled out in some kind of a legislation, giving them legal powers. Involvement of the public in such activities would bring about a variety of advantages: there would be a check and balance of abuse and misuse of power; there would be well-informed and wiser electorates; public needs and priorities would be communicated to planners and decision-makers; morale is built within the citizens and conflict occurrence is minimized; and the skills of the people are discovered and used.

Lastly, the participation of the public in successfully applying evaluation in FEP (see Figure 3.1) is very important, as feedback is crucial in determining errors or areas not considered due to uncertainty and externalities. The public may supply information omitted in initial evaluation cycles or may supply forward information to the evaluation team.

3.6 Conclusion

With the general assumptions that the coastal policy statements to be analyzed in Chapter Four are still in their infancy, ex-post evaluation cannot be employed at this stage and *in-process* evaluation is insufficient. It is then most appropriate to apply the evaluation framework in an *ex-ante* evaluation of the Coastal Policy Statements. The FEP framework can be successfully used in situations where there is limited information about the individual nations/states concerned, because the FEP framework is simple and different people can easily follow the procedures and results involved, incurring less expense, and generating solutions in a short time. Results allow modifications before formal evaluation is employed for specific issues or projects. Therefore, the framework is flexible, and because of this characteristic, it is open-ended.

In some instances, formal evaluation may be used for specific issues or projects. This usually occurs after proving the plans/projects feasible with the use of informal evaluation methods such as topic evaluation. Appendix I discusses three formal evaluation methods: CBA/SCBA, PBS/PBSA, and GAM. (Although GAM is advocated in this study, due to its complexity and time constraints it cannot be applied in this study). In ideal situations GAM is preferred among the three formal evaluation methods for reasons already evident in the above discussion.

Issues/problems are major concerns in the evaluation process and should be considered in the inception of goals and objectives. The FEP framework is an ideal process to pursue or to deal with those issues and problems before concentrating on the main ones. Having dealt with considerations like flexibility, comprehensiveness, uncertainties and open-endedness, there is now an opportunity to concentrate on coastal issues. The FEP framework is both anthropocentric and ecocentric in that it considers the welfare of both humans and coastal ecosystems. It is seen that the FEP framework will contribute to the sustainable utilization of coastal ecosystems and obtain the greatest benefits for current users.

CHAPTER FOUR

ANALYSIS OF COASTAL POLICY STATEMENTS

The purpose of this chapter is to test the applicability of the FEP developed in Chapter Three using the criteria developed in Chapter Two. To carry out the analysis, various coastal policy statements are evaluated against a set of criteria (see Figure 2.1). Only the criteria appropriate for planning in the Philippine coastal environment are considered in developing a National Coastal Policy Statement for the Philippines in Chapter Five.

This chapter analyzes the national coastal policies of New Zealand (DoC 1992), Thailand (USAID *et al.* 1991), the sustainable policies of the Philippines (DENR 1990) and Canada (Hildebrand 1988) pertaining to the coast; the state coastal policy of Hawaii (OSP 1991), and the regional coastal policy of Lingayen Gulf in the Philippines (NEDA 1992). Thailand is chosen because, like the Philippines, it is a developing country and has similar problems/issues. Canada's experiences are very helpful in the development of future policies because in a long transition of implementing policies, there are always failures and successes. New Zealand's draft national coastal policy statement (DoC 1992) is the latest and it is hoped that some policies may be useful for adoption in the Philippines. Likewise, the state coastal policy of Hawaii and the regional coastal plan of Lingayen Gulf will be analyzed to see the variability of policies across different levels of government. A synthesis of the comparative results will serve as a valuable contribution to the development of a national coastal policy statement for the Philippines.

1.1 Introduction

In Chapter One, the importance of having a National Coastal Policy Statement for integrated coastal management is justified. It is seen, in this chapter, that the criteria developed in Chapter Two not only helps the evaluation team to evaluate policies and plans but may also be used as bases for developing efficient policies and plans.

Phase One in the FEP normally deals with the identification of goals of the coastal plans. No identification is undertaken here because the goals and objectives of each plan analyzed are already stated within the plans. The next phase in the FEP, the development of criteria, is covered in Chapter Two. Phase Three in the FEP is the development of a design strategy in evaluating coastal policy statements. The strategy here, is that each CPS is tested with one criterion at a time trying to answer the guiding evaluative questions, but not necessarily in the same order as they appear in the criterion summaries in Chapter Two. Briefly, the applicability of such criteria in each country/state are assessed. The evaluation and analysis of each CPS takes place in Phase Four of the FEP which is the foregoing section. A small part of Phase Five is carried out in the conclusion of the chapter which is the decision section. After the analysis, a number of options may be selected. A policy dealing with a specific issue may be uplifted from the various CPSs, as one of the statements may have an appropriate structure for a CPS and a decision made to vary policies may be applicable to the Philippines. The criteria relevant to developing a NCPS for the Philippines are finetuned. Normally, the last phase in the FEP, Phase Six deals with implementation and monitoring. However, this stage cannot be illustrated adequately in this chapter because most of the CPSs considered are still in their infancy. Obviously, even though all CPSs are being implemented in their countries of origin, there is little available information about the procedures for monitoring and reviewing the schemes to ensure sustainable development. However, in the development of the proposed Philippine NCPS in Chapter Five, all stages of the FEP are illustrated.

The following section analyzes the coastal policy statements and policies of New Zealand, Hawaii, Thailand, Canada, the Philippines and Lingayen Gulf with application of the FEP.

4.2 Analysis of Coastal Policy Statements

In this section, various coastal policy statements and principles are analyzed. The coastal policy statements of New Zealand, Canada, Thailand, Hawaii, Philippines and Lingayen Gulf are analyzed in accordance with the nine criteria and three sub-criteria:

water quality : prevention of pollution at source, species diversity;
 carrying capacity;
 equity: intrinsic values;
 coastal protection from hazards;
 economic efficiency;
 financial criteria;
 cooperation;
 administrative efficacy; and
 systems approach.

In Table 4.1, the symbol * indicates that such criterion is given importance in the coastal policy statements; the symbol x indicates that the criterion is not considered in the coastal policy statements; and the symbol *, with comment, indicates that the criterion is addressed, implicitly, or only some aspects of the criterion are addressed. Table 4.1 summarizes the analysis which is discussed in relation to each country.

4.2.1 New Zealand

New Zealand is one among many nations concerned about its natural environment. Like all coastal nations, NZ has environmental problems such as

Table 4.1
Summary of analysis of national/state/regional
coastal policy statements

CRITERIA	N C P S	N.Z.	HAW.	THAL.	CAN.	PHIL. E C	LINGA- YEN GULF (Phil.)
1. Water Quality Criteria		*	*	*	*	* X	*
a) Prevention of Pollution at Source		*	*	*	*	X *	*
b) Species Diversity		*	*	*	*	* * Implicit	* Fisheries
2. Carrying Capacity		*	*	*	*	* * (No Cul- tural CC)	* Coral reefs, mangroves
3. Equity		X	*	*	*	* *	*
a) Intrinsic Values		*	X	X	X	X X	X
4. Coastal Protection from Hazards		*	*	X	*	X X	X
5. Economic Efficiency		X (Pareto- Safety)	* (Economic Uses)	*	X	* *	X
6. Financial Criteria		X (RMA)	*	X	X	X X	*
7. Cooperation		* (No NGOs, etc.)	* (No NGOs)	*	*	* *	*
8. Administrative Efficacy		*	* (network)	X	*	X X	*
9. Systems Approach		*	*	X	*	* * (Integrated)	* (Integrated)

pollution of coastal waters, species reduction, etc. These environmental concerns are taken care of in the Resource Management Act (RMA). RMA is also the legal basis of the development of the New Zealand Coastal Policy Statement. The following is an analysis of the NZCPS using the eight criteria in Chapter Two.

4.2.1.1 Water Quality

The foremost principle of the NZCPS is the preservation of the natural character of the coastal environment (Outcome 1). This principle encompasses coastal water quality which is a standard for certain flora and fauna in order for continued survival in a particular water habitat (e.g. estuaries, saltwater habitats). Beyond this standard, these species will slowly diminish. As stated in Section 1.1.5, NZCPS claims to "protect the integrity, functioning and resilience of the coastal environment" in terms of natural water quality.

In Outcome 5 of the NZCPS, it is explicitly stated that regional coastal plans should make provision for the maintenance and enhancement of water quality in order to preserve the natural character of the environment.

The NZCPS states no numerical standards of water quality for any use. However, McBride (1992) provides a range of numerical standards for various purposes: shellfish gathering, bathing and swimming in accordance with provisions in the Third Schedule of the RMA (see also Appendix H).

Qualitative water quality criteria provisions such as the prevention of pollution at source and species diversity are discussed below:

4.2.1.1.1 *Prevention of Pollution at Source*

With regard to this criterion, NZCPS states in Section 1.1.2 that in the preservation of the natural character of the coastal environment, it is a must to avoid, remedy or mitigate the adverse effects of subdivision, use or development. Section 3.2.1 provides for the avoidance of any adverse effects of subdivision, use or development as far as practicable.

Section 5.2 of the NZCPS provides for the ultimate cessation of sewage discharges to the coastal marine area while 5.3 limits adverse environmental effects from vessel waste disposal or maintenance.

4.2.1.1.2 *Species Diversity*

Excessive population is not a problem in New Zealand, thus over-exploitation of resources is not a serious issue except where illegal poaching depletes local resources. A primary objective is the maintenance and preservation of the natural character (amenity values) and biodiversity.

The diversity of species is protected in Outcome 1 of the NZCPS. Protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna imply protection and maintenance of biodiversity. Explicitly stated in Section 1.1.5(e) is the protection of the integrity, functioning and resilience of the coastal environment in terms of "natural biodiversity, productivity and biotic patterns".

4.2.1.2 Carrying Capacity

The NZCPS was developed to achieve the purpose of the RMA: "...safeguarding the life-supporting capacity of... ecosystems...." Section 1.1.5 of the NZCPS states the protection of coastal environment resilience as a national priority while the third policy (Outcome 3) provides for the activities involving the subdivision, use or development of the coastal environment. While it does not mention anything about carrying capacity of ecosystems, it is implicitly stated that protection of the coastal environment from adverse effects means the enhancement of carrying capacity of coastal ecosystems.

Outcome 3.1 provides for the maintenance and enhancement of amenity values. All sections of Outcome 3.1 embrace environmental, physical, social and resource carrying capacities.

Cultural carrying capacity is also provided for in Outcome 2 and Section 3.5(b). This includes the protection of Maori cultural values (e.g. mahinga maataitai or shellfish gathering areas) and the protection of characteristics of the coastal environment having special value to tangata whenua (e.g. waahi tapu, etc.).

There is no section in the NZCPS dealing with information systems. However, there are information dissemination schemes which are used by all levels of planning. Examples include rules for conducting hearings, asking for submissions, and the use of all types of media.

4.2.1.3 Equity

The main aim of this criterion is concerned with providing equal opportunities to impoverished coastal residents. This situation does not

exist in New Zealand. The NZCPS does not specify an outcome of providing equal opportunities to coastal residents but justly refers to all users of the coast (i.e. maintenance and enhancement of public access to the coastal marine area - Section 3.5). The developed criterion refers to economic situations while the NZCPS refers to aesthetic values and intrinsic values.

Similar to the above criterion, information on equity considerations, such as intrinsic values, are not directly disseminated to all users of coastal resources, but there are other means by which these are made known to the people.

4.2.1.3.1 *Intrinsic Values*

Section 7 of the RMA explicitly states that the intrinsic values of ecosystems, among other matters, shall be regarded to in the achievement of the Act's purpose (see Appendix J). However, the intrinsic value criterion is implicitly regarded in the NZCPS. That is, the policies/outcomes enumerated clearly regards intrinsic value or values of ecosystems in their own right.

4.2.1.4 Coastal Protection

Outcome 3.4 of the NZCPS provides for the recognition of coastal hazards in considering subdivision, use, or development of the coastal environment. Included here is the provision for mitigation, if applicable. Also recognized are the potential impacts of likely changes in sea level (Section 3.4.1). No mention is stated regarding salt water intrusion.

4.2.1.5 Economic Efficiency

The NZCPS protects coastal ecosystems from determination by actions (resulting from adverse impacts) imposed on them by users. This is a pareto-safety criterion having regard for natural and physical resources. The definition in Section 4.3, however, concerns the protection of individuals. No monetary value is reflected in the document nor the economic instruments to be applied.

4.2.1.6 Financial Criteria

The NZCPS does not cover the subject of fund allocation in relation to the policies/outcomes stated. In New Zealand, this criterion is more appropriately indicated in regional plans as they are resource-based and area-specific. However, Section 32 of the RMA provides for this criterion, generally (see Appendix K).

4.2.1.7 Cooperation

Implementation of the NZCPS requires an expected partnership between the Minister of Conservation (as agent of the Crown) and regional and district councils. The document presents the outcomes which the government wants to achieve regarding coastal management and local authorities are expected to develop plans and policies in agreement with the NZCPS. The NZCPS also states policies that guide users and beneficiaries. However, it does not state the roles of sectors and organizations, such as NGOs, in government.

4.2.1.8 Administrative Efficacy

Obviously, the administration of coastal management in New Zealand may turn out to be effective if policies in NZCPS and the provisions of the RMA are strictly observed. Though true effectiveness can be seen only in the long-term, the consistency of the NZCPS to the RMA is an initial sign of effectiveness. The explicit statement of the role of the Minister of Conservation and the establishment of partnerships with local authorities are also signs of effective measures of coastal management.

4.2.1.9 Systems Approach

Though not explicitly specified, the policies in the NZCPS and the provisions of the RMA require consideration of a systems view in planning. This is evidenced by providing for all users of coastal resources as well as providing for intrinsic values of these ecosystems. The document does not state if there is an information system employed at any level of government.

4.2.2 Hawaii

Like New Zealand, Hawaii's Coastal Zone Management Program (HCZMP) is in compliance with the requirements of a national legislation (RMA for New Zealand and Coastal Zone Management Act - CZMA- for Hawaii). However, unlike, New Zealand, Hawaii or any other state in the USA, is not obliged to develop such a coastal policy statement. Hawaii's voluntary participation in the CZM Program (OSP 1990), led to the development of the Hawaii Ocean Resources Management Plan - HORMP (HOMRC 1991). The HZCMP illustrates objectives and policies grouped into seven sectors:

Recreational Resources;
 Historic Resources;
 Scenic and Open Space Resources;
 Coastal Ecosystems;
 Economic Uses;
 Coastal Hazards; and
 Managing Development.

On the other hand, the HORMP recommends objectives and policies grouped into ten sectors:

Ocean Research and Education;
 Ocean Recreation;
 Harbours;
 Fisheries;
 Marine Ecosystem Protection;
 Beaches and Coastal Erosion;
 Waste Management;
 Aquaculture;
 Energy; and
 Marine Minerals.

The coastal policies of Hawaii are in line with the U.S. national policy to:

...preserve, protect, develop and where possible, to restore or enhance, the resources of the National coastal zone for this and succeeding generations [and] to encourage and assist the states to exercise effectively their responsibilities in the coastal zone, through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and aesthetic values as well as to needs for economic development, which programs should at least provide for... [CZMA @303 in OSP 1990, p 34]

The following is an analysis of Hawaii's Coastal Policy Statements with respect to the developed criteria in Chapter Two.

4.2.2.1 Water Quality

In line with its national policy, Hawaii is concerned with the quality of its coastal water ecosystems. While HZCMP's statement of policies is very general in this aspect, HORMP's is specific and comprehensive. Hawaii observes the US EPA water quality numerical standards for each water classification (Class AA waters are preserved in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human source or actions; Class A waters are protected to ensure that their use for recreational and aesthetic enjoyment is protected).

Numerical quality standards which appear in other documents are addressed in the HORMP. The following are qualitative water quality criteria:

4.2.2.1.1 *Prevention of Pollution at Source*

The aim of HORMP is to

ensure that the State is capable of effectively regulating waste disposal, and accidental oil and chemical spills, while protecting and minimizing environmental degradation (HOMRC 1991, p 81)

The recommendations in the plan are explicit with regard to both point and non-point pollution sources. These include policies concerning waste water and sewage treatments; hazardous,

radioactive, and domestic/municipal wastes; litter; non-point sources such as land-based developments, etc.; oil spillage and discharges to ocean water. For all point sources of pollution, a discharge permit is required.

The quantitative water quality standards, on the other hand, are stated in standards provided by the US EPA, and are applicable to all waters which include floating debris, thermal pollution, turbidity as well as standards for nearly 100 toxic substances.

4.2.2.1.2 *Species Diversity*

The protection and preservation of valuable coastal ecosystems from degradation is another HCZMP policy though it does not explicitly state how. HORMP, however, in its recommended policies, specifically states its policies protecting, maintaining/enhancing the diversity of its coastal ecosystems. Policies stated under Sections on Ocean Recreation, Harbours, Fisheries, Marine Ecosystem Protection, Beaches and Coastal Erosion, Waste Management and Aquaculture all relate to species diversity.

4.2.2.2 Carrying Capacity

The statement on carrying capacity is implicit in both policy statements. In the HORMP, the section on harbours refer to resource and physical carrying capacities, that is, the capacity of the harbours to maintain marinas and small boats at the same time meeting the recreational needs of people shall not be exceeded. In the fisheries section, Policy D ensures native Hawaiian fishermen to have all the rights to which they are entitled: a cultural carrying capacity.

General information on coastal resources and other related matters are covered under the Ocean Research and Education Section of the HORMP. The section states information services and products on "marine education" are offered by an array of government and NGOs. Policy G also provides for the increase of public awareness through interpretive education.

4.2.2.3 Equity

Though the aim of both policy statements is not about poverty alleviation, provision of equal opportunities (such as equal access to the resources, rights of souvenir collectors, etc.) are explicitly stated in Sections under Ocean Recreation, Fisheries, and Research.

4.2.2.3.1 *Intrinsic Values*

The rights of people to have equal opportunity to access resources are provided for in the HORMP. The rights of resources, however, is not considered in the plan.

4.2.2.4 Coastal Protection

Specifically, coastal hazards are a principal issue in the HCZMP. Its policies aim for the reduction of natural hazards (e.g. tsunami, storm waves, flooding, erosion) to life and property. Provision is not made for the effects of sea-level rise. On the other hand, HORMP explicitly states policies regarding beach/shoreline erosion as a result of damage from flood hazards and waves. Policy J, in the same plan, specifically

recommends the State plan for climate change, sea-level rise and emerging issues.

4.2.2.5 Economic Efficiency

The provision of public/private facilities and improvements important to the economy of Hawaii is also a major concern of HCZMP. Similarly, HORMP provides, in all sections, consideration of economic efficiency (e.g. it is a policy to expand the small boat harbour system taking into account economic efficiency of proposed harbours, etc.).

4.2.2.6 Financial Criteria

Funding is a consideration in both documents. In HORMP, funding to finance specific activities like research, erosion protection, etc. are considered.

4.2.2.7 Cooperation

The HCZMP provides for the cooperation among the public, state counties and government agencies. However, no statements concerning sectoral groups and organizations are found in the plan. Likewise, the HORMP is geared towards participation/cooperation as seen in all sections. One concern is the increasing of public awareness in order to enhance cooperation and minimize conflicts.

4.2.2.8 Administrative Efficacy

Found in all sections of the HORMP, are provisions concerning actions and roles of different government departments involved (one of the issues of concern in Hawaii is the lack of coordination, cooperation among agencies). Similarly, the HCZMP provides for implementation of authorities in the coastal zone. The seven resource areas are managed by various state and county authorities of the CZM management network. Both plans are likely to attain effectiveness with regard to administration and management of Hawaii's coastal zone considering the comprehensive delineation of functions. This, however, depends on the implementation of management policies in the long term.

4.2.2.9 Systems Approach

Like New Zealand, Hawaii's coastal policy statement is encompassing and is obviously based on a systems view in planning.

Hawaii also provides for an information system in the plan. Inclusion of marine education in universities and institutions (e.g. conducting field trips relating to coastal zone matters) helps increase public awareness about coastal issues and coastal needs. The presence of government organizations and NGOs, who volunteer for educating the public, is one aspect of the information system.

4.2.3 Thailand

The Thailand document analyzed is entitled *A National Coral Reef Strategy for Thailand*. While it is called a strategy, it does not contain any proposed

strategies but just states the issues and environmental status of Thailand's coral reefs and the desperate need for a national coral reef strategy.

If developed, it is seen that the following criteria will be addressed: water quality (pollution prevention), species diversity, carrying capacity, equity (no intrinsic values), and cooperation. Since this plan is subjective it is evident that it cannot cover all the developed criteria in Chapter Two. This document should be part of a national coastal strategy for Thailand. It is also obvious that administrative efficacy may not be achieved because systems approach is not considered in this plan, for coral reefs cannot exist on their own without considering other interdependent coastal resources as well as resource users.

4.2.4 Canada

Hildebrand (1988) deals with the development of Canadian national coastal zone management policy. Though the document is not included it provides a section for the developed principles for shore management (see Appendix L). Also discussed are the reasons why the implementation of previous policies have failed.

The principles suggested by Hildebrand (1988), are very general with regard to resource protection. Inherent here are the criteria on water quality, species diversity, carrying capacity and coastal protection. Also considered is the necessity recognizing the importance of shore areas. It is more appropriate, though, to consider the importance of the coastal zone as a whole. Equity consideration is, specifically, the right of public access to shore areas. Obviously, the intrinsic values of ecosystems are not considered. Cooperation is a criterion which is of great concern to Canada, where a cooperative approach to management is recommended requiring that all levels of government must strive to coordinate their programs and policies, undertaking programs to increase public awareness which will eventually lead to cooperation. The role of local

government as well as of government agencies, are clearly defined to achieve administrative efficacy. It is explicitly stated that the interrelationship of activities with shore systems should be considered. An information system is also recommended for use in planning and decision-making. However, financial matters are not included in this section.

4.2.5 The Philippines

In 1990, the Philippines developed a strategy to attain sustainable development, generally. The Philippine Strategy for Sustainable Development covers a small area of the coastal zone. Figure 4.1 contains two columns in its analysis of the document: one for the whole environment and a second column for the coast. Considering the whole environmental degradation issue, criteria not covered include intrinsic values, protection from hazards, administrative efficacy and financial criteria.

Concerning the coastal zone, coastal issues are enumerated and the present status of Philippine coasts, in general, is stated. Specific concerns are for mangrove and coral degradation, overfishing (including illegal fishing), and ineffective administrative arrangements for regulating coastal and marine resources. Also enumerated in the PSSD (DENR 1990) are the required key measures:

- identification and quantification of point and non-point sources of pollution;

- setting up of centralized treatment plants for domestic wastes and wastes of similar industry types;

- containment of oil slicks;

- control of siltation by reforestation;

- granting of exclusive rights to small fishermen;

- conduct of hydraulic studies in aquifers;

stepped-up enforcement of fishing laws and zoning rules;

common property management arrangements, i.e. assigning common property rights to coastal communities or fishermen organizations in the use and protection of coastal fishing areas;

preparation of site-specific fishery resources management plans based on inventory of resources and assessment of sustainable fishing yields;

rehabilitation of coastal resources (coral reefs and mangroves) to sustain fish yields, including measures to enhance productivity through artificial means, e.g. artificial reefs;

provision of alternative livelihood opportunities for coastal communities to reduce reliance on fishing as a source of income; and

intensification of environmental information and education.

Obviously, the coast is important to the Philippine economy. The foremost consideration for the government is alleviation of poverty which is a basic cause of fishery and mangrove degradation and extinction. It is also seen among the measures enumerated, that pollution is a serious problem. The PSSD, however, is not sufficient to deal with coastal zones because it does not include policies and objectives specifically regarding the coast. It is envisioned that if policies were included in the PSSD, these criteria would be considered: water quality, prevention of pollution, species diversity (implicit), carrying capacity (including cultural carrying capacity), equity (excluding intrinsic values), economic efficiency, cooperation (with explicit mention of sectoral organizations such as NGOs), and a systems approach. The need of coastal resources for economic reasons overshadows the need to protect the coast (shore, beach systems, etc.) from hazards. The need to identify the functions of agencies, the public and other sectors is not mentioned in the PSSD. However, public awareness is an important consideration.

4.2.6 Lingayen Gulf

The Lingayen Gulf is one coastal area in the Philippines having severe coastal degradation. In partnership with ICLARM, the Philippine government, through NEDA, developed a plan (LGCAMP) which considers coastal issues. LGCAMP is also the pilot integrated coastal plan for the country.

LGCAMP describes the present status of the Lingayen Gulf and identifies the problems and issues regarding resource use and management. One of the major actions to solve the problem of poverty is the introduction and provision of livelihood programs for coastal fishermen. At the same time, this enhances the diversity of species and the protection from degradation, exploitation and/or extinction. Provided in the plan are policies addressing water quality, prevention of pollution, species diversity, carrying capacity, equity, financial criteria, cooperation, and systems approach. The comprehensiveness of LGCAMP as to the roles of each sector in the coastal zone, and the integration of programs, policies, and legislation together with the recommended coordination of agencies involved and cooperation of users including sectoral groups (such as NGOs), makes it an achievable administrative efficacy. LGCAMP is based on a systems approach to planning. Of note, regarding diversity and carrying capacity, is that the LGCAMP only addresses fisheries, coral reefs and mangroves. While it is based on a systems approach, it is still insufficient because it fails to consider other coastal resources such as dunes, beaches, flora and fauna, etc.

4.3 Comparison of CPSs

From the above analysis of coastal statements, it is observed that national statements are more general than state and regional policies. However, state and regional policies are always in agreement with national policies. An example is the similarity of the LGCAMP and the PSSD with regard to poverty alleviation, mangrove and coral reef

protection, cooperation, etc. It is observed, too, that national policy statements do not explicitly state the financial criteria, whereas state/regional policy statements do.

Thailand's NCPS is not an ideal document to adopt, for it does not provide policies which will solve management issues enumerated in the document. For Canada, there is insufficient data, and only a small part of the document is considered in the analysis. New Zealand on the other hand, may have an effective model for a NCPS formulation, although use of the document alone makes users grope in the dark, as the contents are insufficient and require initial knowledge of issues and conditions of the coastal zone, and other related legislations, before one can understand what the NZCPS wants to convey to users. The PSSD of the Philippines covers the coastal zone in only three pages of the whole document. This alone makes it impossible for users to follow what is intended for the Philippine coastal zone and its resources. The LGCAMP of the Lingayen Gulf is a very comprehensive document, considering almost all of the criteria developed except intrinsic values, giving it effective potential in the long-term. However, the LGCAMP is, unfortunately, based at a regional level of government.

Among the CPSs analyzed, the HORMP is the most comprehensive and easily understood. The document is divided into the different sectors each sector providing general information about the sector and related matters. The actual coastal condition is discussed along with management issues and public involvement. Legislation and standards are also discussed as well as the role of different state agencies. The last part provides a recommendation (in response to the issues) in the form of objectives, policies and actions expected from different institutions.

While the PSSD and the LGCAMP provide a general view of the Philippine coastal zone situation, the PSSD is insufficient and too general. The criteria deemed relevant, and recommended for the Philippine situation are: water quality, prevention of pollution at source, species diversity, carrying capacity, equity, intrinsic values, coastal protection from hazards, financial matters, cooperation, administrative efficacy and systems approach. In format, the HORMP is the most systematic and very comprehensive. However, there are aspects in the NZCPS which are also relevant, but are not included

the HORMP, such as the consideration of intrinsic values and cultural carrying capacity including traditional and culture practices regarding coastal resource use.

The following list is a sample of policies that address particular issues:

I. Impact Issues

Policies:

Minimize point and non-point source pollution and its accompanying impacts on the ocean and coastlines by developing appropriate regulatory controls, incentives, monitoring, and research programs (HORMP 1991, p 81)

Expand protection of species, natural habitats and other resources of exceptional value, thereby minimizing environmental degradation from marine and coastal activities and uses (HORMP 1991, p 57)

Provision shall be made to ensure that non-exclusive use of the coastal environment does not have significant adverse effects on the coastal environment, or on the enjoyment or safety of other users (NZCPS 1992, p 19)

II. Hazard Issues

Policies:

Plan for climate change, sea-level rise, and emerging issues (HORMP 1991, p 69)

When considering subdivision, use or development of the coastal environment provision shall be made, as far as practicable, to avoid, remedy or mitigate the actual or potential adverse effects of natural hazards, including: wind, sea and river erosion, landslips, flooding, subsidence, sedimentation, sea-level rise, tsunamis, and storms and cyclones (NZCPS 1992, p 22)

III. Developmental Issues

Policies:

Provision shall be made to avoid any adverse effects of subdivision, use or development as far as practicable. Where avoidance is not practicable, the adverse effects shall be mitigated and provision made for remedying those effects (NZCPS 1992, p 19)

Mitigate user conflicts between the aquaculture industry, fishermen, and the public at large (HORMP 1991, p 91)

IV. Organizational Processes

Principles:

Cooperative information systems must be structured so that information obtained is readily applicable to shore management decision-making and planning (Hildebrand 1988, p 21)

Management of the coastal environment under the Resource Management Act 1991 will be shared between the Minister of Conservation and local authorities (NZCPS 1992, p 11)

4.4 Conclusion

Phase Five, the decision phase, follows the presentation of the FEP, and the HORMP structure is advocated. The proposed Philippine NCPS will cover: the actual condition of the coastal zone in terms of resource use and management; the guiding principles involved; the recommended solutions to issues in the form of objectives, policies and actions at various levels of government; and the implementation and monitoring scheme to be adopted.

Both the FEP (Chapter Three) and the set of criteria developed for evaluating coastal plans, (Chapter Two) can be used in two ways: for the purpose of evaluating plans and policies, and establishing a set of criteria for use in the formulation of a National Coastal Policy Statement for the Philippines. The next chapter uses these factors in the development of the Philippine NCPS.

It is seen in the evaluation/analysis that the criteria developed in Chapter Two are all relevant in the development of a NCPS. Policies on intrinsic values of ecosystems and matters of national importance are based on the NZCPS. On the other hand, policies on waste management and pollution, harbours and fisheries problems are based on those in the HORMP (see Appendix N).

CHAPTER FIVE

PROPOSED NATIONAL COASTAL POLICY STATEMENT FOR THE PHILIPPINES

The aim of this chapter is to develop the National Coastal Policy Statement for the Philippines. The structure of this chapter is based on the FEP developed in Chapter Three. It is vital to note that the FEP and the criteria developed for evaluating coastal plans are able to be used for plan or policy formulation and evaluation purposes.

While the previous chapter highlights the applicability of FEP in evaluating various CPSs using a set of criteria based on coastal issues and problems, this chapter applies the FEP to formulate a NCPS for the Philippines based on the HORMP structure.

5.1 Introduction

As a result of the analysis in Chapter Four, there are three major sections in this chapter. Firstly, there is a discussion about the institutional arrangements involved in creating a national agency to take charge of managing the use and activities in the Philippine coastal zone and its resources. Secondly, the proposed structure of the PNCPS is presented. Thirdly, the policies to address all coastal zone issues (socio-economic, ecological and organizational which includes political) in the Philippines are proposed. The proposed PNCPS takes into consideration the set of criteria developed in Chapter Two and the requirements of IUCN (1991) (see Figure 1.1 and Appendix L) and PSSD which serve as guiding principles.

5.2 Institutional Arrangements

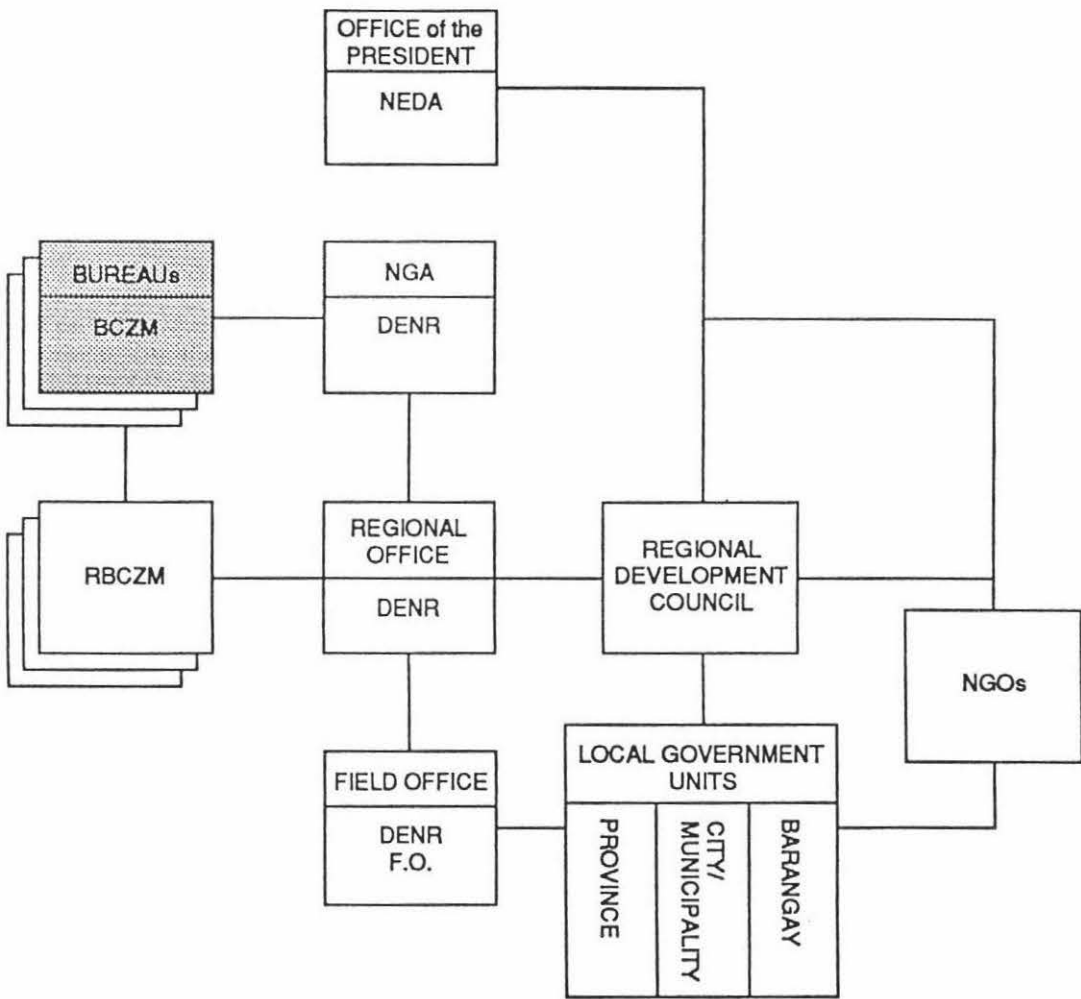
In the Philippines, there is no law requiring any agency to formulate a national document concerned with providing coastal policies. The idea of a single agency for managing the coast was initially discussed in Chapter One.

It is strongly recommended that the Senate pass stronger legislation at the national level similar in purpose to the RMA of New Zealand and CZMA of the USA. The necessary legislation may require the creation and/or assignment of a sole agency to coordinate matters regarding coastal zone management (e.g. the senate legislation) should require the DENR to develop a NCPS. A bureau within the department may be created.

Possibly the most expedient means of achieving this would be to form the **Bureau of Coastal Zone Management (BCZM)** under the Department of Environment and Natural Resources (DENR) (see Figure 5.1). BCZM would have exclusive responsibility for the coastal zone and coordinating activities affecting the zone, and would be a reorganization of the Bureau of Fisheries and Aquatic Resources (BFAR) of the Department of Agriculture, and the coastal components of the Bureau of Forest Development (particularly the mangroves and watershed reservations), the National Environmental Protection Council (NEPC), the National Pollution Control Commission (NPCC), and the Ecosystems Research and Development Bureau (ERDB) of the DENR.

The creation of BCZM accords with national legislation for the purpose of ensuring the sustainable development of coastal ecosystems, sustainable development as defined in IUCN (1991). The coastal zone would be treated as one subject area apart from other natural resources for reasons discussed in Chapter One. The national legislation requires the DENR to create the BCZM to prepare PNCPS. The same legislation requires the cooperation and coordination of all agencies and organizations whose activities are related to the coastal zone.

At the national level, BCZM would continue to carry on the functions of the merged agencies and coordinates with all other agencies whose activities are coastal/marine



Legend:

- BCZM - Bureau of Coastal Zone Management
- RBCZM - Regional Bureau of Coastal Zone Management
- NEDA - National Economic Development Authority
- DENR - Department of Environment and Natural Resources
- NGOs - Non-Governmental Organisations
- F.O. - Field Office

Figure 5.1

BCZM and its relationship with LGUs and other agencies

related at the national level (refer to Appendix A). Previous legislation, introduced by various agencies including decrees from the President of the Republic concerning the coastal zone (see Appendix F), would be implemented by BCZM and all coastal related laws and policies would become the responsibility of BCZM. The creation of a national information system is possible in the Philippine Information Agency (PIA), and would facilitate BCZM ability to function in a network.

The BCZM will also require a counterpart at the regional level of government. At the regional level, personnel of the Regional Bureau of Coastal Zone Management (RBCZM) would see to the implementation of laws emanating from the BCZM. RBCZM is the direct contact of LGUs about matters concerning coastal zone management. RBCZM would transfer skills and technology to concerned LGUs through the National Economic Development Authority (NEDA) by means of training programs assisted by other concerned agencies. This agency should directly coordinate with the Regional Development Council (RDC) which is composed of regional heads of all government departments, heads of LGUs and NGO representatives. The PIA regional representative disseminates information to LGUs such as matters taken up by the RDC, among others.

At the LGU level, the Department of Interior and Local Government (DILG) officers assist the RBCZM in monitoring LGU compliance of laws and regulations. The information network representatives of LGUs are LGU information officers appointed according to qualifications set by PIA. Organizations and institutions responsible of activities related to the coastal zone at the LGU level should report results of activities to the RDC, which is responsible for reporting matters at RDC meetings.

Non-government Organizations (NGOs) would operate at all levels of government with the exemption of a few area-based organizations (e.g. Barangay Cooperatives, Community Associations, etc.). It is envisaged that NGOs will coordinate with LGUs in accordance with the provisions of the Local Government Code. Among other functions they are represented in the Local Development Council meetings (planning

stage) and at the monitoring of program and project implementation, by being a member of the Project Monitoring Committee (refer to Appendix A for other NGO services).

5.3 Structure of the PNCPS

The structure of the proposed PNCPS is based on HORMP. Like HORMP, the first part of the draft PNCPS is the statement of the coastal zone condition, and other information regarding the issues and problems brought about by human intervention. However, in this chapter, the issues will not be discussed having already been discussed in previous chapters. This chapter will present the principles, objectives, policies and actions for a PNCPS.

Principles are the general considerations/assumptions that guide the formulation of the PNCPS. They are basically reflections of ideals. These principles are, in turn, based on the IUCN principles and the PSSD principles. An example principle is: *People should live within the carrying capacity of the earth.*

Objectives are the future state being planned (i.e. sustainable development) In this situation, it is the anticipated levels of human use of coastal resources and their ability to cope over time. These are expressions of wishful thinking with consideration of the values the planner puts on the coastal resources. That is, working with the general principles and considering the present condition of the coastal zone in the Philippines, the objectives are the aims that the planner sets in order to solve the existing issues and problems. An example objective is: *To reduce poverty in coastal communities by 50% in five years with sustainable utilization of coastal zone resources.*

On the other hand, **policies** are the specific statements that guide decision-makers. They are effected by implementation measures or actions and are based on the objectives. As a useful guide to action, policies need clarity. An example policy is: *National departments in charge of managing coastal resources shall not approve the conversion of productive mangrove systems into aquaculture projects.*

Implementing actions are the expected functions at various level of government in carrying out the policies to attain the objectives. An example is: Government departments shall *provide livelihood projects to impoverished communities, with priorities evaluated against poverty alleviation objectives, and objectives concerning rehabilitation of coastal resources.*

There is an introductory section defining the coastal zone (e.g. coastal zone definition of NEPC in Chapter One) including a statement of the boundaries of the Philippine coastal zone (e.g. 200-mile EEZ). Definitions of terms are also provided. The PNCPS is presented on an issue basis: impacts, hazards, development needs and organizational process problems. For each issue, objectives are developed, along with appropriate policies. Expected actions from different levels of government are stated including the role of NGOs. The last part of the proposed CPS is monitoring.

The following sectors in the Philippine coastal zone (in accordance with Chapter Two) are covered in the proposed PNCPS:

I. Impact Issues

- 1.1 Fisheries
- 1.2 Harbours
- 1.3 Coastal Ecosystems

II. Hazard Issues

- 2.1 Hazards

III. Developmental Issues

- 3.1 Aquaculture
- 3.2 Recreational Resources(Tourism)
- 3.3 Energy and Minerals

IV. Organizational Process Problems

- 4.1 Research and Education
- 4.2 Regional Plans Policies

V. Monitoring and Implementation

5.4 The Proposed Philippine National Coastal Policy Statement

PHILIPPINE NATIONAL COASTAL POLICY STATEMENT 1993

PART I. DEFINITIONS

PART II. DESCRIPTION of COASTAL RESOURCES AND EXISTING ACTIVITIES THEREIN

PART III. COASTAL MANAGEMENT ISSUES

3.1 Impact Issues

3.2 Hazard Issues

3.3 Developmental Issues

3.4 Organizational Process Problems

PART IV. PRINCIPLES

PART V. OBJECTIVES, POLICIES, ACTIONS

5.1 Impact Issues

5.2 Hazard Issues

5.3 Developmental Issues

5.4 Organizational Process Problems

PART VI. IMPLEMENTATION and MONITORING

PNCPS 1993**PART IV. PRINCIPLES**

Each policy on the integrated management and use of coastal resources should be based on, but not limited to, the following principles:

- 4.1** The quality of life of Filipino people needs to be improved;
- 4.2** Coastal resources should be preserved and protected from adverse effects of human activities;
- 4.3** Filipinos should live within the physical carrying capacities of coastal ecosystems;
- 4.4** The diversity of ecosystems should be conserved;
- 4.5** Personal attitudes and malpractice in resource use should be changed;
- 4.6** Decentralization in management of the coast should be facilitated;
- 4.7** An integrated management system for the coastal zone should be developed;
- 4.8** An information system at all levels of government should be installed; and
- 4.9** A sense of coordination and participation for all users and among managers of the coast should be developed.

PNCPS 1993

Part V. OBJECTIVES, POLICIES, and ACTIONS**5.1 IMPACT ISSUES**

Human use of coastal resources and human activities in the coastal zone produce ecological and socio-economic changes, (adverse or beneficial) that are of concern to society and the coastal environment guardians and representatives. Activities causing impacts of social concern are found in sectors such as fisheries, harbours and ports, and coastal ecosystems.

5.1.1 FISHERIES

5.1.1.1 Objective: To provide for the nationwide development of an integrated fisheries management system by year 2000.

5.1.1.2(a) Policy A

Depleted and exploited marine stocks shall be restored to sustainable levels as established by BCZM.

5.1.1.2(b) Policy B

Fisheries resources shall be harvested at a rate which will prevent overfishing.

5.1.1.2(c) Policy C

Conflicts among commercial and subsistence fishers shall be minimized. In the event of conflict, the LGU's ordinance regarding conflict shall apply.

5.1.1.2(d) Policy D

The approach towards an integrated fishery system shall be both anthropocentric and ecocentric.

PNCPS 1993**5.1.1.2(e) Policy E**

Fishery development shall co-exist with community development and shall include the LGUs, NGAs and NGOs in the process of allocating quotas.

5.1.1.2(f) Policy F

Provisions for logging shall be made to avoid and/or minimize downstream destruction of marine habitats, such as mangroves and coral reefs.

5.1.1.2(g) Policy G

Provide indigenous communities the rights they are entitled to with regard to fishery resources.

5.1.1.3 Implementing Actions**5.1.1.3(a) National Level: BCZM will**

- i) Coordinate with the National Economic Development Authority (NEDA) to develop a long-term integrated fisheries management plan, taking into consideration the seven policies, enumerated, as guiding principles.
- ii) Coordinate with other agencies involved in fisheries, and those whose activities have impacts on fisheries (such as BFAR), and develop an effective monitoring scheme concerning activities and their effects on all concerned.
- iii) Provide financial assistance to LGUs for conduct of planning activities and for assisting subsistence fishermen in implementing alternative livelihood projects.

PNCPS 1993**5.1.1.3(b) Regional Level: RDC and RBCZM will**

- i) Develop a long-term plan for stock restoration and enhancement which includes construction of artificial reefs where appropriate.
- ii) Conduct seminars and training to equip technical persons with skills appropriate for integrated fisheries management (e.g. stock appraisal, quota monitoring).
- iii) Coordinate all local coastal development plans conducting hearings/ consultations before deciding a regional coastal development plan which includes all sectors.

5.1.1.3(c) Local Level: LGUs will

- i) Re-evaluate existing local fishing/fishery regulations/ordinances with the goal of developing an effective and enforceable management system, taking into consideration the IUCN requirements, etc.
- ii) Enact ordinances which enhance productivity and protect/preserve local fisheries and nursery areas.
- iii) Prepare long-term development plans for local coastal areas including integrated fisheries management.
- iv) Apply zoning measures to protect natural areas of unique significance to each LGU, and minimize conflicts between commercial and subsistence fishermen.

PNCPS 1993

- v) Require project managers/administrators to provide copies of EIA to the respective councils for study before project implementation.
- vi) Provide alternative livelihood projects to subsistence fishermen to prevent overfishing and alleviate poverty.
- vii) Seek financial assistance from the national government and/or outside sources for funding of projects and training.

5.1.1.3(d) NGOs will

- i) Monitor and assess the effectiveness of policies in relation to the people and coastal fishery resources.
- ii) Cooperate with the government and coordinate with line agencies regarding plan inception, project implementation, etc.
- iii) Provide financial and technical assistance to impoverished coastal communities and subsistence fishermen for projects and training purposes.

5.1.2 HARBOURS AND PORTS

5.1.2.1 Objective: To develop a nationwide system which caters to the needs of harbour users (such as shipping) while protecting human life and minimizing degradation to the coastal environment including coastal waters.

PNCPS 1993**5.1.2.2(a) Policy A**

Industries shall be required to have sewage treatment plants, and to regulate waste disposal, and accidental oil and chemical spillage.

5.1.2.2(b) Policy B

The awareness and participation of the people with regard to sources and impacts of marine pollution shall be enhanced.

5.1.2.2(c) Policy C

Cooperation and coordination among regulatory and management agencies, and among national government agencies, and the local governments shall be facilitated.

5.1.2.2(d) Policy D

The participation of NGOs and community organizations in the development and implementation of waste management strategies shall be encouraged.

5.1.2.3 Implementing Actions**5.1.2.3(a) National Level: BCZM will**

- i) Require LGUs to develop a harbour management and use plan to be included in the national coastal plan.
- ii) Encourage the construction of artificial sewage treatment (e.g. by developing artificial wetlands) before any discharge is permitted in coastal waters.
- iii) Require the presentation of EIAs before implementing projects in the coastal environment.

PNCPS 1993

- iv) Develop and install information systems about pollution and its effects to people and to the coastal marine area, and about the roles of institutions, polluters and users of the coast.

5.1.2.3(b) Regional Level: RDC and RBCZM will

- i) Prepare regional coastal plans including harbour management and use of resources in the harbours.
- ii) Conduct seminars and training for technical persons in the LGUs to enable them to acquire skills appropriate to harbour use and management.
- iii) Appropriate regulatory controls, incentives, etc. should be developed to minimize and/or prevent point and non-point source pollution.
- iv) Maintain and enhance the diversity of species in the harbours by developing numerical and/or qualitative standards such as water quality.
- v) Methods and programs for waste disposal and management should be taught to various sectors in government.

5.1.2.3(c) Local Level: LGUs will

- i) Educate communities by sector and make them aware of the impacts of their practices on other individuals and harbour ecosystems.
- ii) Ensure the participation of the public, especially women and children, in such strategies.

PNCPS 1993

iii) Maintain ordinances relating to pollution control and prevention.

5.1.2.3(d) NGOs will

- i) Cooperate with government by participating in the implementation of effective regulatory measures on pollution.
- ii) Monitor entities and tourist developments contributing to sewage disposal problems.

5.1.3 COASTAL ECOSYSTEMS

5.1.3.1 *Objective:* To protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

5.1.3.2(a) Policy A

An integrated coastal area resource management scheme shall be promoted for national plans.

5.1.3.2(b) Policy B

Coastal ecosystems of national significance and/or biological and socio-economic importance shall be preserved and protected.

5.1.3.3 Implementing Actions

5.1.3.3(a) National Level: BCZM will

- i) Coordinate with all agencies involved in activities related to coastal ecosystems and establish an information system for use of the network of agencies at different levels of government.

PNCPS 1993

- ii) Prepare a comprehensive strategy for coastal ecosystems/resources of national and international significance.
- iii) Conduct an evaluation/assessment of all ecosystems as to the size, estimated degree of destruction, projected renewable rate, etc.
- iv) Review existing management systems to determine the appropriateness of rules and policies, discover where pitfalls lie, and determine the feasibility of adding or revising the system to protect ecosystems such as reefs, mangroves, etc.
- v) Establish a natural protected area system to preserve the natural character of significant species and ecosystems.
- vi) Conduct seminars on conservation/development awareness to train representatives at the regional level.
- vii) Provide financial and technical assistance to LGUs.

5.1.3.3(b) Regional Level: RDC and RBCZM will

- i) Encourage public participation by conducting repeat seminars previously given by the national government to LGUs.
- ii) Encourage public involvement in the development of regional coastal management plans.
- iii) Endorse the identified problem areas at the LGU level to the national government for funding assistance.

PNCPS 1993**5.1.3.3(c) Local Level: LGUs will**

- i) Improve the enforcement of regulations/ordinances protecting coastal ecosystems and protected areas and species.
- ii) Educate local communities on the consequences of degradation and the need for conservation and preservation of coastal ecosystems.
- iii) Identify areas and species which are worth preserving and those which need to be conserved and protected.

5.1.3.3(d) NGOs will

- i) Monitor activities which contribute to the degradation of coastal ecosystems.
- ii) Participate in seminars provided by national government.
- iii) Assist LGUs by providing technical training and providing financial assistance.
- iv) Attend hearings/consultations provided by the RDC and participate in identification of issues/problems that affect coastal ecosystems in the region.

PNCPS 1993

5.2 HAZARD ISSUES

The coastal zone, its resources and human life and property are threatened by the occurrence of natural phenomena such as storms and floods, endangering economic well-being as well as the depletion and possible extinction of coastal resources. It is, therefore, proper that these resources, including human life and property, be protected from natural hazards.

5.2.1 HAZARDS

5.2.1.1 Objective: To protect human life and property and coastal ecosystems from natural hazards such as storm waves, stream flooding, erosion, etc.

5.2.1.2(a) Policy A

An information system, shall be developed and installed at all levels of government and coordinated by National government, will include information and other data on natural hazards including storm waves, flooding, erosion, salt water intrusion, sea-level rise and lahar.

5.2.1.2(b) Policy B

Development shall be controlled in hazard prone areas by imposing zoning and land use measures.

5.2.1.2(c) Policy C

It shall be ensured that developments comply with building requirements provided by the Department of Public Works and Highways.

5.2.1.2(d) Policy D

Hazard impacts shall be minimised by developing preventive measures and establishing standards.

PNCPS 1993**5.2.1.3 Implementing Actions****5.2.1.3(a) National Level: BCZM will**

- i) Coordinate with all agencies whose functions are related to coastal ecosystems to establish multi-level information system.
- ii) Identify areas prone to hazards and control activities/development therein.
- iii) Include protection of the coastal zone from hazards in coastal plans and prepare contingency plans for unpredicted occurrence of such.
- iv) Provide adequate funding assistance for protection purposes.

5.2.1.3(b) Regional Level: RDC and RBCZM will

- i) Educate LGUs about hazard issues and protection and prepare people for the consequences and losses that may occur, in coordination with the Regional Disaster Preparedness Coordinating Council.
- ii) Develop, in conjunction with National Government and NGAs, an information system that will enhance public awareness and participation.

5.2.1.3(c) Local Level: LGUs will

- i) Appoint hazard officers who are responsible for training people in calamity preparedness, together with officers from other agencies.

PNCPS 1993

- ii) Encourage communities to engage in activities that help prevent hazard damage.
- iii) Develop, in conjunction with regional NGAs, an information system that will enhance public awareness and participation.

5.2.1.3(d) NGOs will

- i) Monitor activities that enhance damage from hazards.
- ii) Have access to comprehensive information systems.

5.3 DEVELOPMENTAL ISSUES

Countries of the Third World, such as the Philippines, need development. Unfortunately, the focus of economic development is on infrastructures which are constructed without taking into consideration the environment, such as the coastal zone. There is a need to welcome development, but it is vital to care for and protect the coastal ecosystems affected by it. Three major sectors need to be addressed: aquaculture, tourism and other recreational activities, and energy and mineral development.

5.3.1 AQUACULTURE

5.3.1.1 Objective: To develop an integrated approach in managing the impacts associated with the aquaculture industry while maintaining the viability and integrity of the environment.

PNCPS 1993

5.3.1.2(a) Policy A

The conversion of mangroves into aquaculture industry shall be minimized and/or avoided to prevent extinction of species and depletion of ecosystems.

5.3.1.2(b) Policy B

User conflicts between the aquaculture industry, fisheries and the public shall be mitigated, if not stopped.

5.3.1.3 Implementing Actions

5.3.1.3(a) National Level: BCZM will

- i) Assess the socio-economic costs and benefits resulting from the industry.
- ii) Include the assessment of impacts of aquaculture on other ecosystems.
- iii) Adopt new methods of constructing and maintaining aquaculture cages which do not damage mangrove ecosystems, and introduce them to LGUs, through the RDC.
- iv) Fund aquaculture livelihood projects of LGUs that are feasible, practical and income earning for subsistence fishermen and the LGUs.
- v) Strengthen the credibility of the aquaculture industry as an alternative source of income for subsistence fishermen.

5.3.1.3(b) Regional Level: RDC and RBCZM will

- i) Identify prospective areas appropriate for aquaculture.

PNCPS 1993

- ii) Endorse request for funding of LGUs to the national government.
- iii) Conduct seminars and training for LGU technical skills and knowledge of coastal communities regarding coastal degradation and the role of aquaculture as an alternative source of income instead of fishery exploitation.

5.3.1.3(c) Local Level: LGUs will

- i) Assist the RDC in the identification of prospective aquaculture industry sites.
- ii) Develop zoning measures to avoid conflicts among users.
- iii) Identify beneficiaries eligible for financial support and technical training.
- iv) Enforce regulations regarding the impacts on the environment caused by the industry.

5.3.1.3(d) NGOs will

- i) Assist in giving seminars and training to LGUs.
- ii) Monitor benefits resulting from the aquaculture industry, as well as adverse impacts, to help planners in the regulation or expansion of the industry.
- iii) Provide financial assistance to needy/eligible fishermen.

PNCPS 1993**5.3.2 RECREATIONAL ACTIVITIES/TOURISM**

5.3.2.1 Objective: To promote the development of safe ocean recreation opportunities which are socially and ecologically acceptable and compatible with other resource uses.

5.3.2.2(a) Policy A

Equal access to and along the coasts shall be provided for all except in protected areas where access is controlled.

- i) Provision shall be made for the maintenance and enhancement of amenity values in the coastal environment.

5.3.2.2(b) Policy B

Control of strategies for underwater recreation shall be provided where coral reefs and other ecosystems are at risk.

5.3.2.3 Implementing Actions**5.3.2.3(a) National Level: BCZM will**

- i) Develop in the national conscience the belief that the coastal zone is common property, by conducting seminars and/or media promotions.
- ii) Educate the people about the need to protect natural values using information systems.
- iii) Review zoning measures to identify areas of recreation and visual amenities for tourism purposes, and areas for commercial or livelihood use.

PNCPS 1993

- iv) Assign guardians to oversee that zoning regulations are obeyed, and provide appropriate sanctions for non-compliance.

5.3.2.3(b) Regional Level: RDC and RBCZM will

- i) Identify natural areas eligible for protection.
- ii) Maintain an information system linked at all levels.

5.3.2.3(c) Local Level: LGUs will

- i) Provide control measures regarding the access to protected natural areas.
- ii) Monitor areas where recreational activities can adversely affect ecosystems.
- iii) Educate coastal communities and national and international tourists about the various ways of using recreational facilities properly, and how improper use affects the environment and ecosystems.

5.3.2.3(d) NGOs will

- i) Provide information material to tourists and amenity lovers to distinguish the importance of *protection* as opposed to *exploitation*.
- ii) Assist LGUs in monitoring activities that threaten the coastal environment.
- iii) Have access to the information network at all levels.

PNCPS 1993**5.3.3 Energy and Minerals**

5.3.3.1 Objective: To provide for the development and exploitation of energy and mineral sources, taking into consideration precautions and environmental requirements to minimize adverse impacts on coastal resources.

5.3.3.2(a) Policy A

Environmental impact statements shall be required of every project that is likely to cause significant adverse effects on the coastal environment.

5.3.3.2(b) Policy B

Environmental and safety measures shall be maintained for energy and mineral projects.

5.3.3.2(c) Policy C

Energy conservation measures shall be encouraged to promote efficiency.

5.3.3.3 Implementing Actions**5.3.3.3(a) National Level: BCZM will**

- i) Coordinate with line agencies and other entities involved in coastal energy and mineral exploitation.
- ii) Ensure that exploiters follow regulations regarding exploitation activities.

5.3.3.3(b) Regional Level: RDC and RBCZM will

- i) Monitor activities related to energy and mineral exploitation.
- ii) Provide adequate information for use at all levels of government.

PNCPS 1993

5.3.3.3(c) Local Level: LGUs will

- i) Monitor activities related to energy and mineral exploitation.
- ii) Keep RDC informed of any exploitation activity related to energy and mineral resources.

5.3.3.3(d) NGOs will

- i) Assist in monitoring exploitation activities.

5.4 ORGANIZATIONAL PROCESS PROBLEMS

One of the factors achieving successful objectives is the method used by administrators and managers. It is common knowledge that graft and corruption is rampant within agencies of the country and among government leaders and officers. This problem and those discussed in Part III of the PNCPS lead to the poor implementation of programs and projects, hence there is a need for renewal of practices and review of policies.

5.4.1 ORGANIZATIONAL PROCESSES

5.4.1.1 Objective: To eliminate and/or minimize organizational process problems such as management which result in the ineffectiveness and/or failure of policies, plans and programs.

5.4.1.2(a) Policy A

Coordination among concerned agencies with regard the integrated management of the coast shall be developed.

PNCPS 1993

5.4.1.2(b) Policy B

Goals shall be clearly stated and objectives defined in coastal management plans.

5.4.1.2(c) Policy C

Complex, conflicting and confusing laws shall be integrated in order to have a more systematic comprehensible management system.

5.4.1.2(d) Policy D

International obligations shall be provided for, and met.

5.4.1.3 Implementing Actions

5.4.1.3(a) National Level: BCZM will

- i) Delineate roles and functions of each agency to avoid overlapping of functions and occurrence of conflicts.
- ii) Provide for the training and education of personnel in line with integrated coastal management.

5.4.1.3(b) Regional Level: RDC and RBCZM will

- i) Conduct seminars and training for technical people at the LGUs; and
- ii) Assess the efficiency of personnel in the field of integrated coastal zone management and identify weak areas of responsibility for retraining.

5.4.1.3(c) Local Level: LGUs will

- i) Clearly identify goals and objectives to be achieved at their level.

PNCPS 1993

- ii) Send employees to train in new skills especially in the field of integrated coastal zone management.
- iii) Assign duties and responsibilities to competent employees.
- iv) Create a working environment where employees are able to directly relate to employers.

5.4.1.3(d) NGOs will

- i) Monitor the implementation of duties and responsibilities assigned to LGUs and line agencies.

5.4.2 RESEARCH and EDUCATION

5.4.2.1 Objective: To develop a supportive national management system that encourages and promotes coastal zone education and fosters the growth, continued economic viability and effectiveness of research and development.

5.4.2.2(a) Policy A

Schemes to educate people about the importance of coastal resources and the roles that are expected of them in attaining sustainable development shall be provided.

5.4.2.2(b) Policy B

Research and education purposes shall be adequately funded.

PNCPS 1993**5.4.2.3 Implementing Actions****5.4.2.3(a) National Level: BCZM will**

- i) Encourage public participation with the inclusion of NGOs, ensure coordination of national agencies and managers, and install an information system to achieve cooperation among users and to minimize if not eliminate conflicts.
- ii) Include in educational curriculum a subject on the environment (with the coast as a "subsystem" of the whole environment) to instill in all Filipinos the intrinsic values of these resources and, therefore, their negative outlook towards the environment will turn the in the right direction.
- iii) Finance research studies for new skills and technology.
- iv) Attract international funding institutions to finance coastal zone research and education programs.
- v) Maintain international links and be an active member of international coastal organizations.
- vi) Increase public awareness of the Philippine natural scenic, cultural and exploited coastal resources through interpretive education.
- vii) Coordinate closely with line agencies and LGUs in order to maintain a healthy response from the public.

PNCPS 1993**5.4.2.3(b) Regional Level: RDC and RBCZM will**

- i) Coordinate with concerned line agencies and keep LGUs informed of research and education opportunities.
- ii) Endorse to national government identified areas worthy of research financial assistance.
- iii) Conduct seminars and training for LGU planners regarding project identification.

5.4.2.3(c) Local Level: LGUs will

- i) Identify fields of study and projects needing research and propose to national government through RDC.
- ii) Conduct informal education for communities, including out-of-school youths and women, regarding utilization of the coastal environment and how to live sustainably.

5.4.2.3(d) NGOs will

- i) Provide funding assistance for conduct of research studies.
- ii) Conduct appropriate training and seminars for LGUs.

PNCPS 1993

5.4.3 REGIONAL PLANS/POLICIES

5.4.3.1 Objective: To establish an effective implementation of coastal policies at the regional level.

5.4.3.2(a) Policy A

Any Regional Coastal Plans shall not be inconsistent with the PNCPS.

5.4.3.2(b) Policy B

The guiding principles on which the PNCPS is based shall be a consideration among regional authorities.

5.4.3.2(c) Policy C

Regional Coastal Plans shall provide for the maintenance and enhancement of water quality in the region:

- i) Coastal waters shall be classed according to use to provide better management;
- ii) Toxic discharge to the coastal environment, which will have significant adverse effects, shall be avoided; and
- iii) All sewage discharge to the coast shall be initially treated to ensure maintenance of carrying capacity.

5.4.3.2(d) Policy D

Maintenance of species diversity shall be promoted while providing fishers with harvests to support livelihood.

5.4.3.2(e) Policy E

Development of livelihood programs and projects as alternative to fishing shall be provided to minimize exploitation of fisheries:

- i) Conversion of mangroves into aquaculture projects shall be minimized.

PNCPS 1993

5.4.3.2(f) Policy F

Coastal resources shall be protected from activities with adverse impact on the environment.

5.4.3.2(g) Policy G

Lives, properties and coastal ecosystems shall be protected from damage from natural hazards such as erosion, flooding, storm waves, etc.

5.4.3.2(h) Policy H

Public participation shall be encouraged from plan inception and throughout the planning process.

5.4.3.3 Implementing Actions

5.4.3.3(a) National Level: BCZM will

- i) Support the RBCZM and the RDC with financial assistance as well as technical assistance in order for them to implement their functions; and
- ii) Provide timely update of data and other information to be used in the information systems.

5.4.3.3(b) Regional Level: RDC and RBCZM will

- i) Educate the people through LGU representatives, organizations and other sectoral groups about coastal ecosystems, their economic and aesthetic contributions to the users as well as their intrinsic values, the risks and safety involved, etc. using the information systems;

PNCPS 1993

- ii) Provide clear delineation of functions and duties for line agencies, local governments and managers of the coastal environment;
- iii) See to the observance of coastal water quality standards provided by BCZM; and
- iv) Require mining and other industries to secure coastal permits that have provisions in accordance with national policies for waste disposal.

5.4.3.3(c) Local Level: LGUs will

- i) See to the implementation of the regional coastal policies by developing policies, at that level, in accordance with the regional and national coastal policy statements;
- ii) Relay information and technology to communities and other users of the coast;
- iii) Ensure that industries and other users of the coast comply with national and regional water quality standards;
- iv) Provide ordinances as indicated in the Local Government Code regarding resource conservation and protection or as required; and
- v) Encourage the participation and cooperation of the people in each locality for the sustainable use and development of coastal ecosystems.

PNCPS 1993

5.4.3.3(d) NGOs will

- i) Assist RDC and RBCZM in the technical training and seminars; and
- ii) Extend financial support and other services to needy communities in the pursuit of sustainable living.

PART VI. IMPLEMENTATION and MONITORING

Monitoring and implementation play a crucial role in determining the achievement of goals and objectives. The purpose of monitoring is to follow through the implementation of PNCPS and determine the effects (both adverse and beneficial) of policies to all concerned including coastal ecosystems. The monitoring team gathers all the data regarding the effects and reports back to the evaluation team or the planning office in order that the affected phase in planning or evaluation is redone/revised. This feedback mechanism is important in achieving goals. The Format for Evaluating Policies/Plans (FEP) may be used to carry out this activity.

6.1 (a) National level:

The monitoring team is composed of the monitoring and/or information officers of BCZM, NEDA, NGOs and the Office of the President.

6.2 (b) Regional level:

The monitoring team is composed of the monitoring and/or information officers of RBCZM, the RDC, and the NGOs.

PNCPS 1993

6.3 (c) Local level:

The monitoring team is composed of the monitoring/ information/ development officer, the DILG officer, a representative from the local legislative body, and the NGOs.

The monitoring activity generally deals with policing the implementation of the PNCPS with regard to effectively carrying out the guiding principles in Part IV, and in addressing the coastal issues in terms of the following criteria:

- 1) water quality criteria (prevention of pollution at source; species diversity);
- 2) carrying capacity;
- 3) equity (intrinsic values);
- 4) coastal protection from hazards;
- 5) financial criteria;
- 6) administrative efficacy;
- 7) cooperation; and
- 8) systems approach.

Implementation and monitoring can be administered at all levels of government, because of the recent decentralization policy whereby LGUs are given their own funds in order that they be self-reliant. Questions for use by monitoring teams in dealing with the above criteria are enumerated in preceding sections (Chapter Two), and any team may add more questions to guide them in undertaking the monitoring activity. Regarding the management system for the implementation of PNCPS, the following questions are relevant:

PNCPS 1993

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| <ol style="list-style-type: none"> 1) Are the objectives of each policy being fulfilled? 2) To what extent does the implementation of PNCPS achieve the objectives? 3) Are those objectives still relevant? 4) How is the management strategy being enforced? Is it effective? 5) Are there measures that will make the implementation strategy more effective? 6) Is revision of the management strategy necessary? 7) Is the strategy used acceptable to all affected by the policies? How can management be improved? 8) In the overall assessment of the PNCPS implementation, is sustainable development achieved? |
|---|

It is important to note that the questions enumerated above do not limit the monitoring and evaluation teams in gathering more relevant information in determining the effectiveness of PNCPS.

5.4 Implications for Implementation

The success of PNCPS depends on the implementation and compliance with the policies of the plan. Generally, the beneficiaries, in priority, are the impoverished coastal communities and fishers. However, compliance with the policies means mutual consideration of coastal ecosystems. An example would be a fisher who agrees to

engage in prawn aquaculture without converting mangrove ecosystems, which does not only help increase the income of the fisher but saves other coastal resources and ecosystems inhabiting the mangroves.

Another crucial consideration is the involvement of politics. Generally, politicians and administrators of the coast do not have the same goals for each clientele group. In some instances there is resentment amongst people affected by the projects or programs being implemented. Therefore, it is important to include elected representatives in the inception of developmental plans including plans for the coast.

The information systems once installed, should work in a network effectively providing information to all levels of planning and NGOs. Failure to do this will threaten the viability of plans at all levels.

Industry and other interested parties whose activities greatly contribute to the disturbance and degradation of coastal ecosystems, suffer from short-term economic costs (such as fees for permits and the conduct of EIAs). These costs are mainly to protect ecosystems from exploitation, and to maintain diversity and enhance carrying capacity in the long-term (that is, also providing for future generations). However, as industries are profit operating, the people are the ones who pay for the consequences in terms of rises in commodity prices because of the projected effects in the short-term. Hopefully, education through the media, seminars and training will solve this conflict.

5.5 Conclusion

In this study, this is a key chapter as it brings together the best (*best* taken as the result of analysis by means of the criteria developed in Chapter Two) from a number of NCPSs to create a new NCPS for the Philippines.

While implementation of the PNCPS will be tested again using *ex-ante evaluation*, it has been shown that evaluation methods may also be used to bring together policies and

plans from a number of countries to assist in the formulation of the most effective Coastal Policy Statement.

The PNCPS structure is very detailed and comprehensive with effective potential. Policies are developed based on the result of testing the developed criteria, and on the requirements of IUCN. Responsibility of users and managers of the coast at all levels (i.e. national, regional, and local) are individually delineated and are expected to minimize future conflicts. The inclusion of the role of NGOs in the plan is a vital consideration in order to have the full cooperation from the government, public and private sectors. They are the "check and balance" of all activities apart from their regulatory community services.

The PNCPS is recommended for use of the Philippine coastal zone, may be used by other countries with similar coastal issues and problems.

CHAPTER SIX

CONCLUSION

The aim of this chapter is to summarize the main conclusions of the study and to present potential issues for future research.

6.1 Outcomes

The principal aim of this study was to develop a National Coastal Policy Statement for the Philippines, using an integrated approach in management, with the purpose of alleviating the poverty of Filipino fishermen and sustainably using and managing coastal ecosystems. This required reviews of the IUCN principles (objective 1); the selection of an appropriate evaluation method, using a set of ideal characteristics, to evaluate coastal policies and plans (objective 2); the development of evaluation criteria to be used in evaluating coastal plans/policies (objective 3); the formulation of a framework for carrying out evaluation using the criteria and the analysis of various coastal policy statements for their suitability for the development of a NCPS for the Philippines (objective 4); and, finally, the formulation of a NCPS for the Philippines.

Based on the objectives stated above, the following are the outcomes of this study:

1. The requirements posed by IUCN in developing national policies, together with its guiding principles, are considered in Chapters One and Five. This included the general issues affecting the coast, and the need for integration in managing the coast.

2. In Chapter Three, following the evaluation of various methods, it was seen that topic evaluation is generally the only means in evaluating the various CPSs because of limited information about the effects of human activities. Given ample time for implementing CPSs, it is recommended that the Goals-Achievement Matrix (GAM) would be the most appropriate in gauging effectiveness.
3. A check list of issues was presented and a set of criteria for evaluating coastal plans developed in Chapter Two. The resulting criteria were tested and used in analyzing different CPSs at different levels. The same issue-based criteria could be used in any country for evaluating the suitability of policies dealing with those issues.
4. Another feature of the study is the development of the Framework for Evaluating Plans/Policies (FEP) as a method for evaluating the usefulness of other countries' plans and policies for developing a NCPS. FEP can also be used in developing a national policy statement by showing the steps that planners or evaluation team should undertake in order to achieve the evaluation of the prospective effects of newly formulated plans/policies, or evaluating the effectiveness of plans and policies already implemented.

The FEP framework includes formulation of objectives at the initial stage; the development of coastal evaluation criteria derived out of emerging issues and problems of coastal resource management; and the design of a strategy to carry out evaluation. The FEP structure also allows recommendations from decision-makers whether to proceed with the implementation of the newly formulated plan/policy, to revise some aspects of the plan/policy, or to reject the proposed plan/policy. As the implementation is decided upon, monitoring programs are necessary, ensuring feedback needed to identify where plans are ineffective or failing to meet objectives in different phases of the evaluation.

If carried out according to its structure and objectives, FEP is a valuable instrument in evaluating plans and policies. In this study, FEP is used in analyzing various CPSs and is also used in developing the Philippine National Coastal Policy Statement (PNCPS). The difference lies with the way criteria are used. In the former, criteria are used in evaluating the effectiveness of coastal plans. Alternatively, criteria are used as ideal considerations in deriving appropriate policies. FEP can also be used to formulate other plans featuring issues such as water quality (including prevention of pollution at source and species diversity), carrying capacity, equity (including intrinsic values), protection of the coast from hazards, financial considerations, cooperation, administrative efficacy, and systems approach. Other environmental plans may be developed using the FEP framework. However, the framework is best applied at a general level of planning such as national policy.

With the use of the FEP framework, coastal policy statements of New Zealand, Hawaii, Thailand, Canada, the Philippines and Lingayen Gulf are analyzed. The purpose of analyzing such coastal policies is to determine the applicability of the criteria in resolving coastal issues/problems, and to adopt policies which are appropriate to the situation in the Philippines. It is seen, in the analysis, that the Hawaii structure (HORMP) considers all criteria but intrinsic values which are a unique feature of New Zealand (NZCPS). While other countries consider some of the enumerated criteria, they are considered to be inadequate for addressing the important issues in coastal resource management in the Philippines. Policies of Hawaii and New Zealand, which are seen as appropriate in the development of a Philippine NCPS, include policies on fisheries and harbour waste management and the intrinsic value of ecosystems.

The analysis of various coastal policy statements is a very important aspect of the study and a very important consideration in formulating a PNCPS. Although each country is unique in all aspects, physical and biological, the procedures that have already been taken may serve planners developing policy

statements in other countries. Having information about policies and actions already implemented, provides other places with a check list for rapid consideration of possible issues and alternatives. Adoption of appropriate procedures and actions may prevent the "re-invention of the wheel". Therefore, national agencies in other countries save time, energy, resources and money.

5. Adopting some policies from Hawaii and New Zealand, based on the needs of the Philippines (as discussed in Chapter One), the PNCPS is formulated. The PNCPS is a valuable document for the Philippines to use with regard to the integrated use and management of its coastal zone. The benefits of implementing the PNCPS are:

- a) the creation of a national agency to cater for the integrated use and management of the coast. This allows savings on the part of the national government, because of the merging of various agencies, and resolves confusion among coastal resource users, because the people will now consult one agency when they have problems concerning the use and management of the coastal zone;
- b) consideration of national and international obligations in planning at other levels. The requirements of the IUCN are considered along with recommendations seen by the DENR and other departments because they are compiled in one document, not over a series of departmental directives and policies;
- c) a systems approach to planning. That is, the interconnectedness of ecosystems on the coast with those further inland is considered. This means that PNCPS does not deal with coral reefs alone like that of Thailand, nor with mangroves alone such as studies made in the Philippines. The interrelatedness of various developmental activities (industrial, mining, etc.) in lowlands, uplands and the coast are also

considered in policies concerning water quality, resulting in decisions which are holistic, comprehensive and rational;

- d) an integrated approach to issues in the coastal environment and an integrated strategy to management of the coastal zone. The policies in the PNCPS considers the resolution of social, economic, institutional and ecological issues, ensuring sustainable utilization of coastal resources.

Integrated management requires the integration of legislation, research and activities concerning the coast from all disciplines, the coordination of managers of the coast, and the participation of all users of the coast in the protection and preservation of the coastal zone and its resources; and

- e) ecocentricity and anthropocentricity in the philosophy behind the PNCPS. The coastal resources and the people of the Philippines are the concerns of PNCPS, providing for the continued survival and regeneration of ecosystems while providing for the sustenance of the people in a sustainable fashion.

Specifically, PNCPS is concerned with the following:

- a) alleviating poverty of coastal fishing people and communities by introducing other sources of income;
- b) enhancement of the right of indigenous peoples to the use of coastal resources; and
- c) ensuring of the right of coastal ecosystems to maintain their diversity and regenerate to a sustainable carrying capacity.

6.2 Implementation

Integrated coastal resource management is not limited to the implementation of PNCPS at the national and regional level, as it is expected that implementing guidelines will be provided by BCZM and RBCZM at both levels to include and regulations that pertain to PNCPS at all levels of government. The success of PNCPS depends on the implementation of national policies by managers and administrators at all levels of coastal management and on the degree to which coastal resource users comply with regulations. The information system plays a major role in this aspect. Working in a network, all coastal resource use and management information may be made available to anyone whenever desired, and the roles and functions of agencies and sectors including NGOs should be well-defined. It is necessary, therefore, to include in the monitoring program for questions about the degree of compliance of coastal resource managers and users with the duties and responsibilities outlined in PNCPS. If necessary, appropriate sanctions need to be developed for non-compliance. All measures to monitor achievement of the sustainable development of the Philippine coastal resources are provided in the PNCPS.

6.3 Implications for Research

Further research needs to build on the existing knowledge base about coastal ecosystems and the effects of human activities in the coastal environment. Research may be descriptive. In Chapters Two and Four, it is clear that we have a lot more to understand about the dynamic marine environment, such research encompassing ecosystem modelling so that a more comprehensive understanding is gained about the functions of ecological processes.

Future research should be analytical in that more knowledge is needed about the effects of human activities on specific ecosystems. This was highlighted in Chapter Two. This generally requires detailed studies at a local and regional level of planning in most

countries. However, in countries like the Philippines, resources and expertise to carry out such studies are generally at a national level.

Planned research is also required to further develop the relationship between levels of planning ensuring adequate integration of policies, monitoring of policy effectiveness and understanding about planning for cumulative effects of seemingly small developments.

Another possibility for research is the further development of criteria for evaluating and developing coastal plans. While Phase 2 of FEP developed a specific number of criteria, future research may find them obsolete and inappropriate; hence FEP is designed to cater for any externality or uncertainty: the number of criteria is not a concern, but the development of criteria is. This is one point where future researchers may focus refining of FEP.

In developing the PNCPS, only eight criteria are considered appropriate given the existing issues at the time. Future studies may include the considerations of other criteria and issues that affect the use and management of the Philippine coastal zone. Due to unavailability of recently developed coastal policy statements, only six CPSs are analyzed to judge the appropriateness of the criteria (developed out of general coastal issues) for developing a national CPS. New problems may emerge in the future, hence, future research should consider these in revising or formulating another PNCPS.

It is also recommended that future research should allow for post-plan evaluation for recently completed CPSs. To date, only FEP allows for this.

6.4 Conclusion

The ends of integrated coastal resource use and management (such as achieving sustainable development of coastal resources, meeting the requirements of the present generation without impeding the opportunities of future generations, and for the people

to sustainably manage various activities in the Philippine coastal zone) are the potential achievements of the PNCPS. IUCN claims that there is no time to be lost in saving the earth's degraded coastal landscapes. Any delay in implementing PNCPS will result in further chaos for poor people, depleted coastal ecosystems, polluted coastal waters with fewer opportunities for food, aesthetics, recreation, etc. Non-implementation of PNCPS does not only affect the Philippines and its population but also neighbouring countries which connect to the Philippines through its oceans and coastal resources.

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APPENDICES

APPENDIX A

AGENCIES/ORGANIZATIONS RESPONSIBLE FOR CZM IN THE PHILIPPINES

Note: The following institutions and/or organizations are either directly or indirectly involved in the management of coastal resources.

1. Department of Agriculture (DA). This department is mandated to develop agricultural components of the economy - agricultural comprising crop, livestock and fishery production.

Bureau of Fisheries and Aquatic Resources (BFAR). The fisheries component is delegated to BFAR, the main function focusing on development as well as conservation of all aquatic and marine resources, including aquaculture and mariculture.

2. Department of Environment and Natural Resources (DENR). The task of this department is "to conserve, manage, develop and promote the judicious use of the country's natural resources... and to protect the environment by developing an affective environmental management system for the welfare of the present and future generations of Filipinos." Other important concerns are mining and geo-science, forest, land and environmental management, and ecosystem research.

National Environmental Protection Council (NEPC). NEPC has the general function of catering to the protection of the natural environment as a whole. NEPC has also established a coastal zone management program that addresses such issues as ports and dredging, tourism development, and marine pollution. Relative to the protection of the coast, is an Inter-agency Coastal Zone Task Force with representatives from 22 different government agencies.

Bureau of Forest Development (BFD). Under DENR, the task of this bureau is the implementing the provisions of the Revised Forestry Code, jurisdiction of which covers all forest and grazing lands, **mangroves** and all forest reservations including **watershed** reservations. This bureau issues permits for extraction of mangrove products such as firewood and construction materials, but releases to BFAR administration, swamplands that are zoned for fishpond development.

National Mangrove Committee (NMC). Created by DENR in 1976 in response to the need for a comprehensive and integrated mangrove resources management program to rationalize and reorientate policies for sound and optimal management of the country's mangrove resources. Among its functions are the development of appropriate policy guidelines for the rational management and conservation of the mangrove ecosystem and other related coastal ecosystems. In 1987, NMC merged with the Forest Research Institute to form the **Ecosystems Research and Development Bureau (ERDB)**.

3. Department of Social Welfare and Development (DSWD). The goal of this department is to provide a balanced approach to welfare whereby the needs and interests of the population are addressed. DSWD has programs designed to help the poorest of the poor (the bottom 30%) a large number of whom come from coastal regions.

4. Department of Interior and Local Government (DILG). The most important function of this department is to assist the President in exercising general supervision over the local government units unless otherwise provided for in the Local Government Code or elsewhere in RA 7160 and other applicable laws. DILG is a coordinating agency for local government units. Its mandates include the ensuring of socially, politically, economically and morally vibrant communities through the establishment of a more responsive, sensitive and self-reliant LGUs in an environment of peace and order. Important activities of department officers are the mobilization and organization of communities to fully implement the decentralization program of the nation.

Philippine National Police (PNP). This bureau, under DILG, is required to maintain order and enforce the law.

5. Department of Education, Culture and Sports (DECS). This department caters for the educational and cultural needs of the people. Its major concerns are: formal, non-formal, sports and physical education, and preservation and transmission of indigenous cultural heritage.

6. Department of Tourism (DOT). This agency promotes tourism and the development of tourism and tourism-related programmes designed to supplement the economic concerns of the government.

7. Philippine Tourism Authority (PTA). PTA is responsible for the implementation and operation of the infrastructure components of the tourism industry.

8. Department of Trade and Industry (DTI). This department is mandated to contribute to the attainment of economic recovery in the short-term and sustain economic growth in the long-term through implementation of developmental, promotional and regulatory services to trade and industry including the investment sectors.

9. National Economic and Development Authority (NEDA). This agency is responsible for national and regional development planning, investment programming and budgeting and the monitoring and evaluation of economic and social projects funded by the government of the Philippines.

10. Population Commission (POPCOM). This agency is mandated to develop and implement programmes to effectively control the population growth in the country. Coastal communities are one of the areas having high rate of population growth (Tadifa 1991).

11. Philippine Information Agency (PIA). The information arm of the government which provides free flow of accurate, timely and relevant information needed to assist communities in decision-making and identification of opportunities to improve the

quality of life and enabling citizens to participate meaningfully in the democratic processes.

12. Philippine Navy/Philippine Coast Guard (PN/PCG). These are law enforcement agencies considered as agents of persons in authority.

13. Local Government Units (LGUs). Refer to Appendix B.

14. Non-governmental Organizations (NGOs). Rule XIII of the Local Government Code of 1991 provides for the LGU promotion of the establishment and operation of people's organizations, NGOs and the private sector to make them active partners in the pursuit of local autonomy. This directly involves NGOs in plans, programs, projects and activities of LGUs. NGO representatives have the privilege of becoming members of the fully organized local development councils numbering to one-fourth (1/4) of total council membership. As of mid-1985, there are 130 local NGOs in the municipalities bordering the Lingayen Gulf alone (Kalagayan 1990). Organization services include: scholarships (Rotary Club); financial assistance; animal dispersal; day care; educational training; and civic activities such as distribution of educational supplies, powdered milk, seedlings and other needs, medical assistance, income generating projects, etc.

APPENDIX B

THE LOCAL GOVERNMENT UNITS OF THE PHILIPPINES

Note: Below are basic descriptions of the individual political units in the Philippines and the role that each LGU chief executive and legislators play in the LGU concerned. Also enumerated are the roles of each LGU with regard to environmental protection in accordance with the Local Government Code of the Philippines (1991).

I. Barangay

The barangay is the basic political unit and serves as the main planning and implementing unit of government programs, projects and activities. Each barangay consists of an assembly composed of barangay residents, 15 years or over, who discuss problems and activities as reported by the Sangguniang Barangay (SB)(village council). As a forum, the views of the people in the community are considered and crystallized. The chief executive of this unit is the Punong Barangay (village chief), who, among other functions, enforces all barangay laws and ordinances; negotiates and enters into agreement on behalf of the barangay on authorization of the Sangguniang Barangay; and enforce all laws and regulations relating to pollution control and protection of the environment (Art.88, RA 7160). The SB is the legislative body with the overall power to enact ordinances operative within the barangay for the general welfare of its constituents and to assist the establishment, organization and promotion of cooperative enterprises that will improve the economic condition and well-being of the residents (Art.101, RA 7160).

II. Municipality/City

The most exact and direct provisions of law concerning local fisheries as found in PD 704, the Local Government Code and the Local Government Tax Code involving the municipality and/or city. PD 704 delineates explicitly the extent of municipal/city waters (Sec.3P) and gives the municipality/city the power to grant fishing privileges in the form

of grants and licenses (Sec.29). A municipality/city through the Sangguniang Bayan (SB) (municipal Council)/Sangguniang Panglungsod (SP) (city council) can also enact general welfare ordinances, regulate business and adopt integrated zoning ordinances in agreement with the approved comprehensive land use plan, among others (Art.99, Art.100, RA 7160). Specific functions of the SB/SP with regard to the natural environment, are among others:

Art.99(1)(vi)/Art.100(1)(vi), RA 7160: "Protect the environment and impose appropriate penalties for acts which endanger the environment, such as dynamite fishing and other forms of destructive fishing, illegal logging and smuggling of logs, smuggling of natural resource products and of endangered species of flora and fauna, slash and burn farming, and such other activities which result in pollution, acceleration of eutrophication of rivers and lakes, or of ecological imbalance"; and

Art.99(5)(i)/Art.100(5)(i), RA 7160: "Approve ordinances which shall ensure the efficient and effective delivery of the basic services and facilities...[and shall] : Provide for the establishment, maintenance, protection and conservation of communal forests and watersheds, tree parks, greenbelts, mangroves and other similar forest development projects."

The mayor of the municipality/city is expressly empowered to coordinate with any national official or employee in the municipality to formulate and implement plans, programs and projects, and to direct the formulation and execution of municipal/city development plans and programs (Art.86/Art.87, RA 7160). Relative to the above, the municipal/city mayor shall, among others:

Art.86(3)(vii)/Art.87(3)(vii), RA 7160: "Adopt adequate measures to safeguard and conserve land, mineral, marine, forest, and other resources of the municipality/city; provide efficient and effective supply and property management in the municipality/city; and protect the funds, credits, rights and other properties of the municipality/city."

III. Province

The provincial government exercises general supervision over its component municipalities and cities. As the legislative body of the province, the Sangguniang Panlalawigan (Provincial Council) enacts ordinances, approve resolutions and appropriates funds for the general welfare of the province and its inhabitants. Other functions include:

Art.98(1)(i), RA 7160: "Reviews all ordinances approved by the sanggunians of component cities and municipalities and executive orders issued by the mayors";

Art.98(1)(vi), RA 7160: "Protect the environment and impose appropriate penalties for acts which endanger the environment such as dynamite fishing and other forms of destructive fishing, illegal logging and smuggling of logs, smuggling of natural resources products and endangered species of flora and fauna, slash and burn farming, and such other activities which result in pollution, acceleration of eutrophication of rivers and lakes, or of ecological imbalance"; and

Art.98(4)(i), R.A. 7160: "Adopt measures and safeguards against pollution and for the preservation of the natural ecosystem in the province, in consonance with approved standards on human settlements and environmental sanitation."

The governor of the province directs the formulation of provincial development plans and programs and directs implementation after approval by the sanggunian (Art.85, RA 7160). Among his duties is the provision, by law to initiate and maximize the generation of resources, and relative to this:

Art.85(3)(v), RA 7160: "Adopt adequate measures to safeguard and conserve land, mineral, marine, forest and other resources of the province, in coordination with the mayors of component cities and municipalities; provide efficient and effective property and supply management in the province; and protect the funds, credits, rights, and other properties of the province."

APPENDIX C

THE LOCAL DEVELOPMENT COUNCILS OF THE PHILIPPINES

Note: The Local Development Councils (LDCs) are the planning bodies/teams in the Local Government Units. The following are the roles the LDCs play at different levels of government (See Figure C.1).

I. Barangay Development Council

The Barangay Development Council's functions are to:

- mobilize people's participation in local development efforts;
- prepare barangay development plans based on local requirements;
- monitor and evaluate implementation of national or local programs and projects; and
- other functions as required by law or competent authority.

II. City /Municipal/Provincial Development Councils

The Provincial, City and Municipal Development Councils perform the following functions at their respective level:

- formulate long-term, medium-term and annual socio-economic development plans and policies, and public investment programs;
- evaluate and prioritize socio-economic development programs and projects;
- formulate local investment incentives to promote the inflow and direction of private investment capital;
- coordinate, monitor and evaluate the implementation of development programs and projects; and
- other functions provided by law or competent authority.

APPENDIX D**RELATIONSHIPS OF LOCAL GOVERNMENTS TO
NATIONAL GOVERNMENT****(THE PHILIPPINES)**

Articles 54 and 55 of RA 7160 states the relationships of the national government and the local governments as follows:

" Art.54, Mandatory Consultations. (a) All National Government Agencies (NGAs) shall conduct periodic consultations with appropriate LGUs, people's organizations, NGOs, and other concerned sectors of the community before any project or program is implemented in their respective jurisdictions"; and

(b) "NGAs or Government Owned and or Controlled Corporations (GOCCs) authorizing or involved in planning and implementation of any project or program that may cause pollution, climatic change, depletion of non-renewable resources, loss of cropland, rangelands, or forest cover, and extinction of animal or plant species shall consult with LGUs, NGOs, and other sectors concerned, and explain the goals and objectives of the project or program, its impact upon the people and the community in terms of environmental or ecological balance, and the measures that will be undertaken to prevent or minimize the adverse effects thereof."

Art. 55, Coordination with LGUs. "NGAs with project implementation functions shall coordinate with one another and with LGUs concerned in the discharge of these functions. They shall ensure the participation of LGUs both in the planning and implementation of said national projects."

APPENDIX E

COASTAL ISSUES

Note: The following is an excerpt of the result of a survey on the preliminary global list of important coastal resource issues. The extract shows a partial list of issues and impacts of socio-economic concern affecting many nations including the Philippines, New Zealand, Hawaii and Thailand (Sorensen and McCreary 1989).

Three types of issues are included: impact issues, hazards and sectoral planning concerns (development needs). Part I presents a set of causal networks. Flowing from left to right, the sequence of events starts with use of a coastal resource. This use involves human activities which produce changes in environmental or socio-economic conditions resulting to an impact of social concern. For example, increased turbidity reduces light penetration, which in turn decreases or kills coral growth. This produces the impact of decreased yields from coral reef fishery stocks. Note that different issues are important social concerns to different nations.

Table E.1

List of issues of ssocio-economic and ecological concerns in various countries

(Sorensen and McCreary 1989)

USE/ ACTIVITY	ENVIRONMENTAL CHANGE	IMPACTS	N Z	H A W	P H I	I N D	T H A
I. IMPACT ISSUES							
A. Estuary, harbour and nearshore water quality impacts							
1. domestic and industrial sewage and waste disposal	estuary pollution particularly adjacent to urban areas	decrease fish yields		*	*	*	
2. coastal oil development	chronic release of oil and/or large oil spills from accidents, oil pollution of estuarine and nearshore waters	decrease fish yields decrease recreation or tourism quality tainted fish and shellfish				*	
3. port development and shipping and/or offshore shipping of oil	-do-	decrease fish yields decrease recreation or tourism quality				*	*
4. agricultural pesticides	toxic pollutants of estuaries and nearshore waters	decrease fish yields fish kills		*	*		
5. crop, grazing, mining, forestry practices in coastal watersheds	watershed erosion, estuary sedimentation and increased turbidity	decrease fish yields			*	*	
6. -do-	watershed erosion, flood plain deposition	increase flood hazard			*	*	
B. Ground water quality and quantity							
7. agricultural development	withdrawal of ground water at greater rate than natural recharge	saltwater intrusion					*
C. Filling of wetlands including mangroves							
8. mining and spoil disposal	filling of wetlands	decrease fish yields				*	*
D. Mangrove impacts							
9. agricultural, aquaculture or salt evaporation development	draining or diking of mangroves	decrease fish yields			*	*	*

USE/ ACTIVITY	ENVIRONMENTAL CHANGE	IMPACTS	N Z	H A W	P H I	I N D	T H A
10. mangrove harvesting for woodchips, fuel wood and building materials	harvesting at rate greater than sustainable yield; decrease productivity	decrease fish yields; decrease timber yield of successive harvest			*	*	*
11. mining (tin)	removal of mangrove forests	decrease fish yields				*	*
E. Beach, dune and delta impacts							
12. recreation and/or tourism development	trampling beach and dune vegetation	decrease tourism and recreation attraction		*			
F. Fishing Efforts							
13. intensive and extensive fishing efforts	harvesting greater sustainable yield	decrease fish yields		*			*
14. competition between onshore and offshore fishermen (same stock)	-do-	-do- social conflicts between two groups			*		
G. Coral Reef and atoll impacts							
15. municipal and/or industrial sewage disposal	coral reef pollution yields; decreased tourism and recreation attraction	decrease fish yields		*	*		
16. coral mining	coral reef destruction	decrease fish yields; decreased recreation and tourism attraction				*	
17. coral mining	-do-	increase shoreline erosion				*	
18. coastal offshore mining	sediment and turbidity pollution of coral reefs	decrease fish yields; decreased recreation and tourism attraction				*	*
19. crop, grazing or forestry practices in coastal watersheds	watershed erosion; sediment and turbidity pollution of reefs	-do-		*	*	*	
20. fishing with dynamite	coral reef destruction	-do-			*		*
21. intensive localized fishing effort	harvesting at greater sustainable yield rate	decrease coral reef associated fish yields		*			*

USE/ ACTIVITY	ENVIRONMENTAL CHANGE	IMPACTS	N Z	H A W	P H I	I N D	T H A
H. Access to the shoreline and subtidal areas							
22. residential development on the shoreline	block or impair public access to the shore	resentment among local inhabitants; increase recreation pressure on accessible areas; site deterioration; decrease recreational quality		*			
23. tourism development of shoreline	-do-	-do-		*			
I. Visual quality							
24. Residential development	decrease visual quality of rural or natural landscapes	decrease recreation and tourism quality	*				
II. HAZARDS							
1. Water Erosion				*	*		
2. Coastal River Floods (natural)					*		
3. Storms (wind, wave and water damage)				*	*	*	
4. Tsunamis				*		*	
III. SECTORAL PLANNING							
1. Natural Area Preserves				*		*	
2. Water Supply							*
3. Recreation Development (for residents)			*				
4. Port Development (new)			*				
5. Industrial Siting				*			
6. Aquaculture Development (shrimp)					*	*	*
7. Agricultural Development					*		

APPENDIX F

CURRENT RULES AND REGULATIONS CONCERNING THE PHILIPPINE COASTAL ZONE

I. Provisions of the Philippine Constitution

In Philippine law, the government regulates the acquisition, disposition, use and exploitation of its natural resources, through the promulgation and enforcement of laws to achieve goals. This is based on the Philippine Constitution of 1987, where Article XII, Section 2 states that:

"All lands of the public domain, waters, minerals, coal, petroleum and other mineral oils, all forces of potential energy, fisheries, forests or timber, wildlife, flora and fauna, and other natural resources are owned by the State. With the exception of agricultural lands, all other natural resources shall not be alienated. The exploitation, development and utilization of natural resources shall be under the full control and supervision of the State. The State may directly undertake such activities or it may enter into co-production, joint-venture, or production sharing agreements with Filipino citizens, or corporation or association at least sixty per centum of whose capital is owned by such citizens..."

"The State shall protect the nation's marine wealth in its archipelagic waters, territorial seas and exclusive zones, and reserve its uses and enjoyment exclusively to Filipino citizens."

"Congress may, by law, allow small-scale utilisation of natural resources by Filipino citizens, as well as cooperative fish farming, with priority to subsistence fishermen and fish workers in rivers, lakes, bays and lagoons..."

Article XIII, Section 7 of the Philippine Constitution indicates the concept of Territorial Use Rights on Fisheries (TURF) and states:

"The State shall protect the rights of subsistence fishermen, especially of local communities, to the preferential use of the communal marine and fishing resources, both inland and foreshore. It shall provide support to such fishermen, through appropriate technology and research, adequate financial, production and marketing assistance, and other services. The State shall also protect, develop and conserve

such resources. The protection shall extend to offshore fishing grounds of subsistence fishermen against foreign intrusion. Fish-workers shall receive a just share from their labour in the utilization of marine and fishing resources."

Primarily addressed in the Constitution is the role of the State to protect and advance the right of the people to a balanced and healthy ecology in harmony with nature. This emphasizes the role of government agencies, as representatives of the State in every sector, to care for and regulate the utilisation of resources. Also recognized in the Constitution are the indispensable roles of the private sector in coastal resource management and the participation of NGOs and community-based or sectoral organizations at all levels of social, political, and economic decision-making.

II. Environmental Laws (Fisheries)

PDs 704 and 43. The principal laws that regulate the management and disposition of Philippine fisheries are Presidential Decrees 704 and 43. PD 43 creates a Fishery Industry Development Council which provides guidelines to protect fish habitats, marine parks, and other resources from pollution, among others. On the other hand, PD 704 declares the following policies:

- accelerate and promote the integrated development of the fishing industry;
- keep the fishery resources at optimum production levels through proper conservation and protection; and
- assist private organizations engaged in the fishing industry to make it a preferred area of investment.

All fisheries and aquatic resources of the country are under the jurisdiction of BFAR. City or municipal fisheries, though, remain under the city or municipal government concerned except for fishpens and seaweed culture which are BFAR's responsibility.

Exploitation. To prevent exploitation of fisheries, **PD 1015** prohibits the operation of commercial trawls in waters less than 7 fathoms. **Letter of Instruction (LOI) 1261** allows municipal fishermen to exploit, as well as protect, municipal fishing grounds from exploitation. Similarly, **LOI 1328** prohibits the operation of fishing gear such as commercial trawl and purse seine in marine waters within 7 km from the shoreline of all provinces. The BFAR issues Fisheries Administrative Orders (FAOs) and **FAO 115** provides for the legal dimension of meshed-nets to be not smaller than 3 cm when stretched.

Illegal Fishing. **PD 704** states the penalty for dynamite or blast fishing from 20 years to life imprisonment. Possession of explosives and dealing in illegally caught fish or fish products have corresponding punishments. The use of poison and other noxious substances, or devices for electric fishing are punishable with 8 years imprisonment.

PD 1219. This Coral Resources Development and Conservation decree prohibits the gathering of ordinary corals and the exporting of precious and semiprecious corals that have not been processed and manufactured into finished products. **PD 1698** amends PD 1219 providing for the improvement of facilities for enforcement, and prohibiting the use of coral as a building material.

FAO 158. This administrative order prohibits the gathering, selling or possessing for sale of mollusks belonging to the genera *Charonia* and *Cassis*. **FAO 142** provides a framework for the issuing of permits for the exporting of fish and fisheries/aquatic resources. **FAO145** provides for rules and regulations on the payment of fees and other charges for shells and aquatic resources. **FAO 138** provides for rules and regulations on mussel culture. **FAO 146** requires seaweed gatherers to acquire permits and to report quantities harvested, as the law may cover the restriction of an area for seaweed gathering.

Republic Act 3915. This Act provides for the protection and conservation of the marine ecosystem with the establishment of the National Park System. Among the entities that contribute to the implementation are BFAR, Siliman University, Development Academy

of the Philippines, Marine Science Institute, PTA, Environmental Management Bureau and DENR.

III. Environmental Laws (Forests)

PD 705. Commonly known as the Forestry Reform Code, it classifies mangroves as a type of forest and places mangroves under the jurisdiction of the Bureau of Forest Development (BFD) of the DENR. The state policies under the Code are:

- the multiple use of forest lands shall be oriented to the development and progress requirements of the country, the development of science and technology, and public welfare; and
- the protection, development and rehabilitation of forest lands shall be emphasized so as to sustain their productivity.

Mangroves, classified as forest by PD 705, are under the jurisdiction of the BFD (DENR). This bureau with the ERDB is responsible, for mangrove ecosystems, declaring areas/islands as mangrove conservation areas, among others. Critical watersheds may be declared as forest reserves while forest areas within 20 m of the edge of the normal high waterline may not be classified as alienable or disposable. In critical areas, mangrove exploitation is regulated and disallowed. Mangroves or swamps at least 40 m wide along shorelines facing rivers, lakes and other water bodies, and belts or strips not less than 100 m facing bays or the sea, are excluded from fishpond development (Kalagayan 1990).

IV. Environmental Laws (Minerals)

Two aspects of the mining industry which affect the coastal waters are coastal mineral exploitation and mining pollution. Kalagayan (1990) enumerates some of the national policies on mineral lands which are related to mining and the environment:

- promote and encourage the development and optimal use of the country's mineral resources;
- improve the socio-economic conditions of the people and widen the distribution of benefits from mineral wealth; and
- properly manage mineral resources and minimize environmental degradation due to mineral resource exploitation.

PD 463. This decree provides that all mineral/quarry operations are prohibited from directly disposing of tailings or mill waste into natural drainage systems, including rivers and tributaries. This law also prohibits flushing of tailings, and states that impounding of mine tailings shall be far from watershed areas and free from spillage, slides and/or washing away of tailings by surface runoff during heavy rains unto drainage systems, creeks, or rivers.

PD 1251. A Mine Waste Tailing Fee, determined by the Secretary of DENR, is imposed by this order which forms a reserve fund to be used for payment of damages to land, infrastructure, agricultural crops, forest products and aquatic resources affected by mine wastes.

Mines AO 19. This law prohibits the issue of a temporary permit or lease to applicants or operators extracting magnetite along the beaches of seas and lakes and areas adjoining thereto.

V. Environmental Laws (Others)

Other laws not only protect highland and lowland areas but also coastal areas. Obviously, effects of development/activities in the lands (like forests, mines, etc.) entail certain impact either grievous or beneficial, on coastal ecosystems. Tadifa (1991) cites some of these laws :

Commonwealth Act 383 punishes persons who dump any refuse, waste matter, or substances of any kind that may bring about the rise of, or the filling in of, riverbeds or artificial alluvial formations in any river. Improper disposal of garbage and other forms of waste are penalized under **PD 825**.

PD 1151. Also known as the Philippine Environmental Policy, it provides regulations on water, land, noise and air pollution. In supplement to this decree, **PD 1152**, is known as the Environmental Code of the Philippines. PD 1151, however, states the national policy on coastal zone management:

- to create, develop, maintain and improve conditions under which man and nature can thrive in productive and enjoyable harmony with each other;
- to fulfil the social, economic, and other requirements of present and future generations; and
- to ensure the attainment of environmental quality conducive to a life of dignity and well-being.

LOI 588 provides for the appointment and/or designation of a Pollution Control Office in every public and private agency which involves the prevention/mitigation of discharge of pollutants into nearby water or land.

PD 1586 requires the establishment of an Environmental Impact Statement (EIS). Certain areas and types of projects identified to be environmentally critical require the preparation of an EIS before implementation is approved.

PD 1144 creates the Fertilizer and Pesticide Authority. This agency approves the kind of pesticides/fertilizers to be used in land and fish farming to minimize adverse effects to both land and coastal environments.

PD 1160 authorizes Barangay Captains in all barangays (villages) to enforce pollution and other environmental control laws in their respective areas of jurisdiction.

APPENDIX G**IUCN (1991) RECOMMENDATIONS IN CZM
AT THE REGIONAL (LOCAL) LEVEL**

The following are the recommendations of IUCN (1991) in the use and management of coastal resources at the regional level:

- the development of greater consciousness of the importance of coastal zones and the oceans and of human impact on them;
- the establishment of integrated approaches to coastal and ocean management;
- the need for better global and regional cooperation;
- greater involvement of local communities in managing marine resources;
- the conservation of coastal and oceanic ecological processes and biodiversity; and
- the need for sustainable development of marine resources.

APPENDIX H**THIRD SCHEDULE
NZ RESOURCE MANAGEMENT ACT 1991****WATER QUALITY CLASSES**

Note: The standards listed for each class apply after reasonable mixing of any contaminant or water with the receiving water and disregarding the effect of any natural perturbations that may affect the water body.

1. Class AE Water (being water managed for aquatic purposes)

- (1) The natural temperature of the water shall not be changed by more than 3 degrees Celsius.
- (2) The following shall not be allowed if they have an adverse effect on aquatic life:
 - (a) Any pH change:
 - (b) Any increase in the deposition of matter on the bed of the water body or coastal water:
 - (c) Any discharge of a contaminant into the water
- (3) The concentration of dissolved oxygen shall exceed 80% of saturation concentration.
- (4) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

2. Class F Water (being water managed for fishery purposes)

- (1) The natural temperature of the water -
 - (a) Shall not be changed by more than 3 degrees Celsius; and
 - (b) Shall not exceed 25 degrees Celsius.
- (2) The concentration of dissolved oxygen shall exceed 80% of saturation concentration.
- (3) Fish shall not be rendered unsuitable for human consumption by the presence of contaminants.

3. Class FS Water (being water managed for fish spawning purposes)

- (1) The natural temperature of the water shall not be changed by more than 3 degrees Celsius. The temperature of the water shall not adversely affect the spawning of the specified fish species during the spawning season.
- (2) The concentration of dissolved oxygen shall exceed 80% of saturation concentration.
- (3) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

4. Class SG Water (being water managed for the gathering or cultivating of shellfish for human consumption)

- (1) The natural temperature of the water shall not be changed by more than 3 degrees Celsius.
- (2) The concentration of dissolved oxygen shall exceed 80% of saturation concentration.
- (3) Aquatic organisms shall not be rendered unsuitable for human consumption by the presence of contaminants.

5. Class CR Water (being water managed for contact recreation purposes)

- (1) The visual clarity of the water shall not be so low as to be unsuitable for bathing.
- (2) The water shall not be rendered unsuitable for bathing by the presence of contaminants.
- (3) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

6. Class WS Water (being water managed for water supply purposes)

- (1) The pH of surface waters shall be within the range 6.0-9.0 units.
- (2) The concentration of dissolved oxygen in surface waters shall exceed 5 grams per cubic metre.
- (3) The water shall not be rendered unsuitable for treatment (equivalent to coagulation, filtration, and disinfection) for human consumption by the presence of contaminants.

- (4) The water shall not be tainted or contaminated so as to make it unpalatable or unsuitable for consumption by humans after treatment (equivalent to coagulation, filtration, and disinfection), or unsuitable for irrigation.
- (5) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

7. Class I Water (being water managed for irrigation purposes)

- (1) The water shall not be tainted or contaminated so as to make it unsuitable for irrigation of crops growing or likely to be grown in the area to be irrigated.
- (2) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

8. Class IA Water (being water managed for industrial abstraction)

- (1) The quality of the water shall not be altered in those characteristics which have a direct bearing upon its suitability for the specified industrial abstraction.
- (2) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.

9. Class NS Water (being water managed in its natural state)

The natural quality of the water shall not be altered.

10. Class A Water (being water managed for aesthetic purposes)

The quality of the water shall not be altered in those characteristics which have a direct bearing upon the specified aesthetic values.

11. Class C Water (being water managed for cultural purposes)

The quality of the water shall not be altered in those characteristics which have a direct bearing upon the specified cultural or spiritual values.

APPENDIX I

RANGE OF EVALUATION METHODS

I. The Informal Evaluation Methods

The following informal evaluation methods are discussed in the following subsections: Minimum Requirements Approach (MRA), Topic Evaluation and Composite Evaluation.

1) Minimum Requirements Approach

One of the tools/approaches to the evaluation of plans is the minimum requirements approach. While other methods fail to incorporate the resolution of conflicts explicitly, Hill (1985) claims that this approach is intended for this purpose. Rational decisions are facilitated with various interest groups having multiple objectives, often conflicting in nature. The approach is appropriately matched with a participatory planning mode. This does not attempt to achieve the best solution in terms of a weighted set of criteria but tries to arrive at a compromise, with the satisfaction (at least minimally) of all participants. More rational decisions are arrived at based on the minimum requirements of interest groups, conducting reasoned dialogue and sharing of information. With this coalition, an entity or group separate from the participants, e.g. NGOs, should be formed and included in the dialogue with the added task of protecting the options of future generations.

2) Topic Evaluation

A very simple method of evaluation, topic evaluation entails separation of topics and discussed later according to cost and benefits and possible implications (Meister and Rosier, 1992). Where there is a small amount of information regarding specific implication of development, topic evaluation

is the most suitable method to apply. It is criticized because it lacks rationality and scientific methodology (Hill 1985) and is accused of neglecting consideration of marginal costs which may become evident only after policy implementation (Meister and Rosier 1992), but may still serve the interest of evaluators as to the feasibility of policy implementation.

Topic evaluation, as described above, is informal and thus is just a test conducted before using the evaluation techniques. Chadwick (1971) refers to this type as feasibility test, or testing to ascertain if an alternative is practicable. He contends that "if the alternative cannot be brought into being (i.e. not feasible), then there is little point in trying to evaluate it in a complicated and time consuming way". Even Lichfield (1975) asserts that impracticable plans should not be evaluated, or should be modified before subjecting to formal evaluation.

3) Composite Evaluation

Another informal method of evaluation is composite evaluation. Like topic evaluation, this is just another feasibility test from a range of policy options considering all characteristics of policies as a whole (Meister and Rosier, 1992). According to Hill (1985), the main difference between topic evaluation and this method is the degree of scrutiny performed. Conditions for this method include a relation of performance to goals and a comparison of costs and benefits from among each policy option.

II. The Formal Evaluation Techniques

The employment of informal evaluation methods are proven inadequate in the preceding section, but are useful, sometimes, when there is little technical information. However, where possible, formal evaluation methods (after proving one feasible) should be used to test the effectiveness of programs, plans or policies (e.g.

testing how much of the goal has been achieved, etc.). The methods to be discussed are Cost Benefit Analysis or Social Cost benefit Analysis (CBA/SCBA), Planning Balance Sheet Analysis (PBS or PBSA), and Goals-Achievement Matrix (GAM).

1) Cost Benefit Analysis

The cost benefit analysis or benefit cost analysis was devised in the USA in the 1930s and is the most popularly known and applied in evaluation, particularly in transport planning. It has also been used in some environmental problems. CBA was originally proposed as a means of making investment decisions in the private sector which has a sole objective of economic efficiency or maximization of profit. The criterion is that projects are economically desirable if the discounted benefits to whom they may accrue are in excess of the estimated (discounted) costs. In the public sector, decision rules of CBA seek to maximize public benefits or general welfare within the area of responsibility. Criticisms of the method led to its extension and now it accommodates income distribution and the environmental impacts. This evaluation methodology then is sometimes termed social cost benefit analysis. Lichfield. *et al.* (1975) noted that the confinement to economic application is, in fact, a misconception of the method, and thereby supports the SCBA title, with the contention that the costs and benefits include all of the social advantages and disadvantages of planning proposals which are in the society's interest. CBA rests on the theoretical underpinnings of the pareto-criterion: any project or policy change improves social welfare if the earners of profit could compensate the losers with some positive net gain remaining.

Procedure

The basic procedure for carrying out a cost benefit analysis is, first, to consider the cost and benefits of each alternative plan whereby they are identified and given monetary values. Second, it must be recognized that

these costs (monetized value of an adverse impact) and benefits (monetized value of a beneficial impact) are actual flows stretching into the future. That is, the costs being future opportunities for use must be given up if resources are spent on a particular plan with the benefits also consumed over time. This necessitates the application of discounting. The last stage in the procedure is the comparison of alternative plans/policies according to their discounted costs and benefits. In situations where there are alternative plans, the one with a greater beneficial value is adopted while, in evaluating the impacts of one plan, the sum of the benefits should exceed the sum of the costs before it is safe to adopt the proposed actions.

2) Planning Balance Sheet

Because of the difficulty of assigning measurable monetary values, there has been difficulty in directly applying CBA to plans which involve a range of sectors. Lichfield (1970) then developed the Planning Balance Sheet, which is a particular application of social cost benefit analysis. While SCBA deals with the valuation of alternatives in a single sector, the PBS is an expression of the advantages and disadvantages, costs and benefits and their effect on each sector in the community. McAllister (1986) notes that PBS goes beyond CBA in two ways. First, he says, PBS records a detailed information of costs and benefits among all groups of people who are affected by the proposed policy or plan. Second, PBS formally accommodates in the balance sheet, intangibles and other unmeasured effects. This is done by assigning symbols and recording them in the evaluation tables, together with monetary values for enumerated impacts.

The main purpose of PBS is the selection of a plan, which, on the information available, is likely to serve primarily the total interests of the community. PBS allows the community of concern to be grouped into a variety of homogeneous sectors distinguished by functional operations.

Groupings, according to income, age, and other interests, may also be applied. Alternative plans/policies are then evaluated and compared from the point of view of costs and benefits accruing in every sector from each alternative. The aim is to see which would provide the maximum net benefit. The implications of each set of proposals are exposed to the whole community with an indication of how the alternatives might be improved or amalgamated to produce a better end-product.

Procedure

Table I.1 presents the balance sheet of development envisioned by Lichfield. First, the various sectors affected by the plans are enumerated and grouped into producers (X, Y and Z) and consumers (X', Y' and Z'). The costs (adverse impacts) and benefits (beneficial impacts) that would accrue in the different sectors, if the plans are implemented, are measured and given a value. The costs and benefits are indicated as capital (once for all) items or annual (continuing) items (Hill 1968). Costs and benefits are expressed in monetary terms (e.g. \$a, \$b, \$c...), in quantitative but nonmonetary terms (e.g. M1, M2, M3...) and expressed as intangibles (e.g. i1, i2, i3...). For each plan, costs and benefits for each sector are aggregated and compared to the other plan. The rest is value judgment on the part of the evaluation team.

3) Goals-Achievement Matrix

Unsatisfied with CBA (which is a single objective method of evaluation) and with PBS (having CBA's economic efficiency goal aside from considering all costs and all benefits of all community goals in one enumeration, for the evaluation of alternative courses of action), Hill proposed the goals-achievement matrix in an attempt to overcome these weaknesses. The GAM incorporates the traditional CBA and cost effectiveness analysis. However, while CBA places emphasis on the single goal of economic efficiency, GAM focuses on multiple

Table I.1

The Planning Balance Sheet

(Source: Hill 1968, p. 19-29)

	PLAN A				PLAN B			
	BENEFITS		COSTS		BENEFITS		COSTS	
	Cap.	Ann.	Cap.	Ann.	Cap.	Ann.	Cap.	Ann.
Producers								
X	\$a	\$b	-	\$d	-	-	\$b	\$c
Y	i1	i2	-	-	i3	i4	-	-
Z	M1	-	M2	-	M3	-	M4	-
Consumer								
X'	-	\$c	-	\$f	-	\$g	-	\$h
Y'	i5	i6	-	-	i7	i8	-	-
Z'	M1	-	M3	-	M2	-	M4	-

goals with the inclusion of non-quantifiable objectives. Lichfield sees the GAM as an extension of his PBS which gives monetary and non-monetary information on alternatives and their potential effects on various sector groups. Popularly practised in the 1970s the GAM was derived from the theory of rational planning. Hill argues that neither the SCBA nor the PBS satisfy the requirements of rationality in planning.

Originally used in the field of transport engineering and land-use transportation studies in the USA, the GAM is attempted to determine the extent to which alternative plans will achieve a predetermined set of goals or objectives. Utilization of GAM entails the weighting of objectives, activities, locations and groups of sectors in the community/region.

Procedure

First, the degree to which each alternative achieves the operational objectives is identified at the start, and a numerical value is assigned. Each objective is given a numerical weighting to reflect its relative importance to the community and are later used to weight the level of goal achievement. Various groups affected are also identified (a,b) and numerical weights are assigned to each, reflecting the relative importance of each goal to each group. Costs and benefits for each objective are recorded in monetary, non-monetary or qualitative terms. The summation of costs and benefits is then obtained and compared for each goal. Assuming that all assessments are in the same units an illustration of the matrix can be provided (Table I.2). It is evident, though, that in the real world, this cannot be so.

Table I.2

The Goals-Achievement Matrix

(Source: Hill 1968, p. 19-29)

Goal 1: Weight = 2			Goal 2: Weight = 1			
Group Weight	Plan A	Plan B	Group Weight	Plan A	Plan B	
=====						
Group a	3	6	-6	3	-3	0
Group b	1	-2	2	2	0	-2

	4	-4		-3	-2	
=====						
Result: Weighted Index of goals achievement						
Plan A : Score = 4-3 = 1						
Plan B : Score = -4-2 = 6						
Conclusion: Plan A is preferable to Plan B.						

APPENDIX J**NZ RESOURCE MANAGEMENT ACT 1991****PART II****PURPOSE AND PRINCIPLES**

5. Purpose-(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

6. Matters of national importance- In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use,

development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:
- (b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:
- (c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:
- (d) The maintenance and enhancement of public access to and along the coastal marine area, lakes; and rivers:
- (e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

7. Other Matters- In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to-

- (a) Kaitiakitanga:
- (b) The efficient use and development of natural and physical resources:
- (c) The maintenance and enhancement of amenity values:

- (d) Intrinsic values of ecosystems:
- (e) Recognition and protection of the heritage values of sites, buildings, places, or areas:
- (f) Maintenance and enhancement of the quality of the environment:
- (g) Any finite characteristics of natural and physical resources:
- (h) The protection of the habitat of trout and salmon.

8. Treaty of Waitangi- In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

APPENDIX K**RESOURCE MANAGEMENT ACT****SECTION 32**

32. Duties to consider alternatives, assess benefits and costs, etc.- (1) In achieving the purpose of this Act, before adopting any objective, policy, rule, or other method in relation to any function described in subsection (2), any person described in that subsection shall-

(a) Have regard to-

- (i) The extent (if any) to which such objective, policy, rule, or other method is necessary in achieving the purpose of this Act; and
- (ii) Other means in addition to or in place of such objective, policy, rule, or other method which, under this Act or any other enactment, may be used in achieving the purpose of this Act, including the provision of information, services, or incentives, and the levying of charges (including rates); and
- (iii) The reasons for and against adopting the proposed objective, policy, rule, or other method and the principal alternative means available, or of taking no action where this Act does not require otherwise; and

(b) Carry out an evaluation, which that person is satisfied as appropriate to the circumstances, of the likely benefits and costs of the principal alternative means including, in the case of any rule or other method, the extent to which it is

likely to be effective in achieving the objective or policy and the likely implementation and compliance costs; and

(c) Be satisfied that any such objective, policy, rule, or other method (or any combination thereof)-

(i) Is necessary in achieving the purpose of this Act; and

(ii) Is the most appropriate means of exercising the function, having regard to its efficiency and effectiveness relative to other means.

(2) Subsection (1) applies to-

(a) The Minister in relation to-

(i) The recommendation of the issue, change, or revocation of any national policy statement under sections 52 and 53:

(ii) The recommendation of the making of any regulations under section 43:

(b) The Minister of Conservation, in relation to-

(i) The preparation and recommendation of New Zealand coastal policy statements under section 57:

(ii) The approval of regional coastal plans in accordance with the First Schedule:

(c) Every local authority, in relation to the setting of objectives, policies, and rules under Part V.

(3) No person shall challenge any objective, policy, or rule in any plan or proposed plan on the grounds that subsection (1) has not been complied with, except-

(a) In a submission made under clause 6 of the First Schedule in respect of a proposed plan or change to a plan; or

(b) In an application or request to change a plan made under section 64(4) or section 65(4) or section 73(2) or clause 23 of the First Schedule.

APPENDIX L

PRINCIPLES OF A SUSTAINABLE SOCIETY IUCN 1991

Principles of a sustainable society.

Living sustainably depends on accepting a duty to seek harmony with other people and with nature. The guiding rules are that people must share with each other and care for the Earth. Humanity must take no more from nature than nature can replenish. This in turn means adopting life-styles and development paths that respect and work within nature's limits. It can be done without rejecting the many benefits that modern technology has brought, provided that technology also works within those limits. This Strategy is about a new approach to the future, not a return to the past.

The principles of a sustainable society are interrelated and mutually supporting. Of those listed below, the first is the founding principle providing the ethical base for the others. The next four define the criteria that should be met, and the last four directions to be taken in working towards a sustainable society at the individual, local, national and international levels.

The principles are:

Respect and care for the community of life.

This principle reflects the duty of care for other forms of life, now and in the future. It is an ethical principle. It means that development should not be at the expense of other groups or later generations. We should aim to share fairly the benefits and costs of

resource use and environmental conservation among different communities and interest groups, among people who are poor and those who are affluent, and between our generation and those who will come after us.

All life on earth is part of one great interdependent system, which influences and depends on the non-living components of the planet - rocks, soils, waters and air. Disturbing one part of this biosphere can affect the whole. Just as human societies are interdependent and future generations are affected by our present actions, so the world of nature is increasingly dominated by our behaviour. It is a matter of ethics as well as practicality to manage development so that it does not threaten the survival of other species or eliminate their habitats. While our survival depends on the use of other species, we need not and should not use them cruelly or wastefully.

Improve the quality of human life.

The real aim of development is to improve the quality of human life. It is a process that enables human beings to realize their potential, build self-confidence and lead lives of dignity and fulfilment. Economic growth is an important component of development, but it cannot be a goal in itself, nor can it go on indefinitely. Although people differ in the goals that they would set for development, some are virtually universal. These include a long and healthy life, education, access to the resources needed for a decent standard of living, political freedom, guaranteed human rights, and freedom from violence. Development is real only if it makes our lives better in all these respects.

Conserve the Earth's vitality and diversity.

Conservation-based development needs to include deliberate action to protect the structure, functions and diversity of the world's natural systems, on which our species utterly depends. This requires us to:

Conserve life-support systems. These are the ecological processes that keep the planet fit for life. They shape climate, cleanse air and water, regulate water flow, recycle essential elements, create and regenerate soil, and enable ecosystems to renew themselves;

Conserve biodiversity. This includes not only all species of plants, animals and other organisms, but also the range of genetic stocks within each species, and the variety of ecosystems;

Ensure that uses of renewable resources are sustainable. Renewable resources include soil, wild and domesticated organisms, forests, rangelands, cultivated land, and the marine and freshwater ecosystems that support fisheries. A use is sustainable if it is within the resource's capacity for renewal.

Minimize the depletion of non-renewable resources.

Minerals, oil, gas and coal are effectively non-renewable. Unlike plants, fish or soil, they cannot be used sustainably. However, their "life" can be extended, for example, by recycling, by using less of a resource to make a particular product, or by switching to renewable substitutes where possible. Widespread adoption of such practices is essential if the Earth is to sustain billions more people in future, and give everyone a life of decent quality.

Keep within the Earth's carrying capacity.

Precise definition is difficult, but there are finite limits to the "carrying capacity" of the Earth's ecosystems - to the impacts that they and the biosphere as a whole can withstand without dangerous deterioration. The limits vary from region to region, and the impacts depend on how many people there are and how much food, water, energy and raw materials each uses and wastes. A few people consuming a lot can cause as much

damage as a lot of people consuming a little. Policies that bring human numbers and life-styles into balance with nature's capacity must be developed alongside technologies that enhance that capacity by careful management.

Change personal attitudes and practices.

To adopt the ethic for living sustainably, people must re-examine their values and alter their behaviour. Society must promote values that support the new ethic and discourage those that are incompatible with a sustainable way of life. Information must be disseminated through formal and informal educational systems so that policies and actions needed for the survival and well-being of the world's societies can be explained and understood.

Enable communities to care for their own environments.

Most of the creative and productive activities of individuals or groups take place in communities. Communities and citizens' groups provide the most readily accessible means for people to take socially valuable action as well as to express their concerns. Properly mandated, empowered and informed, communities can contribute to decisions that affect them and play an indispensable part in creating a securely-based sustainable society.

Provide a national framework for integrating development and conservation.

All societies need a foundation of information and knowledge, a framework of law and institutions, and consistent economic and social policies if they are to advance in a rational way. A national programme for achieving sustainability should involve all interests, and seek to identify and prevent problems before they arise. It must be adaptive, continually redirecting its course in response to experience and to new needs. National measures should:

- * treat each region as an integrated system, taking account of the interactions among land, air, water, organisms and human activities;
- * recognize that each systems influences and is influenced by larger and smaller systems - whether ecological, economic, social or political;
- * consider people as the central element in the system, evaluating the social, economic, technical and political factors that affect how they use natural resources;
- * relate economic policy to environmental carrying capacity;
- * increase the benefits obtained from each stock of resources;
- * promote technologies that use resources more efficiently; and
- * ensure that resource users pay the full social costs of the benefits they enjoy.

Create a global alliance.

No nation today is self-sufficient. If we are to achieve global sustainability a firm alliance must be established among all countries. The levels of development in the world are unequal, and the lower-income countries must be helped to develop sustainably and protect their environments. Global and shared resources, especially the atmosphere, oceans and shared ecosystems, can be managed only on the basis of common purpose and resolve. The ethic of care applies at the international as well as the national and individual levels. All nations stand to gain from worldwide sustainability - and are threatened if we fail to attain it.

APPENDIX M**PRINCIPLES FOR SHORE MANAGEMENT
CANADA 1978**

Each shore management policy should be based on, but need not be limited to, the following principles:

1) "The recognition of the importance of shore areas"

All levels of government recognize the critical environmental, economic, and social importance of shores and actively promote the sensitive and orderly management of shores and shore resources in the long term.

2) "A cooperative approach to management"

Where interests of governments and/or agencies coincide, a cooperative approach to the management of shores should be undertaken. A lead agency should be identified within each jurisdiction to provide the leadership to develop and integrate intra- and inter-jurisdictional policy. This does not preclude direct cooperation between and among individual agencies in relation to specific issues.

3) "Policy and program coordination"

All levels and agencies of government must strive to coordinate their policies and programs so that integrated management of shores and shore resources can be achieved. To accomplish this, inter-jurisdictional coordinative mechanisms could be adopted to embrace the numerous and diverse interests associated with shore management.

4) "The recognition of the role of local governments"

The key role of local governments in shore management planning and implementation must be recognized. Senior governments could support these efforts by providing technical and financial assistance.

5) "The contribution of industry"

The potential contribution and cooperation of industry in the development and implementation of shore management practices must be actively encouraged.

6) "The interrelationship of shore activities"

All shore users must take into account the consequences of their actions on shore systems and on other activities. Development siting criteria sensitive to the physical, biological and social characteristics of shores must be included within each policy.

7) "The protection of sensitive, unique, and significant areas"

Sensitive, unique, and significant shore areas, including biotic habitats, should be identified and protected. Government could provide incentives to private individuals and groups who manage, protect, and restore sensitive shore areas.

8) "The right of public access"

Rights of public access to shore areas must be ensured. In those areas where shore access is in short supply, efforts should be made to restore public rights-of-way.

9) "Information systems"

Cooperative information systems must be structured so that information obtained is readily applicable to shore management decision-making and planning. Inter-jurisdictional information centres to coordinate the collection, collation, and dissemination of shore management information could be established for this purpose.

10) "Public awareness"

All levels of government must undertake programs designed to increase public awareness and appreciation of the dynamic and sensitive nature of shores. Public concerns should be incorporated into the objectives of shore management policies.

(Hildebrand 1988, 20-21)

APPENDIX N

COASTAL POLICIES OF HAWAII

(An excerpt from HORMP 1991)

I. WASTE MANAGEMENT

Policies:

- A. Minimize point and non-point source pollution and its accompanying impacts on the ocean and coastlines by developing appropriate regulatory controls, incentives, monitoring, and research programs.
- B. Promote waste minimization through source reduction, recycling, and other alternative methods of waste management as part of the State's regulatory programs.
- C. Be prepared to respond effectively to spills and other discharges involving oil and other hazardous materials in the State's waters.
- D. Enhance public awareness and participation with regard to source and effects of marine pollution, as well as methods and programs for waste disposal and cleanup.
- E. Ensure cooperation among regulatory and management agencies within the State, and among Federal, State, and County agencies.

II. SMALL BOAT HARBORS

Policies:

- A. Expand the State's small boat harbour system, including launching ramps, taking into account analyses of the area's carrying capacities and the economic efficiency of proposed harbors.
- B. Minimize the conflicts between harbour development and other ocean and coastal activities.
- C. Facilitate public-private partnerships and other alternative means for financing harbour development.
- D. Minimize and mitigate impacts of harbour development and operations on ecological and cultural resources.

III. FISHERIES

Policies:

- A. Assess the status and population dynamics of fisheries stocks (on an ongoing basis) and develop effective management regimes for inshore, nearshore and offshore resources.
- B. Assess the social and economic costs and benefits of a range of commercial and recreational fisheries development options to support the design of effective management and development regimes.
- C. Coordinate private-sector, State and Federal fisheries development and management efforts.
- D. Ensure that native Hawaiian fishermen receive all the rights to which they are entitled.
- E. Maximize the use of scientific and management resources.

- F. Ensure reasonable access to fisheries resources for subsistence, recreational and commercial fishermen as well as other recreational users (e.g. divers) and aquarium fish collectors.
- G. Minimize and resolve user conflicts among fishermen and between fishermen and other ocean resource users.
- H. Support trade and investment promotion, seafood marketing support, and the promotion of sports fishing and fisheries-related tourism.
- I. Restore depleted stocks and enhance existing stocks by developing an effective management regime.
- J. Provide appropriate infrastructure for recreational and commercial fisheries development.
- K. Evaluate marine safety needs of commercial and recreational fishermen and facilitate developing programs to reduce accidents.