Analysis of the effectiveness of Indonesia's coral reef management framework

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ANALYSIS OF THE EFFECTIVENESS OF INDONESIA'S CORAL REEF MANAGEMENT FRAMEWORK

A thesis submitted in fulfillment of the requirements for the award of the degree

Doctor of Philosophy

from
UNIVERSITY OF WOLLONGONG

by

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DECLARATION

I, Dirhamsyah, declare that this thesis, submitted in fulfillment of the requirements for the award of Doctor Philosophy, in the Centre for Maritime Policy, Faculty of Law, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Dirhamsyah
23 November 2005

ABSTRACT

Coral reefs are one of the important components of coastal and marine ecosystems in Indonesia. Uncontrolled and irresponsible management has resulted in them being severely stressed. At least 70% of Indonesia's coral reefs are under rigorous threat and this is now considered one of the most serious environmental problems in the country. This thesis analyses the challenges of managing coral reef ecosystems in Indonesia. The problems identified include: lack of community participation; weakness in national and local legislative framework; lack of national policy and planning; lack of law enforcement and compliance systems; weakness in institutional arrangements for coastal and coral reef resources management; and most importantly, the general lack of political and bureaucratic commitment and lack of interagency cooperation at the national and regional government levels.

The thesis concludes with several recommendations for improving the management of coastal and coral reef resources and their ecosystems. The recommendations include: the application of community-based management or co-management concepts in coastal and coral reef resources management; the establishment of a national ocean policy; amendment of several natural resource laws and the enactment of a new integrated natural resources law; the establishment of horizontal and vertical interagency cooperative mechanisms for policy and management planning and implementation; the establishment of national and regional law enforcement units; and the creation of a new Coordinating Ministry for Ocean Activities.

ACKNOWLEDGMENTS

I wish to express my gratitude to a number of people who have assisted and encouraged me during the completion of this thesis. I want to give special thank to my supervisors, Professor Martin Tsamenyi and Associate Professor Sam Bateman, for their continuous support and guidance, for their patience and compassion to convince me that I can complete this study. I also thank Professor Richard Kenchington for his intellectual and policy guidance.

I am also deeply indebted to my brother Mr Peter Flewwelling for his time and effort in proof reading of this thesis. His experience in monitoring, control and surveillance for fisheries management around the world guided me to understand how coastal states can, and in many cases do address the problem of illegal fishing.

I am so grateful to ACIL-Australia, who was appointed by the Australian Agency for International Development (AusAID) to manage my scholarship. I am particularly grateful to Mr. Simon Field, Robert Kingham, Sam Chittick, and Sonia Fallon,

I would like to thank sincerely Dr Ono Kurnaen Sumadhiharga, Director of the Research Center for Oceanography-LIPI, Dr Anugerah Nontji, former Director of Project Management Office of COREMAP, and my superior Dr. Kasim Moosa and Drs Wanda Suryana Atmadja, M.Sc., who have supported me throughout my studies in Australia.

I would also like to thank my friend Leonas Chatim, and Dendie Yunanda, my colleagues in the Centre for Maritime Policy, the Research Center for Oceanography-LIPI, and Project Management Office of COREMAP and Dr Arifin Rudyanto from the National Development Planning Agency (BAPPENAS).

Finally, and most important of all, my deepest appreciation to my lovely wife Tuti Priyanti, my daughter Lia, my sons Reza and Gilang, for all their patience and support for my studies, and my parents and my family who have always been a source of strength and support throughout my academic pursuits. Without their love, this thesis would have never have been completed.

DEDICATION

This thesis is dedicated to my dearest wife Tuti Priyanti, my daughter Lia Fauziah Wati, and my sons Mohammad Reza Darmawan and Mohammad Gilang Kurniawan, who have supported me all the time,

and to my father and mother who stimulated my interest in academic pursuit. Their dream that their son will one day graduate with a PhD has finally been realised.

TABLE OF CONTENTS

Chapter Two

Chapter Three

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ADB:	The Asian Development Bank
AIG:	Alternative Income Generation
APBN:	National Income and Expenses
ASL:	Archipelagic Sea Lanes
AURI:	The Indonesian Air Force
BAKOSURTANAL:	National Coordinating Agency for Survey and Mapping
BAPPEDA:	Regional Development Planning Board
BAPPENAS:	National Development Planning Board
BPPT:	Board of Implementation and Assessment of Technology
BPS:	Statistic Bureau of Indonesia
CBCRM:	Community-based Coastal Resource Management
CBCRM:	Community-based Coastal Resource Management
CBM:	Community-based Management
CBNRM:	Community-based Natural Resource Management
CCRMP:	Community Coral Reef Management Plans
CI:	International Conservation
CITES:	Convention on International Trade in Endangered Species of Wild Fauna and Fauna
CMT:	Customary Marine Tenure
COREMAP:	Coral Reef Rehabilitation and Management Programme
CRMP:	Coastal Resources Management Project

DGC:	The Directorate General of Custom
DGFPNC:	Directorate General of Forest Protection and Nature Conservation
DGI:	The Directorate General of Immigration
DMI:	Indonesian Maritime Council
DU:	District Unit
EEZ:	Exclusive Economic Zone
ENSO:	El Niño Southern Oscillation
FAO:	Food and Agriculture Organisation of the United Nations
FPNC:	The Directorate General of Forest Protection and Nature Conservation
FRMP:	Fisheries Resources Management Project
GBHN:	Broad Guidelines of State Policy
GCRMN:	Global Coral Reef Monitoring Network
GDP:	Gross Domestic Product
GESAMP:	Group of Experts on Scientific Aspects of Marine Pollution
GOI:	Government of Republic of Indonesia
ICEL:	The Indonesian Centre for Environmental Law
ICLARM:	International Centre for Living Aquatic Resources Management
ICM:	Integrated Coastal Management
ICRI:	International Coral Reef Initiative
ICZM:	Integrated Coastal Zone Management
IFM:	Institute of Fisheries Management
IMA:	International Marine Alliance

IMO:	International Maritime Organization
IPB:	Institute of Agriculture Bogor
IUCN:	The World Conservation Union
KEHATI:	The Indonesian Biodiversity Foundation (An Indonesian NGO)
KLH:	State Ministry for Environment
LAPAN:	National Agency for Aerospace
LIPI:	Indonesian Institute of Sciences
LNG:	Liquid Natural Gas
LOSC:	United Nations Convention on the Law of the Sea
MAB:	Man and Biosphere
MCS:	Monitoring, Controlling and Surveillance
MENKO EKU:	Coordinating Ministry for Economic
MMA:	Marine Management Area
MNP:	Marine National Parks
MOA:	Memorandum of Agreements
MOCT:	The Ministry of Communication and Transportation
MODS:	Ministry of Defense and Security
MOEMR:	Ministry of Energy and Mineral Resource
MOF:	Ministry of Forestry
MOHARA:	Ministry of Home Affairs and Regional Autonomy
MONE:	Ministry of National Education
MORRI:	Ministry of Resettlement and Regional Infrastructure
MOTC:	Ministry of Transportation and Communication
MOTI:	Ministry of Trade and Industry
MPA:	Marine Protected Area

MPR:	General People Assembly
MREP:	The Marine Resources, Evaluation and Planning Project
MRP:	Marine Recreation Parks
MSY:	Maximum Sustainable Yield
MWWS:	Marine and Wetland Wildlife Sanctuaries
NGO:	Non-Governmental Organization
OECD:	Organization for Economic Cooperation and Development
PCRA:	Participatory Coastal Resource Assessment
PERDA:	Regional Government Regulation
PRA:	Participatory Resource Assessment
PROPENAS:	National Development Program
PU:	Provincial Unit
RCO:	Research Centre for Oceanography
REPELITA:	Five Years Development Plan
RUMSRAM:	A local NGO in Biak Numfor, Indonesia
SEAPOL:	South East Asian Programme in Ocean Law, Policy and Management
SMCT:	State Ministry for Cultural and Tourism
SMNDP:	State Ministry for National Development Planning
SMRST:	State Ministry for Research and Technology
TAC:	Total Allowable Catch
TNC:	The Nature Conservancy
UNAIR:	University of Airlangga
UNCED:	United Nations Conference on Environment and Development
UNDP:	United Nations Development Programme

UNDSD:	United Nations Division for Sustainable Development
UNEP:	United Nations Environmental Programme
UNHAS:	University of Hasanuddin
UNPATTI:	University of Pattimura
UNRI:	University of Riau
UNSRAT:	University of Sam Ratulangi
VMS:	Vessel Monitoring System
WALHI:	The Indonesian Forum for the Environment
WCED:	World Commission on Environment and Development
WSSD:	World Summit on Sustainable Development
WWF:	World Wildlife Funds for Nature

INTRODUCTION

Background

Indonesia became the world's largest archipelagic state with the entry into force of the 1982 Law of Sea Convention (the 1982 LOSC) in 1994. The total length of the Indonesian coastline is estimated at 81,000 km[1] covering 17,506[2] islands. The total area under the jurisdiction of Indonesia is approximately 7.73 million square kilometres, consisting of 1.93 million square kilometres of land area, 2.8 million square kilometres of archipelagic waters, 0.3 million square kilometres of territorial sea, and an exclusive economic zone (EEZ) of 2.7 million square kilometres.[3] The marine environment that forms almost 80% of the archipelago exhibits high physical, chemical and biological diversity. Marine and coastal resources and activities account for about 26.5% of Indonesia's Gross Domestic Product (GDP)[4] and employs over 14 million people, or 7.5% of the total population.[5]

Much of the Indonesian coastline is fringed by coral reefs, mangroves, seagrass beds and intertidal mud flats.[6] Coral reefs and their associated shallow-water habitats such as reef flats, seagrass beds and lagoons, support the richest marine fauna in Indonesia. It is believed that Indonesia is the world's centre of

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1 Dahuri, R. (1995) Indonesia: National Status and Approaches to Coastal Management, in Hotta, K and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*. Tokyo, JIMSTEF, p.277.

2 Originally, Indonesia had 17,508 islands, however, in January, 2003 the International Court of Justice decided that the ownership of Sipadan and Ligitan islands should be transferred to Malaysia.

3 Ibid.

4 The Ministry of Marine Affairs and Fisheries (2003) Urgensi RUU Pengelolaan Wilayah Pesisir dan Pulau-Pulau Kecil (The urgency of the draft of the Act for the Management of Coastal Area and Small Island). The Ministry of Marine Affairs and Fisheries, http://www.dkp.org (accessed on 20 July 2003).

5 Tomascik, T.; A.J. Mah; A. Nontji & M.K. Moosa, (1997) *The Ecology of Indonesian Seas*. (2 volumes). Hong Kong, Periplus Edition., p.7.

6 Ibid., p. 1185.

diversity for many marine and coastal species, including coral reefs, molluscs, reef fish and mangroves.[7] All forms of coral reefs are found in Indonesia's waters including: fringing reefs, barrier reefs, atolls, and patch reefs. It is estimated that about 45% of Indonesia's coastline is fringed by coral reefs.[8] The total size of Indonesia's coral reefs is estimated at 85,700 square kilometres, equating to 14% of the world's coral reef area.[9] Table 0-1 provides a summary of the approximation of the total coral reef area for the Indonesian Archipelago.

Table 0-1: Approximation of total coral reef area in the Indonesian Archipelago

Please see print copy for Table 0-1

Coral reefs have been recognised as one of the world's "essential life support systems".[11] Coral reef ecosystems are among the world's most biologically diverse and productive ecosystems, and are an integral part of tropical coastal ecosystems, which include mangroves, sea grasses and beaches.[12] Coral reefs play important social and economic roles in Indonesia. They provide food and livelihood for millions of people who live in the coastal areas.[13] Healthy coral reefs also assist in protecting infrastructure in the coastal areas by acting as a coastal buffer from

7 Tomascik et al. (1997) "The Ecology of Indonesian Seas," Information provided by Reef Base – A Global Information System "Indonesia: Status Reports" http://www.reefbase.org (accessed on 3 April 2003).

8 State Ministry for Environment (KLH), 1992, as cited by Tomascik et al. (1997) "The Ecology of Indonesian Seas," p.136.

9 Burke, L., Selig, L. and Spalding, M. (2002) Reefs at Risk in Southeast Asia, World Resources Institute, p.36.

10 Tomascik et al. (1997), no 5 above, pp.137-138.

11 IUCN/UNEP/WWF, (1980), as cited by White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1994) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press, p.1.

12 White, A.T. and Trinidad, A.C. (1998) The Values of Philippine Coastal Resources: Why Protection and Management are Critical. Cebu City: Coastal Management Project., p.1.

13 Ibid.

tropical storms, wave and current activities.[14] Further, they support very valuable marine life. Recent studies have revealed the medicinal and industrial potential of some marine organisms in coral reef ecosystems.[15]

One recent study along the west coast of Lombok estimated the value of the reefs in the area to be worth US$5,800 per hectare, with seven thousand one hundred fishermen currently utilising this same coastline sourcing over 35% of their fish catch from these coral reefs.[16] The total potential annual economic benefits per square kilometre of healthy coral reef in Southeast Asia, ranged from US$23,100 to US$270,000 (see table 0-2).

Table 0-2: Potential Sustainable Annual Economic Net Benefits per Km² of Healthy Coral Reef in Southeast Asia

Please see print copy for Table 0-2

This variation in potential economic benefits is largely due to the variety and scale of different tourism operations.[17] The estimated annual net benefits are lower for areas without tourism potential (see table 0-2). The analyses revealed that the potential sustainable economic net benefits per year from coral reefs could be US$1.6 billion for Indonesia and US$1.1 billion for the Philippines. This estimate

14 Tomascik et al (1997), no 5 above, p.7.
15 Wilkinson, C. (2000), Status of Coral Reefs of the World: 2000, Australian Institute of Marine Science, p.7.
16 Tomascik et al. (1997), no 5 above, p.1186
17 Burke et al (2002), no 9 above, p.53.

takes into consideration fisheries, tourism, coastal protection, aesthetic, and biodiversity benefits, but does not include potentially lucrative future values from pharmaceutical development[18] (see table 0-3).

Table 0-3: Potential Sustainable Annual Economic Net Benefits[19]
For Indonesia and the Philippines (US$ Million)

Please see print copy for Table 0-3

Coral reef ecosystems have become stressed in recent decades, with subsequent negative impacts on the human communities that depend on them. The paradox continues and coral reefs are deteriorating in all areas where human activities are concentrated, notably in developing countries.[20] Today, the struggle to conserve coral reefs is at a critical stage. Much effort to conserve and protect coral reef ecosystems from marine pollution and unsustainable extraction has been widely advocated by the international community and action is forthcoming.

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18 Ibid., pp.54-56.

19 Note:

a. Areas with tourism potential are defined as those within 10 km of current tourism centres;

b. The Net Present Value (NPV) provides a summary of the value of the resource by aggregating annual benefits over a 20-year period, but it gives greater weight to the near future by using a "discount rate" of 10% per year. This discount means that the current benefits of a future good are reduced by 10% for each year into the future. Use of this high discount rate may underestimate future losses.

Source: Burke et al (2002), no 9 above, p.55.

20 Wilkinson (2000), no 15 above, p. 7.

Coral reef degradation has been discussed widely on a worldwide scale[21] and on a regional scale.[22] At least 70% of the Southeast Asia region's 200,000 square kilometres of coral reefs amounting to about 140,000 square kilometre, is under threat. Most will be lost within the next ten to twenty years unless workable management plans are put in place.[23] A report by the Global Coral Reef Monitoring Network (GCRMN) in 2004 revealed that the world's coral reefs continue to decline.[24] The assessment to late 2004 was that 20% of the world's coral reefs have been effectively lost and show no immediate prospects of recovery. Approximately 6.4% of the world's reefs were seriously damaged from the coral bleaching event of 1998, and 26% as a result of human activities such as sedimentation, sand and rock mining.[25]

The degradation of Indonesia's coral reefs is now serious. Only a small percentage of Indonesia's coral reefs are still in good condition. The report of the Research and Development Centre for Oceanology (RDCO), now the Research Centre for Oceanography (RCO), on the condition of Indonesia's coral reefs in 1996

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21 Some scholars who have discussed the degradation of coral reefs on a worldwide scale, include by Alcala, A.C., Gomez, E.D. and Yap, H.T. (1988) Philippine Coral Reefs: Status and Human Response to Changes, in Ruddle, K., Morgan, W.B. and Pfafflin, J.R. The Coastal Zone Man's Response to Change, Harwood Academic Publishers, pp. 447-490; Hinrichsen, D. (1998) Coastal Waters of the World: Trends, Threats, and Strategies, Island Press, Washington, D.C. pp.23-25.

22 Gomez (1980); Yap and Gomez (1985), as cited by Alcala et al., "Philippine Coral Reefs: Status and Human Response to Changes", p.465; Chou, L.M. (2000) Southeast Asian Reefs – Status Update: Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam, in Wilkinson, C. (ed.) Status of Coral Reefs of the World: 2000, Australian Institute of Marine Science, 2000; Nontji, A. (2000) Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium. Bali, 23-27, 2000, Proceedings Vol. I pp.17-27; Hopley, D and Suharsono (2000) The Status of Coral Reefs. in Eastern Indonesia. Global Coral Reef Monitoring Network (GCRMN).

23 Wilkinson, C.R., Chou, L.M., Gomez, E., Mohammad, I.S., Soekarno, and Sudara, S. (1993) A regional monitoring approach to monitoring coral reefs studies in Southeast Asian by the ASEAN-Australia Living Resources Project. Proceedings of the 7th International Coral Reef Symposium, 1, pp.138-143. Information provided by Reef Base – A Global Information System "Indonesia - Threat: Reefs At Risk": http://www.reefbase.org (accessed on 3 April 2003).

24 Ibid.

25 Wilkinson, C. (2004) Status of Coral Reefs of the World 2004 Volume 1, Australian Institute of Marine Science, p.7.

revealed that only 6.04% of coral reefs are still in excellent condition.[26] Table 0-4 presents the results of monitoring activities on Indonesia's coral reefs by the staff of the Research Centre for Oceanography of the Indonesian Institute of Sciences.

Table 0-4: The Condition of Indonesian Coral Reefs

Please see print copy for Table 0-4

The study was based on the observation of living corals. The highest degradation occurred in the western part of Indonesia, where more than 50% of corals in that region are classified as being in a "bad or poor" condition. The coral reefs in the eastern part of Indonesia are in better condition. More than 30% of corals in that area are in "excellent" or "good" condition. Generally, more than 70% of Indonesia's reefs are in "fair" or "bad/poor" condition. Although destruction of some corals is due in part to natural causes, the study confirmed that the degradation of Indonesia's coral reefs is due largely to human causes.[27]

The Indonesian government has taken concrete steps to manage its coral reefs. Initially, legal instruments were adopted to reduce and minimise coral reef degradation.[28] By way of example, the fisheries law limited or prohibited the harvest

26 Nontji, A. (2000) Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium. Bali, 23-27, 2000, Proceedings Vol. I p. 23.
27 Ibid., p.26.
28 The Act No. 31 of 2004 concerning Fisheries; The Act No. 5 of 1990 concerning Conservation of Natural Resources and Their Ecosystem; and The Act No. 41 of 1999 concerning Forestry.

of coral itself, as well as key species such as turtles and dugongs.[29] It also prohibited destructive fishing practices such as the use of explosives and trawls. Simultaneously, there was a major effort to stop coral degradation through the establishment of marine parks and reserves.[30]

The implementation of these management measures is widely regarded as ineffective. Laws have not been enforced, impact assessment procedures have not been followed, conflicts among resource users have increased, and traditional rights have become eroded. Centralised management regimes that were institutionalised during the Soeharto era also exacerbated the degradation of coral reefs. They ignored the traditional knowledge and capacity of local communities.[31] The government agencies did not have adequate expertise and skilled staff to adequately perform these functions.

Nontji (2000) argued that the degradation of Indonesia's coral reefs may be attributed to lack of awareness and knowledge of coral reefs, weakness of law enforcement, lack of institutional coordination, pressure on the reefs from coastal people, and lack of a national policy on coral reef management.[32]

Noting the above, it seems Indonesia has a complex problem in managing its coral reefs. The problem has social, political, legal, economic and policy aspects. According to Kenchington (2000), the social and political problems are more difficult to address than the technical problems when managing marine

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29 Article 7 of Act No. 31 of 2004 prohibits the capture of some endangered marine species.

30 White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (eds.) (1994) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press., p.12.

31 Novaczek, I., Sopacua, J., and Harkes, I. (2001) Fisheries Management in Central Maluku, Indonesia, 1997-1998. Maritime Policy, Vol. 25, No.3, pp. 239-249; Zerner, C. (1998) Tracking Sasi: The Transformation of a Central Mollucan Reef Management Institution in Indonesia. In White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1998) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press, pp. 19-32.

32 Nontji (2000), no 20 above, p. 26.

environments.[33] Indonesia needs to employ an integrated management approach to its marine and coastal areas, particularly coral reef ecosystems. Many authors[34] view this as necessary given the close relationship between land activities and the flow on effects on marine and coastal ecosystems. Further, shortcomings in one sector will impact on other sectors. By way of example, the absence of enforcement of environmental laws, while shortcomings in the objectives of the instruments, also erode public confidence in the law, the bureaucracy and community awareness programs. Proper coral reef management requires maintenance of the balance between human usage and the ecological limits of the coral reef ecosystem.

Objectives of the thesis

Noting the background outlined above, the thesis has three interrelated objectives.

The first objective is to analyse the existing institutional arrangements for coastal resource management in Indonesia and to identify their efficacy and adequacy in coral reef management.

The second objective is to examine Indonesia's marine and coastal resources regime and management measures. This is to determine the gaps between theoretical

33 Kenchington, R. (1990) Managing Marine Environments, New York, Taylor & Francis New York Inc., p.2.

34 For example: Cicin-Sain, B., and Knecht, R.W. (1998) Integrated Coastal and Ocean Management: Concepts and Practices. Island Press, Washington, D.C.; Chua, T-E. and Scura, L.F., (1992), Integrative Framework and Methods for Coastal Area Management, Proceedings of the Regional Workshop on Coastal Zone Planning and Management in ASEAN: Lessons Learned, Bandar Seri Begawan, Brunei Darussalam 28-30 April 1992, International Center for Living Aquatic Resources Management (ICLARM); Kenchington, R. and Crawford, D. (1993) On the meaning of integration in coastal zone management. Ocean and Coastal Management, Elsevier Science and Publishers, England. No. 21, pp. 109-127; Tomascik, et al., "The Ecology of Indonesian Seas", p.1169; Hinrichsen, D. (1998) Coastal Waters of the World: Trends, Threats, and Strategies, Island Press, Washington, D.C., pp. 1-2.

policy considerations of marine and coastal resources management and their implementation by central and local governments.

The third objective of the thesis is to analyse the current models of community participation in coral reef management and conservation programs in Indonesia. Here, the emphasis will be on applying the concept of community-based and collaborative management, and community enforcement of coral reef management and conservation.

At the heart of this thesis is a desire to investigate the problems faced in managing Indonesia's marine and coastal resources and to provide possible solutions to achieve the sustainable use of coral reef and coastal ecosystems for Indonesia.

Coral reef management and conservation issues in Indonesia are complex, and differ from region to region. It is necessary therefore for Indonesia to employ a broader integrated approach in order to tackle the complex problems.

It is the argument of this thesis that the problem of environmental degradation in reef areas in Indonesia is due to four main factors. The first factor relates to social considerations. These involve the lack of knowledge, awareness and community involvement in resource management. The second factor is economic pressure. The poverty of the fishers and other resource users provides an inducement to commit illegal activities that result in increased environmental degradation.

The third factor is the legal framework. The lack of integrated law, law enforcement systems and inter-agency commitment and cooperation serve to inhibit the prevention of degradation to reef areas. The fourth factor stems from political problems such as the lack of national planning and appropriate institutional arrangements.

Contribution of the thesis

Over the last few decades, increasing attention has been paid to the study of marine and coastal management, particularly coral reef policy and management. This is due to the growing environmental awareness in all countries, the implementation of the 1982 LOSC and subsidiary conventions and agreements to stop the downward spiral of degradation and destruction of the world's marine resources and habitats. To date, there has been very little analysis of Indonesia's approaches to the management of its coastal and marine resources. Much of the literature on coral reef and coastal management in Indonesia focuses on specific aspects such as institutional arrangements,[35] legal and political aspects,[36] environmental management,[37] community-based and traditional management,[38] national coastal and ocean policy,[39]

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35 Sorensen, J.C., and S.T. McCreary. (1990) Institutional Arrangements for Managing Coastal Resources and Environment. Washington D.C.: National Parks Service, US Department of the Interior; Sloan, N.A., and A. Sugandhy. (1994) An overview of coastal environment. Coastal Management 22, pp. 89-118; Patlis, J.M., Dahuri, R., Knight, M. and Tulengen, J. (2001) Integrated Coastal Management in a decentralized in Indonesia: How it can work. Pesisir and Lautan, Vol. 4(1), pp. 24-39; Purwaka, T.H. and Sunoto (2001) Coastal Resources Management in Indonesia: Legal and Institutional Aspect, in Torell, M. and Salamanca, A.M. (eds.) Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia, SIDA and ICLARM, pp. 60-90; Hidayat, A. (2003) Governance Structure in Coral Reef Management: A report from Gili Indah Village, West Lombok Indonesia. Working Paper on a Research Colloquium of Resource Economic Department, Humboldt University of Berlin.

36 Agoes, E.R. (1991) Indonesia and the LOS Convention: recent developments in ocean law, policy and management. Marine Policy (March): pp. 122-131; Djalal, H. (1995) Indonesia and the Law of the Sea. Jakarta: Centre for Strategic and International Studies; Patlis, J., Knight, M. and Siahaan, W. (2002) Creating A Framework for Integrated Coastal Management in Indonesia: The Importance of Law, in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, pp. V 7-20.

37 Kusuma-Atmadja, M., and Purwaka, T.H. (1996) Legal and institutional aspects of coastal zone management in Indonesia. Marine Policy 20(1), pp. 63-86.

38 Pomeroy, R.S. (ed.) (1994) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Center for Living Resources Aquatic Resources Management (ICLARM); Zerner, C. (1994) Tracking Sasi: The Transformation of a Central Mollucan Reef Management Institution in Indonesia, in White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1994) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press, pp. 19-32; Mantjoro. E. (1996) Traditional management of communal-property resources: the practice of the Sasi system. Ocean & Coastal Management 32 (1), pp. 17-37; Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North

and the effectiveness of maritime law enforcement.[40] None of these studies comprehensively examine coral reef and coastal management in Indonesia. This thesis fills the vacuum in the academic literature by providing an important insight into the extent to which the concept of integrated coastal zone management (ICZM), community-based and collaborative management may lead to more effective coral reef management in Indonesia. It is argued throughout the thesis that Indonesia needs to implement integrated coastal zone management to be able to address the problems of degradation of coastal and coral reef resources.

Organisation of the thesis

This thesis is organised into nine chapters. The first chapter focuses on the significance of coral reefs and other coastal ecosystems for Indonesia. It also reviews the problems associated with the management of Indonesia's coral reef ecosystems. Chapter Two discusses the relationship between coral reefs and other coastal ecosystems. This provides the framework of analysis necessary to identify the important factors influencing coral reef management in Indonesia. The analysis will be focused on the aspects of marine policy and legal framework, institutional arrangements, and maritime law enforcement systems. The central role of

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Sulawesi, in ITMEMS Proceeding, pp. 299-309; Novaczek, I., and J. Sopacua. (2001) Fisheries management in Central Maluku, Indonesia 1997-98. Marine Policy 25(3), pp. 239-249.

39 Dahuri R., (2000), Kebijakan dan Strategi Pengelolaan Terumbu Karang Indonesia (Policy and Strategy of Indonesian Coral Reef Management), Prosiding Lokakarya Pengelolaan dan IPTEK Terumbu Karang Indonesia (Proceedings of the Workshop on Management, Science and Technology of Indonesian Coral Reefs, Jakarta, 22-23 November 1999, Indonesian Institute of Sciences, pp. 1-16; Nontji, A., (2000), Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium. Bali, 23-27, 2000, Proceedings Vol. I pp. 17-27; Kusumastanto, T. (2003) Ocean Policy: dalam Membangun Negeri Bahari di Era Otonomi Daerah (Ocean Policy: In developing maritime country in regional autonomy era). Jakarta, PT. Gramedia Pustaka Utama.

40 Pet-Soede, L. and Djohani, R.H. (1998) Combating destructive fishing practices in Komodo National Park: Ban the hookah compressor. The Secretariat of the Pacific Community (SPC). SPC Live Reef Fish Bulletin, 4, pp. 17-28; Crawford, B.R., Siahainenia, A., Rotinsulu, C., Sukmara, A. (2004) Compliance and Enforcement of Community-Based Coastal Resources Management Regulations in North Sulawesi, Indonesia. Coastal Management, Vol. 32, pp. 39-50.

community participation in the success or failure of coastal and marine resource management at the local level means that it is necessary to analyse the concept of community participation in coastal and ocean resource management in a specific chapter.

Chapter Three provides a review of the concept of community-based management and co-management in administering coastal and ocean resources. The relationship between co-management and decentralisation in Indonesia are also discussed in this chapter. Also discussed are the experiences of Asia Pacific countries in implementing the community-based and collaborative management approaches in coastal and marine resources management.

Chapter Four is a case study of the implementation of the collaborative management approach in Senayang and Lingga Islands, Riau. It discusses the establishment of local marine sanctuaries, the concept of alternative income generation, and community awareness as part of the community participation concept. Chapter Five analyses the institutional and administrative framework for coastal and coral reef management in Indonesia. The chapter reviews the existing institutional arrangements of coastal management at the national, provincial, district and village levels and examines the roles of the national and regional governments in coastal and marine management. Chapter Five also identifies several problems associated with the institutional arrangements of coastal and marine management in Indonesia. It concludes with suggestions to address these problems.

Chapter Six examines the legal framework for coastal and marine management in Indonesia. The chapter identifies the major gaps in the legal framework at all levels of government. It concludes with suggestions to address these

gaps. Chapter Seven is also a case study of regional government policies and regulations with respect to coastal and marine management, particularly coral reef management. It analyses regional government policies and regulations of the Riau Archipelago, Selayar, and Biak Numfor districts. It also reviews and analyses the pattern of coastal resource management and the local institutions that are involved in coastal and marine management.

Chapter Eight discusses the key policy framework for coastal and marine management in Indonesia. The chapter concludes by identifying the major gaps in the policy framework for coastal and marine resource management in Indonesia. Chapter Nine analyses the current and alternative models of coastal and marine law enforcement in Indonesia. The chapter makes some recommendations to improve the maritime law enforcement framework in Indonesia.

The thesis concludes that the development and management of coral reefs should be understood in the broader context of ocean and coastal resources management. The conclusion ties in the findings and recommendations of the earlier chapters, and provides new directions for future research on Indonesian coral reef management.

Chapter One

The Role and Nature of the Indonesia's Coastal and Coral Reef Ecosystems

1.1 Introduction

This chapter sets the scene by providing an overview of the significance of coral reef ecosystems in Indonesia. The chapter discusses the current status of Indonesia's coral reefs and other marine species that are associated with its ecosystems and then analyses the factors contributing to coral reef degradation in Indonesia.

1.2 The Indonesian Coastal Ecosystems

The Indonesian archipelago, stretching roughly from latitude 6º N to 10º S and longitude from 95º W to 142º E, lies in a tropical area. Almost all kinds of coastal features such as cliffs, coves, beaches (sandy, rocky, muddy), deltas, spits, dunes and lagoons are to be found in Indonesia, with 48 different types of marine and coastal habitats having been identified using a simple generic classification system.[1] Although there is a serious lack of marine and coastal resource inventories, it has been suggested that Indonesia's marine and coastal areas are outstanding.[2] In contrast to the extensive knowledge of Indonesia's tropical rain-forest, and its mega-biodiversity,[3] the biodiversity of Indonesia's marine and coastal ecosystems remains relatively unknown and undocumented. However, information from similar

1 Tomascik, T., Mah, A.J., Nontji, A., and Moosa, M.K. (1997) The Ecology of Indonesian Seas. (2 volumes). Hong Kong, Periplus Editions., p.1167.
2 Ibid
3 Ibid.

ecosystems in other Indo-Pacific regions clearly indicates that the marine biodiversity potential in Indonesia is among the highest in the world.[4] Indonesia is home to 47 species of mangroves[5] and contains the world's largest mangroves forest: some 4.25 million hectares, close to 30% of the world total.[6] Indonesia also contains about 15 from 52 of all of the world's seagrass species, and about 3 million hectares of seagrass beds are located within the Indonesian Archipelago.[7]

The Indo-Pacific and the Caribbean biogeographic provinces are the world's two main centres of marine and coastal biodiversity.[8] However, in terms of species diversity, the Indo-Pacific is the richer with three times as many coral genera as the Caribbean.[9] About 25% to 30% of the world's 600,000 km^2 of coral reefs are concentrated in the seas of Southeast Asia.[10] All of the world's 15 families of true reef-building corals are represented in the Indonesian Archipelago, with a total of 80 genera and 452 species having been identified to date.[11]

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4 Ibid.

5 Noor et al. (1999), as cited by The State Ministry of Environment (2004) *Strategi Nasional dan Rencana Aksi Pengelolaan Lahan Basah Indonesia (the National Strategy and Action Plan for the Management of Indonesia Wetlands)*, p. 19.

6 Hinrichsen, D. (1998) *Coastal Waters of the World: Trends, Threats, and Strategies*, Island Press, Washington, D.C, p. 164.

7 The State Ministry of Environment (2004), no 5 above, p. 17.

8 Tomascik, et al (1997), no 1 above, p. 1172.

9 Ibid.

10 Chou, L.M. (1997) Southeast Asia as the Global Center of Marine Diversity, in Tropical Coasts Vol.4 No.1 July 1997 "Marine Biodiversity." Information provided by PEMSEA, http://pemsea.org/ (accessed on 18 May 2003)

11 Pet-Soede, L, Merkl, A., Claussen, J., Thompson, H., and Wheeles, D. (2002) Integrated Marine Management Concessions – A New Approach to An Old Problem. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings)*, Bali, Indonesia, p. v-35.

Table 1-1: The richness of some selected groups of marine organisms around Indonesia

Please see print copy for Table 1-1

The Indonesian archipelago, in particular eastern Indonesian waters, is a centre of diversity for many other marine and coastal species, including molluscs, reef fish and mangroves. It is believed that more than 3,000 species of inshore fish inhabit Indonesia's waters, making it one of the most species rich in the world.[12] Table 1-1 above presents the richness of Indonesia's marine biodiversity.

12 There are 3,657 species of Indonesian fishes, which have been recorded by Fishbase (2002) including marine and freshwater fish species. Information provided by Fishbase, http://www.fishbase.org (accessed on May 25, 2003).

1.3 Significance and Status of Indonesian Coral Reefs

1.3.1 Present Uses and Values

Alcala et al., [13] argue that there are five benefits of coral reef ecosystems for humans. These are food production, coastline protection, production of non-food products, tourism, science and education.

Food production: Coral reefs, being among the most productive natural ecosystems, generate considerable biomass useful to human beings. Most Indonesians dwell in coastal and marine areas, where generations have derived a major portion of their protein intake from shallow coastal waters and coral reefs. The increase in population of Indonesia has resulted in an increase in domestic consumption of fish products, from 15.9 kg per capita per year in 1991 to 19 kg per capita per year in 2000.[14] It is estimated that more than 60% of the animal protein consumed by the Indonesian population is derived from the fisheries sector.[15] About 90% of Indonesia's marine landings come from artisanal fisheries for direct consumption or local markets.[16]

Coastline protection: Fringing and barrier reefs act as natural barriers that protect low-lying coastal areas from erosion and other mechanical, destructive actions by the sea.[17] Under certain hydrodynamic conditions, coral reefs also contribute to terrestrial accretion by serving as sources of sand for the beaches and low islands.[18]

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13 Alcala, A.C., Gomez, E.D. and Yap, H.T. (1988) Philippine Coral Reefs: Status and Human Response to Changes, in *Ruddle, K., Morgan, W.B. and Pfafflin, J.R. The Coastal Zone Man's Response to Change*, Harwood Academic Publishers, pp. 454-461.

14 Tomascik, et al (1997), no 1 above, p. 1186.

15 Ibid.

16 Ibid.

17 Nontji, A. (2000) Coral Reefs of Indonesia: Past, present and future. *Proceedings 9th International Coral Reef Symposium*, Bali, 2000 Indonesia, Vol. I p.24.

18 Ibid.

Construction material: Coral reefs have traditionally served as construction materials for fish pots or ponds, for buildings, fences and road foundations. The mining of coral and sand in Indonesia has occurred for centuries.[19] Sukarno et al. reported that more than 400 limestone kilns consumed about 12,000 metre^3 stony corals per month in Bali.[20]

Pharmaceutical and industrial products: Many bottom-dwelling invertebrates such as sponges and soft corals have no value as food and thus have not been considered as economically important resources. However, studies in the past three decades have revealed that coral reef organisms are an important source of biologically active (bioactive) substances, which have potential to be developed into new drugs.[21] Research in the late 1990s found that some sponges contain agents that could prove to be valuable commercial products.[22] A broad range of antibiotics from other invertebrates are also being investigated.[23] Reef-associated algae such as *Euchema* are being tapped for widespread industrial applications. Examples are the *colloids* agar and carrageenan, which are used as suspenders in paints, cosmetics and various foodstuffs.[24]

Ornamental Products: A notable development which began in the late 1960s and which is now generating widespread concern, is the international trade in ornamental corals, shells, turtles and coral reef fish.[25] Corals, shells and turtles end up in markets worldwide, mainly as decorative pieces. Collection of fish and corals

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19 Ibid.
20 Ibid.
21 Alcala, et al (1988), no 13 above, p. 455.
22 Higa, T. (1997) Coral Reefs: Mines of Precious Substances, in Tropical Coasts Vol.4 No.1 July 1997 "Marine Biodiversity". Information provided by PEMSEA: http://pemsea.org/ (accessed on 18 May 2003)
23 Ibid.
24 Alcala et al. (1988) , no 13 above, p. 455
25 Ibid., p. 459.

for export in the ornamental and aquarium trade is considerable. Indonesia is known to be the world's largest exporter of corals under the Convention on International Trade in Endangered Species of Wild Fauna and Fauna (CITES), exporting well over 1,000 tons of coral per year since the early 1990s.[26] Indonesia has provided approximately 41% of world coral exports since 1995.[27]

Aesthetic benefits and tourism: The biological richness, clear waters and relative accessibility of Indonesia's coral reefs make them popular recreation areas for local residents as well as foreign visitors. Activities such as sky and scuba diving and under water photography are becoming increasingly common in Indonesia. The beauty of Indonesia's coral reefs has helped turn tourism into a major industry. This is demonstrated by the fact that over 5 million foreign tourists visiting Indonesia in 2000, spending, on average, US$1,135 per visit.[28]

Scientific and Education: Coral reefs are excellent field laboratories for education and research. Scientists and students are using coral reef ecosystems to illustrate, study and understand ecological and biological processes. The interest in coral reef ecosystems as scientific sites has resulted in the establishment of marine science education and research centres in Indonesia. Six universities[29] have been established by the Indonesian government to manage marine and coastal resources in Indonesia.[30]

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26 Spalding, M., Ravilious, C., and Green, E.P., (2001) World Atlas of Coral Reefs. University of California Press, Berkeley. Information provided by Reef Base – A Global Information System: "Indonesia: Threat – Human": http://www.reefbase.org (accessed on 29 July 2003)

27 Ibid.

28 Indonesian Static Bureau/BPS (2003)

29 These are: University of Riau (UNRI), Bogor Institute of Agriculture (IPB), University of Diponogoro (UNDIP), University of Hasanuddin (UNHAS), University of Samratulangi (UNSRAT) and University of Pattimura (UNPATTI)

30 Dahuri, R. (1995), Indonesia: National Status and Approaches to Coastal Management, in Hotta, K and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*, Tokyo, JIMSTEF, p. 287.

Moral and Cultural Value: In addition to the direct and indirect benefits humans derive from coral reefs, it is believed that coral reefs also hold significant moral and cultural values for some traditional communities.[31] Reefs are believed to be a source of personal enrichment and inspiration for many people in tropical coastal areas. They are components of complex and important social systems and the source of unique forms of cultural identification and expression.[32]

1.3.2 Status of Indonesia's Coral Reef Resources

There has been no clear estimation of the exact area of the Indonesian coral reefs. The various estimates are 17,500 sq. km.[33], 75,000 sq. km.[34], 85,000 sq. km.[35], 51,020 sq. km.,[36] and 85,707 sq. km.[37]. The variation in estimates is due to the differences in criterion and assumptions used in the models.[38] A recent survey using data satellite has been carried out by the Indonesian Institute of Sciences (*Lembaga Ilmu Pengetahuan Indonesia*/LIPI) and the National Agency for Aerospace

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31 White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1994) *Collaborative and Community-Based Management of Coral Reefs*. Kumarian Press, p. 5.

32 Ibid.

33 Dahuri (1995), no 30 above p. 279.

34 Cesar, H., (1996) *Economic Analysis of Indonesian Coral Reefs*, the World Bank, Environment Department., p. 2.

35 Pet-Soede, L, Merkl, A., Claussen, J., Thompson, H., and Wheeles, D. (2002) Integrated Marine Management Concessions – A New Approach to An Old Problem, in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings)*, Bali, Indonesia, p. v-35.

36 Spalding, et al., stated that this figure came from the UNEP-WCMC maps. Further, they argued that in order to avoid the problems associated with scale and resolution, data were collected on a 1 sq. km. grid prior to calculation (see: Spalding and Greenfell, 1997 New Estimates of Global Areas: Coral Reefs 16: 225-230). Although the true error terms cannot be calculated caution should be applied when these statistics are uses for detailed analysis as figures have been rounded to the nearest 100 sq. km2, while for those countries with small areas of coral reefs the terms <100, <50, and <10 km have been used in order to provide an approximate estimation. These figures were converted to 100, 50, 10 km2 respectively in order to allow numerical display in Reef Base. Source: Spalding, M., Ravilious, C., and Green, E.P., (2001) World Atlas of Coral Reefs. University of California Press, Berkeley. Information provided by Reef Base – A Global Information System: "Indonesia: Status – Coral Reefs": http://www.reefbase.org

37 It is mentioned in the Appendix of State Minister for Environment Decree No. 4 of 2001 concerning the standard criteria of coral reef destruction.

38 Nontji (2000), no 17 above, p. 18.

(*Lembaga Penerbangan dan Antariksa Nasional*/LAPAN) to clarify the situation. However, the absence of a standardised methodology for measurement resulted in a lack of agreement among the scientists involved on the exact size of Indonesia's coral reefs. Satellite imagery can provide data to a depth up to 25 to 30 metres in clear seawater conditions.[39] In some areas reefs can grow on slopes of coasts down to between 30 to 50 metres.[40] This survey only calculated the coral reefs present between the water surface and to a depth of 25-30 metres. Consequently, the results of the surveys have not yet been published.[41] A field survey is required to address this gap in scientific knowledge.

Research Centre for Oceanography – Indonesian Institute of Sciences (RCO-LIPI), universities and some international and local non-governmental organizations (NGOs) have undertaken surveys of coral reef in Indonesia over the past twenty years. The results of these surveys have been analysed by several authors, presented in Table 1-2 below.

Gross results are not comparable over time as different frequencies and locations of stations were involved. Nevertheless, they do show that Indonesia's coral reefs are seriously threatened, with almost 70% being severely distressed. Data from 2000 based on 520 stations from 56 sites throughout the Indonesian archipelago show that over 32.3% of the reefs were in poor condition, 35.3% fair, 25.5% good, and 6.7% excellent.[42] This shows improvement over the 1999 data. The coral reefs in central and eastern Indonesia are considered to be in better shape than western

39 Suharsono (personal communication, 10 July 2002). Suharsono is Director of Research Centre for Oceanography, Indonesian Institute of Sciences.

40 Ibid.

41 It is the result of a workshop on the estimation of the width of coral reefs, along the coastline and total islands of Indonesian archipelago, Jakarta, 24 April 2002

42 Ibid.

Indonesia (the data is shown in Table 1-3). It is estimated that the total coral reef degradation has increased four to five times over the fifty years to 1993.[43]

Table 1-2: Status of Indonesian coral reefs 1989 – 2002

Please see print copy for Table 1-2

It is known that nearly one third of all fish species live on coral reefs, while others are dependent on reefs and nearby seagrass beds and mangrove swamps during critical stages of their life cycles.[49] Indonesia as a whole is believed to have one of the world's richest reef fish faunas, perhaps only surpassed by Australia.[50] Even though there is no comprehensive published faunal list, Indonesia is still believed to have the richest reef biodiversity in the world, particularly on the eastern reefs.[51] For example, the presence of 193 pomacentrid species and 83 species of

43 Hopley, D., and Suharsono (2000) The Status of Coral Reefs in Eastern Indonesia. Information provided by Reef Base – A Global Information System: "Indonesia: Status – Coral Reefs": http://www.reefbase.org. (accessed on 29 July 2003)

44 Wilkinson, C.R., Chou, L.M., Gomez, E., Mohammad, I.S., Soekarno, and Sudara, S. (1993) A regional monitoring approach to monitoring coral reefs studies in Southeast Asian by the ASEAN-Australia Living Resources Project. *Proceedings of the 7th International Coral Reef Symposium, 1*, pp. 138-143.

45 Soegiarto, A. (1997) Assessment of the present health of coral reefs in Indonesia, in Grigg, R.W. and Birkeland, C. (eds) *Status Reefs in the Pacific*, University of Hawaii, pp. 75-78.

46 Moosa, K.M., and Suharsono (1997) Rehabilitasi dan Pengelolaan Terumbu Karang: Suatu Usaha Menuju ke Arah Pemanfaatan Sumberdaya Terumbu Karang Secara Lestari (Coral Reef Rehabilitation and Management: An effort towards the sustainable use of Coral reef resources), in Sumodihardjo, S. *Proceedings Seminar National Pengelolaan Terumbu Karang (Proceedings of National Workshop on Coral Reefs Management)*, LIPI, p. 194.

47 Suharsono (2000), as cited by Nontji (2000), no 17 above, p. 23.

48 Wilkinson, C., (2000), *Status of Coral Reefs of the World: 2000*, Australian Institute of Marine Science.

49 Hinrichsen, D. (1998) *Coastal Waters of the World: Trends, Threats, and Strategies*, Island Press, Washington, D.C, p. 24.

50 Allen, G.R. (2002) Reef fishes of the Togean and Banggai Islands, Central Sulawesi, Indonesia. Information provided by Reef Base – A Global Information System: "Indonesia: Status – Reef Fisheries": http://www.reefbase.org (accessed on 29 July 2003)

51 Ibid.

angelfishes and butterfly fishes far exceeds that in other areas of the world (see Table 1-4).[52]

Table 1-3: Assessment of the rate of coral degradation in different parts of Indonesia, December 1993

Please see print copy for Table 1-3

A survey of reef fish species conducted in late 1998 at 47 survey sites in the Togian and Banggai Islands off the coast of Sulawesi discovered 819 species belonging to 273 genera and 75 families.[53] This richness in species is due predominantly to the relatively clear water with periodic strong currents, and the presence of additional habitats (e.g. mangroves, seagrass, etc.).[54]

52 Based on this index, Indonesia possesses the richest coral reef fish fauna in the world, with an estimated species total of 1,656.52 This compares to estimated totals for tropical Australia of 1,584, the Philippines 1,525, Papua New Guinea 1,419, Micronesia 1,220, and Sabah 1,046.52 Coral Fish Diversity Index (CFDI) values for restricted localities in Indonesia and resulting estimates of reef fish species number and recorded number of species. At most sites (except Maumere where the estimated and recorded figures are almost identical), only 70% to 80% of the fauna has been recorded to date. The use of CFDI values may be a useful tool in assessing the status of reef fishes at sites for which only limited census data are available Allen (1998). Information provided by Reef Base – A Global Information System: "Indonesia: Resources – Reef Fish": http://www.reefbase.org (accessed on 29 July 2003).

53 Allen, G.R. (1991) Damselfishes of the World. Aquarium System. Information provided by Reef Base – A Global Information System: "Indonesia: Status – Coral Reefs": http://www.reefbase.org (accessed on 29 July 2003).

54 Ibid.

Table 1-4: Comparison of total fish species of selected countries

Please see print copy for Table 1-4

1.4 Coral Reef Environment and Resource Degradation

In general, the degradation of coral reefs is caused by anthropogenic impacts and natural disturbances.[55] The anthropogenic impacts to the coral reefs may be direct or indirect. Cyclones, El Niño Southern Oscillation (ENSO), earthquakes, tsunami and predators are forms of natural disturbances. Human activities that negatively impact on Indonesia's coral reefs are coral and sand mining practices, destructive fishing, pollution (run-off land based and oil pollution) coastal construction, and uncontrolled tourism.[56]

1.4.1 Natural Causes

Coral reef communities are subjected to a variety of environmental disturbances of varying intensity, frequency and duration. The magnitude of impact of these natural disturbances varies with the nature and intensity of the disturbance. This section identifies and analyses some of these threats.

Cyclones: The Indonesian Archipelago lies between two main tropical cyclone regions.[57] Tropical cyclones are intense, low-pressure vortices that develop

55 Nontji (2000), no 17 above, pp. 20-23.
56 Ibid.
57 Ibid., p. 20.

over warm tropical oceans or seas. They entail a range of hazards including strong winds, storm surge, high waves and torrential rainfall.[58] In the largest cyclones, winds can exceed 300 km hr^{1}. Tropical cyclones usually develop between December to May in the southern hemisphere and from June to October in the northern hemisphere.[59] In Indonesia, cyclone "Lena" which occurred on 23 January 1993 destroyed several coral communities at various locations in Maumere Bay (Flores). It was estimated that almost 95 to100% of coral communities in that area were destroyed.[60]

ENSO: El Niño Southern Oscillation (ENSO) is a well-known event, which is linked to changes in the atmospheric pressure system in the Pacific.[61] It is responsible for about 30% of the variance in rainfall records.[62] The greatest variance in rainfall attributal to the Southern Oscillation occurs in the western part of the cell in southern Africa, India, Indonesia and Australia.[63] Bryant and Bateman argue that ENSO events also cause other climatic hazards such as tropical cyclones.[64] Many researchers also suggest that global warming is triggered by the ENSO. Research also indicates that changes in temperature result in coral bleaching.[65]

There are relatively few reports of climatically induced coral bleaching in Indonesia. The first recorded coral bleaching was in the western Java Sea between

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58 Bryant, E.A. and Bateman, W.S.G. (1998) Maritime Hazards in the Indian Ocean Region – Overview, in Woodroffe, C.D. (ed.) *Maritime Natural Hazards in the Indian Ocean Region, Wollongong Papers on Maritime Policy*, Centre for Maritime Policy, University of Wollongong, Australia, p. 25.
59 Ibid.
60 Nontji (2000), no 17 above, p. 23.
61 Bryant and Bateman (1998), no. 58 above, p. 56.
62 Ibid.
63 Ibid., p. 24.
64 Ibid., p. 26.
65 Burke, L., Selig, L. and Spalding, M. (2002) *Reef at Risk in Southeast Asia*, World Resources Institute., p. 10.

Sunda Strait and Karimun Jawa in 1982.[66] The biggest coral bleaching in Indonesia occurred in 1998.[67] This appeared to be caused by two separate events. The first occurred on Lombok and Bali in early February 1998 and was initiated by a warm current generated from northern Australia.[68] Coral bleaching of between 75-100% was observed around Bali Barat National Park and Tulamben (Bali) with many soft corals disintegrating. The second occurred in April to July 1998 and was part of a much larger Southeast Asian episode generated by the westerly monsoon.[69] Many reefs in western Indonesia, including Riau, Pulau Seribu and Karimun Jawa were heavily bleached.[70]

Earthquakes and tsunamis: Earthquakes and tsunamis have contributed to the destruction of Indonesia's coral reefs. The Indonesian region experiences 10% of the world's earthquakes with many reaching a magnitude of 8 and greater.[71] Earthquakes cause damage to coral reefs through fragmentation and the overturning of coral colonies, especially, *Acropora sp*. and large coral boulders tumbling down reef fronts.[72]

Indonesia is one of the most tsunami-prone regions on earth.[73] In the 1990s, there were at least three major tsunamis either in the waters of or adjacent to eastern

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66 Brown, B.E., and Suharsono (1990) Damage and recovery of coral reefs affected by El Niño related seawater warming in the Thousand Islands, Indonesia. Coral Reefs Vol. 8, pp. 163-170. Information provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org. (accessed on 30 July 2003)

67 Suharsono (1999a), as provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org (accessed on 30 July 2003).

68 Ibid.

69 Ibid.

70 Ibid.

71 Tomascik et al. (1997), no 1 above, p. 1388.

72 Hantoro, W.S., P.A. Pirazolli, C. Jouannic, H., Faure, C.T. Hoang, C. Causse, M. Borel Best, R. Lafonte, S. Bieda, and K. Lambeck (1994) Quaternary Uplifted Coral Terrace on Alor Island, East Indonesia. *Coral Reefs* 13, pp. 215-223 provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org. (accessed on 30 July 2003)

73 Hopley, D., and Suharsono (2000) The Status of Coral Reefs in Eastern Indonesia. Information provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org. (accessed on 30 July 2003)

Indonesia. Since 1990, 18 major tsunamis were recorded in Indonesia,[74] with fifteen of them occurring in eastern Indonesia.[75] The most recent tsunami and earthquake in Indonesia occurred on 26 December 2004. It caused massive damage to thousands of kilometres of coastline in Aceh and North Sumatra Provinces and the western islands. The initial damage assessment estimated 30% loss of coral reefs, approximately 97,250 hectares, a net loss of US$332.4 million (US$11,599/ha estimated value).[76]

Predators: Coral reefs may also be damaged by coral predators. There are two groups of predators: the crown-of-thorns starfish (*Acanthaster planci*) and two species of muricid gastropods *(Drupella rugosa and Drupa concatenata).*[77] *Acanthaster* was a major coral predator in the Indo-West-Pacific area in the 1960s and 1970s.[78] It is still a significant predator on the Great Barrier Reef.[79]

Before the 1990s, the crown-of-thorn-starfish was rarely reported in Indonesia. Only a few aggregations had been noted in P. Seribu, in the Java Sea. Large numbers of juveniles were reported in Ambon, and damage from starfish was reported in the 1980s in northern West Papua.[80] Other outbreaks have been reported

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74 Tomascik et al. (1997), no 1 above, p. 1388.

75 These include two biggest event:

- In December 1992 – at Flores northern shore reaching 26m at Riangrak, 7.3m at P. Babi, and 4m at Maumere Bay;
- In June 1994 – at Banyuwangi, southeast Java, reaching 4m; and
- In February 1996 – at Biak.

76 BAPPENAS (2005) Indonesia: Preliminary Damage and Loss Assessment. The December 26, 2004 Natural Disaster. Government of Indonesia., as cited by the United Nations Environment Programme (UNEP) (2005) After the Tsunami: Rapid Environment Assessment, Indonesia Part., p. 23. Information provided by: http://www.unep.org (accessed on 10 March 2005).

77 Alcala et al. (1988), no 13 above, p.467.

78 Miller, I., (2000) Historical patterns and current trends in the broad scale distribution of crown-of-thorns starfish in the northern and central sections of the Great Barrier Reef. *Proceedings 9th International Coral Reef Symposium, Bali, 2000 Indonesia, Vol. 2*., p. 1273.

79 Lawrence, D., Kenchington, R., and Woodley, S. (2002) the *Great Barrier Reef: Finding the Right Balance*. Melbourne University Press., p. 33.

80 Lane, D.J.W. (1996) A crown-of-thorn outbreak in the eastern Indonesia archipelago, February 1996. Coral Reef No. 15, pp. 209-210. Information provided by Reef Base – A Global

in Ambon during 1990, on Pulau Walae (Togian Island) between 1992-1993, on Pulau Barang Lompo in 1996, at Sompini Bay on Bentenan and Punten Islands (North Sulawesi) in 1997 and at Lasolo in the Wakatobi National Park in 1997.[81]

Unlike human causes, which occur continuously, natural disturbances occur sporadically and therefore allow the coral reefs some time to recover. For example, the recovery of coral reefs in Banda Island occurred in a relatively short period after the volcanic eruption of Banda Api in 1988.[82] It is argued by many scientists that the recovery of the reefs is an exceptional case, therefore it cannot be generalised that nature can recover from all natural disturbances.[83] The fast recovery of coral reefs in Banda Sea can be explained in two ways. First, the recovery may be caused by the discharge of volcanic ash and lava, which may contain materials needed by reefs to recover.[84] Second, the changing temperatures in the sea caused the volcanic lava to freeze creating a fertile environment for the growth of some species of coral.[85] The complicated natural processes have provided the opportunity for the survival of only some coral reef species. Therefore, it is possible that the composition of the coral community changed from multi-species to homogenous species.[86]

Information System: "Indonesia: Threats – Bleaching": http://www.reefbase.org. (accessed on 30 July 2003)

81 Lane (1996) "A crown-of-thorn outbreak in the eastern Indonesia archipelago, February 1996"; Fraser, N., Rotinsulu, C., Siahainenia, A., and Crawford, B. (1998a) Crown of thorns cleanup brings North Sulawesi communities together. NRM News, Vol. 1(1), pp.1-11; Suryadi, P., and Supriatna, J. (1999) Bridging community needs and government planning in the Togean Islands, Central Sulawesi, Indonesia. Information provided by Reef Base – A Global Information System: "Indonesia: Threats – Bleaching": http://www.reefbase.org. (accessed on 30 July 2003)

82 Suharsono (personal communication, 10 July 2002).

83 Ibid.

84 Ibid.

85 Ibid.

86 Ibid.

1.4.2 Human Causes

Many studies have confirmed that the degradation of the marine environment in the world has been mainly caused by human impact.[87] Some of the major human causes are identified below.

Coral and sand-mining practices: Coral and sand-mining have been practiced for many years. Excessive coral and sand mining have not only resulted in the degradation of coral reefs but also caused beach abrasion in some areas in Indonesia.[88] In Jakarta Bay, for example, the exploitation of corals started in the early part of this century.[89] In the 1930s, there was an annual removal of 8,500 to 20,000 cubic metres of coral rock in the Seribu Islands.[90] Since then, it has been claimed that the scale of exploitation has escalated with values in 1982 double those recorded in 1979.[91] As a result of subsequent erosion, Ubi Kecil and Air Kecil Islands have now disappeared.[92] This also occurred in the Riau Archipelago.[93] Nipah Island, a border island with Singapore, is slowly disappearing because of large quantities of sand mining in the Singapore Straits.[94]

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87 Nontji (1999), as cited by Kunzman, A. (2002) On the way to Management of West Sumatra's Coastal Ecosystems. *The ICLARM, quarterly* (Vol. 25. No. 1) January-March 2000., p. 4.

88 Nur, Y., Fazi, S., Wiryoatmodjo, N., Hansen, T., and Steffen, J.H. (2002) Reducing the Impact of a Coastal Megacity on Island Ecosystems, Jakarta and the Seribu Islands. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings)*, Bali, Indonesia, p. v-25.

89 Ibid.

90 Ibid.

91 Ibid.

92 Ibid.

93 COREMAP and the Marine Geological Institute, Department of Energy and Mineral Resources (2002) Studies on Mitigation of Environmental Impact to Reefs in Senayang and Lingga Islands. Final Report. COREMAP.

94 "Reklamasi Pulau Nipah Harus Diperluas" (The reclamation of Nipah Island should be increased) Tempo Interaktif, 23 August 2004, http://www.tempointeractive.com/hg/nasional/2004/htm

Destructive fishing: There are three principal destructive fishing practises which destroy coral reefs: dynamite blasting, *muro-ami,* and poisoning. These techniques are widespread in the Indo-West Pacific region.[95]

Dynamite fishing is a quick, effective method but is very destructive to the reef environment, devastating stony corals within the radius of the blast. According to Hinrichsen even a small bottle bomb can pulverise all coral within a radius of 1.5 metres; a gallon jug kills everything within 5 metres, and the shock waves from the blast can kill or incapacitate many more organisms further away.[96] Dynamite fishing is an old, illegal practice, dating back to the 1930s, but reached its peak during the decade following World War II, when explosives could be easily obtained from undetonated munitions.[97] Dynamite fishing is widely used in very remote islands in Indonesia and its use is very difficult to control without appropriate monitoring by the community and enforcement agencies. In East Nusa Tenggara, and probably elsewhere, the practice is used most during the doldrums seasons (April-May, October-November), with 20 to 30 explosions heard daily in local areas.[98]

Alcala et al. (1988) revealed that there are very slow recovery rates for dynamited reefs, taking at least 30 years to attain 50% live coral cover. Even after 10 years, not much coral is able to regenerate.[99] A study of the economic valuation of coral reef in Southeast Asian revealed that both Indonesia and the Philippines suffer from blast fishing activity. The total net loss from blast fishing activity is estimated at US$570 million in Indonesia and US$1.2 billion in the Philippines.[100]

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95 Alcala et al. (1988), no 13 above, p. 470.
96 Hinrichsen (1998), no 49 above, p. 25.
97 Alcala, et al. (1988), no 13 above, p. 470.
98 COREMAP (1998) COREMAP Preparation Document. Indonesian Institute of Sciences.
99 Alcala et al. (1988), no 13 above, p. 471
100 Burke et al. (2002), no 65 above, p. 56

Muro-ami is a "drive-in" net design for reef fishing. This technique uses many fishers or swimmers (30 to 50 persons) to drive the fish to the net using sound from bamboos that are punched into the coral by the swimmers. This fishing technique has been widely utilised in Indonesia, Philippines and Malaysia.[101] The *muro-ami* method is highly destructive to the coral reef environment.[102] Experimental trials of *muro-ami* show that one *muro-ami* operation can damage 17.0 m^2 of reef area.[103]

Poisoning or cyanide fishing is another illegal fishing practice, which is also highly destructive. A recent survey found that one bottle (0.5-1 L) of cyanide solution used to catch fish can destroy one square metre of live coral cover, as a result of poisoning the coral polyp and the fishers breaking away coral to extract the stunned fish.[104] It is estimated that between 0.05 and 0.06 $metre^2$ per 100 $metre^2$ of Indonesia's live coral cover is lost due to this practice.[105] Cyanide fishing also results in the bleaching of corals.[106] However, corals do not appear to be affected by the toxicity of the cyanide. This is because the rate of coral growth may be more than coral loss or it may be that under natural conditions cyanide is dispelled rapidly by strong currents.[107]

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101 Moosa, K.M. and Suharsono (1997) Rehabilitasi dan Pengelolaan Terumbu Karang: Suatu Usaha Menuju ke Arah Pemanfaatan Sumberdaya Terumbu Karang Secara Lestari (Coral Reef Rehabilitation and Management: An effort towards sustainable use of Coral reef resources), in Sumodihardjo, S. *Proceedings Seminar National Pengelolaan Terumbu Karang (Proceedings of the National Workshop on Coral Reefs Management)*, MAB Indonesian Program and LIPI, p. 196.

102 Ibid.

103 Carpenter and Alcala (1977), as cited by Alcala et al. (1988), no 13 above, p. 471.

104 Mous, P.J.; Pet-Soede, L.; Erdman, M.; Cesar, H.; Sadovy, Y.; and Pet, S.P. (2000) Cyanide Fishing on Indonesian coral reefs for the live food fish market – What is the problem? SPC Live Reef Fish Information Bulletin, Vol. 7 (May 2000), p. 21.

105 Ibid., p. 23.

106 Ibid., p. 21.

107 Ibid.

The use of sodium or potassium cyanide for fishing has become very common throughout the ASEAN region since the 1960s.[108] Prior to 1990, the main targets of cyanide fishing were ornamental fish and invertebrates for the aquarium trade.[109] In the years following 1990, fish caught using cyanide are usually sold to up-market restaurants and displayed in aquariums for selection by wealthy dinners. Customers pay phenomenal prices, usually 5 to 8 times the price of a comparable dead fish. A fisherman can receive 2 to 25 times more for a live grouper than for a dead one.[110]

Pollution: There are five human activities classified by the Group of Experts on Scientific Aspects of Marine Pollution (GESAMP)[111] that have potential to pollute the marine environment. They are run-off and land-based activities; marine transportation; dumping; offshore production and atmospheric pollution. In its report of 1990, GESAMP confirmed that run-off and land based activities are two of the major activities that have potential to pollute the marine environment.[112] These activities contribute 44% of pollutants entering the marine environment.[113] Other activities producing pollutants include maritime transportation, dumping, offshore production and atmospheric pollution, contributing 12%, 10%, 1% and 33% respectively of the total sources of marine pollution.[114]

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108 Johannes, R.E. and Riepen, M. (1995) *Environmental Economic and Social Implications of the live reef fish trade in Asia and Western Pacific*. Report prepared for the Nature Conservancy.

109 Mous et al. (2000) "Cyanide Fishing on Indonesian coral reefs for the live food fish market – What is the problem?", p. 23.

110 Nur et al. (2002), no 88 above, p. v-25.

111 GESAMP Reports and Studies No. 30 (1990) The State of the Marine Environment; IMO/FAO/UNESCO/WMO/WHO/IAEA/UNEP, United Nations Environment Programme, 1990, p. 88. Information provided by GESAMP, http://www.gesamp.imo.org/publicat.htm (accessed 7 October 2003)

112 Ibid.

113 Ibid.

114 Ibid.

Almost 60% of the Indonesian population of 210 million people live in coastal areas.[115] A great part of the livelihoods of these people are wholly dependent on the marine and coastal environment. This fact alone has contributed to pollution of the marine ecosystem in Indonesia. Most Indonesian rivers have been severely polluted by industrial, urban and agriculture wastes. Land run-off leads to decreased seawater transparency.[116]

Indonesia's coral reefs are also threatened by oil pollution from offshore oil platforms and marine transportation. Pollution from ships is due to the operational discharge of oily ballast water and/or tanker washings, and tanker accidents like groundings or collisions. Some coral islands of the Riau Archipelago have been threatened by oil pollution.[117] The beach of four coral islands of Riau Archipelago fronting the Strait of Singapore have been polluted by tar balls of about 1.91 g/m².[118] According to Dahuri (1994) the east coast of Kalimantan has been subjected to oil pollution from ship operations since the 1970s.[119] Approximately half a million barrels of oily water, with an average oil concentration of 25 milligrams per litre, are discharged, untreated, into the waters of the Makassar Strait daily.[120]

Coastal and offshore constructions: Dredging, filling and coastal construction activities have a negative impact on coral reefs. The enlargement of the navigation channels to the Liquid Natural Gas (LNG) plant in Bontang, East Borneo led to a large area of the adjacent reefs and coral island being dredged, resulting in

115 The Ministry of Marine Affairs and Fisheries/DKP (2003) Urgensi Undang-Undang Pesisir (Urgency of Coastal Act). Information provided by DKP, http://www.dkp.go.id (accessed on 20 July 2003)

116 It estimates that more than 60% of rivers in Indonesia have been polluted by industry, urban and agriculture wastes. Source: Strategi Nasional dan Rencana Aksi Pengelolaan Lahan Basah Indonesia (the National Strategy and Action Plan for the Management of Indonesia Wetlands), The State Ministry of Environment 2004, p. 1.

117 Bilal (1990), as cited by Nontji (2000), no 17 above, p. 25.

118 Ibid.

119 Dahuri (1994) as cited by Hinrichsen (1998), no 49 above, p. 163.

120 Ibid.

detrimental effects on the reefs.[121] Coastal construction, such as port and naval base developments have also contributed to the degradation of Indonesia's coral reefs.[122]

Tourism: Indonesia's coral reefs have also been threatened by uncontrolled development of marine tourism, such as anchor damage, trampling on the reefs, snorkelling and boating.[123] Collection of corals and shells for the tourism industry at rates beyond sustainable levels also threaten the reefs.[124] Many coastal resorts, too, are constructed on the reefs, resulting in the destruction of the reefs.[125]

1.4.3 Valuation of economic loss of coral reef degradation

This section examines the economic loss associated with coral reef degradation in Southeast Asian, particularly in Indonesia and the Philippines. Table 1-5 provides the analysis of total net benefits and losses on Indonesian coral reef per activity. The table compares benefits to individuals and losses to society in terms of reduced goods and services over a twenty five-year period for many of the destructive activities. For instance, fishers may get an income from poison fishing of US$33,300 per square kilometre, but they generate losses to society over twenty-five years ranging from US$42,800 to US$475,600. In the wider perspective, this activity will also generate potential losses to the tourism industry.

121 Nontji (2000), no 17 above, p. 24.
122 Dahuri, R., (2000), Kebijakan dan Strategi Pengelolaan Terumbu Karang Indonesia (Policy and Strategy of Indonesian Coral Reef Management). *Prosidings Lokakarya Pengelolaan dan IPTEK Terumbu Karang Indonesia (Proceedings of the Workshop on Management, Science and Technology of Indonesian Coral Reefs*, Jakarta, 22-23 November 1999, Indonesian Institute of Sciences, p. 6
123 Nontji (2000), no 17 above, p. 22.
124 Ibid.
125 Ibid.

As noted earlier, the majority of coral reefs across Southeast Asia are under threat from human activities.[126] Table 1-5 presents potential losses of coral reefs in Indonesia and the Philippines from damaging activities such as blast fishing, over fishing, sedimentation from upland activities, and areas with high tourism potential.

Table 1-5: Total Net Benefits and Losses due to threats of Indonesian Coral Reefs (Present Value: 10% discount rate; in US$ 1. 000 per km² over a 25-year period)

Please see print copy for Table 1-5

Over-fishing is the activity that is the most financially harmful to reefs in Indonesia and the Philippines. Burke et al. argue that more than 32,000 km² of reefs in Indonesia are over-fished and that this resulted in massive societal losses, estimated at US$1.9 billion over twenty years.[127] The financial damage from over-fishing more than 21,000 km² of reefs in the Philippines is estimated at US$1.2 billion (see Table 1-6).

126 Burke, et al (2002), no 65 above, p. 55.
127 Ibid.

Table 1-6: Net Losses to Society over a 20-year period from Over-fishing, Blast fishing, and Upland Activities in Indonesia and the Philippines (US$ Million)

Please see print copy for Table1-6

Both Indonesia and the Philippines suffer from blast fishing activity. The total net losses to society over a 20-year period from blast fishing activity are US$570 million in Indonesia and US$1.2 billion in the Philippines. In spite of the greater area of Indonesian reefs, losses in the Philippines are due to the proliferation of blast fishing.[128] Due to the fact that the areas of high sedimentation do not always overlap with tourism centres; the estimated losses from sedimentation are relatively low (US$114 million in the Philippines and US$100 million in Indonesia).

128 Ibid., p. 56

1.5 Conclusion

This chapter has analysed the key threats to coral reef ecosystems generally in Indonesia. The key threats identified include natural hazards such as cyclone, ENSO, earthquakes, tsunamis, and predators; and human induced causes such as coral and sand-mining practices, destructive fishing, pollution, coastal and offshore constructions, and tourism. The chapter has shown that the most damage to coral reefs result from human activities. This finding supports the need for an integrated approach to coral reef management, an approach adopted by this thesis.

The next chapter will discuss the theoretical framework underpinning the thesis in order to achieve the sustainable management of coral reefs in Indonesia.

Chapter Two

A Framework of Analysis for Managing Coral Reefs

2.1 Introduction

This chapter explains how the study is conceptualised and how it is undertaken. It starts with a discussion of the relationship between coral reefs and other coastal ecosystems, followed by a review of studies on integrated coastal zone management addressing coral reef and other coastal resource management. The policy setting of viable sustainable coral reef ecosystems is elucidated within the context of the coastal and marine resource sector to determine the key components of coral reef management in Indonesia. This provides the framework of analysis necessary to identify the important factors influencing coral reef management in Indonesia.

2.2 Linkages between coral reefs and other coastal ecosystems

Most reef colony growth stops at a depth of between 30 and 50 metres.[1] Coral reefs usually occur in waters surrounding islands or in coastal areas. There are

1 Although the degree of active growth of coral reefs is not clear, in some cases, it can grow at 13-20 metres below the surface. For example, in the west coast of Sumatra, coral reefs can grow at 13-20 metres below the surface. Source: Spalding, M.D., Ravilious, C., and Green, E.P. (2001) World Atlas of Coral Reefs, Prepared at the UNEP World Conservation Monitoring Centre, University of California Press, Berkeley USA. Information provided by Reef Base – A Global Information System: "Indonesia: Resources – Coral Reefs": http://www.reefbase.org (accessed on 29 July 2003).

basically two types of corals: hard and soft. The hard corals are known as reef builders whose protected skeleton is a hard stony structure. The soft corals also have a skeleton but they are not hard and stony.[2] Coral reefs cannot exist in the size and density that they do without close interdependent relationship with algae.[3]

Coral reef ecosystems are one type of coastal ecosystem. Other types include barrier islands (which include beaches, dunes, and inlets), mangrove forests, and seagrass beds.[4] There is substantial interaction between coral reefs and other coastal ecosystems, such as mangroves and seagrasses. For example, mangroves and seagrasses bind soft sediments, and can facilitate coral growth.[5] Thus, the destruction of mangroves and seagrasses will also impact on coral reef ecosystems. This relationship is illustrated in table 2-1. In many areas, the typical coastal profile moves from mangroves to shallow waters with seagrass beds to offshore coral reefs.[6]

The substantial and close relationships between coral reefs and other coastal ecosystems make it difficult to manage coral reefs without managing the ecosystems in which they live. It is impossible to achieve sustainable coral reef management without addressing other related problems of coastal and marine resources management. Thus, a study of coral reef management is necessarily a study of coastal and marine resource management. This is the approach taken in this thesis. The central argument is that successful coastal and marine management policy and implementation is the necessary ingredient for the management of coral reefs.

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2 Alamilla, L., and Hoare, A.D. (2005) Coastal Treasures of Belize: Coastal Ecosystems, http://www.coastalzone@bze.net (accessed on 26 March 2005).
3 Ibid.
4 Hinrichsen, D. (1998), Coastal Waters of the World: Trends, Threats, and Strategies, Island Press, Washington, D.C., p. 2.
5 Burke, L., Selig, L. and Spalding, M. (2002) Reef at Risk in Southeast Asia, World Resources Institute, p. 14.
6 Ibid.

Table 2-1: Linkages between Mangrove, Seagrass, and Coral Reef Ecosystems

Please see print copy for Table 2-1

2.3 Integrated Coastal Zone Management

The close relationship among coastal ecosystems causes difficulty in defining the boundaries of coastal areas or coastal zones and the marine areas. Sorensen, et al. (1990) defined the coastal zone as the interface or transition space between two environmental domains, the land and the sea.[7] Coastal zones can be wafer-thin strips of coastline not more than a few kilometres wide, extending from the low-tide mark inland; or they can extend inland so far as to include entire watersheds and may run

7 Sorensen, J.C. and McCreary, S.T., (1990) Institutional Arrangement for Managing Coastal Resources and Environments, 2nd edn, National Park Service, U.S. Department of the Interior and U.S. Agency for International Development, p. 5.

seaward to the continental shelf, surrounding the full extent of a country's EEZ.[8] However, there are many interpretations of the definition of coastal zones in real terms. Kay and Alder argue that coastal areas can be defined in four possible ways.[9] The first is fixed distance definitions.

The coastal areas are calculated from the boundary between land and water at the ocean component of a coastal areas, usually from the government jurisdiction, for example the limits of Territorial Sea. The second approach is a variable distance definitions. The boundary is set from some measure of the coastal area, usually from high water mark however but the boundary is not fixed, but differ along the coast according to a range of variables, such as: physical or biological features, constructed landmarks and administrative boundaries.[10]

The third approach is according to use definitions. The coastal area is defined according to particular coastal management issues being addressed.[11] This approach is usually used by international organisations and large coastal nations. The fourth is a hybrid definition, adopting more than one definition of the coastal area or a mix of two types of coastal definitions.[12] This is a relatively common practice by governments; for example, the United States of America and Australian governments adopt this approach.[13] Some Australian States measure their coastal areas 3 nautical miles from the coastline, while others define their coastal area to include the landward boundary.[14]

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8 OECD (1993) Coastal Zone Management – Integrated Policies. Paris., as cited by Hinrichsen (1998) no 4 above, p. 2.

9 Kay, R. and Alder, J. (1999) Coastal Planning and Management, London: E & FN SPON., pp.4-7.

10 Ibid.

11 Ibid.

12 Ibid.

13 Ibid.

14 Ibid. p. 2

The complicated processes and the fragility of coastal areas resulting from human and natural interactions need comprehensive planning and management to address the numerous stresses in the coastal area. Policy makers and planners cannot view the impact on coastal areas from a single approach but should see them as a whole.

A comprehensive approach to coastal zone management is known as integrated coastal zone management (ICZM). During the last few decades the methodology of ICZM has been thoroughly developed. Several definitions of ICZM have been put forward by scholars.[15] One of the more concise definitions is provided by the Organization for Economic Cooperation and Development (OECD):

> integrated coastal zone management is a whole integrated system in relation to local, regional, national and international goals. It implies a particular focus on the interactions between the various activities and resource demands that occur within the coastal zone and between coastal zone activities and activities in other regions.[16]

The ICZM concept requires institutional capacity to handle the problems that cut across academic disciplines, agency mandates, and institutional boundaries.[17] The efficiency of policy and legislation in coastal management depends on the coordination and effectiveness of the administrative structure. Experience shows that the most valuable component is an administrative body capable of taking political decisions. This institution should consist of representatives of various governmental organizations, representatives of major stakeholders and highly qualified staff for consultation on technical questions. Hinrichsen argues that successful coastal

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15 For example, Cicin-Sain and Knecht defined ICZM as "a constantly realised decision-making process with a view of sustainable use, development and protection of seaside terrestrial and coastal areas and their resources." Cicin-Sain, B. and Knecht, R. (1998) Integrated Coastal and Ocean Management: Concepts and Practices, Island Press, Washington, D.C., p. 71.

16 OECD (1993) Coastal Zone Management – Integrated Policies. Paris., as cited by Hinrichsen (1998), no 4 above, p. 3.

17 Ibid.

management strategies should provide a workable mechanism for analysing and responding to the threats facing coastlines. It should also address several issues simultaneously, including: the impact of population growth in and migration to coastal urban areas; the introduction of zoning regulations for certain types of activities in coastal areas; addressing the local concerns and coastal communities' participation; regulating the use of critical coastal ecosystems such as coral reefs; and regulating coastal fisheries.[18]

However, most regions in the world have collectively failed to manage coastal resources sustainably or to introduce long-term development strategies and accommodate local communities' concerns.[19] As a consequence, deterioration in coastal zones has occurred in coastal developing countries.

The ICZM concept has been reflected in several international conventions and recommendations, such as the United Nations Convention on the Law of the Sea of 1982 (the 1982 LOSC); the United Nations Conference on the Human Environment held in Stockholm of 1972, and the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in June 1992. ICZM has also been addressed by the World Summit for Sustainable Development in Johannesburg in August–September 2002.

The 1982 LOSC represents a constitution of the world's ocean, including, not only the rights of nations related to the ocean and its resources, but also the duties and obligations of nations.[20] The preamble to the 1982 LOSC acknowledges "that the problems of ocean space are closely interrelated and need to be considered as a whole." However the 1982 LOSC does not address conflicts among uses or users and

18 Ibid.
19 Ibid.
20 Cicin-Sain and Knecht (1998), no 15 above, p.71.

does not deal with alternative institutional mechanisms for ocean and coastal management. Conflict resolution provisions, though one of the convention's major innovations, relate to international disputes rather than disputes among users within a given country.[21]

The other major problem in the implementation of ICZM relating to the 1982 LOSC is in defining the coastal zone, in particular the boundary of the coastal zone. Although the 1982 LOSC includes a definition of territorial waters and the EEZ,[22] it is far from clear how far the coastal zone can be defined. As mentioned above, the objective of ICZM is to ensure the sustainability of coastal ecosystems. This often does not accord with the prescribed recognition of boundaries that have been adopted in accordance with the 1982 LOSC.[23] For example, the management of coral reef ecosystems may not rest entirely within the territorial waters or the EEZ of one State. Consequently, there may be interactions from land or ocean activities that affect other coastal nations.

The United Nations Conference on the Human Environment (1972) held in Stockholm focused on the relationship between economic development and environmental degradation. One of the most significant outcomes of this conference was the creation of a new institution to coordinate environmental activities within the United Nations system – the United Nations Environment Programme (UNEP). Even though UNEP has been important in the international arena since its establishment in 1972, it has had little success with the integration of environmental concerns into economic planning and decision-making. Overall, the environment continues to

21 Ibid., p.72.
22 Articles 8 and 57 of the 1982 LOSC provide the definition of territorial waters and EEZ.
23 Woodroffe, C.D. (1995) Integrated Coastal Zone Management: Transnational Issues that relate to Australia, South-East Asia, and the Indian Ocean, in Tsamenyi, M. Bateman, S. and Delaney, J. (eds.) Coastal and Maritime Zone Planning and Management: Transnational and Legal Considerations. Centre for Maritime Policy, University of Wollongong, Australia, p. 101.

deteriorate, and such problems as ozone depletion, global warming and marine pollution continue to grow more serious, while the destruction of natural resources is accelerating at an alarming rate.[24]

The World Commission on Environment and Development noted that environmental degradation was a side effect of industrial growth and only limited knowledge of its impact was understood by developing nations.[25] The Commission in its report (the Brundtland Report) put forward the concept of sustainable development as an alternative approach to one based simply on economic growth. Based on the findings of the Brundtland report, the United Nations General Assembly held an international conference on the environment and development (UNCED) in 1972.[26] The primary goals of the historic Earth Summit were to come to an understanding of "development" that would support economic development, prevent the degradation of the environment, and develop a foundation of global partnership between developing nations and industrialised countries.[27]

One of the basic recommendations emanating from the UNCED was that national management of coasts and oceans (including EEZs) should be "integrated in content and precautionary in ambit."[28]

Seven major program areas are included in Chapter 17 of Agenda 21 as an output of the Earth Summit in Rio in 1992: (a) integrated management and sustainable development of coastal and marine areas, including EEZs; (b) marine environmental protection; (c) sustainable use and conservation of living marine

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24 Earth Summit (2003) UN Conference on Environment and Development (1992), in United Nations websites: http://www.un.org/geninfo/bp/enviro.html (accessed on 28 March 2004).
25 Ibid.
26 Ibid.
27 Ibid.
28 Cicin-Sain and Knecht (1998), no 15 above, p.73.

resources of the high seas; (d) sustainable use and conservation of living marine resources under national jurisdiction; (e) addressing critical uncertainties for the management of the marine environment and climate change; (f) strengthening international, including regional cooperation and coordination; and (g) sustainable development of small islands.[29] The text of the UNCED calls for integrated policy and decision-making process and institutions.[30] The call was taken up in Section 17.5 of Agenda 21:

> Coastal states commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction. To this end, it is necessary to, inter *alia*: provide for an integrated policy and decision-making process, including all involved sectors, to promote compatibility and a balance of uses…[31].

Therefore, it is necessary for nations to define and operationalise key concepts and to detail specific steps that national governments, international organisations or NGOs must take to translate ICZM and prescribed strategies into tangible action, before they start to implement the mandates and recommendations emanating from the Earth Summit.

Due to its focus on land-sea interface and methods for management of multiple uses of such areas, the ICZM concept must deal with inter-related and complex management situations. International experience shows that the success of the implementation of ICZM requires clear guidance (policy and regulatory); a well-organised government structure for the effectiveness of the programs (enforcement

29 United Nations Division for Sustainable Development/UNDSD (2003) Agenda 21, in UNDSD website: http://www.un.org/esa/sustdev/agenda21/english/agenda21chapter17.htm (accessed on 2 March 2004).
30 Ibid.
31 Ibid.

and compliance); and public participation in the coastal and marine resource management decision-making process.[32]

2.3.1 The Role and Importance of Institutions in Coastal Resources Management

There is no doubt that institutions are important for the management of coastal and marine activities. In the case of resource management, institutions are created by the government in order to allocate scarce resources and to resolve conflicts among resource users. Thus, the performance of institutions determines the success or failure of the management of coastal and marine activities.

It is important to distinguish between the terms institution and organisation when undertaking institutional analysis. Institutions are defined as the long-standing rules and rights governing social and productive behaviour.[33] Organisations are the players and structures, or "groups of individuals bound together by some common purpose to achieve objectives."[34] Sorensen and McCreary describe institutional arrangements as "the composite of laws, customs, and organisations established by society to allocate scarce resources and competing values."[35]

Institutions can be divided into two types: formal and informal. Formal coastal zone institutions are formed through a combination of written legislation and administrative and court decisions. Informal institutions, on the other hand, may be

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32 Kay and Alder (1999), no 9 above, p. 46.

33 North (1990), as cited by Manchur, W., Zurbrigg, A. and Reichratch, S. (2003) CBNRM Social Science Resources Kit: A Guide for Researchers. Volume 5: Institutional Analysis. Source provided by Environment and Natural Resource Management websites: http://web.idrc.ca/en/ev-3221-201-1-DO_TOPIC.html (accessed on 29 April 2004)

34 Ibid.

35 Sorensen, J.C. and McCreary, S.T., (1990) Institutional Arrangements for Managing Coastal Resources and Environments, 2nd edn, National Park Service, U.S. Department of the Interior and U.S. Agency for International Development, p. 87.

norms of oral tradition and traditional beliefs that exist in communities, mostly traditional communities.[36] The informal institutions however, may not be recognised or supported by government regulation.

Another indicator of the distinction between formal and informal institutions is how rules are enforced. Formal institutions need enforcement by a third party such as the courts while informal institutions are enforced endogenously through mutual agreements or by relations of power and authority between or among the social actors involved.[37]

There are three reasons why formal institutions are important in coastal resources management. First, formal institutions play a significant role in the sustainable management of resources.[38] Second, significant improvement in the management of common property resources, such as fisheries, has been seen in the Southeast Asian region through the design of appropriate formal institutions, accompanied by strong political support.[39]

Third, the interest in cooperation and interaction between government, agencies, and resource users as well as community involvement is increasing due to

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36 Ostrom, E. (1990). Governing the commons: the evolution of institutions for collective action. Cambridge University Press, Cambridge, as cited by Torell, M. and Salamanca, A.M. (2001), Navigating the Institutional Landscape: Introduction and Overview, in Torell, M. and Salamanca, A.M. (eds.) Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia, SIDA and ICLARM, p. 2.

37 Leach, M., R. Mearns and I. Scoones. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. World Development 27, pp. 225-247., as cited by Torell and Salamanca (2001), no 36 above, p. 2.

38 Garcia, S.M. and R. Grainger. (1997). Fisheries management and sustainability: A new perspective of an old problem?, pp. 631-654. *In* D. A. Hancock, D. C. Smith, A. Grant and J. Beumer. (eds.) Developing and sustaining world fisheries resources: the state of science and management. Second World Fisheries Congress proceedings. CSIRO Publishing, Collingwood, Victoria., as cited by Torell and Salamanca (2001), no 36 above, p. 2.

39 Ostrom (1990), as cited by in Torell and Salamanca (2001), no 36 above, p. 2.

the benefits that accrue from sharing responsibilities and ownership.[40] This requires the creation of appropriate institutions at all local levels.

A feasibility and cost-effective analysis is a prerequisite for the creation of an institution for coastal and marine resources management. Institutional arrangements can be considered effective if they facilitate and encourage various parties to agree and cooperate to achieve common goals, to make realistic and acceptable rules and develop strategies which comply with the rules. If the parties do not interact well and the policies are not implemented, the existing legal and institutional arrangements fail to deliver the necessary processes to ensure efficiency, equity and sustainability in the use of coastal resources.[41]

2.3.2 Policy and Legislation in Coastal Management

It is valuable to look at the relationship between policy and law. Both are management tools that have been commonly utilised in coastal management. It is widely recognised that administrative, social and technical approaches are part of coastal management around the world. Kay and Alder divide administrative technique into four management tools: policy, legislation, guidelines and zoning, of which policy and legislation are the major component of coastal and marine

40 Pomeroy, R.S. and M.J. Williams. (1994). Fisheries co-management and small-scale fisheries: a policy brief. Manila Philippines ICLARM 15., as cited by Torell and Salamanca (2001), no 36 above, p. 2.

41 The Asian Development Bank (2002) Legal Institutional and Policy Reform Report – India (Kerala) Component. Regional Technical Assistance for Coastal and Marine Resources Management and Poverty Reduction in South Asia (ADB RETA 5974). IUCN.

management regimes.[42] Policy is defined as "a purposive course of action followed by an actor … in dealing with a problem."[43]

Managers and bureaucrats often consider policy to be the toolbox for management, with a list of required tools to make sure each policy is successful. The tools often include scientific assessment and monitoring, public participation, social and economic considerations, and codification in law.[44] From this perspective, law or legislation is just one of the tools to implement policy.

2.3.3 International issues regarding the development of a legal framework for coastal and marine resources management

The failure of national laws to resolve and assign effective roles and common strategies for natural resources management has caused increasing conflicts throughout the world. This is particularly evident in developing countries, where the social and economic conditions are not very good. Many national laws tend to adopt a centralised approach to resource management and discourage any existing community-based systems. However, recent years have witnessed the emergence, in an increasing number of countries, of important new laws designed to be more supportive of community initiatives. Three types of laws have evolved.[45]

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42 Kay and Alder (1999), no 4 above, pp. 110-127.

43 Anderson, J.E., Brady, D.W., Bullock, C.S., and Stewart, J.S. (1984) Public Policy and Politics in America. Brooks Cole, Monterey, California., as cited by Kay and Alder, "Coastal Planning and Management", p. 111.

44 Ibid., p. v-11.

45 Lindsay, J.M. (1998) Creating a legal framework for community-based management: principles and dilemmas, in the World Bank Legal Paper Online: http://www.wb.org/default.htm (accessed on 10 October 2003).

The first type of laws recognises local ownership or property rights over land and/or natural resources based on historical claims, such as, ancestral domains. Examples of this include native title legislation in Australia and Canada.[46]

The second type of legislation provides mechanisms for site-specific delegation of some measures of management responsibility over state land and/or natural resources for a particular term to local people. Examples include, joint forest management practises in India and community-based mangrove forest management in the Philippines and Indonesia.[47]

The third type of legislation promotes the devolution of authority from central government to local management units as has occurred in many developing countries such as the Philippines and South Korea.[48]

All three types of laws require the involvement of community institutions in resource management, although devolution generally requires a greater involvement than the first two types. It is not necessary, however, that all the problems of natural resources management be solved through devolution. Where the central or higher level of government appears more accountable than a lower level of government, laws of recognition or delegation may assist in effective resource management.[49]

Nonetheless, there is no easy way to improve a legal framework for natural resource management. It is generally not practical to adopt or transfer a model of laws or system from one country to another. Workable laws supporting effective resource management need to address the nature of the existing legal and

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46 Ibid.
47 Ibid.
48 Ibid.
49 Ribot, J.C. (1997) Decentralization without representation: rural authority and popular participation in Sahelian forestry. Paper presented at the FAO Technical Consultation on Decentralization, Rome, 16-18 December 1997, as cited by Lindsay (1998), no 44 above.

institutional arrangements and the setting of a wide range of social, political, economic and cultural factors that exist in the community. Two key principles are essential to enable improvement of the legal environment for community-based management: security and flexibility.[50]

Workable laws should provide security for the efforts and rights of a community to manage its natural resources. This is a fundamental requirement for community-based natural resource management. If a community does not feel secure, it will develop a fundamental distrust of state laws and legal institutions, no matter how carefully and strong their rights have been defined or set forth in legal documents. The law itself cannot ensure security in an inherently insecure environment.[51] The community may feel secure enough to undertake management merely on the basis of a promise from local officials. Involvement, trust and support of the community are key to acceptance and success in coastal and coral reef management.

The success of community-based management is also determined by the flexibility of the law. Flexibility of the law should also be considered for all aspects of the design and support phases of community-based management. These include three interrelated component activities: planning and management; the recognition and identification of local groups; and jurisdiction. However, it is not an easy task to ensure flexibility in law. The protection of the community's interests requires very delicate balancing because state law should accommodate all groups in the community, including those individuals in the decision-making process.[52]

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50 Lindsay (1998), no 44 above.
51 Ibid.
52 Ibid.

From the discussion above, it can be concluded that the evolving international trend in the development of legal frameworks for natural resource management has two key themes relating to community involvement: recognition of traditional community management in national laws and decentralisation of authority to local governments and community institutions. Although the legal problems in Indonesia are not identical to other countries, there are valuable lessons for Indonesia from international experiences in addressing problems relating to natural resources management.

2.3.4 The principles of developing a legal framework for coral reef management

The success or failure of a law is measured by the degree of acceptance and compliance by society. Obligation, either voluntary or forced, is a critical part of the success of a law. Obligation can be expressed in the sense of peer pressure of the moral duty of the individual to act in a certain manner recognised and endorsed by others in the community.[53] The alternatives are formal punishment, such as fines or imprisonment, or informal social pressure, such as shame, guilt or isolation.[54]

The sense of obligation encompasses the notion of 'the rule of law.' According to Dicey (1959), the rule of law consists of three elements: supremacy of the law and absence of arbitrariness; equality before the law; and constitutional law

53 Patlis, J., Knight, M. and Siahaan, W. (2002) Creating A Framework for Integrated Coastal Management in Indonesia: The Importance of Law. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia* (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings*)*, Bali, Indonesia, p. v-13.

54 Ibid.

in assigning rights to individuals.[55] The rule of law is a critical element for any country in the modern world. The modern concept of the rule of law is that governments and citizens both obey the laws and use them to guide their activities.[56] Laws exemplify legislative policy choices that provide officials with orders and inform people what to expect if they comply or fail to do certain things.[57] Desirably, legislative policy choices are reached through a process with transparent, public participation providing for consideration of the expectations of the majority of stakeholders, public endorsement and voluntary compliance.

Within the past three decades, Indonesia achieved its developmental success in circumstances where the rule of the law and rule based behaviour were not the fundamental basis of social and political order. The government operated through political centralisation aimed at forced integration and stability of an extremely heterogeneous, potentially fractious state. Centralisation operated through economic liberalisation aimed at economic growth, with little regard for the international concept of the "humaneness" of a legal system.[58] Under the Soeharto regime the focus was on quelling insurgency and enhancing social and economic development. Law, legal institutions and legal reform were not seen as development priorities.

The success of Indonesia without the rule of the law raises the question: "Why can Indonesia not continue the success previously achieved?" Goodpaster (1999) argues that without the rule of law, Indonesia cannot manage to function

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55 Dicey, A.V. (1959) Introduction to the Study of the Law of the Constitution. London, Macmillan., pp. 585.

56 Goodpaster, G. (1999). The Rule of Law, Economic Development & Indonesia, in Seidman, A., Seidman, R.B., Walde, T.W. (eds.) Making Development Work: Legislative Reform for Institutional Transformation and Good Governance. The Hague-London-Boston, Kluwer Law International, p. 21.

57 Ibid., p. 21.

58 Ibid., pp. 22-24.

effectively in the global economy, or continue its strong economic growth.[59] More recently, Patlis et al. (2002) reported that although Indonesia is reputed to be a country that has good laws, unfortunately, they are not implemented effectively. Thus, although Indonesia has a series of laws that address coastal management in Indonesia, in reality, widespread illegal activities continue as a result of a consistent lack of enforcement and systematic corruption by public officials.[60]

This analysis gives some insight into the correlation between the rule of the law, good governance and sustainable development. There is a consensus that the rule of law and good governance are a necessary foundation for efforts to achieve sustainable development.[61] Good governments or good governance will provide public services and goods, national security, and assist people or citizens to achieve better lives. The World Bank defined good governance as: "the manner in which power is exercised in the management of a country's economic and social resources for development."[62] However, there is no generally accepted definition of 'good governance'. Good governance is generally characterised by accountability, participation, predictability and transparency.[63] Sachiko and Durwood (2005) argue the key elements of good governance are: openness, participation, accountability and transparency.[64] The World Bank divided good governance into the following eight elements or characteristics: participatory, consensus, oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follow

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59 Ibid.

60 Patlis et al. (2002), no 53 above, p. v-13.

61 Sachiko, M. and Durwood, Z. (2005) Rule of Law, Good Governance and Sustainable Development. Conference Proceedings Volume 1 of Seventh International Conference on Environmental Compliance and Enforcement in 10-15 April 2005, Marrakech, Morocco., p.2.

62 The World Bank (1993), as cited by Turner, M., Podger, O., Sumardjono, M., and Tirthayasa, W.K. (2003). Decentralization in Indonesia: redesigning state. Canberra, Asia Pacific Press, The Australian National University, p. 6.

63 The Asian Development Bank (2003). Elements of Good Governance, http://www.adb.org.htm (accessed on 10 November 2003).

64 Sachiko and Durwood (2005), no 61 above, p. 2.

the rule of law.[65] There are additional principles that should also be included in the concept of good governance. These include: the minimization of corruption, and the accommodation of minorities in the decision-making processes. It should also be receptive to the present and future needs of society.[66]

The role of legal systems in good governance is to provide the "rule of law" and create stability for the various actors in society. The World Bank identified five functions of legal systems that should support the rule of law in good governance.[67] First, legal systems should provide "a set of rules known in advance." This means that the enacted laws should be clearly publicised and understood by the citizens through discussion during development stages prior to enactment. Secondly, legal systems should ensure that all enacted laws are not merely "paper laws", but are implemented. Thirdly, legal systems should ensure that rules would be implemented consistently to all, including state officials. Fourthly, the legal systems must provide an effective and independent mechanism for dispute resolution. The judiciary should be protected from government intervention. Finally, all legal systems should provide an amendment mechanism.[68]

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65 The World Bank (1993), as cited by Turner, et al. (2003), no 62 above, p. 6.

66 The United Nations Economic and Social Commission for Asia and the Pacific / UN ESCAP (2003) What is Good Governance? http://www.unescap.org/huset/gg/governance.htm (accessed on 10 November 2003).

67 The World Bank (1992), as cited by Perry, A.M., (1999) International Economic Organization and the Modern Law and Development Movement, in Seidman, A., Seidman, R.B., Walde, T.W. (eds.) Making Development Work: Legislative Reform for Institutional Transformation and Good Governance. The Hague-London-Boston, Kluwer Law International, p. 23.

68 Ibid.

2.3.5 The effectiveness of Compliance and Enforcement in Coastal Management

Enforcement is an essential component of coastal and marine resources management. It is a management tool used to effect compliance with regulations, permits, licences, policies or plans.[69] Compliance is a state in which environmental requirements are met and maintained. Enforcement is defined as the application of a set of legal tools to assist in and compel compliance with legislative requirements.[70] Effective enforcement is key to ensuring that the goals of the maritime laws are realised. Enforcement involves an active effort of surveillance, monitoring, patrolling, apprehension of violators and their processing through an administrative justice system. Compared with other management mechanisms such as education programs, the outcome of enforcement activity is that it can be highly visible in a relatively short time.[71]

There has been growing research focusing on compliance in fisheries resource management. Most of the research can be classified into two approaches. The first is from an economic perspective. This approach assumes that fishers act as rational agents. This is based on the assumption that the individual fisher primarily responds to the immediate benefits of compliance and non-compliance behaviour. It is assumed that a fisher's decision is based on a calculation of economic gain to be obtained from by-passing a regulation compared to the likelihood of detection and

69 Causey, B.D. (1995) Enforcement in marine protected areas, in Gubbay, S. Marine Protected Areas: Principles and techniques for management, London, Chapman & Hall, p. 119

70 Wasserman, C.E. (1994) the Principles of Environmental Enforcement and Beyond Building Institutional Capacity. Proceedings Volume 1 of Third International Conference on Environmental Enforcement. Source: International Network for Environmental Compliance and Enforcement website: http://www.inece.org/ (accessed on 29 November 2004).

71 Kay and Alder (1999), no 9 above, p. 128.

the severity of the sanction.[72] This approach, first developed by Becker in the late 1960s, argued that the choice of compliance or non-compliance to a regulation by a fisher is dependent upon what is of most benefit to her or him.[73]

The first structured analysis of non-compliance behaviour was undertaken by Sutinen et al. in the early 1990s.[74] Alder et al. (1994) were convinced that the benefits and sacrifice are balanced and that socio-economic improvement of coastal communities will increase compliance.[75] Perception of legitimacy of the enforcement institution, the rules, and personal values of the individual are the factors that influence the moral obligation and social influence of a fisher.[76] However, moral obligation and social influence are also the factors that will influence a fisher as to whether or not to engage in illegal behaviour.[77]

The economic approach also provides another important premise for compliance behaviour studies. Kuperan and Sutinen (1998) argued that there is no direct correlation between the increase of enforcement activities and the reduction of the number of violations, or even the prevention of non-compliant behaviour. This is especially so if the aim of enforcement activities is reasonably balanced between the cost and the profit to be obtained from fishing activities. Fishers are often creative in

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72 Raakjær Nielsen, J. and Mathiesen, C. (2000) Important Factors Influencing Rule Compliance in Fisheries – Lessons from Danish Fisheries, http://www.oregonstate_edu/dept/IIFET/2000/papers/nielsen, (accessed on 14 September 2004).

73 Becker (1968) as cited by Eggert, H. and Ellegård, A (2003) Compliance and fisher influence in Swedish commercial fisheries regulation – A case for co-management? Website: http://www.beijer.kva.se/conference2003/Eggert_Ellegård (accessed on 14 September 2004).

74 Sutinen et al., (1990) as cited by Raakjær Nielsen and Mathiesen (2000) "Important Factors Influencing Rule Compliance in Fisheries – Lessons from Danish Fisheries", p. 1.

75 Alder, J., N.A. Sloan, and H. Uktolseya, (1994) A comparison of management planning and implementation in three Indonesian marine protected areas. Ocean and Coastal Management. Vol. 24, pp. 179-198.

76 Crawford, B.R., Siahainenia, A., Rotinsulu, C., and Sukmara, A. (2004) Compliance and Enforcement of Community-Based Coastal Resources Management Regulations in North Sulawesi, Indonesia. Coastal Management, Vol. 32, p. 40.

77 Sutinen and Kuperan (1999), as cited by Crawford et al. (2004), no 76 above, p.40.

finding other ways to avoid getting caught while fishing illegally.[78] Therefore, Sutinen argues that the high level of non-compliance behaviour could partly be explained by relatively low economic sanctions compared to economic gain obtained from illegal fishing.[79] However, several empirical studies indicate that compliance behaviour in fisheries is more complex than was offered by this instrumental approach,[80] because it was addressing human behaviour.

The second approach is co-management or cooperative action theory. This theory argues that the involvement of the community in the management processes for the establishment of reasonable rules in some cases is considered more effective,[81] and leads to higher levels of compliance.[82] Cultural values, social relationships, religion, traditional sanctions and community norms are also important factors that may improve the degree of enforcement effectiveness.[83] A recent study of compliance behaviour carried out by Crawford et al. argued that the success of community-based enforcement is also determined by the distance of a marine zone from a village settlement.[84] This suggests that social aspects of non-compliance are also important for compliance decisions.

To achieve the sustainable management of coral reefs, it is necessary to synthesise the key issues that underpin coral reef management in Indonesia. A systematic understanding of the complexity of coral reefs management within the context of coastal and marine resource management is required. Such an approach

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78 Kuperan and Sutinen (1998), as cited by Raakjær Nielsen and Mathiesen (2000), no 72 above, p.2.

79 Sutinen , J, A. Rieser, and J. R. Gauvin, (1990). Measuring and Explaining Noncompliance in Federally Managed Fisheries, in Ocean Development and International Law 21, 335-372, as cited by Raakjær Nielsen and Mathiesen (2000), no 72 above, p. 2.

80 Raakjær Nielsen and Mathiesen (2000), no 72 above, p. 2.

81 Mantjoro (1996), as cited by Crawford et al. (2004), no 76 above, p.41.

82 Jentoft, S. (2000) Legitimacy and disappointment in fisheries management. Marine Policy, vol. 24, pp. 141-148.

83 Crawford et al. (2004) no 76 above, p. 41.

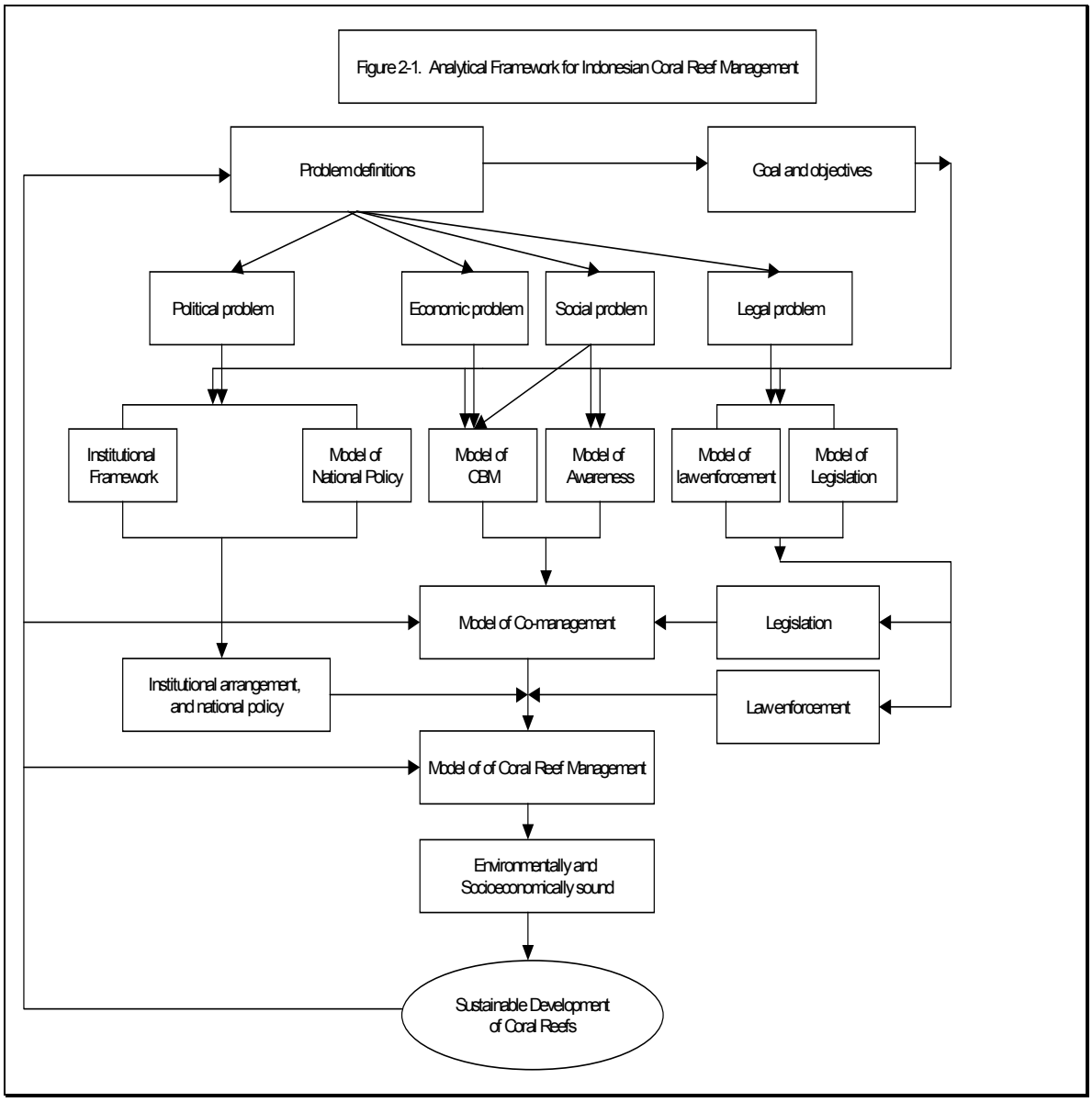
84 Ibid., pp. 47-49.

also provides an appreciation of why the policy focus on coral reef management is intrinsically linked to the management of marine and coastal resources.

2.4 Framework of Analysis

All it is not possible within the scope of this thesis to incorporate the diverse and complex interactions existing within the coastal and marine ecosystems. Five key issues are used as the pillars of analysis. These are the institutional arrangements; policy; legislation; community-based management and co-management; and the effectiveness of coastal and maritime law enforcement. This framework provides the theoretical basis for the sustainable development of coral reefs in Indonesia.

A planning framework for Indonesia's coral reef management has been proposed in this thesis (see figure 2-1). Since planning is a systematic scenario to achieve certain objectives, it is logical that goals and objectives of coral reef management should be clearly defined at the beginning of the planning process. To define the goals and objectives properly, they have to be derived from an analysis of the actual problem issues and challenges associated with coral reef management. This analysis should be used as a stepping-stone for the subsequent stages of the planning framework. The grouping of the problems and issues into political, economic, social and legal areas was proposed to help locate them, and then facilitate a solution for each area.



Even though the models are created based upon specific problems, the creation of these sub-models is also influenced by other related problems, and the goals and objectives. For example, the creation of a CBM approach is also influenced and determined by the goals and objectives, as well as the social and economic challenges. In this framework, collaborative management (co-management) is a central feature of integrated coral reef management. The co-management approach is primarily based on the sub-model of CBM. It is then strengthened by the legislative aspect.

In the implementation, co-management will also be strengthened by national policy, institutional frameworks and data management (political aspects), and the sub-model for law enforcement (legal aspect). The coral reef management model is created by the combination of these sub-models. The integration of these components into one model is expected to produce responsible and sustainable development of coral reef ecosystems.

As a management model, this model also accommodates the management principles; one of these is a never-ending process. Thus, the outcomes of each stage of the management process feed back into the system to influence the cyclic processes. Some problems will not be identified until the process is fully implemented. Even though this framework is developed with a focus on managing human impact on coral reef degradation, this framework can also be used to solve the problems of coral reef degradation from natural disturbances.

2.5 Scope and Limitations

While based on the Indonesian government, this study is limited to the districts of Riau Archipelago, Selayar and Biak Numfor to illustrate the national and local government approaches to coastal and coral reef management. Two case studies present good examples of divergent environments for the development of coastal and marine management of each district. It is recognised that coral reefs and other coastal ecosystems exist in most of the coastal districts in Indonesia. Since the enactment of the Regional Government Law (Autonomy Law) in 2001, provincial and district governments have full authority to manage their coastal areas based on their needs.

However, detailed studies were not possible during the study period in all province and district governments because of logistical and budgetary constraints.

The preference of Riau Archipelago, Riau Province; Selayar, South Sulawesi Province; and Biak Numfor, Papua Province as the research sites was based on geographical aspects and human impact pressures on coral reefs. In terms of the geographical perspective of this research, Indonesia was divided into three regions or parts, i.e. western, central and eastern. Western Indonesia comprised Sumatra, Java and the small islands that surround those main islands. Central Indonesia consisted of Kalimantan, Sulawesi, Bali, Lombok and Nusa Tenggara, while the eastern part of Indonesia was represented by Maluku and Papua. The division of the regions was based on the similarities of the coral reef ecosystem, and management problems. Each site was assumed to represent the problems in that region, Kepulauan Riau (Senayang and Lingga Islands) was expected to represent the coral reef management in the western part of Indonesia. While Kepulauan Padaido (Padaido Islands), Biak Numfor, in West Papua, was assumed to represent coral reef management problems in eastern Indonesia. The central part of Indonesia was represented by Takabonerate, Selayar in South Sulawesi (see Figure 2-2).

As already mentioned, the coral reefs in the western part of Indonesia are generally in worse condition than those in the eastern part due to increased human activity. Understandably, development in the main islands in the western part of Indonesia has been more progressive than in the eastern portion. It is also interesting to learn how much the human activities on land have contributed to coral reef degradation. For example, Riau is one Indonesian province that has been pressured by human activities in both mainland and ocean activities, but the reefs still exist in that area.

Figure 2-2 Field site locations

Please see print copy for Figure 2-2

A thorough evaluation of coastal and marine programs of Indonesia over time has been constrained in the literature because of lack of adequate data. There is a general scarcity of historical records and documentation of coastal and marine initiatives at both national and local levels. Coral reef and coastal management information and databases at the national level are also often limited.

2.6 Study Methods

The methodological approach adopted in this thesis is based on the case study method. The case studies were conducted at Riau Archipelago, Riau Province; Biak Numfor, Papua Province; and Selayar, South Sulawesi Province as the three selected districts research sites. This method involves the empirical investigation of a particular contemporary phenomenon within three selected sites its real life context using multiple sources of evidence. Methodological tools used to collect data for this thesis included document and literature review, structured and unstructured interviews, focus groups and a questionnaire. Participant observation was particularly useful for gaining the community understanding of the case study site.

The literature review covers library research and official government reports and documents including what could be termed 'gray literature' unavailable in the public domain. Electronic mail contact was also used during the study period to clarify and cross-check details in the respective sites. Discussions incorporating broader regional perspectives were possible on two occasions through attendance and presentation of a paper at international conferences.[85]

The next chapter analyses and reviews the concept of co-management of coral reefs and conservation programs.

85 The Coastal Zone Asia-Pacific Conference'04, in Brisbane Australia 5-10 September 2004; Indonesia Update, in Canberra 24-25 September 2004.

Chapter Three

Community Participation in Coral Reef Management and Conservation Programs: A Review of Co-Management Concepts

3.1. Introduction

The purpose of this chapter is to analyse the concept of co-management of coral reefs and conservation programs. It starts with a review of common property regimes and traditional marine resource management. It then discusses the relationship between co-management and decentralisation, and decentralisation issues in Indonesia. The chapter also analyses three models of community-based management and co-management that are operating and being tested in the Asia-Pacific region. These include: establishing community-based village-level marine sanctuaries, developing integrated coastal management plans at village-level, and the implementation of alternative income generation activities (AIGs).

The chapter argues that co-management is an appropriate model for effective coral reef management at the local level. However, the success of co-management of coral reefs at the national level depends on integrated action, coordination, support and facilitation from the central government. This includes the restructuring of government institutions and regulations, enhancing data and research management and designing appropriate systems for monitoring and controlling coral reefs and associated ecosystems.

3.2 Community-based Management and Collaborative Management

Coral reef management and conservation issues in Indonesia are complex, and differ from region to region. However, it is obvious that education and awareness programs about coral reefs will not be sufficient to stop the tide of degradation. Innovative management techniques, which focus on people management at the village level, rather than purely on coral reef management, are needed.[1] This technique is known as community-based management or community-based coastal resources management.

The community-based management approach involves people's active participation in the planning and implementation of resource management strategies.[2] It is based on the concept of empowering people with responsibility to manage their resources. Community-based management uses a holistic approach to management by incorporating environmental, socio-economic and cultural considerations in decision-making by stakeholders.[3] Community-based management has been implemented and well documented in various renewable resource management systems in the world, especially in irrigation, forestry, and upland agriculture areas. However, the number of completed and successful community-based management coastal resource efforts is still relatively small.[4] This is due to the complexity of coastal and marine resources systems, the social and cultural structure, the lack of

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1 Tomascik, T., Mah, A.J., Nontji, A., and Moosa, M.K. (1997) The Ecology of Indonesian Seas. (2 volumes). Hong Kong, Periplus Editions., p. 115.

2 Sandolo, R.M. (1994) Community-based Coastal Resources Management: the Palawan Experience, in Pomeroy, R.S. (ed) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Centre for Living Resources Aquatic Resources Management (ICLARM), p. 166.

3 Kay, R. and Alder, J. (1999) Coastal Planning and Management, London: E & FN SPON., p.139.

4 Pomeroy, R.S. and Carlos, M.B. (1997) Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994. Maritime Policy, Vol. 21 No. 5, p. 445.

education of coastal communities and the independent nature of fishers.[5] Despite the comparative lack of emphasis on coastal management, the Philippines has still recorded the highest number of community-based management of coastal resources in the world.[6]

It is clear that community-based management plays an important role in the success or failure of the ICZM. However, international experience shows that the number of completed and successful examples of community–based management in marine and coastal areas is still relatively small compared with the success of community-based management activities for terrestrial resource management.[7]

Community-based management is not the only approach to resource management and it may not be suitable for every coastal community. Many communities may not be willing to take, or be capable of taking, on the responsibility of coastal resource management. Not all elements of coastal resource management authority can, or should, be allocated to the local community.[8] The economic, social and/or political incentives to implement successful community management may not be present in many communities. The risks involved in attempting to change coastal resources management may be too high for these communities.[9]

Community-based management in the Sumilon Islands, Cebu, is a good example of such a case. The community involvement in reef management at Sumilon Islands, was the first example of community-based reef management in the Philippines. Although this initiative generated many lessons and provided guidance

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5 Pomeroy, R.S. (1994) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Center for Living Resources Aquatic Resources Management (ICLARM), p. 2.
6 Pomeroy and Carlos (1997), no 4 above, p. 445.
7 Ibid.
8 Pomeroy (1994), no 5 above, p. 3
9 Ibid.

for future projects, it ultimately failed due to a change in political leadership, the lack of institutional and legal support, and lack of community support.[10] It has been found that for community-based management to be successful, the community needs to build a partnership with other stakeholders particularly in national and local governments. This partnership is known as collaborative management or co-management. Collaborative management is defined as "the collaborative and participatory process of regulatory decision-making among representatives of user-groups, government agencies and research institutions."[11] The amount and degree of power-sharing the government and the community have will differ and depend upon country and site-specific conditions.[12]

Co-management and community-based management concepts emerged internationally during the 1980s, concurrent with the World Conservation Strategy and the 1982 Bali World Congress on National Parks.[13] Those congresses emphasised the linking of protected area management with local area economic activity. Further ideas were developed in the late 1980s to link conservation with sustainable development.[14]

Co-management and community-based management are not only a developing country phenomenon; they are also being utilised in developed countries such as Australia, Norway, Japan and the United States.[15] However, the co-management concept has been used more widely than community-based

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10 White, A.T. and Vogt, H.P (2000) Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation. Marine Pollution Bulletin Vol. 40, No. 6, pp. 537-538.

11 Jentoft, S., McCay, B.J., and Wilson, D.C. (1998) Social Theory and Fisheries Co-management. Marine Policy, Vol. 22. No. 4/5, pp. 423-424.

12 Pomeroy (1994), no 5 above, p.3.

13 Kay and Alder (1999), no 3, p.137.

14 Ibid.

15 Ibid.

management with a number of partnerships between communities and resources management agencies.[16]

Collaborative and community-based management are the two major forms of effective community participation in coastal management programs. The choice of strategy depends on the factors that impinge on the community's role in the planning and implementation of the resource management policy. For example, the application of community-based management programs is possible in the Philippines because local authorities have rights to manage their areas, while collaborative management is better suited to Government and social structure of Sri Lanka because of the absence of community management rights.[17] Both approaches may be ideal in formulating a plan of management. Community-based management, however, is rarely achieved since governments are reluctant to devolve power and full authority, and communities are often viewed as unskilled to take responsibility for managing their resources.[18]

In terms of community participation, community-based management is more advanced than co-management because decision-making has been taken over by government, while local decision-making is undertaken by community representatives. For example, community-based management in the Philippines[19] and the Caribbean[20] reveal the effectiveness of community participation. Table 3-1 provides the characteristics of co-management and community-based management.

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16 Ibid., p. 141.
17 Ibid.
18 Ibid., p. 140.
19 Buhat (1994); Christie and White (1994), as cited by Kay and Alder (1999), no 3 above, p. 140.
20 Smith and Homer (1994), as cited by Kay and Alder (1999), no 3 above, p. 140.

Table 3-1: Characteristics of Collaborative and Community-based Management

Characteristic	Collaborative Management	Community-based Management

Please see print copy for Table 3-1

3.3 Common Property Regimes

The success of any resource management system, whether community-based or centralised, depends on incentives, sanctions and rights, and rules for controlling the behaviour of resource users. Thus, at the core of community-based management are the issues of common property regimes, resource management regimes and institutional arrangements.[21] The central issue in community-based management is common property regimes. *Common property regimes* are defined as a set of accepted rights and rules by a group of resource users for the sustainable and interdependent use of collective goods.[22]

According to Feeny, *property rights* are "a set of characteristics of exclusivity, transferability, inheritability, alienability and enforcement mechanisms."[23] Property rights are an essential element of common property resources.[24] There are two characteristics of common property resources. First, there is the difficulty of controlling access to the resources and preventing people from

21 Pomeroy (1994), no 5 above, p. 3.
22 Ibid.
23 Feeny, D. (1994) Frameworks for Understanding Resources Management on the Commons, in Pomeroy, R.S. (ed.) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Center for Living Resources Aquatic Resources Management (ICLARM), p. 21.
24 Ibid, pp. 21-22.

using it. Second, the ability to use a common property resource depends on the capability of each user.[25]

Berkes eluded to the boundary problem, pertinent to fisheries, as another characteristic of common property resources. Almost all living resources of the sea are common property resources, except for a few aquaculture species.[26] This fact often produces a discrepancy between individual and collective economic rationality that leads to a "tragedy of the commons".[27] This is a situation that typically occurs in the absence of property rights to the resources.[28]

The literature on common property regimes recognises four basic categories of common property: (i) open access regime (*res nullius*) where there is no management regime at all and where property rights are absent, and access is free and open to all; (ii) common property or communal property (*res communes*) in which the exclusive rights to exploit the resource are assigned to a group of individuals who can exclude others and regulate their own use; (iii) private property (*res privatus*) in which the rights rest with an individual or a corporate body, which may exclude others and regulate the use of the resources; and (iv) state property or state supremacy (*res republica*) in which the rights to control the resources rest with government agencies.[29] These four categories are ideal analytical types. In reality many other resources are held under a combination of two or more of these types.[30]

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25 Ibid., p. 20.

26 Berkes, F. (1994) Property Rights and Coastal Fisheries, in Pomeroy, R.S. (ed.) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Centre for Living Resources Aquatic Resources Management (ICLARM), p. 56.

27 Literature on "tragedy of the commons" see Hardin, G. (1968) The Tragedy of the Commons. Science, 162, pp. 1243-1248

28 Feeny et al., (1995); Hanna et al., (1996), as cited by Pomeroy, R.S. and Berkes, F. (1997) Two tango, the role of government in fisheries co-management. Marine Policy, Vol. 21 No. 5, p. 466.

29 Feeny (1994), no 23 above, p. 22.

30 Berkes (1994), no 26 above, p. 56.

During the last half century, there has been a significant change in property rights regimes. Management authority for resources has been moved away from the hands of resource users into those of governments and their institutions.[31] This loss of community responsibility and authority has often involved the transfer of marine tenure from the community to the government, effectively placing the resources under an open-access regime. In many parts of the world, we now have a coral reef management regime based on state ownership and de facto "open access". This has contributed to coral reef degradation and resource use conflict.[32] The "tragedy of the commons" has become a reality, the rush to take limited resources, over-capitalisation and lack of access controls create a spiralling degradation of the resource until halted, or the resource collapses. Some form of access control and some form of institutional design are necessary to regulate use and minimise exploitation.[33] This condition occurs in Indonesia, where state ownership has seen state encouragement of massive environmental degradation and private property owners are not necessarily nature conservationist either.

3.4 Traditional Marine Resource Management and Co-Management

The co-management concept can be considered an innovation in property rights regimes because it examines the interaction between coastal communities and regulatory regimes.[34] One of the key components in the co-management approach is

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31 Renard (1991), as cited by White, A.T., Hale, L.Z., Renard, Y., and Cortesi, L. (1994) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press, p. 12.

32 White et al. (1994), no 31 above, p. 12.

33 Pomeroy and Berkes (1997), no 28 above, p.467.

34 Charles (1988), as cited by Viswanathan, K.K., and Raja Abdullah, N.M. (1994) Planning and Management of Small-Scale Coastal Fisheries, in Pomeroy, R.S. (ed.) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Centre for Living Resources Aquatic Resources Management (ICLARM), p. 118.

the adaptation of marine resource management systems to local conditions. It also involves the recognition and legitimisation of customary marine tenure or traditional or local-level management systems.[35]

A traditional management system is a common property regime in which access to a particular territory is limited to a defined user group, and where operational rules are specified and controlled by residents in traditional society.[36] According to Hviding, customary marine tenure is considered the basic system of social relationships that involve participants and operators, decision-makers, insiders and outsiders. The system is generated, maintained, and transformed through social processes.[37] Ruddle identifies six principles of traditional marine resource management in the South Pacific. These are: (i) sea rights are determined by social status; (ii) resource exploitation is managed by user rights; (iii) resource-use territories are defined; (iv) traditional authorities control marine resources; (v) traditional conservation is widely practised; and (vi) sanctions and penalties are meted out for violation of regulations.[38]

Traditional systems in relation to coral reef resources management are found worldwide. These regimes are particularly well developed in the Asia-Pacific region, where traditional management systems have often employed common property regimes.[39] Traditional local authorities regulate access to a particular territory, which is restricted to a defined user group, who are controlled by traditional or specific

35 Pomeroy and Berkes (1997), no 28 above, p.467; Viswanathan and Raja Abdullah (1994), no 34 above, p. 119.
36 Mantjoro, E. (1996) Management of Traditional Common Fishing Grounds: The Experience of the Para Community, Indonesia. Coastal Management Vol. 24(3), p.230.
37 Hviding (1990), as cited by Viswanathan and Raja Abdullah (1994), no 34 above, p. 119.
38 Ruddle (1988), as cited by Viswanathan and Raja Abdullah (1994) no 34 above, p. 120.
39 Ruddle (1996), as cited by Senaratna, S. (1999) Common Property Resources and Coral Reef Ecosystems. International Union for Conservation of Nature and Natural Resources (IUCN): The Sustainable Use Initiative, p. 8.

rules and understandings.[40] In the Solomon Islands, for example, village communities (known as *butubutu*) control access to reef and associated resources, while the traditional chief administers regulations on harvesting within the community areas.[41] Communally controlled management systems for marine resources were used throughout Maluku, in eastern Indonesia. Historically, Moluccan coastal communities set well-defined marine territories. Boundaries of these community-controlled territories were frequently associated with natural features of particular villages. These community practices are known as *sasi*. *Sasi* regulations focus on resources harvested for subsistence purposes, such as the trochus mollusk (*Trochus niloticus*) which was extracted for food.[42] These practices have been shaped and amended from generation to generation to meet cultural needs and resource sustainability.

However, in many parts of the world, traditional local resource management has been inadvertently weakened or destroyed by colonial administrations and replaced by centralised institutional systems that are responsible for policy formulation through to enforcement.[43] Traditional resource management regimes have also been weakened by two other factors. The first is the global market for prized species of shells, fish and corals that stimulated new economic pressures; and the second is technological changes that brought in the use of explosives for fishing on reefs.[44] The disappearance of traditional reef management, *sasi,* in Maluku,

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40 Ruddle, K. (1994) Changing the Focus of Coastal Fisheries Management, in Pomeroy, R.S. (ed.) Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Centre for Living Resources Aquatic Resources Management (ICLARM), p. 63.

41 Senaratna (1999), no 39 above, p. 8.

42 Zerner, C. (1994) Tracking Sasi: The Transformations of a Central Moluccan Reef Management Institution in Indonesia, in White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (eds.) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press, pp. 20-23.

43 Ruddle (1994), no 40 above, p. 63.

44 White et al. (1994), no 31 above, p. 11.

Indonesia was caused by these factors. Zerner confirmed that the emergence of a new trochus (*Trochus niloticus*) market resulted in new pressure on *sasi* community management institutions and practices throughout the Maluku Islands.[45] Private entrepreneurs as well as local government authorities started competing with local communities for control of rights to inshore reef resources had led to a significant over-harvesting of trochus, causing a depletion of resources and also a loss of income for local communities.[46]

Another issue is the centralised systems of natural resources management in Indonesia, since its Independence in 1945. The policy to encourage the planting of commercial crops such as, nutmeg, pepper, coconut and rice caused the destruction of traditional management systems. This was aggravated by the imposition of local taxes, which greatly affected village management systems.

There are three basic alternative policy approaches to implement community-based marine resource management that are particularly relevant to coral reef management.[47]

The first is legislation to dilute traditional systems. This approach requires legislative action to limit and define the powers of traditional rights holders. It also modifies traditional management systems to accommodate commercial fisheries in certain traditional fishing areas. The advantage of this approach is that it allows both commercial fisheries and economic sectors to develop and define modern fishing rights. However, the implementation of this approach often results incursions of mobile, commercial and often uncontrolled, fishers into traditional areas frequented by small-scale, poorer, subsistence fishers with limited mobility, but with total

45 Zerner (1994), no 42 above, p. 24.
46 Ibid.
47 Ruddle (1994), no 40 above, pp. 77-80.

dependence on the local, coastal fishery for their very survival. This results in conflict and an increase in political pressure from the poor to the comparatively affluent commercial fishers.

The second policy approach is legislation to reinforce and specify the scope and power of traditional rights. The advantage of this approach is that it recognises the realities of the past and present situations and promotes resource conservation. However, the transfer of responsibility and the modification of traditional rights can result in the protection of vested interests of one group, or the other. It requires careful negotiation and management with sufficient enforcement and deterrence to prevent one side taking control of the process.

The third approach that can be utilised for implementing community-based marine resource management is the ad hoc approach. Under this approach, each problem is resolved through negotiation on a case by case basis for a "win-win solution".[48] This has the advantage of political acceptability, since no changes are required immediately, and initially traditional sentiments and rights can be reinforced. However, this approach creates difficulty for development because no guidelines are produced for problem resolution. This approach is unsatisfactory in the long term as it is reactive to problems after they occur and is not pro-active enough to prevent over-exploitation of the resources.

Selecting which of the three alternative approaches to use is not an easy task. In the Pacific region, for example, the reinforcement of traditional rights may be an appropriate approach.[49] In the case of Indonesia, however, it may be possible to apply a combination of "dilution" and "empowering traditional rights". Indonesia is

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48 Ibid.

49 Ruddle (1994), no 40 above, p. 79.

an archipelago and a multicultural nation. As an archipelagic nation, it is becoming increasingly evident that it is impossible to adopt a centralised democratic system due to the lack of financial and personnel capacity and capability to control inshore waters across the nation. Experience shows that a centralised approach to resource management systems results in increased financial, administrative and personnel burdens on the central government. The central government was, and is, neither politically committed, nor capable of enforcing its regulations. One solution to reduce these pressures on government is through community empowerment to manage their marine resources and ecosystems with some support from government. The combination or modification of "dilution" and "empowering traditional rights" approaches will result in a co-management system that accommodates both the traditional management system and government policies.

3.5 Co-Management and Decentralisation

Decentralisation is a central theme of the co-management approach. The co-management concept implies a relative autonomy of users within an overall institutional framework.[50] Successful co-management initiatives require a clear commitment from the central government to transfer some of its power and authority to local government and to the local communities, or local organisations. The transfer of some authority from the central to the lower levels or smaller units in the government system is known as decentralisation or devolution of authority. Pomeroy and Berkes define *decentralisation* as the systematic and rational distribution of

50 Jentoft et al. (1998), no 11 above, p. 424.

power, authority and responsibility from the central government to lower or local institutions to provinces or districts in the case of republic countries.[51]

International experience shows that although many initiatives in community-based resource management have been implemented throughout the Asia-Pacific region in the last century under different names, in fact only a small number of those initiatives have successfully stimulated and encouraged the community to establish local institutional structures and control.[52] This has been due to the lack of legislation and effective transfer of authority from the central government to the local government and local community for the management of their resources.

Development of co-management regimes in the Philippines provides a good example of the need to provide the appropriate framework to support co-management initiatives. Since the failure of the community-based initiative in Sumilon Islands, the Philippines has embarked on a variety of approaches to manage its coastal resources. There were some fundamental measures taken by the Philippines to address the problems. These included: (i) enactment of a local autonomy law,[53] whereby the municipal governments were given sufficient authority to manage their natural resources and environment and to set up sustainable management approaches; and (ii) increased collaboration between national agencies, universities and other related research centres which lead to cross-sectoral management. This collaboration addressed the lack of expertise of government officers. Three collaborative management initiatives in Apo Islands, Mabini and Tingloy, Batangas and Tubbataha Reef National Park, Sulu Sea, have reported great successes, since the enactment of

51 Pomeroy and Berkes (1997), no 26 above, p. 469.
52 Ibid., p. 470.
53 The enactment of the Philippines Local Government Code of 1991.

local autonomy law.[54] This experience shows that the success of co-management initiatives requires collaboration between users, government officials and scientists in planning and implementing resource management schemes. It also shows that the devolution of management responsibility is required for this success.

Three major forms of administrative decentralisation are usually practised: deconcentration, delegation and devolution.[55]

Deconcentration involves shifting some management responsibilities from central government departments to sub-national units of the same department or ministry. This is considered to be the weakest form of decentralisation and is used mostly in unitary states.[56]

Delegation involves the transfer of responsibility from central government authorities to semi-autonomous organisations or sub-national authorities not wholly controlled by central government.[57] This is a more extensive form of decentralisation.

Devolution involves the transfer of responsibility from the central government to quasi-autonomous units of local governments with corporate status.[58] In a devolved system, local governments have clear and legally defined geographic boundaries over which they exercise authority.[59]

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54 White, A.T. and Vogt, H.P (2000) Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation. Marine Pollution Bulletin, Vol. 40, No. 6, pp. 537-550.

55 The World Bank (2003) Project Design: Administrative: http://www.decentralisation.htm (accessed on 17 August 2003).

56 Ibid.

57 Ibid.

58 Ibid.

59 Ibid.

Some authors argue that privatisation or concession is also a kind of decentralisation.[60] *Privatisation* occurs when certain governmental functions are transferred to non-governmental organisations, voluntary organisations, community associations and private enterprises.[61] This approach is used mostly in developed nations, where the private sectors have an equal role in managing the development programs of the country.

In regard to collaborative management of coastal resources, decentralisation confers at least three major advantages on government. These are: (i) it brings government closer to the people and devolves resource allocation decisions to local management, based on the premise that local government plans and policies would better address the local community needs; (ii) mechanisms are developed for increased transparency and accountability in delivery of basic services; and (iii) it reinforces participation from all sectors of the community.[62]

Nevertheless, the devolution of resource management authority from the central to regional, or municipal governments is an issue that is not easily implemented. It requires restructuring of government administrative and institutional structures, fisheries and/or resources laws and national policies.[63] The transfer of responsibility from central government to local institutions, or local government levels, often encounters resistance from central authorities who perceive a "loss of power" and possible "loss of financial control" two basic fears of any centralised

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60 Pet-Soede, L, Merkl, A., Claussen, J., Thompson, H., and Wheeles, D. (2002) Integrated Marine Management Concessions – A New Approach to An Old Problem. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) (2002) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, pp. v-35-v-48.

61 de Guzman (1991) and Helmsing et al. (1991), as cited by Pomeroy and Berkes (1997), no 26 above, p. 471.

62 Courtney, C.A., White, A.T., and Deguit, E. (2002) Building Philippine Local Government Capacity for Coastal Resource Management. Coastal Management, Vol. 30, p. 28.

63 Pomeroy and Berkes (1997), no 26 above, p. 470.

system. Moreover, this may create a conflict between local fishers and outsiders that arise from ecological and geographic factors, e.g. competition over fishing areas. As has been noted by Berkes, the "boundaries problem will be faced in all local resources management because of the characteristics of common property resources." However, whatever the resource management system employed, there is a cost, and that cost should be shared by all parties, e.g. the use of a centralised system will result in costs of communication, enforcement and control.

In summary, it is necessary for the government to consider ecological and geographical factors in designing co-management programs. It is also clear that structures for coordination and mechanisms for conflict resolution are required for implementation of co-management and decentralised regimes. To avoid conflict among the resource users, it is advisable that regulatory tasks be kept under the central government and not delegated to the regional government. But enforcement and implementation of the regulatory instruments can and should be devolved following standardised training and certification of appropriately mandated law enforcement units. In a broader sense, the collaboration between community, government officials and scientists in planning and implementation should take place at all levels of decision-making.[64]

3.6 Decentralisation of Management Authority in Indonesia

The government reform movement, the so-called *reformasi,* which arose with the fall of President Soeharto in 1998, has triggered a tremendous push for decentralisation in Indonesia. Since Independence on August 17, 1945, and

64 Jentoft et al. (1998), no 11 above, p. 431.

particularly since Soeharto came to power in 1965 and established the New Order regime, Indonesia operated under a centralised system of government. In 1995, the central government announced a policy to devolve greater autonomy to the regions in order to address the problems of resources depletion and environmental degradation.[65] However, the policy is considered a failure due to opposition from some central government ministries who refuse to devolve their authority to local governments.[66] The authority for managing and conserving coastal areas is retained by central government agencies. For example, the permits for oil and mineral mining are still processed in the Ministry of Energy and Mineral Resource.

In 1999, the government again introduced significant policy measures to decentralise authority from the central government to regional officials at the province and district levels, through the enactment of Act No. 22 of 1999 on Regional Government (Autonomy Act) and Act No. 25 of 1999 on Financial Balancing between Central and Regional Government. The enactment of these laws led to significant changes in administrative and institutional structures and authority at the national and regional government levels. Despite the efforts of central governments to delegate some of their authority to regional governments, there are some major issues that still need to be addressed.

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65 Through the enactment of Government Regulation No. 8 of 1995, the central government announced a pilot project of decentralisation for twenty-six selected districts on all the major Indonesian Islands. These districts included: Aceh Utara (Aceh), Batanghari (Jambi), Kampar (Riau), Simalungun (North Sumatra), Tanah Datar (West Sumatra), Bengkulu Selatan (Bengkulu), Muara Enim (South Sumatra), Lampung Tengah (Lampung), Banyumas (Central Java), Bandung (West Java), Sidoardjo (East Java), Sleman (Yogyakarta), Lombok Tengah (West Nusa Tenggara), Timor Tengah Selatan (East Nusa Tenggara), Kutai (East Kalimantan) Kotawaringin Timur (Central Kalimantan), Sambas (West Kalimantan), Tanah Laut (South Kalimantan), Minahasa (North Sulawesi), Donggala (Central Sulawesi), Kendari (Southeast Sulawesi), Gowa (South Sulawesi), Maluku Tengah (Maluku), Sorong (Irian Jaya), and Alleu (East Timor).

66 Holland, P. (1999) Regional Government and Central Authority in Indonesia, in Lindsey, T. (ed.) Indonesia: Law and Society. The Federation Press, NSW, p. 217.

First, the enactment of the regional Autonomy Law has given rise to "district territorial ego", particularly in the districts that still have valuable natural resources. This has resulted in conflict between fishers from the different regencies, for example, conflict between Sumenep/Madura's fishers (a district of East Java Province) and the other fishers from Indramayu (a district of West Java Province).[67]

Second, the limitation of human capacity in natural resources management and conservation in most of the coastal regencies has posed problems for effective management, and consequently excessive exploitation of natural resources. Many regency governments have focused on economic gain, and have not attempted to manage their resources' sustainability. The Department of Home Affairs estimated that more than 7,000 Provincial or Regency Regulations (*Peraturan Daerah*/PERDA) have been issued by regional governments in forestry, mining, trade and industry sectors that have not complied with the higher-level government conservation regulations. These PERDAs have been issued solely to increase the regional government's income, and not for conservation.[68]

Third, the enactment of the Autonomy Law has created a wider gap between the poor and the wealthy coastal provinces or regencies, resulting in jealousy among the regional governments.

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67 Nikijuluw, V.P., Bengen, D.G. and Purwanto, A.B. (2002) Identifikasi Pola Pergeseran dari Rezim Sentralistik kepada Desentralisasi dalam Pengelolaan Sumberdaya Pesisir dan Laut (Identification of changing pattern of Centralistic regime to Decentralization in Marine and Coastal Management), in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, p. III.44.

68 "DEPDAGRI menilai 7,000 PERDA tidak layak" (Department of Home Affairs assessed 7,000 of regional regulations are not valid), *Kompas Daily News*, 14 August 2003, http://www.kompas.co.id

Fourth, there is no recognition of traditional rule and customary laws that relate to natural and coastal resources in the national constitution.[69] The breakdown of traditional management was aggravated by economic pressures that forced coastal communities to exploit their natural resources without consideration for ecological issues.

It is necessary for Indonesia to apply integrated coastal management strategies to address these challenges successfully. The strategies must include improvement in political commitment, legislation, socio-economic and government administration. Success or failure of integrated coastal management is determined by socio-economic factors, because the community is the central part of the Indonesian development process.

This chapter also analyses the global experience in developing approaches to or models of community-based and co-management programs for coral reefs. Three such models are being developed and tested in the Asia-Pacific region. These include: (i) community-based village-level marine sanctuaries; (ii) integrated coastal management plans at the village level; and (iii) implementation of Alternative Income Generation activities (AIGs).

3.7 Community-based Marine Sanctuaries

The successful local marine sanctuaries in the Apo Islands in the Philippines and at Blongko in North Sulawesi, Indonesia, are good examples to use to analyse the model of community-based village-level marine sanctuaries. A marine sanctuary

69 Article 33 of the Constitution of the Republic of Indonesia stipulates that land- and water based resources belong to the State and will be exploited as optimally as possible for the health and welfare of all citizens.

or marine reserve is an area of the sea in which all consumptive or extractive uses, including fishing are effectively prohibited and other human interference is minimised.[70]

The purpose of establishing a village marine sanctuary is twofold. First, it can function as a nursery ground for marine organisms and for marine biodiversity protection. Second, it can function as an economic resource for the local community. Healthy corals and mangroves can provide sustainable fish production, and in some cases the healthy reefs can also be a tourist attraction, such as for diving.

There are three elements that should be included in the development of community marine sanctuaries. These are: (i) community socialisation, (ii) capacity building and public education, and (iii) the development of village ordinances.

One of the important ways to assist the community to attain desired outcomes is through the encouragement of more community participation in planning and implementation. The experience in community-based and co-management initiatives in similar sectors of other countries (e.g. Sri Lanka and the Philippines) show that it is critical to assign an extension officer to facilitate this process.[71] The extension officer or field facilitator acts as the principal catalyst and coordinator for community-based and co-management activities with technical support from a government department, NGO or university.[72] As the "agents of change", the extension officers should work with the community, but not work for the community. This is an important distinction because the extension officer should only act as a

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[70] Sobel, J. and Dahlgren, C. (2004) Marine Reserve: A Guide to Science, Design and Use. Island Press., p. 21.

71 Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi. ITMEMS Proceedings, p. 302.

72 Ibid.

facilitator in the community decision-making process, and not push his or her own self-interest or ideas. The program should belong to the community.

There is significant anecdotal, and some empirical, evidence that suggests community participation in decisions taken during program development ensure the project's success.[73] Community participation is the core of community-based management, and collaborative management initiatives. There are two agents involved in community participation activities: the community, and the external organisation. The external organisation can be a government department or a non-governmental organisation (NGO).

3.8 Integrated Coastal Management Plans at the Village Level

One of the ways to address the main objective of community-based and co-management of coral reefs is through the establishment of the community coral reef management plans (CCRMP). The development of the CCRMP is similar to the establishment of a local marine sanctuary. This takes time, and needs intensive socialisation to get agreement among the community groups. The CCRMP is an integrated plan of coral reef management, which consists of key village programs required to improve reef management practices. The plan should address the problems of destructive fishing (use of dynamite and poisons/cyanide), illegal trawling, over-fishing, the impact of sand-mining and pollution.

Village ordinances (*aturan desa*) have been prepared as part of the CCRMPs to regulate extractive activities, ensure the enforcement of the CCRMP management

73 Khwaja, A.I. (2001) Can good projects succeed in bad communities: Collective action in the Himalayas. The World Bank Publications, http://www1/worldank/decentralisation/publication, p.10.

decisions, and provide legal support for the plan. Village ordinances are developed through a series of formal and informal meetings and small group discussions amongst all the stakeholders of the village. The ordinances contain specific rules on issues that relate to reef management, patrolling, monitoring and development of Alternative Income Generation Activities (AIGs).

The approved coral reef management plan and village ordinance are submitted to district and regency officials for their agreement, and to seek additional strength and support for implementation and enforcement. With regional government approval, the responsibility to manage marine and coastal resources is thus delegated to the community. Such approval also indicates a change of the property management regime, from state property rights to communal or community property rights.

3.9 Alternative Income Generation (AIG)

One of the most common strategies used in the Asia-Pacific region to reduce pressure on coastal resources is to promote AIG.[74] This strategy is based on the assumption that much of the illegal fishing and over-exploitation of marine resources is caused by a need for cash and food, and that communities would use legal fishing techniques if they had other ways to generate income. Income generation programs are introduced for the explicit purpose of alleviating pressure on coastal resources. [75]

74 This strategy has been used by many external programs, including the World Bank, in the Pacific as the alternative ways to earn income, such as aquaculture and offshore tuna fishing. The World Bank (2000) Voice from the Village: A comparative study of coastal resource management in the Pacific Islands. Discussion Paper Series Number 9, p. 42.

75 Ibid., p. 43.

As part of capacity building, the community is introduced to the idea and trained to create and manage a small-scale enterprise as an alternative way to generate income from non-fishing sources. Such enterprises include: tourism, farming, aquaculture, handicraft, retail fishery kiosks, credit schemes, and other village-based activities. The alternative income sources have a vital role in coral reef conservation. Alcala and Russ (2000) argued that the implementation of alternative income generation options in the Philippines reduced the pressure on coral reef resources. For example, sea farming of the alga *Euchema* in the Sulu Sea resulted in switching the attention of fishers from fishing on coral reefs to using adjacent non-reef areas.[76] However, it is also fair to say that only a modest success has been achieved by the implementation of alternative income generation around the world, the Philippines is the exception. Many fishermen will not move into alternative livelihoods as they view them as either women's work or simply as additional options for other members of the family to work.

3.10 Conclusion

Noting the aforementioned theories and lessons learned from the implementation of collaborative and community-based management concepts, several implications can be drawn from this study that are relevant to Indonesia and for developing policies for future collaborative and community-based management initiatives.

76 Alcala, C. and Russ, G.R. (2000) Role of socioeconomic factors in coral reef protection and management, in Proceedings 9th International Coral Reef Symposium, Bali, Indonesia, 23-27 October 2000, Vol. 1, p.31.

The first is the successful implementation of community-based management. International experience shows that the success rate for implementation of community-based management is relatively low. Community-based management cannot be successful on its own without becoming part of a co-management framework. The community needs assistance from other institutions such as government, NGOs, and university or research centres to address the problems in managing their resources. This review has shown that community-based management is a long and complex process involving several phases of implementation, with many interdependent interventions. The need for competent staff and a community that is willing, committed, and amenable to manage their own lives and resources is a key starting point. Therefore, the concepts of community-based management should be viewed as an alternative, or supplemental, and not as an immediate replacement for the existing centralised management systems. The co-management approach will not work in every community because the conditions for successful implementation are probably not present in all communities.[77] The combination of community-based management and co-management is the best option to change the centralised system.

The second issue is decentralisation. Despite the previously centralised system and top-down approach to all development sectors, including marine and coastal resources management, decentralisation has contributed to the success of collaborative and community-based initiatives in Indonesia. This has encouraged local governments to become active partners with local organisations and NGOs in the pursuit of local autonomy. However, the success of decentralisation requires

77 Pomeroy and Carlos (1997), no 4 above, p. 462.

restructuring of government institutions, regulations and policies, with a new vision and responsibility towards development and management in a sustainable manner.

The third is traditional resource management. It is clear that the ownership of coral reef resources should belong to the community. The community should take responsibility for problems associated with their resources based on the success of common property regimes in the past. Therefore, the recognition of communal property rights and tenure are key elements for the success of community-based collaborative management programs and projects. This recognition and support for communal property rights need to be supported and enforced through government policies and regulations.

The fourth is institutional collaborative management. Collaboration between government institutions in undertaking community-based and co-management programs provides technical assistance, financial, and administrative support for the community. This support leads to effective management of the co-management program. The collaboration produces a stronger foundation for the sustainability of a community-based management initiative beyond the project life. In addition, intra-institutional coordination can further promote integrated planning, management and implementation of programs in the coastal zone.

The fifth is community participation. It cannot be denied that the community involvement in planning and implementation results in the increased potential for success and sustainability of the program. However, community members may not take responsibility for resource management if it is not clear to them what and how they will benefit.[78] It is very important, therefore, to ensure community understanding, acceptance, and support for coastal projects. Social intervention is an

78 Pomeroy and Carlos (1997), no 4 above, p. 458.

absolute necessary for project preparation. This can be accomplished through community awareness, development of core groups and public education for all stakeholders.

In conclusion, it can be argued that collaborative management is an appropriate model for effective coral reef management at the local level. However, the success of co-management of coral reefs at the national level needs integrated action, coordination, support and facilitation from central government. This required restructuring government institutions, regulations, data and research management, and developing appropriate systems for monitoring and controlling the exploitation of coral reef and other associated ecosystems.

Chapter Four

INDONESIA'S CORAL REEF REHABILITATION AND MANAGEMENT PROGRAM: CASE STUDIES IN CO-MANAGEMENT AT SENAYANG AND LINGGA ISLANDS, RIAU*

4.1 Introduction

The objective of this chapter is to review the implementation of the concept of community-based management and collaborative management (co-management) of coral reefs and conservation programs in Indonesia. This study will describe the experiences and lessons learned in Phase I of the Coral Reef Rehabilitation and Management Project (COREMAP) in implementing community-based reef management at Senayang and Lingga Islands in Riau Province. It is argued that the involvement of the community in the planning and implementation process of coral reef management will improve the management and conservation of coral reef ecosystems.

4.2 COREMAP Project: a Brief Background

Officially launched in July 1998, COREMAP is a 15-year program of the Government of Indonesia with the goal "to protect, rehabilitate, and achieve sustainable use of coral reefs and associated ecosystems in Indonesia which will, in

* This case study has been presented and published at the Coastal Zone Asia Pacific Conference in Brisbane 5-10 September 2004.

return, enhance the welfare of coastal communities."[1] The program is divided into three phases:

(i) a 3-year "Initiation" Phase designed to test and develop viable community-based management systems in pilot areas of Indonesia;[2]

(ii) a 6-year "Acceleration" Phase to build and expand community-based management systems in other sites in Indonesia;[3]

(iii) a 6-year "Institutionalisation" Phase to ensure institutional (administrative, economic, and financial) sustainability of program activities.

The first phase of COREMAP focused on four sites: (i) Senayang and Lingga Islands in Riau Archipelago district, Riau Province; (ii) Taka Bonerate in Selayar district, South Sulawesi Province; (iii) Padaido Islands in Biak district, Papua Province; and (iv) Maumere in Sikka district, East Nusa Tenggara Province. COREMAP Phase II will expand to the provinces of North Sumatra, West Sumatra, Southeast Sulawesi and Malukas including the districts of Batam and Natuna Islands of Riau province and Sorong of Papua.

COREMAP is funded by several donors, including: the World Bank, the Global Environmental Facility, the Asian Development Bank, the Australian Agency for International Development, and the Government of Indonesia. The total funding for Phase I was US$26 million, broken down as follows: US$6.9 million from the

1 The World Bank (1998), COREMAP Project Appraisal Document (PAD).

2 This phase was originally scheduled to be completed in April 2001, however, due to political changes and devolution of authority as well as initial civil unrest in Indonesia, it was extended to June 2003 for the Asian Development Bank funded activities and June 2004 for the World Bank and the Global Environmental Facility activities.

3 This second phase covers the period 2003-2009. A loan of agreement for COREMAP Phase II for several project sites was signed by the Asian Development Bank and the Government of Indonesia in early 2003.

World Bank loan; US$4.1 million grant from the Global Environmental Facility; US$7 million loan from the Asian Development Bank; US$4 million grant from the Australian Agency for International Development; and US$4 million counter budget from the Government of Indonesia.[4]

The main objective of COREMAP Phase I was to develop a viable and sustainable coral reef management system in Indonesia by delegating management authority to the people in the coastal areas that depend on coral reefs. At the core of COREMAP Phase I is a co-management strategy through which regional governments and local communities work together to manage the resources.[5] The objective of this program is derived from the experience that it is difficult to avoid or reduce the degradation of coral reefs and other marine resources without the active and positive support of all stakeholders. Through the active involvement of the regional governments acting jointly with the local communities the efficacy of Indonesian coral reef manage is expected to improve. Phase I of COREMAP had five major components. These are described below.

Community-based management: Community-based management of coral reefs is considered to be at the 'core' of the project, as shown by its illustration at the top of the pyramid of COREMAP Phase I (see figure 4-1). The aims of this component were to empower coastal communities to design, implement, monitor and

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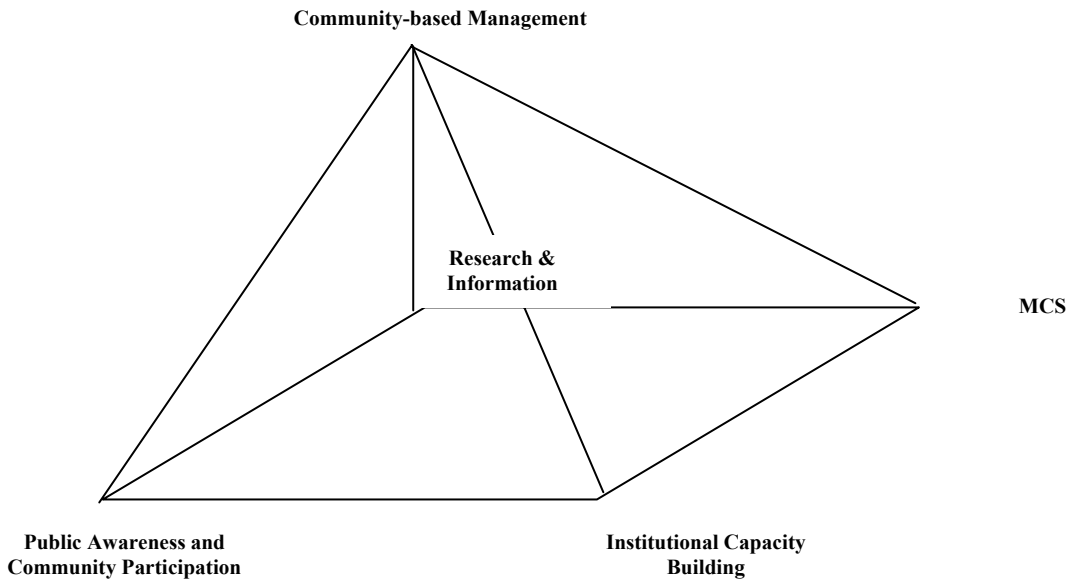
4 Sources:
- Loan of Agreement No. 1613-INO, the Asian Development Bank and the Republic of Indonesia (1 May 1998);
- Loan of Agreement No. 4305-IND, the World Bank and the Republic of Indonesia (15 May 1998);
- Grant of Agreement No. TF-028373, Global Environment Facility and the Republic of Indonesia (1 May 1998); and
- Memorandum of Understanding between the Government of Australia and the Government of Indonesia on Coral Reef Rehabilitation and Management Project includes its amendment II and I, (1999).

5 Nontji, A., (2000), Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium, Bali, 23-27, 2000 Proceeding Vol. I, pp. 24-25

secure legal endorsement of coral reef management plans, to declare local sanctuaries, and to implement controls on fishing access, and other activities that pose threats to reefs. The ultimate goal was to achieve sustainability while maximizing economic benefits to the community.

Figure 4-1: The Pyramid of COREMAP Phase I



Public Awareness and Community Participation: The primary objective of this component is to enhance community awareness of the important role played by coral reef ecosystems in their lives and their livelihoods, and to encourage their active participation and sharing of the responsibility for the management of coral reefs.

Institutional Development / Capacity Building: The aims of this component are: (a) to strengthen coordination among all coral reef stakeholders at the national and regional levels, including resource managers, enforcement officers, resources users and non-government organizations and community structures; and (b) to enhance the capacity of local human resources through various courses and training

related to coastal management and coral reef rehabilitation and management techniques.

Research and Information: This component is concerned with research directly connected with coral reefs and the development of a coral reef information system to promote local understanding and to facilitate informed management decision-making and community participation in management decisions. Coral Reef Information and Training Centres (CRITCs) were established at the national and regional levels to improve data and information for all aspects of coral reef management.

Monitoring, Controlling and Surveillance (MCS). The main objective of this component is to implement community-based coral reef management plans, enhance awareness and support for voluntary compliance to reduce destructive fishing practices, particularly the use of explosives and cyanides and over fishing. Support for voluntary compliance by the community was to be provided by enhanced commitment and capacity of law enforcement agencies for deterrent enforcement action against persistent non-compliance activities. This activity required the establishment of MCS systems for coral reef management at district levels, a community reef watch system, and an MCS Information System (MCSIS) at central and regional levels to measure effectiveness and enhance operational planning.[6]

6 The World Bank (1998), COREMAP Project Appraisal Document (PAD).

4.3 Community-based Management and Co-Management in Senayang and Lingga Islands

The community-based management and Co-management concepts are approaches to enhance community participation in marine environmental programs. The community-based management concept was introduced to many regions across the world in the late 1970s and early 1980s. Its primary objective was to encourage and empower the local community to be involved in the management of their environment through the design and development of relevant programs. There were, and still remain, several approaches in community-based management in the world; however, there is no standard for implementing community-based management, particularly in marine and coastal areas community-based coastal resource management (CBCRM).[7] The application will depend on each situation, socio-cultural aspect, and the political atmosphere in the sites. For example, three community-based management approaches have been employed by Proyek Pesisir[8] in "community-based Coastal Resources Management in North Sulawesi, Indonesia."[9] They were: (1) community-based village-level marine sanctuaries; (2) community-based village-level integrated coastal management plans; and (3) community-based village-level ordinances and policies.

This approach was a key factor in the success of the project's efforts for coral reef management as a whole. Gawell stated that no coral reef management program

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7 Pomeroy, R.S. and Carlos, M.B. (1997) Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994. Maritime Policy, Vol. 21 No. 5, pp. 445-464.

8 Proyek Pesisir (Coastal Resources Management Project - Indonesia), a cooperative initiative of the Government of Indonesia and the US Agency for International Development (USAID). Proyek Pesisir: http://www.crmp.cbn.net.id (accessed on 24 March 2003)

9 Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi, in ITMEMS Proceeding, pp. 299-309, Proyek Pesisir: http://www.crmp.cbn.net.id (accessed on 24 March 2003)

can be successful without the full involvement of resources users, and the success of the program is significantly determined by them.[10] This approach also became an important issue in the international forum for world coral reef management. One of the six principles of coral reef management resulting from a major global workshop on coral reef management sponsored by International Coral Reef Initiative (ICRI) held in the Philippines in 1995[11] confirmed that:

> "integrated coastal management, with its special emphasis on community participation and benefits, provides a framework for effective coral reef and related ecosystem management."[12]

One of the important ways to achieve expected outcomes in community-based management activities is to encourage a high level of community participation in the planning and implementation processes. The experience has shown that the appointment of a competent extension officer is critical in facilitating community-based management activities.[13] The extension officer (in COREMAP called field facilitator) acted as the coordinators for community-based activities, with technical support provided by a senior field manager. Technical support was also provided by the COREMAP project through its consultant specialists (based in Jakarta), and local government agencies (provincial and district).

The COREMAP community-based management process in Senayang and Lingga Islands involved a consortium that comprised two NGOs (Yayasan Tuah

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10 Gawell (1984), as cited by White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (eds.) (1994) Collaborative and Community-Based Management of Coral Reefs. Kumarian Press (1994), p. 15.

11 This workshop held in Dumaguete City, Philippines, on May 29 to June 2, 1995 titled "Partnership Building and Framework Development", produced six principles of coral reef management and it was signed by forty-four nations that attended the workshop, as quoted in Cicin-Sain and Knecht, "Integrated Coastal and Ocean Management: Concepts and Practices", p.101.

12 ICRI (1995), as cited by Cicin-Sain and Knecht, "Integrated Coastal and Ocean Management: Concepts and Practices", p. 101.

13 Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi. In ITMEMS Proceedings, p. 302.

Belia and Yayasan Laksana Samudra) and a local University (University of Riau). All full-time facilitators were based in villages, except the senior field facilitator who was based in Tanjung Pinang (the capital of Riau Archipelago district). The seven field facilitators were based in Medang, Temiang, Mamut, Senayang (Penaah) and Pasir Panjang (Sub-district of Senayang) and Limbung and Sekanah (Sub-district of Lingga).

Community-based management activities in the marine sector are relatively new in comparison to other sectors, i.e. forestry and urban sectors,[14] therefore, COREMAP held additional training on marine community-based management facilitation techniques for the field facilitators to enhance their knowledge on marine issues prior to and during deployment.

The community-based management activities in Senayang and Lingga Islands commenced at the end of 1999 and lasted to mid 2003. Several community-based management activities were conducted during that period, including community socialization activities and community capacity building; disbursement of seed funds for local projects; village grants; establishment of coral reef management plans (CRMPs) and establishment of marine management areas (MMA); and the implementation of the community reef watcher program.

The following sections address first the general core community-based management activities and then relate them to the COREMAP situation in Senayang and Lingga Islands.

14 Pomeroy, R.S. and Carlos, M.B. (1997) Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994, in Maritime Policy, volume 21 number 5, p. 445.

4.3.1 Community Socialisation

The first question that should be addressed in community-based and co-management initiatives is: "Who are the people targeted to be involved in the program?" The decision about the people targeted to be involved in program participation is critical to its success. This truism has important implications for the design of community-based and co-management initiatives.[15] Defining the community as a target group is an essential factor in success. The failure to define the "community" will result in failure of the co-management program as a whole.

The community can be defined in one of three ways: (i) using a geographical boundary, where the community can be seen as a group of people that live in an area; (ii) functional groups, in which the community is seen as a group of people who share activities or functions in an area, such as fishers group; and (iii) traditional approach whereby the scope of the community includes a group of people who conduct social interaction tied to place, history and identity.[16]

The objectives of the community socialisation activities are to develop community understanding of the program. The activities will be carried out through formal and informal meetings with residents inside and outside the targeted village. As an "agent of development", the field facilitator should be involved in all community activities, e.g., religious, sport, and social village activities.

COREMAP introduced the Participatory Resource Assessment (PRA) or Participatory Coastal Resource Assessment (PCRA) to the community. The PRA is one intervention model in community-based management initiatives that can

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15 Jentoft, S., McCay, B.J., and Wilson, D.C. (1998) Social Theory and Fisheries Co-management. Marine Policy, Vol. 22. No. 4/5., pp, 429.

16 Ibid., pp. 429-430.

encourage the community to understand the profile, problems and needs of their own village. The important output of this activity is community-based village profiling and data gathering for marine resources, population, employment (full and part time), value added or landed products and other social and economic aspects of their village. These include the condition of the coral reef, seagrass area, mangroves, marine biota, etc. This also includes the activity for selection of marine sanctuary areas. Seven village profiles were established in Senayang and Lingga Islands.

4.3.2 Capacity Building and Public Education

The objective of capacity building and public education is to strengthen the capability of community groups in managing their resources. The identification of existing community groups and/or the facilitation of the formation of new groups is a central focus of the capacity building activity. In some areas that already have implemented a traditional management system, the extension officer should also liaise with the community traditional leaders before developing and implementing any new initiatives.

Public education is a continuous process. The education activities usually follow a non-formal approach, in small groups or one-on-one contact, with a focus on resource management and methods.[17] To strengthen community capacity, it is necessary for the project implementer to conduct training, workshops and other public education activities on marine and coral reef ecology, and sanctuary concepts as part of the public education process.

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17 White, A.T. and Vogt, H.P (2000) Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation. Marine Pollution Bulletin Vol. 40, No. 6, p.539.

As part of developing the community capacity and commitment to the project or to manage a marine sanctuary, COREMAP provides a small grant. This grant is used for funding some early action programs to address community concerns, gain commitment and, hopefully, address coastal management problems. In some cases, this grant was also used as a 'community trust fund', which was used for funding the common needs of the community, e.g. garbage boxes, repair of the mosque, church, community hall, etc.[18] This activity is aimed at encouraging the local community to join with the environmental program and build community trust in the coastal program.

To strengthen and build community capacity, COREMAP conducted training and workshops in all seven COREMAP villages in Senayang and Lingga Islands. These included training of organizations and community groups. The community was also trained in leadership subjects in particular for the village motivator. The village motivator's duties as on-site assistant to the field facilitator were to run the community-based management activities in their village. The village motivator was also expected to become an informal leader, or at least a key advisor to the recognized community leader. COREMAP's seven village motivators (one per village) were democratically elected by the villagers. Thirty-one community groups were established in Senayang and Lingga Islands with approximately 440 active members, including women. At least three community groups were established per village, selected from production, conservation, and gender groups.[19]

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18 In COREMAP community-based management initiative provides a small grant, which called seed funds.

19 Sudiarno, A.R. (2003) (personal comm.) He is a senior field facilitator of Collaborative Management in Riau Archipelago. He is a staff of the Riau Consortium, communicated on 12 August 2003.

The conservation group dealt with coral reef management and coastal environment. It focused on assessment of reefs, mangroves and marine species for village coral reef management plans. It also dealt with monitoring and surveillance of local reef sanctuaries. The production group concentrated on economic assessment. This group was to make proposals for alternative income generation and to enhance the economic value of the local fisheries catches. Equality in the roles of men and women was an issue that was addressed by the gender group. This group had the duty to develop and implement economic activities to increase family income while the men went fishing. The management of the village library was also one of the functions of the gender group. Community capacity building activities included some training sessions i.e. training of community members on village coastal resource profiling; training on financial management of community groups (POKMAS); and training and workshop on community participation for coral reef management.

4.3.3 Site selection of the Marine Sanctuary

Based on the community maps and data collected by the village surveys, the community, with the assistance of the extension officer can continue to select the appropriate site for the local marine sanctuary. A series of formal and informal meetings should be held in order to decide on the appropriate site for establishing local marine sanctuaries. In some cases, the local university or research centre may also provide technical assistance to the community to help decide on the site of the marine sanctuary.

All marine and reef sanctuaries in COREMAP sites were designed using the World Conservation Union (IUCN) standard guidelines for the establishment of

Marine Protected Areas. The community decision on the marine sanctuary included a map and zoning to be included in the integrated coastal management plans for the reef management area. All seven villages in Senayang and Lingga Islands delineated sanctuaries as 'no-take' zones with technical advice from scientists from Riau University and LIPI. The total area of those sanctuaries was about 260 ha with an average live coral cover of about 20%, and 58 ha of mangroves.[20] The sanctuaries are close to populated areas making them easy to monitor. Each sanctuary comprised a core zone (no-take zone) and a buffer zone. The area surrounding the sanctuaries, including the whole reef management area less the sanctuary (no-take zone), was managed as a multiple-use zone where traditional and modern fishing gear and/or non-destructive fishing activities were allowed.

In establishing coral reef and mangrove sanctuaries the inhabitants of the seven villages actively participated in mapping and developing historical transects and identification of environmental problems for their areas.[21] Noteworthy was the inclusion of both women and youth in active participation.

4.3.4 Seed Funds and Village Grants

Seed funds and village grants were funds to communities provided by COREMAP to assist in supporting and stimulating the implementation of community-based management activities at all project sites. The total seed funds provided Rp. 20 million (US$2,500) per village. These funds were used for several

20 For detailed information see Dirhamsyah (2004.a) Regional Policies and Regulations for Coral Reef Management: Case Studies on Riau Archipelago, Selayar, and Biak Numfor Districts, Indonesia. In Maritime Studies No. 136, Australia, pp. 7-20.

21 COREMAP Project Management Office (2002) COREMAP Consolidated Report January 2001 – April 2002; Sudiarno (2003), personal comm.

activities such as the creation of a community trust fund for buying or making items that addressed the common needs of the community, e.g. garbage boxes, repair of the mosque, church, community hall, etc. The aim of this activity was to encourage the local community to participate in environmental programs and to build community trust in the COREMAP program. The monies were also used in funding environmental improvement activities, such as water supply, solid waste management, and mangrove reforestation; and funding the promotion of alternative income generation activities.

Village grants were used to support such activities as the development of community social structures (supply of electricity, water storage, and sanitation facilities); the establishment of marine sanctuaries (including signboards for sanctuaries, installing mooring buoys); creation of information centres and village libraries; and alternative income generation activities. COREMAP provided Rp. 100 million (US$12,500) as a grant per village. However, the payment of village grants is tied with some project requirements that should be compiled by the community, such as the establishment of marine community sanctuary. This should be proofed by the draft of Village Coral Reef Management Plans (CRMPs) and Village Ordinance.

The tying of village grant funds to conservation outputs has been criticized. According to Hunnam (2000) the tying of village grants to designation of a sanctuary could be interpreted as payment for reef protection measures. Contrary to Hunnam's point of view, the community appreciated the close link between reef conservation and their own livelihood, in particular the importance of the reef in the live fish trade.[22] This is further supported by the demonstration of the community

22 Hunnam, P. (2000) COREMAP Phase I Mid-Term Evaluation, 1998-2000. Independent Report to the COREMAP Program Management Office.

appreciations for the close link between reef conservation and their own livelihood, in particular the importance of the reef for the live fish trade. The community-based management groups in Penaah gave 10% of their AIG's profit to finance the reef watcher program.

It is worth noting that the seven target communities at Senayang and Lingga Islands established revolving fund schemes from their seed funds and village grants. As mentioned earlier, it was agreed that some of the COREMAP grants could be used for funding economic activities. The economic activities were usually carried out by the community production and gender groups. Communities agreed that all the COREMAP grants used for economic activities would be done on a credit system. The community groups decided the interest and payment procedure of the credit system. The collected funds from re-payment were then revolved and used for other economic activities proposed by other community members. The benefits of this scheme for the delivery of micro-credit were well demonstrated in Senayang and Lingga Islands. Credit was provided to support kiosks, and other village-based activities. Although some borrowers were in default, in general this was tolerated as there were only a few members, and it was a new system for them.

4.3.5 Implementation of Alternative Income Generation (AIG)

COREMAP alternative income generation activities included the establishment of a small-scale grouper fattening project, coconut oil production, tailoring, food processing, fish retail kiosks, credit scheme, bakeries and handicrafts. To ensure the successful implementation of AIG activities COREMAP held several

training courses, such as mariculture of estuarine grouper, the establishment of reserve areas for natural restocking of grouper, and tailoring for women.[23]

As in the Pacific Islands countries[24] and other COREMAP sites, the implementation of AIG activities in Senayang and Lingga Islands showed some initial, but modest success. A number of problems were identified as affecting COREMAP's alternative income generation strategy.[25] These included the un-willingness by fishers to accept a change from their former livelihood to land-based activities; the narrow scope of AIGs permitted by COREMAP with no alternative activities which met with their intended desires and also their capabilities;[26] and given the lack of markets, some AIGs products could not be sold in the local market.[27]

To address the complexities of AIGs, a comprehensive feasibility study is necessary before planning or conducting activities. The feasibility study can provide communities with accurate market analyses for demand of AIG products and present

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23 The training programs were proposed by the community groups themselves (bottom-up approach).

24 A comparative study on coastal resources management in the Pacific Islands carried out by the World Bank concluded the program of alternative generation income has generally not been successful in reducing pressure on coastal resources. This is due to the lack of social awareness and culture problems. Source: The World Bank, "Voice from the Village: A comparative study of coastal resource management in the Pacific Islands," p. 43.

25 IUCN, "The Coral Reef Rehabilitation and Management Program: Phase I Evaluation Report," p.24.

26 The COREMAP Guidelines for Community-based Management 2001 (Buku Panduan Pengelolaan Berbasis Masyarakat COREMAP 2001) provide a list of AIG activities that were permitted by the COREMAP project. These activities include smoke fish, salty fish, animal husbandry, coconut oil and seaweed production and grouper aquacultures (pp. 144-173). Strict implementation of those guidelines caused many community's proposals on AIG to be rejected by the COREMAP project

27 It is noteworthy that the Philippines also found similar results in the ADB Fisheries Sector Project between 1985-1994, AIGs suffered from three key problems:

- they were considered by fishers as "supplemental income generation opportunities" and not alternative – extra income from employment of other family members;
- there were no market studies and business plans prior to commencing activities thus the manufacturing of unsealed "widgets" often resulted; and
- the tendency to copy others rapidly resulted in over-supply to the intended markets and placed the borrower for the AIG in a more stressful economic plight.

Source: Flewwelling, P. the Team Leader of the ADB FRMP design (2003) personal communication. 10 October 2003.

other alternatives to the community to generate income. However, this technical assistance is complementary to the AIG selection process. The community still has the right to decide on the type of AIG activities. The success of AIG activities is mainly determined by proper training, therefore, it is necessary to conduct appropriate and suitable AIG training before implementing this program.

4.4 Integrated Coastal Management Plans at Local Level

The main objective of community-based reef management or co-management in COREMAP program is to develop community capability for managing their coral reefs and its ecosystems. Communities were encouraged to develop a Community Coral Reef Management Plan (CCRMP) (*Rencana Pengelolaan Terumbu Karang*/RPTK). This is an integrated plan for coral reef management, which consists of key village programs required to improve reef management practices. The plan should address the problems of destructive fishing (use of cyanide and poisons/cyanide), illegal trawling, over-fishing, the impact of sand mining and pollution. Steps in the plan can include:

(i) development of village reef management strategies and programs;

(ii) establishment of community reef and mangrove sanctuaries;

(iii) development and implementation of village ordinances to support the plan;

(iv) development of a village institutional capacity for reef management;

(v) conflict resolution mechanisms for fishing gear; and

(vi) gender issues to enhance the capacity of both genders in community development.

The development of the CCRMP is similar to the establishment of a local marine sanctuary; this takes time, and needs intensive socialisation to get agreement among the community groups.[28] At the end of 2002, there were six draft CCRMPs completed and endorsed by the leaders of the six villages in Senayang and Lingga Islands. Senayang village was one of the seven villages that were faced with a conflict between its villagers and another village as resource users. However, in early 2003 this conflict was resolved though local government intervention, and then the seventh draft CCRMP to cover all selected villages in Senayang and Lingga Islands was completed. Unfortunately, the CCRMPs have not yet been adopted as District Regulation (*Peraturan Daerah*),[29] although they have received approval of the Riau District Administrator (*Bupati)*.

Village ordinances (*aturan desa*) have been prepared as part of the CCRMPs to regulate protection activities, ensure the enforcement of the CCRMP management decisions, and provide legal support for the plan.[30] Village ordinances are developed through a series of formal and informal meetings and small group discussions amongst all stakeholders of the village. The ordinances contain specific rules for issues that relate to reef management, patrolling, monitoring and development of AIGs. The village ordinances also include:[31]

- rules and sanctions on the protection and use of sanctuary zones;

28 Sudiarno (2003), personal comm.

29 In Indonesian law a PERDA must be approved by the local parliament before it can be promulgated as a district regulation.

30 Six villages of Senayang and Lingga sub-districts were developed their village ordinances in 2002. These include: Medang, Temiang, Mamut, and Pasir Panjang (Sub-district of Senayang) and Limbung and Sekanah (Sub-district of Lingga). Due to the conflict in Senayang (Penaah) caused the terminated of village ordinance process in this village. Source: COREMAP Project Management Office, "COREMAP Consolidated Report January 2001 – April 2002"

31 COREMAP Project Management Office, "COREMAP Consolidated Report January 2001 – April 2002"

- description and terms of reference for village institutions for implementation of the CCRMP, in particular the control and monitoring functions;
- selection of criteria and mechanisms for alternative income generation activities and basic infrastructure for reef protection.

Besides these accomplishments of communities, there were also valuable points that can be noted from these experiences. These points come from the evaluation carried out by the Riau NGO consortium one month before terminating their assistance to the seven villages after 14 months from the establishment of coral reef and mangrove sanctuaries in six villages. These results were:[32] the management of reef sanctuary areas (no take zone area) have been well implemented in five villages, although there was still a few minor violations; however there were no violations in the mangrove conservation areas in six villages; with all communities having implemented and enforced the village ordinance well. Offenders had been penalized according to the village ordinance.

The approved coral reef management plan and village ordinance are submitted to district and regency officials for their agreement, and to seek additional strength and support for implementation and enforcement. With regional government approval, the responsibility to manage marine and coastal resources is thus delegated to the community. Such approval also indicates a change of the property management regime from state property rights to communal or community property rights.

32 Sudiarno (2003), personal. comm.

4.5 Establishment of Marine Management Areas (MMA)

One of the objectives of COREMAP Program in Riau Archipelago was to establish a Marine Management Area (MMA).[33] MMAs are one of the models of Marine Protected Area (MPA) management strategies according to IUCN classifications.[34] Although it is far from complete, COREMAP together with local government initiated the establishment of a Marine Management Area (MMA) for that area in 1999-2000. Based on field studies carried out in 1999-2000[35] four possible sites were suggested for the MMA. These were: Medang village, Pasir Panjang village, the islands around Selat Dasi and Penaah village in Senayang Island.

A detailed work plan for the MMA was developed by the consultants and staff of the COREMAP Riau unit to work together with communities to establish the MMA for the four candidate locations. The land and marine area of the MMA covered approximately 88,371 ha. This included 62,552 ha allocated to traditional fisheries. The MMA also included more than 800 ha of mangroves, to be managed by the communities and a 20 m protected greenbelt and zone for selective exploitation of mangrove wood.[36] COREMAP initiated a series of meetings and workshops at the local and district levels to seek further support for the MMA. The establishment of this MMA is expected to be completed during COREMAP Phase II.

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33 It was mentioned in Loan of Agreement between the GOI and ADB.

34 COREMAP Project Management Office, "COREMAP Consolidated Report January 2001 – April 2002."

35 Originally, these field studies were also combined with the field studies that previously conducted by the Riau Coastal Zone Project in 1995-1997. Source: COREMAP Project Management Office, "COREMAP Consolidated Report January 2001 – April 2002."

36 COREMAP Project Management Office, "COREMAP Consolidated Report January 2001 – April 2002".

4.6 Community Reef Watcher Program

Senayang and Lingga adopted a different model of MCS in which the MCS activities were merged with community-based management activities. The MCS activities were carried out by reef watchers selected by villagers. They had the duty to monitor, control and report the fisheries activities in their own marine sanctuary. The reef watchers used simple equipment such as radios (short distance) and binoculars provided by COREMAP to monitor activities in their areas. The reef watchers also sought support from the military and police to enforce the rules against non-residents, with varying degrees of success. Reef watchers routinely carried out about 8-12 patrol trips per month. The operational costs of the reef watcher program were supported by COREMAP and the local government. The community managed the MCS operational funds and fees.

This enforcement strategy was working very well to control destructive fishing as long as funding was available and integrated into community budgets. The strategy had advantages over other reef MCS models as it addresses only the community side of reef conservation and protection and relies on the law enforcement agencies for the back-up support for deterrent law enforcement. This strategy works very well if the cooperation and commitment of law enforcement agencies is secured and maintained. Unlike with Senayang and Lingga, the implementation of MCS activities in Taka Bonerate, South Sulawesi and Biak, Papua required a full community based enforcement scenario. This therefore required expensive and sophisticated monitoring and surveillance equipment such as radar, radio telecommunications, and high-speed boats. This system requires full passive and deterrent enforcement capability and is complex in its management and expensive in cost for maintenance and repair of equipment as it assumes that there

may not be the required support from mandate law enforcement agencies. The implementation of MCS activities in Takabonerate and Biak have not been embedded in a core community-based management program. These tasks are carried out by specific organisations or task forces under the local government coordination. However, the problem of training, sustainability and self-sufficiency of funds resulted in the ineffective performance of MCS component in Taka Bonerate and Biak. The strategy adopted in Senayang and Lingga Islands maximizes the self-reliance and commitment of the villagers, minimizes costs and provides the best foundation for long-term organizational and financial sustainability.[37]

4.7 Lessons Learned

The road to improved management of coral reefs in Indonesia is long and a lot of work remains to be done by all stakeholders. However, the initiation of the COREMAP projects has been a first step for Indonesia in improving its performance in managing its coastal and marine resources. The employment of the co-management approach, in this project, has been successful in establishing local reef management at project sites. Several reserve areas or marine protected areas have been established by the communities in those areas. Experience with these projects provides several lessons learned in community-based management for future programs on coral reef management in Indonesia. These experiences are analysed below.

37 IUCN, "The Coral Reef Rehabilitation and Management Program: Phase I Evaluation Report," p.19.

4.7.1 Community Socialisation

Community socialisation is an important part of community-based management and co-management activities. It should be done before, during and after project completion. Lack of community socialisation will result in the failure of the program, or at least engender a lack of understanding, acceptance, commitment, and possibly conflict. Due to the lack of socialisation, the establishment of a marine protected area in Senayang Island at Riau resulted in conflict between villagers (as a target village of COREMAP) and other communities (non-target villages) regarding the fishing area.[38] The problem became complicated because it deals with coastal fishers' livelihoods, those generally reported to be the "poorest of the poor" without alternative livelihood opportunities. This conflict was resolved after a public campaign carried out by the local government. The lesson from this conflict was that community awareness activities should be carried out not only for the villagers of the target village, but should also be promoted in other villages. Another lesson is that the "general approach" to all villages cannot be applied. The success of community-based and co-management initiatives needs a specific approach for each village. There is no standard blueprint for designing and implementing community-based management and co-management. Finally, the resolution of Senayang's conflict clearly indicated the need for a government role in local resource management, especially in the case of conflict resolution.

38 Senayang village is one of seven target villages of COREMAP in Riau. This was the only conflict that arose in that area.

4.7.2 Use experienced community members as development agents

The effective way to train a community or fishers is by using other fishers as trainers, as they will use the same language and have a similar vision. Their experience and knowledge will be accepted. The success of COREMAP in implementing community-based management and co-management was also influenced by inclusion of community leaders. Cross-visits to fishing villages and sites with successful community-based and co-management activities help accelerate the appreciation, comprehension and adoption process.[39] The cross-visits of some local communities of COREMAP sites to the Philippines, Malaysia, Sri Lanka, Thailand and some countries in the South Pacific encouraged the communities in both sites to learn the lessons from the communities in their overseas visits. COREMAP also funded cross-visits within Indonesia, to see and learn from the progress that was achieved by other neighbouring villages.

4.7.3 Extension officer

The use of an extension officer in community-based and co-management approaches is a critical factor in promoting effective management of the program. According to Heinan and Gonzales, there is a clear relationship between the performance of a program or project and the technical background of the staff.[40] The failure of the COREMAP project to tackle the resource user conflict at Senayang islands was started by the withdrawal of the extension officer or field facilitator of that village. There was some reluctance by the community to accept a younger

39 Pomeroy and Carlos, "Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994," p. 460.

40 Heinan and Gonzales (1993), as cited by Pomeroy and Carlos, "Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994,"p. 459.

COREMAP field facilitator. Therefore, it is necessary for the extension officer to have a mature personality, effective communication skills, and inter-personal skills as well as technical expertise, as they are dealing with different members and levels of the community.

4.7.4 Alternative Income Generation Activities (AIGs)

Although the AIG activities were initiated through a bottom-up approach, they were not very successful. The failure of AIG activities in Senayang and Lingga Islands was caused by lack of preparation and lack of taking in the lessons learned from other projects and agencies. The community needs to be offered a choice of AIG activities that suit their culture, capability, and market demands. The familiarisation of new technology should be conducted through proper training and continue until the communities are familiar, comfortable and fully understand the new technology and its market standards. Therefore, comprehensive feasibility studies that involve scientists and professionals from several backgrounds should be conducted before planning and implementing such a program.

4.7.5 Community Reef Watcher Program

The integration of MCS into community-based management activities resulted in community pressure to reduce illegal fishing practices in Senayang and Lingga Islands and it also encouraged the local communities to voluntarily generate some funding for the community reef watcher program. This experience showed that the success of MCS activities on coral reef management should be community-based with full support from mandate law enforcement agencies. In turn the success of

community-based management depended on other supporting elements and thus linkages among the various program components should be strengthened, with the community-based management at the core.

4.8 Conclusion

COREMAP is the first program that provided a major opportunity in Indonesia to overcome the problem of coral reef management. It recognized the need for an approach that combines bottom-up community-based management and top-down support.[41] However, there are two major external factors that affected the performance of COREMAP Phase I. The first was political instability in Indonesia from 1998 to 2000 that resulted in several changes to the pilot sites and delays in implementation of field programs. Due to the security problems caused by this instability, the government of Indonesia and the donors to relocated their project team from Mollucas[42] and Kupang Bay,[43] to Biak for the World Bank's site and Maumere in Flores for the AusAID's site.

The second factor was the enactment of the Autonomy Laws in 2001, which gave more authority to district governments to manage their resources. The enactment of this law required the re-alignment of the COREMAP program to merge with the autonomy law. Some central government responsibilities of managing the COREMAP program needed to be transferred to regional governments. The COREMAP program was designed during the centralised administration era, where

41 IUCN – The World Conservation Union (2002) The Coral Reef Rehabilitation and Management Program: Phase I Evaluation Report, p. vi.

42 The WB moved the COMMUNITY-BASED MANAGEMENT activities from Mollucas to Biak. In the original project design, the WB was reluctant to implement the COMMUNITY-BASED MANAGEMENT activities in Biak.

43 AusAID totally pulled out from Kupang. There was no COREMAP activity in that area due to the Timor situation and the backlash against foreign aid efforts in Kupang.

most management activities and funding were controlled by the more affluent central government. Even though some of the management activities were planned to be implemented by regional governments and local communities, the involvement of regional governments and local communities in the decision-making process was still very limited. For instance, all the decisions for infrastructure procurement activities were carried out directly by the central government. This practice had to be changed as a result of the autonomy law, although it is not easy for regional governments to manage the COREMAP program as their experience in such affairs was very limited.

COREMAP involved international agencies and foundations such as the WB and the ADB that have specific mechanisms and procedures for each management activity. Today, almost all regional governments in Indonesia are faced with problems of lack of capacity and training to meet the complex and bureaucratic donor agency operational and reporting requirements. The success of the next phases of the COREMAP will depend largely on the capacity of regional governments to improve their staff to be able to handle the complexity of the COREMAP program.

Despite the challenges outlined above, COREMAP Phase I achieved remarkable results. IUCN, in its independent evaluation noted several achievements of COREMAP Phase I. These included: (i) increase in community awareness and commitment to sustainable fishing practices at all COREMAP sites; and (ii) reduction in illegal and destructive fishing practices, such as dynamiting and poisoning in most of the coastal communities of COREMAP project sites.[44] Therefore, the IUCN independent evaluator strongly recommended that international donors and GOI proceed to fund the second phase of the project.

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44 IUCN, "The Coral Reef Rehabilitation and Management Program: Phase I Evaluation Report," p.vi.

The IUCN evaluation team also noted that Senayang and Lingga Islands (in Riau) had the most advanced community-based management programs in comparison to other COREMAP sites.[45] According to the IUCN, the implementation of community-based management in Senayang and Lingga Islands has contributed significantly to the success of COREMAP Phase I in Riau. These successes included: (i) a high level of awareness and motivation of community groups had been developed in both islands; (ii) the community in both islands had developed Coral Reef Management Plans (CRMPs). CRMPs were established in seven villages of Senayang and Lingga Islands and no-take zones were created; and (iii) the community in both islands developed and supported the reef watcher program. However, the implementation of Alternative Income Generation (AIG) activities was perceived as modest in the islands.

In summary, the implementation of community-based management activities in Senayang and Lingga Islands has shown that the effective coastal resource management requires a multi-disciplined approach. It is more than a problem of simple conservation education or law enforcement. The complex problem on community-based management also requires intervention and support from government, universities and NGOs for socio-economic, legislation and policy aspects. It is also necessary to ensure the widest participation of all the people who depend on the reef resources to gain the success of the community-based management approach. The integration of community participation, environmental education, economic incentives, and the legal mandate, with a commitment for compliance is an appropriate management system of reef and resources management in Senayang and Lingga Islands. However, the long-term successes of this system

45 Ibid., p. 19

depended very much on the long-term institutional support from the participating government, university, and NGO.

This experience confirmed the economic benefits to management from the establishment of strong links to education, community and government participation, and co-operation of all involved organizations for successful resource management. Nevertheless, the community involvement in all management processes is the key aspect for success. Thus, there is wisdom in placing the community at the centre of coral reef management.

Chapter Five

Analysis of Institutional Arrangements Relevant to Coral Reef Management in Indonesia

5.1 Introduction

This chapter analyses the institutional framework for coastal and ocean management in Indonesia. The chapter starts with a discussion of several international issues of governance arrangements for coastal and coral reef management. It then examines institutional arrangements for coastal management in Indonesia. The specific issues and problems associated with the institutional arrangements in Indonesia are also analysed in this chapter. The chapter concludes with a summary and recommendations on how to address the problems of institutional arrangements for coastal and ocean management in Indonesia.

5.2 Governance Arrangement in Coastal Management

The entry into force the United Nations Convention on the Law of the Sea of 1982 (the 1982 LOSC) on 16 November 1994 has led to the single greatest partitioning of the world's resources ever seen. By ratifying this convention, coastal states such as Indonesia now have legal access to huge potential biological and mineral riches in their 200-nautical mile zone. However, the rights of exploitation

and exploration of natural resources come with the duty to conserve and ensure sustainable management of the zones.[1]

Sorensen identified seven types of governance arrangements for coastal and ocean management around the world.[2] These range from sectoral planning and development systems to cross-sectoral planning units. However, there are other governance arrangements, which have been used by some coastal states such as the United States of America. The network approach is illustrated by the United States of America under the Coastal Zone Management Act.[3] This approach has also been adopted by other coastal nations around the world.[4]

Born and Miller identifying four principles of the networked approach:[5] The first is the recognition of the pre-existing authorities work better and in a coordinated manner. The second is the designation of a "lead agency" based on a broad policy formulation, coordination responsibilities, and a horizontal orientation. The third is that the lead agency is an Executive Department and not an operating agency. The fourth is reliance of the lead agency on other agencies and/or different levels of government, specifically regarding regulatory powers.

Regardless of the institutional model utilised, the design of administrative structures and laws for coastal and marine activities is always influenced significantly by internal and external factors. Internal factors are politics, socioeconomics and the culture of the country. External factors include colonial influences, the role of donors and the external flow of funds and investment.

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1 Article 61 of the 1982 LOSC.
2 Sorensen (1997) as cited by Kay, R. and Alder, J. (1999) *Coastal Planning and Management*, London: E & FN SPON., p.77
3 Kay and Alder (1999), no 2 above, p. 77.
4 Kay et al., (1997), as cited by Kay and Alder (1999), no 2 above, p. 77.
5 Born and Miller (1998), as cited by Kay and Alder (1999), no 2 above, pp. 77-79.

5.2.1 Cultural and Colonial Influences

Evidence from the Asia Pacific countries would seem to indicate that institutional arrangements are based on traditional approaches. An example is the Philippines where devolution of authority down to the municipal level provides for municipal government legal support for community-based coral reef management. This has increased fish yields and influenced most of the coastal programs in the Philippines.[6]

The development of laws and institutional structures for public administration in the Southeast Asian region were also influenced significantly by the colonial powers and patterns of governance.[7] Except for Thailand, most of the countries in the Southeast Asian region have experienced European colonisation. Indonesia was colonised by the Dutch and the Japanese; the Philippines by the Spanish and Americans; Indo China, including Cambodia, Laos and Vietnam by the French; while Malaysia, Singapore and Burma were under British colonisation. Even though the colonial era ended several decades ago, the institutional arrangements established during the colonial era remain in many countries in the Asia Pacific region. The colonial pattern became a "culture" for these countries in designing their administrative structures and laws. This pattern can be seen in several ways. For example, most of the administrative laws of Indonesia are still based on the Dutch system of law, such as the Criminal Code (*Kitab Undang-Undang Hukum Pidana*)

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6 McManus (1989); White (1989), as cited by Hildreth, R.G. and Gale, M.K (1995), Institutional and Legal Arrangements for Coastal Management in Asia-Pacific Region, in Hotta, K. and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*, Tokyo, JIMSTEF, p. 26.

7 Torell, M. and Salamanca, A.M. (2001) Navigating the Institutional Landscape: Introduction and Overview, in Torell, M. and Salamanca, A.M. (eds.) *Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia*, SIDA and ICLARM, p. 11.

No. 1 of 1946. Many articles and clauses of this law still reflect the conditions during the Dutch colonial era and the prevailing Dutch system of administration.

The colonial pattern can also be seen in the institutional arrangements, with most of countries in the region using colonial functional lines of administration. This colonial pattern or European colonisation system still exists in the Asia Pacific region. For example, the design of the natural resources department in Indonesia adopted the pre-independence system which emphasised efficiency. Efficiency was a main concern of the colonial system in order to fully utilise all the resources of the colony.[8]

5.2.2 Political Influences

The literature in the Asia Pacific region suggests that the development of governance arrangements is also influenced by political factors that exist in the country. For example, the legal and institutional development in Cambodia was significantly affected by its history of political turmoil. Despite current reconstruction effort, the old systems of laws and institutional structures are still being used.[9] Another example is Thailand, where political influences dictate the establishment of numerous committees and plans to address the problems of coastal and marine resources management.[10] This has resulted in overlapping mandates and confusing lines of command. It has also resulted in bureaucratic rivalry between government departments.[11]

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8 Ibid.
9 Ibid., p. 5.
10 Ibid.
11 Ibid.

5.2.3 Socio-economic Influences

The increased environmental awareness in civil society outside government structures from the late 1990s has resulted in a change in the roles of government, industry and the community in most developed countries in the world.[12] The involvement of civil society outside the government structures in fisheries and other coastal and ocean resources management in Southeast Asia has increased during the last decade.[13] Civil society encompasses the range of organisations that includes political scientists, labour unions, professional associations (such as those formed by lawyers, doctors and teachers), ethnic associations, NGOs, and others that are labelled as interest or pressure groups.[14] Those organisations, particularly NGOs, are important pressure groups that influence policy formulation. A successful example of an institutional arrangement that was influenced by civil society is the development of community-based coastal resource management initiatives in the Philippines.[15]

5.2.4 External flow of funds and investment

Bilateral and multilateral assistance is an important part of the development of Southeast Asian countries. This assistance has played an important role in fisheries, reefs and other coastal resources management as well as in other sectors. As part of the benefits of bilateral and multilateral assistance, the donor agencies also influence the development of new institutional arrangements in the client country.

However, the evidence seems to be that foreign assistance has resulted in the establishment of ad hoc legal and institutional structures, and contributed to the lack

12 Kay and Alder (1999), no 2 above, p. 89.
13 Torell and Salamanca (2001), no 7 above, p. 11
14 Ibid., p. 12.
15 Ibid.

of coordination in development.[16] The consultants, who always come from the donor countries, often contribute to the problems of "institutional culture" of the client country, resulting in the lack of national and community support for programs.[17]

Although donor agencies have positive intentions, unfortunately their own internal bureaucratic demands, egos and ineffective management and monitoring of their own bright, but sometimes arrogant and demanding, field staff contribute to the failure of aid programs. This has resulted in personality-driven development initiatives and experiments of unaccountable donor field staff failing through micro-management, inexperience and lack of communication skills or cultural sensitivities.[18]

5.2.5 Financial and Human Resources Problems

Apart from the significant efforts of the governments of the Southeast Asian countries, most are still faced with a lack of financial and human resources to implement programs of coastal and marine resources management. This impacts on the effectiveness of management and enforcement measures. Case studies of institutional arrangements in the Asia Pacific region found that most countries cannot monitor and survey their coastlines.[19] A Monitoring, Controlling and Surveillance (MCS) system needs infrastructure, including vessels, fuel, and radar or aircraft. Aside from the required and costly infrastructure, an MCS system also needs routine

16 Ibid.
17 Ibid.
18 Hughes, H. (2003) Aid has Failed The Pacific, in Issue Analysis No. 33, 7 May 2003. Information provided by the Centre for Independent Studies: http://www.cis.org.au (accessed on 21 May 2004).
19 Torell and Salamanca (2001), no 7 above, pp. 7-8.

operational funding, maintenance and funds for professional staff to operate it.[20] According to Sutinen and Viswanathan, a good enforcement system requires expensive and intensive capital that may exceed at least a quarter to over half of all public expenditure of many developing countries.[21] Institutional arrangements for coastal resource management are not well developed in the Asia Pacific region partly because of the lack of enforcement capability of many countries.

5.3 The Indonesian Governmental System

Indonesia is a republic, where the national government is led by a president. The President is elected every five years by the Indonesian people. The governmental system in Indonesia is complex. According to Article 2(1) of Act No. 32 of 2004, the governmental system in Indonesia is divided into three main levels:

- national or central;
- provincial;
- regency (district or city) (*kabupaten or kota*);

In addition there are two further levels of government, sub-district (*kecamatan*) and rural village (*desa*) or urban village (*kelurahan*). Province and regency governments are considered autonomous. As the autonomous government, province and regency governments have local houses of representatives.[22] The two lower levels of government, *kecamatan* and *kelurahan* or/and *desa* are not considered as autonomous governments because they do not have local

20 Ibid., p. 8.
21 Sutinen, J.G. and K.K. Viswanathan. (1999). A socio-economic theory of regulatory compliance. International Journal of Social Economics 26, pp.174-193., as cited by in Torell and Salamanca (2001), no 7 above, p.7.
22 Article 3 of Act No. 32 of 2004.

representatives. The province is headed by a governor, the regency or district is headed by a regent (*bupati*) and the municipality (*kota*) headed by a mayor. While, *kecamatan* is headed by a *camat, kelurahan* and *desa* are headed by a *lurah* and a chief of the village (*kepala desa*).

The enactment of the Autonomy Act No 32 of 2004 has caused a significant change in the rights and responsibilities of all of the levels of government, in particular provincial governments. The rights and responsibilities of provincial governments decreased significantly after more than thirty years[23] of enjoying rights and authority as *Daerah Tingkat I* (Regional Government Level I). Provincial governments had authority and duties to manage and assume responsibility for all government activities within their jurisdictions, including all district and city governments (*Daerah Tingkat II* or Regional Government Level II).

Today, there is no direct hierarchy or reporting responsibility among district and city governments and provincial governments. According to Article 2 (2)(3) of Act No 32 of 2004, provincial governments are autonomous. The provinces are considered to be at the same level as the district or city governments. This has, unfortunately, changed the roles and responsibilities of regional/provincial governments from direct control and management to the development of guidelines and policies within their territories — fairly similar to that of the central government. The provincial governments have neither the right nor authority to control or direct district or city governments.

23 According to the former Regional Government Act No. 5 of 1974, the provincial government was a Daerah Tingkat I (Regional Government Level I), and the district or city governments was Daerah Tingkat II (Regional Government Level II).

5.4 Institutional Arrangements for Coastal Management in Indonesia

Coastal and marine resources governance in Indonesia is the primary responsibility of the state. At the national level, the authority for coastal and marine resources management is the responsibility of state ministries. However, this responsibility is shared among various agencies.

5.4.1 Institutional Arrangements at the National Level

There are three forms of ministries that are recognised in the Indonesian government system. These are: (i) ministries or line departments, (ii) coordinating agencies, which are divided into two types: coordinating ministries (*Menteri Koordinator*) and state ministries (*Menteri Negara*); and (iii) non-departmental government agencies. Line ministries have legislated responsibilities for the management of various coastal resources or sectors. Coordinating ministries have a government mandate to bring together various line agencies with other relevant parties and formulate coastal management initiatives. Non-departmental agencies have a mandate to conduct a specific government function. Indonesia has a permanent inter-ministerial council for coastal and ocean management called the Indonesian Maritime Council *(Dewan Maritim Indonesia*), similar to those in the Philippines and Thailand.[24]

In theory, three main agencies are responsible for fisheries and coastal resources management and conservation. These are the Ministry of Marine Affairs and Fisheries, the Ministry of Forestry and the State Ministry for Environment.

24 Sorensen, J.C. and McCreary, S.T., (1990) *Institutional Arrangement for Managing Coastal Resources and Environments*, 2nd edn, National Park Service, U.S. Department of the Interior and U.S. Agency for International Development., pp. 104-105.

Overall responsibility for the management, development and conservation of fisheries, and other coastal and marine resources lies within the Ministry of Marine Affairs and Fisheries, while coastal environmental protection and management is under the responsibility of the State Ministry for Environment and the Ministry of Forestry. The Ministry of Forestry is also responsible for the management and conservation of mangroves, and national parks including marine parks.

However, the Indonesian bureaucratic system is more complicated than it appears. In practice, at least, nine line departments, three state ministries, one coordinating ministry, four non-departmental government agencies and one inter-ministerial council are involved in coastal management at the national level. Table 5-1 provides a list and functions of some of the major government agencies in the Megawati cabinet that had some responsibility for the management of coastal and marine resources. Detailed discussion of the problems associated with the complexity of institutional arrangements on coastal management at the national level will be undertaken later.

Table: 5-1 Institutional Arrangements for Coastal Management in Indonesia

Government Agencies	Major Duties and Functions in Coastal Management	Relevant Regulations
Line Agencies		
Ministry of Marine Affairs and Fisheries (MOMAF)	Responsible for overall coastal and marine resources management, from policy development to control of implementation of the policy.	▪ Act No. 9 of 1985 ▪ Presidential Decree No. 102 of 2002
Ministry of Forestry (MOF)	To manage and control forestry resources, including mangroves. Through the Directorate General of Forest Protection and Nature Conservation, this department also has responsibility for managing the trade and conservation of endangered plant and animal species, and marine parks and reserve areas.	▪ Act No. 41 of 1999 ▪ Act No. 5 of 1990 ▪ Act No. 5 of 1994 ▪ Govt. Regulation No 68 of 1998 ▪ Presidential Decree No. 43 of 1978 ▪ Presidential Decree No. 102 of 2002
Ministry of Energy and Mineral Resource (MOEMR)	To regulate mining exploitation activities in all Indonesian territory, including coastal areas.	▪ Act No. 11 of 1967 ▪ Act No. 22 of 2001 ▪ Govt. Regulation No.

	To prevent negative impacts of mining activities on marine and coastal ecosystems.	17 of 1974 ▪ Presidential Decree No. 102 of 2002
Ministry of Home Affairs and Regional Autonomy (MOHARA)	To coordinate national and regional policies and programs, including spatial planning. Through Directorate General of Regional Development, this ministry also has responsibility for supervising the regional government agencies.	▪ Act No. 22 of 1999 ▪ Act No. 24 of 1992 ▪ Presidential Decree No. 102 of 2002
Ministry of Transportation and Communication (MOTC)	To reduce and prevent pollution from ship operations. To supervise the development of ports, harbours, and navigational aids and safety.	▪ Act No. 21 of 1992 ▪ Presidential Decree No. 102 of 2002
Ministry of National Education (MONE)	To manage national educational systems, through its universities, and responsibility for conducting research in marine science.	▪ Act No. 20 of 2003 ▪ Presidential Decree No. 102 of 2002
Ministry of Resettlement and Regional Infrastructure (MORRI)	To establish national policy for water resources. To develop national spatial planning. To coordinate and implement coastal engineering, coastal erosion and coastal infrastructures.	▪ Act No. 24 of 1992 ▪ Presidential Decree No. 102 of 2002
Ministry of Defence and Security (MODS)	To conduct national and regional security and defence, including in coastal and marine areas. To conduct hydrographic surveys and mapping.	▪ Act No. 20 of 1982 ▪ Act No. 9 of 1985 ▪ Act No. 8 of 1981 ▪ Act No. 6 of 1996 ▪ Act No. 5 of 1983 ▪ Presidential Decree No. 102 of 2002
Ministry of Trade and Industry (MOTI)	To regulate industrial development in coastal areas. To administer trade activities of coastal and marine resources, including the trade of endangered species and sea-sand mining.	▪ Act No. 5 of 1984 ▪ Presidential Decree No. 33 of 2002 ▪ Presidential Decree No. 102 of 2002
Coordinating Ministries or Agencies		
Coordinating Ministry for Economic (MENKO EKU)	To coordinate and synchronise economic policy that relates to ocean and coastal activities.	▪ Presidential Decree No. 100 of 2001
State Ministry for Environment (KLH)	To develop national policy for the living environmental. To establish national guidelines for the management and conservation of all natural resources.	▪ Act No. 23 of 1997 ▪ Presidential Decree No. 101 of 2001
State Ministry for Culture and Tourism (SMCT)	To develop and establish national policy for culture and tourism. To encourage community involvement in eco-tourism industries. To protect natural ecosystems, including coral reefs.	▪ Act No. 9 of 1990 ▪ Presidential Decree No. 101 of 2001
State Ministry for Research and Technology (SMRST)	To develop and establish government policy on research, science and technology activities, including marine science and technology.	▪ Presidential Decree No. 101 of 2001
Non-Departmental Government Agencies		

National Development Planning Agency (BAPPENAS)	To develop and establish national development planning. To coordinate sectoral and regional development planning and institutional control for international projects.	▪ Presidential Decree No. 103 of 2001
Indonesia Institute of Sciences (LIPI)	To establish national guidelines for basic scientific studies. Through the Research Centre for Oceanography, this institute plays an important role in coral reef management in Indonesia. LIPI also is a scientific authority for biodiversity management.	▪ Presidential Decree No. 103 of 2001
National Coordinating Agency for Survey and Mapping (BAKOSURTANAL)	To establish national guidelines for surveys and mapping To conduct surveys and mapping in all areas, including coastal areas.	▪ Act No. 24 of 1992 ▪ Presidential Decree No. 103 of 2001
Board of Implementation and Assessment of Technology (BPPT)	To review and establish national policy for the application of technology. To carry the research on technology development related to natural and energy resources.	▪ Presidential Decree No. 103 of 2001
Permanent Inter-ministerial Council		
Indonesian Maritime Council (DMI)	To establish general national policy for the maritime sector.	▪ Presidential Decree No. 161 of 1999

5.4.2 Institutional Arrangements at the Regional Level

At present, Indonesia has 33 provinces administrated by governors who exercise considerable autonomy.[25] There was also a significant increase in the number of districts and city governments in Indonesia following the entry into force of the former Regional Government Act No. 22 of 1999 (called Autonomy Law) in 2001.[26] For example, data from the 1990s revealed that there were 292 municipalities or districts.[27] This was increased significantly in 2002 to 354.[28]

25 Thirty of those provinces have coastal and marine territory. Until 1998, the number of Indonesian provinces was twenty-seven, but following the independence of East Timor the number was reduced to 26. However, since the enactment of the Regional Government Act (Autonomy Act), seven new provinces have been established by the national government.

26 In 2004, it was replaced by the new Regional Government Act No. 32 of 2004.

27 Dahuri (1996), as cited by Cicin-Sain, B., and Knecht, R.W., (1998), *Integrated Coastal and Ocean Management: Concepts and Practices*, Island Press, Washington, D.C., p. 140.

The authority of regional governments in Indonesia has changed considerably since the enactment of the Autonomy Law in 2001. A number of sectoral autonomous agencies *(dinas)* and technical institutions such as board *(badan)* and office *(kantor)* come under the control of governors and the mayors (*bupatis*). These cover most of the government functions, including: marine and fisheries, agriculture and forestry, tourism, mining, transportation and communication, health, education, etc. According to Article 120 of Act No. 32 of 2004 regarding Regional Government (Autonomy Act), regional governments have discretionary authority to create a *dinas* and/or a technical institution, depending on their individual needs.

The Regional Planning and Development Board *(Badan Perencanaan dan Pembangunan Daerah* / BAPPEDA) is one of the most important regional government agencies responsible for coastal and ocean management at provincial and district levels. The main function of BAPPEDA is the coordination and formulation of development planning for all government sectors, including coastal and ocean resources management, and social and cultural development. The implementation of the Marine Resources, Evaluation and Planning Project (MREP) has given some BAPPEDAs an opportunity to formulate provincial strategic plans for integrated coastal management projects.[29]

The institutional capacity for coastal management of most *dinas* and *badan* in regional governments is very weak in contrast to national government agencies. They are faced with a lack of educated professional staff, particularly in marine science

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28 232 of those districts and cities have coastal and marine territory (Minister of Home Affairs Decree No. 5/2002 dated 11 March 2002). It must be noted, however, that this data, could be flawed, as verification systems in Indonesia are inherently and traditionally weak.

29 The MREP Project was in ten provinces, including: Riau, North Sumatra, East Java, Bali, West and East Nusa Tenggara, South and North Sulawesi, Mollucas, and Papua.

and unclear, overlapping jurisdictions.[30] Further, tight central control under earlier regimes atrophied creativity at the regional level. Centralists, unsupportive of devolution, continue to favour and foster this former culture.

5.4.3 Institutional Arrangements at Local Level (Village Level)

Two forms of institutions, formal and informal, exist at the local level, with the latter having undocumented rules and roles. Informal institutions can be more flexible and dynamic over time, but may not be recognised or understood by outsiders. They can also be very rigid and very reluctant with internal participants. Local institutions can also range from indigenous, with their origins clearly going back many generations, to contemporary or more "modern" forms.[31]

Many scholars have noted the traditional management systems that existed in Indonesia a few decades ago, such as *sasi*.[32] However, these systems have nearly all disappeared from Indonesia over the past few years. *Sasi* was pressured by internal factors as well as external ones. These include: the change from traditional management to a centralist system by colonial and new order regime

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30 Hopley, D and Suharsono (2000) The Status of Coral Reefs. in Eastern Indonesia. Global Coral Reef Monitoring Network (GCRMN). Information provided by Reef Base – A Global Information System: "Indonesia: Management Gaps" http://www.reefbase.org (accessed on 20 April 2004)

31 Manchur, W., Zurbrigg, A. and Reichratch, S. (2003) *CBNRM Social Science Resources Kit: A Guide for Researchers. Volume 5: Institutional Analysis*. Source: Environment and Natural Resource Management Online: http://web.idrc.ca/en/ev-3221-201-1-DO_TOPIC.html, p. 2.

32 For examples, Purwaka, T.H. and Sunoto (2001) Coastal Resources Management in Indonesia: Legal and Institutional Aspect, in Torell, M. and Salamanca, A.M. (eds.) *Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia*, SIDA and ICLARM, p. 81; Zerner, C. (1998) Tracking Sasi: The Transformation of a Central Mollucan Reef Management Institution in Indonesia, in White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1998) *Collaborative and Community-Based Management of Coral Reefs*. Kumarian Press, pp. 19-32.

administrations;[33] global market pressures; and the introduction of new technologies for natural resources exploitation.[34]

The numbers of *kecamatan, kelurahan* and *desa* have also increased significantly since the enactment of the Autonomy Law in 2001. Data in the 1990s revealed that the total number of sub-districts was 3,500, and the number of rural or urban villages was 66,400.[35] In 2002, these increased to 4,646, and 69,255 respectively.[36] However, there is no evidence that demonstrates a parallel improvement in the performance of local administration in managing their natural resources.

The Autonomy Law was expected to improve the involvement of bureaucrats at all levels of government and the community itself in traditional natural resources management. Although this law has not clearly stated the importance of traditional management, Article 2(9) of Act No. 32 of 2004 states that the traditional norms and cultures that existed in the villages are explicitly recognised as long as they are consistent with existing written laws and regulations of the Republic of Indonesia. However, the imposition of centralised administration over a long period has hampered the functioning of all traditional resource management systems in Indonesia. This has resulted in the lack of informal institutions at local sites in most regions in Indonesia, particularly community institutions that would address conservation and natural resources management.

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33 Ruddle, K. (1994) Changing the Focus of Coastal Fisheries Management, in Pomeroy, R.S. (ed.) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. International Centre for Living Resources Aquatic Resources Management (ICLARM), p. 63; Zerner (1998) "*Tracking Sasi: The Transformation of a Central Mollucan Reef Management Institution in Indonesia*", p. 24.

34 White, A.T. and Trinidad, A.C. (1998) *The Values of Philippine Coastal Resources: Why Protection and Management are Critical*. Cebu City: Coastal Management Project., p. 11.

35 Dahuri (1996), as cited by Cicin-Sain and Knecht (1998), no 27 above, p. 140.

36 Source: Minister of Home Affairs Decree No.: 5/2002 dated 11 March 2002.

Nevertheless, the growing awareness of the importance of traditional knowledge for natural resource management in some areas in Indonesia (usually donor project areas) has resulted in increasing efforts by some progressive local administrations to revive traditional management. Several programs of community empowerment for natural resources management have been introduced to improve the capacity of community institutions to manage their own resources. Minimal success has been seen in Desa Blongko, North Sulawesi, and several sites of the Coral Reef Rehabilitation and Management Program (COREMAP).[37] A COREMAP survey in 2002 revealed the success of community-based reef management in Senayang and Lingga Islands (Riau Province) and Takabonerate Islands (Selayar District) in increasing coral health in those areas from 31.9% and 23.8% in 2001 to 36.7% and 30.1% respectively.[38] Success in those areas confirms that co-management of coastal and marine resources is a good model for managing natural resources in Indonesia in the future.

However, it is fair to say that this has not been an easy task. The success of those community programs has required considerable effort and support from all natural resources stakeholders, including government, NGOs and the community itself, without which community empowerment would have failed. It is also reasonable to say that the COREMAP experience is only the first step for Indonesia in managing its coastal and ocean resources. There is still considerable work for Indonesia to reduce the degradation and destruction of coral reefs due to inappropriate and poor management. Clearly defined roles and responsibilities of all

37 The COREMAP Project initiated the community empowerment program for marine and coastal management at fourteen villages in Riau Archipelago and Selayar.

38 COREMAP (2002) ADB COREMAP Phase I Consultant's Final Report. Prepared by AMSAT Ltd.

levels of government in coastal and marine resources management are key in achieving an appropriate institutional model for Indonesia's diversified culture.

5.5 Roles and Responsibilities of Government

5.5.1 National Government Roles and Responsibilities

During the 1990s, there was a re-examination of coastal management roles at all levels of government in Indonesia, particularly at the central level. Significant policies were developed to respond to the increasing global and national awareness of the importance of coastal resources management. These policies included the enactment of the two key autonomy laws that have influenced the roles and responsibilities of all levels of government with respect to coastal and marine resources management.

Some government functions remained under the authority of the national government, including political foreign affairs; security and defence; judicial; fiscal and monetary; and religion.[39] The enactment of the Autonomy laws resulted in the devolution of most other national government functions to regional governments (provincial and district governments), including coastal management. This has resulted in a change in the role of the national government from direct control and management of activities, to developing guidelines and policies. Legally, the central government has retained authority to manage coastal and marine resources only in the areas outside 12 nautical miles and the boundary of the Exclusive Economic Zone and the Continental Shelf. In addition, the Autonomy Law also requires that the

39 Article 10(3) of Act No. 32 of 2004.

national government supervise regional governments in the implementation of decentralization.[40]

5.5.2 Provincial Government Roles and Responsibilities

Although, the provincial governments are considered autonomous at the same level as district or city governments, there are still some rights retained by this regional government authorities, such as exploration, exploitation and conservation of natural resources of marine areas from 4 to 12 nautical miles from the baseline, and cross-jurisdictional issues involving multiple districts or regencies.[41]

It has been argued that the new role of the provinces needs to be defined explicitly,[42] as their authority under the regional autonomy laws is ambiguous.[43] Patlis, et al. argue that provincial authority for the management of cross-boundary issues is extremely broad, particularly in the management of marine and coastal resources. They argue that almost all issues involving the management of coastal and coral reefs involve cross-sectoral agencies and multi districts. It is hard to find a coastal management issue that does not cross the jurisdiction of more than one district. There is a strong connection between terrestrial activities and coastal water quality and resources.[44] Using the Autonomy Law, the provinces have argued that they have the right to manage all coastal areas, although the 4 nautical mile sea

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40 It was included in Articles 217-223 of the Act No. 32 of 2004.

41 As was arranged by Articles 18 (4) of Act No. 32 of 2004.

42 The Autonomy laws of Indonesia made a similar error to the Local Government Code 1991 of the Philippines which devolved authority direct from the central government to municipal governments, by-passing regional and provincial governments with the vague authority of 'coordination' between municipalities. This still plagues the efficiency of local government in the Philippines today. (Personal discussion with P. Flewwelling, an independent international consultant who has experience with the ADB, the World Bank, and the FAO, and who has resided in the Philippines over ten years, discussion on 20 May 2004).

43 Patlis, J.M., Dahuri, R., Knight, M. and Tulengen, J. (2001) Integrated Coastal Management in a decentralized in Indonesia: How it can work. *Pesisir and Lautan*, Vol. 4(1), p. 11.

44 Ibid.

territory from the baseline is under the jurisdiction of district governments. Thus, the provision of Article 13 (1) of Act No. 32 of 2004 is a possible source of conflict between provinces and districts in managing coastal and marine areas.

Despite their authority, provincial governments may now be faced with the difficulty of finding the budget to fund their proposed wider intra-district activities for natural resource management. This has already occurred since the enactment of the Act No. 25 of 1999 concerning Financial Distribution between Central and Regional Governments,[45] whereby the portion of the general fund allocated *(Dana Alokasi Umum)* to provinces has been reduced and is relatively small compared to that of district and city governments. The distribution of revenue, particularly revenue derived from the natural resource sector, is largely directed to the central government and the districts/cities.[46] This situation will negatively influence the provinces' capacity to address cross-jurisdictional issues. Patlis, et al., argue that the provinces may have a stronger vote in shaping policies, coordinating activities, and settling disputes, but little capacity to do more.[47]

Yet having a key role in integration of coastal resource management programs is still very important for provincial governments, in particular for conflict resolution in the management of coastal and marine areas in western Indonesia, where these issues are increasing significantly.[48]

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45 In 2004, it was replaced by the new Financial Distribution between Central and Regional Government Act No. 33 of 2004.

46 Article 14 of the new Act No 33 of 2004 concerning Financial Balancing between Central and Regional Governments provided the calculation and disbursement of the national income derived from natural resource consumption, including: forestry, fisheries, and general mining sectors. See detailed discussion in Chapter Five.

47 Patlis et al., (2001), no 43 above, p.11.

48 An example is the conflict between Sumenep's fishers and the North Coast of Java fishers regarding fishing areas. Source: Nikijuluw, V.P., Bengen, D.G. and Purwanto, A.B. (2002). Identifikasi Pola Pergeseran dari Rezim Sentralistik kepada Desentralasi dalam Pengelolaan Sumberdaya Pesisir dan Laut (Identification of the changing pattern of Centralistic regime to

There are at least four roles that can be played by the provincial government. First, it can act as a mediator to resolve conflicts between districts under its coordination area, or with districts of other provinces. This role is in line with the functions of the provinces as administrative regions and representative of the central government.[49] If the provinces can be successful in this role, resource use conflicts may be reduced.

Second, provinces could act as information providers for coastal and marine resource management, including coral reef management, for the districts. The availability of information has been a key factor in coastal and marine management.[50] The lack of trained staff results in poor information in most districts in Indonesia. This problem is caused by the movement of professional staff to the provincial centres for social and economic reasons. It is reasonable therefore for the provincial government to assume the role of information provider for districts under its area. This role is also a valid responsibility for provincial governments under Act No. 32 of 2004.[51]

Third, the provinces can take on the role as "interpreters" of broad central government policy. It is a challenge for the provinces to interpret the general guidelines or standards from the central government and create specific guidelines and standards that meet the needs of their district/city governments.

Decentralization in Marine and Coastal Management), in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings)*, Bali, Indonesia, p. III-44

49 Article 13 (1 g, h and k) of Act No. 32 of 2004 noted that the provincial government has the authority for inter-jurisdictional issues and Article 10(5) of Act No. 32 of 2004 noted that provinces are also administrative regions that have authority to assist in the implementation of the central authorities in the overall governance system.

50 Patlis, et al., (2001), no 43 above, p.11.

51 Article 13 (1 a, b, and f) of Act No. 32 of 2004 states that the provincial governments have authority to manage some government functions in their jurisdiction, including: regional development plan, human potential resources allocation, and regional spatial planning.

Fourth, the provinces can act as facilitators between the districts and the central government. Their trained human resource advantage can be used by the provinces to assist districts in reviewing and integrating their plans for coastal and marine resources management, and together facilitate approval from central government for either individual district-level or integrated multi-district plans.

5.5.3 District and City Governments Roles and Responsibilities

Decentralisation under the Autonomy legislation devolved significant authorities and funds to the district and city governments. Therefore, it is reasonable to say that those governments are the "winners" in the decentralisation process compared with the provincial governments, although some government functions are still held by the central and provincial governments. These district and city governments have full authority for all decision-making within their jurisdiction of about one-third of the marine area under the provincial jurisdiction.

International experience shows that the success of coastal management requires the implementation of a management strategy for an area as close to the authority as possible.[52] The district and city governments are closer to the resources and its users than other government levels; hence the devolution initiative appears to be consistent with international trends.

With the full authority for almost all government functions, including coastal management, it is logical for districts to assume the role of initiators, facilitators and implementers of integrated coastal and marine resources management in their areas of jurisdiction. The districts should be active in initiating sustainable coastal resource

52 Pomeroy, R.S. and Berkes, F. (1997) Two tango, the role of government in fisheries co-management. *Marine Policy*, Vol. 21 No. 5, pp. 465-480.

programs. The districts should invite and encourage coastal communities to join in integrated coastal and marine resources management, including those activities pertaining to management of coral reef ecosystems. The districts should also act as facilitators for the sustainability of programs initiated by the community and support them through technical assistance, funds and provision of legal assistance. The districts can also act as the implementers of national or provincial programs pertaining to coastal and marine management.

Unfortunately, the lack of experienced and trained staff in coastal and coral reef management is still evident in most coastal districts in Indonesia. Case studies in Riau Archipelago, Selayar, and Biak Numfor reveal that the implementation of decentralised authority has not yet had a significant effect on sustainable and integrated coastal management programs.[53] There is no evidence that the district governments are successful in their roles, although, in some cases, several marine programs and regulations had been developed by districts. Most of the coastal and marine programs and regulations were focused on securing economic revenue, with very few regulations issued for sustainable and integrated coastal and coral reef management. Implementation of environmentally sustainable development and community empowerment programs in these districts had not been initiated and developed by the local district governments, but by the central government.

The effects of thirty-five years of a strong centralised regime with the suppression of regional/district initiatives may be the influencing factor in these cases. The habits of awaiting instruction, guidance and direction from the central government have not yet disappeared in many districts. Even though legally, the

53 For detailed discussion of this case study, see Dirhamsyah, 2004 Regional Policies and Regulations for Coral Reef Management: Case Studies on Riau Archipelago, Selayar and Biak Numfor Districts, Indonesia, in *Maritime Studies* Vol. 136, pp. 7-20.

authority to act and decide on their needs is already given to the districts, their lack of expertise, experience, knowledge, and confidence has hindered implementation of the programs. They do not know clearly what they want to do, are still unsure of their authority, and do not know how to proceed. It is clear that the district governments need support from the national and provincial governments to strengthen their management capacity, especially in coastal and coral reef management. Without such support, the decentralised system will fail, a result that is possibly an unconscious desire of the core group of centralists in Jakarta that do not favour decentralisation and the empowerment of communities and districts.

5.6 The Roles and Responsibilities of Non-Governmental Organisations

As mentioned earlier, the involvement of civil society or lobby groups in the resource decision-making process has increased in Indonesia. Therefore, the roles and responsibilities of NGOs in the development and management of coastal and marine resources, in particular coral reef management in Indonesia, is also an important area for analysis.

A significant increase in the number of NGOs in Indonesia has occurred, synonymous with the "blooming" of the community empowerment program in the last decade. Since then, many national and international NGOs have been active in the natural resource sectors in Indonesia, including coastal and coral reef management. Table 5-2 provides a list of major national and international NGOs operating in Indonesia, with their focus on coastal management.

Many national policies, in particular for coastal management have been developed by the government due to pressures and/or assistance from NGOs.[54] Together with the government, some national and international NGOs have achieved several successes in implementing programs for community empowerment and natural conservation in Indonesia. For example, a sound scientific basis for conservation planning has been established by Conservation International (CI), together with LIPI and KLH and a small local NGO in the Togian Islands.[55]

NGOs became major actors in the development and management of natural resources, alongside the government sector and have played an important role in all community empowerment programs in Indonesia. Many successful government programs and projects on community empowerment were due to the professionalism of the NGOs in the program as facilitators for communities. The success of the COREMAP program and Proyek Pesisir[56] in implementing community empowerment programs in some areas in Indonesia was also due in a large part to the contributions from the local NGOs involved in these projects.[57]

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54 For example, KEHATI has assisted the Government of Indonesia in the development of the National Strategy for Biodiversity Management of 1993 and the Action Plan for Biodiversity Conservation of 1992. Information provided by the Embassy of the United States of America, Jakarta Indonesia: http://www.usembassyjakarta.org (accessed on 30 April 2004)

55 Suryadi, P., and Supriatna, J. (1999) Bridging community needs and government planning in the Togean Islands, Central Sulawesi, Indonesia. Information provided by Reef Base – A Global Information System: "Indonesia: Management Capacity" http://www.reefbase.org (accessed on 30 April 2004).

56 The main goal of the Proyek Pesisir was to test a range of integrated coastal management approaches in three sites, these include: North Sulawesi, Lampung and East Kalimantan. This project is funded by the USAID. Information provided by Reef Base – A Global Information System: "Indonesia: Management Capacity", http://www.reefbase.org (accessed on 30 April 2004).

57 Personal experience, the author is a COREMAP staff officer.

Table 5-2: List of major Non-Governmental Organisations on Coastal Management in Indonesia

Please see print copy for Table 5-2

However, it is also fair to say that not all programs carried out by NGOs have been successful. This is due to the lack of skilled staff, funds and experience that face many local NGOs in Indonesia. Understandably when news of the availability of donor funds for NGOs became public, many local NGOs in Indonesia were established without the capacity to run community programs. Most of their personnel do not yet have appropriate educational backgrounds related to the community culture. Almost all local NGOs in Indonesia have little or no capacity to raise funds

to finance their programs; they rely totally on the governments and/or overseas funding support.

The choice of the most appropriate NGO(s) for a project is critical for its success. A mix of credible international and local NGOs can enhance local NGO capacity. Large international NGOs, however, are often like donor agencies and develop their own agendas, and in their business plans tend to adopt "template" solutions and thus lose their local perspective and ability to listen and respond to local needs. Nevertheless, whatever their weaknesses, NGOs are potential assets to assist in managing coastal and marine resources. It is a challenge for Indonesia to strengthen the capacity of local NGOs.

5.7 Specific Issues of Institutional Arrangements of Coastal Management in Indonesia

Since 1999, Indonesia has been making efforts to develop an integrated ocean management policy. Many international conventions related to coastal and ocean management have been ratified by the Indonesian Government,[58] plus the enactment of domestic laws for natural resources management. The first step in the commitment to address the problems of coastal and ocean activities can be seen clearly, when in 1999 the Government of Indonesia established a new ministry, the Ministry of Marine Affairs and Fisheries that was to have special functions to manage fisheries and the sustainable exploitation of other living marine resources.

Unfortunately, aside from the initial central state level and small pockets of provincial and district level government commitment to address coastal and ocean

58 See detailed discussion of Indonesian ratification on international conventions in Chapter Six.

resources management, the system is not yet working as envisaged. Resource depletion and environmental degradation are continuing and are largely the result of poor institutional arrangements.

The development of institutional structures for governing coastal and ocean activities still faces specific problems. These include overlapping jurisdictions of government agencies; lack of management capacity for implementation; and lack of political will for implementation.

5.7.1 Overlapping jurisdictions of government agencies

The establishment of the Ministry of Marine Affairs and Fisheries was originally expected to address the problem of coordination in the implementation of coastal and ocean management in Indonesia. This ministry was mandated as the coordinator of several government agencies for coastal management. However, the problems associated with overlapping jurisdictions, unclear mandates, internal power broking, insufficient institutional mechanisms, and lack of commitment to both devolution and implementation of marine science management has had a negative impact on its ability to deliver on its mandate. The result has been a failure in coordination among the existing government agencies both vertically and horizontally at all levels of government. Horizontal integration commonly called "intersectoral" integration, of several agencies at the same government level has not yet been achieved. Vertical integration of agencies at different levels of government to coordinate their programs has also been unsuccessful. Most of the government agencies remained focused on their sectoral, temporal, and spatial mandates. This has

led to weak governance, lack of consultation with stakeholders, and a negative factor in the implementation of integrated coastal management.

Success requires cooperation of all involved government agencies and stakeholders in all decision-making process for coastal and ocean management, and this has not yet been achieved. For example, there were a number of ministries and non-departmental agencies involved in the formulation of the recently approved national policy for wetlands management in Indonesia.[59] Among these were the Ministry of Forestry, the State Minister of Environment, the Ministry of Home Affairs, the Ministry of Transportation and Communication, Ministry of Energy and Mineral Resource, the Ministry of Resettlement and Regional Infrastructure, the Ministry of Agriculture, the National Coordinating Agency for Survey and Mapping, the Indonesian Institute of Sciences, and Indonesian Navy. The national policy was a "compromise" document to accommodate the desires of all parties, but unfortunately remained too broad to be an effective guide for ministries and did not focus on the key issue of ocean policy development for sustainable management.

Another example that highlights inter-agency challenges is in the conservation management areas, particularly in the establishment of marine protected areas. Previously, the management of some marine protected areas, including national marine parks was under the Ministry of Forestry, however, this management system created conflict after the establishment of the Ministry of Marine Affairs and Fisheries. The Ministry of Marine Affairs and Fisheries claimed that its duties and functions under Presidential Decree No. 102 of 2001 include marine parks, and

59 For example, the National Strategy and Action Plan for the Management of Indonesia Wetlands (Strategi Nasional dan Rencana Aksi Pengelolaan Lahan Basah Indonesia), which was made in 1996. However, due to the lack of socialisation and lack of focus, it is considered a failed program.

therefore requested the Ministry of Forestry to transfer the six national marine parks[60] to the Ministry of Marine Affairs and Fisheries. Conflict between these agencies arose when the Ministry of Forestry refused the Ministry of Marine Affairs and Fisheries request. The Ministry of Forestry argued that, as long as the formal legislation[61] that granted it the mandate to manage these areas had not been repealed, the management of national marine parks should remain under its authority. Several strategies have been tried to solve this conflict, such as a Memorandum of Understanding between both parties, but the problem has not yet been resolved. There is a "convention"[62] in the Indonesian government system that if there is a conflict between government agencies, it should be settled through a Coordinating Ministry forum, but this has not yet occurred.

The above are only a few examples of the functional overlaps in mandates. Table 5-3 below provides other examples of functional overlaps among Indonesia's government agencies in coastal and marine resources management. This highlights the failure of the Ministry of Marine Affairs and Fisheries to carry out its function to coordinate coastal management in Indonesia. The fragmented management system in coastal management is caused by the absence of a strong unifying institutional arrangement in Indonesia.[63] It is a case where more is less unless there is clear leadership supported from the Executive.

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60 The six national marine parks are: TNL. Kepulauan Seribu, TNL. Karimun Jawa, TNL. Taka Bone Rate, TNL. Wakatobi, TNL. Bunaken and TNL. Teluk Cendrawasih.

61 There are some central government legislative instruments that place the management of national marine parks under the mandate of the MOF. These include: Act No. 41 of 1999, Act No. 5 of 1990, Act No. 5 of 1994, Government Regulation No 68 of 1998, Presidential Decree No. 102 of 2002 and Presidential Decree No. 43 of 1978

62 "Convention" here means an unwritten government process for conflict resolution.

63 For example, Sloan, N.A., and Sugandhy, A. (1994) An overview of Indonesia Coastal Environmental Management. Coastal Management No. 22, pp. 215-233. Information provided by Reef Base – A Global Information System: "Indonesia: Management Capacity", http://www.reefbase.org (accessed on 1 May 2004).

Table 5-3: Functional Overlaps between Agencies Involved in Coastal, Coral Reef and Marine Resources Management in Indonesia

Please see print copy for Table 5-3

This institutional analysis also gives some insight into the statement that there is little or no correlation between the Autonomy Law and vertical integration between the central and the regional government agencies. Inconsistency in the devolution of some authority by central government ministries and agencies to

regional governments has led to further confusion at the regional level in conducting coastal management programs. This inconsistency can be seen clearly in Government Regulation No 25 of 2000, where some authority is still held by central government agencies, although according to the Autonomy Law these functions are to be transferred to regional governments with a few exceptions.[64]

An example in the management of conservation areas is the authority for the management of nature/marine conservation areas, which remains with the central, the Ministry of Forestry. Legal and administrative matters in the regional forestry office (*dinas*) are still coordinated by the central Ministry of Forestry.

Legally, it is not necessary for the head of the local forestry office to be responsible to, or report on his/her duties to the head of the district or provincial government. In some cases, due to lack of coordination between the local forestry office (as the representative of the MOF) and the governor or the *bupati*, a parallel local office was established with a different name in many regional governments for forestry functions. That is, there are two offices with different names but they have the same functions and different "owners".[65]

Therefore, it can be argued that the unclear jurisdiction of government agencies, exacerbated by lack of central executive direction, hence, lack of commitment to implement devolution, has led to conflict between government agencies and contributed to the absence of horizontal and vertical integration for coastal resources management in Indonesia. The establishment of the Ministry of

64 See discussion of National Government Roles and Responsibilities above.

65 For example, there are two offices in South Sulawesi that have functions in forestry activities with different "owners". First is Forestry Agency of South Sulawesi (Dinas Kehutanan Provinsi Sulawesi Selatan). This office is under the control of the Province of South Sulawesi. Second is Conservation and Natural Resources Office of South Sulawesi (Balai Konservasi Sumber Daya Alam Sulawesi Selatan/KSDA). KSDA office is under the control of the Ministry of Forestry.

Marine Affairs and Fisheries has not resolved the coordination problems. The fragmented development of the supporting legal framework for the establishment of a clear, workable and integrated government institution for ocean and coastal resource management has resulted in unclear mandates and unclear jurisdictions for many government agencies, thus allowing strong ministers and their agencies (such as the Ministry of Forestry) to ignore devolution and the Autonomy Laws.

5.7.2 Lack of management capacity for implementation

The Indonesian administrative structure also faces problems of insufficient management capacity to implement programs and policies, or to enforce the laws and regulations for coastal and marine management.

The lack of professional personnel is a critical problem in the development of institutional arrangements for managing coastal and marine resources in Indonesia. This occurs at all government levels, from the national to the regional, and extends to the scientists. Rokhmin Dahuri the former Minister of Marine Affairs and Fisheries, revealed that the Ministry of Marine Affairs and Fisheries had, and still has a major problem recruiting qualified personnel. There is only a handful of staff of the Ministry of Marine Affairs and Fisheries, who have a theoretical understanding of coastal management and fewer still who have any practical experience. For example, in the entire Directorate General for Coasts and Small Island Affairs, there are only two staff who have had experience or real knowledge of coastal management (the Director General himself and one other).[66]

66 Dahuri, R. Decentralising and Delegating ICM to Regional and Local Communities: A Precarious Balance of Authority, Capacity and Consistency. UNESCO, Oceans and Coasts. Pre-World Summit on Sustainable Development Conference, Paris, France – December 2001, p. 8.

Despite national investment in developing institutional and professional capacity for the marine sector,[67] there is a scarcity of professional staff in the scientific research and educational sectors. Many universities and research centres are still lacking scientists and lecturers. A lack of interdisciplinary approach in marine science; a lack of co-ordination among agencies delivering extension programs; and inadequate training in the basic sciences are the major problems.[68] Technical and managerial capacity is also lacking in both the government and the private sectors.[69] Unavoidably, this problem affects the management of Indonesia's coastal and marine resources due to the size of Indonesia and its extensive coral reefs.

Since the economic crisis in 1998, the Indonesian economy has not fully recovered. The impact of the economic crisis also influenced the development and management of institutional arrangements for coastal and marine resources, especially, in the area of law enforcement. The financial crisis has forced the Indonesian government to put poverty alleviation and education as the first priority in national budget planning, and hence, place the lowest priority on law enforcement. This has resulted in less monitoring operations for all Indonesian waters due to the decreasing budget for capital infrastructure and operations.[70]

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67 Through the funding assistance from the Asian Development Bank, the Government of Indonesia implemented the Marine Science Education Project in 1988 in order to improve marine science education in Indonesia.

68 Dahuri, R. (1999) Coastal Zone Management in Indonesia: Issues and Approaches, in Rais, J., Dutton, I.M., Pantimena, L., Plouffe, J. and Dahuri, R. (eds.) Integrated Coastal and Marine Resources Management Proceedings Symposium Malang, 1998, pp. 60-72.

69 Ibid.

70 "Indonesia Butuh Ratusan Kapal Patroli Laut" (Indonesia needs hundreds patrol boats), *Kompas Daily News Online*, 11 September 2003, http://www.kompas.com

5.7.3 Lack of political will for implementation

Another crucial problem in developing institutional arrangements for coastal management in Indonesia is the lack of political will and commitment of Indonesian politicians to conservation and environment issues. Although discussions about marine and coastal issues have taken place over more than ten years throughout the central line agencies, the positive impact of these discussions is very limited. Most Indonesian politicians place emphasis on economic benefits rather than conservation.[71] Politically, implementation of conservation measures is not a popular concept with their business constituents nor does it suit their short-term financial gain.[72] Historically, conservation has been considered a luxury in developing countries, including Indonesia. Most local politicians in Indonesia do not consider conservation and environmental issues as important.

This is due to the assumption that in short-term programs conservation activities do not add to the national income or to the overall economic growth of the nation; they do not provide employment for local populations; they do not attract aid from the developed countries; and they do not increase political benefit for local populations.[73] The lack of perceived immediate and direct economic benefits has resulted in many potential conservation budgets being directed elsewhere.

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71 Haeruman (1988), as cited by Llewellyn, G., and Azhar, I (1998) Science for management of coral reef resources: an Indonesian perspective. Unpublished Paper, 35pp. Information provided by Reef Base – A Global Information System: "Indonesia: Management Capacity", http://www.reefbase.org (accessed on 4 May 2004).

72 Ibid.

73 Ibid.

5.8 Solution and Policy Implication

In order to address the above-mentioned institutional problems, a more efficient administrative structure for dealing with marine activities is required. New solutions should be adopted by the government to address the current administrative shortcomings and they must start with the establishment of appropriate and workable national coordinating mechanisms.[74]

Three key options are available to Indonesia to address the problems of overlapping jurisdiction and lack of coordination amongst central government agencies. These options are also relevant to other countries with large governments.

5.8.1 Improve Coordinating Mechanism

The improvement of coordinating mechanisms can be done through the revitalisation of an existing inter-ministerial council, such as the Indonesian Ministerial Council. This option assumes that the responsibilities are so widely dispersed and so well entrenched within the existing government agencies that a major restructuring of government departments would require significant funds, personnel and time, all of which are not realistic at the present time. Therefore, to minimise public expenditure on major restructuring, the revitalisation of the Indonesian Ministerial Council is a better choice. Coordinating mechanisms are necessary to exchange information and develop homogenised viewpoints on maritime issues.[75]

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74 Ibid.

75 The Asian Development Bank (1999) *Technical Assistance Marine Resource Evaluation Management and Planning (MAREMAP) – TA No. 2958 INO: Final Report Appendices*. Prepared by: Canora Asia Inc., p. 23.

There is however, a growing resistance with most bureaucrats, researchers and local politicians to the improvement of coordination through the Indonesian Ministerial Council. Indonesia has a long and sad history with this institution.

The first inter-ministerial council on the maritime sector was originally established in Indonesia in 1971 and known as the Committee of Coordination for the Settlement of the National Regions and the Seabed (PANKORWILNAS).[76] In 1996, however, the committee was disbanded by the government due to its failure to achieve results. In the same year, the government established the National Maritime Council (DKN) as a replacement.[77] Again, however, the National Maritime Council was diffused, and became the Indonesian Maritime Council in 1999.[78] This Council still exists as a permanent inter-ministerial council for the maritime sector that is nominally led by the president but day-to-day coordination is given to the Minister of Marine Affairs and Fisheries. To date, no significant policy or program has been produced by this institution.

A number of reasons explain the failure of the Indonesian Maritime Council. First, there is a wide range of line agencies involved in the Council's consultation forum, each of which has some maritime interests, but none have ocean management as the primary focus, except for the Ministry of Marine Affairs and Fisheries. This has resulted in no specific program or policy being produced by the Maritime Council that can be implemented by the line agencies. As noted earlier, the national ocean policy is too broad as it was a compromise document. Second, there is no single act or regulation that obliges line departments to implement the decisions of the Maritime Council.

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76 Established by the Presidential Decree No 36 of 1971.
77 Established by the Presidential Decree No 77 of 1996.
78 Established by the Presidential Decree No 161 of 1999.

However, political will and commitment from all parties is needed for the revitalisation of the Indonesian Maritime Council. This commitment should be demonstrated by the government agency that has a responsibility for the Council. The key problem appears to be the lack of executive leadership for the Council. The chairmanship by any one minister handicaps the operation of the council and so a neutral chairman is required. Presumably, therefore, a possible neutral chairman would be the Vice President.

5.8.2 Expand the powers and duties of an existing agency (creation of a super-agency)

The second option to address the coordination problem among the existing government agencies on coastal and marine activities is through expansion of the powers of an existing agency or department.

This option is based on the assumption that the existing Ministry of Marine Affairs and Fisheries lacks sufficient legal authority or power to address the full range of complicated maritime activities. As noted earlier, many other government agencies are involved in coastal and marine management in Indonesia. Legally, the Ministry of Marine Affairs and Fisheries has the authority and responsibility for fisheries management and marine affairs only. This option suggests that the enhancement of powers and duties of the Ministry of Marine Affairs and Fisheries from fisheries and habitat management and marine affairs to all related functions of ocean activities, such as marine transportation, ocean mining, marine tourism, marine conservation, coastal forestry (mangroves management) and other ocean activities, may merit consideration as a potential solution.

Incorporating several ocean-related sectors into one government agency will offer some advantages, which cannot be matched by the other options. First, the conflict of function overlaps can be avoided or at least reduced, because they will be under "one roof" and one minister. Second, the development of a single ministry for all ocean and coastal activities can ensure the implementation of national policy and programs, because all decision-making processes from planning to implementation will also be under "one roof". Another advantage of the establishment of a single ministry would be the encouragement of a career development system. A single ministry could facilitate the employment of both specialists and generalists under the same umbrella with a wider scope for career planning and progression.

A super ministry system is not new in institutional arrangements for coastal and ocean management. This approach has been used by the Republic of Korea. The Ministry of Maritime Affairs and Fisheries of Korea has extensive powers and duties for coastal and ocean management activities ranging from the development and coordination of marine and fisheries related policies, promotion of the shipping industry, safe navigation of vessels, port operations and port development, promotion of the fishing industry, support for the development of marine resources, and integrated coastal management for scientific research and development.[79] The establishment of the Ministry of Maritime Affairs and Fisheries of Korea was to address the fragmentation on the implementation of national ocean and marine policies in that country.[80] So far, this ministry has been functioned as long as it designed. It can be argued, however, this success is due to the strong centralised management system that has been implemented by the Government of Korea in the

79 Centre for Maritime Policy of University of Wollongong (2002) Current Development in Integrated Oceans Management & Governance in APEC Members Economies: Korea-APEC Oceans Governance. Prepared for APEC (unpublished document).

80 Cicin-Sain and Knecht (1998), no 27 above, p. 344.

coastal area.[81] Noteworthy also, is the Department of Fisheries and Oceans in Canada which now, after the cod fishery collapse, includes fisheries science, oceanography, hydrography, management, enforcement, coastal system management, the Canadian Coast Guard (former Ministry of Transport) for all sea marine and ports management, search and rescue, navigational aids and general enforcement.[82]

However, it cannot be denied that the enlargement of the Ministry of Marine Affairs and Fisheries power with other powers with respect to ocean activities will create a super ministry or super agency. This is a sensitive issue that may create a conflict at the national level, because the formulation of a super ministry absorbing the coastal and ocean mandates of existing agencies requires a major restructuring of government. Sloan and Sugandhy argued that this option would create too overwhelming a task and they believed that it goes against the Indonesian culture of decision-making based on deliberation and consensus.[83] The establishment of a super ministry will have the effect of the increasing public expenditure on the required restructuring.

5.8.3 Establishing a new coordinating ministry (Menko)

The Indonesian government system recognises two types of coordinating agencies: a coordinating ministry *(Menteri Koordinator)* and a state ministry *(Menteri Negara)*. In general, the role and functions of both agencies are quite similar. They often both coordinate and advise. More specifically, however, the

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81 Ibid.

82 Discussion with P. Flewwelling, former A/Director Regulations and Enforcement, DFO Canada, May 2004.

83 Sloan and Sugandhy, "An overview of Indonesia Coastal Environmental Management". Information provided by Reef Base – A Global Information System: "Indonesia: Management Capacity", http://www.reefbase.org (accessed on 5 May 2004).

Coordinating Ministry has responsibility for coordinating and synchronizing both planning and implementation of government policy; while the State Ministry has responsibility for coordinating the development of national policy only. The position of the Coordinating Ministry in the Indonesian government system is "half a step" higher than other technical and/or state ministries. The Coordinating Ministry is the more important actor in the Indonesian government system as a whole. Most national policy and political decisions of the Indonesian government have been developed in these ministries. Therefore, the performance of the Coordinating Ministry determines the success or failure of a government policy in Indonesia. Nevertheless, there is no special Menko for the maritime sector in the present Indonesian Cabinet.[84] The coordination of coastal and ocean activities is included in the functions of the Coordinating Ministry for Economics *(Menteri Koordinator Ekonomi)*.

The third option, therefore, to address the coordination mechanism problem for national institutional arrangements is to establish a new ministry, which will have a special function for the coordination of all ocean and coastal management activities.

There are some advantages in the creation of a Coordinating Ministry for ocean activities *(Menteri Koordinator Kelautan)*. First, it attempts to improve a flawed system through cosmetic changes. Second, the Coordinating Ministry could also act as the facilitator for conflict resolution regarding functional overlaps of the technical and state ministries, e.g., the conflict of national marine park management between the Ministry of Marine Affairs and Fisheries and the Ministry of Forestry as

84 According to Presidential Decree No. 100/2001 concerning positions, functions and authorities of coordinating ministries, there are three Coordinating Ministries in the Indonesian cabinet: Menko POLKAM (Coordinating Ministry for Political, Social and Security Affairs; Menko KESRA (Coordinating Ministry for Social Welfare); and Menko Perekonomian (Coordinating Ministry for Economics).

mentioned earlier. The existing Coordinating Ministry for Economics, include the Ministry of Marine Affairs and Fisheries and the Ministry of Forestry as parties, but it cannot resolve conflict due to its economic focus with respect to managing coastal and ocean resources. The Coordinating Ministry for Ocean Activities could also act as a mediator for conflict between the national and regional government agencies.

This option may be the best and least costly one, as it does not require a major restructuring of existing government agencies. As a large country with two-thirds of its territory being ocean, it is reasonable for Indonesia to create a new coordinating ministry for ocean activities.

Three elements should be addressed before deciding on the options.[85] The first is the legal regime. The ultimate effectiveness of a super-ministry, an inter-ministerial council, or coordinating ministry as a management vehicle will rest primarily on the legal framework upon which it draws its mandate. An appropriate legal framework will avoid possible conflict and will ensure support for the implementation of policy and programs that have been produced at a higher level. This suggests that whichever option is selected, it must have an authority greater than that of a current line ministry to be able to clearly resolve ministerial mandate conflicts. The second is scientific backup. The effectiveness of the implementation of the ocean policy will be dependent on how the policy has been developed. The availability and correct use of knowledge determines the quality and credibility of the final policy. Therefore, it is reasonable, and perhaps a necessity, for a new super-ministry, new inter-ministerial council, or new Menko to develop a research and development unit for its own organisation. The third is the autonomy issues. Whichever option is chosen, the government should consider the roles and

85 The Asian Development Bank (1999), no 75 above, pp. 25-27.

responsibilities of local governments and communities for coastal and ocean resources management. The development of a new ministry or council cannot be allowed to reduce rights and the authority of regional governments. All regulations produced by the central government will need to accommodate the existing Autonomy Law.

5.9 Conclusion

From the above analysis, it can be concluded that the development of institutional arrangements for coastal and marine management in Indonesia is faced with several challenges. These include the lack of a clear and authoritative coordinating mechanism; unclear mandates and functional overlaps; lack of management capacity; and lack of political will for implementation.

Coral reefs and other coastal resources are managed by an extensive number of institutions in Indonesia including a number of government agencies and NGOs. Involved are nine line departments, three state ministries, one coordinating ministry, four non-departmental government agencies, one inter-ministerial council, and a plethora of national and international NGOs.

Three potential solutions can be considered by Indonesia to address the problems of institutional arrangements for the management of its coastal and marine resources. The first option to improve the coordinating mechanism is through the revitalisation of the Indonesian Maritime Council. The second option that can be considered by Indonesia in order to address the coordinating mechanism is through the expansion of the powers and duties of an existing agency (creation of a super-agency). The last option is through the establishment of a new coordinating ministry.

The last option may be the best option for Indonesia because this does not require a major restructuring of existing government agencies.

However, the success of coastal and ocean resource management also requires an appropriate legal framework and administrative structures. Success is also determined by the commitment from all involved, both direct and support sectors, including data and research management; and the establishment of appropriate and effective systems for monitoring and controlling the exploitation of coral reefs and other associated ecosystems. As both management tools and strategies have close linkages with each other, the success of one is determined by the other.

Chapter Six

Indonesian Legislative Framework Relevant to Coral Reef Management

6.1 Introduction

The aim of this chapter is to analyse the legal framework for coral reef management in Indonesia. The chapter argues that an adequate and appropriate legal framework will promote sustainable development and management of coastal and coral reef resources and that the complicated and inappropriate legal framework currently in place in Indonesia has contributed to serious degradation of coastal and marine resources. It also argues that this degradation has been exacerbated by the weaknesses in enforcement of natural resource and fisheries laws and regulations in Indonesia.

The chapter starts with a review of the Indonesian legal framework, followed by an analysis of the national legal framework for coastal resources management. It then examines gaps in the national and local legal framework for coastal and marine management. Finally, it concludes with a brief review and recommendations on how to address the problems associated with Indonesia's legal framework for coastal and ocean management in Indonesia.

6.2 Indonesian Legal Framework

Marine resource management in Indonesia is implemented through particularly extensive and complex regulatory framework. The foundation for this is laid down in Section 33, Para 3 of the 1945 Basic Constitution which reads: "Land and water and natural resources therein shall be controlled by the State and shall be utilized for the greatest benefit of or welfare of the people."

Since its independence in 1945, Indonesia has had a very complex hierarchical legal system. It has "one of the most formidable legislative frameworks in the world."[1] Until 1999, there were nine levels of laws in Indonesia.[2] The Basic Constitution is the supreme law of Indonesia. The other levels are created through General Peoples Assembly decree (MPR decree) and laws or decrees under the Basic Constitution. MPR Decrees are implemented through laws enacted by the Parliament. After enactment, the laws are published in the formal statute book. These laws may be made more specific through government regulations or ministerial decrees. However, this hierarchical legal system changed significantly in 1998, when major legal reforms took place. The enactment of MPR Decree No III/MPR/2000, reduced to hierarchy to seven levels (see table 6-1).

The Indonesian legal framework for marine and coastal management comprises two groups. The first consists of the laws that address management of national or internal issues. The second consists of the national laws that implement

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1 Tomascik, T.; A.J. Mah; A. Nontji & M.K. Moosa, (1997) *The Ecology of Indonesian Seas*. (2 volumes). Hong Kong, Periplus Edition. Information provided by provided by Reef Base – A Global Information System: "Indonesia: Management – Gaps": http://www.reefbase.org (accessed on 2 October 2003).

2 According to General Peoples Assembly Temporary Decree (Ketetapan Majelis Permusyawaratan Rakyat Sementara/MPRS) No.XX/MPRS/1966 concerning the hierarchical of Indonesia's legal system, see also table 5-1.

international obligations as a consequence of the Government of Indonesia ratifying international conventions.

Table 6-1: The hierarchy of Indonesia's legal system comparing of MPRS Decree No. XX/MPRS/1966 and MPR Decree No. III/MPR/2000

	MPRS Decree No. XX/MPRS/1966	MPR Decree No. III/MPR/2000
1	Basic Constitution	Basic Constitution
2	General Peoples Assembly Decrees	General Peoples Assembly Decrees
3	Laws and Acts	Laws and Acts
4	Government Regulation Substitute Law or Act	Government Regulations Substitute Law or Act*
5	Government Regulations	Government Regulations
6	Presidential Decrees	Presidential Decrees
7	Ministerial Decrees	Regional Government Regulations•
8	Provincial Government Regulations	
9	District or City Regulations	

6.3 National Legal Framework for Coastal Resources Management

The management of coral reef resources in Indonesia is not regulated by an individual legal instrument, by a group of natural resource laws and regulations.

According to Putra (2001), no fewer than twenty Acts or laws and hundreds of regulations and ministerial decrees relate to the management of coastal resources.[3]

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* This government regulation can be enacted by the government, if the state is in a critical condition (chaos), but it is only applied for temporary situations. This regulation should be submitted to the parliament to get approval during the next assembly period. If the parliament accepts the regulation, it can be increased as a law or Act, but if not, this regulation should be terminated (Para 4 of Article 3 of People's General Assembly Decree No. III/MPR/2000).

• Para 7 of Article 3 of People's General Assembly Decree No. III/MPR/2000 arranges that Regional Government Regulations include:
  - Provincial Government Regulations;
  - District or City Regulations; and
  - Village Ordinances

  Each of the lower regional government levels is required to adhere to and execute the higher level regulation.

However, only sixteen laws on natural resources management relate to coastal and marine management. These include fourteen laws on natural resources management and ocean activities, and two national laws for the ratification of international conventions. Those laws are listed in Table 6-2 below, where the fourteen national laws are grouped into six broad categories.

Table 6-2: Legislations Affecting Coral Reef Management and Marine Resources Management

No	Regulations	Subject
I	**National Level**	
A	**Ocean and Maritime Jurisdiction Claims**	
1	Act No. 6/1996	Indonesian Waters
2	Act No. 5/1983	Indonesian Exclusive Economic Zone
3	Act No. 1/1973	Indonesian Continental Shelf
B	**Management of Ocean Activities**	
4	Act No. 21/1992	Shipping
5	Act No. 11/1967	Basic Provisions for Mining
C	**Terrestrial Spatial and General Planning Laws**	
6	Act No. 24/1992	Spatial Use Management
7	Act No. 9/1990	Tourism
D	**Coastal and Marine Resources Management**	
8	Act No. 31/2004	Fisheries
9	Act. No. 41/1999	Forestry
10	Act No. 16/1992	Quarantine of Agriculture, Cattle, and Fish
E	**General Legislation of Environmental Management**	
11	Act No. 23/1997	Environmental Management
12	Act No. 5/1990	Conservation of Biological Resources and Their Ecosystems
F	**Legislation of Decentralization**	
13	Act No. 32/2004	Regional Government
14	Act No. 33/2004	Financial Balancing between Central and Regional Government
II	**International Level**	
1	Act No.17/1985	Ratification of United Nations Convention on the Law of the Sea
2	Act No. 5/1994	Ratification of United Nations Convention on Biological Diversity

3 Putra S. (2001) as cited by Patlis, J.M., Dahuri, R., Knight, M. and Tulengen, J. (2001) Integrated Coastal Management in a decentralized in Indonesia: How it can work, Pesisir and Lautan, Vol. 4(1), pp. 24-39.

6.3.1 Laws of ocean and maritime jurisdiction claims

There are three laws concerning ocean and maritime jurisdiction claims. These include the Indonesian Waters Act; Indonesian Exclusive Economic Zone (EEZ Act); and Indonesian Continental Shelf (Continental Shelf Act). These laws are analysed below.

6.3.1.1 Act No. 6 of 1996 concerning Indonesian Waters (Indonesian Waters Act)

The archipelagic regime was introduced to Indonesian law subsequent to the ratification of the 1982 LOSC in 1994. The territories of the Indonesian Waters comprise the Indonesian territorial sea, the archipelagic waters and the inland waters. The Indonesian territorial sea extends seawards for a distance of 12 nautical miles measured from the Indonesian archipelagic baseline.[4] The baseline for the Indonesian archipelagic waters is drawn using the archipelagic straight basic line. If such line cannot be used, the basic common line or the straight basic line as described by Article 5 shall be used. Article 7 provides for the boundary between the archipelago waters and the inland waters. Article 10 establishes the process for defining boundaries between Indonesia and other countries.

Article 23 of the Indonesian Waters Act provides that the utilisation, management, protection and preservation of marine ecosystems, including coral reefs in those waters should be conducted in accordance with existing national and international laws for those activities. However, there is no specific article granting

4 Article 3.2 of Act No. 6 of 1996.

of power to regional governments regarding the use and management of marine resources in internal waters.

6.3.1.2 Act No. 5 of 1983 concerning the Indonesian Exclusive Economic Zone (EEZ Act)

This Act grants Indonesia sovereign rights for exploring, exploiting, conserving and managing natural resources in its Exclusive Economic Zone (EEZ).[5] The natural resources include living marine resources such as fish, marine mammals and coral reefs, and non-living marine resources, such as oil, mineral and gas.

Although most coral reefs are within territorial waters, activities of exploration and exploitation of living and non-living marine resources in the EEZ outside territorial waters have an impact on coral reef ecosystems. Therefore, the management of resource exploitation activities in the EEZ addressed by the EEZ Act relates closely to coral reef management in Indonesia as a whole.

6.3.1.3 Act No. 1 of 1973 concerning the Indonesian Continental Shelf (Continental Shelf Act)

This law grants to Indonesia the rights of exploitation and exploration for natural resources on the seabed and subsoil beyond its territorial sea. Activities such as gas and mineral mining on the seabed and subsoil of the submarine areas can impact negatively coral reef ecosystems. Therefore, provisions of this Act specifically cover the prevention of pollution in the superjacent waters and the airspace above the continental shelf. There is a complementary relationship between

5 Article 4 of Act No. 5 of 1983.

the continental shelf law, the basic mining law, and government regulations on the supervision of offshore oil exploration and exploitation.

6.3.2 The laws on management of ocean activities

There are two laws concerning the management of ocean activities. These include maritime transportation (shipping) and basic provisions for mining. These laws are analysed below.

6.3.2.1 Act No. 21 of 1992 concerning Maritime Transportation (Shipping Act)

This law deals with maritime transportation, including navigation, port management, loading, shipping accidents, investigation, shipping lines and seafarer safety. In relation to coral reef management, some provisions of Articles 65-68 specifically cover marine pollution generated from ship operations. However, the implementation of the maritime transportation laws include legal instruments for the reduction and prevention of pollution from ships' operations that relate to other laws that address ship sourced pollution requirements arising from international conventions such as the IMO conventions.

6.3.2.2 Act No. 11 of 1967 concerning Basic Provisions for Mining (Mining Act)

No specific article of this Act addresses marine resource management planning, but it notes the requirement for the prevention of negative impacts of

mining activities on coastal and ocean resource management.[6] Government Regulation No. 17 of 1974, subsequent to this law addresses the Supervision of Offshore Oil Exploration and Exploitation providing for marine protection and controls to address problems of pollution from seabed activities.

6.3.3 The laws on terrestrial spatial and other general planning activities

There are two laws concerning the terrestrial spatial and other general planning activities. These include spatial use management and tourism Acts. These laws are analysed below.

6.3.3.1 Act No. 24 of 1992 concerning Spatial Use Management (Spatial Use Management Act)

This is a general law with the principal purpose of regulating use, planning and control over space, waters and land, including management of marine and coastal resources. Even though coral reef management is not specifically addressed in this Act, the obligations to manage marine and coastal areas are clearly management measures relevant to coral reefs. Articles 1 and 2 of the Spatial Use Management Act provide the definitions and the aims of spatial use management activities including marine reserve areas. The Act emphasises the importance of integration in the development and management of the province and district areas. Article 8 provides that development and management of the region should be

6 Group of Experts on Scientific Aspects of Marine Pollution (GESAMP) confirmed that offshore production activities also potential to pollute the marine environment. GESAMP Reports and Studies, No. 30, The State of the Marine Environment; IMO/FAO/UNESCO/WMO/WHO/IAEA/UNEP, United Nations Environment Programme, 1990, p. 88. Information provided by GESAMP website: http://www.gesamp.imo.org/publicat.htm (accessed 7 October 2003).

integrated at the national, provincial, and district levels. It also provides the rights for local government to manage its region (including ocean and space), but the areas beyond its jurisdiction are to be addressed by central government.[7] However, Article 9 does not clearly state the area of marine responsibility of regional governments. Government Regulation No 47 of 1997 subsequent to this law addresses National Spatial Planning. Article 3 provides the national goal and scope of National Spatial Planning. The regulation provides the definition and management criteria for such planning areas. Article 10 provides a definition of protected areas, such as forest-protected areas, water catchments areas, national park area, and agriculture areas, such as wetland agriculture, animal husbandry areas, and fisheries areas.

6.3.3.2 Act No. 9 of 1990 concerning Tourism (Tourism Act)

Healthy coral reefs are potential sites for tourist attractions and infrastructure. In regard to the development of the marine tourist industry, Act No. 9 of 1990 includes a basic rule for tourism industry development. Articles 16 and 18 define three types of tourist attraction: natural, cultural and specific tourist developments allowing for the potential to manage these sites specifically for tourist industry purposes.

Although no single article of this Act specifically addresses the use and management of coral reefs, Article 35 provides that the destruction of a tourism object, including a natural ecosystem, is prohibited. The offence attracts a maximum penalty of five years in jail or a fine up to Rp. 50 million (US$6,000).

7 Article 9 of Act No. 24 of 1992.

6.3.4 The laws of coastal and marine resources management

Three pieces of legislation regulate the management of marine resources. These are fisheries; forestry; and quarantine of agriculture, cattle and fish Acts. This section outlines the key aspects of these laws in relation to coral reef management.

6.3.4.1 Act No. 31 of 2004 concerning Fisheries (Fisheries Act)

Act No. 31 of 2004 is the legal basis for fisheries management in Indonesia. Enacted on 6 October 2004, it replaces the former Fisheries Act (No. 9 of 1985). Under the Fisheries Act, coral reefs are classified as fish resources.[8] Article 7 provides the right for the Minister of Marine Affairs and Fisheries to implement management measures to control fishing activities. These include: (i) specifying fishing method or gear; (ii) determining the maximum sustainable yield (MSY) or total allowable catch (TAC) for domestic and foreign fishing; (iii) specifying fishing and aquaculture activities; (iv) preventing activities such as pollution and destructive fishing of the resource and its ecosystems; and (v) rehabilitation of the resources and its habitat.

The Fisheries Act prohibits the use of illegal fishing methods and equipment that pollute and degrade the fisheries and their ecosystems,[9] with maximum penalties of six years in prison and a fine of up to Rp. 1.2 billion (US$133,000). These activities can be categorised as a crime.[10]

8 Article 1.4 of Act No. 31 of 2004
9 Articles 8-14 of Act No. 31 of 2004
10 Article 84 of Act No. 31 of 2004.

6.3.4.2 Act No. 41 of 1999 concerning Forestry (Forestry Act)

Act No. 41 of 1999 addresses forestry activities in Indonesia. These include: management, planning, inventory, conservation, rehabilitation and reclamation of forests. The Forestry Act also addresses research and development, and the development of human capacity to deal with forestry matters. The Forestry Act does not directly address the management of coral reefs, but coastal forestry activities can damage coral reefs and their ecosystem, especially in mangrove areas.

The Forestry Act defines forest to include mangroves.[11] There is no single article of the Forestry Act that specifically arranges the management of mangroves. Mangroves are defined like other forests and can be addressed with respect to forest conservation, forest production and forest reserves in the forest management system.[12] Mangrove ecosystems are an important area for fisheries management. They can function as the nursery ground for some fish and marine species, and also as a buffer zone or "filter area" for coral reef ecosystems reducing pollution, abrasion and sedimentation from land-based activities.[13] Excessive and illegal logging of mangroves will result in the destruction of fisheries and coral reef ecosystems.

Mangrove forest management is a controversial issue between forestry and fishery agencies. However, the Forestry Act does not address the relationship among different agencies, thus increasing the exacerbating sectoral resource conflict.

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11 Article 1.b of Act No. 41 of 1999, defines forest as "the area that consists the natural resources that dominated by reforestation in alliance with their ecosystems where they cannot isolate each other." Here, mangroves are seen as trees although they live at the borders between land and sea.

12 Article 6 of Act No. 41 of 1999.

13 Dioscoro, M.M., Emma, M.M., and Amuerfino, M.M. (2000) Mangrove Management and Development in the Philippines. Paper presented in the meeting on: "Mangrove and Agriculture Management" held at Kasetsart University, Bangkok, Thailand on February 14-16, 2000. Information provided by: http://www.angelfire.com (accessed on 20 March 2005).

6.3.4.3 Act No. 16 of 1992 concerning quarantine of agriculture, cattle and fish (Quarantine Act)

This Act regulates the export and import of certain types of animals and plants. Corals are included in the regulatory framework. Like the Fisheries Act, the Quarantine Act defines fish to include corals.[14] Act No. 16 is relevant to the management of coral reefs in Indonesia, owing to the import and export of reef species and materials to and from Indonesia.[15]

Although no single article of this Act specifically addresses the use and management of coral reefs, Article 7 requires that the export or import of all animals or plants should be accompanied by a health certificate regarding the animals or plants. The offence is punishable with a maximum penalty of three years in jail or a fine up to Rp.150 million (US$18,000).[16]

6.3.5 General Legislation on Environmental Management

There are two laws concerning environmental management. These include the Environmental Management Act and the Conservation of Biological Resources and their Ecosystems Act. These laws are analysed below.

6.3.5.1 Act No. 23 of 1997 concerning Environmental Management (Environmental Management Act)

The aim of this Act is to create environmentally sustainable development through planning policies and rational exploitation, development, maintenance,

14 Article 1.10 of Act No. 16 of 1992.
15 Articles 5 and 6 of Act No. 16 of 1992.
16 Article 31 of Act No. 16 of 1992.

restoration, supervision and control. The Environmental Management Act is a comprehensive law on environmental management in Indonesia. It adopts a holistic approach based on the archipelagic concept of the essential unity of the living space of the Indonesian people, which covers the land, air space and sea under Indonesian sovereignty.[17]

The law grants to the state the right to manage natural resources.[18] The state is required to regulate and develop policies for environmental management. The authority for managing the supply, allocation, use and management of the environment and the re-use of natural resources, including genetic resources are also retained by the state. This law grants the state control of the activities which have a social impact on the general public. However, this law also requires to the state to develop a funding system to address the preservation of environmental functions.[19]

Two Government Regulations under the Environmental Management Act have been made. The first is regulation No. 7 of 1999 which deals with the preservation and conservation of plants and animals. The second is Regulation No. 19 of 1999 which addresses standardisation of water quality. Both of these regulations are relevant to coral reef management. For example, Article 9 of the Government Regulation No. 19 of 1999 prohibits activities of persons or legal entities that will cause marine pollution and destruction is prohibited. The offence is punishable by requiring the payment of all costs of pollution prevention and recovery of the destruction.[20]

17 Article 2 of Act No. 23 of 1997.
18 Article 8.1 of Act No. 23 of 1997.
19 Article 8.2 of Act No. 23 of 1997.
20 Articles 23 and 24 of Government Regulation No. 19 of 1999.

Ministerial decrees have also been made to implement the Environmental Management Act that relates to coral reefs. For example, the State Minister of Environment Decree No. 4 of 2001 promulgated guidelines for the prevention of coral reef destruction and rehabilitation of coral reefs, including standards for the status and destruction of coral reefs, programs controlling coral reefs destruction; guidelines for management authorities at provincial and district levels; and establishment of a funding program for controlling the destruction of coral reefs.

6.3.5.2 Act No. 5 of 1990 concerning Conservation of Biological Resources and Their Ecosystems (Biological Resources Act)

The Biological Resources Act establishes basic principles for the management, conservation, and use of biological resources, natural habitats and protected areas. This Act focuses on the protection of life-support systems, the conservation of animal and plant species diversity and their ecosystems, and the sustainable use of biological resources and their ecosystems. The principle of sustainable and balanced use of biological resources in Indonesia is also implemented by this Act. The Biological Resources Act also establishes the development of human capacity and quality of life.

The Biological Resources Act promotes two types of "nature protection areas": nature reserve areas and nature sustainable areas.[21] Subsequent to this Act, a government regulation was enacted that specified the types of nature reserve areas and nature sustainable areas. Indonesian Government Regulation No. 68 of 1998 divides the nature reserve areas into two types of nature protection areas: (i) nature

21 Articles 14 and 29 of Act No. 5 of 1990.

reserve area *(kawasan cagar alam)* and (ii) wildlife reserve area *(kawasan suaka margasatwa)*. The nature sustainable area is divided into three types: (i) national park area *(kawasan taman nasional)*, (ii) grand forest park area *(kawasan taman hutan raya)* and (iii) nature recreational park area *(kawasan taman wisata alam)*.[22]

6.3.6 The laws of decentralisation authorities

The fall of President Soeharto and the subsequent democratisation of Indonesian politics resulted in new laws on decentralisation which have tremendous impact on marine resources management. Two of the key Acts, which are analysed below are Act No. 32 of 2004 concerning Regional Government and Act No. 33 of 2004 concerning Financial Distribution Central and Regional Government.

6.3.6.1 Act No. 32 of 2004 concerning Regional Government (Autonomy Act)

The Regional Government Act grants authority to the regional governments to manage their own natural resources. Article 18.4 grants to the Provinces jurisdiction over Indonesia's territorial sea which extends up to 12 nautical miles from the archipelagic baseline. One-third of the territorial sea is given to district or

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22 Article 1 of Government Regulation No. 68 of 1968 defines:

- Nature Reserve Area is "the specific area in land or waters which has function as the area for prevention of biodiversity of plants and animals and its ecosystems."
- Wild Reserve Area is "the area that because of it nature has specific plants, animals and their ecosystems that need to conserve."
- National Park is "the nature preservation area on land and/or waters which consists original ecosystems of plants animals that are managed by zonation system and used for research, education, tourism and recreation."
- Grand Forest Park Area is "the nature preservation area on land and/or waters that purposed for the collection of origin or non-origin plants and animals that used for research, education, tourism and recreation."
- Nature Recreational Park Area is "the nature preservation area on land and/or waters that purposed for tourism and recreation."

city governments. Where the distance between two provinces is less than 24 nautical miles, the jurisdiction of each province is the median line from each province.[23] However, this arrangement does not apply to traditional fishing activities.[24]

The Autonomy Act provides for the authority of the regional governments (province, district and city) for exploration, exploitation, conservation and management of the coastal resources.[25] The obligation of regional governments to conduct their government administrative and spatial planning of their areas is also created by this Act. The Autonomy Act also obliges regional governments involvement in maintaining national security and sovereignty, and to conduct law enforcement activities in regard to local regulations and regulations that have been decentralised by the central government.[26]

Except for some functions that are retained by the central government,[27] the regional governments have full authority. However, in general, the role of the provincial government has decreased dramatically. Most functions are now devolved from central and provincial to local district or city governments, including public works, health, education and culture, agriculture, communications, industry and trade, direct investment, environmental management land use, co-operatives and labour.[28]

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23 Article 18.5 of Act No. 32 of 2004.
24 Article 18.6 of Act No. 32 of 2004.
25 Article 18.3 of Act No. 32 of 2004
26 Article 18.3 of Act No. 32 of 2004
27 These include foreign affairs, security, defence, judicial, national fiscal and monetary, and religion (Article 10.3 of Act No. 32 of 2004).
28 Article 14 of Act No. 32 of 2004.

6.3.6.2 Act No 33 of 2004 concerning Financial Distribution Central and Regional Government (Financial Distribution Act)

The Financial Distribution Act provides for an almost complete transfer of budgetary management from the central to local government. Article 10 of the Financial Distribution Act provides that the equilibrium funds consist of money derived from the National Income and Expenses *(Anggaran Pendapatan dan Belanja Negara/APBN)* that are divided into three components: (i) sharecropping funds; (ii) general funds; and (iii) specific allocation funds. The equilibrium funds that are derived from sharecropping funds are sourced from tax and natural resource conversion.[29] Sharecropping funds sourced from tax include land and building tax, tax on land and building acquisitions, and income tax.[30] The sharecropping funds sourced from natural resource conservation come from forestry, general mining, fisheries, oil mining, natural gas production, and natural heat production.[31]

The first component of the equilibrium funds derived from sharecropping particularly from natural resource revenue is divided into four components:

First, revenue from forestry activities is divided into two arrangements. Revenue from forestry levy and forestry resources is divided with the regional government receiving 80%, while the remaining 20% goes to the central government.[32] Revenue from reforestation fees is divided with the regional governments receiving 40% and the central government 60%.[33]

29 Article 11.1 of Act No. 33 of 2004.
30 Article 11.2 of Act No. 33 of 2004.
31 Article 11.2 of Act No. 33 of 2004.
32 Article 14.a of Act. No. 33 of 2004.
33 Article 14.b of Act No. 33 of 2004.

Second, for revenue from fishing, general mining and geothermal production, regional governments receive 80%, while the remaining 20% goes to the central government.[34]

Third, for oil production revenue, regional governments receive 15.5% and the central government 84.5%.[35] Finally, for revenue from natural gas production, regional governments receive 30.5% and the central government 69.5%.[36]

According to article 27.1, the central government should provide the second component of equilibrium funds, the general allocation, to regional governments, equalling 26% of the National Income and Expenses (APBN). General allocation funds of a regional government are allocated based on the fiscal gap and basic allocation.[37] The fiscal gap is calculated from the regional fiscal need minus the regional fiscal capacity, while the basic allocation is calculated based on the number of regional government officers.[38] The regional fiscal need is calculated from a combination of the total population, area, expense of the construction index, gross regional domestic product per capita, and the human development index.[39]

The third component of the equilibrium funds, i.e. specific allocation funds, is allocated to assist the regional governments to finance specific regional needs. The total of the specific funds is determined annually in the APBN.[40]

The Financial Distribution Act significantly influences the use and development of coral reefs in regional areas through its allocation of funds and

34 Article 14.c.d.g of Act No. 33 of 2004.
35 Article 14.e of Act No. 33 of 2004.
36 Article 14.f of Act No. 33 of 2004.
37 Article 27.2 of Act No. 33 of 2004.
38 Article 27.2.3 of Act No. 33 of 2004.
39 Article 28 of Act No. 33 of 2004.
40 Article 38 of Act No. 33 of 2004.

establishment of priorities. The implementation of this law may address the lack of funds for coastal and ocean resource development programs at the regional level.

6.4 The laws for ratification of international conventions and agreements

Some Acts that have been enacted by Indonesia in connection with the ratification of international marine and coastal environmental agreements related to the management of coral reefs. These include Act No. 17 of 1985 concerning the ratification of the 1982 LOSC, Act No. 5 of 1994 concerning the ratification of the United Nations Convention on Biological Diversity, and other major international conventions on marine pollution, such as the International Convention for Prevention of Pollution from Ships/MARPOL).

6.4.1 Act No. 17 of 1985 concerning the ratification of the 1982 LOSC

As a consequence of the ratification of the 1982 LOSC, there are some duties and obligations required by Indonesia as a party to the 1982 LOSC. Although, no direct reference to coral reef management was included in the 1982 LOSC, one chapter deals with conservation in somewhat general terms. Part XII of the 1982 LOSC entitled "Protection and Preservation of Marine Environment" is a legal basis for marine conservation activity related to the use and management of coral reefs. It imposes a basic obligation on states to protect and preserve the marine environment, and requires them individually or jointly, to take action to prevent, reduce and control pollution from any source of pollution[41] such as from land-based sources,

41 Articles 192 and 194 of Act No. 17 of 1985.

seabed activities, activities in the surrounding area, dumping vessels, and the atmosphere. State parties to the convention are required to conduct such measures, including: the duty to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.

6.4.2 Act No. 5 of 1994 concerning the ratification of the United Nations Convention on Biological Diversity

The United Nations Convention on Biological Diversity influences the use and management of coral reefs. Act No 5 suggests that it is necessary to protect and preserve most of the ecosystems that exist in Indonesia including coral reefs. This Act also advocates that the government take action with respect to natural resource management, such as the inclusion of traditional rights, clarification and inclusion of the role of women in development, and the assurance of the sustainability of small islands' biodiversity.

6.4.3 International Conventions Regarding Prevention of Pollution of Marine Ecosystems

Aside from the international conventions mentioned above, there are also numerous international conventions for the prevention of pollution of marine ecosystems, and the establishment of particular marine protected areas has been ratified by Indonesia. One such convention is the International Convention for Prevention of Pollution from Ships (MARPOL) of 1973 and MARPOL 1978.

Annexes I and II of MARPOL, and the Protocol 1978 of MARPOL were ratified by Indonesia in 1988.[42]

Even though the MARPOL Convention only prescribed standards for the prevention of pollution from ship sources, it also imposed stricter controls in certain 'special areas' from any pollution from ships (Annex I of MARPOL). These "special areas" include coral reef ecosystems, which are the most sensitive areas.[43] The IMO has developed guidelines for the identification of fragile ecosystems, such as coral reefs and mangroves, which may be designated as 'particularly sensitive sea areas' susceptible to pollution from ships.[44] Although some Indonesian coral reefs exist close to designated Archipelagic Sea Lane areas, there are no sensitive areas declared by Indonesia to prevent coral reefs from oil pollution produced by shipping

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42 Beside these, Indonesia has also ratified several other international conventions that relate to marine safety and marine environment protection. These include:

- The United Nations Framework Convention on Climate Change (ratified in 1994);
- Basel Convention for the Control of Transboundary Movement of Hazardous Waste and Disposal of 1989 (ratified by Government regulation No. 19 of 1994);
- International Convention on Civil Liability for Oil Pollution Damage, 1969 (ratified in 1978);
- International Convention for the Safety of Life at Sea (SOLAS), 1960 (ratified in 1966);
- International Convention for the Safety of Life at Sea (SOLAS), 1974 (ratified by Presidential Decree No. 65 of 1980);
- International Convention for Prevention of Pollution from Ships (MARPOL, Annexes I and II), 1973 and MARPOL Protocol 1978 (ratified by Presidential Decree No. 48 of 1986);
- International Agreement for the Facilitation of Search Ships in Distress and Rescue of Survivors of Ships Accidents (ratified in 1976);
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (ratified in 1978);
- Convention on the International Regulation for Preventing Collisions at Sea (COLREG), 1972 (ratified by Government Regulation No. 50 of 1979);
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 (ratified in 1988);
- SOLAS Protocol, 1978 (ratified in 1988);
- International Convention on Load Lines (LL), 1966 (ratified in 1976); and
- International Convention for Safe Containers (CSC), 1972 (ratified in 1989)

Source: Kusuma-Atmadja, M. and Purwaka, T.H. (1996) Legal and institutional aspects of coastal zone management in Indonesia. *Marine Policy*, Vol. 20 No. 1, p. 83.

43 Similarly, Indonesia has established several sensitive special areas for coral reef protection (marine protected area), for a detailed explanation see also discussion of Act No. 5 of 1990 concerning Conservation of Biological Resources and Their Ecosystems.

44 Gibson, J. and Warren, L. (1995) Legislative requirements, in Gubbay, S., Marine Protected Areas: Principles and techniques for management, London, Chapman & Hall, p. 39.

operations. Recently, the Great Barrier Reef in Australia was declared a 'particularly sensitive area'.[45]

6.5 Gaps in the National Legal Framework

The very extensive and complex nature of the Indonesian legal system governing coastal and marine resources management has created conflict among existing laws and regulations. The gaps and overlaps among the various coastal and ocean resource management laws that need to be addressed are discussed below.

6.5.1 Status of Ministerial Decree

The General Peoples Assembly Decree (MPR Decree) No III/MPR/2000 was originally intended to reform the Indonesian legal system. The simplification of the hierarchical legal system was intended to make decentralisation easier. However, the enactment of this decree created more difficulties in the legal system of Indonesia. It has been argued that the MPR Decree No III/MPR/2000 is inconsistent with the Indonesian law.[46] The removal of ministerial decrees in the hierarchy of laws caused confusion regarding the position and authority of ministerial decrees in the new system. Inconsistencies can be seen in the contradictory and conflicting articles of the MPR Decree. Articles 2 and 3 make it clear that ministerial decrees are no longer valid legal instruments in the new Indonesian legal system. However, these articles

45 Ibid.

46 Chandra, W.R. (2003) "Perlunya Undang-Undang Hierarki Perundang-undangan" (The need of law for hierarchical legal system), *Kompas Daily News*, 23 September 2003, http://www.kompas.co.id

contradict Article 4.2 which recognises the legitimacy of ministries and other government decrees.

This creates confusion as to the status of a ministerial decree in the hierarchy of laws. Are pre-existing ministerial decrees valid legal instruments in current Indonesian law? If such decrees are still valid, the question of the status of a ministerial decree in the hierarchy arises: Are ministerial decrees superior or subordinate to regional government regulations? If the answer is that a ministerial decree is inferior to a regional government regulation, it can be contended that the MPR Decree No. III/MPR/2000 has violated the Basic Constitution. Article 17 of the Basic Constitution provides that "the minister is a state official who is recruited and terminated by the President." In other words, the minister reports to the president, not the regional government and is not subject to any legal regulation by regional governments.

Article 17 of the Basic Constitution also states that the authority and obligations of ministers will be addressed in laws and government regulations which are superior to regional government legislation. This has resulted in confusion as to whether it is necessary or not for regional governments to consider appropriate ministerial decrees in designing their regional regulations. In fact most recent regional regulations, from both provincial and district governments have been designed and enacted without consideration of the related ministerial decree.

A combination of the negative impacts resulting from MPR Decree No. III/MPR/2000 and autonomy has resulted in mismanagement of coastal and marine resources at the local level. Since the enactment of the Autonomy Law in 2001, it is estimated that more than 7,000 government regulations (PERDAs) that were enacted

by several regional governments in forestry, mining, trade and industry sectors do not comply with the higher authority laws and regulations.[47]

6.5.2 Lack of detailed information and clarity

Conflicts often arise within Indonesian laws due to their vagueness and lack of detail. Sometimes conflicts arise within a single law or with the regulation made under the law. An example is the Fisheries Act No. 31 of 2004 which prohibits activities that will result in the destruction of fish habitats,[48] but also allows the use of bottom trawl fishing and other types of fishing gear that in some situations can be destructive to coral reef ecosystems.[49] Also, although trawling was banned in western Indonesia, regulatory changes are sometimes made to cater for influential industry interests at the local level. For example, the trawl net was renamed a "fish net" and authorised for the purpose of fishing for fleet gear enabling the continuing damage of demersal fish and coral reef habitats.

Inconsistencies in the Fisheries Act have also resulted in confused fisheries management at the local level. Many regional government regulations on fisheries management allow the use of *muro ami*,[50] a destructive form of fishing. This gear has

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47 Department of Home Affairs (2003) "Depdagri Menilai 7,000 Perda tidak layak" (Department of Home Affairs evaluates 7,000 regional government regulations are not valid", in *Kompas Daily News*, 15 August 2003, http://www.kompas.co.id

48 Articles 8-10 of Act No. 31 of 2004.

49 The Agriculture Ministry Decree No. 607 of 1976 as the subsequence of Article 4 of the Fisheries Act No. 31 of 2004 regulates the size of fishing gear and MSY of the fish species. This Ministerial Decree is still valid as a source of fisheries regulation.

50 For example, the Regional Regulation (PERDA) of Riau Archipelago District No. 22 of 2001 concerning fisheries retribution (Retribusi Usaha Perikanan) allows the use of muro ami for fishing in Riau Archipelago waters (see detailed discussion in Dirhamsyah (2004.a). This fishing method was also allowed by the Regional Government of West Lombok (see Hidayat, A. (2003) Governance Structure in Coral Reef Management: A report from Gili Indah Village, West Lombok Indonesia. Working Paper on a Research Colloquium of Resource Economic Department, Humboldt University of Berlin).

been banned in most Asian countries[51] and is banned under national Indonesian law.[52]

6.5.3 Conflict in the use of terms "conservation area" or "protected area"

Many natural resource management laws use the term "conservation area" or "protected area", but they have different meanings under different laws, thus giving rise to different interpretations.[53] This results in conflicts among the laws. One example is the conflict between forestry and fishery laws regarding the management of mangroves.[54] According to the provisions of the Forestry Act No 41 of 1999, the management of mangroves is part of the forestry sector and so mangroves are treated the same as other inland forests. The law allows a person and/or firm to harvest mangroves as long as the person and/or firm obtains permission from the government.[55] This contradicts Article 8 of the Fisheries Act No. 31 of 2004 which prohibits all activities that are damaging to fish habitats and fishery resources. The two ministries have yet to resolve this issue more than two decades after these laws were enacted.

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51 For example, the operation of muro ami fishing gear has been banned by the Government of the Philippines since 1986. Source: Bureau of Fisheries and Aquatic Resources, Department of Agriculture of the Philippines online: Regulation governing Pa-aling fishing operation in Philippine waters. http://bfar.da.gov.ph/legislation/fao/fao190.htm (accessed on 22 March 2005).

52 This was arranged by the Act No. 31 of 2004 and Government Regulation No. 15 of 1990.

53 There are four laws that specifically establish protected areas. These are:
- Article 7 of Act No. 31 of 2004 establishes protected areas relating to fisheries;
- Articles 14 and 29 of Act No. 5 of 1990 establishes protected areas relating to conservation;
- Article 7 of Act No. 24 of 1992 establishes protected areas relating to spatial use planning; and
- Article 7 of Act No. 41 of 1999 establishes protected areas relating to forestry.

54 Patlis, J., Knight, M. and Siahaan, W. (2002) Creating A Framework for Integrated Coastal Management in Indonesia: The Importance of Law. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia* (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings*)*, Bali, Indonesia, p. v-9

55 Articles 28 and 29 of Act No. 41 of 1999.

6.5.4 Conflict in the meaning of "conservation"

Almost all sectoral and general laws on natural resources management use the term "conservation";[56] however, different acts have different meanings and scope for the term. For example, the scope of conservation in the Conservation Act No. 5 of 1990 focuses on conservation and protection of biological resources and management of natural living resources. The Environmental Management Act No. 14 of 1997 has a broader focus on all natural resources (living and non-living). Neither law has clearly designated which government institution or department has responsibility to manage the "conservation activities" identified in the laws. This differs from sectoral laws such as the Forestry and Fisheries Acts where the responsible department is clearly stated.[57] Confusion in the use of the term "conservation" has resulted in overlapping and sometimes competing mandates by government institutions.

6.5.5 Conflict in the definitions of marine species

Broader definitions of terms for some species also exist in other natural resource management laws. An example is Article 1.2 of the Fisheries Act No. 31 of 2004 which defines fish resources as "all species of fishes, including all other marine biota, such as sea turtles, sea mammals, and coral reefs." This is an extremely broad definition which creates conflict between fisheries and other natural resource

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56 The terms "conservation" has been defined in several laws, including:
- Article 1.15 of Act No. 23 of 1997;
- Article 1.2 of Act No. 5 of 1990;
- Article 1 of Act No. 41 of 1999; and
- Article 1 of Act No. 31 of 2004.

57 For example, Article 1 of Act No. 41 of 1999 defines Minister as the Minister responsible for Forestry. Therefore, it is clear that the Ministry of Forestry is responsible for implementing the Act No. 41 of 1999. While, definition provided for Minister in Act No. 5 of 1990. In other words, there is no single Minister that responsible to imply this Act.

management laws. There is no article in the fisheries law that restricts the harvest of all fish species in all Indonesian waters provided the local and/or foreign fishermen have licences from the government. This contradicts the Conservation Act No. 5 of 1990, where some species such as sea turtles, marine mammals (such as whales), and sea cucumbers are protected species.

6.5.6 Conflict in the penalties and liability

Differences in standards of enforcement also occur among the natural resource management laws. Most sectoral laws establish sanctions and liability for similar offences but sanctions for similar violations vary widely. One example is the sanction for illegal fishing with dynamite and/or cyanide. The penalties under the Fisheries Act is imprisonment up to six years and a fine of up to Rp. 1.2 billion (US$133,000).[58] For a similar violation, the Environmental Management Act No. 23 of 1997 has similar prison penalties but a fine of up to Rp. 300 million (US$36,000).[59] On the other hand, the Criminal Code (*Kitab Undang-Undang Hukum Pidana*) No. 1 of 1946 has a penalty of up to ten days in jail or a fine of up to Rp. 750 (US$0.10) for possession of explosive materials without permission. This complicates enforcement and prosecution efforts but not to the same extent as the poorly worded legislation. For example, proof of fishing with poisons and explosives under the Fisheries Act is almost impossible unless one is on the scene and/or in the water next to the alleged violator. As a result the higher fines in the Fisheries Act and Environmental Act are almost never applied and are virtually useless. A clause that makes it an offence to possess any poisons, explosives or parts thereof, or of fish

58 Article 84 of Act No. 31 of 2004.
59 Article 43 of Act No. 23 of 1997.

caught by such means as prima facie evidence of fishing using such means, could make these clauses enforceable.

6.5.7 A short-cut approach for conflict resolution

Most conflicts among the natural resource management laws cannot be resolved through the judicial process. In Indonesia most conflicts are resolved through the issuance of a presidential decree or ministerial decree.[60] A process that further complicates clarity of the law is that some decrees actually contradict the very laws they are mandated to support.[61] The shortcut approach is used because of the complicated nature of the Indonesian legal system. This has created a large degree of uncertainty in the application of the laws.

6.5.8 Conflict of jurisdiction among the national laws

Enactment of the Autonomy Act has highlighted the need to revise several laws that relate to resource management at the regional level. An example is Articles 15 and 16 of the Spatial Planning Act No. 24 of 1992 which concern the granting by the central government of rights for exploitation, exploration and utilisation of all natural resources on the land, ocean and in space. This contradicts the Autonomy Law. The Autonomy Law establishes that provincial and district governments have rights to manage their natural resources extending out to 12 nautical miles from the baseline. This creates further conflict and confusion among institutions at the central and regional levels to manage natural resources.

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60 Heydir (1984), as cited by Patlis, et al. (2002), no 54 above, p.v-8.
61 Ibid.

It is suggested that a specific, holistic and integrated law on marine and coastal management be made to address the complex problems in coastal areas. In preparation for such a law it is suggested that the Indonesian Government consider a legal review to analyse the extent to which existing marine and coastal resource management laws address the problems, conflicts and overlap between Indonesia's coastal management laws.

6.6 Gaps in Local Legal Framework at Local Level

This section analyses the gaps in legal framework at the local level. This analysis is based on case studies of the regional legal framework of the Riau Archipelago, Selayar and Biak Numfor districts.

The management of coastal and marine resources in all three selected districts is difficult because of the poor implementation of existing laws on coastal and marine resource management and because the existing local regulations provide an insufficient legal basis for management.

Originally, some national legal instruments provided the authority to regional governments to enact local regulations for managing their coastal and marine resources. For example, Article 9 (1) of the Spatial Planning Act No. 24 of 1992 gave the regional governments a mandate to conduct spatial planning in their marine areas. Although some survey and mapping activities for the preparation of spatial planning have been conducted by some districts, to date, no single local regulation has been enacted by the three selected districts that address spatial planning in their

marine areas. Very few local regulations on coastal resource management have been enacted.[62]

The absence of local regulations for coastal and marine spatial planning has resulted in unclear jurisdiction over fishing and conservation areas. This has led to conflict between resource users from local coastal communities and intruders from other outside areas. All three districts had, and still have, this problem. For example, a conflict between a local village on Senayang Island, Riau and its neighbouring village concerning the establishment of a local conservation area versus a fishing area has created problems. This conflict was exacerbated by the eradication of *adat*[63] laws in the national and local legal systems. There is no single regulation in those districts that addresses or recognises the *adat* laws on coastal and marine resources management. This lack of recognition of the *adat* law has resulted in an 'open access' regime. The 'open access' regime has resulted in conflict between the local fishers and outsiders who both compete for resource access.

The conflict over fishing areas has been further exacerbated by a regional perspective of the Autonomy Law. The enactment of this law increased the 'sense of belonging and owning' by local fishers of their marine resources to a somewhat fanatical level in some districts. It caused a dramatic increase in the number of conflicts over fishing areas in all regional waters in Indonesia. These conflicts were

62 For example, only one local regulation relating to coastal and marine conservation has been produced by the Riau Archipelago district since the implementation of the Autonomy Law in 2001. This regulation is Keputusan Bupati Kepulauan Riau (The decree of Major of Riau Archipelago District) No. SK.71/III/2002 dated 4 March 2002, concerning Penetapan Wilayah Pengelolaan Terumbu Karang di Kecamatan Senayang – Lingga (Establishment of Coral Reef Management Area at Senayang and Lingga Islands).

63 Purwaka and Sunoto define *adat* law as unwritten traditional laws. See Purwaka, T.H. and Sunoto (2001) Coastal Resources Management in Indonesia: Legal and Institutional Aspect, in Torell, M. and Salamanca, A.M. (eds.) Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia, SIDA and ICLARM, pp. 60-90.

worse in western Indonesia where the issues of tenure and territoriality of local communities surfaced because of over-fishing.[64]

This case study also revealed that the devolution of authority from central to regional governments has not yet resulted in the expected positive impacts for coastal and marine resource management at the local level. Management is still carried out using the sectoral approach. There is not one single regional regulation enacted addressing integrated coastal management in the study area. Since the enactment of the Autonomy Law in 2001, only few local regulations on marine resource conservation programs have been enacted by regional governments. Analysis indicates that all local regulations (*Peraturan Daerah* / PERDA) from those districts relating to fisheries, forestry, mining, and marine transportation sectors have focused solely on increasing regional government income.[65] The absence of integrated coastal and marine resources management in those districts has caused uncertainty and unclear responsibility regarding the functions of the regional government agencies in the management of marine and coastal resources.

From the analysis above, it can be concluded that although several regional regulations have been enacted by most regional governments, they have been implemented using a sectoral approach. Further, the enactment of those regulations has focused on increasing regional governmental income. The lack of recognition of the *adat* law in coastal resource management has contributed to the conflict amongst

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64 See Nikijuluw, V.P., Bengen, D.G. and Purwanto, A.B. (2002). Identifikasi Pola Pergeseran dari Rezim Sentralistik kepada Desentralasi dalam Pengelolaan Sumberdaya Pesisir dan Laut (Identification of the changing pattern of Centralistic regime to Decentralization in Marine and Coastal Management), in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, p. III-44.

65 "Depdagri Menilai 7,000 Perda tidak layak" (Department of Home Affairs evaluates 7,000 regional government regulations are not valid), in Kompas Daily News, 15 August 2003, http://www.kompas.co.id

resource users. Both the sectoral focus and concentration on increased income are challenges that will have to be addressed in the policy and the legal framework for the successful management of coastal and marine resources at the local level.

The complex nature of the Indonesian policy and the regulatory framework has increased the tension and distrust between levels of government.

6.7 Solution and Policy Implications

The sections above have identified the problems in the current legal system of Indonesia which reduce its effectiveness in providing a sustainable framework for coral reef management. This section provides suggested solutions to these problems.

6.7.1 Amendment of existing legislation

Based on the analysis above, there are two areas where amendment of existing legal arrangements needs to be considered. The first is, the MPR Decree No III/MPR/2000 regarding Indonesia's hierarchical legal system. It can be argued that because there was no appropriate socialization of this law, it resulted in negative impacts on other sectors in Indonesia. These problems include uncertainty and displacement of institutional arrangements of state agencies and authorities such as ministerial decrees, and disruption of the coordination and cooperative arrangements between central and regional governments.

Because of the central role of MPR Decree No III/MPR/2000, it is critically important to amend and clarify it to specify the authority of ministerial decrees and their relationship with other laws. It is preferable to make ministerial decrees

superior to regional regulations. This would address the requirement for common standards for management of natural resources. Re-instating the superiority of ministerial decrees would also ensure that regional regulations (PERDAs) fall within national guidelines. The amendment would need to establish a due process for challenges or appeals so that the essential elements of decentralisation are maintained. This should prevent a return to the corrupt practices which resulted from ministerial decrees. However, noting the level of corruption in Indonesia, it is likely that people may resist a return of ministerial decrees unless there is an independent "ombudsman type" mechanism to provide a check on abuse of administrative power.

The second issue that needs priority attention is the recognition of *adat* law in all natural resources management laws and in national policy. One of the central concerns is the lack of recognition of community rights in the management of coastal and marine resources. Initial efforts were made to recognise the *adat* law through amendment of the Basic Constitution of Indonesia.[66] However, this amendment has not been followed by the consequential amendment of other existing laws and regulations.

Recognition of traditional resource rights for local communities would have a significant positive impact on their welfare and increase the potential for improving the natural ecosystems. The government and private sectors have now recognised the commercial potential of biodiversity resources and the use of traditional knowledge.[67] This recognition is also in line with the Convention on Biological Diversity (CBD), which states that there is a close relation between the indigenous

66 Through the amendment of Article 18 of the Constitution of 1945 in 2000 (Amendment no. 2 of 2000), the traditional community rights have formally been recognised in the Indonesian legal system.

67 Lowry, K. (2000) Decentralised Coastal Management. Proyek Pesisir (Indonesia Coastal Resources Management Project). USAID/BAPPENAS NRM II Program. , pp. 25-29.

people and the conservation of their natural resources.[68] The Acts which need to be amended to recognise traditional resource rights, include the Fisheries Act No. 31 of 2004, the Forestry Act No. 41 of 1999, the Spatial Use Management Act No. 24 of 1992, and the Tourism Act No. 9 of 1990.

6.7.2 Development of a new integrated law for managing natural resources

Another option worth considering is to enact a natural resource management Act. It can be argued that the increasing conflicts among coastal and marine resources users in Indonesia is due in part to the absence of a single, integrated natural resources management Act that addresses a broad range of issues including small island and coastal management. The benefits of such an Integrated Act would include:

- resolution of several conflicts amongst existing laws concerning the terms or definitions regarding coastal and marine ecosystems management.
- reduction in the overlap among and gaps in the existing legislation, for example, the overlap in management authority for mangrove ecosystems.[69]
- addressing of relationships between ministerial decrees and regional government regulations, which should reduce the overlap in regulations between the central and regional government agencies.

The benefits identified above would only be realised if all other conflicting Acts or clauses in other Acts are repealed and there is a commitment from related

68 It is stated in the Preamble to the Convention on Biological Diversity 1992.
69 See discussion on the gaps in the national legal framework.

ministries and regional governments to endorse and accept this Act as the one national guideline and legal instrument for coastal and coral reef management.

The suggestion to include small island and coastal management in a natural resources management Act arise from the recognition of the need for integration of land and sea concerns, especially in coastal and island areas where interactions occur. Many international conventions, such as the 1982 LOSC, noted that marine space issues should be addressed in a holistic manner.[70] This means that in addressing marine concerns, it is necessary also to consider the land and coastal activities that impact the marine areas. This is a critical issue for the Indonesian archipelago where 10,000 of the 17,506 islands are categorised as small islands.[71] The uniqueness of the size and specific ecosystems that surround small islands dictate that their management requires an integrated approach.

6.7.3 Strengthening local regulations (PERDAs)

Notwithstanding the suggestions above for national legislation there is also a need to strengthen local regulations as the "frontier legislation" intended to directly address the needs and responsibilities of stakeholders. There are two suggestions that could be considered to improve the performance of PERDAs.

The first is to accommodate *adat* law on coastal and marine resources management. Recognition of this traditional law in PERDA should not be a big challenge, because some provinces have already successfully undertaken maritime activities, including licensing for fishing, mining, tourism, agriculture, fishpond

70 It stated in preamble of the 1982 LOSC.

71 Kusumastanto, T (2003) Ocean Policy: dalam Membangun Negeri Bahari di Era Otonomi Daerah (Ocean Policy: In developing maritime country in regional autonomy era). Jakarta, PT. Gramedia Pustaka Utama, p. 107.

(*tambak*) development, and marine preservation.[72] For example, in 1993 the Moluccas Province enacted PERDA No. 5 of 1993 regarding regional spatial use management to create a special area for traditional fishing (*sasi*). Unfortunately at that time, this regulation was not approved by the Minister of Home Affairs because of the assumption that the regional governments did not have authority over marine space.[73] This is no longer an issue because following the amendment of Article 18, the Indonesian Constitution of 1945 now provides a strong basis for the implementation of this PERDA. The most important thing in the recognition of *adat* law is the "political will" of regional governments (local parliament and governor and/or mayor) to accommodate this issue in their PERDA.

The second is the need to accommodate the issues arising from transnational law. Transnational marine resource management patterns are becoming an important issue that should be considered by the districts and provinces that border neighbouring countries when they develop their PERDA.[74] There are two aspects that should be considered by the regional governments in establishing their local regulations. These include: economic interdependency and historical aspects. The economic interdependency between Indonesia and neighbouring countries is increasing significantly. For example, due to the inter-relatedness of regional communities (economic, social and cultural) many residents of Singapore live in the Riau Archipelago district and other districts of Riau province.

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72 The Asian Development Bank (1999) Technical Assistance Marine Resource Evaluation Management and Planning (MAREMAP) – TA No. 2958 INO: Final Report Appendices. Prepared by: Canora Asia Inc., p. 20.

73 Ibid.

74 For example, Riau Archipelago borders with Singapore and Malaysia, West Kalimantan Province borders with Sabah, Malaysia, and Irian Jaya borders with Papua New Guinea.

The historical aspect: Indonesia and other ASEAN member countries have signed several bilateral agreements concerning the recognition of traditional fishing rights in the border areas, as historical rights.[75]

Noting this trend, it is critical for border districts and provinces to accommodate the patterns of transnational marine resource use and management when developing their regulations. The future PERDA of those districts or provinces should address obligations of Indonesia in key international instruments such as the 1982 LOSC and the Convention on Biological Diversity with regard to marine environmental management and fostering regional cooperation.[76] The accommodation of transnational marine resources management does not mean the transfer of sovereign power from national to regional governments, but should assist and support the national government in the implementation of some regional and international obligation.

6.8 Conclusion

This chapter has shown that the Indonesian legal system has a number of defects which reduce the effectiveness of marine and coastal management measures. There is a lack of effective, specific and formal management measures to protect and conserve coral reef ecosystems. Coral reef ecosystems and other marine and coastal resources are managed and controlled through a very extensive and complex regulatory framework. There are sixteen parliamentary laws or Acts and hundreds of

75 In addition to these aspects, some regional agreements have been signed by Indonesia that relate to the management of natural resources in the districts and/or provinces that border with neighbouring countries. For example, a Memorandum of Understanding on Fishery cooperation for border area (Sulu Sea) has been signed by between Indonesia and the Philippines in 2001. Sulu Sea borders with the Province of North Sulawesi.

76 Ibid., p. 21.

regulations and ministerial decrees that relate to the use and management of these resources. Most laws on coastal and marine resources management were designed to address a specific problem or sector.

A clearer framework for the implementation of the principles of integrated coastal zone management is needed to achieve effective management for coastal and coral reef ecosystems in Indonesia. However, the success of coral reef management is not determined only by a legislative framework. Success is also determined by the commitment of other sectors including institutional arrangements between government agencies; data and research management; the establishment of appropriate and effective systems for monitoring and controlling the exploitation of coral reef and other associated ecosystems and involvement and commitment of stakeholders in the achievement of sustainability.

Chapter Seven

Regional Policies and Regulations for Coral Reef Management: Case Studies on Riau Archipelago, Selayar and Biak Numfor Districts, Indonesia*

7.1 Introduction

The Indonesian archipelago contains large areas of coral reef that are scattered across many local districts and provinces. This chapter presents a case study in the Riau Archipelago, Selayar, and Biak Numfor districts of Indonesia relating to coastal and marine management, particularly coral reef management. The particular field sites used for these case studies are Takabonerate for the Selayar district, Senayang and Lingga Islands for the Riau Archipelago district, and Padaido Islands for the Biak Numfor district.

The case studies focus on the legal framework at the local district or city government level only. Provincial governments also have an important role in coral reef management but this has declined since the enactment of the Regional Government Law (Autonomy Law) in Indonesia that gave autonomy to district and city governments. According to Article 18.4 of the new Autonomy Law No. 32 of 2004, the territorial sea of a provincial government extends up to 12 nautical miles, and one-third of this area belongs to the district or city government. Most coral reefs lie in shallow water under the jurisdiction of the districts and cities.

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* This case study has been published in Maritime Studies No. 36 (May/June 2004).

The chapter will address the following:

- A review and analysis of the pattern of coastal resource management;
- A review and analysis of the legal and policy framework; and
- A review and identification of the local institutions that are involved in coastal and marine management.

The selection of research sites was based on geographical and socio-cultural factors. In geographical terms, Indonesia is divided into three regions or parts: the Western, Central and Eastern parts. Western Indonesia comprises *Sumatra, Java* and the small islands, which surround the main islands. Central Indonesia consists of *Kalimantan*, *Sulawesi*, *Bali, Lombok* and *Nusa Tenggara*, while Eastern Indonesia comprises *Maluku* and *Papua*. Each site is assumed to represent the problems of that region.

Data for the case studies were collected using a combination of a desk-top analysis and semi-structured questionnaires, followed by in-depth interviews with key persons at local government offices, NGO staff, and village leaders.

7.2 Riau Archipelago District, Riau Province[1]

The district of Riau Archipelago borders on Singapore. More than 96% of the Riau Archipelago is water (234,202 km²), and only 3% (9,982 km²) is land. It

1 Sujianto (2002) Studi Pengembangan Kelembagaan Masyarakat Nelayan Kepulauan dan Pesisir: Studi Pengembangan Kelembagaan berdasarkan Kultur Masyarakat Melalui Community-based Management di Kepulauan Riau (Institutional Development Study on Coastal Communities: Institutional Development Study Based on Local cultural through Community-based Management at Riau Archipelago), Laboratory of Business Administration, Faculty of Social Science and Politic, University of Riau.

comprises 1,062 islands, of which 335 islands are inhabited. In government administrative terms, the district of Riau Archipelago is divided into five sub-districts, (*kecamatan)*. The *kecamatan* include: Singkep (comprised 10 villages, called *desa*), Lingga (19 villages), Senayang (6 villages), Bintan Utara (14 villages), and Bintan Timur (10 villages). This field research for this chapter is focused on Lingga and Senayang sub-districts (see Fig. 7-1).

Figure 7-1 Senayang and Lingga Islands

Please see print copy for Figure 7-1

Geographical Aspects[2]

Lingga Island is the second largest island in the Riau Archipelago District, the largest being Bintan Island. The total area of the Lingga sub-district is about 892 km². The small islands in the West are more fertile than those in the East. Lingga Island is particularly fertile with a large rainfall, averaging 314.9 mm per year.[3] This island also has several rivers, including Sungai (River) Daik, Sungai Kelumu, Sungai Panggak, Sungai Semarung, Sungai Mentuda and Sungai Tande. Even though some

2 The sources for the discussion of geographical factor of Senayang and Lingga Islands are cited from: Sujianto (2002) no 1 above, pp. 34-50.

3 Rainfall recording station in Lingga (2002).

rivers, such as the Daik, are influenced by ocean tides they are still a major source of clean water.

The sub-district of Senayang is located in the southern part of the district of Riau Archipelago. It comprises 254 islands, of which 68 islands are inhabited. The Senayang Islands, like Lingga Island, have a large rainfall, and are regarded as being in the wet tropical climatic zone.

Socioeconomic Aspects[4]

A number of ethnic groups live on Lingga Island, including: Melayu or Malays, Bugis, Chinese and Indians. Melayu are the original inhabitants, while the others are migrants from Eastern Indonesia, China, and India. The Lingga Island sub-district had 22,528 inhabitants in 2000. More than 40% worked as farmers, and the rest were fishers, traders, workers, and government staff. The level of education in Lingga Island is low. In 2000, only 44% of residents had completed elementary education, more than 20% had not passed their elementary education, and the remaining 36% had high school or university degrees.

According to 2000 statistics, the total population in the Senayang sub-district was 16,737 persons. The community consisted of two migrant groups. Malays, the original inhabitants, are predominantly farmers. Immigrants from China and South Sulawesi (Bugis) work as traders and fishers. In 2000, more than 60% of the population were fishers; 25% were farmers, and the rest were traders, workers, and government staff. The level of education in Senayang Islands is low. More than 70% of the population has not completed their primary education, 23% have completed

4 The sources for the discussion of socioeconomic factor of Senayang and Lingga Islands are: Sujianto (2002), no 1 above, pp. 41-58.

their elementary education, and the remaining 7% have graduated from high school and/or university.

The pattern of fishing activity in Senayang and Lingga areas is noteworthy. Most fishers of the Lingga and Senayang Islands and other islands in Riau Archipelago are bound by the *tauke* system (patron system).[5] A *tauke*, a trader or businessman, usually has a few fishers as his followers. Initially, the fishers do not work for the *tauke* who is just a lender and trader. However, the *tauke* becomes vital for the livelihood of fishers during the doldrums season, when there is no wind and fishers cannot sail out to fish. The livelihood of fishers then relies mainly on the *tauke* to supply all the fisher's needs, including money for capital goods and subsistence. In return for these loans, the fishers must sell the fish caught to their *tauke* with the price being decided by the *tauke*. The interest rate of the loan is not formally made known to the fisher. Consequently the *tauke* can earn significant profits.

The *tauke* earns this profit in two ways. The first is from subsistence transactions, and the second is from fish trade transactions, with the *tauke* functioning as the fish collector. Some *taukes* also deceive fishers about the weight of fish bought. In addition, the lack of education of fishers sometimes results in their purchasing luxury goods from the *tauke* at expensive prices thus deepening their debt to the *tauke*. The fisher is then pushed to catch as much fish as he can to repay his debts, and often resorts to destructive fishing practices, using explosives and poisons.

In the *tauke* system, the fisher has no bargaining position in the fish and subsistence trade transactions. The fish price is determined by the *tauke*, and not by

5 This analysis is based on personal communication with several social scientists at the University of Riau, local NGOs and some local fishers when the author was involved in the COREMAP Project in 1998-2002.

the free market system. The *tauke's* price is always lower than the market price and this further increases his profit margin. If the fisher wants to sell the fish caught to another *tauke* or put it up for sale on the free market, he is asked to pay back the loan together with the high rate of interest. In addition, if a fisher quits the *tauke* system, no other *tauke* will take him on as a member because he is seen as disloyal. Consequently, most fishers are bound by the tauke system; a system from which they cannot escape. Understandably with such practices, fishers face continual poverty in the Riau Archipelago, although the fish price in this area is relatively higher than in other areas. Breaking the *tauke* circle of debt is not an easy problem to solve, because it has been engrained in local culture and customs in the Riau Archipelago for generations.

A challenge for local and provincial governments will be to replace the tauke system with a fairer scheme, so that the living standards of Riau Archipelago fishers can be improved. Community-based and co-management approaches are alternative solutions that could be introduced by governments. Through the implementation and development of alternative income generation activities and knowledge of how to form collective groups or organisations, fishers may be able to overcome the lack of bargaining power they have under the present arrangements.

Resource Access

The lushness of Lingga and Senayang Islands influences various sectors including agriculture, animal husbandry, plantation farming, and forestry industries. According to statistics, 3,757 km² of Lingga Island have been used for rubber,

coconut, clove, sago and pepper plantations.[6] Most fishers of the Senayang and Lingga Islands are still using traditional fishing gear, such as hooks and lines, fish traps (*bubu*), and fishing nets. However, Senayang Island has more fisheries potential than its neighbouring islands.[7]

Since the 1990s, mining in the Riau Archipelago has increased dramatically, particularly sand mining. This is the result of increasing demand for sand for infrastructure development in Singapore. This leads to both positive and negative consequences for the economy and environment of the Riau Archipelago, including Senayang and Lingga Islands. Sand-mining activities provide labour and income for coastal communities and the Riau Archipelago government, but this is offset by the negative impact on the marine and coastal environment.

Local policies and regulations

Like the central government, in general the pattern of the legislative framework of the Riau Archipelago district is divided into two types: regional development planning and regional regulations. The basic planning of development programs in Riau Archipelago district refers to *Pola Dasar Pembangunan Daerah Kabupaten Kepulauan Riau* (Basic Pattern of Regional Development of Riau Archipelago District). It is also called *Rencana Stratejik/RENSTRA* (Strategic Plan).[8] This guideline comprises the five-year development program for the region.

Several programs related to the use and management of coastal and marine areas - covering fisheries, mining, marine transportation and tourism - have been

6 Kepulauan Riau dalam Angka tahun 2000 (Riau Archipelago in numbers 2000), as cited in Sujianto (2002), no 1 above, p. 44.
7 Ibid., p. 63.
8 It has been enacted by PERDA No. 30 of 2001

implemented by the regional government. However, most of these programs are focused solely on economic outcomes. For instance, in fisheries management there have been three programs established in *Rencana Pembangunan Tahunan Daerah Kabupaten Riau Kepulauan Tahun 2003/REPETADA* (Annual Development Planning of Riau Archipelago District 2003). These include increasing catch and effort, aquaculture and the control of illegal fishing by foreigners, albeit overlooking illegal or overfishing by nationals. There is no program for sustainable development and fisheries conservation or for community empowerment.

As with the fisheries programs, the development programs for sea mining and marine transportation are also focused on economic interests. For example, the main mining program is centred on compiling an inventory of land and sea mining potential. While in marine transportation, the development program only focuses on improving shipping facilities and safety at sea for passengers. There is no program for reducing or minimising pollution from ships or for reducing the negative impact of sea-sand mining.

Due to the proximity of the Riau Archipelago to Singapore, the tourism sector has advantages over other marine sectors. An integrated tourism area has been established by the local government to cater for tourists from Singapore and Malaysia.[9] However, due to the lack of preparation, community involvement and a "real integrated approach" in the implementation of this program, there is a conflict between the local government and the community regarding spatial planning. Although several progress have been conducted in that area, they were all sectorally focused. Most of them were associated with the development of tourist infrastructure

9 The integrated tourism area is located in the north of Bintan Island, It comprises about 23,000 ha. Source: Rencana Pembangunan Tahunan Daerah Kabupaten Riau Kepulauan Tahun 2003/REPETADA (Annual Development Planning of Riau Archipelago District 2003)

such as hotels.[10] Almost no programs dealt with local community interests or the economic empowerment of the local community.

Only one local regulation relating to coastal and marine conservation has been produced by the Riau Archipelago district since the implementation of the former of Autonomy Law in 2001.[11] Although there have been some local regulations enacted by the regional government relating to coastal and marine management, these regulations were focused solely on economic issues. For example in 2002, the Riau Archipelago district produced regional regulation (*Peraturan Daerah/PERDA)* No 22 for the fisheries sector concerning *Retribusi Usaha Perikanan* (fisheries retribution). This provided rights for the local government to take a fee from fisheries activities. It also prescribed the type of fishing gear that could be used in the Riau Archipelago area. The enactment of this PERDA was heavily influenced by economic considerations. This included authority for the use of *muro ami*,[12] although it is known that the *muro ami* is one of the most destructive fishing practices for coral reef ecosystems.[13] The controversy of allowing the *muro ami* net has also occurred in some other regional areas of Indonesia. For example, a

10 Tourism infrastructures built in this area includes seven international hotels, and three golf courses (36 holes and 18 holes).

11 Keputusan Bupati Kepulauan Riau (The decree of Major of Riau Archipelago District) No. SK.71/III/2002 dated 4 March 2002, concerning Penetapan Wilayah Pengelolaan Terumbu Karang di Kecamatan Senayang – Lingga (Establishment of Coral Reef Management Area at Senayang and Lingga Islands).

12 Muro-ami is a "drive-in" net design for reef fishing. This technique uses many fishers or swimmers (30-50 persons) to drive the fish to the net using the sound from bamboo that is punched into the coral by the swimmers. The muro-ami method is highly destructive to the coral reef environment. The experimental trial of muro-ami discovered that one muro-ami operation will damage 17.0 m2 of reef area. Source: Alcala, A.C., Gomez, E.D. and Yap, H.T. (1988) Philippine Coral Reefs: Status and Human Response to Changes in Ruddle, K., Morgan, W.B. and Pfafflin, J.R. The Coastal Zone Man's Response to Change, Harwood Academic Publishers, pp. 447-490.

13 Approved in Article 12 of PERDA No. 22 of 2002.

local regulation of the West Lombok district on fisheries management allowed the use of *muro ami* nets.[14]

Currently, the conflict of interest over the use of coastal and marine resources is not a big problem in Riau Archipelago District. This does not mean, however, that spatial planning of sea territory of Riau Archipelago will not become a future problem as marine-based activities are expanded to support the economic development of communities and local government in this area. There is no local regulation on spatial planning, although a survey and mapping project for the spatial planning of Riau Archipelago water territory has been approved but not yet completed.

Most coastal communities in the western part of Indonesia have no experience in local community management of coastal resources, unlike communities in the eastern part. A sea culture existed in this region a few centuries ago but it disappeared because of external influences. Until the last decade, there were no formal community regulations or village ordinances in this area. A mistake of the central government is the failure to recognise pluralism and the differences that exist among its local communities.

Nevertheless, the political and social changes occur in the region. With support from the central government and international foundations, a coral reef rehabilitation and management program has been running since 1998. This program has tried to encourage the local community to manage their natural resources themselves. Through the support of all stakeholders, seven village ordinances were

14 PERDA No 14 of 2001 concerning fisheries management. Source: Hidayat, A. (2003) Governance Structure in Coral Reef Management: A report from Gili Indah Village, West Lombok Indonesia. Working Paper on a Research Colloquium of Resource Economic Department, Humboldt University of Berlin.

enacted in Senayang and Lingga Islands leading to the local community establishing seven marine protected areas (see Table 7-1).

Table 7-1: List of Community Reef Sanctuaries and Protected Mangrove Zones in Senayang and Lingga Islands

Please see print copy for Table 7-1

The issue of *Bupati* Decree No SK.71/III/2002 dated 4 March 2002, concerning the establishment of the Coral Reef Management Area at Senayang and Lingga Islands was a significant effort by the Riau Archipelago government in managing its coral reefs. Although this decree was initiated by a collaborative program between the central and Riau Archipelago governments and the

community,[15] it may be the first regional regulation on environment and conservation aspects in the area. It may also be the first regulation and policy on coastal and marine conservation management that was initiated by, and involved, the local community in Riau Archipelago district.

Although there have been some development programs for coastal and marine management in the Riau Archipelago district, these were implemented using a sectoral approach. The programs that have been developed were not oriented to regional development or community empowerment, but have focused solely on economic development. Moreover, the implementation of policy and local regulations failed to address substantial problems of coastal and marine management. This has been particularly so with respect to the empowerment of community institutions in order to fight poverty. In the end, these local, sectoral, economically focused programs have resulted in increased degradation of natural resources in this district.

The failure to address the substantial problems of coastal resources management cannot be attributed to the local governments only. They have simply adapted the development system during the era of the previous administration. In addition, the lack of trained human resources has led to relatively few policies and local regulations being developed by the Riau Archipelago government. Although there are some coastal and marine environmental programs, such as the Coral Reef Rehabilitation and Management Project (COREMAP), most of these programs have been initiated by the central government. Almost no environmental and conservation

15 This enactment is mainly due to effort from the Coral Reef Rehabilitation and Management Program (COREMAP) Phase I (1998 – 2003).

programs have been initiated by the Riau Archipelago district, due partly to the lack of professional staff in this area.

7.3 Selayar District, South Sulawesi Province

Selayar is a district of the South Sulawesi province. It is located on the southern part of Sulawesi Island. This district is comprised of 123 small islands, the biggest one being Selayar Island. More than 94% of Selayar territory is water (2,113,841 km²), and only 5% (118,828 km²) is land. There are nine sub-districts under the coordination of the district of Selayar: Benteng, Bontoharu, Bontomatene, Bontomanai, Pasimasunggu, Pasimarannu, Bontosikuyu, Takabonerate, and Pasilambena. This thesis focuses on Takabonerate sub-district as one of the field research sites (see Fig. 7-2).

Geographical Aspects

Takabonerate is a group of atolls located in the southern portion of the Selayar district. It borders the Flores Sea (see Fig. 7-2). Takabonerate is known as the third largest atoll in the world.[16] Takabonerate comprises twenty-one islands of which seven are inhabited. These are: Rajuni Kecil, Rajuni Besar, Latondu Besar, Tarupa, Jinato, Pasitallu Timur, and Pasitallu Tengah. According to the Ministry of Forestry Decree No 286/Kpts-II/1992, dated 26 February 1992, the Takabonerate area is designated as a National Marine Park. The total area of the national park is approximately 530,765 km², including 2,200 km² of coral reef ecosystems. The

16 The first largest atoll in the world is Kwajalein in Marshall Islands and the second largest is Suvadiva in Moldiva Islands. Source: Ministry of Forestry: http://www.dephut.go.id (accessed on 28 August 2004).

Takabonerate National Park area consists of core zones (no-take zones) and buffer zones. Five atolls are designated as core zones, including Latondu Kecil, Taka Bala Loong, Taka Kumai, Tinanja and Taka Ampalas which have diversity in coral fish, seabirds, and sea turtles, as well as diversity in coral reefs.

Figure 7-2:
Takabonerate Islands

Please see print copy for Figure 7-2

Socioeconomic Aspects

More than 5,000 people live in the Takabonerate area. A 1999 survey indicated that Rajuni Kecil was the most populated island.[17] Most Takabonerate residents are migrants from southern Sulawesi towns of Sinjai, Bantaeng and Bulukumbu). A number of ethnic groups, including Bugis and Bajo, live in this area.

17 Mananring, B. (1999) Laporan Triwulan Pengelolaan Berbasis Masyarakat (PBM): Program Pengelolaan dan Rehabilitasi Terumbu Karang (COREMAP) di Taman Nasional Takabonerate, Selayar (Quarterly report on Community-based Management (CBM): Coral Reef Rehabilitation and Management Program (COREMAP) in Takabonerate National Park, District of Selayar). Lembaga Pengkajian Pedesaan, Pantai dan Masyarakat, p. 4.

The level of education in Takabonerate is low. A survey in 1999 found that only 27% of the Takabonerate residents had completed elementary education. More than 70% of the population had not passed this level, while only 2% had graduated from high school and university.[18] This serious social constraint hampers development in the area. School teachers lack the incentive to be placed in this remote area. This situation is also aggravated by the lack of school infrastructure such as books, equipment and buildings. Only seven elementary schools have been built on the inhabited islands. Secondary and high schools are only in Benteng, the capital of Selayar district.[19] Most people living in Takabonerate are fishers, traders, traditional shipyard businessmen, and government staff. According to the 1999 survey, 90% of Takabonerate residents are traditional or artisanal fishers.

Resource Access

As this is a national marine park, fishing is prohibited in no-take zones. The communities are allowed to fish only in the buffer area. The fishing area is about 1,500 – 2,000 m from shore. Fishers usually reach the area using a traditional boat.[20] More than 75% of the fishers in Takabonerate use hooks and lines; 18% use fishing nets, 1% use fish traps (*bubu*) and 4% use other gear.[21] All the inhabitants of Takabonerate depend totally on the ocean for their livelihood.

Grouper and Napoleon wrasse are valuable species in the area. One kilogram of grouper can be priced at Rp. 45,000 – Rp. 50,000 (US$5-US$6) usually sold in live or salted form. However, illegal-fishing practices (i.e. use of cyanide and

18 Ibid., p. 5.
19 Ibid.
20 Jarangka, is a small traditional boat and jolor is a larger one.
21 Mananring, "Laporan Triwulan Pengelolaan Berbasis Masyarakat (PBM): Program Pengelolaan dan Rehabilitasi Terumbu Karang (COREMAP) di Taman Nasional Takabonerate, Selayar," p. 7.

explosives) have caused a decrease in the grouper population. The economic crisis in Southeast Asia at the end of the 1990s led to destructive fishing practices being used throughout the eastern part of Indonesia often in marine national park areas.[22] It also resulted in the use of other reef resources such as non-traditional marine products, e.g. trepang (beche-de-mer) and trochus. The docile lifestyle of these creatures, combined with a largely flat reef distribution, make them easy targets.[23]

The opposite may be true of the less wide-ranging artisanal fisheries, particularly where *punggawas* or "fishing bosses" are involved.[24] The *punggawa* system is a traditional economic fishing activity that has existed for a few generations in Sulawesi, particularly in southern Sulawesi, including the Selayar and Takabonerate areas. Most Sulawesi ethnic groups, including Bugis, Bajo and Makassarese are bound by it. These ethnic groups often use dynamite and cyanide for fishing, as do the Madura ethnic groups of Java. A *punggawa* acts as a creditor to the fishermen similar to a *tauke* in Riau, lending equipment or money in return for being able to buy the catch at a low price. A recent study carried out by Destructive Fishing Watch (DFW) described three actors who are directly involved in destructive fishing activities:[25] *Punggawa Pulau* (the Owner); *Punggawa Kapal* (Leader of the boat operation); and *Sawi Kapal* (Boat Crews).

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22 Pet-Soede, L., Cesar, H.S.J., and Pet, J.S (1999) An economic analysis of blast fishing on Indonesian coral reefs. In Environmental Conservation No. 26, pp. 83-93

23 Pet-Soede, J. and Djohani, R.H. (1998) Combating destructive fishing practices in Komodo National Park: Ban the hookah compressor. The Secretariat of the Pacific Community (SPC). SPC Live Reef Fish Bulletin, 4, pp. 17-28.

24 Llewellyn, G. (1999) Review of existing law and policies relating to migratory marine species: conservation and commercial and coastal fisheries. Information provided by Reef Base – A Global Information System: "Indonesia: Management Legislation", http://www.reefbase.org (accessed on 3 April 2003).

25 Destructive Fishing Watch (2003) Profile of Destructive Fishing in Spermonde Islands 2003. Coral Reef Rehabilitation and Management Project. DFW is an Indonesian NGO established and operating in South Sulawesi.

Punggawa Pulau is the owner of boat, fishing gear and capital, including explosive materials. The Punggawa Pulau will provide all the needs for fishing. Besides being responsible for safety and security, the *Punggawa Pulau* also provides subsistence for the fishermen's families.

Punggawa Kapal is a man that has experience in fishing with dynamite. He is responsible for all fishing operations at sea, together with the *sawi* (boat crew). He is the "bomber" of the group. Due to this responsibility, the position of *Punggawa Kapal* is held by *Punggawa Pulau* himself or by one of his relatives. Most Punggawa Pulau are older and prefer to stay at home.

At least eight crew members will be on board for fishing, but there are specialised additional positions in the vessel, including: the *paselang* (diver) and *pa'tula* (thrower). They are the labourers working for their boss, the *Punggawa Pulau*.

As with the *tauke* system in Riau, the *punggawa* system has become a part of Sulawesian culture. The artisanal fishers of the southern coast of Sulawesi are bound strongly by this system. Llewellyn reports that one *punggawa* in Makassar has 43 boats worked by twenty families.[26] He takes 20% of the value of the catch.[27] The *punggawa* is the main actor in local economic activities and can do almost anything that he wishes. For example, an official fish landing site at Bulukumba, South Sulawesi has been closed because all the catch was collected by the one *punggawa*.[28] He is one of the key coral reef stakeholders, who by his personal and financial

26 Llewellyn (1999) Review of existing law and policies relating to migratory marine species: conservation and commercial and coastal fisheries. Information provided by Reef Base – A Global Information System: "Indonesia: Management Legislation", http://www.reefbase.org (accessed on 3 April 2003).
27 Ibid.
28 Ibid.

influence, forced artisanal fishers to switch from their traditional fishing methods to destructive fishing, because they are deeply indebted to him. However, he is also an asset who can be used by government to change the mindset of the community towards sustainable practices.

Through intensive awareness of the importance of coral reefs for their livelihood and also strong law enforcement, the *punggawa* can be persuaded to use non-destructive fishing methods. The involvement of *punggawa* in coral reef management and other community activities may be critical to the success of coral reef rehabilitation programs in coastal areas. However, this problem has still not been properly addressed. Even though many coastal community empowerment projects have been carried out by central and local governments, they have not involved one of the key stakeholders who can influence change – the *punggawa*. It is necessary for the government to involve *punggawa* in all community programs and activities in the future.

Local policies and regulations

The basic planning of development programs in the district of Selayar refer to: i) Basic Pattern of Regional Development of Selayar District *(Pola Dasar Pembangunan Daerah Kabupaten Selayar*),[29] ii) Regional Development Program of District of Selayar *(Program Pembangunan Daerah Kabupaten Selayar/PROPEDA*),[30] and iii) Strategic Plan of District of Selayar 2003-2007

29 Pola Dasar Pembangunan Daerah Kabupaten Selayar was enacted by PERDA No. 11 of 2001.
30 Program Pembangunan Daerah Kabupaten Selayar/PROPEDA was enacted by PERDA No. 12 of 2002.

(Rencana Strategis Kabupaten Selayar 2003-2007/RENSTRA 2003-2007).[31] These are the guidelines for all five-year development programs in the Selayar District.

Although, there has been no specific program for coral reef management, marine policy development in the district of Selayar is relatively better than Riau Archipelago and Biak Numfor districts. A coral reef ecosystems program has been included in the marine and fisheries program, and in the development of tourism program. Some integration among marine sectors can be seen, even though not too many aspects are involved in any one program. For example, a comprehensive program was developed for fisheries management in the area and this included a law enforcement program to control and manage fisheries.[32] However, due to lack of expertise and financial resources these programs were not implemented. Many environmental programs initiated solely by local government could not be implemented due to the lack of funds, even though the total income of Selayar district has increased significantly from 28.9 billion rupiah (US$3.6 million) in 2000 to 81.3 billion rupiah (US$10.1 million).[33] The district of Selayar remains the poorest district in the South Sulawesi Province.

The other challenge for marine development in the district of Selayar is the lack of a community-based management program for marine conservation and environment protection. Most of the community programs developed have focused on economic enhancement initiatives, and because of lack of preparation and competence in implementation many failed. The failure of community empowerment

31 Rencana Strategis Kabupaten Selayar 2003-2007 was enacted by PERDA No. 01 of 2003

32 The law enforcement program was developed and supported by the central government, through the COREMAP Program.

33 The increase was due to the increasing of special fund allocation granted by the central government due to the implementation of regional autonomy and the financial sharing laws.

programs resulted in the failure of government to improve community living standards, and this encouraged the growth of the *punggawa* system in this area.

The COREMAP Program is one of the community empowerment programs initiated and funded by central government and international donors. It was implemented in Takabonerate, as there had been no community program on marine conservation proposed, funded, or implemented by the local government up to that time.[34] As in the Riau Archipelago, the implementation of COREMAP in Takabonerate was considered a success, encouraging the six communities of Tarupa, Jinato, Rajuni Kecil, Pasitalu Tengah, Pasitalu Timur, and Latondu Islands to establish community marine protected areas and village ordinances to support their marine sanctuaries. Although the village ordinances have not yet received endorsement from the Selayar local parliament as a PERDA,[35] they are the first experiences of involvement of the Selayar communities in decision-making and developing a local regulation or PERDA.

There is one interesting point to be noted with the development of a marine management regime for the district of Selayar. The awareness of the importance of marine and coastal resources and demands for the decentralisation of authority has increased significantly in this area. This has led to the new phenomenon of a local marine management regime in Selayar. The regional government of Selayar declared that Selayar is an archipelagic district.[36] As a consequence of this declaration, they demanded that the central government grant the rights of coastal and marine resource management inside waters between its islands and not just for the 4 nautical miles

34 COREMAP was officially launched in July 1998.

35 Similar to Riau Archipelago District, the six village ordinances of Takabonerate have received an approval from the Mayor (Bupati) of District of Selayar.

36 This issue was mentioned clearly in PERDA No. 11 of 2001 concerning Basic Pattern of Regional Development of Selayar District (*Pola Dasar Pembangunan Daerah Kabupaten Selayar*).

offshore authorised by the Regional Government Law (Autonomy Law) No. 32 of 2004. This declaration is driven by two factors.

The first is the concept of archipelago under the 1982 LOSC. According to the 1982 LOSC, an "archipelago" is "a group of islands, including parts of islands, interconnecting waters and other natural features which are so closely associated that such islands, waters and other natural features form an intrinsic geographical, economic and political entity, or which historically have been regarded as such."[37] Based on this definition, the local government argued that it is reasonable for Selayar to be a *Kabupaten Maritim* (an archipelagic district), because Selayar is such an entity in geographic, economic and political terms. Therefore, they proposed that it was also reasonable for the community of Selayar to manage the natural resources inside the archipelagic waters among their islands. This issue has not yet been resolved at the national level.

The second factor relates to marine and coastal resources management. Coastal and marine resources management is the central issue that drives the regional government of Selayar to claim recognition as an archipelago district. According to the Autonomy Law, the sea territory of a district regional government is 4 nautical miles measured from the shore; and up to 12 nautical miles is under the authority of the provincial government. This means that there are some areas under provincial jurisdiction in the area claimed by Selayar. This situation results in difficulties in managing natural resources in a consistent manner. It is impossible for this local government to apply an integrated approach to manage of the coastal and marine resources as there is no clear jurisdiction over all relevant activities. For example, the licenses for fishing activity in the 4 to 12 nautical mile areas are issued by the

37 Article 46 of the 1982 LOSC

provincial government. This leads to the question: how can the provincial government control this activity? Selayar is located in a remote area and far from the national capital of Jakarta and Makassar the capital of South Sulawesi Province. The lack of infrastructure, funds and staff is prescriptive in the provincial government's failure to conduct monitoring functions. The lack of monitoring and law enforcement will result in the degradation of coastal and marine resources and the environment, including coral reef ecosystems, not only in the 12 nautical mile areas, but also in the archipelagic waters.

Through the recognition of Selayar as an archipelagic district, it is expected that the management performance and capacity of the regional government in coastal and marine resources and environment will increase gradually. This is a reasonable and legally rational request that needs an equally reasonable rational response by the central and provincial governments. A comprehensive analysis should be conducted by the national and provincial governments to respond correctly to this demand. Development of marine resources and fisheries should be based on regional orientations, specifically for archipelagic and remote areas.

By employing regional and community approaches the duties and resource pressures on the central government should fall dramatically. All management processes from planning to final monitoring and evaluation will be the responsibility of local communities and governments. Through the devolution of full authority to archipelagic districts and/or remote districts, the effectiveness of management and control will increase, hopefully achieving sustainable development of fisheries, coral reef and other marine resources. It is time for Indonesia to change its "free access law" to "local management rights". Experience has demonstrated many

disadvantages of a "free access system".[38] It is necessary therefore, for Indonesia to review the existing Autonomy Law to respond to demands from the district.

7.4 Biak Numfor District, Papua Province

The District of Biak Numfor is located at the north of Yapen Island in Cendrawasih Bay and borders directly on the Pacific Ocean. It is part of the Papua Province. This district covers three large islands: Biak, Supiori and Numfor Islands, along with sixty-three other smaller islands. Biak Numfor lies in a strategic position with direct ocean access to the Asia Pacific region. There are twelve k*ecamatan* (sub-districts) under this district.[39] The sub-districts of Padaido Atas and Padaido Bawah were chosen as the field research sites for this chapter (see Fig. 7-3).

Geographical Aspects[40]

The Padaido Islands are located in the northern part of Biak Numfor (see Fig. 7-3). According to a Ministry of Forestry Decree (No.91/Kpts-VI/1997) dated 13 February 1997, the Padaido Islands are designated as a Marine Recreation Park. The islands are divided into two sub-districts: Padaido Atas (Upper Padaido) and Padaido Bawah (Lower Padaido). The Padaido Islands consist of eleven islands, including:

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38 Pet-Soede, L, Merkl, A., Claussen, J., Thompson, H., and Wheeles, D. (2002) Integrated Marine Management Concessions – A New Approach to An Old Problem. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, pp. v-37-v-38.

39 Kecamatan Biak Utara, Biak Timur, Biak Barat, Numfor Barat, Numfor Timur, Supiori Utara, Supiori Selatan, Warsa, Padaido Bawah, Padaido Atas, Yendidori and Samofa.

40 The sources for the discussion of geographical and socio-economic factors are: Kriastomo, T., (1998) Profil Kepulauan Padaido (Profile of Padaido Islands) Buana Khatulistiwa, NGO Spatial for Information, http://www.bk.or.id (access on 24 September 2003); "Ekonomi Kabupaten Biak Numfor" (Economic of the District of Biak Numfor), Kompas Daily News, 14 January 2003, http://www.kompas.co.id (accessed on 24 September 2003).

Owi, Auki, Pai, Pakreki, Padaidori, Mbromsi, Pasi, Manggwandi, Workbondi, Nusi, Wurki, and other small islands of Rasi, Nukori, Dawi and Runi.

Figure 7-3: Padaido Islands

Please see print copy for Figure 7-3

Socioeconomic Aspects

Most of the Padaido Island residents are migrants from Biak Numfor Island. According to 1995 statistics, the population of the Padaido Islands was 3,877. Most are fishers, and the rest are farmers. Fisheries provide most of the regional income. In 2001, approximately Rp. 74.47 trillions (US$8.75 millions), or 35% of Biak Numfor's total income came from fisheries.

As on some other islands in eastern Indonesia, traditional community management, s*asi,* applied in the Padaido Islands. Almost all of the management in the area, including that of marine resources, was by the community. However, due to the implementation of a centralised system, the *sasi* system is now disappearing. Only, *sasi* of coconut still exists in these islands.

The community of the Padaido Islands, like others in Papua, is strongly influenced by the Church. The Christian missionaries from Europe established missions here in the twentieth century. Since then, there has been significant upgrading of the community's quality of life. This was driven by the emergence of a new culture with modern cultural systems replacing primitive techniques. These include: (i) the economy changing from barter to cash; (ii) the changing of the belief system from animism to Christianity; (iii) introduction of education; and (iv) the change from a local system of government to a centralised system.

Resource Access

The structure of the Padaido Islands consists mainly of limestone; therefore, these islands are not agriculturally fertile. They are poor in land-based natural resources in comparison with other islands in Papua, but they do have marine and coastal resources. Coconut is the main agricultural product.

The Padaido Islands also have potential as a tourist destination. Almost all the islands are surrounded by white sandy beaches. However, due to inadequate transportation infrastructure, the Padaido Islands cannot compete with other tourist destinations in Indonesia, such as Bali and Lombok. Originally, there was an international flight from Jakarta-Bali-Honolulu through Biak. However, this route was closed following the economic crisis in 1998. The closure of the area to tourism had a significant negative impact on community income. Destructive fishing practices then started to supplement this reduced income.

Local policies and regulations

As in other districts in Indonesia, the district of Biak Numfor also developed *Pola Dasar Pembangunan Daerah Kabupaten Biak Numfor Tahun 2001-2005* (Basic Pattern of Regional Development of Biak Numfor District of 2001-2005),[41] as the basis of planning development programs of the district. However, it may be that Biak Numfor is the worst case of the selected districts in this study in terms of marine development programs. Even though almost 30% of its territory is comprised of ocean, there has been no single program focused on marine development. The planning for development of the marine sector, including the use and development of coral reefs, is included in the program of natural resources and the living environment. This has resulted in a lack of focus on marine development programs implemented by the regional government, as they appear as an "add on" to other key programs, and not a key program in their own right. Although some marine environment projects have been implemented, such as COREMAP, these were initiated and funded by the central government and international donors. Other community-based resource management initiatives were carried out and funded by national and international NGOs, such as KEHATI and RUMSRAM. There is no single program on the marine environment initiated and funded by local government.

Similar problems also occur in the development of local regulations for coastal and marine resources management. Since the enactment of the Autonomy Law in 2001, there has been no single regulation on coastal and marine resources management issued by this local government. With the support of some NGOs and COREMAP, a "draft" local regulation for integrated natural resources management

41 Pola Dasar Pembangunan Daerah Kabupaten Biak Numfor Tahun 2001-2005 was enacted by PERDA No. 21 of 2001.

was prepared for the Padaido Islands. However, due to lack of awareness and expertise at all government levels, including in its own parliament, this regulation was never issued.[42]

This lack of district action may have been caused, in part, by the effect of thirty-five years of strong, centralised control under the former President Soeharto, which suppressed local initiatives. The impact is clearly visible in this region. It has resulted in lack of motivation, creativity and commitment, with the district government being wary of taking individual action. District officials wait for instruction or guidance from the central government, even though the right to decide and take appropriate action has been provided by the Autonomy Law.

It is fair to say, however, that the Biak Numfor condition is just one example of the failure of implementing decentralisation in Indonesia which is particularly so with the regional governments located in remote areas of eastern Indonesia. Former Minister Rohkmin Dahuri revealed that many local governments are still slow to act on their own and are continuing to voice the need for national guidance and direction in many sectors, including coastal and marine resource management.[43] Capacity building and public awareness activities are needed by regional governments to improve and strengthen their management capacity. Without support from the central government, decentralisation cannot be implemented successfully.

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42 This fact is based on the result of field research carried out by the author in February 2004.

43 Dahuri, R. (2001) Decentralizing and Delegating ICM to Regional and Local Communities: A Precarious Balance of Authority, Capacity and Consistency. UNESCO, Oceans and Coasts. Pre-World Summit on Sustainable Development Conference, Paris, France – December 2001.

7.5 Conclusion

The development and implementation of regional policies and regulations for coral reef management in the Riau Archipelago, Selayar and Biak Numfor Districts demonstrates a diversity in outcomes and leads to several conclusions relevant to this thesis.

First, there have been no specific policies for coral reef management issued by these selected districts. Use and development of coral reefs has been included in marine environment, natural resources and fisheries development programs. However, due to the lack of effective, specific and formal management measures focused on conserving coastal and marine resources, including coral reef ecosystems, the selected districts have been unable to address their coastal and marine resources management problems. There is also no integrated approach to marine sector management that has been applied by the selected districts.

Second, although some regional policies for the marine sectors have been developed and implemented by the regional governments, in fact most of these policies did not address socioeconomic problems at the local sites and thus were not successful. The practices of the *tauke* and *punggawa* systems still exist in some areas of Indonesia, particularly in Riau and South Sulawesi. These systems encourage coastal communities to use illegal fishing practices to meet subsistence needs. This situation can only be redressed by involving all stakeholders in sustainable, integrated marine, coral reef and fisheries management programs, supported by an effective monitoring, control and surveillance enforcement schemes. However, the most important one is to break down the patron-client system that entraps small poor fishermen into cycles of indebtedness and dependency.

Third, a new impetus for coastal and marine management has emerged in some regional governments since the enactment of the Autonomy Law. The lack of infrastructure, staff and funds of the central and provincial governments has resulted in the lack of capability of these levels of government to control and manage the exploitation of natural resources under their authority. This has led to greater demand from some archipelagic districts for more authority for coastal and marine resources management in archipelagic and remote areas. It is a reasonable demand that merits farsighted consideration from central and provincial governments. This requires a review of the existing Autonomy Law.

Fourth, the effects of thirty-five years of a strong, centralised regime are still visible in some regional governments with regard to their lack of initiative and commitment to action. The habits of awaiting instruction, guidance and direction from central government have not yet disappeared in many governance aspects, including coastal management. This has resulted in the suspension of many regional regulations. Even though legally, the authority to act and decide on their needs is already given to district government, due to a lack of expertise, experience, assistance and knowledge, they do not know what they want to do, are still unsure of their authority, and do not know how to proceed. It is clear that the regional governments need support from the national government to strengthen their management capacity; otherwise, the decentralized system will fail. This could possibly be an unconscious desire of the core "centralists" in Jakarta who do not favour decentralisation and empowerment of communities and districts.

Fifth, the case studies in this chapter have demonstrated that there is a lack of effective, specific and formal management measures to protect and conserve coral reef ecosystems in all the selected districts. The principles of integrated coastal zone

management are needed to achieve effective management of coral reefs in all sites. It is also argued that the success of coastal and marine resources management, including coral reef management at the local sites requires intervention and support from all stakeholders who influence the socioeconomic situation in the communities, even those who may not support conservation at present, e.g. the *punggawa* and the *tauke*.

Finally, it appears that the Autonomy Law cannot accommodate an "archipelagic" district's commitment to manage its marine resources in a holistic manner. This needs to be addressed. Further, the implementation of the Autonomy Law was not accompanied by the required education and information programs which would have allowed district leaders to assume their new management responsibilities and authority. Without this, decentralisation continues to struggle and be prone to re-centralisation. This may impact on the sustainable management of marine and coastal areas.

Chapter Eight

Analysis of the National Policy Framework Relevant to Coral Reef Resources Management in Indonesia*

8.1 Introduction

The purpose of this chapter is to examine the Indonesian policy framework for coastal and ocean resources management, including coral reef management. This chapter examines the function of policy on coastal and ocean resource management and will include policy at national and regional levels that relate to coastal and marine resource management, in particular those that impact on coral reef management. It will also outline several major challenges faced by the Indonesian government in formulating a national coral reef policy. Alternative policy recommendations for the Indonesian Government's consideration will be provided to improve coral reef management.

8.2 Indonesian National Marine Policy

Before attempting to discuss the existing marine policy, it is valuable to look at the previous Indonesian marine policy. The previous Indonesian marine policy was called "Chapter 18". Chapter 18 was the result of cooperation between the

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* Some parts of this chapter have been formulated into a paper with the same title. It will be published in *Jurnal Lingkungan*, University of Indonesia (forthcoming).

Indonesian Government and the United Nations Development Program (UNDP) created as the follow-up to Agenda 21. The objective of this cooperation was and is still to produce a sustainable development outcome.[1] Chapter 18 deals specifically with "Integrated Management and Sustainable Development of Coastal and Marine Areas." Seven programs were included in Chapter 18:

- Integrated Planning and Resource Development in Coastal Zones;
- Monitoring and Protecting Coastal and Marine Environments;
- Sustainable Utilisation of Marine Resources;
- Enriching and Empowering Coastal Communities;
- Sustainable Development of Small Islands;
- Monitoring Security of the Exclusive Economic Zone; and
- Managing the Impacts of Climate Change and Tidal Waves.

In general, the policies for coastal and marine management are highlighted in "Chapter 18" and the programs it established. These are credible programs to address the problems of marine and coastal management in Indonesia. There is no doubt that the management of coastal and marine resources would improve significantly if Indonesia were to implement those policies.

From 1969 to 1998, the Indonesian development strategy used the Broad Guidelines of State Policy *(Garis-Garis Besar Haluan Negara/GBHN)* as a national

1 Dutton, I.M. (1999a) What is Chapter 18 of "Agenda 21 Indonesia", in Rais, J., Dutton, I.M., Pantimena, L. Plouffee, J. and Dahuri, R. (eds.) Integrated Coastal and Marine Resources Management. Proceedings of International Conference. Malang 1998. Information provided by Reef Base – A Global Information System: "Indonesia: Management – Legislation": Reefbase: http://www.reefbase.org (accessed on 2 November 2003).

plan for the holistic development of the country at that time. This strategy had been decreed by the General Peoples Assembly *(Majelis Permusyawaratan Rakyat/MPR)* held once every five years. However, based on the Act No 25 of 2004 concerning National Development Planning Systems (NDPS Act), the GBHN was changed to the Long Term National Development Plan (Long Term Plan). The Long Term Plan is the vision, mission and guidelines of the national development plan which is valid for twenty years.[2]

The NDPS Act also provides for the obligation of government to develop the Medium Term National Development Plan (Medium Plan) for a five-year period and the Annual National Development Plan or the Annual Government Development Plan (Annual Plan).[3] The Medium Plan also symbolised the vision, mission and program of the President of the Republic of Indonesia.[4] The Annual Plan comprises development priority; a macro economic plan; and ministerial and non-departmental programs.[5]

The NDPS Act was enacted on 5 October 2004. Thus, it is too early to asses the achievement of the national development plan. It takes several years to establish an appropriate Medium Plan. To avoid the absence of a national development plan in this transition time, Article 34 (1) of NDPS Act stipulates that if the Medium Plan has not been established, the government can use the GBHN as the national guidelines. With respect to the NDPS Act the GBHN of 1999-2004 is being used as a

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2 Articles 4(1) and 1(4) of Act No 25 of 2004.

3 Articles 1(5) (8) of Act No. 25 of 2004.

4 It was arranged in Article 4 (2). This article originally is the follow-up of the amendment of the Indonesian Constitution of 1945, which dramatically changed the system of the President's election from indirect to direct election. The former Constitution arranged that the President of the Republic of Indonesia is elected by the MPR. Article 6 of the 1945 Constitution stipulates that the President and Vice President are elected as a pair and elected directly by the Indonesian people. As a consequence of the new system, this amendment was also deleted and changed Article 6 of the former Constitution regarding the rights of the MPR in establishing the GBHN.

5 Article 4 (3) of Act No. 25 of 2004.

guideline for the national development plan until the Long Term Plan is established. Therefore, analyses of the national marine policy will be based on the GBHN of 1999-2004 and other subsequent documents of GBHN.

The basis of the national marine policy is Section X of GBHN of 1999-2004 concerning the development of natural resources and the living environment. This document suggests that the utilisation of natural resources will be governed by the objective of achieving sustainable development, economic development, local community culture and spatial planning.

However, it is fair to say that the development of the policy and its implementation for a marine program has lagged behind other sectors. From its independence in 1945 up to 1994, Indonesia has paid little attention to the sustainability and development of the marine sector.

A change occurred after 1994 when the marine sector was made independent from other institutional and economic sectors in the Five Year Development Planning (Rencana Pembangunan Lima Tahun/REPELITA)[6] VI of 1994. Since then, national development planning has focused on the marine sector. The National Development Program (Program Pembangunan Nasional / PROPENAS) of 2000-2004,[7] stipulates six objectives for marine development in Indonesia. These include: the development and empowerment the coastal communities; the increasing of the effort on rehabilitation and conservation of coastal ecosystems, including mangroves, coral reefs, seagrasses, and other marine biodiversity; the improvement of the

6 In 1999, REPELITA was changed to Program Pembangunan Nasional/PROPENAS (National Development Program) and later according to the Act of the NDPS the PROPENAS also changed to Rencana Pembangunan Jangka Menengah Nasional/RPJMN (the Middle Term National Development Plan).

7 PROPENAS of 2000-2004 has been enacted as Act No. 25 of 2000 in Indonesian law to provide a legal base for action under its mandate.

security and control of marine natural resources utilization, including fisheries resources; conducting the spatial planning in marine space; the development and utilisation of coastal, marine and small islands resources; and the improvement of efficiency and productivity of coastal and marine resources, including fish resources through integrated management of the resource users.

The road to improve the management of coastal and marine resources in Indonesia is long and a lot of work remains to be done by all stakeholders. The separation of the marine sector in the REPELITA or PROPENAS has not yet fully addressed all the problems of the sector. Time has proven that Indonesia has not been able to implement these programs. Further degradation has and is still occurring in all of Indonesia's natural resources, including fisheries, coral reef, sea-grass and mangrove ecosystems. Indonesia has not shown the political commitment to seriously address responsible or sustainable coastal ecosystem, including coral reef management. Fragmentation and duplication in planning and implementation are still challenges facing the development program of coastal and marine resources.

Today, it appears that the three main problems in the national marine policy of Indonesia. The lack of any effective inter-agency mechanisms to integrate these policies is the main problem in national marine policy. Ego-sectoral exists in almost all national government agencies. Each sectoral agency feels that their sector is more important than the others. A lack of coordination also exists in the existing laws for the conservation and protection of coastal/coral reef ecosystems. This resulted in difficulties in implementing the national marine policy effectively. Finally, there is a weak commitment to enforcement of conservation measures.

The remaining part of this section, therefore, analyses the detailed aspects of Indonesia's marine policy in the fisheries, environmental, mining, maritime transportation and tourism sectors.

8.2.1 Fisheries Policy

Indonesia has a large and diverse fish resource base. The Maximum Sustainable Yield (MSY) of Indonesia's fish resources was estimated in 2002 at approximately 6.26 million tonnes per year, of which about 4.4 million tonnes can be caught in internal waters and about 1.86 million tonnes from the EEZ.[8] A Total Allowable Catch (TAC) of about 5.01 million tonnes or 80% of total MSY has been set by the Ministry of Marine Affairs and Fisheries.[9] The fisheries sector contributes approximately 12.4% (US$ 7 billion) to the GDP of Indonesia.[10]

Currently Indonesian fisheries development is faced with micro technical and macro structural problems. The micro technical problems include the high rate of poverty of Indonesia's fishers, low productivity, over-fishing in some areas, illegal fishing by national and foreign fishers, increasing degradation of fish habitats, conflict of interest on spatial planning, lack of post-harvest production skills resulting in waste and poor marketing, and lack of data and information.[11] Macro structural problems occur due to external conditions regarding socioeconomic, political, legal and institutional arrangements. These include the lack of legal and institutional arrangements, and lack of a macro-economic policy for sustainable

8 Source: Departemen Kelautan dan Perikanan (the Ministry of Marine Affairs and Fisheries): Rencana Strategis Pembangunan Kelautan dan Perikanan Tahun 2001-2004 (Strategic Plan of Marine Development and Fisheries of 2001-2004), 29 May 2002., p. 5.
9 Ibid.
10 Ibid., p. 9.
11 Ibid., pp. 16-17.

fisheries development: in essence a lack of political commitment to sustainable natural resource management.[12]

There are three components to the fisheries policy in Indonesia. The first is the management of fish catches through the monitoring and control of catches. The policy of management of fish catches will be focused on the overfished areas. The precautionary principle will be employed in the future through the limitation on development of fishing fleets in the over-fished areas. Strict implementation of the TAC or effort controls throughout the EEZ, and particularly eastern Indonesia where intensive fisheries harvesting is ongoing.[13] Those fish catches policy and strategy will be conducted through an integrated regional[14] approach to management of fisheries.[15]

The second major component of the fisheries policy is the enhancement of aquaculture production. This is a priority fishery policy and should be developed in future. To implement this policy three strategies need to be addressed by government, including: establishment of spatial planning for aquaculture purposes; developing appropriate water quality and environment standards for aquaculture; and establishment of a seed restocking management program.

The third component is to increase added value for fisheries processing. This is to be achieved through the establishment and implementation of policies for post-

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12 Ibid., p. 19.

13 In these areas, the empowering of artisanal fishers is a goal to achieve joint stewardship and co-management of resources.

14 "Regional" in this sense, means internal country regions as opposed to the international concept of "regions"

15 The Regional Development and Fisheries Management (Wilayah Pengembangan dan Pengelolaan Perikanan dan Kelautan/WAPPEL) was developed to implement the regional integrated approach. WAPPEL is created based on: the natural resource potential, human resource development, regional economics, the availability of infrastructure, a socio-cultural component and community institutions.

harvest production such as quality control standards and processing to meet international requirements.

8.2.2 Environmental Policy

Over-fishing and other destructive fishing practices have caused degradation of coastal and marine resources.[16] Policy on the marine and coastal environment entails two major activities: (i) the conservation of marine resources, and (ii) the prevention of marine pollution. Both aspects are addressed by Indonesia's environment policy.[17]

There are five objectives of the Indonesian environmental policy.[18] The first is to manage the natural resources and maintaining its carrying capacity for the benefits and improvement of social welfare from generation to generation. The second is to increase the utilisation of natural resources and living environment through conservation, rehabilitation and the application of environmentally friendly technology.

The third is to prevent and control degradation and pollution of the living environment. The fourth is to delegate central government authority to regional governments in the management of natural resources in a selective way and maintaining the living environment until quality of ecosystems is maintained as prescribed by law.

The fifth is the utilisation of natural resources for social welfare with give attention to sustainable function and the balancing of living environments,

16 Nontji, A. (2000), Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium. Bali, 23-27, 2000 Proceeding Vol. I, p. 22.
17 Source: Chapter X of PROPENAS 1999-2004.
18 Ibid.

sustainable development, economic purposes, local community culture and spatial planning that have been arranged by laws.

8.2.3 Forestry Policy

The policy of the conservation and management of coral reefs and other coastal ecosystems, in the forestry sector, is included in the national policy for the management of Indonesian wetlands. The National Strategy and Action Plan for the management of Indonesian wetlands was developed in 1996. However, the lack of stakeholder involvement in the preparation, and the lack of formal legislative implementation resulted in the lack of implementation. This national policy failed to address the problems associated with the management of wetlands in Indonesia.[19] The National Strategy and Action Plan for the Management of Indonesian Wetlands of 2004 (SPNLB-2004) was developed by government to replace the former one.

According to the SPNLB-2004, there are five policies for the management of Indonesian wetlands. The first policy is sustainable development and use. In order to achieve this policy, there are two principles that should be adopted in utilisation of wetland ecosystems. These include conservation and rehabilitation activities.[20] The second policy is benefits and priority principles. This policy suggests that it is necessary to identify functions, values and types of appropriate management before utilising wetlands ecosystems.[21]

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19 The National Strategy and Action Plan for the Management of Indonesia Wetlands (Strategi Nasional dan Rencana Aksi Pengelolaan Lahan Basah Indonesia), the State Ministry of Environment (2004), p. 2.
20 Ibid., pp. 58-59.
21 Ibid., pp. 59-60.

The third policy is community-based management. The involvement of local communities in the decision-making process in wetlands management is required. The fourth is the need to adopt an integrated management approach. This policy is to address conflict of interest among the resource users of wetlands areas. The management of coastal wetlands should be based on local culture and traditional knowledge.[22] The fifth is the need to apply good governance principles. Coastal wetlands have important functions and values for the national economy and the environment. To avoid conflict of interest, transparent and wise utilisation principles are required in the management of these areas.[23]

There are eleven strategies to implement these policies that have been suggested in the SPNLB-2004. However, only four main strategies relate to development and management of coral reefs. The first policy is increasing the community roles in wetlands management. The vast area and complex management of wetlands areas with several ecological, social, and economic characteristics caused difficulty in the government management of these areas. A community role is required in developing and implementing the policies of wetlands management. This strategy can be done through the improvement of community awareness of the importance of coastal wetlands, and the increasing community involvement in all levels of the decision-making process.

The second strategy is the development of policy and legislation. Sustainable wetland management requires consideration of several aspects, including the legal aspect.

22 Ibid. pp. 59-60.
23 Ibid., p. 61.

The third strategy is the strengthening of institutions. The wetlands areas sometimes possess on several provinces, districts and cities jurisdictions; and also managed by several sectoral departments. No one of all government agencies has a single responsibility for all aspects of wetlands conservation and management. Although there are efforts to improve coordination mechanisms, there is no significant result in managing of wetlands areas at national level. The need to develop a strong institution for managing wetlands areas, including institutional capacity and financial aspects is very urgent. The development of integrated management mechanisms at the national level is also required.

The fourth strategy is the education through a public campaign regarding the importance of wetland ecosystems for human kinds. Community support is required in developing and implementing policy and legislation of wetland management. The community support can be achieved through public socialization of wetland management issue, including the understanding of the value and function of wetland ecosystems for community welfare. It is known that the Indonesian wetlands have influenced directly and indirectly the lives of most Indonesian people. However, there is only little community attention on the sustainability of wetland ecosystems. A systematic effort is needed from all institutions to elevate the issues of value and functions of wetland ecosystems into primary consideration in community and government programs.

8.2.4 Marine Tourism Policy

Marine tourism including seaside, cultural, sport and cruise tourism is a potential sector for the marine development in Indonesia. It is reasonable therefore, for the marine tourism sector to be expected by the Indonesian government to drive

the community's economic agenda with its multiplier effects. Further, by providing and creating jobs, marine tourism can also be expected to assist with the alleviation of poverty of coastal communities in Indonesia. A recent study estimated the potential contribution of the marine tourism sector to the Indonesian economy at US$ 26.56 billion between 2004-2024.[24] Several policies have been developed by the Indonesian government to realise this potential. Policies relating to the use and development of coral reefs, include (i) to develop a model of marine tourism management that stresses sustainable development of marine ecosystems and encompasses the cultural aspects of the local community; and (ii) to increase the capacity and capability of human resource development in the management of the marine tourism industry.[25]

8.2.5 Mining Policy

The Indonesian mining policy applies to mining activities for all non-living resources and their exploration and exploitation both on land and from the ocean. Oil and gas are the primary mining activities of Indonesia, providing the main source of revenue for Indonesia since the 1970s.[26] The mining sector financed and fuelled Indonesia's economic development during the 1970s when oil revenue contributed over 80% to the national revenue.[27] Almost 35% of oil production in Indonesia is derived from offshore mining activities.[28]

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24 PKSPL-IPB (1998), as cited by Kusumastanto, T. (2003) Ocean Policy: dalam Membangun Negeri Bahari di Era Otonomi Daerah (Ocean Policy: In developing maritime country in regional autonomy era). Jakarta, PT. Gramedia Pustaka Utama, p. 115.

25 Kusumastanto (2003), no 24 above, pp.114-115.

26 Soegiarto, A. and Stel, J.H. (1998) The Indonesian experience in marine capacity building. In Marine Policy Vol. 22 No. 3, p. 258.

27 Ibid.

28 Ibid.

More recent economic development in other Asian countries, particularly Singapore, has diversified mineral exports from Indonesia. For example, sand-mining has been developed in Riau Province in order to fulfil Singapore's demand for sand for roads, building construction, and reclamation of its beaches.[29] This is both positive and negative for Indonesia. Economically, the sea-sand mining industry contributes significant money to Indonesia's economy,[30] but it also has a negative impact on marine ecosystems, including coral reefs. The government's policy on sea-sand mining has vacillated considerably and remains unclear. This is further aggravated by the lack of effective coordination among the government agencies that are mandated to coordinate this sector, although a committee for the monitoring and controlling of sea-sand mining was established by the government.[31] Through the Minister of Trade and Industry Decree No. 117/MPP/Kep/2/2003, the Indonesian government finally decided to place a moratorium on sea-sand mining activities for export.

Although coral reef mining is prohibited by law, it still occurs in some coastal areas in Indonesia.[32] Enforcement of the Mining Act is very weak.[33] The Indonesian mining policy has focused on exploitation of non-living resources for economic purposes only and the conservation and minimisation of the negative ecological impacts on coral reefs has largely been ignored.

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29 Sea-sand mining activities in Riau have been conducted since 1984. Source: "Pemerintah didesak cabut moratorium ekspor pasir laut" (Government is pressured to withdraw the moratorium of sea-sand export), *Kompas Daily News*, 16 November 2003, http://www.kompas.com

30 It estimates that 5% of Riau Province income or Rp. 26 trillion (US$2.8 million) come from sea-sand mining activities in that province. Source: *Jaringan Advokasi Tambang (Mining Advocacy Network) Newsletter*, Vol. III. No. 14, July 2001, http://www.jatam.org/Indonesia/newsletter

31 Tim Pengendali dan Pengawasan Pengusahaan Pasir Laut (Committee of Monitoring and Controlling for Sea Sand Mining Management) was established by the government in order to increase coordination among the government institutes. It was comprised of all the government institutes.

32 Nontji (2000), no 16 above, p. 22.

33 For detailed discussion see Chapter Six.

8.2.6 Marine Transportation Policy

As an archipelagic state, Indonesia must rely heavily on marine transportation. This sector has significant political and social economic significance by providing lines of communication between the central and regional areas. The development of the marine transportation sector may not directly affect the use and management of coral reefs, but this activity, if uncontrolled, can potentially create pollution that can damage coral reef ecosystems.

Indonesia's waters are susceptible to pollution from oil spills. It was estimated that 27% of the world's traffic or 7 million barrels of crude oil per day are transported through the Malacca Straits and other Archipelagic Sea-Lanes of Indonesia, such as the Sunda, Macassar and Lombok Straits. These are the busiest traffic routes of crude oil transportation in the world.[34] Ship transportation through Indonesian waters resulted in a number of maritime incidents. Between 1975 and 1997, 104 shipping accidents occurred that caused damage to marine and coastal areas through pollution from oil spills.[35]

Even though Indonesia has ratified several international conventions that address prevention of pollution from ships,[36] inter-agency co-operation and enforcement/implementation of the laws are weak. There is no single program within the marine transportation policy that relates directly to the prevention and rehabilitation of coastal and marine ecosystems from ship-sourced pollution. Government policy, once again is focused on the development of the shipping

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34 The State Ministry of Environment and PKSPL-IPB (2003) Potret kondisi dan permasalahan pengelolaan sumberdaya di wilayah pesisir dan laut (A snapshot of condition and problems of resources management in coastal and marine areas), the State Ministry of Environment, http://www.menlh.go.id (accessed on 8 April 2005)

35 Ibid.

36 See discussion on international conventions that have been ratified by Indonesia in Chapter Six of the thesis.

industry itself, and not the implementation of standards to address transportation-related pollution. Indonesia has not yet developed any Oil Spill National Contingency Plans. In fact, there is no special agency responsible for the management of oil spills from ship operations.

8.2.7 Small Islands Development Policy

The Convention on Biological Diversity (CBD) and other results of United Nations Conference on the Environment and Development in Rio de Janeiro (such as Agenda 21) were approved by Indonesia almost ten years ago, but there have been no significant efforts to implement these instruments. One program of Agenda 21 is the sustainable development of small islands. More than two-thirds of all Indonesian islands are small, they have considerable natural resources that can potentially be developed. There are two categories of small islands adopted by UNESCO in 1991. First, "small islands" are defined as those having an area equal or less than 2,000 square kilometres and a width not exceeding 10 kilometres. Second, "very small islands" include those whose surface area does not exceed 100 square kilometres or a width not greater than 3 kilometres.[37] To date there has been no significant effort by Indonesia to develop its small islands. Most of development programs have focused on the larger islands.

There are two political and economic benefits that can accrue from developing small islands. Specific ecosystems and resources of small islands are a source of capital for local economic development that can contribute to the national

37 Tsiourtis, N.X. (2004) Small islands water resources development a holistic approach. http://www.waterinfo.gr/eedyp/Paros_papers/pdf (accessed on 12 May 2004).

income. The success of sustainable development of small islands will also reduce the development gap between different regional and community groups.

It is not easy, however, to develop small islands. The characteristics of size, resources, remoteness and uniqueness create limitations for development. According to Kusumastanto, there are five limitations in developing small islands.[38] The first is their size and location which create a limitation on the human resource development. Their remoteness and lack of infrastructure also result in a lack of skilled labour. The second limitation is the lack of natural resources and environmental services such as the availability of fresh water, land, and stock of wild animals. These affect the carrying capacity of the islands to accommodate human activities.

The third limitation is the difficulty of generating profitable economic activities. The limitations of natural resource availability and the size of the island make it difficult to develop transportation, industry and administrative sectors. The fourth limitation addresses the close linkage between natural resources productivity and environmental services. The exploitation of natural resources (such as coral reefs and mangroves) contributes to the degradation of the natural ecosystem. For example, illegal logging in Palawan Island in the Philippines and some islands in the East Caribbean caused land erosion and subsequently increased sedimentation in coastal areas, resulting in further degradation of coral reef ecosystems.[39] The fifth limitation of small islands is the local community culture. It is known that some local cultures are against marine development, especially marine tourism. For example,

38 Kusumastanto (2003), no 24 above, pp. 107-109.
39 Ibid., p. 108.

some of Indonesia's local cultures do not permit marine tourism development such as swimming, snorkelling and other beach activities for religious reasons.[40]

Although there are problems associated with small islands development, it does not mean that they cannot be developed. An integrated approach should be used to address these problems. The development should follow ecological principles, and not be only economically oriented. The change in development orientation from land to coastal and ocean development, and the political change from centralised government to local autonomy, is directly influencing the opportunity for the Indonesian government to develop its small islands.

The Development Strategy of the marine sector by the Ministry of Marine Affairs and Fisheries for 2001-2004, identified five main policies for small islands and coastal areas programs.

The first policy is increasing the efficiency of the utilisation of marine and coastal space. The purpose of this policy is to manage coastal and marine space. This policy can be done through the establishment of regulations for the spatial planning of small islands, marine and coastal areas.

The second policy is the implementation of integrated and sustainable management of small islands. This policy will be focused on the utilization of coastal resources that exist around small islands and the empowerment of the local community that live on that island.

The third policy is protection and preservation of coastal and marine resources and its ecosystems. This policy will focus on the management of marine conservation areas, fish sanctuaries and marine endangered species. The fourth policy is improvement and enhancement of the quality of marine and coastal

40 Ibid., pp. 108-109.

resources. This policy will be carried out through the rehabilitation of marine and coastal ecosystems that have degradated. The policy also include the control of marine pollution from land based activities and natural disaster mitigation.

The fifth policy is the empowerment of social economic of coastal communities. This policy is to address the problems of poverty in coastal communities. The complicated problems on social and economic sectors force to apply a holistic approach that covers all living aspects and economic activities of coastal communities.

In terms of sustainability, it cannot be denied that these programs are credible for small island development, they also relate to the use and management of coral reefs. It is necessary for the government to implement the above programs in order to achieve the desired outcomes for the country.

8.3 Evaluation of National Marine Policy in Indonesia

It is fair to say that no specific management measures have been applied to protect and conserve coral reefs in Indonesia. Their use and management is included in general marine and coastal resources management and conservation programs, but not integrated into specific marine sector programs. Although some aspects of marine activities e.g. fishing, mining, forestry, marine tourism, marine transportation and small island development are related to or influence the use and development of coral reefs, only two of these activities, forestry and small island development programs have provided programs for the preservation and conservation of marine ecosystems. The implementation of these preservation and conservation programs, however, remains very weak.

The orientation of most of the marine development programs is sectoral. No integrated policy for marine coastal management at the national level has been developed by Indonesia. The policies are more focused on economic development, for example, the mining and transport policies. Although there is a program for small islands the policy was only launched in 2001, and it is limited to the development of small islands only. The absence of an integrated policy on coastal and marine resources management has resulted in a lack of coordination among coastal and ocean resource programs and government agencies. This is further exacerbated by the lack of inclusion of the provinces and districts in the policy process.

The National Development Planning Board/BAPPENAS notes that the government faces five problems regarding the upstreaming component of the marine development sector.[41]

The first is the legal support for management, including the uncompleted legal framework for the management of coastal and marine resources.[42] Although in 1985 Indonesia has ratified the 1982 LOSC, there has been no legislation to implement this international legal agreement since its ratification.

The second problem is the combined concern of human resource development, institutional arrangements, and science and technology capacity. These include the limitation of human capacity and capability in the marine sector; the existing institutional arrangements which have not yet developed a framework for sustainably developing the marine and coastal resources; and marine science and

41 Marine Sector Program on National Development Plan 2000-2004 (PROPENAS 2000-2005)
42 Ibid.

technology capacity which has not yet been developed and implemented appropriately.[43]

The third concern relates to the problems of data and information. These include the lack of data and information on marine living and non-living resources; the lack of commitment to establish a credible data collection system; and the lack of a networking system within the country or linkages to the international networks on marine data and information. The Ministry for Marine Affairs and Fisheries also lacks data verification and analytical capacity.[44]

The fourth concern of BAPPENAS is the inadequacies of the development planning system, including the lack of integration for marine sector development. This has resulted in conflicts among stakeholders in the marine sector, among regional and district governments, and among community groups.[45]

The fifth and final concern highlighted by BAPPENAS is the lack of focus on sustainable development. The government has not yet paid attention to the local community institutions that traditionally provided mechanisms for the sustainable use of natural resources. This lack of attention to local experience has resulted in over-exploitation of the natural resources.[46]

The problems with the national policy and development planning system of coastal and marine resources management in Indonesia have also been exacerbated by the lack of institutional arrangements for marine and coastal management. Until the end of 1999, there was no single national, provincial or local institution(s) that

43 Ibid.
44 Ibid.
45 Ibid.
46 Ibid.

had responsibility for management of coastal and ocean resources.[47] Even though significant efforts had been made in 1999, such as the establishment of the Ministry of Marine Affairs and Fisheries and the enactment of the Autonomy legislation and more equitable financial sharing in 1999, Indonesia has not yet holistically addressed the problems surrounding the planning and development of coastal and ocean resource management. Fragmentation still occurs among government institutions at the national, provincial and district levels due to the lack of effective inter-agency mechanisms.

Devolution of authority from central to local governments in managing the natural resources has not yet fully addressed the problems and challenges of coastal and marine resource management at the local level. The absence of national policy and guidelines is the key problem that influences the ad hoc policies at the local level. As a result of the economic focus at the national level, most of the local policies are also heavily influenced by economic outcomes as opposed to rational and sustainable resource management. There have been only a few regional policies that have considered environmental and sustainability issues.[48]

In summary, it can be concluded that although Indonesia has a wide range of policies on coastal and marine management at the national level, most of these policies were enacted by the Indonesian government as national laws. Nevertheless, aside from that advantage, policies are scattered among several government institutions. This has resulted in fragmentation in planning and implementation of a marine and coastal management policy. The establishment of an integrated,

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47 For detailed discussion of institutional arrangement see Dirhamsyah (2004.a) Regional Policies and Regulations for Coral Reef Management: Case Studies on Riau Archipelago, Selayar, and Biak Numfor Districts, Indonesia. *Maritime Studies* No. 136, pp. 7-20.

48 Ibid., p. 10.

sustainable national policy on marine and coastal/coral reef resources management could be considered by Indonesia as a solution to reduce fragmentation. The establishment of a national policy should also define the rights and duties of government institutions and other stakeholders with respect to coastal and marine resources. The establishment of an effective inter-agency mechanism for the integration of development planning and implementation of such plans at all levels is urgently required.

As one of the instruments of coastal management, a policy cannot standalone, it should be given a formal legislative effect to provide its authority for implementation. The Indonesian experience shows that it is hard, if not impossible to get voluntary compliance from government agencies to an unregulated agreement or planning scheme. It is therefore necessary for Indonesia to ensure that national policy is enacted into national law.

8.4 Solution and Policy Implications

From the problems identified above, it can be seen that the Indonesian policy framework for coastal and marine resources management at both national and regional levels is very complex. A combination of both comprehensive and specific approaches is needed to address these issues. This section provides options for a policy framework for coastal and marine resources management, with a specific focus on coral reef management.

8.4.1 Creating the policy and strategy for the use and management of coral reef ecosystems

Natural resource management in Indonesia will not improve through the implementation of the current programs for the management of coastal and marine resources. The success of coastal and marine resources management is not determined by the number of coastal programs, but it is determined by the quality and interrelation of the programs. In other words, an integrated program is the key to the success of coastal and marine policy. Therefore, one solution that can be considered is the establishment of a National Policy on Coral Reef Management that is accepted by all ministries and enshrined in law.

As a country that possesses almost 15% of the world's corals, which are scattered over one-third of its sea territory,[49] it is reasonable for Indonesia to have a national policy for managing its coral reefs. The establishment of one national policy and strategy on coral reefs will unify and integrate coral reef development and management at national and local levels. The national policy and strategy can function as an umbrella for all development programs regardless of the ministry or institution or level of government. The establishment of one national coral reef policy and strategy can also address the problem of communication and coordination between the state agencies, the lack of coordination between central and regional governments, and mismanagement at these levels.

The establishment of a national coral reef policy and strategy is a one of the management measures for coral reefs that has been successfully used in several countries in the world. For example, in order to reverse trends in coral reef

49 Cesar, H., (1996) Economic Analysis of Indonesian Coral Reefs, the World Bank, Environment Department., p. 2.

degradation, Thailand released a national coral reef policy and strategy in late 1991.[50] Significant progress on coral reef management has been seen in Thailand since the implementation of this policy and strategy.[51] The adoption of the National Coral Reef Policy and Strategy by the Thai cabinet in 1992 encouraged bureaucrats, politicians and the private sector to provide an appropriate budget for its implementation.[52]

Noting the experience of Thailand, it should also be reasonable for Indonesia to establish a national policy and strategy on coral reef management. However, this will not be an easy task, for a national policy and strategy should include and accommodate all aspects of coral reef management. The national policy should also consider the management of coral reefs as part of the broader coastal ecosystem that includes, for example, mangroves, seagrass beds, and other wetlands. Therefore, the policy should be designed to address two basic needs – the need to protect and conserve coral reef resources; and the need to manage coral reef resources nationally, to address conflict over its use, and to obtain a balance between use and conservation.[53] According to Dahuri, the national policy for coral reef management should include six principles.[54] Firstly, program of conservation and rehabilitation of coral reef ecosystems that refers to integrated national and international standards

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50 The establishment of A National Coral Reef Strategy for Thailand is supported by The University of Rhode Islands, USA.

51 Hinrichsen, D. (1998) Coastal Waters of the World: Trends, Threats, and Strategies, Island Press, Washington, D.C., p. 173.

52 Thai government provided a budget of about $2 million and $25,000 over two years from local businessmen for the implementation of the Thai National Coral Reef Policy and Strategy. Ibid., p. 174.

53 Moosa, M.K. (2004) Implementing Policy and Strategy for Coral Reef Rehabilitation and Management: Lessons Learnt from an Indonesian Effort. Information provided by World Fish Center, http://www.worldfishcenter.org/Pubs/coral_reef/pdf (accessed on 20 December 2004).

54 Dahuri R., (2000), Kebijakan dan Strategi Pengelolaan Terumbu Karang Indonesia (Policy and Strategy of Indonesian Coral Reef Management), Prosidings Lokakarya Pengelolaan dan IPTEK Terumbu Karang Indonesia (Proceedings of the Workshop on Management, Science and Technology of Indonesian Coral Reefs, Jakarta, 22-23 November 1999, Indonesian Institute of Sciences, pp. 12-16.

should be formulated. There should also be some level of capacity building for government, community and other stakeholders to effectively participate in planning and managing coral reef ecosystems.

The third principle is to begin planning for Special Marine Protected Areas in the coastal zone in order to conserve coral reef ecosystems and other natural marine resources. Community involvement should also be increased so as to allow for the creation of partnerships between government and the community for managing the coral reef ecosystems. There should be integrated community-based management for coastal communities; and increasing public and community awareness of the importance of coral reef ecosystems as biodiversity places.

Several studies and activities need to be undertaken in order to understand the real problems at local sites. These include baseline studies on the economic and biological aspects of coral reef ecosystems and a subsequent workshop to identify key problem areas for coral reef management at local sites.

Several initiatives have been undertaken to establish a national policy on coral reef management. One example is the draft of the National Policy and Strategy for Coral Reef Rehabilitation and Management for Indonesia developed by COREMAP in 2002. Lack of "political will" resulted in the failure to get the draft accepted by all ministries and government levels as the formal national guideline for coral reef management. The failure may also have been a result of the lack of distribution of the document to all stakeholders resulting in a lack of ownership of the document by the Indonesian government agencies.[55]

55 It fact that the draft of the National Policy and Strategy for Coral Reef Rehabilitation and Management for Indonesia is made by international COREMAP consultants. The lack of stakeholder's involvement in preparation has resulted in the lack of ownerships of this document.

By taking a lesson learned from that experience, it could be argued that the success of the development and acceptance of a nationally integrated policy is truly determined by the political will and commitment of the government bureaucrats and lawmakers. Although such a process was successful in Thailand, the lack of political will and commitment resulted in failure of the exercise in Indonesia. No program has been implemented to meet the recommendations in this document. The failure of "COREMAP's national policy and strategy" provides lessons on how to approach the issue. It requires: socialization at all levels; participation of all stakeholders; acceptance by all, or the majority of those agencies and institutions involved; commitment of all stakeholders and government for adoption and implementation; and legislative support.

8.5 Conclusion

From the above analysis, it can be concluded that there is a lack of effective, specific and formal management measures to protect and conserve coral reef ecosystems in Indonesia. Coral reef ecosystems and other marine and coastal resources are managed and controlled through a very extensive and complex policy framework. Indonesia has not developed a National Policy for management of coastal and marine resources, particularly coral reefs management.

This chapter proposed policy options that can be considered by Indonesia to develop national policy and strategy for the management of its coastal and marine resources, particularly coral reef management. However, the success of coral reef management is not determined by a policy and strategy framework only; success is also determined by the effectiveness and efficiency of management systems. As both

management tools and strategies have close linkages with each other, the success of one aspect is determined by the other.

Chapter Nine

Maritime Law Enforcement and Compliance in Indonesia: Problems and Recommendations

9.1 Introduction

This chapter provides an alternative model of law enforcement for the management of coastal and marine resource in Indonesia. The chapter argues that the establishment of the national maritime law enforcement will improve coordination mechanisms at the national level. It argues that a regional approach is an appropriate law enforcement model at the local level. It is also argued that community-based enforcement integrated into the participatory co-management approach is an appropriate model for effective coral reef management at the village level.

The chapter starts with a review of the implementation and enforcement of maritime laws and regulations in Indonesia and examines several specific issues or problems with maritime law enforcement activities in Indonesia. It continues with a review of recent developments on law enforcement programs in Indonesia. Finally, recommendations to improve the performance in law enforcement activities for coastal and ocean resource management will be put forward.

9.2 Review of implementation of the law enforcement activities on maritime law and regulations in Indonesia

This section will review the practices of maritime law enforcement and the institutions involved in law enforcement in the coastal and marine areas of Indonesia.

9.2.1 Enforcement Authority

Enforcement of Indonesia's coastal and marine resources management[1] is a joint responsibility of several national government institutions. The two major departments are the Ministry of Marine Affairs and Fisheries and Ministry of Forestry. Two directorates of the Directorate General for the Control of Marine Resources and Fisheries of the Ministry of Marine Affairs and Fisheries have functions that relate to the monitoring, control, surveillance (MCS), and enforcement of coastal and marine resources management activities; the Directorate for the Control of Marine Ecosystems and the Directorate for the Control of Fish Resources. The control of coastal areas is one of the functions of the Directorate for the Control of Marine Ecosystems. Together with the navy and marine police, the Directorate General conducts monitoring, control, surveillance, and enforcement within the Indonesian territorial seas and offshore waters.

The Directorate General of Forest Protection and Nature Conservation of the Ministry of Forestry also conducts surveillance and enforcement activities in marine protected areas.[2] To implement these functions both the Ministry of Marine Affairs and Fisheries and the Ministry of Forestry have "civil investigation officers"

1 There are not less than sixteen laws and over hundreds of regulations that regulated coastal/coral reef management in Indonesia. For detailed discussion see Chapter Six.

2 There are four types of marine protected areas in Indonesia, including: national marine parks, marine recreation parks, marine nature reserves, and marine and wetland life sanctuaries.

(Penyidik Pegawai Negeri Sipil (PPNS)), who have power to investigate illegal practices in each sector.[3]

There are also other national government agencies involved in marine law enforcement activities. These include the State Ministry for Environment, the Ministry of Communication and Transportation, the Directorate General of Immigration, the Directorate General of Customs, the Indonesian Navy, and the Indonesian Police (Marine Police). Table 9-1 provides a list of the central government agencies involved in maritime law enforcement in Indonesia, including the laws and regulations that provide the basis for the powers.

Although, the State Ministry of Environment does not conduct surveillance activities in marine and coastal areas, it is one of the principal government institutions involved in coastal environmental protection and management and the enforcement of environmental law. Similar to the Ministry of Marine Affairs and Fisheries and the Ministry of Forestry, the State Ministry for Environment also has civil investigation officers for the enforcement of environmental laws.

The Indonesian Marine Police is primarily responsible for the enforcement of maritime law, drug prohibition, immigration and other similar civil responsibilities. It has limited authority, and hence is responsible only for surveillance and enforcement activities in the territorial waters.

3 Article 31 of Act No 31/2004 concerning Fisheries and Article 77 of Act No 41/1999 concerning Forestry provide rights to civil investigation officer of both the Ministry of Marine Affairs and Fisheries and the Ministry of Forestry personnel to investigate the illegal practices in their sectors.

Table 9-1: National Government Agencies Involved in Law Enforcement Activities

Agency		Responsibility	Legislation
1	National Coordinating Body for Ocean Safety	▪ To coordinate maritime law enforcement activities in Indonesia	▪ Cooperation Decree of 1972
2	Ministry of Marine Affairs and Fisheries	▪ To undertake fisheries management and ensure compliance by both Indonesian fishermen and foreign fishing vessel; ▪ To control illegal fishing; ▪ To prevent the exotic diseases through importation of infected marine species.	▪ Act No. 9 of 1985 ▪ Act No. 16/1992
3	Ministry of Forestry	▪ To conserve, preserve and utilise marine biodiversity and its ecosystems; ▪ To establish marine protected areas; ▪ Management authority for CITES.	▪ Act No. 41 of 1999 ▪ Act No. 5 of 1990 ▪ Act No. 5 of 1994
4	Ministry of Energy and Mineral Resources	▪ To prevent negative impact of mining activities on Indonesian marine and coastal areas	▪ Act No. 22 of 2001 ▪ Act No. 11 of 1967
5	Ministry of National Education	▪ To preserve cultural material on marine and coastal areas.	▪ Act No. 5 of 1992
6	Ministry of Transportation and Communication	▪ To manage shipping activities in Indonesia; ▪ To establish sea-lanes for foreign and domestic ships; ▪ To conduct search and rescue operation; ▪ To prevent marine pollution generated from oil spills.	▪ Act No. 21 of 1992
7	State Ministry for Environment	▪ To monitor marine pollution; ▪ To preserve and conserve the marine environment and ecosystems in all Indonesia territorial waters and the zones beyond its territory, including EEZ, Continental Shelf.	▪ Act No. 23 of 1997
8	Indonesian Navy	▪ To enforce maritime laws only on the areas beyond territory, including EEZ, Continental Shelf.	▪ Act No. 5 of 1983 ▪ Act No. 9 of 1985 ▪ Act No. 5 of 1990 ▪ Act no. 21 of 1992 ▪ Act No. 23 of 1997 ▪ Act No. 2 of 2002
9	Indonesian Air Force	▪ To conduct air surveillance in all Indonesia territorial waters and the zones beyond its territory, including EEZ, Continental Shelf.	▪ Act No. 20 of 1982
10	Marine Police	▪ To enforce maritime laws in internal waters.	▪ Act No. 2 of 2002 ▪ Act No. 8 of 1991 ▪ Act No. 8 of 1981 ▪ Act No. 12 of 1951
11	Directorate General of Immigration	▪ To control the entry of individuals into Indonesia;	▪ Act No. 9 of 1992
12	Directorate General of Customs	▪ To control the importation of illicit drugs and illegal goods.	▪ Act No. 10 of 1995

In an effort to streamline and coordinate surveillance and enforcement policies program in Indonesian waters, including the EEZ, the National Coordinating

Body for Ocean Safety (*Badan Koordinasi Keamanan Laut*/BAKORKAMLA) was set up in 1972. Membership of the National Coordinating Body comprised representatives from the Navy, Police, Customs, Ministry of Judicial Affairs, and the Attorney General's Office.[4]

9.2.2 Enforcement Programs and Practices

Two modes of enforcement activities are currently being practised by Indonesia to ensure compliance with the laws and regulations: sea patrols and aerial surveillance (maritime surveillance). Aerial surveillance flights are carried out by the Indonesian Air Force (*Angkatan Udara Republik Indonesia*/AURI). Maritime surveillance activity is focused on the Indonesian EEZ and Archipelagic Sea Lanes.[5] The absence of integrated law enforcement activity, including the lack of a national integrated air surveillance system, has resulted in ineffective aerial surveillance activities in Indonesia.[6] Data and information collected from the aerial surveillance have not been used effectively by the client agencies, such as the Ministry of Marine Affairs and Fisheries.[7] This problem has been exacerbated by the lack of funds and infrastructure that resulted in the limited number of aerial surveillance operations.

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4 This was set up by the Cooperation Decree (Surat Keputusan Bersama/SKB) of the Minister of Defence, the Minister of Communication, the Minister of Judicial Affairs, and the General Attorney in 1972. At that time, the Ministry of Marine Affairs and Fisheries had not yet been established by the Indonesian Government.

5 Several maritime reconnaissance aircrafts of the AURI are used including: 3 units for B737-200 2X9, 2 units for C-130H-MP, 4 units for Hu-16, and N-22-24 Nomad Searchmaster-B. Source: Based on information from: International Institute of Strategic Studies (IISS), The Military Balance, 1991-1992, Oxford University Press for the IISS, London, 1991, pp. 164-165; "Menyingkap Tabir B737 Surveiller" (Discovered Screen of B737 observer), *Majalah Angkasa Online*, 8 May 2003, http://www.angkasaonline.com

6 Kardi, K. (2003) as cited by, "Menyingkap Tabir B737 Surveiller", *Majalah Angkasa Online*, 8 May 2003, http://www.angkasaonline.com

7 Ibid.

There are several sea patrols activities that are currently carried out by government agencies to enforce maritime laws and regulations. Within the territorial/coastal waters, at least two different tasks are undertaken. The first is sea patrol focused on monitoring, control and surveillance for fisheries activities. This operation is carried out by the Directorate General for the Control of Marine Resources and Fisheries of the Ministry of Marine Affairs and Fisheries, the Indonesia Navy and the Marine Police. Nine surveillance vessels of the Ministry of Marine Affairs and Fisheries are used for patrolling territorial waters.[8] These vessels are equipped with radios, radar, and other navigation equipment.

Sea patrol is focused on monitoring, control, and conservation of marine biodiversity and is usually under the Directorate General of Forest Protection and Nature Conservation of the Ministry of Forestry, with support from the Indonesian Navy and the Marine Police. These are the second type of sea patrol operations in the coastal areas to protect marine parks and the environment. It should be noted that for coastal areas, the agency funding the operation, controls the focus and area of patrols with the navy and marine police providing law enforcement support to the primary agency, unless the latter are so directed to take control of the primary task.

Several Indonesian agencies also carry out sea patrols beyond the territorial waters and into the EEZ.[9] National sovereignty and the control of other illegal activities such as smuggling, anti-piracy, and illegal fishing activities are the main focus of these sea patrols in these areas.

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8 These vessels are docked in seven Indonesian regional waters: Jakarta, North Sulawesi, West Sumatra, Papua, East Nusa Tenggara, West Kalimantan, and Banda Sea.

9 These include DG of Customs, DG of Immigration, Marine Police, Sea Transportation and Indonesian Navy.

9.3 Problems in Maritime Law Enforcement

Although, Indonesia has a series of laws that address coastal management in Indonesia, in reality, there appears to be a high degree of noncompliant behaviour. This has caused widespread illegal fishing practices in almost all Indonesian coastal areas, even in the remote areas.[10]

Fegan argues that the involvement of the Indonesian Navy in the fishing industry has also resulted in difficulties for the government in implementing the trawling regulation (banning of trawl nets) in the Arafura Sea, surrounding West Papua.[11] The involvement of the *Induk Koperasi Angkatan Laut* (INKOPAL)[12] in the fishing industry as a business partner of the leading foreign fishing companies whose trawlers fish the Arafura Sea has resulted in ineffective law enforcement in this area.

These problems, however, are only a small part of the multitude of problems facing all law enforcement activities, from monitoring and surveillance to trial and deterrent penalties. These problems are due to several interrelated factors: (i) the limited enforcement input, including funds, personnel, and assets; (ii) loopholes and lack of integration in the laws and regulations for coastal resource management; (iii) lack of inter-agency coordination mechanisms and communications among the various enforcement agencies; (iv) lack of environmental and natural resource awareness and impact from illegal or destructive practices in the short, medium and long term for food security and the livelihoods of the coastal communities; (v) lack of an appropriately aware, competent, and committed judicial system with respect to

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10 Pet-Soede, L. and Djohani, R.H. (1998) Combating destructive fishing practices in Komodo National Park: Ban the hookah compressor. The Secretariat of the Pacific Community (SPC). *SPC Live Reef Fish Bulletin*, 4, pp. 17-28.

11 Fegan, B. (2003) Plundering the Sea. Inside Indonesia Jan-March 2003, http://www.insideindonesia.org. (accessed on 27 September 2004).

12 The Navy's Cooperative Enterprise

marine resource issues; and (vi) the vast area requiring surveillance and enforcement. These issues are discussed below.

9.3.1 Limited enforcement inputs

The success of law enforcement is determined by the availability of and commitment to enforcement. However, that the results of maritime law enforcement for coastal and marine resources in Indonesia suffer from limitations, such as operating funds, patrol vessels, professional and trained enforcement personnel and equipment.

9.3.1.1 Lack of funds

The regional economic crisis in the late 1990s hit Indonesia significantly.[13] The economic crisis forced the Government to divert government funds to poverty alleviation and currency support programs rather than for law enforcement programs, particularly in coastal and marine areas.[14] This re-prioritisation away from law enforcement has impacted on the performance of most of the law enforcement agencies in Indonesia. Insufficient budgets, coupled with inadequate budget controls, resulted in difficulties in financing sea operations costs, including procurement of facilities and equipment, maintenance and personnel costs.[15] The number of sea patrols and air surveillance decreased significantly,[16] and some law enforcement

13 The World Bank (2000) as cited by Torell, M. and Salamanca, A.M. (2001), Navigating the Institutional Landscape: Introduction and Overview, in Torell, M. and Salamanca, A.M. (eds.) Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia, SIDA and ICLARM, p. 8.
14 Ibid.
15 Ibid.
16 Ibid.

agencies became part of the compliance problem rather than the solution. Indonesia had not yet "bought in" to the advantages of devolution of authority and the alternate options it offered to centralised deterrent MCS activities through shared and joint responsibility with the coastal areas and communities for their stewardship and input into responsible management of their coastal areas, including law enforcement.

9.3.1.2 Lack of Assets

Patrol vessels and other enforcement equipment are viewed by the centralist oriented, police style law enforcement agencies to be critical, and many government enforcement agencies collapsed and become more inefficient through lack of these assets. For example, the nine patrol vessels of the Ministry of Marine Affairs and Fisheries are far from enough to provide effective sea patrols in coastal and marine areas.[17]

As one of the leading agencies with maritime law enforcement responsibilities, the Ministry of Marine Affairs and Fisheries needs at least 90 to 100 patrol vessels to cover the huge fishing areas in Indonesia.[18] Andin argues that the Ministry of Marine Affairs and Fisheries needed at least twenty years to enhance its equipment and resources.[19] Currently, the Ministry of Marine Affairs and Fisheries has only the capacity to build five patrol vessels a year.

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17 "Indonesia Butuh Ratusan Kapal Patroli Laut" (Indonesia need hundreds patrol boats), *Kompas Daily News*, 11 September 2003, http://www.kompas.com

18 Ibid.

19 Andin H.T (2003) as cited by Kompas daily news, "Indonesia Butuh Ratusan Kapal Patroli Laut" Mr. Andin is the Secretary General of the Ministry of Marine Affairs and Fisheries.

The lack of assets is also a problem for the Indonesian Navy and the Ministry of Forestry. According to traditional military-equipment needs assessments, the Indonesian Navy requires at least 300 vessels, large and small, to conduct effective sea patrols within the Indonesian jurisdiction. Thus far, it has only 115 vessels, and of these, only about 25 are operating at sea at any given moment.[20]

As one of the leading agencies in preventing and protecting marine biodiversity in Indonesia, the Ministry of Forestry also suffers from the lack of enforcement assets. The lack of funds, facilities and personnel has resulted in ineffective enforcement activity in most marine protected areas under its management, including Marine National Parks, Marine Recreation Parks, and Marine and Wetland Wildlife Sanctuaries.[21] This has resulted in illegal fishing practices in many marine protected areas. The illegal fishing practices occur even in totally protected areas, such as the Komodo National Park.[22]

9.3.1.3 Lack of trained personnel

The limited funds that hamper most government enforcement agencies also results in the lack of training for personnel in its units. Many law enforcement agencies cannot conduct proper basic training to improve the capacity and capability of their personnel due to a lack of budgets for enhanced professionalism. They also

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20 Djalal, H. (2004) Piracy in South East Asia: Indonesia and Regional Responses. Paper prepared for Strategic and International Studies – American – Pacific Sealanes Security Institute Conference on Maritime Security in Asia. January 18-20, 2004, Honolulu, Hawaii, pp. 2-3.

21 These include: Takabonerate Islands, Padaido Islands and Raja Ampat Islands, and Wakatobi. Source: COREMAP (2004).

22 Pet, J.S., and Djohani, R.H. (1998) Combating destructive fishing practices in Komodo National Park: Ban the hookah compressor. The Secretariat of the Pacific Community (SPC). SPC Live Reef Fish Bulletin, 4, pp. 17-28.

cannot attract trained or professional personnel, because they cannot pay appropriate salaries.

The lack of quality and quantity of trained personnel in law enforcement is very critical. For example, COREMAP and the district government of Selayar faced a serious problem over personnel recruitment to operate the MCS program in that area. Several trained personnel were required to be vessel operators, radio operators, maintenance technicians and civil prosecution officers. However, not one of the officers of the Fisheries Office of Selayar District had formal qualifications as a civil investigation officer or for vessels and radio communication operations. This situation forced COREMAP and the Selayar District Government to recruit personnel from the Provincial Fisheries Office of South Sulawesi for several key positions.[23]

9.3.2 Loopholes and lack of integrated law and regulations

Indonesia is reputed to be a country that has good laws, but unfortunately, they are not implemented effectively.[24] On the surface most of the laws look good, but in reality they are often useless, cannot be enforced, and make a mockery of Indonesian coastal and fisheries authorities, the lawyers and lawmakers. Many loopholes in the laws allow people to commit violations without being arrested. For example, the use of poisons or explosives or other illegal gear for fishing is prohibited by the law. According to the fisheries law, an official can arrest an

23 This fact is based on the authors' experience involving in COREMAP Phase I in 1998-2002.

24 Patlis, J., Knight, M. and Siahaan, W. (2002) Creating A Framework for Integrated Coastal Management in Indonesia: The Importance of Law, in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, p. v-13.

offender only when found illegally fishing on site. Hence, fishermen committing offences who see approaching patrol boats simply drop their illegal gear or trawl nets under water and wait until the patrol boats leave the area. When the officers fail to find their illegal fishing apparatus, fishermen continue their illegal fishing operations. According to the law, illegal fishers must be caught in the act to be guilty of an offence, and in the area of the use of poisons, this would require an authorized officer to be in the water with a camera next to an illegal fisherman as he poisoned the fish for the Act to be effective. Possession of fish caught by destructive methods, or possession of destructive or deleterious substances on board a vessel is not addressed under the current legislation.

The evidentiary proof required to convict an alleged offender makes it difficult to secure convictions for violations of fisheries and other marine resources laws. For example, to prove the use of dynamite or cyanide for fishing, police and the district attorney must get a formal statement from the Crime Laboratory or Forensic Laboratory that stated that the evidence, such as fish, were caught by using explosives or cyanides. Then one needs to prove that the fish was actually caught by this fisher, and not transferred from another vessel or friend.[25]

Laboratory testing causes further problems. Not all districts have the required facilities. Consequently, many fisheries violations, particularly those using explosives and poisons, have been prosecuted under other laws, such as the Critical Condition Act No. 12 of 1951 (possession of explosives without a permit) and the Criminal Act No. 1 of 1946 (*Kitab Undang-Undang Hukum Pidana*).

25 Article 73 of Act No. 31 of 2004.

9.3.3 Lack of coordination

Coordination among the various agencies responsible for enforcement in Indonesia is poor. In theory the National Coordinating Body for Ocean Safety (BAKORKAMLA) was established as the mechanism to improve coordination among the various enforcement agencies. In practice, however, it has not been easy this institution to coordinate their activities at sea. As stated by The Hon. Susilo Bambang Yudoyono, then Minister of Coordinating Ministries of Politics and Defence (MENKO POLKAM), "BAKORKAMLA has not yet fully performed it functions, as it was expected." This institution cannot properly respond to transnationals' crimes that have increased significantly. Ineffective surveillance and enforcement programs have caused a loss for Indonesia of about Rp. 90 quintillion (US$10 billion) annually."[26]

Effective coordination among enforcement authorities is further undermined by a lack of clear delineation of duties and responsibilities, thus resulting in overlap and duplication of efforts. The recent problem of oil spills in the Seribu Islands demonstrates this lack of coordination. Although five oil spills have occurred in the Seribu Islands since 2003, there has been no effective response action from government. During the most recent spill, several government enforcement agencies, including the Ministry of Marine Affairs and Fisheries, the State Ministry of Environment, and the Marine National Park of Seribu Islands as the representative of the Ministry of Forestry sent their officers to investigate the problem.[27] However,

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26 "Pemerintah Siapkan Keppres Badan Koordinasi Keamanan Laut" (Government prepared Presidential Decree for the National Coordinating Body for Ocean Safety), *Tempo Interaktif Online*, 27 January 2004, http://www.tempointeractive.com. Hon. Yudoyono became the President of Indonesia in 2004.

27 "PEMKAB Kepulauan Seribu Akan Tuntut Perusahaan Minyak" (Regional Government of Kepulauan Seribu will prosecute Oil Company), *Kompas Daily News*, 8 October 2004, http://www.kompas.com

that was not the end of the problem. There was no coordination among agencies and the activities were totally fragmented, each ministry working alone. They each carried out separate investigations based on their specific sectoral mandates. To date, not one oil company that operated in Seribu Islands has been prosecuted.

9.3.4 Lack of environmental awareness

Effectiveness of law enforcement programs is often determined by the compliance of the community to the existing regulations and policies. This can be achieved through public awareness activities or campaigns emphasising the importance of marine resources and ecosystems for humankind. This program should be conducted continuously, before, during and after the enforcement program, and should incorporate the need for rules and regulations, with examples of those developed and implemented by other "communities".

Although the need for sustainable development programs may be understood by local politicians and bureaucrats, in fact, only limited programs on public awareness on the marine environment have been implemented. The lack of public awareness and knowledge of the marine environment has contributed to the degradation of marine and coastal ecosystems.[28] The lack of environmental awareness occurs at all levels, including government officers, police, attorneys and judges.[29] This is often a reason for a lack of commitment in supporting and implementing responsible and sustainable fisheries management practices. Many judges do not have the capacity to understand or handle environmental cases from a

28 See, Nontji, A., (2000), Coral Reefs of Indonesia: Past, present and future. International Coral Reef Symposium. Bali, 23-27, 2000 Proceeding Vol. I pp. 17-27.

29 "Banyak Penegak Hukum Tak Mengerti Lingkungan" (Many law enforcement officers do not understand about Environments), *Gatra Magazine Online*, 9 July 2002, http://www.gatra.com

scientific point of view.[30] This has caused many violations to go unpunished. For example, many cases of forest fires in Riau have not been punished due to the lack of knowledge and understanding of the district attorney and judge[31] about the processes and negative impact of such activities on the environment. This, coupled with the resources available to illegal loggers to "influence" decisions reduces the potential to change attitudes.

9.3.5 Inappropriate Judicial Systems

The existing court systems in Indonesia cannot appropriately address the complexities that arise from illegal marine and coastal resources exploitation in Indonesia. The current Indonesian judicial system has four types of courts: general courts, religious courts, military courts and state administration courts.[32] All environmental cases proceed to the general court. Consequently, environmental cases are treated in the same way as other general court cases and are presided over by judges and attorneys that only have a very "general" knowledge of law. This lack of specific knowledge of environment and marine ecosystems has resulted in difficulties in the prosecution of alleged violators, due to the lack of knowledge of the negative impacts of such violations. If the case proceeds to the court, the usual penalty is minimal and serves little deterrence. For example, a contentious issue occurred with regard to the punishment of seven illegal dredging vessels in the District Court of Tanjung Pinang. The district court punished the offenders for Rp.

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30 Hafild, E. (2000), as cited by *Kompas Daily News* (25 February 2000), "Banyak Kasus LH Kandas di Pengadilan" (Many environmental cases stop in court), http://www.kompas.com. Ms. Hafild is Executive Director of Wahana Lingkungan Hidup Indonesia (WALHI), a well-known NGO in Indonesia.

31 The Hon. Nabiel Makarim, the Minister of State Ministry of Living Environmental (2002), as cited by *Gatra Magazine Online*, "Banyak Penegak Hukum Tak Mengerti Lingkungan"

32 Article 10 of Act No 4 of 2004 concerning Judicial Power.

30 millions (US$3,100) for each vessel. The judge's decision was based solely on illegal mining without any consideration of the destruction of the marine environment caused by these illegal activities.[33] It is clear, therefore, that the members of the court do not have the capacity, commitment or incentive to address marine environmental problems appropriately.

9.3.6 The vast maritime jurisdiction

The very extensive maritime jurisdiction of Indonesia is another cause of the ineffective maritime enforcement in Indonesia. With the country's 17,506 islands, and their coastlines measuring some 81,000 km and sea area covering about 7.73 million sq. km, it is hardly surprising that the existing patrol vessels cannot effectively monitor the entire sea area and coastline. This is exacerbated by the fact that law enforcement in coastal and marine areas is much more expensive and difficult than enforcement on land due to the costs of assets and maintenance. This severely limits the ability of Indonesia's enforcement agencies to enforce maritime laws and regulations using conventional methods of patrols by aircraft and ships. Furthermore, fisheries' enforcement activities conducted in the open seas or remote areas are less visible to other fishermen than on land, and consequently, have resulted in less of a deterrent effect than land-based enforcement.[34]

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33 "WALHI dan TNI AL Sesalkan Putusan PN Tanjung Pinang" (WALHI and the Indonesian Navy regret to the court decision of District Court of Tanjung Pinang), *Kompas Daily News*, 10 October 2002, http://www.kompas.com.

34 Sutinen, J.G., Yahaya, J., and Hinrunruk, V. (1992) Fisheries Law Enforcement Programs, Practices, and Problems in Malaysia, the Philippines, and Thailand. In Marsh, J.B. (ed.) Resources and Environment in Asia's Marine Sector. New York Taylor & Francis Inc., p. 148.

9.4 Recent Development of Law Enforcement Programs in Indonesian coastal areas

Even though law enforcement programs face several problems, it is fair to say that some significant efforts are being made to address the problems of maritime law enforcement at both the national and local levels. These include: the introduction of the concept of community enforcement; the enactment of two decentralisation Acts; and the enactment of the new Fisheries Act (No. 31 of 2004).

9.4.1 Community enforcement programs

The growing concerns over the depletion of some key marine species has increased significantly in the world since the late 1970s. This has resulted in a shift of coastal resources management from local and central government authorities to community institutions. The community-based management concept was introduced to many regions in the world in the late 1970s and early 1980s. Many NGOs were engaged to educate the fishers and other coastal communities to be able to assume the management of their marine and coastal resources.[35] Since then, the pendulum has swung to the opposite extreme, which has resulted in increasing the conflict between fisheries organisations, NGOs and local authorities.[36] However, the involvement of communities in natural resources management (CBM) became a trend and an alternative management measure, after several successes in the Philippines and some other regions in the world.

35 Flewwelling, P., Cullinan, C., Balton, D., Sautter, R.P., and Reynold, J.E. (2002) Recent trends in monitoring, control, and surveillance systems for capture fisheries. FAO Fisheries Technical Paper. No. 415, Rome, FAO., p. 40.

36 Ibid.

Stakeholder involvement has become an essential element in all integrated coastal and marine resources management initiatives. These have been tempered by a "top down" and centralised regime on one hand to the current co-management (stakeholder and local government) regime at the community/district level. Community enforcement programs are an integration of the CBM approach and MSC system for coastal areas. This encourages the community to become involved in monitoring, control and surveillance of their surrounding marine resources and take a role in protecting these resources from illegal activities. Communities are then encouraged to work with local governments and to have input into the deterrent/penalty processes through traditional practices now included in law, or input with respect to determining the level of fines and penalties under the law.

The community enforcement program in the marine sector was introduced in Indonesia in the early 1990s, during the implementation of the community-based management concept in Indonesia, as it was in other developing countries. With assistance from some international foundations and NGOs, a reef watcher, beach watcher, or coast watcher program was introduced in some coastal communities in Indonesia.[37] The program encourages the local community to conduct regular sea patrols in the village marine protected areas or marine conservation zones near their villages. For safety reasons, the community acts as a surveillance or "watcher" only. The reef watchers report and call for assistance from authorised law enforcement

37 As one package with community-based reef management, the community-based enforcement has been implemented in some areas of Indonesia:

- Blongko, Bentenan, and Talise of Minahasa District of North Sulawesi Province (initiated by The Indonesia Coastal Resources Management Project);
- Medang, Temiang, Mamut, Senayang (Penaah), Pasir Panjang, Limbung and Sekanah of Riau Archipelago District of Riau Province (Initiated by Coral Reef Rehabilitation and Management Program/COREMAP);
- Tarupa, Tinabo, Jinato, Pasitallu Tengah, Pasitallu Timur, Latondu, Rajuni Kecil, and Rajuni Besar of Selayar District of South Sulawesi Province (COREMAP);
- Mbromsi, Sasari, Samber Pasi, Meos Mangundi, Nusi, Pai, Owi and Auki of Biak Numfor District of Papua Province (COREMAP)

officers, authorized security officers, or the village leader, if they find illegal activities in their marine areas.

Although this program is relatively new, the community's sea patrols have achieved significant success in some districts in Indonesia. For example, there was a significant decrease in illegal fishing activities in the District of Biak Numfor since the implementation of the COREMAP-MCS program in that area. Figure 9-1 provides a data comparison of the number of illegal fishing activities in the period of 2002 and 2003 at eight sites of the COREMAP initiative in the Padaido Islands of Biak Numfor District.[38]

The data shows the important role the community played in the MCS program. They were the "front line for conservation" the eyes and ears of the program. Based on the community's information, the local security officers were able to catch the alleged fishers "red-handed", when they committed illegal fishing offences. This success has shown that the involvement of the community in law enforcement activities in the marine sector has contributed to the decrease of the number of illegal fishing activities. Also noteworthy was the pride and confidence generated in the community through this empowerment to protect their resources. Community-based enforcement may be an effective step to address marine resources degradation in Indonesia.

38 However, it is fair to say that the success in reducing illegal fishing practice in that area is not only due to the implementation of community enforcement alone, it also involved the intervention and real commitment of several security officers, e.g. the district attorney, the navy and the police.

Figure 9-1: Data Comparison of Illegal Fishing in Padaido Islands of 2002-2003

Please see print copy for Figure 9-1

9.4.2 Devolution of Authority

With the enactment of the Autonomy laws, the responsibility for law enforcement of national laws is not only the responsibility of central government, but also the responsibility of the regional governments in their areas of jurisdiction. The involvement of provincial and district/city governments in law enforcement activities is a new concept in Indonesia. For more than thirty-two years, the responsibility of law enforcement was under the central government. This shift of responsibility is a reasonable one. Besides being in a better position to recognise the problems in their areas, today the regional governments also have the financial capacity to fund the law enforcement programs in their territorial seas, and take direct action in natural marine resource management.

Nevertheless, the lack of detailed operational guidelines for the Autonomy laws created confusion for the implementation of law enforcement programs at local sites. The involvement of regional governments in enforcement programs became

contentious as some strayed into areas of national responsibility, particularly in national defence and security. A good illustration of this occurred when several 'rich' regional governments such as Riau and East Kalimantan provinces built a patrol vessel and delivered it to the navy for their operation, presumably for their respective areas.[39] This situation was exacerbated by the fact that the enactment of the autonomy laws resulted in considerable wealth differential among the regional governments. Those with abundant natural resources receive greater income than poorer regions. For example, Riau, East Kalimantan, Aceh and Papua became richer. It is not difficult for the 'rich' regional governments to fund law enforcement programs but it is still a problem for the 'poor' regional governments to fund these programs to the same level. This has resulted in the reluctance of some regional governments to plan and implement law enforcement activities.

9.4.3 The enactment of the new Fisheries Act No. 31 of 2004

The new Fisheries Act, enacted on 15 October 2004, has provisions that will revolutionize aspects of the maritime law enforcement in Indonesia. The transformation of the existing legal enforcement institutions and increase on the maximum penalty for illegal fishing activities are two significant changes.

For the first time since its independence Indonesia will have a specific court to hear fisheries infractions. Five ad hoc fisheries courts have been established.[40] At least four factors distinguish the ad hoc fisheries courts from the general courts. First, the prosecutor is required to understand marine, coastal and fisheries ecosystems

39 "Heboh Soal Kapal Patroli" (Uproar about Patrol Vessel), *Kompas Daily News*, 6 September 2003, http://www.kompas.com.

40 Ad hoc fisheries courts have been established in Medan (North Sumatra), Jakarta Utara (Jakarta), Pontianak (West Kalimantan), Bitung (North Sulawesi) and Tual (Southeast Maluku).

with certified proofed through formal training. Second, in some circumstances, it is possible to recruit an ad hoc judge from academia, government institutions, NGOs, and other formal fisheries associations. Third, the maximum time for proceedings (from investigation to punishment) has been reduced to approximately two and half months. Fourth, in some circumstances, to speed up the court processes people can be sentenced *in absentia*.[41] The establishment of the ad hoc fisheries courts is expected to address fisheries violations in an effective, efficient and professional manner.

Significantly, the new Fisheries Act has increased sanctions for fisheries violations. For example, the maximum penalty for the use of dynamite, cyanide and other illegal gear was increased significantly from Rp. 100 million (US$12,000)[42] to Rp. 1.2 billion (US$133,000).[43] However, the maximum imprisonment for the same violation was decreased from 10 years to 6 years.

Unfortunately, this amendment has not yet fully addressed the law enforcement problems in terms of prosecution. There is no article that permits the use of technology in evidence of a violation of illegal fishing practices, e.g., the use of a camera (photograph) or a video camera (film) recording the destruction of coastal ecosystems caused by the use of dynamite, cyanide or illegal nets as evidence to aid the prosecution of the offender. The principle of *prima facie* evidence still remains. The use of scientific experts (expert witnesses) in prosecution has been introduced. If there is a lack of strong political will and commitment to improve fisheries management in Indonesia, the new fisheries law will become a "paper tiger"

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41 Speech by the Minister of Marine Affairs and Fisheries in Temu Teknis Nasional Aparat Penegak Hukum (Workshop of National Law Enforcement Officers). The MOMAF websites: http://www.dkp.go.id (accessed on 7 October 2004).

42 Article 24 of Act No. 9 of 1985.

43 Article 84 of Act No. 31 of 2004.

and it will remain ineffective. Lack of commitment and the limitations on the use of common law enforcement technology may be potential problems to the enforcement of this new fisheries law, particularly in remote areas where complex procedures normally used to support the law are absent, e.g., crime and forensic laboratories.

It is fair to say that only a small part of the problem has been solved. It is still a long road ahead for Indonesia to reach a level of effectiveness in maritime law enforcement. A lot of "home work" on maritime law enforcement waits for coastal managers, police, navy, and other resource stakeholders. An integrated approach is required to solve the complicated problems of natural resource management and maritime law enforcement in Indonesia. The following section provides some possible solutions to address the problems of maritime law enforcement and proposes policies that should be adopted by Indonesia as steps towards sustainable maritime law enforcement.

9.5 Suggested Solution

The analysis above has demonstrated the complexity of maritime enforcement in Indonesia. An integrated approach is required to address the complicated problems. The discussion below provides some policy options for solving this complex maritime enforcement problem.

The cost of law enforcement activities is often a primary concern of any government. According to Sutinen and Viswanathan, a good enforcement system requires expensive and intensive capital that may exceed at least a quarter to over

half of all public expenditures of many developing countries.[44] Cost-effectiveness and efficiency are the important factors for successful law enforcement. In many cases, a civilian approach to deterrent fisheries enforcement in coastal areas has proven to be the most cost-effective strategy compared to a military/police approach.[45] It is possible for Indonesia to reduce the military involvement in monitoring and surveillance in coastal areas. However, the military can play a significant supporting role for a strong coastal MCS system. The military components (navy and police) can also play a lead role in the areas beyond the territorial seas.

Based on this premise, this thesis proposes two solutions that can be considered by Indonesia. These are: (i) the establishment of an effective and professional national law enforcement unit; and (ii) the establishment of well-trained, professional regional law enforcement units supported by a strong commitment from appropriate political bodies.

9.5.1 Establishing a National Maritime Law Enforcement Unit

The Autonomy Law has clearly defined the rights and duties of central and regional governments. The regional governments have rights to manage the marine areas up to 12 nautical miles from the shore, the newly defined "coastal areas," while, the central government has authority for the management of marine areas beyond the coastal areas. Therefore, there is no reason for the central government to involve itself in the management of coastal areas, including law enforcement activities, although the central government retains authority and responsibilities in

44 Sutinen and Viswanathan (1999), as cited by Torell and Salamanca (2001), no 13 above, p.7.
45 Flewwelling et al. (2002), no 35 above, p. 4.

matters of security and defence and some other strategic government functions. In simple words, the responsibility of the central government in coastal areas must be reduced to that of coordinating activities, security and defence.

There are many central government institutions involved in day to day management of coastal areas, including law enforcement activities. This has created conflict between central and regional governments, and among central government agencies, and has also resulted in inefficiencies and ineffectiveness in the implementation of an appropriate law enforcement program. The establishment of a national law enforcement unit is a possible solution to address the coordination problem at the national level and for coordination of regional units.

The proposed national law enforcement unit will have two main functions. The first function will be to coordinate the inter-agency law enforcement operations in the areas beyond coastal waters. The functions of law enforcement activities in the areas beyond coastal areas can still remain with sectoral agencies. As mentioned above, there are many government law enforcement agencies, including the Ministry of Marine Affairs and Fisheries, the Ministry of Forestry, the Navy, Marine Police and the State Ministry of Environment. There is no clear authority and responsibilities for each agency, and also no clear mandate for leadership. Law enforcement in these areas is not only for fisheries management and other environmental protection, but it also deals with maritime peace, security and defence that relate to Indonesian sovereignty, therefore it appears wise to appoint the Indonesian Navy to take this lead role in this sector. Alternatively, the Navy could have a lead role in a general sense, but it would revert to a support role.

The second function of a national law enforcement unit will be to assist regional law enforcement units. This includes the coordination of national law enforcement agencies that are involved in law enforcement activities at the regional level.

Three options can be adopted to establish the national law enforcement unit. The first option is through the revitalisation of the National Coordinating Body for Ocean Safety. There are some advantages in the designation of the National Coordinating Body for Ocean Safety as an integrated coordination unit for law enforcement activities. These include: reduction of potential for sectoral conflict and avoidance of duplication between the government institutions; and provision of comprehensive coverage of all aspects of maritime affairs, such as fisheries, customs, pollution control, and conservation. However, the political will and commitment of all members of the Committee are required to enhance the effectiveness and efficiency of law enforcement operations. This can be achieved through Memoranda of Understanding among the various agencies, providing detailed guidelines for cost and operational procedure. One example where this has been effective is Canada where there is a quarterly planning meeting that provides tentative plans two quarters in advance and confirms the support for each agency for the next quarter.[46] This process is also similar to that of the Malaysian Maritime Enforcement Coordinating Centre, which may also serve as a model for further study.[47]

The second option is through the designation of one national law enforcement agency, such as the Ministry of Marine Affairs and Fisheries, or the Customs Department as the national law enforcement unit. The advantage of this option is the

46 Flewwelling, P. (2004), personal communication in October 2004.
47 Ibid.

potential efficiency and effectiveness. Lines of command and control will be reduced significantly, thus making law enforcement activities more efficient and responsive to management needs. However, a significant institutional restructuring may be required to implement this option, because many aspects of marine affairs are not under the responsibility of one institution.

The third option is the creation of a national coast guard. Coast guards protecting national sovereignty in internal waters are not new. Bateman suggests that there are at least three advantages of having a coast guard.[48] First, there are the legal benefits. A coast guard should be a paramilitary organisation. As a civil organisation, a coast guard unit is more suitable than a warship for conducting law enforcement in sensitive areas where there are conflicting claims to maritime jurisdictions. The arrest of a foreign vessel by a coast guard vessel may be more acceptable as legitimate law enforcement action than a navy vessel.

The second is cost effectiveness. Coast guard vessels and aircraft are generally less expensive than naval units.[49] As a civil organisation, it is possible for a coast guard unit of a developing country to attract funding from international aid agencies.[50] The third, the establishment of a coast guard can promote an integrated law enforcement program, because all maritime aspects from the monitoring and surveillance of fisheries, customs, and immigration sectors can be accommodated in one agency.

However, it cannot be denied that establishing a separate coast guard as the national maritime enforcement agency may generate contentious debate. It would

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48 Bateman, S. (2003) Coast Guards: New Forces for Regional Order and Security, in Asia Pacific Issues No. 65, January 2003. East-West Center., pp. 2-3
49 Ibid., p. 3.
50 Ibid.

also require extensive amendment of many existing maritime laws, because, as discussed earlier, most of those laws assign to the Indonesian Navy the rights and duty for maritime law enforcement power.[51] It would be reasonable to conduct a feasibility study on the establishment of a coast guard unit by Indonesia. The purpose of a feasibility study is to provide a detailed report on the advantages and disadvantages of the establishment of a coast guard unit for the purpose of maritime law enforcement in Indonesia from all aspects, including politic, legal, and social-economic aspects.

9.5.2 Establishing Regional Maritime Law Enforcement Units

The Autonomy Law gives to regional governments the rights to manage their coastal and marine resources. This also includes the authority to enforce their jurisdiction. However, to date, the regional governments have more interest in the benefits that accrue to them from their new jurisdiction than the responsibilities. Almost all of the monitoring, control, and surveillance functions are still carried out by the central government.

It was noted in Chapter Six that most of the national income has already been distributed to provincial and district governments, therefore it is difficult for the central government to continue to fund regional law enforcement activities. It is now time for regional governments to share the cost and responsibility of maritime law enforcement programs, through the establishment of maritime law enforcement units at the regional level.

51 See Table 9-1.

At least three advantages can be achieved through the establishment of regional maritime law enforcement units. First, the efficiency and effectiveness of law enforcement activities would improve significantly, because the areas covered are relatively small. On-site coordination of activities should reduce the number of agencies involved. Second, the establishment of regional maritime law enforcement units would provide better opportunities for funding enforcement activities. The involvement of local government in law enforcement will ensure that they allocate budgets for these enforcement activities. Third, the establishment of regional law enforcement units will serve the community better in law enforcement activities in their villages and coastal areas.

Two options can be adopted by local governments to establish a regional law enforcement unit. The first is through the designation of one regional law enforcement agency, such as fisheries or forestry offices as a regional maritime law enforcement unit. The second is the establishment of a regional coast guard that is attached to the national coast guard unit (in this case, the national government would need to consider establishing a national coast guard unit).

Nevertheless, not all regional governments have the capacity to operate full maritime law enforcement programs, due to lack of funds, infrastructure and personnel. Thus, it may be necessary for the central government to support the operation of regional law enforcement units in these regions to ensure uniform national standards.

9.5.3 Community-based Enforcement Program

Community-based enforcement is another option worth considering. There have been some previous attempts to implement community-based enforcement.[52] The COREMAP and Proyek Pesisir experiences have shown that a number of requirements must be met to achieve the expected results.[53] First, the program should be incorporated into the initial design of the implementation of community-based resources management framework as a whole. Second, the involvement of the community in all management processes is critical. It is often more effective to let the community decide everything that relates to the management of their natural resources, within the national policy and legal guidelines. The government then acts as a facilitator in a supporting role.

9.5.4 The Need for "Political Will" or Commitment to success

Both proposed solutions are just part of one strategy to address the coordination problems for maritime law enforcement in Indonesia. There is still much to be resolved in order to reform the current Indonesian law enforcement system. This includes the need to amend the existing laws, and 'political will' or "commitment" of central and regional governments for law enforcement activities.

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52 The central government through the Ministry of Marine Affairs and Fisheries has promoted the concept of community-based enforcement in some areas of Indonesia. The guidelines of community-based monitoring and enforcement of marine and fisheries resources (Pedoman Sistem Pengawasan Sumberdaya Kelautan dan Perikanan Berbasis Masyarakat / SISWASMAS) have been issued by the Ministry of Marine Affairs and Fisheries to implement these programs (it was issued by the MOMAF Decree No.: KEP.58/MEN/2001). However, due to the lack of preparation and centralised nature of this system, it has not been successful to date.

53 For detailed discussion see Dirhamsyah (2004) The Indonesian Coral reef rehabilitation and management program: lessons learned in community-based reef management at Senayang and Lingga Islands, Riau. Proceedings of CZAP 2004, Brisbane 5-9-2004; Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi. ITMEMS Proceeding, pp. 299-309.

The establishment of ad hoc fisheries courts is not enough to address all the problems of legislation for law enforcement activities in Indonesia. The existing laws are still fragmented and sectorally oriented. It is urgent for Indonesia to enact the new integrated law on natural resources management that accommodates the development of law and technology, and other gaps currently not addressed for MCS effectiveness.[54]

Political will is the most important factor for the success of law enforcement. It should exist at all levels of government. It is fair to say that the current failure of the maritime law enforcement program in Indonesia has been the result of a general lack of political will and commitment from central and regional governments. The lack of funds, assets and personnel can be solved if all stakeholders are committed. The reluctance of local politicians and bureaucrats to provide appropriate budgets to support maritime law enforcement can be clearly seen at all government levels. For example, only a small budget has been allocated by local governments to law enforcement activities in these areas. The lack of funds has, and will, continue to result in difficulties in financing sea patrol operations, training courses, equipment or facilities procurement, awareness activities and paying appropriate salaries for law enforcement staff. This will open the door further to continued corruption and abuse by law enforcement authorities, and the poorest coastal communities will pay the price of resource collapses in their areas.

54 For detailed discussion of this see Chapter Six.

9.6 Conclusion

From the above analysis, it can be concluded that the maritime law enforcement for coastal and marine resources management faces several challenges. These include the lack of law enforcement funding, assets, and trained personnel; loopholes in the law, lack of integrated regulations; lack of inter-agency coordinating mechanisms; lack of environmental awareness; inappropriate judicial systems; and the vast maritime jurisdiction.

Some potential solutions have been proposed to address the problems identified These solutions include two broad options: (i) establishing a national law enforcement unit, and (ii) establishing regional maritime law enforcement units. It cannot be denied that the option of establishing a national law enforcement unit may reduce some rights and responsibilities of some existing national law enforcement units such as the Indonesian Navy, but this should be balanced against the gains to be made.

CONCLUSION

This thesis has analysed the institutional, legal and policy framework for the management of coastal and marine ecosystems supporting coral reefs in Indonesia**.** The thesis has shown that coastal and marine ecosystems, particularly coral reef ecosystems, are an important for sustainable development in Indonesia. They provide food, coastline protection, non-food products, tourism, science and education. Despite the significance of coastal and marine resources for Indonesia, the thesis has demonstrated that these resources are not being managed in a sustainable manner.

Historically, coastal and marine natural resources in Indonesia were managed through a centralised system of administration which displaced local communities and other resource stakeholders. This has resulted in the disappearance of most traditional management systems in Indonesia, such as *sasi*.

The fall of President Soeharto in 1998 brought about government reform (*reformasi*), which triggered a push towards decentralisation. The enactment of the Regional Government Law No. 22 of 1999 (Autonomy Law) in 2001 ended centralised governance in Indonesia. Regional governments now have the right to manage their marine and coastal areas, after more than thirty years of operating under a centralised system. In addition, the enactment of Act No. 25 of 1999 concerning Financial Distribution between Central and Regional Governments in granted regional governments access to income from the exploitation of the natural resources of Indonesia.

A significant development in institutional arrangements for coastal and marine resources management also occurred in Indonesia almost at the same time as the enactment of the Autonomy laws. In 1999, the new Ministry of Marine Affairs and Fisheries was established. This was the most significant effort to date by Indonesia to improve the management of its coastal and marine areas. Despite the central government's efforts in establishing the Ministry of Marine Affairs and Fisheries to address coordination of institutional arrangements for coastal and marine activities, Indonesia has not yet been able to fully address the complex problems and challenges relating to coastal and marine resources management. The degradation of marine and coastal ecosystems still continues at an alarming rate.

A critical issue hindering the sustainable management of coastal and marine ecosystems in Indonesia is what may be described as "negative political influences". This is reflected in the lack of a national ocean policy, the weakness in institutional arrangements and the lack of government commitment to manage these resources. These weaknesses have contributed to unclear jurisdiction between national government agencies, and are further complicated by conflict over the rights and responsibilities between national and regional governments in managing marine and coastal areas.

The case studies of regional policies and regulations in Riau Archipelago, Riau Province, Selayar, South Sulawesi Province, and Biak Numfor, Papua Province show that the effects of thirty-five years of a strong centralised regime are still visible in some regional governments. This is demonstrated by their lack of initiative and commitment to action. The habit of waiting for instruction, guidance and direction from the central government had not yet disappeared in many regional

governments. This has resulted in the suspension of the implementation of many regional regulations. Even though legally, the authority to act and decide on their needs was already in their hands, the lack of expertise and experience, the lack of confidence in authority, and the lack of knowledge of how to proceed is prevalent at the Provincial level.

It is clear that regional governments need support from the national government to strengthen their management capacity in general, and specifically for coastal management. It would appear that the Autonomy Law could not accommodate an "archipelagic district" committed to management of its marine resources in a holistic manner, such as was proposed in Selayar District, South Sulawesi. Further, the implementation of the Autonomy Law was not accompanied by education and information programs which would have allowed district leaders to assume their new management responsibilities and authority with confidence.

The lack of community participation in management decisions has contributed to the lack of knowledge and environmental awareness of coastal and coral reef ecosystems in most coastal communities, among local government officers and other local resource stakeholders. This has also contributed to an increase in illegal fishing practices in Indonesia. Poverty in coastal communities in Indonesia is very critical. Fishers and other rural coastal communities are considered the poorer communities in Indonesia. Poverty has resulted in the lack of capability of artisanal fishers to compete with large-scale fishing enterprises and foreign fishermen. This situation has promoted illegal fishing practices, and consequently distructive fishing practices at the community level.

Analysis of five key components of ICZM (institutional arrangements, policy and regulatory framework, the community-based management concept and maritime law enforcement system) and the case studies demonstrate that the co-management concept, or sharing of authority between government and community, is the best option for Indonesia to improve the management of its coral reef ecosystems. It can be argued that the co-management approach would positively improve the government's limitations to manage coral reef ecosystems. For example, the community-based enforcement program could reduce operational costs for monitoring and surveillance for the community areas. The sharing of authority between government and community could improve the management of coral reefs. This latter point has been confirmed by several "lessons learned" in respect of coral reef management from national and international experiences. These experiences also show that not all community resources management could succeed without support from government, since the power of the community is limited. Therefore, it is not reasonable to expect that all the management aspects for the use and development of coral reefs can be delivered by the community. This conclusion is also demonstarted by the fact that not every coastal community is willing to or capable of taking on the responsibility for coastal resource management. It can be argued, therefore, that the community resources management concept may not be an appropriate system in all cases, but it can be a good system if it is combined with government efforts, i.e. co-management.

However, to be successful, the implementation of the co-management approach needs to be strengthened by policy, regulatory and institutional frameworks, and an appropriate law enforcement system through the adoption and implementation of a national ocean policy.

A national ocean policy is meant to function as a guideline for national planning for coral reef management in Indonesia. It can also function as a reference point for regional development planning. The institutional arrangements provide a guide for coastal and coral reef management to improve the mechanisms of coordination.

Two indicators of effective coral reef management include the soundness of environmental and socioeconomic outcomes. "Environmentally sound" means that effective coral reef management can improve the coastal and coral reef ecosystems by reducing the coral mortality index and reducing or stopping illegal fishing practices. "Socioeconomically sound" means that effective coral reef management can improve the income base for both the community and government. The target of environmentally and socioeconomically sound management can be achieved with solid preparation and parallel implementation of a sound policy framework for coral reef management. Proper implementation of alternative income generation activities from the community program can be expected to stimulate the community economy and improve its revenues, while the implementation of maritime law enforcement programs can be expected to reduce illegal fishing practices.

Recommendations

With more than 60% of its population living in coastal areas, these areas and their ecosystems are very important for the food security of Indonesians. High productivity and extraordinarily high levels of human economic activity have led to overexploitation of coastal and coral reef resources and severe degradation of the environment. This degradation is exacerbated by the sectoral development approach

that has been employed over many years in managing the marine environment and marine activities.

Five broad recommendations are proposed to address the complex problems of coastal and coral reef resources management in Indonesia. These recommendations flow from the analysis in the substantive parts of the thesis.

The first recommendation is the need to involve the community actively in coastal and coral reef resources management. To successfully implement this recommendation, the following requirements must be met:

- The need to implement community-based management and collaborative management for coastal and coral reef resources close to where the community lives;
- The need to recognise the traditional resource management practices where these complement conservation and use of resources. The recognition of communal property rights and tenure are key elements for the success of community-based and collaborative management programs and projects;
- The need to establish an integrated institutional structure for collaborative management between the government institutions, universities, and NGOs in undertaking required community-based and co-management programs to provide the necessary technical and financial assistance to the community; and
- The need to decentralise management authority to local communities.

The second recommendation is the need to establish a national policy and strategy for marine and coastal resources management. This recommendation is proposed to address the lack of integration amongst the coastal and marine policies and programs in Indonesia. The establishment of a national coral reef policy and strategy is one management measure that has been successfully used in several countries in the world to provide direction for all stakeholders and government agencies. The enactment of a special legislation to give legal recognition to the policy is also required, to avoid a lack of commitment and complacency.

The third recommendation is the need to reform the Indonesian legal framework with respect to coastal and coral reef resources management. Three sub-recommendations can be considered by Indonesia to address the complicated regulatory framework for the marine sector. The first is the need to amend several of the existing legislation, including the General Peoples Assembly/MPR Decree No. III/MPR/2000 regarding the hierarchy of laws to clarify the status of Ministerial Decree in Indonesia's legal system, and the need to amend the existing laws on resources management to recognise the *adat* (traditional) laws.

The second issue in legal reform is the need to develop a new, integrated law for managing marine resources in Indonesia. It has been argued in this thesis that the continuing mismanagement and degradation of Indonesia's coastal and marine environment are due to the absence of a single integrated natural resources management legislation that addresses a broad range of issues including small islands and coastal management. The development of a new, integrated law on natural

resources management can reduce conflict, overlap, and gaps among the existing laws for natural resources management.

The third issue in legal reform is the need to strengthen local regulations or PERDA. In addition to the suggestions above for national legislation, there is also a need to strengthen local regulations to address problems at the local level. The existing PERDA should be strengthened to accommodate local *adat* law for coastal and marine resources management.

The fourth recommendation is the need to establish effective, integrated national and regional law enforcement units. Many central government agencies are involved in law enforcement activities and this has created conflict among them, resulting in inefficiencies and ineffectiveness in the implementation of enforcement programs. This is due to the lack of integration and co-operation among relevant agencies. The establishment of a national law enforcement unit, an umbrella group, is one possible solution to address the coordination problem at the national level and for the coordination of regional units to maintain standards of performance under national laws.

The establishment of regional law enforcement units would also address the problems such as lack of funds, lack of coordination at local sites, and the lack of capacity to accommodate the community enforcement programs for a more effective use of available resources. This recommendation is also to respond to the regional Autonomy Law that has given responsibilities to regional governments for their coastal areas.

The fifth recommendation is the need to reform the institutional arrangements for coastal and coral reef management at the national level. Three key options are available to address the problems of overlapping jurisdiction and lack of coordination amongst central government agencies. These include improvement of current coordinating mechanisms (revitalisation of DMI, the national coordinating council); expansion of the powers and duties of an existing agency (creation of a super-agency); and the establishment of a new coordinating ministry (Menko). The thesis has argued that that the establishment of a new coordinating ministry may be the best option for Indonesia, as it does not require significant public expenditure as would result from a major restructuring of existing government agencies. As a large country with two-thirds of its territory being ocean, it is reasonable for Indonesia to create a new coordinating ministry for ocean activities.

BIBLIOGRAPHY

A. Books, Monographs, Articles and Papers

Acheson, J.M. (1989) Management of common property resources. *Economic Anthropology*, Plattner, S (ed.), Stanford, CA.: Stanford University Press, pp. 351-378.

Agardy, T.S. (1997) *Marine Protected Areas and Ocean Conservation*, Texas U.S.A.: R.G. Landes Company and Academic Press.

Agoes, E. R. (1991) Indonesia and the LOS Convention: recent developments in ocean law, policy and management. *Marine Policy* (March), pp. 122-131.

Agoes, E.R., (1997), Current Issues of Marine and Coastal Affairs in Indonesia. *The International Journal of Marine and Coastal Law*, Vol. 12, No. 2, pp. 201-224.

Alcala, A.C., Gomez, E.D. and Yap, H.T. (1988) Philippine Coral Reefs: Status and Human Response to Changes in Ruddle, K., Morgan, W.B. and Pfafflin, J.R. *The Coastal Zone Man's Response to Change*, Harwood Academic Publishers, pp. 447-490.

Alcala, C. and Russ, G.R. (2000) Role of socioeconomic factors in coral reef protection and management. *Proceedings 9th International Coral Reef Symposium,* Bali, Indonesia 23-27 October 2000, Vol. 1, pp. 29-32.

Alder, J. (1993) Permits, and evolving tool in the day-to-day management of the Cairns section of the Great Barrier Reef Marine Park, *Coastal Management*, 21(1), pp. 25-36.

Alder, J. (1996) Have Tropical Marine Protected Areas Worked? An Initial Analysis of their success, *Coastal Management*, Vol. 24. No. 1, pp. 97-114.

Alder, J. and Wicaksono, A. (1992) *Community and outside fishers use of marine resources at Takabonerate atolls*, KLH/EMDI, 30pp.

Alder, J., N.A. Sloan, and H. Uktolseya, (1994) A comparison of management planning and implementation in three Indonesian marine protected areas. *Ocean and Coastal Management*. Vol. 24, pp. 179-198.

Allen, G.R. (1991) *Damselfishes of the World*. Aquarium System.

Allen, G.R. (2002) *Reef fishes of the Togean and Banggai Islands, Central Sulawesi, Indonesia*. Information provided by Reef Base – A Global Information System: "Indonesia: Status – Reef Fisheries": http://www.reefbase.org

Allison, E.H. and Ellis, F. (2001) The livelihoods approach and management of small-scale fisheries. *Maritime Policy*, Vol. 25 No. 5, pp. 377-388.

Bateman, S. (2003) Coast Guards: New Forces for Regional Order and Security. *Asia Pacific Issues* No. 65, January 2003. East-West Centre.

Beatley, T.; Brower, D.J. and Schwab, A.K. (2002) *An Introduction Coastal Zone Management* (2nd eds.) Island Press, Washington.

Bergh, P.E and Davies, S. (2002) Fishery Monitoring, Control, and Surveillance in Cochrane, K.L. (ed.) A fishery manager's guidebook: Management measures and their application. *FAO Fisheries Technical Paper* No 424. Rome, FAO., pp. 175-204.

Berkes, F. (1986) Local-level management and the commons problem: A comparative study of Turkish coastal fisheries. *Marine Policy*, Vol. 10, pp. 215-229.

Berkes, F. (1989) Co-management and the James Bay Agreement. In *Co-operative Management of Local Fisheries*, ed. Pinkerton, E. University of British Columbia, Vancouver, pp. 189-208.

Berkes, F. (1994) Property Rights and Coastal Fisheries, in Pomeroy, R.S. (ed.) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. International Centre for Living Resources Aquatic Resources Management (ICLARM), pp. 51-62.

Bower, B.T. (1992) *Producing Information for Integrated Coastal Management Decisions: An Annotated Seminar Outline*, NOAA, Washington, D.C.

Brown, B.E. and Howard, L.S. (1985) Assessing the effects of 'stress' on coral reefs. In *Adv. Marine Biology* 22, pp. 1-63.

Brown, B.E., and Suharsono (1990) Damage and recovery of coral reefs affected by El Niño related seawater warming in the Thousand Islands, Indonesia. *Coral Reefs* Vol. 8, pp. 163-170. Information provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org.

Brown, D.N., and Pomeroy, R.S. (1999) Co-management of Caribbean Community (CARICOM) fisheries. *Maritime Policy*, Vol. 23 No. 6, pp. 549-570.

Bryant, E.A. and Bateman, W.S.G. (1998) Maritime Hazards in the Indian Ocean Region – Overview, in Woodroffe, C.D. (ed.) *Maritime Natural Hazards in the Indian Ocean Region*, Wollongong Papers on Maritime Policy, Centre for Maritime Policy University of Wollongong, Australia.

Bureau of Fisheries and Aquatic Resources, Department of Agriculture of the Philippines online: *Regulation governing Pa-aling fishing operation in Philippine waters.* http://bfar.da.gov.ph/legislation/fao/fao190.htm

Burke, L., Selig, L. and Spalding, M. (2002) *Reef at Risk in Southeast Asia*, World Resources Institute.

Causey, B.D. (1995) Enforcement in marine protected areas, in Gubbay, S. *Marine Protected Areas: Principles and techniques for management*, London, Chapman & Hall, pp. 119-148.

Cesar, H., (1996), *Economic Analysis of Indonesian Coral Reefs*, the World Bank, Environment Department.

Chou, L.M. (1997) Southeast Asia as the Global Center of Marine Diversity. In Tropical Coasts Vol.4 No.1 July 1997 "Marine Biodiversity" Source provided by PEMSEA: http://pemsea.org/

Chou, L.M. (1997) *The Status of Southeast Asian Coral Reefs*. Proceedings 8th International Coral Reefs Symposium 1, pp. 317-322.

Chou, L.M. (1998) Status of Southeast Asian Coral Reefs, in Wilkinson, C. (ed.) *Status of Coral Reefs of the World: 1998*, pp. 79-87.

Chou, L.M. (2000) Southeast Asian Reefs – Status Update: Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. In Wilkinson, C. (ed.) *Status of Coral Reefs of the World: 2000*, Australian Institute of Marine Science, 2000, pp. 117-130.

Chou, L.M., Wilkinson, C.R., Licuanan, W.R.Y., Alino, P., Cheshire, A.C. Loo, M.G.K., Tongjaitrong, S., Sudara, S., Ridzwan, A.R., and Sukarno (1994) Status of coral reefs in the Asian Region. In Sudara, S., Wilkinson, C.R., and Chou, L.M. (eds.) *Proceedings Third ASEA-Australia Symposium on Living Coastal Resources*, 1, pp. 1-10.

Chua, T-E. and Scura, L.F., (1992), *Integrative Framework and Methods for Coastal Area Management*, Proceedings of the Regional Workshop on Coastal Zone Planning and Management in ASEAN: Lessons Learned, Bandar Seri Begawan, Brunei Darussalam 28-30 April 1992, International Centre for Living Aquatic Resources Management (ICLARM).

Cicin-Sain, B. (1993) Sustainable Development and Integrated Coastal Management. *Ocean and Coastal Management*, No. 21, pp. 11-43.

Cicin-Sain, B., and Knecht, R.W., (1998), *Integrated Coastal and Ocean Management: Concepts and Practices*, Island Press, Washington, D.C.

Cordes, B. (1998) An update from a community-based marine resource management project in the Padaido Islands, West Papua, *NRM News*, 1(2), 5.

Courtney, C.A., White, A.T., and Deguit, E. (2002) Building Philippine Local Government Capacity for Coastal Resource Management. *Coastal Management* Vol. 30, pp. 27-45.

Crawford, B. and Tulungen, J. (1999) Concept for a Decentralized Provincial and/or Kabupaten Coastal Management Program in North Sulawesi. *Proyek Pesisir Working Paper*.

Crawford, B., Cobb, J.S., and Friedman, A. (1993) Building capacity for integrated coastal management in developing countries. *Ocean and Coastal Management*, 21, pp. 311-337.

Crawford, B.R., Dutton, I.M., Rotinsulu, C., and Hale, I.Z. (1998) Community-based Coastal Resources Management in Indonesia: Examples and Initial Lessons from North Sulawesi, in *ITMEMS Proceeding*, pp. 299-309.

Crawford, B.R., Siahainenia, A., Rotinsulu, C., Sukmara, A. (2004) Compliance and Enforcement of Community-Based Coastal Resources Management Regulations in North Sulawesi, Indonesia. *Coastal Management*, Vol. 32, pp. 39-50.

Dahuri R., (2000), *Kebijakan dan Strategi Pengelolaan Terumbu Karang Indonesia* (Policy and Strategy of Indonesian Coral Reef Management). Prosidings Lokakarya Pengelolaan dan IPTEK Terumbu Karang Indonesia (Proceedings of the Workshop on Management, Science and Technology of Indonesian Coral Reefs, Jakarta, 22-23 November 1999, Indonesian Institute of Sciences, pp. 1-16.

Dahuri, R. (1994) The Challenge of Sustainable Coastal Development in East Kalimantan, Indonesia. *Coastal Management in Tropical Asia* (March, 1994), pp. 12-15.

Dahuri, R. (1995), Indonesia: National Status and Approaches to Coastal Management, in Hotta, K and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*, Tokyo, JIMSTEF, pp. 277-290.

Dahuri, R. (1999) Coastal Zone Management in Indonesia: Issues and Approaches, in Rais, J., Dutton, I.M., Pantimena, L., Plouffe, J. and Dahuri, R. (eds.) *Integrated Coastal and Marine Resources Management* Proceedings Symposium Malang, 1998, pp. 60-72.

Dahuri, R. (2001) *Decentralizing and Delegating ICM to Regional and Local Communities: A Precarious Balance of Authority, Capacity and Consistency*. UNESCO, Oceans and Coasts. Pre-World Summit on Sustainable Development Conference, Paris, France – December 2001.

Destructive Fishing Watch (2003) *Profile of Destructive Fishing in Spermonde Islands 2003. Coral Reef Rehabilitation and Management Project*. DFW is an Indonesian NGO established and operated in South Sulawesi.

Dicey, A.V. (1959) *Introduction to the Study of the Law of the Constitution*. London, Macmillan., 585 pp.

Dirhamsyah (2004.a) Regional Policies and Regulations for Coral Reef Management: Case Studies on Riau Archipelago, Selayar, and Biak Numfor Districts, Indonesia. *Maritime Studies* No. 136, Australia, pp. 7-20.

Dirhamsyah (2004.b) The Indonesian Coral reef rehabilitation and management program: lessons learned in community-based reef management at Senayang and Lingga Islands, Riau. *Proceeding of Coastal Zone Asia Pacific Conference (CZAP) 2004*, Brisbane 5-9-2004.

Djalal, H. (1995) *Indonesia and the Law of the Sea,* Jakarta: Centre for Strategic and International Studies.

Djalal, H. (2004) Piracy in South East Asia: Indonesia and Regional Responses. Paper prepared for Strategic and International Studies – American – Pacific Sealanes Security Institute Conference on Maritime Security in Asia. January 18-20, 2004, Honolulu, Hawaii.

Edinger, E.N., Jompa, J., Limmon, G.U., Widjatmoko, W., and Risk, J. (1998) Reef degradation and coastal biodiversity in Indonesia: land-based pollution, destructive fishing practices and challenges overtime. *Marine Pollution Bulletin*, No. 36, pp. 617-630.

Eggert, H. and Ellegård, A (2003) Compliance and fisher influence in Swedish commercial fisheries regulation – A case for co-management? Website: http://www.beijer.kva.se/conference2003/Eggert_Ellegård

FAO (1981) *Report on expert consultation on MCS for fisheries management*. Rome, FAO.

Feeny, D. (1994) Frameworks for Understanding Resources Management on the Commons, in Pomeroy, R.S. (ed.) *Community Management and Common*

Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences. International Centre for Living Resources Aquatic Resources Management (ICLARM), pp. 20-33.

Fegan, B. (2003) Plundering the Sea. Inside Indonesia Jan-March 2003, http://www.insideindonesia.org.

Flewwelling, P. (2001) *Fisheries Management and MCS in South Asia*. FAO/FISH CODE Project, GCP/INT/648/NOR: Final Report C-6 (En), Rome, FAO.

Flewwelling, P., Cullinan, C., Balton, D., Sautter, R.P., and Reynold, J.E. (2002) Recent trends in monitoring, control, and surveillance systems for capture fisheries. *FAO Fisheries Technical Paper*. No. 415, Rome, FAO.

Fox, J.J. (1995) Fishing resources and marine tenure: the problems of eastern fishermen. In Barlow, C., and Hardjono, J. (eds.) *Indonesia Assessment 1995: Development in Eastern Indonesia*. ANU Canberra, pp. 163-173.

Fraser, N., Rotinsulu, C., Siahainenia, A., and Crawford, B. (1998a) Crown of thorns cleanup brings North Sulawesi communities together. *NRM News*, Vol. 1(1), pp.1-11.

Garcia, S.M. and R. Grainger. (1997). Fisheries management and sustainability: A new perspective of an old problem?, pp. 631-654. *In* D. A. Hancock, D. C. Smith, A. Grant and J. Beumer. (eds.) Developing and sustaining world fisheries resources: the state of science and management. Second World Fisheries Congress proceedings. CSIRO Publishing, Collingwood, Victoria.

GESAMP Reports and Studies, No. 30, *The State of the Marine Environment*; IMO/FAO/UNESCO/WMO/WHO/IAEA/UNEP. The United Nations Environment Programme, 1990, http://www.gesamp.imo.org/publicat.htm.

Gibson, J. and Warren, L. (1995) Legislative requirements, in Gubbay, S. *Marine Protected Areas: Principles and techniques for management*, London, Chapman & Hall, pp. 32-59.

Gomez, E.D. (1980) *Status reports on research and degradation problems of the coral reefs of the East Asian Seas*. Paper presented at the meeting of Experts on Review

the Draft Action Plan for the East Asian Seas, Baguio, Philippines, 17-21 June 1980. Manila: South China Sea Fisheries Development and Coordinating Programme, UNEP/WG.41/INF.15.

Goodpaster, G. (1999) The Rule of La, Economic Development & Indonesia. In Seidman, A., Seidman, R.B., Walde, T.W. (eds.) *Making Development Work: Legislative Reform for Institutional Transformation and Good Governance*. The Hague-London-Boston, Kluwer Law International, pp. 21-32.

Grigg, R.W. and Dollar, S.J. (1990) Natural and Anthropogenic disturbance on coral reefs, in Dubinsky, Z. (ed.) *Ecosystems of the World 25, Coral Reefs*, Elsevier, pp. 439-452.

Hadley, M., (1994), *Island Agenda*, the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Haeruman, H. (1999), *Kebijaksanaan Pembangunan Taman Nasional dalam Rangka Otonomi Daerah (National Park Development Policy in Regional Autonomy*), in Proceedings of the Eastern Indonesia Regional National Park Conference, Manado, Indonesia, 24-27 August 1999.

Hantoro, W.S., P.A. Pirazolli, C. Jouannic, H., Faure, C.T. Hoang, C. Causse, M. Borel Best, R. Lafonte, S. Bieda, and K. Lambeck (1994) Quaternary Uplifted Coral Terrace on Alor Island, East Indonesia. *Coral Reefs* 13, pp. 215-223 provided by Reef Base – A Global Information System: "Indonesia: Threats – Natural": http://www.reefbase.org. (accessed on 30 July 2003).

Hardin, G. (1968) The Tragedy of the Commons, *Science*, 162, pp. 1243-1248.

Hidayat, A. (2003) Governance Structure in Coral Reef Management: A report from Gili Indah Village, West Lombok Indonesia. Working Paper on a Research Colloquium of Resource Economic Department, Humboldt University of Berlin.

Higa, T. (1997) Coral Reefs: Mines of Precious Substances. In Tropical Coasts Vol.4 No.1 July 1997 "Marine Biodiversity". Source provided by PEMSEA, http://pemsea.org/

Hildreth, R.G. and Gale, M.K (1995), Institutional and Legal Arrangements for Coastal Management in Asia-Pacific Region, in Hotta, K. and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*, Tokyo, JIMSTEF, pp. 21-38.

Hinrichsen, D. (1998) *Coastal Waters of the World: Trends, Threats, and Strategies*, Island Press, Washington, D.C.

Holland, P. (1999) Regional Government and Central Authority in Indonesia, in Lindsey, T. (ed.) *Indonesia: Law and Society*. The Federation Press, NSW., pp. 200-220.

Hopley, D and Suharsono (2000) The Status of Coral Reefs. in Eastern Indonesia. Global Coral Reef Monitoring Network (GCRMN). Information provided by Reef Base: http://www.reefbase.org

Idris, I. (2000), *Otonomi daerah dalam pengelolaan sumber daya kelautan di wilayah pesisir (Regional autonomy: Marine resources management in coastal zone)*, Prosidings Lokakarya Pengelolaan dan IPTEK Terumbu Karang Indonesia (Proceedings of the Workshop on Management, Science and Technology of Indonesian Coral Reefs, Jakarta, 22-23 November 1999, Indonesian Institute of Sciences, pp. 166-172.

International Institute of Strategic Studies (IISS), *The Military Balance, 1991-1992*, Oxford University Press for the IISS, London, 1991.

Jentoft, S. (2000) Legitimacy and disappointment in fisheries management. *Marine Policy*, Vol. 24, pp. 141-148.

Jentoft, S., McCay, B.J., and Wilson, D.C. (1998) Social Theory and Fisheries Co-management. *Marine Policy*, Vol. 22. No. 4/5., pp, 423-436.

Johannes, R. (ed.) (1989) *Traditional Ecological Knowledge: A Collection Essays*, International Union for Conservation of Nature, Gland, Switzerland and Cambridge, UK.

Johannes, R.E. (1975) Pollution and degradation of coral reef communities, in Ferguson Wood, E.J. and Johannes, R., eds. *Tropical Marine Pollution*, Amsterdam, Elsevier Scientific Publishing Co., pp. 13-20.

Johannes, R.E. and Riepen, M. (1995) *Environmental Economic and Social Implications of the live reef fish trade in Asia and Western Pacific*. Report Prepared for the Nature Conservancy.

Jones, V. and Westmacott, S.E. (1996) *Management Arrangement for the Development and Implementation of Coastal Zone Management Programmes* National Institute for Coastal and Marine Management, Coastal Zone Management Centre, The Netherlands, Noordwijk.

Jusuf, G.D.H. (1997) *Economic Analysis of Sustainable Development of the Indonesian Coastal Resources: A Dissertation of Doctor of Philosophy*, University of Rhode Island.

Kay, R. and Alder, J. (1999) *Coastal Planning and Management*, London: E & FN SPON.

Kay, R.C., Cole, R.G., Elisara-Laulu, F.M. and Yamada, K. (1993) *Assessment of Coastal Vulnerability and Resilience to Sea level Rise and Climate Change, Case Study: 'Upolu Island, Western Samoa. Phase I: Concepts and Approach*, South Pacific Regional Environment Programme (SREP), Apia, Western Samoa.

Kaza, S., (1995), Marine Education and Interpretation, in Gubbay, S. (ed.) *Marine Protected Areas: Principles and techniques for management*, London, Chapman & Hall, pp. 174-198.

Kelleher, G., (2000) The development and establishment of coral reef marine protected areas. *Proceedings 9th International Coral Reef Symposium, Bali, 2000 Indonesia*, Vol. 2, pp. 609-613.

Kenchington, R. and Crawford, D. (1993) On the meaning of integration in coastal zone management. *Ocean and Coastal Management*, Elsevier Science and Publishers, England. No. 21, pp. 109-127.

Kenchington, R., (1990), *Managing Marine Environments*, New York, Taylor & Francis New York Inc.

Kenchington, R., (1992), Decision making for marine environments. *Marine Pollution Bulletin* 24 (2), pp. 69-76.

Kenchington, R., (1995) Future Prospects for Coastal Zone Management, in Hotta, K and Dutton, I.M. *Coastal Management in the Asia-Pacific Region: Issues and Approaches*, Tokyo, JIMSTEF, pp. 385-394.

Khwaja, A.I. (2001) Can good projects succeed in bad communities: Collective action in the Himalayas. The World Bank Publications websites: http://www1/worldank/decentralization/publication

KLH (the Ministry for Environment) (1992) *Indonesia Country Study on Biological Diversity*. UNEP, 209pp.

KLH (Ministry for Environment) and UNDP (1997) Integrated Management and Sustainable Development of Coastal and Marine Areas. In *Agenda 21 Indonesia: National Strategy for Sustainable Development chapter 18.*

Kriastomo, T., (1998) Profil Kepulauan Padaido (Profile of Padaido Islands) Buana Khatulistiwa, NGO Spatial for Information, http://www.bk.or.id; "*Ekonomi Kabupaten Biak Numfor"* (Economic of the District of Biak Numfor), *Kompas Daily News*, 14 January 2003, http://www.kompas.co.id

Kunzman, A. (2002) On the way to Management of West Sumatra's Coastal Ecosystems. *The ICLARM Quarterly*, Vol. 25. No. 1, January-March 2000, pp. 4-10.

Kusuma-Atmadja, M. and Purwaka, T.H. (1996) Legal and institutional aspects of coastal zone management in Indonesia. *Marine Policy* Vol. 20 No. 1., pp. 63-85.

Kusumastanto, T. (2003) *Ocean Policy: dalam Membangun Negeri Bahari di Era Otonomi Daerah* (Ocean Policy: in developing maritime country in regional autonomy era). Jakarta, PT. Gramedia Pustaka Utama

Lawrence, D., Kenchington, R., and Woodley, S., (2002), *The Great Barrier Reef: Finding the Right Balance*, Melbourne University Press.

Leach, M., R. Mearns and I. Scoones. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. World Development 27, pp. 225-247.

Licuanan, W.Y., and Gomez, E.D. (2000) Philippine coral reefs: Status and the role of the academe to improve their management. *Proceedings 9th International Coral Reef Symposium, Bali*, October 23-27, 2000 Vol. 2, pp. 835-840.

Lindsay, J.M. (1998) Creating a legal framework for community-based management: principles and dilemmas, in *the World Bank Legal Paper Online*: http://www.wb.org/default.htm.

Llewellyn, G. (1999) Review of existing law and policies relating to migratory marine species: conservation and commercial and coastal fisheries. Information provided by Reef Base – A Global Information System: "Indonesia: Management Legislation", http://www.reefbase.org

Lowry, K. (2000) Decentralised Coastal Management. *Proyek Pesisir (Indonesia Coastal Resources Management Project)*. USAID/BAPPENAS NRM II Program.

"Menyingkap Tabir B737 Surveiller" (Discovered Screen of B737 observer), *Majalah Angkasa Online*, 8 May 2003, http://www.angkasa-online.com

Mananring, B. (1999) Laporan Triwulan Pengelolaan Berbasis Masyarakat (PBM): Program Pengelolaan dan Rehabilitasi Terumbu Karang (COREMAP) di Taman Nasional Takabonerate, Selayar (*Quarterly report on Community-based Management (CBM): Coral Reef Rehabilitation and Management Program (COREMAP) in Takabonerate National Park, District of Selayar)*. Lembaga Pengkajian Pedesaan, Pantai dan Masyarakat

Manchur, W., Zurbrigg, A. and Reichratch, S. (2003) *CBNRM Social Science Resources Kit: A Guide for Researchers. Volume 5: Institutional Analysis*. Source: Environment and Natural Resource Management Online: http://web.idrc.ca/en/ev-3221-201-1-DO_TOPIC.html

Mantjoro, E. (1996) Management of Traditional Common Fishing Grounds: The Experience of the Para Community, Indonesia. *Coastal Management* Vol. 24(3), pp. 229-250.

Miller, I., (2000) Historical patterns and current trends in the broad scale distribution of crown-of-thorns starfish in the northern and central sections of the Great Barrier

Reef. *Proceedings 9th International Coral Reef Symposium, Bali, 2000 Indonesia*, Vol. 2, pp. 1273-1279.

Moosa, K.M.. and Suharsono (1997) Rehabilitasi dan Pengelolaan Terumbu Karang: Suatu Usaha Menuju ke Arah Pemanfaatan Sumberdaya Terumbu Karang Secara Lestari (Coral Reef Rehabilitation and Management: An effort towards to sustainable use of Coral reef resources), in Sumodihardjo, S (ed.) *Proceedings Seminar National Pengelolaan Terumbu Karang (Procedings of National Workshop on Coral Reefs Management*), MAB Indonesian Program and LIPI, pp. 189-200.

Moosa, M.K., (1994) *Laporan Ekspedisi Pulau Rinca 1994* (ed.) (Report on the Rinca island expedition: 1994), P3O-LIPI Jakarta.

Moosa, M.K., (1999) The Extent of Knowledge about Marine Biodiversity in Indonesia. *Proceeding of the International Symposium on Integrated Coastal and Marine Resource Management, Malang, Indonesia*: 126-153.

Moosa, M.K. (2004) Implementing Policy and Strategy for Coral Reef Rehabilitation and Management: Lessons Learnt from an Indonesian Effort. Information provided by World Fish Center, http://www.worldfishcenter.org/Pubs/coral_reef/pdf (accessed on 20 December 2004).

Mous, P.J.; Pet-Soede, L.; Erdman, M.; Cesar, H.; Sadovy, Y.; and Pet, S.P. (2000) Cyanide Fishing on Indonesian coral reefs for the live food fish market – What is the problem? *SPC Live Reef Fish Information Bulletin*, Vol. 7 (May 2000), pp. 20-28.

Nikijuluw, V.P., Bengen, D.G. and Purwanto, A.B. (2002) Identifikasi Pola Pergeseran dari Rezim Sentralistik kepada Desentralasi dalam Pengelolaan Sumberdaya Pesisir dan Laut (Identification of changing pattern of Centralistic regime to Decentralization in Marine and Coastal Management), in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia*

(National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, pp. III-41-III-53.

Nikijuluw, V.P.H. (1998a) Identification of Indigenous Coastal Fisheries Management (ICFM) system in Sulawesi, Maluku and West Papua. *Pesisir and Lautan*, 1 (2), pp. 1-10.

Nikijuluw, V.P.H. (1998b) Management of Coastal Areas by villagers of Jemluk, Bali Island. *Jurnal Pengelolaan Sumberdaya Pesisir and Lautan Indonesia*, 1, pp. 21-30.

Nontji, A., (2000), Coral Reefs of Indonesia: Past, present and future. *Proceedings 9th International Coral Reef Symposium, Bali, 2000 Indonesia*, Vol. I pp. 17-27.

Novaczek, I., Sopacua, J., and Harkes, I. (2001) Fisheries Management in Central Maluku, Indonesia, 1997-1998. *Maritime Policy*, Vol. 25, No.3, pp. 239-249.

Nur, Y., Fazi, S., Wiryoatmodjo, N., Hansen, T., and Steffen, J.H. (2002) Reducing the Impact of a Coastal Megacity on Island Ecosystems, Jakarta and the Seribu Islands, in Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan Indonesia* (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia.

O'Connor, M. (2002) Future Organizational Directions for Maritime Border Protections: The Case for an Australian Coast Guard, in Tsamenyi, M. and Rahman, C. (eds.) *Protecting Australia's Maritime Borders: The MV Tampa and Beyond*. Wollongong Paper on Maritime Policy No. 13.

Ostrom, E. (1990). Governing the commons: the evolution of institutions for collective action. Cambridge University Press, Cambridge.

Patlis, J., Knight, M. and Siahaan, W. (2002) Creating A Framework for Integrated Coastal Management in Indonesia: The Importance of Law. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) *Prosiding Konperensi Nasional III 2002: Pengelolaan Sumberdaya Pesisir dan Lautan*

Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings*)*, Bali, Indonesia, pp. V 7-20.

Patlis, J.M., Dahuri, R., Knight, M. and Tulengen, J. (2001) Integrated Coastal Management in a decentralized in Indonesia: How it can work. *Pesisir and Lautan*, Vol. 4(1), pp. 24-39.

Pease, L. (2004) *JFK, Indonesia, CIA and Freeport Sulphur: What is past is prologue*. Information provided by Real History Archive websites: http://www.realhistoriarchives.com

Perry, A.M., (1999) International Economic Organization and the Modern Law and Development Movement, in Seidman, A., Seidman, R.B., Walde, T.W. (eds.) *Making Development Work: Legislative Reform for Institutional Transformation and Good Governance*. The Hague-London-Boston, Kluwer Law International, pp. 19-32.

Pet, J., and Djohani, R. (1996) A framework for management of the marine resources of Komodo National Park and surrounding marine areas in Eastern Indonesia. Paper presented for the Nature Conservancy, Reefbase: http://www.reefbase.org

Pet-Soede, L. and Djohani, R.H. (1998) Combating destructive fishing practices in Komodo National Park: Ban the hookah compressor. The Secretariat of the Pacific Community (SPC). *SPC Live Reef Fish Bulletin*, 4, pp. 17-28.

Pet-Soede, L. and Erdmann, M. (1999) An overview and comparison of destructive fishing practice in Indonesia. The Secretariat of the Pacific Community (SPC). *SPC Live Reef Fish Bulletin*, 4, pp. 28-36.

Pet-Soede, L., Cesar, H.S.J., and Pet, J.S (1999) An economic analysis of blast fishing on Indonesian coral reefs. *Environmental Conservation* No. 26, pp. 83-93.

Pet-Soede, L, Merkl, A., Claussen, J., Thompson, H., and Wheeles, D. (2002) Integrated Marine Management Concessions – A New Approach to An Old Problem. In Bengen, D.G., Arthana, I.W., Dutton, I.M., Tahir, A., and Burhanuddin (eds.) Prosiding Konperensi Nasional III 2002: *Pengelolaan Sumberdaya Pesisir dan*

Lautan Indonesia (National Conference III of 2002: Management of Indonesian Coastal and Ocean Resources Proceedings), Bali, Indonesia, pp. v-35-v-48.

Pet-Soede, L. (2000) *Option for co-management of an Indonesian coastal fishery*, PhD Thesis. Wageningen Universitiet, with ref. And with summary in Dutch, cited in Reefbase website: http://www.reefbase.org

Pinkerton, E. (1989) *Co-operative Management of Local Fisheries: New Directions for improved Management and Community Development*, University of British Columbia Press, Vancouver.

Pomeroy, R.S. (ed.) (1994) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. International Center for Living Resources Aquatic Resources Management (ICLARM).

Pomeroy, R.S. and Berkes, F. (1997) Two tango, the role of government in fisheries co-management. *Marine Policy*, Vol. 21 No. 5, pp. 465-480.

Pomeroy, R.S. and Carlos, M.B. (1997) Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984-1994. *Maritime Policy,* Vol. 21 No. 5, pp. 445-464.

Pomeroy, R.S., Katon, B.R. and Harkes, I. (2001) Condition affecting the success of fisheries co-management: lessons from Asia. *Maritime Policy*, Vol. 25 No. 3, pp. 197-208.

Pomeroy, R.S., Pollnac, R.B., Predo, C.D. and Katon, B.M. (1997) Impact evaluation of community-based coastal resources management projects in the Philippines, NAGA *The ICLARM Quarterly*, 19 (4), 9-12.

Pomeroy, R.S. and M.J. Williams. (1994). Fisheries co-management and small-scale fisheries: a policy brief. Manila Philippines ICLARM 15.

Prasetyo, H. et al. (1996) *Profil Kelautan Nasional Menuju Kemandirian* (National Maritime Profile towards Independency). Jakarta: National Committee for Maritime Technology and Industrial Development.

Proyek Pesisir (2001) The need for an integrated coastal management program. Makalah and Journal. Vol. 4, No. 1, Proyek Pesisir: http://www.crmp.cbn.net.id

Purwaka, T.H. and Sunoto (2001) Coastal Resources Management in Indonesia: Legal and Institutional Aspect, in Torell, M. and Salamanca, A.M. (eds.) *Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia*, SIDA and ICLARM, pp. 60-90.

Raakjær Nielsen, J. and Mathiesen, C. (2000) *Important Factors Influencing Rule Compliance in Fisheries – Lessons from Danish Fisheries*. Website: http://www.oregonstate_edu/dept/IIFET/2000/papers/nielsen

Rogers, C.S. (1990) Responses of coral reefs and reef organisms to sedimentation. *Marine Ecology Progress* Series, 62, pp. 185-202.

Ruddle, K. (1994) Changing the Focus of Coastal Fisheries Management, in Pomeroy, R.S. (ed.) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. International Center for Living Resources Aquatic Resources Management (ICLARM), pp. 63-86.

Ruddle, K. and Johannes, R.E. (1983) *The Traditional Knowledge and Management of Coastal System in Asia and the Pacific*, UNESCO, Jakarta, Indonesia.

Rudyanto, A. (1999), Marine and Coastal Management in Indonesia: a Planning Approach. *Maritime Studies*, 106. The Australian Center for Maritime Studies Incorporated, pp. 1-9.

Sachiko, M. and Durwood, Z. (2005) Rule of Law, Good Governance and Sustainable Development. Conference Proceedings Volume 1 of Seventh International Conference on Environmental Compliance and Enforcement in 10-15 April 2005, Marrakech, Morocco.

Salm, R. (1984) *Ecological boundaries for coral reef reserves: principles and guidelines*., Environment and Conservation, 11, pp. 209-215.

Salm, R., and Halm, M. (1984a) *Marine and Coastal Protected Areas in Indonesia*. IUCN/WWF Conservation for Development Program, Bogor.

Salm, R., and Halm, M. (1984b) *Marine Conservation Atlas*. IUCN/WWF Project, 3108.

Salvat, B. (1974) Degradation of coral reef ecosystems. *Le Courrier de la Nature* Vol. 30, pp. 49-62 (Translated by Robinson, A.H.)

Sandolo, R.M. (1994) Community-based Coastal Resources Management: the Palawan Experience, in Pomeroy, R.S. (ed) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. International Center for Living Resources Aquatic Resources Management (ICLARM), pp. 165-181.

Scialabba. N. (1998) Integrated coastal area management and agriculture, forestry and fisheries. *FAO Guidelines*. Food and Agriculture Organization of the United Nations, Rome.

Senaratna, S. (1999) *Common Property Resources and Coral Reef Ecosystems*. International Union for Conservation of Nature and Natural Resources (IUCN): The Sustainable Use Initiative.

Shihata, I.F.I., (1999) Good Governance and the Role of Law in Economic Development, in Seidman, A., Seidman, R.B., Walde, T.W. (eds.) *Making Development Work: Legislative Reform for Institutional Transformation and Good Governance*. The Hague-London-Boston, Kluwer Law International, pp. xvii-xxiv.

Sloan, N.A., and Sugandhy, A. (1994) An overview of Indonesia Coastal Environmental Management. *Coastal Management* No. 22, pp. 215-233.

Smyth, D. (1993) *A Voice in All Places: Aboriginal and Torres Strait Islander Interests in Australia's Coastal Zone*, Commonwealth of Australia, Canberra.

Sobel, J. and Dahlgren, C. (2004) Marine Reserve: A Guide to Science, Design and Use. Island Press.

Soegiarto, A. (1997) Assessment of the present health of coral reefs in Indonesia, in Grigg, R.W., Birkeland, C. (eds.) *Status of Reefs in the Pacific*. University of Hawaii, pp. 75-78.

Soegiarto, A. and Stel, J.H. (1998) The Indonesian experience in marine capacity building. *Marine Policy* Vol. 22 No. 3, pp. 255-266.

Sofa, F. 2000. *Program Pengelolaan Pesisir dan Kelautan di Indonesia: Sebuah Tinjauan* (Marine and Coastal Resources Management Program in Indonesia: a Review). Proyek Pesisir Technical Report.

Sorensen, J.C. and McCreary, S.T., (1990) *Institutional Arrangement for Managing Coastal Resources and Environments*, 2nd edn, National Park Service, U.S. Department of the Interior and U.S. Agency for International Development.

Spalding, M.D., Ravilious, C., and Green, E.P. (2001) *World Atlas of Coral Reefs*, Prepared at the UNEP World Conservation Monitoring Centre, University of California Press, Berkeley USA.

Sujianto, (2002) Studi Pengembangan Kelembagaan Masyarakat Nelayan Kepulauan dan Pesisir: Studi Pengembangan Kelembagaan berdasarkan Kultur Masyarakat Melalui Community-based Management di Kepulauan Riau (*Institutional Development Study on Coastal Communities: Institutional Development Study based on Local cultural through Community-based Management at Riau Archipelago*), Laboratory of Business Administration, Faculty of Social Science and Politic, University of Riau.

Sukarno (1994) The Status of coral reefs in Indonesia, in Sudara, S., Wilkinson, C.R. and Chou, L.M. (eds.) *Proceedings Third ASEA-Australia Symposium on Living Coastal Resources*, 1, pp. 43-47.

Suryadi, P., and Supriatna, J. (1999) *Bridging community needs and government planning in the Togean Islands, Central Sulawesi, Indonesia.*

Sutinen, J.G., Yahaya, J., and Hinrunruk, V. (1992) Fisheries Law Enforcement Programs, Practices, and Problems in Malaysia, the Philippines, and Thailand. In Marsh, J.B. (ed.) *Resources and Environment in Asia's Marine Sector*. Taylor & Francis New York Inc, pp. 129-159.

The Asian Development Bank (2003). Elements of Good Governance, http://www.adb.org.htm

The State Ministry of Environment and PKSPL-IPB (2003) Potret kondisi dan permasalahan pengelolaan sumberdaya di wilayah pesisir dan laut (A snapshot of condition and problems of resources management in coastal and marine areas), the State Ministry of Environment, http://www.menlh.go.id

The United Nations Economic and Social Commission for Asia and the Pacific/UN ESCAP (2003) What is Good Governance? http://www.unescap.org/huset/gg/governance.htm

The United Nations Environment Programme (UNEP) (2005) After the Tsunami: Rapid Environment Assessment, Indonesia Part., p. 23. Information provided by: http://www.unep.org

The World Bank (2003) Project Design: Administrative http://www1.decentralization.htm

Tomascik, T.; A.J. Mah; A. Nontji & M.K. Moosa, (1997) *The Ecology of Indonesian Seas*. (2 volumes). Hongkong, Periplus Edition.

Torell, M. and Salamanca, A.M. (2001) Navigating the Institutional Landscape: Introduction and Overview, in Torell, M. and Salamanca, A.M. (eds.) *Institutional Issues and Perspective in the Management of Fisheries and Coastal Resources in South East Asia*, SIDA and ICLARM, pp. 1-15.

Tsamenyi, M. and McIlgorm, A (1999) *International Environmental Instruments: Their effect on the Fishing Industry* (second edition). University of Wollongong and AMC Search Ltd.

Turner, M., Podger, O., Sumardjono, M., and Tirthayasa, W.K. (2003). *Decentralization in Indonesia: redesigning state*. Canberra, Asia Pacific Press, the Australian National University

UNESCO (2000) *Integrated Tourism and CBM in Ulugan Bay*, Jakarta.

Viswanathan, K.K., and Raja Abdullah, N.M. (1994) Planning and Management of Small-Scale Coastal Fisheries, in Pomeroy, R.S. (ed.) *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts,*

Methods and Experiences. International Center for Living Resources Aquatic Resources Management (ICLARM), pp. 115-123.

Wasserman, C.E. (1994) *the Principles of Environmental Enforcement and Beyond Building Institutional Capacity*. Proceedings Volume 1 of Third International Conference on Environmental Enforcement. Source: International Network for Environmental Compliance and Enforcement websites: http://www.inece.org/

Wells, M. and Brandon, K. (1992) *People and Park: Linking Protected Area Management with Local Communities*, World Bank, Washington, DC.

Wells, S. and White, A.T. (1995), Involving the Community, in Gubbay, S. *Marine Protected Areas: Principles and techniques for management*, London, Chapman & Hall, pp. 61-84.

White, A.T. and Trinidad, A.C. (1998) *The Values of Philippine Coastal Resources: Why Protection and Management are Critical*. Cebu City: Coastal Management Project.

White, A.T. and Vogt, H.P (2000) Philippine Coral Reefs Under Threat: Lessons Learned After 25 Years of Community-Based Reef Conservation. *Marine Pollution Bulletin* Vol. 40, No. 6, pp. 537-550.

White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (eds.) (1994) *Collaborative and Community-Based Management of Coral Reefs*. Kumarian Press.

Wilkinson, C. (2004) Status of Coral Reefs of the World: 2004 Volume 1 and 2, Australian Institute of Marine Science

Wilkinson, C., (2000), *Status of Coral Reefs of the World: 2000*, Australian Institute of Marine Science.

Wilkinson, C.R., Chou, L.M., Gomez, E., Mohammad, I.S., Soekarno, and Sudara, S. (1993) A regional monitoring approach to monitoring coral reefs studies in Southeast Asian by the ASEAN-Australia Living Resources Project. Proceedings of the 7th International Coral Reef Symposium, 1, pp. 138-143.

Wiltshire, B.M. (1999) Community-based strategies for a sustainable lifestyle in the coastal environment. M.E.S thesis, University of Waterloo, CIDA Project 472/18270, Reefbase: http://www.reefbase.org

Woodroffe, C.D. (1995) Integrated Coastal Zone Management: Transnational Issues that relate to Australia, South-East Asia, and the Indian Ocean. In Tsamenyi, M.; Bateman, S. and Delaney, J. (eds.) *Coastal and Maritime Zone Planning and Management: Transnational and Legal Considerations*. Centre for Maritime Policy, University of Wollongong, Australia, pp. 99-113.

Yap, H.T. and Gomez, E.D. (1985) Coral reef degradation and pollution in the East Asian Seas region. In Dahl, A.L. and Carew-Reid, J. (eds.) Environment and Resources in the Pacific. Nairobi: *UNEP Regional Seas Reports and Studies* No. 69, pp. 185-204.

Young, P. *et.al.* (1995) *Australia's Ocean Age: Science and Technology for Managing Our Ocean Territory*. Office of the Chief Scientist, Department of the Prime Minister and Cabinet. AGPS, Canberra.

Zerner, C. (1994) Tracking *Sasi*: The Transformation of a Central Mollucan Reef Management Institution in Indonesia. In White, A.T., Hale, L.Z., Renard, Y and Cortesi, L. (1994) *Collaborative and Community-Based Management of Coral Reefs*. Kumarian Press, pp. 19-32.

B. Regulations

Act No. 1/1946 concerning the Criminal Code

Act No. 5/1960 concerning the Land Reform

Act No. 11/1967 concerning Basic Provisions for Mining

Act No. 1/1973 concerning Indonesian Continental Shelf

Act No. 20/1982 concerning Defense and Security

Act No. 5/1983 concerning Indonesian Exclusive Economic Zone

Act No. 9/1985 concerning Fisheries

Act No.17/1985 concerning Ratification of United Nations Convention on the Law of the Sea

Act No. 5/1990 concerning Conservation of Biological Resources and Their Ecosystems

Act No. 9/1990 concerning Tourism

Act No. 9/1992 concerning Immigration

Act No. 16/1992 concerning Quarantine of Agriculture, Cattle, and Fish

Act No. 21/1992 concerning Shipping

Act No. 24/1992 concerning Spatial Use Management

Act No. 5/1994 concerning Ratification of United Nations Convention on Biological Diversity

Act No. 10/1995 concerning Customs

Act No. 6/1996 concerning Indonesian Waters

Act No. 23/1997 concerning Environmental Management

Act No. 22/1999 concerning Regional Government (Autonomy)

Act No. 25/1999 concerning Financial Balancing between Central and Regional Government

Act. No. 41/1999 concerning Forestry

Act No. 2/2002 concerning the Indonesian Police

Act No. 25/2004 concerning National Development Planning Systems

C. Documents:

COREMAP (1996) *COREMAP Preparation Document*, including annexes: AMSAT, November 18, 1996.

COREMAP (1997) *COREMAP Project Preparation Document*, Technical Assistance, 2535-IND.

COREMAP (1998) *COREMAP Preparation Document,* Indonesian Institute of Sciences.

COREMAP (2001) *Buku Panduan Pengelolaan Berbasis Masyarakat COREMAP 2001* (COREMAP Guidelines for Community-based Management 2001)

COREMAP and the Marine Geological Institute, Department of Energy and Mineral Resources (2002) *Studies on Mitigation of Environmental Impact to Reefs in Senayang and Lingga Islands*. Final Report. COREMAP.

COREMAP PMO (2002) COREMAP Consolidated Report January 2001 – April 2002.

Grant of Agreement No. TF-028373, Global Environment Facility and the Republic of Indonesia (1 May 1998).

Hunnam, P. (2000) COREMAP Phase I Mid-Term Evaluation, 1998-2000. Independent Report to the COREMAP Program Management Office.

IUCN – The World Conservation Union (2002) *The Coral Reef Rehabilitation and Management Program: Phase I Evaluation Report* (made for the Government of Indonesia).

Loan of Agreement No. 1613-INO, the Asian Development Bank and the Republic of Indonesia, dated on 1 May 1998.

Loan of Agreement No. 4305-IND, the World Bank and the Republic of Indonesia (15 May 1998).

Memorandum of Understanding between the Government of Australia and the Government of Indonesia on Coral Reef Rehabilitation and Management Project includes its amendment II and I. 1999.

Pola Dasar Pembangunan Daerah Kabupaten Biak Numfor Tahun 2001-2005 (Basic Pattern of Regional Development of Biak Numfor District of 2001-2005)

Pola Dasar Pembangunan Daerah Kabupaten Kepulauan Riau (Basic Pattern of Regional Development of Riau Archipelago District).

Pola Dasar Pembangunan Daerah Kabupaten Selayar (Basic Pattern of Regional Development of Selayar District).

Program Pembangunan Daerah Kabupaten Selayar/PROPEDA (Regional Development Program of District of Selayar).

Rencana Pembangunan Tahunan Daerah Kabupaten Riau Kepulauan Tahun 2003/REPETADA (Annual Development Planning of Riau Archipelago District of 2003).

Rencana Strategis Kabupaten Selayar 2003-2007/RENSTRA 2003-2007 (Strategic Plan of District of Selayar 2003-2007).

The Asian Development Bank (1998), Report Recommendation of the President (RRP) to the Board of Directors on Technical Assistance Loan and Grant to the Government of Indonesia for Coral Reef Rehabilitation and Management Project. RRP No. 29313.

The Asian Development Bank (1999) Technical Assistance Marine Resource Evaluation Management and Planning (MAREMAP) – TA No. 2958 INO: Final Report Appendices. Prepared by: Canora Asia Inc.

The Asian Development Bank (2002) Report and Recommendation of the President to the Board Directors on a proposed loan Republic of Indonesia for the Coral Reef Rehabilitation and Management Project Phase II. RRP: INO 32176.

The Asian Development Bank (2002) Legal Institutional and Policy Reform Report – India (Kerala) Component. Regional Technical Assistance for Coastal and Marine Resources Management and Poverty Reduction in South Asia (ADB RETA 5974). IUCN.

The State Ministry of Environment (2004) *Strategi Nasional dan Rencana Aksi Pengelolaan Lahan Basah Indonesia* (the National Strategy and Action Plan for the Management of Indonesia Wetlands)

The World Bank (1998), COREMAP Project Appraisal Document (PAD).