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THE COASTAL RESOURCES OF SARANGANI BAY, PHILIPPINES:  
PROPERTY RIGHTS, COMPETITION, AND  
DISPUTE SETTLEMENT

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE  
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

POLITICAL SCIENCE

DECEMBER 1995

By

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G. Kem Lowry

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## ACKNOWLEDGEMENTS

My interest in environmental conflicts has grown a great deal over the past ten years. I have been very fortunate to have learned from, worked with, and developed friendships with a number of individuals who have dedicated their careers to understanding more about these conflicts. At this time, I wish to acknowledge those individuals who had a direct role in guiding me through my graduate studies and dissertation. Although not enumerated here, I also wish to thank my friends and colleagues who provided intellectual, moral, and spiritual support for me throughout my graduate studies. Their enthusiasm and good nature made this project a whole lot more enjoyable. If they smile when they read this, then they know that I am referring to them.

I am very grateful for the guidance I received from my dissertation committee -- Neal Milner, Benedict Kerkvliet, Deane Neubauer, Kem Lowry, and Michael Dove -- while I developed my proposal, conducted my field research, and wrote my dissertation. The flexibility given to me by the chair of my committee, Neal Milner, allowed me to approach this study from several theoretical angles. He created an environment that encouraged self-discovery of new insights. These discoveries were truly the most rewarding accomplishments of my graduate studies. He and the other committee members posed challenging questions throughout this study that encouraged me to look for alternative ways to understand my data. In addition to their instruction and research, I learned a great deal from their work experience and

community service in Hawaii and in Asian countries with people who are less fortunate than most. I admire their ability and commitment to apply their intellectual knowledge to problems in society that are difficult to resolve. I wish to thank my committee members for all of the time and effort that they put into guiding me through this dissertation.

Three sources of funds allowed me to continue my graduate studies. A Pacific-Asian Scholarship from the Graduate Division, University of Hawaii paid my tuition for three semesters. A field research grant from the East-West Center covered my expenses for one year in the Philippines. Finally, an East-West Center Grant provided tuition, housing, and stipend for four years of my studies. I wish to thank these institutions for their financial support.

My experiences at the Program on Environment of the East-West Center, had a profound influence on this research. I am very grateful for the guidance I received from Dick Carpenter and Terry Rambo. I benefited a great deal from their research experience in the Asia/Pacific region. I greatly appreciate the keen interest that they took in developing me as researcher. I wish to thank Evelyn Klinkman for her assistance in helping me to prepare my proposal for the field research grant. Furthermore, I am very grateful for the support I received from Fannie Lee Kai, Jeanne Hamasaki, and June Kuramoto. Their kindness and genuine concern for my studies greatly enhanced my experiences at the East-West.

Numerous friends and colleagues exchanged ideas with me on my proposal, field research, theoretical framework, or drafts of my dissertation. Craig Mulling provided much needed, and much appreciated, motivation and support during good and frustrating times. William Callahan, Greg Ira, Jeff

Walters, Charles Johnston, Chen Xin, Antonio Contreras, Francisco Magno, Neric Acosta, Saba Khattak, and Steve Bjorge offered valuable insights and personal support throughout this project. I greatly appreciate their contributions to this study. Jim Franz volunteered numerous hours to edit drafts and offer new perspectives. Other friends whom I am very grateful for their personal support and the interest they took in my research include Charles and Laurie Belles, Douglas Hudak, Fr. John Chandler, Al Mossing, Lil Yse-al, Cherie Mulling, John and Diane Smith, William and Tess James, Ed and Arlene George, Achie and Eloisa Reyes, Joy Ira, Steve and Jean Balog, Jim Hansen, Jill and Martin Alles, Tom Eisen, Catherine Cane, Doug Lamerson, Jayanthi Thesarathapany, Susan Siar, Alyssa Miller, Don Shrug, Laura and Peter Brennan, Robin Salsburg, Scott Moore, Doris and Av Ramos, Sumalee Bumaroomsok, Jan and Dave Stillwell, Jamuna Ramakrishna, Morris Oshiro, Carlton Mau, Lew Metelize, Yeap Soon Beng, Dar Warmke, Mark Scheffel, Jenny Samaan, Michael Keltos, Shur Fang Lin, Joji Reyes, Chongsoo Song, Michael Robotham, Ted Stepp, Paul Oshiro, Jonathan Lyau, and Dave and Lalaine James. Many other friends from the East-West Center and University of Hawaii made my experiences more fulfilling. I wish to thank all of them for sharing their cultures, knowledge, and friendship with me.

I would not have made it to the University of Hawaii without the support of my professors from University of Tennessee including David Folz, Patricia Freeman, and Michael Gant. Furthermore, Sam Carnes, Tom Wilbanks, Carl Petrich, and Ed Hillsman from the Oak Ridge National Laboratory greatly influenced my professional development. I wish to thank them for giving me my first opportunity to conduct research on environmental projects. I am grateful

that they continued to encourage and motivate me after I moved away from Tennessee.

I greatly appreciate the numerous individuals in the Philippines who made this research project possible. Foremost is the Kenmore family -- Peter, Zenny, Andrew, Martin, and Debbie. They graciously provided for many of my housing and logistical needs while I conducted interviews in Manila. Moreover, their stimulating conversations led me to important insights and sources of information that I would not have otherwise come across. I am very grateful for their hospitality as well as the hospitality of the Flores family. I am also very grateful for the hospitality I received from close friends in Silang and Los Baños including Greg, Joy, and Justin Ira, the Quintana family, and the Lapis family.

Also in Manila, I received a great deal of assistance from a number of individuals and organizations. Rosalinda Temprosa, Robert Pomeroy, Giselle Samonte, and Michael Pido from the International Center for Living Aquatic Resource Management provided access to valuable information on coastal resource management. Becky Rivera, Theresa Gladys Hingco, Elmer Ferrer, and Lito Anonuevo of the Tambuyog Development Center introduced me to important coastal resource management approaches and material. Professors Gene Peralta and Mydee Valencia of the University of the Philippines assisted me in setting up interviews with coastal resource management experts. Marissa David and Angie Brabante of Environmental Management Bureau, DENR also guided me to important sources of information and individuals to interview. Kenneth Prussner, Alfredo Buergo, and Fred Vande Vusse of the United States Agency for International Development gave me access to numerous documents

on resource management in the Philippines and in Sarangani Bay. They also provided valuable insights on the role of international funding agencies and nongovernment organizations in coastal resource management. Private consultants, Myra Hechanova, and Nora de Leon were instrumental in providing information for my study and setting up interviews for me. At Silliman University in Dumagete, Hilconida Calumpong, Betty Abregana, and Roy Olsen de Leon introduced me to new data sources and approaches to coastal resource management.

In General Santos City and Sarangani Province, I was warmly received by numerous people. The people that I am about to mention went out of their way to assist me in gathering information. I am very grateful for all of the information that they provided for me. I am also very fortunate to have developed good friendships with many of them. I admire the dedication of these residents of General Santos City and Sarangani Province to assist coastal villagers and protect the coastal resources of Sarangani Bay. Nael Cruspero, Gloria Jumamil-Mercado, Bong Coloso, Cresencio Arcamo, Cesar Cadorna, and Ebol of the City Economic Management Office permitted me to spend a lot of time at their office reading through their reports. They were also instrumental in setting interviews for me. Becky Magantes, also with the city government, assisted me in setting up interviews. Marilyn Abiera, Pids Octura, Norma Leonida, and Tersa Castilla from the Mindanao State University in General Santos City as well as Morgan Partridge and Caloy Baldostamon of the Mahintana Foundation (now the Sarangani Bay Marine and Inland Resource Conservation Foundation) gave me the opportunity to participate in their coastal resource management projects. These projects provided valuable

information for my study because they are successful case studies of community-based coastal resource management and water quality assessments. Br. Bob McGovern, Carmelo and Edwina Enriquez, and Lourdes Binuya of the Business Resource Center at the Notre Dame College of Dadiangas gave me the opportunity to join them in collecting data from municipal fishers. The BRC is an important source of statistical information on the status of coastal resources and the coastal population. The dedication of the BRC's staff is truly reflected in the quality of their work. Ray Visitacion, Azela Chiew, Tom Falgui, and Larry Ilagan were reliable sources of information because of their NGO and environmental work in General Santos City. I benefited greatly from their insights. Representatives from the Federation of Fishermen and Farmers' Associations provided detailed information on the conflicts between municipal fishers and other resource users. I was received warmly in their fishing villages. General Santos City Council members Renato Diagon and Minda Falgui, Provincial Board member Mike Andang, Barangay Captain Pedrito Lopez, and the mayors of Kiamba, General Santos City, and Glan took a keen interest in sharing their understanding of conflicts over coastal resources. Officials from the Department of Environment and Natural Resources and the Department of Agriculture were very cooperative especially Ruel Divino, Director Ursua, Regional Director Alex Yadao, Director Fecundo "Pakito" Yeneza, Meriam Pahm, Andrew Ventura, George Campeon, and the staffs of the SOCSARGEN Project Management Unit, the Philippine Fisheries and Development Authority, and the Community Environment and Natural Resources Offices. Raul Reyes and Renato of the South Cotabato Foundation accompanied me to their project sites in coastal villages to interview municipal

fishers. I also learned a great deal from private business persons who spent a considerable amount time sharing their insights with me including John Heitz, Fred and Jeness Christensen, Roger Lim and the members of GSTTEOI, Ernesto Salazar and the members of SOCOPA, Don Partridge, Carmen Granfon and the members of UFLA and SASFA, Gaylord Bautista, and Mike Kingery.

After my field research, I returned to Sarangani Bay for several months in 1993 and 1994 as a consultant for the SOCSARGEN Growth Plan. I was very fortunate that Charles Feibel and Larry Silonga from Louis Berger International, Inc. (LBI) gave me this opportunity. Because of this opportunity, I had the pleasure and good fortune to work with a number of highly qualified environment and coastal resource management specialists including Emma Porio, Flordeliz Guarin, Butch Aragon, Harvey Van Huizen, Geoff Waite, Mike Ross, Cora Baylon, James Sharman, David Gwyther, Roger Wellnor, Virgilio Palaganas and Heidi Gloria. I also received much needed research assistance from Allen Marcella and Junah Culanculan as well as other staff members from LBI. This opportunity enriched my research by providing me the chance to follow up on many of the conflicts I examined in 1991 and 1992.

Finally, the completion of this project could not have been accomplished without the unconditional love and bountiful support from God; my wife Gigi; our parents Dr. John and Sue Olive, and Bob and Myrna Austria; our siblings and their families including Kelly and Keith, Dee Dee and Will, Jerry and Elizabeth, Bobet and Nening, Detdet, Vaye, Michael, and Cecil; our grandparents; and many of our other relatives in the Philippines. My parents are largely responsible for inspiring me to pursue a career in environment and coastal resource management. My interest in environmental conflicts came directly

from their passion to understand and protect nature. In numerous ways, the Austria and Ramos families provided for my needs in the Philippines and assisted me in conducting my research. They often went out of their way to ensure that my research proceeded smoothly. Gigi was very instrumental in assisting me with translating and interpreting my interviews. This project would have never pushed through if it were not for her patience, understanding, challenging questions, editing, and tremendous support throughout my graduate studies. She tolerated many of the frustrations involved in completing this project and responded by inspiring me to push to new levels of understanding. As a result, we both grew to love and respect each other more. From the depths of my heart, I wish to thank Gigi, Dad and Mom, Papang and Nanay, and the rest of our family in the U.S. and the Philippines for the sacrifices they made to give me this opportunity to pursue my interests in conflicts over the use of coastal resources. I am extremely grateful that God gave me the talent, good fortune, wife, family, and numerous friends, colleagues, mentors, and participants to complete this study.

## ABSTRACT

The problem I address in this dissertation is the depletion and degradation of the coastal resources -- tuna fisheries, municipal fisheries, coral reefs, and mangrove forests -- in Sarangani Bay, Philippines. Intense competition for the use of coastal resources leads to numerous conflicts over property rights. Resource users resolve their conflicts through a number of different dispute settling processes. The way resource users resolve their property rights conflicts has a dramatic affect on the supply and condition of the resources. Current institutional arrangements for the management of coastal resources have three main characteristics. First, resource users rely on local officials to resolve many of their conflicts through informal dispute settling processes. They use their mélange of informal relationships with local officials to get these officials to selectively support their property rights. Second, the intense competition for property rights among resource users does not lead to open access rights; rather this competition leads to a number of different kinds of property rights that resource users establish and maintain to varying degrees. Third, in many cases, resource users lack opportunities to debate and share their knowledge about the effects of their resource use practices on the resources. This situation limits their ability to effectively change institutional arrangement to improve resource management. Thus, informal dispute settling processes, not formal, state processes lead to institutional changes in resource management. Dispute settling processes that

provide opportunities for adversarial resource users to discuss the impacts of their practices on resources lead to more sustainable management of coastal resources.

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## LIST OF ABBREVIATIONS

AASAI -- Agro-Aquatic Services Association Inc.  
ADP -- Area Development Program  
BFAR -- Bureau of Fisheries and Aquatic Resources  
BRC -- Business Resource Center  
CAFGU -- Citizens Armed Forces Geographic Units  
CFDC -- Calumpang Fishermen's Development Cooperative, Inc.  
COSAC -- Constabulary Offshore Anti-Crime Unit  
CPR -- Common property regime or common property rights  
DA -- Department of Agriculture  
DENR -- Department of Environment and Natural Resources  
DLG -- Department of Local Government  
DOLE -- Department of Labor and Employment  
DTI -- Department of Trade and Industry  
EEZ -- Exclusive Economic Zone  
EII -- Earth Island Institute  
EMB -- Environmental Management Bureau  
FAD -- fish aggregation device  
FAO -- Fisheries Administrative Order  
FAO -- Food and Agriculture Organization  
FRDC -- Fisherfolk Research and Development Center  
GSTTEOI -- General Santos Traders and Tuna Exporters Organization, Inc.  
gts -- gross tons  
JOFFA -- Jolohano Fishermen's and Farmers Association  
KMFR -- Kerala Marine Fisheries Regulation  
KSMTF -- Kerala Swatantra Malsya Thozhilali Federation  
LGC -- Local Government Code  
LGU -- Local Government Unit  
LOI -- Letter of Instruction  
MFI -- Mahintana Foundation Inc.  
MMC -- Marine Management Committee  
MNLF -- Muslim National Liberation Front  
MSU -- Mindanao State University  
mt -- metric ton  
NGO -- Non-government organizations  
OECF -- Overseas Economic Cooperation Fund  
PCG -- Philippine Coast Guard  
PD -- Presidential Decree  
PFDA -- Philippine Fisheries Development Authority  
PMU -- Project Management Unit

PNP -- Philippine National Police  
PPA -- Philippine Ports Authority  
PPR -- private property regime or private property rights  
Q-PPR - quasi-private property rights  
SALAG -- Structural Alternatives Legal Assistance for Grassroots  
SASFA -- Sarangani Small Fishermen's Association, Inc.  
SBMIRCFI -- Sarangani Bay Marine and Inland Resource Conservation  
Foundation, Inc.  
SCFI -- South Cotabato Foundation, Inc.  
SOCSARGEN -- South Cotabato, Sarangani, and General Santos City  
SOCOPA -- South Cotabato Purse-seine Association  
SPR -- State property regime or state property rights  
UFLA -- Umbrella Fish Landing Association  
U.S. -- United States  
USAID -- United State Agency for International Development

## PROLOGUE

I chose this research topic because the resolution of environmental conflicts is a primary research interest to me. I narrowed my study to conflicts over the use of coastal resources because of my interest in human impacts on coastal resources, especially on coral reefs. I wanted to study a tropical country in the Asia/Pacific region where a large number of people rely on coastal resources for their livelihood. The Philippines, and Sarangani Bay in particular, provided a good setting to conduct a case study of this nature.

From this study, I wanted to determine the extent to which the dispute-settling processes that resources users use to resolve their conflicts over the use of coastal resources lead to resource degradation or sustainable management. I planned to use concepts from legal anthropology and cultural ecology studies such as customary law, legal pluralism, local knowledge, ethnography, ethnoecology, and indigenous resource management systems to provide the theoretical framework for this study.<sup>1</sup> I expected that these concepts would assist me in understanding the differences among dispute-settling processes and why resource users preferred certain processes over others. In addition, I thought that these concepts would help me to understand the knowledge that resources users have about their environment and their

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<sup>1</sup>Hunt (1987), Merry (1988), Moore (1989), Nader (1989), and Zerner (1990) were the primary sources I used to develop the legal anthropology concepts. Acheson (1981), Cordell (1978), Dove (1983), Dunn (1975), Foreman (1967), and Vayda and Rappaport (1968) were the primary sources I used to develop the indigenous resource management concepts.

social, economic, and political relationships. I wanted to know how resource users use this knowledge to make resource management decisions.

Later, at the time of my comprehensive exams, I incorporated these concepts into a common property theoretical framework. I categorized my data using common property concepts such as common-pool resources, institutional arrangements, resource users, property rights (state, private, common, and open), and property regimes.<sup>2</sup> I thought these concepts would apply more to my study, especially as I moved away from focusing only on indigenous resource management system to focusing on the competition for property rights among the major coastal resource users from Sarangani Bay. I expected that these categories would help me to group resource users. I thought they would be useful in explaining why resource users in the Philippines are depleting and degrading coastal resources. I wanted to determine, for example, why the Philippine State, which has de jure ownership of coastal resources, is unable or unwilling to prevent the depletion of coastal resources. I also wanted to identify strategies where resource users have attempted to improve their management of resources. Furthermore, I wanted to compare and contrast the resource management systems of different groups of resource users (i.e., property regimes). The criteria developed in the common property literature to make these comparisons include efficiency, stability, and sustainable use of resources.

---

<sup>2</sup>Berkes and Farvar (1989), Bromley (1989), Bromley and Cernia (1989), Ciriacy-Wantrup and Bishop (1975), Cruz (1986), Dani, Gibbs, and Bromley (1987), Feeny, Berkes, McCay, and Acheson (1990), Gibbs and Bromley (1989), McCay and Acheson (1987), Oakerson (1986), Ostrom (1988), Ostrom (1990), Schlager (1990), Schlager and Ostrom (1992) and Sorensen, McCreary, and Hershman (1984) were the primary sources I used to develop the conceptual categories for this study.

In Chapter One, I discuss my research questions and methodology. In Chapter Two, I describe the coastal resources of Sarangani Bay. In Chapters Three and Four, I define the theoretical concepts from legal anthropology and common property literature that I use to analyze my data. In Chapters Five and Six, I use this theoretical framework to categorize and analyze the data I collected from Sarangani Bay. In Chapter Seven and the Epilogue, I develop the theoretical implications of this study.

While writing the final two chapters of this dissertation, Chapters Six and Seven, I found that the common property theoretical concepts and categories began to limit my study more than enhance it. I found myself trying to fit my data from Sarangani Bay into these pre-established categories when my data seemed to be indicating other insights. Local government officials, for example, rarely act as a coordinated state property regime with state, *de jure*, property rights. Their actions make it difficult for one to categorize them as a state property regime. Their *de jure* property rights do not have much of an impact on the practices of resource users. The difficulty in categorizing a state property regime, in turn, makes it difficult for one to compare and contrast property regimes on the basis of efficiency and stability. In addition, the concept of "property right" is awkward when applied to the resource uses of municipal fishers. Their actions and perceptions indicate that what constitutes proper resource use practices concerns them more than protecting common property rights. In other words, they base their perception of rights more on the right to a livelihood and the right to protect resources from destructive techniques rather than on excluding other resource users from a particular area. The term, "property rights," is a Western term that does not

seem to apply to the way Philippine municipal fishers, at the subsistence level, perceive ownership and use of coastal resources.

Instead of revising the theoretical framework I develop in Chapters Three and Four, I address these theoretical limitations in Chapter Seven and in the Epilogue. I do not suggest that common property theoretical categories and concepts are inappropriate to describe resource management and use in Sarangani Bay, but I do identify the need to revise these categories and concepts. I also acknowledge that even my own attempts to develop different categories and concepts have been, up to this point in time, equally awkward. I believe that we, as researchers, have more to work to do if we want to understand why resource depletion occurs and suggest how resource users may prevent it from occurring.

## CHAPTER ONE

### Competition for Property Rights to Coastal Resources

But, is expansion (of the fishing industry) feasible when the nearby waters like Sarangani Bay have started to get depleted of fish and mangrove areas ideal for fish spawning? Definitely, it is now that we should look seriously into the practices and methods of the fishermen as well as the conservation plans for the coastal areas. After all, there is one and only one thing for sure: fishing can and must remain a vital industry in General Santos City.

-Business Resource Center (1985:9)

#### The Depletion and Degradation of Coastal Resources

The problem I address in this dissertation is the depletion and degradation of the coastal resources in Sarangani Bay, Philippines. The coastal resources of Sarangani -- tuna fisheries, municipal fisheries, coral reefs, and mangrove forests -- contribute significantly to the rapid economic growth in the area that has occurred over the past fifteen years. Nevertheless, recent declines in these resources have occurred as a result of unsustainable resource uses.

Throughout the Philippines, coastal resources are under stress from a variety of sources. Overfishing, overcapitalization, and illegal fishing methods cause fishing effort to be beyond the level of effort that generates maximum sustainable yields for demersal, small pelagic, and large pelagic fisheries (Pauly, 1989:5-7 and Philippine Council for Aquatic and Marine Research and

Development, 1991:3). The catching of juvenile fish and the lack of enforcement of fishery laws further deplete offshore and nearshore fisheries (Aprieto, 1989:188 and Pomeroy, 1991:39). In addition, the destruction of fish habitats including mangroves, estuaries, and coral reefs deplete fisheries. Mangrove cutting, dynamite fishing, and cyanide poisoning degrade these ecosystems where many organisms important to the aquatic resources' food chain live (Gomez, 1988:166, 168 and Pauly, 1989:5). Prawn and salt farms damage fish habitats in coastal areas through land clearings and waste disposal (Gabriel, 1978:17 and Scura et al., 1992:59). Pollution from industries, domestic sewage from human settlements, and soil erosion from deforestation and other land clearings further deplete these important fish habitats (Department of Agriculture, 1991:2 and Scura et al., 1992:18). As a result of these activities, researchers estimate that mangrove areas in the Philippines are about twenty-five percent of their original cover and only thirty percent of coral reefs are in good or excellent condition (Gomez, 1988:168 and White, 1988:4).

Competition for coastal land is intense in many areas throughout the Philippines. Private wharves and fish pond walls block access to the beach leaving municipal fishers with few places to land their boats. Wastes from nearby industries threaten the economic value of beach resorts and other coastal recreational activities. Squatters in coastal areas create social, sanitary, and public health problems. Private land owners want squatters removed, but relocation efforts are difficult because squatters often resist. These unsettled conflicts lead to further declines in the value of coastal resources and make management solutions all the more difficult to implement (Pomeroy, 1992:149-150 and Lowry, 1989:197).

Similar problems threaten the sustainability of the coastal resources of Sarangani Bay. Reports by the Business Resource Center (1992a:10 and 1992b:11) and the Philippine Fisheries Development Authority (1992:A-8) indicate that fish yields have declined over the past five years. The Business Resource Center (1994:66-69) cites five reasons for the decline in fish yields: (1) the use of destructive fishing methods; (2) the use of too efficient fishing gear; (3) the increase in the number of fishers; (4) the degradation of coral reef and mangrove areas; and (5) intense competition between commercial and municipal fishers.

Competition for the use of coastal land is also intense around Sarangani Bay. Agricultural industries, private fishing wharves, fish landings, squatter areas, and prawn farms occupy the north and northwest coasts of the bay. Beach resorts occupy portions of the east and west coast. A newly paved coastal road along both sides of the bay increases access to other coastal areas where business owners may construct more beach resorts and industries. To make room for these projects, business owners clear mangrove areas and damage coral reefs. Because these habitats replenish fisheries, municipal fishers conflict with coastal land owners over the use of mangrove areas and coral reefs in the bay.

As a result of this competition for coastal resources in Sarangani Bay, numerous conflicts over property rights to these resources occur. The intense competition for property rights affects the institutional arrangements to manage these resources and the supply and condition of the resources. Albert Church (1982:92) writes:

. . . cases reveal that property rights to the income from natural resources and their control are subject to controversy and competition and are not clearly defined by institutions at one moment in time. The institutions themselves are an integral part of the competitors' strategies. Ambiguity and constant change prevail concerning the power and policies of political, legal, and economic institutions. Consequently, a comprehensive economic model of natural resources should address the question of what role changing property rights and institutions play and what determines those changes.

Church talks about property rights in the Western legal tradition. Nevertheless, in Sarangani Bay, Western legal traditions interact with local, indigenous legal codes to mold and change property rights to coastal resources. This process affects the way resource users manage, compete for, and extract coastal resources. Furthermore, resource users change property rights through dispute-settling processes, which, like property rights, develop from the interactions among Western and indigenous legal systems. As a result, several different types of dispute-settling processes exist for resource users to resolve their conflicts over access to coastal resources.

### Research Questions

The economy and the livelihood of the people from Sarangani Bay depend a great deal on coastal resources. More than 36,000 people, who support almost 200,000 dependents, work in the fishing industry alone. To manage coastal resources in a sustainable manner, resource managers need to understand how resource users establish property rights, what dispute-settling processes they use to resolve conflicts, and how these processes affect the supply and condition of coastal resources. In this thesis, I seek to answer the following questions:

- Who are the resource users of Sarangani Bay's coastal resources?
- What types of institutional arrangements -- property rights, rules, and property regimes -- exist to control the practices of resource users?
- Why are property rights to coastal resources ambiguous?
- How do resource users establish property rights to resources?
- What kinds of resource use conflicts exist?
- What types of dispute-settling processes do resource users use to resolve their conflicts over property rights?
- To what extent do current dispute-settling processes and other institutional arrangements lead to the depletion and degradation of coastal resources in Sarangani Bay?

To answer these questions, I situate this study within the conceptual framework of theories for common property, legal studies, and ethnoecology. I use the case study approach described by Lincoln and Guba (1985) to pursue these research questions.

### **Research Hypothesis**

My research hypothesis is that the competition among resource users for property rights to coastal resources leads to ambiguity over these property rights. Current institutional arrangements fail to clarify property rights and adequately resolve conflicts among resource users. As a result, resource users degrade and deplete Sarangani Bay's coastal resources.

To test this hypothesis, I conducted field research for one year in the Sarangani Bay area. I spent an additional seven months in the area working

for a United States Agency for International Development (USAID) project. The rest of this chapter discusses the methodology I followed during my field research.

In chapter two, I describe Sarangani Bay's geography, political setting, and coastal resources. Chapter three provides a theoretical description of institutional arrangements for coastal resources. It demonstrates why property rights to coastal resources are ambiguous. Chapter four describes the strategies that resource users pursue to establish property rights, the dispute-settling processes that they use to resolve their conflicts over property rights, and criteria I use to measure the effects of conflicts over property rights on institutional arrangements and resources. Chapter five describes the institutional arrangements for Sarangani Bay's coastal resources. It discusses the strategies that the resource users use to establish property rights to resources. It also shows why property rights to the bay's resources are ambiguous. Chapter six discusses the dispute-settling processes that resource users use to resolve conflicts over property rights to Sarangani Bay's coastal resources. Furthermore, it examines the effects of conflict over property rights on institutional arrangements and the resources. Chapter Seven describes how and why conflicts over property rights to coastal resources leads to institutional change.

## Methodology

### Research Techniques

The field research for this study occurred over a twelve month period under a field research grant provided by the Program for Environment, East-West Center. I selected the case study method described by Lincoln and Guba (1985:120-122) as the means to collect data and test the validity of my research hypothesis. I selected Sarangani Bay as the case study area because of its abundance of coastal resources, existence of diverse resource users competing for these resources, and its distance from the center of the Philippine state, Manila, on the island of Luzon. The latter is important because few social science researchers have conducted coastal and fisheries resources studies on the Island of Mindanao. The major studies on resource users and coastal resource management in the Philippines have occurred on the island of Luzon and in the Visayan Islands.<sup>1</sup>

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<sup>1</sup>See for example Ian R. Smith, et. al. (1983) "Small-scale Fisheries of San Miguel Bay, Philippines: Options for Management and Research," Technical Report No. 11, International Center for Living Aquatic Resources Management, Manila, Philippines; David L. Szanton (1967) "The Fishing Industry of Estancia, Iloilo," in George M. Guthrie et. al. (eds.) Modernization: Its Impacts in the Philippine II, Institute of Philippine Culture, IPC Papers No. 5 (Ateneo de Manila University Press, Quezon City) pp. 4-34; Mai Davide G. Lopez (1985) "Notes on Traditional Fisheries in the Philippines," in Kenneth Ruddle and R. E. Johannes (eds.) The Traditional Knowledge and Management of Coastal Systems in Asia and the Pacific, papers presented at the UNESCO-ROTSEA Regional Seminar, Jakarta, Pusat, Indonesia pp. 191-206; Geronimo Silvestre, et. al. (eds.) (1989) Towards Sustainable Development of the Coastal Resources of Lingayen Gulf, Philippines, Proceedings of an ASEAN/US Coastal Resources Management Project Workshop, Bauang, La Union, Philippines; Alan White (1986) "Marine Reserves" How Effective as Management Strategies for Philippine, Indonesian, and Malayan Coral Reef Environments?" Ocean Management 10:137-159; and Robert S. Pomeroy (1991) "Small-scale Fisheries Management and Development: Towards a Community-based Approach," Marine Policy January, 1991 pp. 39-48.

The seven techniques I used to elicit and validate the data I collected for this study were as follows: (1) A review of written sources of information; (2) interviews with key informants; (3) focus group discussions and in-depth interviews; (4) observations of participants in a natural setting; (5) triangulation; (6) peer debriefing; and (7) a detailed journal (Lincoln and Guba, 1985:289-331). These research techniques helped to establish validity and reliability in qualitative studies.<sup>2</sup> In this section, I discuss how and why I used these research techniques.

I began my field research by reviewing written sources of information and interviewing key informants. At the start of my field study, I lived in the capital city of Manila for three months. During this time, I interviewed more than 40 people including officials from the Philippine national government and USAID, researchers from the University of the Philippines, consultants from firms who worked in General Santos City, and representatives from several environmental and fisheries non-government organizations (NGOs). I also reviewed written material obtained from these sources. I spent the remaining nine months in General Santos City. During this time, I conducted interviews with about fifty key informants from around Sarangani Bay. These interviews included national and local government officials, NGO representatives, and local university professors. I used these interviews and written sources of information to form culturally appropriate questions designed to delineate local

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<sup>2</sup>Lincoln and Guba (1985:289-331) use the term "trustworthiness" instead of validity (internal and external), reliability, and objectivity. Table 11.2 (p. 328) summarizes the techniques they use to establish trustworthiness. I used most of these techniques during my field research.

knowledge, values, and cognitive systems from municipal fishers, commercial fishers, and government officials around the bay (Barker, 1977:2-3).<sup>3</sup>

After formulating these questions, I conducted focus group discussions and in-depth interviews with municipal and commercial fishers from coastal villages around the bay. Often times, NGO representatives or government officials accompanied me to coastal villages to introduce me. Once I gained access to these villages, I scheduled meetings with the fishers or received their permission to stop by and visit them. Other information came from informal conversations and interactions with people living around the bay (White, 1984:60). I varied the type of people I interviewed to ensure that I obtained as large and as diverse a sample size as possible. I also considered the different ages, genders, economic status, social background, religions, social affiliations, and family backgrounds of those that I interviewed to diversify my sources of information (Dunn, 1975:26, 64). I followed Lynch and Hymes' (1967:16) recommendation to interview new informants until additional informants added little or no new information. In total, I interviewed more than 300 people for this study.

In addition to these interviews, I spent a great deal of my time observing coastal resource users and noting their behaviors. Fish landings, boat trips, public hearings, community meetings, dispute-settling forums, and walks along the coast provided valuable information about coastal resource users and their perceptions of property rights (Forman, 1967:420). I also observed how local residents used and perceived objects and words borrowed from other cultures.

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<sup>3</sup>In this study, "municipal fishers" refer to small-scale fishers and "commercial fishers" refer to fishing entrepreneurs. Chapter 5 defines these terms in more detail.

I made a conscientious effort to keep my own perceptions of these objects and words from influencing my observations (Rambo, 1991:87).

The research technique *panunuluyan*, described by Galves et al., (1989:44-45) proved to be a useful guide to follow to observe participants in a natural setting. *Panunuluyan* is an indigenous research method developed by San Juan and Soriaga (1985) which uses and observes aspects of Filipino social relations. There are several techniques used in the *panunuluyan* research method. First, *hindi ibang tao* -- become a common person in the village. This enables the local residents to become comfortable with talking to the researcher. Second, *pakikipagpalagayang loob* -- build the trust and confidence of the local people. This enables respondents to feel comfortable about disclosing information on sensitive issues to the researcher. Third, *pakikilahok* -- participate in people's activities. *Pakikilahok* helps to integrate the researcher into the community. Fourth, *pakikibagay* -- do things the way local residents do them. Fifth, *pakikisama* -- make friends and accompany residents in their daily activities. Sixth, *pakikiramdam* -- show sensitivity and perceptiveness. This technique encourages the researcher to look for nonverbal cues or actions that might express what the informant is communicating (Galvez et al., 1989:44-45). These techniques proved to be useful for conducting qualitative research in coastal fishing villages. They were equally useful for collecting data from other participants including local entrepreneurs, government officials, and NGO representatives.

Triangulation and peer debriefing also proved to be useful research techniques in this study. Triangulation validates each piece of information by checking the data collected with other sources of information (Lincoln and

Guba, 1985: 283). I was able to accomplish this by asking the same questions to diverse groups of resource users. In addition, my work with a USAID project enabled me to return to Sarangani Bay to check the validity and reliability of my data. Peer debriefing entails discussions about initial findings and methodological changes with peers. Throughout my field research, I discussed these aspects with my dissertation committee members, NGO representatives in the Philippines, and with fellow graduate students in Political Science and Geography (Lincoln and Guba, 1985:308). I also asked some of my key informants to review summaries of my research results (Lincoln and Guba, 1985:313-314).

To complement my notes from interviews and from personal observations, I kept a detailed journal of the methods I used and the reasons why I chose to pursue certain methods. In this journal, I noted changes in my methodology and problems I experienced while collecting data (see next section). I also reflected on the data I collected and identified the gaps in my field notes. In addition, my wife, Gigi, with a background in agricultural and resource economics, assisted me in collecting data. She proved to be an invaluable asset to my study because of our endless conversations about my research methods and the types of data I collected. Her poignant questions and insightful comments kept me from overlooking and misinterpreting important perceptions and knowledge of local residents. The following section provides more details about the methods I followed in the field.

### Field Research Summary

Using the techniques described above, I collected data on resource users, institutional arrangements, property regimes, property rights, and dispute settlement processes. First, I spent three months in Manila reviewing several reports pertaining to natural resources management in the Philippines.<sup>4</sup> At the beginning of my research in Sarangani Bay, I used environmental assessments, prepared for three USAID infrastructure projects in General Santos City, as initial sources of information. These assessments included the expansion of the Makar wharf, the construction of an agro-processing center and fish port complex, and the construction of a new international airport (Louis Berger International, Inc., 1991 and Dames and Moore International, 1991). Furthermore, I reviewed two more reports prepared for USAID projects -- a growth plan and a feasibility study for a wastewater system for South Cotabato and General Santos City (Louis Berger International, Inc., 1992 and Wilbur Smith and Associates, 1991). The General Santos City government graciously provided other documents to review including the City's development plan (Office of the City Planning and Development Coordinator, 1990). The local offices of several national government agencies, including the Department of Environment and Natural Resources (DENR), the Department of Agriculture (DA), the Philippine Fisheries Development Authority (PFDA), the Department of Trade and Industry (DTI), and the Department of Labor and Employment (DOLE), provided further information and materials. Newsletters and reports from local NGOs were also valuable sources of information.

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<sup>4</sup>These included Asian Development Bank, 1991; Dames and Moore International, Louis Berger International, Inc., and Institute for Development Anthropology, 1989; and World Bank, 1989.

Second, I observed resource users first hand during field trips. Fish landings, boat trips, tours of industries, and field trips with local NGO representatives provided me with opportunities to make these observations and discuss resource uses with local residents. Furthermore, I accompanied a research team from the Mindanao State University during their water sampling trips to test the water quality in various locations around Sarangani Bay. After collecting these data, I identified the major natural, social, economic, and political causes (both direct and indirect) of resource use and degradation in the area.

Third, I identified the decision-making arrangements that different groups of resource users follow. I documented the goals, strategies, projects, and programs of these resource users. In addition, I analyzed the variations within decision-making arrangements and the causes of these variations.

Fourth, I observed how resource users access, manage, and establish property rights to the resources. I documented the resource conflicts that occur between groups of resource users. I also identified the processes they use to resolve disputes over property rights.

To collect data on the latter two activities, I organized focus group discussions and in-depth interviews. In addition, I attended public hearings and community meetings. On several occasions, I accompanied NGO representatives to their projects sites to conduct interviews. On one occasion, I helped a local NGO conduct a survey of municipal fishers.<sup>5</sup> I documented the different strategies that resource users follow to establish property rights to resources. My goal was to understand and describe the political arena in which

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<sup>5</sup>See Business Resource Center (1992a) for the results of the survey.

resource management regimes compete to establish property rights to resources.

### Changes in Methodology

At the start of my field research, I expected to collect detailed ethnoecological data from municipal fishers regarding their knowledge of their environment and the resources they use. I planned to live in one or two fishing villages for an extended period of time to collect these data. I intended to compare their knowledge of resources, their practices, and their processes for resolving disputes over property rights to resources. Efficiency, equity, stability, and sustainability were the criteria I planned to use to make comparisons between the different property regimes within which resource users operate.

After a few months in the field, I decided to change the focus of my study. To make comparisons between groups of resource users, I determined that I needed to interview a large number of resource users from around the bay. It became apparent to me that the time it would take to collect detailed ethnoecological data from municipal fishers would take away from the time needed to gather information about other resource users. Furthermore, because of the uniqueness of each coastal village around the bay, I chose to interview a few fishers from numerous villages rather than spend a great deal of time in one or two villages. As a result of this decision, I did not collect detailed ethnoecological data.<sup>6</sup> Instead, I collected more data on the ways in

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<sup>6</sup>Jeff Walters, Ph.D. candidate, Geography Department, University of Hawaii, is conducting a detailed ethnoecological study of municipal fisher's knowledge of their environment and ecological processes in fishing villages in Palawan, Philippines throughout 1995.

which different groups of resource users compete for property rights and resolve their disputes over property rights. I focused on how these conflicts effect the supply and condition of the resources.

In addition, I changed the focus of my research because I encountered some problems in the field including different languages and unstable peace-and-order conditions. First, before arriving in Sarangani Bay, I studied the Philippine national language, Pilipino (Tagalog), for two years at the University of Hawaii and for three months in Manila. Nevertheless, around the coastal villages in Sarangani Bay, the fishers speak a variety of other languages and dialects including Cebuano, Ilonggo, Karay-a, Maguindanao, Badjao, Samal, and Tausog. Because fishers from these coastal villages speak different languages and dialects, I was unable to conduct interviews on my own. I relied on my wife, who knew most of these languages, to translate my conversations with fishers. Even with her language skills, there were words and expressions used by some fishers that she was unable to translate. Not only is this a problem that I encountered, but it also is a problem encountered by resource users when they communicate with each other and settle their disputes.

Second, the presence of Muslim National Liberation Front (MNLF) rebels around Sarangani Bay made it difficult for me to spend a great deal of time in fishing villages outside General Santos City, especially in Muslim fishing villages. These rebels conducted several kidnappings before I arrived and one while I was living in General Santos. Although I never experienced a confrontation or problem with the rebels, local officials advised me to be cautious. They recommended that I not spend the night in certain villages. Once again, these

conditions not only limited my study, but they also affect the way resource users interact with each other.

In addition to these problems, I made adjustments in my methodology to compensate for other difficulties I encountered in the area. First, many government agencies lack quality environmental data because of a lack of funds to conduct rigorous scientific and social science studies. Few studies existed that scientifically documented the degradation and depletion of the coastal resources in the area. For example, no study exists that shows how many hectares of mangrove forests residents converted to other uses in the past ten years around Sarangani Bay; nor is there a study documenting coral reef degradation. The local university, Mindanao State University (MSU), conducted a water quality analysis of the bay, but they lacked the funding, facilities, and equipment to continue the project. Second, as expected, I experienced problems with communication and transportation. The nature of my interviews required me to travel a great deal around the bay, but poor roads and communication facilities, coupled with the presence of rebels in certain villages, limited my number of trips to fishing villages. Although I anticipated these problems, I miscalculated the amount of time it took to arrange interviews and travel around the bay. During my contract with the USAID project, I overcame some of these difficulties because the project produced more scientific data and evidence of resource degradation and depletion.

Despite these difficulties and adjustments in my methodology, I continuously reviewed my research methods and data to ensure that I established validity and reliability. In addition to interview notes and personal

observations, I kept a detailed journal in which I documented methods and techniques used during the study and the reasons why I chose to use them. I carefully analyzed each of the methodological changes and problems described above and discussed these issues with my research assistant. Furthermore, I checked each item of information with at least one other source of information to validate its accuracy.

As a result of my changes in methodology, I collected data on several different groups of coastal resource users. I documented the ways they use coastal resources; their perceptions of property rights; the strategies they pursue to establish property rights, the dispute-settling processes they use to resolve conflicts over property rights; and the effects that these conflicts have on resource users and coastal resources.

## CHAPTER TWO

### The Coastal Resources of Sarangani Bay

Located in southeastern Mindanao, the second largest island in the Philippine archipelago, Sarangani Bay is a deep-water bay ideal for fishing and shipping (Figure 2.1). In most places around the bay, shallow waters extend out only to one hundred meters or less. Reef flats drop off sharply into deep waters. The bay is 16 kilometers at its widest; it stretches 33 kilometers from the head to the mouth; it has a total coastline of 125 kilometers; and it is 449 square kilometers (Louis Berger International Inc., 1993a:2-1). The mouth of the bay opens to the south into the Celebes Sea, a major fishing ground in Philippine waters. To the north and northwest lie the rich soils that nourish agricultural lands.

In this chapter, I describe the geography of Sarangani Bay. Next, I outline the political jurisdictions around the bay. In the third section, I discuss the socio-economic features of the area. In the final section, I describe the coastal resources of the bay including tuna fisheries, municipal fisheries, coral reefs, and mangroves as well as other coastal resources.

### Geography of Sarangani Bay

Sarangani Bay separates the Daguma Range from the Alip Range. It opens to the south into the Celebes Sea. To the north, Mt. Matutum, a dormant volcano that last erupted in 1914, towers 2,293 meters above sea level. Its peak is visible from all parts of the bay. To the west is Mt. Parker, also a dormant volcano. The large rivers flowing down from these mountains bring sediment which over centuries has created an alluvial plain consisting of sandstone rocks and loam soils. A coastal plain stretches from the head of the bay to the foothills of the western mountains. The eastern coast gives way quickly to steep slopes.

Located about six degrees above the equator, the area has a tropical climate throughout the year with little distinction between seasons. The southwest monsoon winds blow from June to October bringing slightly more rain from the Celebes Sea into the mountains; the northeast monsoon winds blow from November to January. March and April tend to be warmer with less wind and drier air. Unlike other areas in the Philippines, the area is typhoon-free.

### Political Setting

A census conducted by the Philippine Commonwealth at the turn of the 20th century found 33 people living at the north end of the bay in 1903. On February 27, 1939, the National Land Settlement Administration of President

Manuel Quezon's government charged General Pauline Santos, the first Chief of Staff of the Philippine Army, to prepare the area for settlers from Luzon. General Santos brought with him 62 Christian settlers who established communities around the bay (Office of the City Planning and Development Coordinator, 1990:1).

During World War II, the Japanese occupied the bay. General Santos died during their occupation in 1945. After the war, the population of the area began to grow turning the pioneer town of Buayan, established in 1948, into the Municipality of General Santos in 1954. In 1966, the municipality changed its name back to the Municipality of Rajah Buayan, named after a respected Muslim leader from the area. Two years later, in 1968, the Philippine Congress classified the municipality as a city, established its boundaries on the north and northwest coast of the bay, and changed its name to General Santos City. (Office of the City Planning and Development Coordinator, 1990:2). The name changes reflect the struggles between the Christians and Muslims in the area since General Santos arrived. Today, General Santos City has a population approaching 300,000 people -- growing at an astonishing growth rate of over five percent per year. Because of its rapid population and economic growth in the 1980's, the city became known as the "boom city" of the South. It is the center of economic activity within Sarangani Bay because of its shipping, storage, and fish-landing facilities. The city continues to attract migrants from throughout the Philippines who desire more employment opportunities and who want to avoid armed conflicts.

Also in 1968, Congressman James Chiongbian, persuaded his colleagues in the legislature to split the province of Cotabato, in which Sarangani Bay lies,

into two -- South Cotabato and North Cotabato. Eighteen municipalities made up the new Province of South Cotabato including the four municipalities that border Sarangani Bay - Maasim, Alabel, Malapatan, and Glan. Twenty-four years later, Congressman Chiongbian once again persuaded his colleagues to submit a referendum to the South Cotabato voters in the May 1992 elections. The referendum called for South Cotabato to split into two provinces -- South Cotabato and Sarangani. The voters passed the referendum. South Cotabato retains the eleven inland municipalities and the capital, Koronadal; the other seven municipalities, all but one on the coast, constitute the new province of Sarangani. The capital seat of Sarangani is in the Municipality of Alabel. Along with General Santos City, this study includes the four municipalities from Sarangani Province that border Sarangani Bay, Maasim (west), Alabel (north), Malapatan (northeast), and Glan (southeast). It also includes information from the Municipality of Kiamba, Sarangani Province, which is west of Maasim and borders the Celebes Sea.

In terms of population, the coastal municipalities of Sarangani Province are much smaller than General Santos City, averaging from 25,000 to 60,000 people. Kiamba is a Spanish-style town with neatly constructed town blocks, adequate drainage, and a well-maintained town plaza. Rice and prawn farms occupy the lowlands; forests and upland crops grow in the moist mountains. Maasim consists mostly of small fishing villages along the coast. Farmers grow cotton and coconuts on the parched coastal agriculture lands; open grassland hills and small patches of forests dominate the inland areas. Dry agricultural lands and rolling hills dominate Alabel where corn is the major crop. Prawn and salt farms adjacent to fishing villages occupy the coastal area; fishpens occupy

the nearshore waters. Coconut plantations line the road through Malapatan where flat coastal lands quickly give way to steep inclines. One prawn farm and other small fishponds occupy the muddy mangrove swamps along the east coast where hundreds of municipal fishers live. The coconut plantations continue into Glan where flat lands increase and steep inclines decrease. The coastline of Glan is a mix of sea cliffs and sandy beaches with a small protected bay that leads to the heart of the municipality. This bay and other smaller bays along the eastern coast of Sarangani Bay are convenient homes for the fishpens that occupy them.

### The People of Sarangani Bay

"Sarangani" comes from the language of the B'laan, a tribal group historians believe were one of the first to inhabit Sarangani Bay. Gani was a B'laan warrior who protected the sea. *Sarang* was his shield. *Ga* was a B'laan word for sea. Thus, Sarangani means "protector of the sea."

A B'laan legend, which historians believe originated in the 15th century, tells of how the "*busaw*" captured gani. The *busaw* refers to either colonizers or demons. The story says that the *busaw* had fair skin and big noses. Historians believe that perhaps the legend refers to the Dutch. Although the Spanish first arrived in the Philippine archipelago in the 16th century, historians believe that the Dutch already occupied parts of Indonesia. Because Sarangani Bay is closer to Indonesia than the Visayan Islands, where Magellan first landed, it is quite possible that the *busaw* were Dutch. Until the time that General

Santos settled in the area, few Spaniards lived near the bay. Furthermore, ancient maps of the area show a "Port of Holland" within Sarangani Bay.

The legend goes on to say that gani escaped captivity from the *busaw*, but was injured while trying to escape. His uncle cured him while he was hiding in the mountainous areas around the bay. At about this time, Sharif Kabungsuwan of Arabia led a contingent of Muslim settlers to the area to spread Islam. Historians believe that this was the third wave of Malay immigrants to reach the Southern Philippines in the 14th and 15th Century (Agoncillo, 1975:18). Sharif Kabungsuwan's followers pushed the B'laan into the mountainous areas near Mt. Matutum and Mt. Parker -- away from the lands historians believe they, and another tribal group, the T'boli, had occupied since 4,000 BC (Office of the City Planning and Development Coordinator, 1989a:8). Nevertheless, despite gani's retreat, the bay holds the name of its former protector, Sarangani.

Today, nearly 500,000 people live in General Santos City and the municipalities around Sarangani Bay; fifty-eight percent in coastal villages. Migrations to the area did not stop with General Santos because only twenty-five percent of the people living around the bay were born here. Fifty-three percent of the migrants are from the Visayan islands (mostly Cebu and Bohol); twenty-four percent from other parts of Mindanao (Louis Berger International, Inc., 1993a:2-43). Other migrants from the southwest Philippine islands come to Sarangani Bay to search for richer fishing grounds and to avoid armed conflicts between rival clans. Unlike fishers in other parts of the world, Filipino fishers show a willingness to migrate to other areas in hopes of improving their standard of living (Bailey, 1982:24). Often the names of fishing villages they

establish, such as Jolohano in the Municipality of Malapatan (from the island of Jolo), indicate the place from which the fishers migrated.

As a result of all of the migrations to Sarangani Bay, residents speak a number of different languages and practice different religions. The languages commonly spoken in the area include Tagalog, Cebuano, Ilokano, Ilongo, Hiligayon, Kworay-a, Maguindanao, Badjao, Samal, and Tausag. Cebuano, a Philippine language originating in the Visayan Islands, is the most common language shared by the fishers from the bay. The two major religions practiced by residents are Islam and Christianity. The latter now prevails in Kiamba, Glan, and General Santos City; the former in Alabel, Malapatan, and Maasim. Nevertheless, each municipality contains a mix of these two religions.

### Coastal Resources

In this section, I describe the coastal resources of Sarangani Bay that gani protected centuries ago with his shield. I describe the coastal resources that are the focus of this study -- tuna fisheries, municipal fisheries, coral reefs, and mangroves. Although tuna are highly migratory species caught by fishers outside the bay, I include them as coastal resources because a majority of the fishers from Sarangani Bay rely on these fisheries for their livelihood. In addition, I briefly describe other coastal resources located around the bay.

## Tuna Fisheries

The Fishery Code of the Philippines, Presidential Decree (PD) 704 of 1975, divides fishers into two groups, commercial and municipal. It declares municipal waters to be the area from the shore out to seven kilometers and national waters from seven kilometers to the Exclusive Economic Zone (EEZ) boundary (200 miles or the midpoint between two countries closer than 200 miles). Commercial fishers are fishers with boats weighing more than three gross tons. PD 704 requires them to fish in waters more than seven fathoms deep. Other regulations that followed PD 704 require commercial vessels to fish more than seven kilometers from the shore. PD 704 requires commercial vessels to register with the Department of Agriculture. Municipal fishers are fishers with boats less than three gross tons, or no boats at all. They may fish anywhere except in protected areas (La Viña, 1991:92-97). The term "municipal fishers" refers to small-scale, artisanal, traditional, and subsistence fishers -- terms used in other literature (Calud et al., 1989:3 and Christy, 1986:122).

In Sarangani Bay, both commercial and municipal fishers catch tuna. In this section, I describe tuna fishers and the techniques they use to catch tuna. Second, I describe the history of the tuna fishing industry in the bay. Third, I discuss the problems faced today by the tuna fishers from the bay.

### *Tuna Fishers*

Tuna fishers from Sarangani Bay fish in the Celebes Sea, Moro Gulf, Mindanao Sea, and the southern Sulu Sea. More recently, they started to fish farther south into Indonesian waters, near Sulawesi and Halmahera, and

Malaysian waters near Sabah. Some commercial fishers fish as far away as Papua New Guinea and Micronesia (Business Resource Center, 1994:25).

In General Santos City, 43 commercial fishing companies operate 592 vessels including 120 purse-seine vessels, 248 carrier boats, 185 light boats, and 39 ranger boats. They employ 4,000 to 5,000 fishers and laborers (Business Resource Center, 1994:24; and Philippine Fisheries Development Authority, 1992:1-4). Purse-seine vessels are large commercial fishing boats with immense, rectangular nets over 700 meters long that can plunge a hundred meters below the surface. A purse-seine fleet consists of the purse-seiner (35-50 fishers), a ranger boat (1-3 fisher) to locate schools of tuna, one or two light boats (1-3 fishers) to shine high powered lights into the sea to attract fish, and two or more carrier vessels (3-6 fishers) to haul the catch back to the coast. Purse-seine vessels (mother boat), along with ranger and light boats, stay at sea up to three months. The carriers stay at sea only seven to fifteen days because of their perishable cargo. Purse-seine vessels cost more than 12 million *pesos* (\$480,000) each; light boats 300,000 *pesos* (\$12,000) to 400,000 *pesos* (\$16,000) each (Hingco, 1993:24).

Unlike commercial tuna fishers from other parts of the Pacific Ocean, commercial tuna fishers from Sarangani Bay fish around *payaos* -- fish aggregating devices (FADs) fishers use to attract tuna. The *payao* is an indigenous fishing technique first recognized in Davao City, 130 kilometers north of General Santos City (Sanchez, 1988:143). Originally, municipal fishers made them by constructing bamboo rafts, anchoring them, and then dangling palm branches down into the water. Sunlight from the surface creates shadows in the sea that attract smaller fish. These smaller fish in turn attract the larger

fish, which the fishers scoop up with their nets. This technique proved to be effective in attracting tuna. Because the high seas are much rougher than nearshore areas, commercial tuna fishing companies make the *payaos* out of concrete and tires or steel (Floyd, 1986:33).

Commercial fishers attach radio transmitters to *payaos* so that they can locate them on the high seas. Scout boats locate the *payaos* by following the radio transmissions. Light boats shine high powered lamps through them to create shadows in the water that attract fish. Once the schools of tuna congregate near the *payaos*, the mother boat lowers the purse-seine net to scoop up the fish. Commercial tuna fishing companies usually place 20 to 25 *payaos* for each purse-seine vessel that they own at a cost of 80,000 *pesos* (\$3,200) to 120,000 *pesos* (\$4,800) for each *payao* (Hingco, 1993:25).

The catch from purse-seine vessels consists mostly of frigate mackerel (*pirit*), skipjack tuna (*sambagon*), and juvenile yellowfin tuna (*carao*). In 1992, purse-seine vessels along with other commercial vessels landed 26,011,200 metric tons of frigate mackerel, 11,768,700 metric tons of skipjack, and 9,363,600 metric tons of juvenile yellowfin tuna in General Santos City (Business Resource Center, 1994:92). Commercial fishers sell the majority of these fish to five local tuna canneries. They sell the rest of the catch to exporters or in the local fish market where sellers use red lamps to add color to the pale flesh of the fish rejected by the canneries and exporters.

Sarangani Bay is also home to nearly 20,000 municipal tuna fishers who operate 4,000 to 5,000 pumpboats (Business Resource Center, 1994:26, and Philippine Fisheries Development Authority, 1992:1). Municipal tuna fishers fish from pumpboats -- small boats made of wood with bamboo outriggers.

Pumpboats are motorized boats with double outriggers usually powered by 85 to 135 horsepower (hp) diesel engines. The hulls are 16 to 18 meters long and two to three meters wide. Large ice boxes in the middle of the hull store the catch until the fishers get back to shore. On top of the hull, the fishers place cook stoves to cook their meals during long fishing trips. Capital requirements are high to buy pumpboats, gear, and fuel. Fishers pay from 150,000 *pesos* (\$6,000) to 200,000 *pesos* (\$8,000) for a pumpboat (Hingco, 1993:11). To cover these costs, municipal fishers must pool their resources or seek financing from capitalists (Business Resource Center, 1985:55).

Although a tourist might enjoy a ride around the bay in a pumpboat, these boats are municipal tuna fishers' only protection against the winds, rains, and rough seas they endure to obtain their livelihood. On average, six fishers ride these boats on fishing trips that last nine to fifteen days on the high seas (Aprieto, 1990:19 and Philippines Fisheries Development Authority, 1992:3). Municipal fishers spend a better part of their lives at sea.

Similar to commercial tuna fishers, municipal tuna fishers also fish around *payaos*. Because they cannot afford to place their own *payaos*, they fish around those owned by large tuna fishing companies. At *payaos*, municipal tuna fishers sink their hooks deep into the water to catch adult yellowfin tuna (*bariles*), skipjack tuna (*sambagon*), or marlin (*marang*). Yellowfins, skipjack, and blue and white marlins congregate near *payaos* because they feed on the smaller fish that *payaos* attract (Aprieto, 1990:18). Adult yellowfin tuna are 110 to 150 centimeters long, with small yellow spiked fins on their backs. Marlins are usually twice the size of yellowfin tuna. Because of their long, sharp snout, fishers quickly sever the heads from these mighty finfish to make room

for them in their ice boxes. The skipjack tuna caught by municipal fishers are much smaller than yellowfins. They measure 40 to 55 centimeters in length and weigh about a kilo or two (Aprieto, 1990:10).

Municipal fishers land their catch in General Santos City where traders classify, buy, and subsequently sell the fish. In 1992, municipal fishers landed 4,317,500 metric tons of yellowfin tuna, 1,076,000 metric tons of skipjack tuna, and 213,800 metric tons of marlins in General Santos City (Business Resource Center, 1994:91). On average, fishers receive two to four dollars per kilo per fish, depending on the quality. Tuna exporters buy good quality tuna, pack them on ice, and transport them over the rugged, mountainous road to Davao by truck. From there, tuna exporters fly them to Manila and then on to Japan. The final destination of the majority of the fresh tuna caught by the municipal fishers from Sarangani Bay is Japanese fish auction markets. Prices for sashimi-grade tuna fluctuate greatly on a daily basis at these markets. According to some sources, General Santos City ranks sixth in the Japanese markets for quality of fresh tuna. Fishers sell poor quality tuna to traders who sell fish in the General Santos domestic market.

At the tuna fish landing in General Santos City, Lion's Beach, syndicates often take advantage of municipal tuna fishers. First, unscrupulous classifiers classify the tuna as low quality. Next, their business associates buy the fish. After these buyers purchase the fish, the classifiers reclassify the fish to reflect the true quality. Their associates then sell the fish for higher prices. Municipal tuna fishers call this process "*siko-siko*" (elbow touch), "*kindat-kindat*" (winking of the eyes) or "*yapak-yapak*" (stepping on one's foot), because syndicates use non-verbal signals to classify the fish. As a result, these syndicates make

their income solely through this system, at the expense of the municipal tuna fishers.

### *History of Tuna Fishing in Sarangani Bay*

Not until the second half of this century did tuna become a major resource in the Philippines. Before World War II, municipal fishers occasionally caught tuna, but they received low prices for their catch in the domestic market; therefore, they had little incentive to exploit tuna fisheries. In 1950, the first Philippine tuna company operated two longline boats in Philippine waters. Ten years later, the first longline vessel from Japan fished in Philippine waters (de Jesus, 1988:8). Fishers aboard longline boats set a long rope or line to support hundreds of fishing lines and thousands of hooks that dangle perpendicular into the depths of the sea. Because of the demand and high prices for fresh tuna in Japan, this technique proved to be profitable for these fishing entrepreneurs.

In addition to the lucrative fresh tuna market in Japan, the market for canned tuna in other countries expanded. In 1965, the Food and Agriculture Organization (FAO) administered the Deep-Sea Fishing Development Project which introduced purse-seine vessels into Philippine waters (de Jesus, 1988:8). Tuna fishing companies using purse-seine vessels sold their catch to local fish canneries. This tuna-fishing technique increased production in the Philippines from fewer than 25,000 metric tons in the early 1970's to 200,000 metric tons by 1980 (Floyd, 1986:3). The peak year for the Philippine tuna industry was 1986 when tuna fishers landed 266,000 metric tons nationwide (Aprieto, 1990:8). In General Santos City, the peak year was 1985 when tuna fishers

landed 123,000 metric tons (Business Resource Center, 1989:16). Clearly, purse-seine vessels made a dramatic impact on the Philippine tuna industry.

As early as 1953, municipal fishers placed *payaos* in Sarangani Bay. Starting in the 1960's, commercial fishers used *payaos* and purse-seine nets within the bay to catch sardines (Sanchez, 1988:143). From 1974 to 1977, the FAO South China Sea Fisheries Development and Coordinating Programme applied the indigenous *payao* method of fishing to tuna fishing with purse-seiners (de Jesus, 1988:7-8). Because of the success of this program, two companies based in Manila, one of them owned by the congressman from Sarangani, applied this technique to their operations (Floyd, 1986:5). The use of *payaos* along with purse-seine vessels revolutionized the tuna industry in the Philippines, especially in south and southwestern territorial waters.

Some government officials refer to General Santos City as the "boom city" of the southern Philippine because of the rapid growth of the tuna fishing industry in the 1980's. The high value of fresh tuna in the Japanese fish-auction markets helped to turn this small town in the south into a "boom" city. In the late 1970's and early 80's, a fishing company, with a large refrigerated vessel, anchored its boat at the mouth of the bay. The workers aboard the vessel bought tuna caught by municipal fishers from Sarangani Bay. The company paid the fishers much higher prices than the fishers received in the General Santos City fish market. When the vessel was full, the company transported the tuna to Japan. It sold the tuna in Japanese fish auction markets for even higher prices. Soon, other tuna fishing operations followed.

After seeing the success of this fishing company, a local fishing entrepreneur built a large ice plant and fish landing on shore in *Barangay Bula*,

General Santos City. He bought fresh tuna from local municipal fishers. He sold the tuna to Japanese buyers at high prices. Soon after, other entrepreneurs bought tuna from the local fishers. They, too, exported the tuna to Japan. A few years later, these tuna exporters increased in number. They became unhappy with the fish landing in Bula because one person monopolized all of the operations. They moved their operations to Lions Beach where they operate their businesses today.

Not only did the number of tuna fishers with hook and line gear grow rapidly during this time, but also the number of fishing companies with purse-seine vessels. In the same way that purse-seine nets in the 1970's dramatically changed a local fishery in Prigi Bay, East Java, Indonesian, they changed the tuna fishing industry in Sarangani Bay (Kendrick, 1993:6, 7). These tuna fishing companies soon owned not only purse-seine vessels, but entire fishing operations including private wharves, cold storage, transport vehicles, and fish canneries. The catch from these commercial vessels went from around 2,200 metric tons in 1985 to almost 17,600 metric tons (Barut, 1990:70).

Furthermore, in the 1980's, two Manila-based fish canning companies built fish canneries in General Santos City to be closer to fishing grounds. This enabled these companies to obtain fresher fish and lower their transportation costs (Floyd, 1986:16). Three other canneries followed in the late 1980's and early 1990's; two more companies intend to build canneries by 1996.

#### *Problems for Tuna Fisheries*

The tuna fishing industry in Sarangani Bay hit its peak by the mid 1980's. By 1990, tuna fishing companies experienced notable decreases in the amount

of tuna caught by their fishers. Today, local tuna fishers ponder the future of their industry and hope for a return of the 1980's boom years.

Because of the large number of tuna fishers using active fishing gear (e.g., purse-seiners), overfishing is one cause of the recent decline in southern Philippine tuna fisheries. Fishery scientists identify two types of overfishing that may be occurring in the fishing grounds close to Sarangani Bay -- growth and recruitment overfishing.

Growth overfishing, the catching of fish before they mature into adults, occurs because the bulk of the skipjack and yellowfin tuna caught by purse-seine vessels consists of juveniles (Aprieto, 1990:10; and Pauly et al., 1989:310). Skipjack feed near the surface under *payaos*, which makes them easier to catch with purse-seine nets. Purse-seine nets also scoop up juvenile yellowfin tuna feeding off the skipjack (Louis Berger International, Inc., 1991:7 - 11). At the fish landings in General Santos City, the vast majority of tuna landed by fishers are juvenile skipjack weighing 70 to 100 grams (Barut, 1990:68; Floyd and Doulman, 1987:177; and Hizon, 1987:3). As much as two-thirds of the purse-seine catch in 1981 consisted of juvenile tuna (Floyd, 1986:24). Many fishery specialists believe that the catching of juvenile tuna will eventually deplete tuna fisheries (Aprieto, 1989:188).

Recruitment overfishing, a reduction in spawning stocks, occurs because of intense fishing efforts in spawning areas and because of the degradation of coral reefs and mangrove forests around the bay (Enriquez, 1993:4; and Pauly et al., 1989:314-315). Although fishery scientists believe the mouth of Sarangani Bay to be a spawning area for yellowfin and skipjack tuna, there are few restrictions on fishing effort in these areas (Aprieto and Ganaden, 1987:3).

Some of the female yellowfin tuna landed in 1990 had eggs indicating that they were spawners (Louis Berger International, Inc., 1991:7 - 10). Furthermore, mangrove forests and coral reefs around the bay show extensive damage (Louis Berger International, Inc., 1992: 7- 15).

Another problem tuna fishers from Sarangani Bay face is the need for them to fish in farther fishing grounds. In the 1980's, tuna fishers placed their *payaos* exclusively in southern Philippine territorial waters. Today, they place their *payaos* farther and farther from shore because tuna stocks in southern Philippine waters are in decline. Tuna fishers from the bay travel farther south into Indonesian waters near Sulawesi and Halmahera and Malaysian waters near Sabah to catch tuna. The increasing distance to tuna fishing grounds especially hurts municipal tuna fishers because of their small boats and their lack of capital to finance long fishing trips.

Although *payaos* are partly to blame for the heavy fishing pressures in fishing grounds near Sarangani Bay, ironically, they may protect dolphins. In other areas of the Pacific, tuna companies locate dolphins because schools of tuna often swim below them. These companies set their purse-seine nets below the dolphins and tuna. When they scoop up their nets, they catch dolphins along with the tuna. *Payaos*, however, eliminate the need for Filipino tuna fishers to locate dolphins. Although Filipino fishers using purse-seine nets inadvertently catch some dolphins, compared to other Pacific fisheries, the catch is minimal. In other cases, municipal fishers catch dolphins for food on the high seas, or they catch them out of economic desperation to sell in the local market. In all of these cases, it appears that the catching of dolphins is a concern, but not a major issue in Sarangani Bay. Nevertheless, this was not

the opinion of one reporter who wrote an article about dolphin slaughter in General Santos City (Gamalinda, 1992:11).

In a series of articles printed in the Philippine national papers, and published by the Associate Press, the reporter charged that rampant dolphin slaughter occurs in General Santos City and that traders openly sell dolphin meat in the fish market.<sup>1</sup> The reporter wrote that purse-seine vessels and municipal tuna fishers were responsible for catching these dolphins (Gamalinda, 1992:11). National and foreign newspapers printed these reports even though the Earth Island Institute (EII), an international NGO which monitors tuna fishers from General Santos, declares that the tuna industry in General Santos is "dolphin safe" except for isolated incidents.

"Dolphin safe" tuna is an important distinction in the tuna fishing industry. To sell canned tuna in the United States, tuna canneries need to certify that their tuna are "dolphin safe." The European community is considering similar measures. Because of this distinction, the EII monitors the tuna fishing companies in this area. The opinions of local EII officials, fishers and environmentalists indicate that the reporter overstated the problem. The media, in this case, created a problem for tuna fishers from Sarangani Bay that could have adversely affected the industry.

### **Municipal Fisheries**

PD 704 defines municipal waters as those within seven kilometers from the shore. The Local Government Code of 1991 authorizes cities and

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<sup>1</sup> Associate Press (1992) "Systematic Killing of Dolphins in RP," The Nation, December 15; and Associate Press (1992) "Dolphins Are Slaughtered," Honolulu Advertiser, December 14, p. A9.

municipalities to increase municipal waters out to fifteen kilometers. General Santos City and the municipalities bordering Sarangani Bay are in the process of extending their jurisdiction over municipal waters out to fifteen kilometers. As a result, the entire bay is municipal waters. Municipal fisheries are the fisheries located within municipal waters. Thus, the Philippine government defines municipal fisheries based on political boundaries, not on geographical boundaries.

#### *Fishers and Gear*

Commercial fishers fish within the municipal waters of Sarangani Bay and the rest of Sarangani Province. Up to fifteen commercial vessels fish regularly inside the bay at night -- eleven from General Santos City and four from other parts of the Philippines. These operations use ring nets to catch fish, *payaos* to attract fish, light boats to shine lights (200 to 500 watts) through the *payaos*, and carrier boats to transport the catch. Leyteno and Boholano migrants brought *basnig* (bag nets) and *sensoro* (ring nets) to Sarangani Bay in the 1940's and 50's (Business Resource Center, 1994:2-3). Usually, a commercial fishing company will place two *payaos* for each commercial vessel. Ring net operations take place in the deeper parts of the bay in waters more than 100 fathoms deep. They catch pelagic and demersal fish.

In addition, other commercial vessels periodically fish within the bay. Trawlers from other parts of the Philippines, for example, occasionally fish in the shallow areas of the bay. The United States government introduced trawls in the Philippines in 1946 and modern trawling methods in 1967 (IBON,

1981:11). Trawlers drag weighted nets behind them across the sea bottom. They catch mostly demersal fish and shellfish.

Other commercial fishers use superlights. They shine high-powered light bulbs (more than 1,000 watts) into the water to attract fish. They catch fish with ring nets and bag nets. Because of the power of their light bulbs, they do not necessarily need to fish around *payaos*. Their catch is similar to the catch of other ring net vessels. The superlight fishing method is new to Sarangani Bay.

More than 25,000 municipal fishers live in crowded, squalid coastal *barangays*<sup>2</sup> in General Santos City. Around 7,000 municipal fishers live in less crowded, but equally poor coastal villages in Sarangani Province (Louis Berger International, Inc., 1993a:2-29). Municipal fishers make up twenty-six percent of the population in the coastal *barangays* around the bay. They operate 9,000 motorized and nonmotorized fishing boats. Sixty percent own a fishing boat; the rest work on boats owned by other municipal fishers, fishing companies, or tuna exporters (Louis Berger International, Inc., 1993a:2-29; 2-44 to 45). The Business Resource Center estimates that 6,000 municipal fishers from General Santos and Sarangani Province fish inside the bay; the rest fish outside the bay, usually for tuna. Approximately 80 percent of all municipal fishers earn less than 3,000 pesos (\$120) per month (Louis Berger International, Inc., 1993a:2-45).

Municipal fishers from Sarangani Bay and throughout the Philippines use a wide-variety of gear. Some researchers believe that the Filipino fishers use more varied gear than those in any other country. Indeed, in a fishing village

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<sup>2</sup>*Barangays* are political units within cities and municipalities in the Philippines. General Santos City, for example, has twenty-six *barangays*.

with only 15,300 residents on Panay Island, researchers list 52 distinct fishing methods (Szanton, 1967:9).

The major fishing gear used by municipal fishers from Sarangani Bay include hook and line, multiple hand line (*palangre*), longline, beach-seines (*baling*), fish corrals, drift gill nets (*patuloy*), spears (*pana*), fish traps (*bunsod/baklad*), and push nets (*sudsud*). Ilokano migrants brought beach-seines (*baling*) to Sarangani Bay; Ilongo and Cebuano migrants brought hook and line methods (Business Resource Center, 1994:2-3 and 28-30). In addition, municipal fishers use the *muro-ami* fishing technique -- a fishing technique in which fishers lower a weighted net then pound the reef with poles and weights to scare fish into the net (Figure 2.2) (Gomez, 1988:168; and Rivera and Cao, 1993:3). In the shallow waters of the bay, it is common to see young boys holding a pole a meter long with a fine-mesh net between the poles. With these thin nets, the boys collect milkfish fry to sell to traders. Women and smaller children wait on the beach with wash basin to collect the fry from the net. Buying and selling milkfish fry is a lucrative business in Sarangani Bay and other places in the Philippines because fishpond owners need the fry for their ponds. "Hookah" diving is another type of fishing method fishers use in the bay. These fishers attach tubes to compressors aboard boats. They breathe through the tubes while spearing large reef fish (Business Resource Center, 1994:30). Fishers also use illegal fishing methods in the bay including dynamite, poisons, electro-fishing, and fine-mesh nets (Business Resource Center, 1994:31). With all of these fishing gear, municipal fishers catch pelagics, demersals, and a variety of other marine species.<sup>3</sup>

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<sup>3</sup>For more detailed descriptions of municipal fishing gears used in the Philippines, see Smith, Ian R., Miguel Y. Puzon, and Carmen N. Vidal-Libunao (1980) "Philippine

Municipal fishers use a variety of fishing boats including motorized and nonmotorized *bancas* (pumpboats). Local fishers use paddles to power nonmotorized *bancas*. *Baroto nga na'ay layag* are *bancas* powered by sails that municipal fishers often use in the bay (Business Resource Center, 1994:2)

Often, municipal fishers cannot afford to finance their own fishing operations, especially if they use motorized boats. They must rely on financiers to provide capital for their fishing trips. Researchers in the Philippines refer to this system as the "*suki*" system -- a system that requires the fisher (producer) to sell all of his catch to the financier, at the financier's price. This price is often lower than the fisher can get in the open market. Nevertheless, financiers guarantee fishers that they will buy their fish. In addition, the *suki* often helps the fisher and his family during hard times (Smith et al., 1983:22).

#### *Fishing Industry Statistics*

As stated above, municipal fisheries contain pelagic and demersal fish. Pelagic fish inhabit the upper layers of the sea. They include tuna, marlin, and adult milkfish (large pelagics) as well as roundscads, big-eye scads, anchovies, sardines, round herring, mackerel, moonfish, flying fish, and fusiliers (small pelagics) (Trinidad et al., 1993:2, 10). Demersal fish live at the bottom of the sea or in shallow waters. They include snappers, breams, groupers, shrimps, squid, crabs, oysters, green mussels, and milkfish fry (Louis Berger International, Inc., 1993a:2-29 and Ordonez, 1987:A-7). Small pelagics comprise 94 percent of the country's total catch, but in Sarangani Bay, small pelagics account for 60 percent of the total production; large pelagics account

for 37 percent (Business Resource Center, 1994:91-92 and Philippine Council for Aquatic and Marine Research and Development, 1991:1). Of the fish landed in General Santos City in 1992, for example, 35 percent were frigate mackerel, 21 percent were roundscad, 20 percent were yellowfin tuna, 17 percent were skipjack tuna, and seven percent were other fish (Business Resource Center, 1994:91-92). In addition to these fish, fishers and scuba divers report seeing whales in the mouth of Sarangani Bay during the months of January and February. Nevertheless, fishers from Sarangani Bay do not catch whales.

Government officials keep fishing statistics based on the type of fishers who land them. They do not separate the fish caught in municipal fisheries from fish caught in territorial waters or in international waters; therefore, they do not know how many fish come exclusively from the municipal waters of Sarangani Bay. In a survey conducted by the Business Resource Center in 1984, municipal fishers indicated that they caught 59 percent of their fish in Sarangani Bay, 26 percent in the Moro Gulf, 11 percent in the Celebes Sea, two percent in the Mindanao Sea, and two percent in other seas. Commercial fishers indicated that they caught 38 percent of their fish in the Moro Gulf, 25 percent in Sarangani Bay, 17 percent in the Mindanao Sea, 14 percent in the Celebes Sea, and six percent in the Sulu Sea (Business Resource Center, 1985:11-12). Nevertheless, government officials divide the catch based on those that municipal fishers catch and those that commercial fishers catch, regardless of where the fishers catch the fish. As a result, the following statistics do not separate municipal fisheries from tuna fisheries.

In General Santos City, commercial fishers account for most of the fish landed. From 1988 to 1992, commercial fishers landed 86 percent (an

average of 71,856 mt/year) of the total fish landed in General Santos City; municipal fishers accounted for the other 14 percent (an average of 11,101 mt/year) (Enriquez, 1993:4). In contrast, of the total fishery production in the Philippine, municipal fishers account for 50 percent, commercial fishers 26 percent, and aquaculture 24 percent (World Bank, 1989:8).<sup>4</sup> Sarangani Bay landings account for about six percent of total national fish production (Louis Berger International, Inc., 1992:3 - 31). Table 2.1 list the top five species landed by commercial and municipal fishers in 1992.

Municipal fishers land their catch in General Santos City at Lion's beach, the Poblacion fish landing, the Bula fish landing or fish landings in other municipalities around the bay. Commercial fishers land their catch at the Makar wharf, the Poblacion fish landing, or one of the 20 private fishing wharves within the city. Fifty percent of the commercial fishers' landings goes to other parts of Mindanao, the Philippines or other countries; thirty percent to the five fish canneries; and twenty percent to the fish market in General Santos City (Business Resource Center, 1989:16 and Louis Berger International, Inc., 1991:7 - 22).

The fishing industry in General Santos City is a two-billion peso (\$80 million) industry and employs about 35,000 people, just less than 15 percent of the population. Thousands of other workers and local businesses depend on the fishing industry (Enriquez, 1993:1). The national government plans to build a large fish port by 1996 in General Santos City on the western shore to replace the fish landings at Lion's Beach, Bula, and some private fishing wharves. Fish canneries may increase from five to seven by 1996.

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<sup>4</sup>Note: The General Santos City percentages do not include aquaculture production.

### *Problems of Municipal Fisheries*

Nearshore fisheries, like Sarangani Bay, are often highly competitive and prone to overfishing. Throughout the 1970's and 1980's, more and more fishers from the Visayan Islands, Tawi Tawi, and other parts of Mindanao migrated to the bay in search of richer fishing grounds and safer places to live. As the fishing industry grew, residents from rural areas and their families came to General Santos City looking for employment in the fishing or agricultural industries. These industries require steady supplies of labor because of high turnover. Often, workers receive six month contracts from their employers. When their contracts expire, they choose to stay in the area rather than return to rural areas. Many of them become municipal fishers.

Fishers from Sarangani Bay report a decline in fish over the past five years (Business Resource Center, 1992a:12; Business Resource Center, 1992b:11; and Enriquez, 1993:4). Municipal fishers, surveyed by a local NGO, cite the increase in fishers, the nine month drought in 1991 - 1992, commercial vessels fishing in the bay, and the use of destructive fishing techniques by some fishers as the main causes of fish catch declines (Enriquez, 1993:4). Mangrove clearings by private landowners, siltation from denuded watersheds, and pollution from domestic sewage and industries further deplete municipal fisheries (Business Resource Center, 1994:68).

As in other competitive fisheries, fisheries in Sarangani Bay may be past their maximum sustainable yield (Lawson, 1984:32). Malthusian overfishing, the use of too efficient fishing gear such as trawls, ring nets, and bag nets, and superlights, occurs in the bay (Pauly et al., 1989:320-321). In addition,

recruitment overfishing occurs in the bay because of intense fishing efforts in spawning areas (Enriquez, 1993:4 and Pauly et al., 1989:314-315). Ecosystem overfishing also occurs in the bay because fishers using fine-mesh nets scoop up and throw away aquatic species with little market value as part of their catch. These by-catch species are valuable to the marine food chain and coastal ecosystems. Furthermore, fishers using destructive fishing techniques such as dynamite, poisons, and *muro-ami*, damage ecosystems important to aquatic food chain (Pauly, et al., 1989:314-321 and Rivera and Cao, 1993:7). The next section discusses two of these ecosystems important to the sustainability of Sarangani Bay's fisheries -- coral reefs and mangroves.

### **Coral Reefs and Mangroves**

Coral reefs and mangroves are two of the most productive and diverse ecosystems in the world (White, 1987:1 and Fortes, 1988:207-208). Nevertheless, many resource users underestimate their value to coastal ecosystems (Dixon, 1991:1). As a result, resource users degrade these ecosystems without realizing their full value.

#### *Coral Reefs*

Coral reefs act as physical buffers to protect coastal land areas from erosion and storm surges. They provide habitats, feeding areas, and spawning areas for thousands of plant and animal species. They also provide important nutrients for other aquatic organisms. Reef fish landed by fishers in the Philippines contribute 8 to 20 percent of the country's total fish production (McManus, 1988:189-190 and White, 1987:8, 10). Other benefits from coral

reefs include medicines, recreation, and aesthetics (Hatcher et al., 1989:350).

Table 2.2 summarizes the products from and the uses of coral reefs.

Coral reefs are fragile ecosystems. Although natural phenomenon, such as storms, degrade coral reefs, human activities cause the most damage to coral reefs. Rivers deposit silt and sediments from denuded forests and agricultural areas on top of coral reefs. Illegal fishing methods such as *muro-ami*, poisons, and dynamite, as well as trawls, which drag weights across the reefs, destroy soft and hard corals. Pollution and sewage from land-based activities, such as piggeries, prawn farms, fish canneries, agriculture, and domestic sewage, kill reef organisms. These activities increase turbidity and cause algae blooms in coastal waters. Dredging and coral mining rip up coral reefs. Tourists, including swimmers, SCUBA divers, and boaters, further damage corals they brush up against (Gomez, 1988:168; Hatcher et al., 1989:351; McManus, 1988:190-191; and Pauly and Chua, 1988:205).

The coral reefs in Sarangani Bay are fringe reefs with gently sloping beaches at one end, reef flats in the middle covered and uncovered by the movements of the tides, and steep slopes at the end dipping into the blue waters of the bay. The central and southern coasts of the bay contain coral reefs. A severely damaged coral reef lies in the northwest part of the bay. Excessive silt and wastes from industrial developments kill corals on this reef. The reefs along the southwestern shore are in good condition, but evidence of degradation exists because of destructive fishing techniques. The reefs along the southeastern shore are in fair to good condition. Nevertheless, fishers using destructive fishing techniques in this area threaten the productivity of these reefs. Throughout the bay, rivers transport eroded soils from denuded

forests and agricultural areas that settle on top of coral reefs (Business Resource Center, 1994:68; Louis Berger International, Inc., 1992:7- 15; and Suazo, 1989:4)

Municipal fishers from Sarangani Bay depend on productive coral reefs to sustain municipal fisheries. Nevertheless, more and more fishers exploit the reefs' resources. Many of the coastal villages along the bay are adjacent to coral reefs. Increasing numbers of SCUBA divers and tourists explore these reefs as tourism grows in the area. This increase in human activities over and near coral reefs threatens their productivity.

### *Mangroves*

Mangrove forests stabilize coastal lands, protect coastal areas from storm surges and sedimentation, and aid in soil formulation. They occupy foreshore areas where the movement of the tide covers and uncovers their roots and trunks with seawater. Mangrove areas are important ecosystems for land species such as birds and reptiles. They also provide nutrients and habitats for marine organisms as well as nurseries and spawning areas for dozens of species of fish. Mangroves support the aquatic food chain because they leak nutrients into the soil and the water for organisms to feed on. They produce the food and nutrients necessary to sustain nearshore and offshore fisheries (Dixon, 1989:5; Fortes, 1988:208, 211; Hatcher et al., 1989:346, 372; Primavera, 1991:29; and Rivera and Cao, 1993:4). Table 2.3 summarizes the direct and indirect benefits from mangrove forests.

Human activities degrade mangrove ecosystems in a number of ways. Coastal villagers, for example, cut mangroves for fuel and furniture. They clear

mangrove forests for fish ponds and human settlements. Industries clear mangrove forests to build fish ponds and prawn farms, salt farms, fish canneries, private fishing wharves, beach-resorts, and other facilities. Pollutants from industries, agricultural chemicals, and domestic sewage further degrade mangrove areas (Feliciano, 1991:25-26; Fortes, 1988:208; Gabriel, 1978:17-18; and Rivera and Cao, 1993:5). As a result of these activities in the Philippines, scientists estimate that current mangrove areas are only twenty-five percent of their original cover (Gomez, 1988:168; and Primavera, 1991:29).

Local residents usually underestimate the value of mangrove forests which is why they often choose to convert mangrove areas to fish ponds or other industrial purposes. Mangroves, for example, protect coastal areas from storm surges and soil erosion. These are public goods that few people recognize (Herring, 1990:97). In addition, they support other valuable resources such as fisheries (Dixon, 1989:5).

Mangroves line most of the east coast of Sarangani Bay. Scattered patches of mangroves occupy the north and west coasts (Mahintana Foundation, Inc., 1992:5). On the northwest coast, industries such as fish canneries and prawn farms remove mangroves to make room for their operations. Industries on the north and northeast coast convert significantly more mangrove areas to prawn, fish, and salt farms. In other mangrove areas, especially those on the drier west coast, local residents cut mangroves for firewood, charcoal, and building material. Residents along the east coast remove mangroves to develop small fish ponds. Beach resort owners on the east and west coasts of the bay bulldoze mangroves to make room for picnic and swimming areas. Although few people notice the effects of these activities

on fisheries, taken together, these conversions significantly decrease the amount of coastal areas covered and protected by mangroves around the bay.

### Other Coastal Resources

Sarangani Bay also contains other important coastal resources such as aquaculture, salt farms, recreational areas, agriculture, and shipping. Although these resources are not the focus of this study, this section briefly describes them.

#### *Aquaculture and Salt Farms*

The flat coastal plains and the abundance of fresh water from rivers and aquifers make Sarangani Bay an ideal place for fish ponds, prawn farms, and salt farms (Suazo, 1989:4, 8). Some of the families of the original Christian settlers who accompanied General Santos in 1939, continue to raise *bangus* (milkfish) and tilapia in fish ponds along the north coast. Canal systems guide seawater into the ponds at high tide to mix with fresh water from rivers and aquifers. Some fish pond owners convert their milkfish ponds into prawn farms because prawns usually fetch higher prices. Other businesses develop prawn farms along the northeast and northwest coasts of the bay. On the north coast, a local company operates a salt farm. The company pumps saltwater into manmade ponds. After the water evaporates, workers gather the salt to process into table and industrial salt.

Nearly fifty fish pond owners manage 305 hectares of fish ponds around the bay. They raise *bangus* (milkfish) and tilapia in their ponds. In 1993, they

produced around 260 metric tons of fish. Eighteen prawn farm owners manage 485 hectares of prawn farms in coastal areas around the bay and Sarangani Province. Dole Seafood operates the largest prawn farm with 200 hectares in production. In 1993, these prawn farms produced approximately 2,400 metric tons of prawns. Total aquaculture production in and around the bay accounted for six percent of total fishery production in 1993 (Business Resource Center, 1994:31-33).

The number of ponds producing prawns changes periodically because of fluctuating prices and harvesting problems. Just as prawn farms in Sarangani Bay began to produce in the 1980's, the price of prawns in the world market fell dramatically. The price of prawns dropped for two major reasons. First, when the Emperor in Japan died in the late 1980's, many Japanese abstained from eating luxury foods, like prawns. As a result, the demand for Philippine prawns decreased. Second, several countries in Southeast Asia, including the Philippines, got caught up in the "prawn craze" because of high prices for prawns in the 1980's. On the Island of Negros in the Visayan Islands, for example, wealthy landowners converted their unprofitable sugar lands into prawn farms in the hopes of capturing immediate profits. Other countries, including Thailand, Indonesia, and China, also expanded their prawn production (Far Eastern Economic Review, 1989:99). As supplies went up and demand went down, the once lucrative prawn industry watched prices fall sharply in the world market. Furthermore, prawn farming requires a significant amount of biological knowledge which many operators lack (Primavera et al., 1993:36-39). Although these factors -- world prices and biological knowledge -- currently limit the number of prawn farms in operation around the bay, prawn farm

operators indicate that hundreds more hectares are available for production (Business Resource Center, 1994:32-33).

### *Recreational Areas*

Since the total solar eclipse in General Santos City in 1988, more and more tourists have come to Sarangani Bay. Around the bay, private landowners construct beach-resorts to attract tourists. Because of the lack of developed public beach areas, these resorts are prime locations for weekend outings. There are eight beach-resorts in General Santos City (Office of the City Planning and Development Coordinator, 1990:65). Dozens more occupy the east and west coast since the completion of a road paving project. Two dive shops in General Santos City organize trips to explore the coral reefs in the bay. In addition, there are several fresh, hot-spring resorts along the Silway river leading into the bay from the northwest valley.

### *Agriculture*

At the base of Mt Matutum, north of Sarangani Bay, the Dolefil company grows pineapples on hundreds of hectares of land. Other tropical fruits and vegetables, such as bananas and asparagus, flourish along the rich slopes and valleys leading down from Mt. Matutum towards the bay. Corn, the most abundant crop in the Province of South Cotabato, and rice occupy other agricultural lands north of the bay.

In the dry pasture lands along the west coast of the bay, ranchers raise livestock such as cattle and goats. Farther into the mountains, a lumber company leases forest lands from the government to cut mahogany trees.

Farmers grow cotton along the dry western coast of the bay and the northeastern coast. Closer to the center of General Santos, livestock companies operate a number of piggeries. Along the eastern coast, coconut plantations stretch into the grassland hills where farmers plant corn.

The leading products exported by the 28 agricultural industries in General Santos are canned pineapples, fresh and dried pineapples, fresh bananas, canned tuna, mahogany lumber, cotton seeds, fresh frozen tuna, bat *guano* (fertilizer), and fresh asparagus (Office of the City Planning and Development Coordinator, 1989b). To promote agricultural expansion and foreign investment in the area, national government officials, with assistance from the United States Agency for International Development, administer the South Cotabato, Sarangani, and General Santos City (SOCSARGEN) Area Development Program (ADP). The goal of the program is to attract agricultural investors to the area to stimulate the economy. The program includes the expansion of the Makar wharf, the construction of a fish port, the construction of an agro-processing center, the pavement of more than 200 kilometers of roads, and the construction of a new international airport.

The industrial and agricultural development of the area stalled during a drought from the end of 1991 to the middle of 1992. The drought severely damaged agricultural crops. It also caused prolonged electrical power shortages because the area relies on hydroelectric power. According to fishers, fish catch declined during this period. In addition, some farmers turned to fishing, which increased fishing effort in the bay, when their crops dried up. The coconut trees without branches (over one-third) along the eastern coast of the bay attest to the devastating effects brought on by the drought.

### *Shipping*

Sarangani Bay's deep waters are ideal for accommodating large cargo ships. In 1990, 770 domestic vessels and 73 foreign vessels docked at the Makar wharf in General Santos City. Workers at the wharf unloaded 259,000 metric tons of domestic inward cargo and 60,000 metric tons of foreign imported cargo. They loaded 512,000 metric tons of domestic outward cargo and 13,000 metric tons of foreign export cargo. Also in 1990, 46,000 people disembarked, mostly from the ferry service between General Santos City, Zamboanga, Cebu, and Manila. In addition, 62,000 people embarked at the wharf (Louis Berger International, Inc., 1991:2 - 50).

### Summary of Environmental Issues

Studies conducted by researchers from Mindanao State University combined with other scientific studies in the area indicate several environmental issues within Sarangani Bay. Among them are: (1) the effects of too efficient and destructive fishing methods on fisheries; (2) the effects of erosion and siltation on rivers, coastal waters, estuaries, coral reefs, and mangrove swamps; (3) the effects of industrial and domestic wastes on coastal water quality; (4) the effects of pesticide contamination in groundwater and coastal waters; (5) the effects of high groundwater extraction rates on aquifers; (6) the effects of routine discharges and cleaning operations from prawn ponds on coastal water quality; and (7) the loss of mangrove and coral reef habitats to

coastal industrial development, beach-resorts, prawn farms, and salt farms (Business Resource Center, 1994:66-69; Dames and Moore, 1991:x-xxviii; Enriquez, 1993:4-5; Louis Berger International, Inc., 1991:2 - 47 to 101; Louis Berger International, Inc., 1992:7 - 4 to 25; Office of the City Planning and Development Coordinator, 1990:30; and Wilbur Smith and Associates, 1991:5 - 5 to 15 and 10 - 20 to 24).<sup>5</sup>

Conflicts exist among resource users over who has the right to the use the bay's resources in certain ways. These conflicts cause the environmental issues highlighted above. The next four chapters describe the conflicts that exist over property rights to coastal resources; the processes that resource users use to resolve these conflicts; and the effects of these conflicts on institutional arrangements and the coastal resources of Sarangani Bay.

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<sup>5</sup> For environmental impact assessment methods for coastal areas, see Carpenter, Richard A. and James Maragos (eds.) (1989) How to Assess Environmental Impacts on Tropical Islands and Coastal Areas, South Pacific Regional Environment Programme Training Manual, sponsored by the Asian Development Bank and prepared by the Environment and Policy Institute, East-West Center, Honolulu, Hawaii; and Sorensen, Jens C., Scott T. McCreary, and Marc Hershman (1984) Institutional Arrangements for Management of Coastal Resources, Research Planning Institute, Inc., Columbia, South Carolina, prepared for the National Parks Service, United States Department of the Interior, and the United States Agency for International Development.

Table 2.1. Fishery Production in General Santos City, 1992  
(in thousand metric tons)

Commercial		Municipal	
Species	Production	Species	Production
Frigate Mackerel	26,001.2	Adult Yellowfin	4,317.5
Roundscad	15,364.6	Roundscad	1,092.1
Skipjack	11,768.7	Skipjack	1,076.0
Juvenile Yellowfin	9,363.6	Juvenile Yellowfin	999.7
Big-eye Scad	1,645.8	Frigate Mackerel	716.7
Other	1,877.5	Other	2,168.5
Total	66,021.4	Total	10,370.5

(Source: Business Resource Center, 1994:91-92)

Table 2.2. Coral Reef Products and Uses

Resource	Product/use
Stony coral	Building material
Precious coral	Jewelry and decorations
Fish	Food, food chain, and aquarium fish
Mollusks	Shells, food, and food chain
Clams	Shells, food, and food chain
Oysters	Pearls, food, and food chain
Lobsters	Food and food chain
Sea cucumbers	Detritus feeder and food chain
Sponges	Household material and food chain
Other invertebrates	Antibiotics, drugs, and food chain
Coral sand	Concrete, building materials, beaches, and substrate
Ecosystem	Biodiversity, conservation, tourism, aesthetics, and storm barrier

(Source: Adapted from White, 1987:12).

Table 2.3. Direct and Indirect Products of Mangrove Forests

Use	Direct Products	Resource	Indirect Products
Fuel	Firewood for cooking, smoking fish, and making charcoal	Finfish	Food, fertilizer, food chain
Building materials	Poles, bridges, shelters, docks, boats, and posts	Crustaceans	Food and food chain
Fishing	Fish poles, traps, poisons, and fish aggregating devices	Mollusks	Food, and food chain
Agriculture	Fodder and green manure	Birds	Food, feathers, recreation, and fertilizer
Food and drugs	Sugar, alcohol, cooking oil, vinegar, tea substitutes, cigarette wrappers, and medicines	Mammals and reptiles	Food and skins
Household items	Furniture, glue, and tool handles	Other fauna	Food and food chain

(Source: Adapted from Dixon, 1989:3)

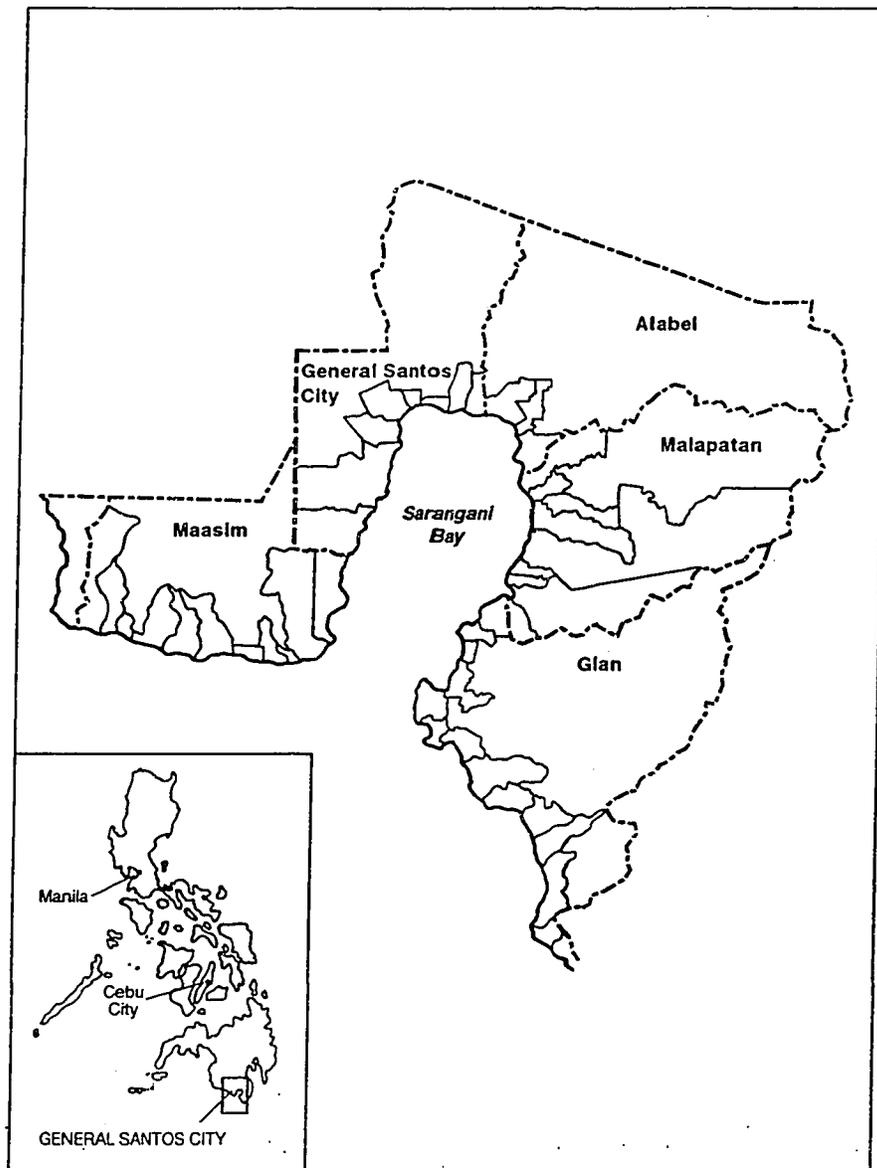


Figure 2.1. Sarangani Bay

(Source: Olive, 1995, redrawn from Louis Berger International, Inc., 1993b and 1993c)

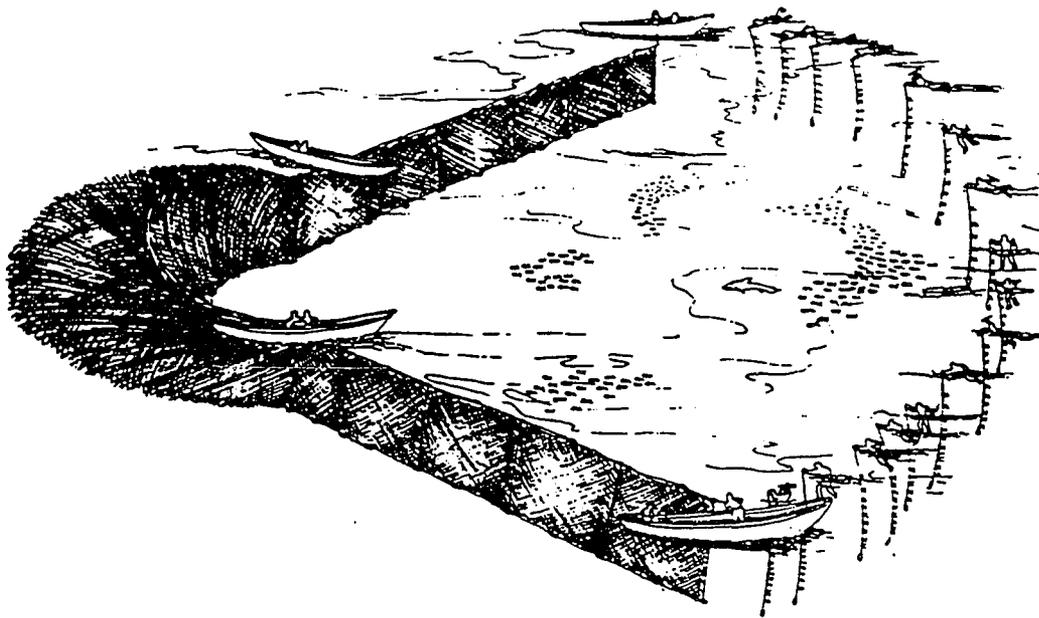


Figure 2.2. *Muro-ami* Fishing Technique  
(Source: White, 1987:28)

## CHAPTER THREE

### Whose Fish?: Property Rights to Coastal Resources

As the morning sun rises over the mountains in the east, tuna fishers anchor their pumpboats off Lion's Beach in General Santos and await their turn to unload their catch. At peak season, close to one hundred boats anchor here, but on this particular day, about thirty boats have arrived. The fishers anxiously wait to unload their fish to find out how much they will earn for their families from their two week fishing trip. Fishers, financiers, exporters, laborers, classifiers, and buyers scurry along the shore, each trying to maximize their income from today's landings. A stout young fish laborer with his sinewy muscles rippling under the weight of a shiny 50 kilogram frozen yellowfin tuna carried on his shoulder, wades through the water from the boat to the beach. Splashing through the waters behind him is Jojo, the fisher who caught the tuna. Although Jojo marked the fish by cutting his own trademark into the tail of this mighty fish, he stays with the fish to make sure that he receives a just price for it.

The fish laborer drops the tuna on to the scale and the needle points to 51 kilograms. The recorder at the scale writes the weight on the tuna and the laborer carries the fish to the tent owned by the tuna exporter who financed the fishing trip and owns the pumpboat Jojo used. With a proud smile, Jojo waits by his fish for the classifier to come and determine the quality of the tuna. Jojo knows that the quality of the fish will determine his share from the

catch. He also knows that unscrupulous classifiers, who work with syndicates at the beach, have cheated him before by classifying fish as low quality at first and then reclassifying the fish once someone buys them. The classifier arrives to determine the quality of the fish. The tuna exporter pays Jojo his percentage share, congratulates him for catching such a fine fish, and prepares the tuna for shipment. Another laborer packs the tuna on ice. He places it on a truck heading towards Davao City airport. The tuna exporter will transport the fish by air from Davao to Manila and then on to Japan in the shortest time possible to maintain the fresh quality of the fish. Between General Santos City and the Japanese fish auctions, ownership of the fish might pass through several different companies, all expecting a profit from the transactions. The volatile Japanese fish auction will ultimately determine the value of the tuna, probably as much as thirty to forty times what Jojo received for catching the fish.

When asked where he caught the fish, Jojo says that he caught it around a *payao* several miles north of the northern tip of Sulawesi Island, Indonesia. This leads to an important question. Who owns the property right to catch these large fish from the sea? Does Jojo, a municipal tuna fisher, own a property right to fish in this area? Does the tuna exporter own a property right to fish there? After all, he financed the fishing trip and provided the boat and fishing gear. Does the fishing company that owns the *payao* hold a property right to catch fish in this area? Because Jojo caught the fish in Indonesian waters, does the Indonesian government own a property right to this fishery? Because Jojo is a Filipino and lands the fish in the Philippines, does the Philippine government own a property right to this fishery?

On this particular day, fishers will land dozens of yellowfin tuna and marlins of all sizes that they caught in different fishing grounds. Fishers operate under a variety of institutional arrangements to gain access to these fishing grounds. Property rights to resources, such as tuna fisheries, are important components of institutional arrangements. Nevertheless, as the example above illustrates, they may be difficult to distinguish and define for certain types of resources. Church (1982:131) writes:

In a complex society, legally defined and pragmatic politics and social relationships make it difficult to discern what property rights actually prevail. This complexity also means that many people and organizations are able to exercise property right so that a large number of special interests would also have to be described. Another result is that participants are also unsure about the structure of property rights, which makes the entire structure itself uncertain. The perceived and actual uncertainty enhances the incentives for various participants to seek to shift the structure of property rights to their benefit, and it is from this competition that changes ultimately occur.

In this chapter I: (1) define common-pool resources; (2) define and discuss the components of institutional arrangements including property rights, rules, and property regimes; and (3) discuss why institutional arrangements, principally property rights to common-pool resources, are often ambiguous.

### Ownership of Common-pool Resources

Common-pool resources pose unique management problems for resource managers because they have characteristics that differentiate them

from private and public goods. As a result, institutional arrangements to common-pool resources, principally property rights, are often problematic. To understand why institutional arrangements to common-pool resources are often problematic, it is important to first discuss the relationship between humans and resources and the attributes of common-pool resources.

### **Relationships Among Humans and Resources**

Ciriacy-Wantrup (1952:28) defines a resource as a concept that "presupposes that a 'planning agent' is appraising the usefulness of his environment for the purpose of obtaining a certain end." This definition implies that human assessments determine the value of resources and that resources are means, not ends (Rees, 1990:12). Because communities and societies appraise the usefulness of resources through ongoing, social, cultural, economic, and political processes, the value of resources changes over time (Rees, 1990:6 and Ferrer, 1992:28). In addition, the technological capabilities of a society to extract a resource limit the extent to which the society uses resources (Ciriacy-Wantrup, 1952:28).

### **Attributes of Common-pool Resources**

Common-pool resources include communal forests, fisheries, coral reefs, mangroves, estuaries, grazing areas, groundwater basins, and irrigation systems (Ostrom, 1990:26). Resource economists classify common-pool resources as flow resources in critical zones. Economists define flow resources as renewable resources that may increase or decrease over relatively short periods of time (Rees, 1990:14-15). They subdivide flow resources into non-

critical and critical zone resources. Non-critical zone resources are resources not significantly affected by human action such as solar energy, tides, wind, waves, water, and air. Critical zone resources are resources that human activities can significantly affect. Humans can exploit these resources to exhaustion despite their renewable potential. (Ciriacy-Wantrup, 1952:35-42 and Rees, 1990:14-16).

To control human use of resources, societies develop rules and institutions to manage resources and determine resource practices. Resource economists determine if resource users have joint or separable consumption and whether or not resource users can exclude others from extracting the resource. Using these criteria, resource economists divide resources into private and public goods. Economists define a private good as a resource that an individual or corporation has the legal right to extract (separable consumption) and the right to exclude others from extracting the resource (excludability). To put it another way, what one individual consumes is not available to another. They define a public good as a resource available to all individuals to use (non-excludability) at the same time (joint consumption). In other words, what one person consumes does not take away from what others can consume (Thomson, 1992:10).

Common-pool resources present unique problems to resource managers because they have attributes similar to private and public goods. Private ownership of these resources is difficult because they are available for anyone to exploit. At the same time, consumption is separable because what one person consumes is not available for another to consume (Blaikie and Brookfield, 1987:186-187; and Thomson, 1992:10-11). These characteristics

pose two challenges to common-pool resource managers: (1) How does one exclude other users from the resource; and (2) how does one regulate resource users and prevent overexploitation? In the case of tuna fisheries, for example, exclusion is a problem because the migratory patterns of tuna make it difficult to establish the physical boundary of tuna fisheries. The jurisdictional boundaries of political units rarely coincide with the physical boundaries of common-pool resources (Oakerson, 1986:16). Furthermore, if one fisher in a municipal fishery, for example, decides to conserve the resource and limit his catch, no mechanisms exist to keep another fisher from catching fish in the same area. For this reason, resource users frequently overcapitalize their operations to extract common-pool resources (Acheson, 1989:356).

In summary, the common-pool resources analyzed in this study -- tuna fisheries, municipal fisheries, coral reefs, and mangroves -- present problems for resource managers because exclusion (excludability) is difficult and each user subtracts from the ability of others to use the resource (subtractability) (Blaikie and Brookfield, 1987:188; Feeny et al., 1990:3-4; and Ostrom, 1990:26). Because of these problems posed by common-pool resources, societies and resource users establish different institutional arrangements to control the use of these resources.

### Institutional Arrangements

Through socio-economic, political, and legal processes, societies establish institutional arrangements to define resource users' relationships to resources

and the relationships among resource users (Bromley and Cernea, 1989:5; Gibbs and Bromley, 1989:22; and Sorensen et al., 1984:33). Changes in the power and policies of political, legal, social, cultural, and economic institutions continuously cause institutional arrangements for common-pool resources to change (Church, 1982:92). Institutional arrangements reflect the contradiction between the need for individuals to compete with others to extract resources and the need for individuals to cooperate and set rules to regulate the practices of resource users (Levine, 1984:99).

Ronald Oakerson's (1986:13-30) model for analyzing problems associated with common-pool resources recommends dividing information into these components: (1) the technical or physical attributes of the common-pool resources; (2) the institutional arrangements that govern relations among the users of these resources; (3) the interactions between resource users; and (4) the outcomes or consequences from these interactions (Oakerson, 1986:14). The strength of this model is that it examines the physical attributes of common-pool resources. Moreover, it examines the relations between the resources and human processes (i.e., political, legal, social, and economic) (Rees, 1990:6 and Ferrer, 1992:28).

Institutional arrangements include resource users, property rights, rules, and property regimes (Oakerson, 1986:17). Resource users are individuals who extract, use, manage, or own common-pool resources. Property rights give certain individuals the right to access and withdraw resources. Rules govern the way resource users extract resources. Property regimes are groups of resource users who jointly develop organizations, property rights,

and rules to manage and control access to the resources. Property regimes establish their own incentives and disincentives to control resource use.

### Resource Users

Resource users are individuals involved in extracting, producing, managing, or controlling the use of common-pool resources. Resource users are those people who have a stake or interest in how society manages resources (Pomeroy et al., 1993:8). Local resource users are resource users who live near the area where they extract resources. They belong to communities that have traditionally managed the resources for a long period of time (Walters, 1994:3). Resource users also include those whose activities indirectly affect the resource. Individuals or companies who pollute an area, for example, put substances into the area that decrease the amount of common-pool resources available for others (Hardin, 1968: 1245). Other indirect resource users include NGO representatives who assist local resource users by improving their access to resources. They assist municipal fishers, for example, by providing loans for fishing gear or helping fishers construct artificial reefs and replant mangroves.

### Property Rights

Property rights are a bundle of entitlements defining the owner's rights and duties (Ciriacy-Wantrup, 1952:141 and Tietenberg, 1984:39). A property right is a secure claim to use and control a benefit stream such as resource (Bromley and Cernea, 1989:5; Church, 1982:113; Ciriacy-Wantrup and Bishop, 1975:714; and Dani et al., 1987:38). An individual may have a property right

only when other individuals have a duty to respect the right (Bromley, 1989:871). The owner of a property right expects that, in law and practice, others with duties will respect one's right (Bromley, 1989:871). Property rights have no meaning if the owner of a property right cannot exclude others from using the resource (Ciriacy-Wantrup and Bishop, 1975:715). Feeny et al., (1990:13) stress the importance of understanding property rights and the impacts that property rights along with other institutional arrangements have on the resources.

On Apo Island, a small island of the coast of Negros Oriental, Philippines, for example, the Municipality of Dauin authorizes the Marine Management Committee (MMC), through a municipal ordinance, to control access to the marine reserve and sanctuary around the island. The MMC permits no fishing inside the sanctuary. It permits only the use of passive fishing gear (e.g., hook and line) in the marine reserve around the sanctuary. The MMC expects fishers fishing in the reserve to respect the property rights of the MMC (Flores, 1992:7; Savina and White, 1986:111-112; White, 1988:21).

## Rules

Rules are prescriptions to create authorized actions (Schlager and Ostrom, 1992:250). Rules define actions that the property regime requires, prohibits, or permits (Ostrom, 1990:51; and Thomson, 1992:15). Rules structure a situation through incentives and disincentives (Ostrom, 1986:6 and Thomson, 1992:21). Rules determine who makes decisions and what procedures the group follows. They also determine the rewards and penalties for certain actions (Ostrom, 1988:123 and Ostrom, 1990:51). Individuals

devise rules to order relationships, create predictability, and minimize conflict (Acheson, 1981:289 and Ostrom, 1986:5).

On Apo Island, for example, the MMC develops rules for the users of the marine reserve. The MMC takes primary responsibility for enforcing the boundaries and rules for the sanctuary. The MMC prevents the use of trawls, small-mesh nets, dynamite, and *muro-ami* in the reserve. The MMC calls upon researchers at Silliman University, Philippine National Police (PNP) officers, and Coast Guard officials to assist them in apprehending fishers using illegal fishing methods. On other occasions, the MMC records incidents of illegal fishing for these authorities. In addition, the MMC collects fees from tourists who swim, snorkel, and SCUBA dive around the protected reef (Flores, 1992:8).

### Property Regimes

Property regimes are social institutions that develop a structure of rights and duties to characterize the relationships between resource users and resources. They also characterize the relationships among resource users (Bromley, 1989:871; and Bromley and Cernea, 1989:5). Property regimes establish organizations, property rights, and rules to manage the use of resources (Sorensen et al., 1984:81 and World Bank, 1989:47). They create incentives and disincentives, and set the parameters, for resource users to exploit resources (Smith et al., 1980:75 and Thomson, 1992:v). At the same time, the broader societal institutional context limits the authority of each regime.

Researchers identify four types of property regimes -- open access, state, private, and common. Each regime develops different organizations, property rights, and rules to manage the use of resources.

#### *Open Access Regimes*

Open access property regimes exist when no defined organizations, property rights, or rules exist to regulate the patterns of resource extraction (Feeny et al., 1990:4). The resource belongs to the first person to extract it (Bromley and Cernea, 1989:19). In the absence of organizations, property rights, and rules, individuals have the privilege to use the resources, but no rights or duties (Bromley, 1987:15 and Dani et al., 1987:19).

The existence of open access regimes usually leads to overextraction of the resources. Fishers use destructive fishing methods, for example, because in some fisheries no one owns a property right to a fishery, and no one has a duty to respect someone else's right. It is rational for each fisher to catch as much fish as possible because whatever one fisher does not catch another fisher will (Kalagayan, 1991:3).

#### *State Property Regimes*

State property regimes exist when the state owns, controls, and establishes the institutional arrangements to access resources. The state determines the organizations, property rights, and rules to govern access to common-pool resources (Bromley, 1989:872). Each resource user has a duty to observe the access rights and rules determined by the state (Bromley, 1987:15).

Some of the tools used by states to control the use of common-pool resources include laws, regulations, leases, licenses, fees, taxes, quotas, and rents (Acheson, 1989:357). The Philippine Fishery Code, for example, forbids the use of dynamite for fishing. Those caught using dynamite by government officials receive fines, penalties, or jail terms. Also, in the Philippines, government officials require commercial fishers to acquire fishing licenses before they permit them to fish in Philippine waters (La Viña, 1991:97). In Indonesian fisheries, the state requires Japanese tuna fishers to pay fees or start joint ventures with Indonesian fishing companies in exchange for the right to fish in Indonesian waters (Matsuda and Ouchi, 1984:204-207). By granting licenses and leases, the state shifts some of its control over common-pool resources to private or common property regimes (Bromley and Cernea, 1989:11).

#### *Private Property Regimes*

Private property regimes exist when individuals or corporations own or manage a resource and control resource extraction. These regimes have the legal and social ability to exclude others from the resource; accrue all costs and benefits; voluntarily transfer property rights from one individual to another; and expect the state and society to protect their rights to access resources from the encroachment of others (Feeny et al., 1990:4 and Tietenberg, 1984:39). Prawn farm owners, for example, own the right to raise prawns in their ponds. They have the right to exclude others from harvesting prawns in their ponds and from using these areas for other purposes. In Negros Occidental, Philippines, for example, prawn farm owners convert sugar lands in coastal areas into prawn ponds. They retain the right to exclude other

resource users from using these lands (Far Eastern Economic Review, 1989:99; and Primavera, 1991:30).

### *Common Property Regimes*

Common property regimes are community-based management systems in which an identifiable community manages the use of common-pool resources. Common property regimes base their management systems almost entirely on community rules and norms, regardless of who legally owns or leases the resources (Berkes and Farvar, 1989:11). Common property regimes in coastal areas collectively allocate property rights to access resources to members of the regime. In addition, they allocate duties to other individuals from the community to respect the rights of members. These regimes establish a bundle of informal property rights for members of the regime that state legal systems often fail to recognize. These regimes develop their own property rights, rules, and enforcement mechanisms based on social norms, local institutions, cultural practices, and indigenous knowledge about the resources (Alexander, 1982:262; Berkes and Farvar, 1989:12; Bromely, 1989:871-872; Bromley and Cernea, 1989:15; Buck, 1989:104; Gibbs and Bromley, 1989:22; McCay and Acheson, 1987:31; and Pomeroy et al., 1993:19).

Local communities and indigenous cultures have considerable knowledge about their environment that often goes unnoticed or unappreciated by resource users in other property regimes. These local resource users manage, distribute, and resolve conflicts over the use of resources in sophisticated ways. Research studies show evidence that traditional resource management

systems often manage resources efficiently, sustainably, and equitably (Bailey and Zerner, 1991:2).

Resource users in common property regimes pass down their knowledge of resources and their perceptions of property rights from generation to generation. These resource users determine the best management strategies based on their knowledge of resources (Bailey and Zerner, 1991:2). The way they use resources is an integral part of their lifestyle and culture (Berkes and Farvar, 1989:12). At the same time, these resource users continuously incorporate new knowledge about the social, political, economic, and physical environment. To survive, their property regimes must adapt to changes in their society. In Turkey, for example, Berkes and Farvar (1989:8) describe new common property regimes developed by municipal fishers within the last twenty years to manage coastal fisheries. Apo Island is another example. For the past ten years, the municipal fishers from Apo Island have elected their own Marine Management Council (MMC) to establish property rights and rules for their marine reserve. The MMC controls access to the marine reserve around the island and prohibits fishing in a marine sanctuary (Flores, 1992:7; Savina and White, 1986:111-112).

In summary, institutional arrangements include resource users, property rights, rules, and property regimes. Resource users develop property regimes that determine the organizations, property rights, and rules to manage access to resources. Although most state property regimes, including the Philippine government, legally own coastal, common-pool resources (i.e., tuna fisheries, municipal fisheries, coral reefs, and mangroves), other property regimes perceive different sets of institutional arrangements to control access to

resources. The next section discusses why these perceptions lead to ambiguous property rights to common-pool resources.

### Why Property Rights Are Ambiguous

When two or more property regimes perceive property rights to the same resource, property rights become ambiguous. This ambiguity, coupled with the attributes of a common-pool resource -- excludability and subtractability, often leads to the depletion of the resource (Feeny et al., 1990:3-4).

Garret Hardin (1968) describes this situation as "the tragedy of the commons." Hardin states, "Freedom in the commons brings ruin to all" (Hardin, 1968:1244). According to Hardin, to resolve the tragedy of the commons, societies should clearly allocate property rights of common pool-resources to either state or private property regimes (Hardin, 1968:1245). In many developing countries, including the Philippines, states institute this policy through their formal legal system. These states, through their constitutions, laws, and policies, own property rights to common-pool resources within their territorial boundaries. States charge themselves with the formal legal authority to determine who has the right to access these resources as well as who has the duty to observe these rights. These states often lease property rights of common-pool resources to private property regimes for their exclusive use.

In practice, Hardin's solution -- establishing state or private property rights to common-pool resources -- fails to prevent the depletion of these

resources in most Third World countries. Most of these states are unable to control access to resources by excluding unauthorized users from extracting resources. Public and private property regimes in these countries show more interest in making quick profits than in conserving resources. These regimes extract common-pool resources to export in exchange for foreign capital (Gibbs and Bromley, 1986:7). Third World states welcome these practices because of the need for foreign capital in their cash-strapped economies.

### Perceptions of Property Rights

Hardin's analysis mistakenly equates the lack of formal property rights to the lack of all property rights (open access). His analysis assumes a western legal definition of property rights. As a result, he fails to recognize the differences in perceptions of property rights among resource users, especially those in common property regimes. Albert Church's quote at the beginning of the chapter also refers to property rights in the western legal sense, but he recognizes the complexity surrounding the interpretation of property rights. In other countries where western legal traditions interact with local, indigenous legal codes, like the Philippines, the perceptions of property rights among resource users may vary to significant degrees.

The perceptions that resources users have about property rights, significantly affect the way they use resources. These different perceptions often explain why resource users choose certain extraction techniques or observe different property rights. In discussing the perceptions of municipal fishers from the Philippines, Juliano, Anderson, and Librero (1993:5) write:

These differences in perceptions and attitudes towards their [coastal residents] world have a profound influence on the way in which extractive activities in the coastal zone relate to management of coastal zone resources.

Visayan fishers, for example, perceive the use of fish corrals to be more efficient than the use of nets. Their use of fish corrals reinforces their perception of owning common property rights to the fishery where they build their corrals. These fishers have more control over who may catch fish in these areas than fishers who use nets (Juliano, 1993:7). Another example is a Sri Lankan fishing village where municipal fishers regulate access to a nearshore fishery through a series of procedures. Collectively, they perceive the right to manage this fishery. They expect other fishers to respect their property rights. Although they do not possess a formal property right to manage this fishery, they establish common property rights to the fishery "based on a moral notion of equal opportunity" (Alexander, 1982:4).

Resource users in other common property regimes perceive property rights based on their right to a livelihood and their right to meet the basic needs of their families. Berkes and Farvar (1989:11) write, "With guaranteed access rights to a vital resource, everyone in the community is assured of the opportunity of meeting their basic needs." Common property regimes often have more incentive to conserve resources because their lives and their communities depend on the resources.

Kerkvliet (1990:251) found similar perceptions among peasant rice farmers in the Philippines. He writes:

Widespread, however, among those of lower class and status is the belief that they are entitled to security and dignity. On that basis they frequently make claims on how resources should be used, distributed, and produced, in effect pitting this belief against capitalist [private property] ones.

In one incident, landless, peasant farmers cultivated a parcel of land left vacant by the landowners. When the landowners tried to evict the farmers, the farmers resisted. The farmers perceived a right to farm the land to maintain their livelihood (security) and meet the needs of their families. They did not want to take private property rights from the landowner. They wanted only to be tenants. As tenants, they could fulfill the basic needs of their families (Kerkvliet, 1990:190-195, 264). At issue in this incident, Kerkvliet (1990:270) writes, "was their right to a livelihood versus the landowners' private property claims." Kerkvliet further adds that peasant farmers perceive a right to dignity, or in other words, "to be treated as a human being, with courtesy and without ridicule" (Kerkvliet, 1990:250). These perceptions conflict with resource users who own private or state property rights to resources.

### de Jure and de Facto Property Rights

Often, in cases where resource users' perceptions of property rights conflict with other resource users, de jure and de facto property rights exist. De jure property rights to access and withdraw resources are rights that the state recognizes in the formal legal system. De facto property rights are rights that resource users observe in practice. In the example above about the peasant farmers, the landowners own a de jure private property right to the field because they possess a private land title that the state's formal legal system recognizes. Nevertheless, the peasant farmers attempt to practice de

facto property rights by farming the land. In the Sri Lankan nearshore fishery example, the state owns de jure property rights to this fishery, but the local fishers practice de facto property rights by instituting their own procedures. Similar to other common property regimes, these informal procedures and codes influence the practices of municipal fishers more than the state's formal rules (Cordell and McKean, 1986:85-86; Feeny et al., 1990:13; and Schlager and Ostrom, 1992:254).

In numerous cases in Southeast Asia, the resource users who own de jure property rights to coastal resources, such as tuna fisheries, municipal fisheries, coral reefs, and mangroves, differ from those who practice de facto property rights. The following case studies demonstrate the existence of different property right claims to the same resources. These examples illustrate why property rights to these resources are ambiguous. Table 3.1 summarizes the different perceptions of property rights that the resource users in these examples have towards resources.

#### *Indonesian Tuna Fisheries*

In Indonesian waters, Indonesian officials conflict with Japanese tuna fisher over property rights to tuna fisheries. The Convention on the Law of the Sea authorizes coastal countries to claim exclusive economic zones (EEZ) over waters within 200 nautical miles from their coastline or the midpoint between countries less than 400 nautical miles apart. Empowered with this legal document, Indonesian officials claim de jure state property rights to tuna fisheries within their EEZs.

Japanese tuna fishers believe that Indonesia and other countries enforcing EEZ boundaries on tuna fishers take away their property rights to these fisheries without adequate compensation (Matsudo and Ouchi, 1984:201). These fishers believe that no one should have exclusive property rights to migratory species. Japanese tuna fishing companies perceive *de facto* property rights to Indonesian tuna fisheries because they (1) discovered these fishing grounds; (2) took risks to develop their fishing operations to exploit these fisheries; (3) have continuously fished in these fisheries (with the exception of World War II) since the beginning of this century; (4) pay licensing fees to their government for the right to fish in distant waters; and (5) rely on these fisheries as a source of income (Matsudo and Ouchi, 1984:200, 225). These conflicting perceptions of property rights make property rights to Indonesian tuna fisheries ambiguous.

#### *Municipal Fisheries*

In San Miguel Bay, Philippines, the state owns *de jure* property rights to municipal fisheries based on the Philippine Constitution and the Fishery Code of 1975. Fishers using trawls fish in these waters. Philippine fishery laws and regulations prohibit trawls weighing more than three gross tons from operating in waters less than seven fathoms deep. They also prohibit baby trawls, those weighing less than three gross tons, from fishing in waters less than four fathoms deep. Nevertheless, trawlers make high capital investments in their fishing gear. To make a return on their investment, most trawlers fish inside the bay in waters less than four fathoms deep to catch high value shrimp and other fish. Because government officials do not enforce restrictions on

trawlers, trawlers practice de facto open access to municipal fisheries in San Miguel Bay (Cruz, 1986:119-126; and Pomeroy et al., 1993:4, 12-14).

The entry of commercial trawls into municipal waters triggers conflicts among commercial fishers and municipal fishers because they compete for the same resources (Cruz, 1986:126; and Smith et al., 1983:8). Municipal fishers perceive that trawlers take away their de facto common property rights by destroying the marine environment, undermining equitable sharing patterns, and damaging their fishing equipment such as nets and traps (Cruz, 1986:127-128). In sum, the entry of trawls into traditional fishing grounds leads to ambiguous property rights to municipal fisheries in San Miguel Bay.

### *Coral Reefs*

In Lingayen Gulf, Philippines, the Philippine state owns de jure state property rights to the coral reefs inside the bay. Within the bay, some municipal fishers use dynamite to catch fish over coral reefs.<sup>1</sup> Not only does the blast from the dynamite kill fish, it also kills hard and soft corals in the area. Because the use of dynamite destroys coral reefs, the Philippine state prohibits its use for fishing.

Dynamite fishers know that their fishing techniques are illegal. Nevertheless, they use this method regularly inside the bay. Because government officials are unable to stop these fishers, these fishers practice *de facto* open access rights to coral reefs. Dynamite fishers avoid authorities by

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<sup>1</sup>The use of dynamite by fishers is common throughout the Philippines. Another study, not previously cited in this thesis, that discusses perceptions of property rights among dynamite fishers and other municipal fishers is Pilar R. Jimenez and Josefa S. Francisco (1984) The Rural Poor in Leyte: A Social and Institutional Profile (Research Center, De La Salle University, Manila).

setting up look outs; by having faster boats; by bribing government officials; and by establishing friendly relations with law enforcers (Galvez et al., 1989:51-53). Because of their ability to avoid arrests, dynamite fishers maintain their de facto open access rights to fish over coral reefs. As a result, property rights to coral reefs are ambiguous.

### *Mangroves*

Prawn farm owners in Negros Occidental, Philippines perceive private property rights to mangrove areas adjacent to their land. They perceive the right to exclude others from shoreline areas. They remove mangroves from foreshore areas to make room for canals, pumps, ponds, and wastewater discharge areas. Although the Philippine state owns de jure property rights to the foreshore area, prawn farm operators remove mangroves without permission from the state. In some cases, operators acquire de jure property rights by receiving foreshore leases from the state. Nevertheless, few operators adhere to the state's requirement that an environmental assessment be conducted before removing mangroves.

Furthermore, by exercising private property rights to mangrove areas, these operators take away the de facto common property rights of municipal fishers who use mangrove areas to collect marine, food, and wood products. Prawn farm owners transform multiple use areas with multiple resource users into privately owned, excluded areas. Their private property claims lead to conflicts and ambiguity over property rights (Bailey, 1988:37; Pollnac, 1992:17-18; Primavera, 1991:29-30; and Skladany, 1992:35).

In summary, the attributes of common-pool resources -- excludability and subtractibility -- make ownership of these resources problematic. In addition, although resource users develop institutional arrangements (i.e., property regimes, property rights, and rules) to control access to common-pool resources, often resource users perceive different property rights to the same resource. Case studies show, for example, that one property regime may have a *de jure* property right to a resource. At the same time, another property regime may practice a *de facto* property right. Thus, in these situations, property rights to common-pool resources are ambiguous.

The next chapter, Chapter Four, discusses how resource users establish property rights to resources. It examines the strategies that resource users pursue to establish property rights; the types of conflicts that occur as a result of conflicting property right claims; the dispute-settling processes resource users use to resolve these conflicts over property rights; and the effect of these conflicts on institutional arrangements and resources.

Table 3.1. Perceptions of Property Rights

Property Regime	Perceived Property Right	Basis for Perceptions
<b>Tuna Fisheries</b>		
Indonesian officials	State (de jure)	Exclusive Economic Zone authorized by the Law of the Sea Convention
Japanese tuna fishers	Private (de facto)	Discovered fishing grounds; took risks to develop tuna fisheries; historical use of fishing grounds; licenses from the Japanese government; and the importance of these fisheries to their businesses
<b>Municipal Fisheries</b>		
Government officials	State (de jure)	The Philippine Constitution and the Fishery Code of 1975
Trawl fishers	Open access (de facto)	Lack of enforcement of fishery laws; high capital investments in fishing gear
Municipal fishers	Common (de facto)	Protection of the marine environment; equitable sharing arrangements; traditional fishing practices
<b>Coral Reefs</b>		
Government officials	State (de jure)	The Philippine Constitution and the Fishery Code of 1975
Dynamite fishers	Open access (de facto)	Distribution of benefits within the community; less destructive than other fishing techniques such as trawls
<b>Mangroves</b>		
Prawn farm owners	Private (de jure and de facto)	Foreshore leases obtained from government officials; possession of private land adjacent to foreshore areas.
Municipal fishers	Common (de facto)	Traditional uses of mangrove areas for livelihood and household needs

## CHAPTER FOUR

### Strategies to Establish Property Rights to Coastal Resources

One morning, I was walking along the beach when I saw a dozen or so municipal fishers pulling a *baling* net (beach seine, see Figure 4.1) from the sea. Because I was in this municipality to learn more about the fishing methods and management regimes of municipal fishers, I decided to join and help them (not much actually) haul in the net. They, of course, got a good laugh out of the fact that I had to wrap my smooth hands with my shirt to avoid getting blisters from the rope. Before I knew it, dozens more villagers came out to help pull in the net or watch the "*kano*" struggle awkwardly with the rope. After we pulled the net to shore, the fishers collected the fish and placed them into large basins. The catch consisted of small fish, barely three to four inches in length, and one small octopus. They dumped the rest of the material caught in the net along the shore. The fishers, still amused at my sore hands and my awkward way of pulling in the net, offered to give me a couple of fish in return for my so-called labor.

Before leaving, I took a closer look at the net and noticed that the mesh of the net was very small. It was then that I realized I had just assisted them in pulling in an illegal net. Its mesh size was so small that local residents often refer to these kinds of nets as "mosquito" nets. Ironically, this incident did not happen in an isolated place along the coast. It took place only a few hundred meters away from the Municipal Hall, the police station, the coast guard

station, the *barangay* captain's home, and a judge's home. I asked myself, "Why can fishers use an illegal fishing net and not be apprehended by the authorities?"

This story illustrates the difference between de jure property rights and de facto property rights. Government officials own de jure property rights to the fishery where these fishers fish. Nevertheless, these fishers either follow the property rights of a de facto common property regime or open access, de facto property rights. They evidently do not follow the formal property rights and rules of state property regimes. The question I seek to answer in this chapter is how do resource users establish de jure or de facto property rights to common-pool resources?

To answer this question, I describe the interactions among resource users and the outcomes from these interactions -- the third and fourth components of Oakerson's (1986:13-30) model, respectively. In the first section of this chapter, I describe the strategies that resource users pursue to establish de jure or de facto property rights to coastal resources. I demonstrate that these strategies often lead to conflicts and ambiguity over which property regime has a property right to a resource. In the second section, I describe the dispute-settling processes that resource users use to resolve their conflicts over property rights. I examine the role that dispute-settling processes play in determining how resource users establish and change property rights. In the last section, I show how the results of dispute-settling processes affect institutional arrangements and resources.

### Strategies of Resource Users to Establish Property Rights

The use of common-pool coastal resources is competitive because of the difficulty in excluding other resource users and the ability of each resource user to subtract from the ability of others to use the resource (Acheson, 1981:307; and Feeny et al., 1990:3-4). Moreover, their use is competitive because of conflicts over which property regime's (state, private, or common) property rights and rules apply to a certain resource (Acheson, 1981:288 and Church, 1982:131). Conflicts over property rights occur when resource users compete for the same resources at the same time (e.g., fishers fishing for the same species of fish) or compete for different uses of the resource (e.g., convert mangroves swamps into prawn farm or protect mangrove swamps to replenish fisheries) (Ciriacy-Wantrup, 1952:44).

Resource users attempt to create an institutional framework through which other resource users will recognize their property rights to the resources. As a result of this competition, property rights continuously change. In Chapter one, I quoted Albert Church (1982:92) who writes:

. . . cases reveal that property rights to the income from natural resources and their control are subject to controversy and competition and are not clearly defined by institutions at one moment in time. The institutions themselves are an integral part of the competitors' strategies. Ambiguity and constant change prevail concerning the power and policies of political, legal, and economic institutions. Consequently, a comprehensive economic model of natural resources should address the question of what role changing property rights and institutions play and what determines those changes.

Church points out the importance of understanding how and why property rights change. Moreover, he highlights the role that institutions play in changing and defining property rights. In this section, I discuss how resource users in the three types of property regimes -- state, private, and common -- pursue strategies to change and establish property rights. Table 4.1 summarizes the examples I use to illustrate the strategies that property regimes pursue.

### Strategies of State Property Regimes

State officials may pursue a number of different strategies to establish property rights to coastal resources and control the practices of resource users. Some of these strategies include: (1) Establishing de jure rights through the formal legal system; (2) creating incentives for resource users to exploit coastal resources under the control of the state; and (3) developing disincentives to regulate the use of resources under the control of the state. These strategies reveal that government officials have their own perceptions of who has a property right to access a resource and who has a duty to recognize another's property right. The following case studies from Indonesia, India, and the Philippines illustrate some strategies that state property regimes pursue to establish property rights to coastal resources.

#### *Indonesia and the Philippines*

As the example from Chapter Three illustrated, the Law of the Sea Convention grants countries that border the ocean de jure property rights to ocean resources within their Exclusive Economic Zones (EEZ). Indonesia and the Philippines both, for example, are signatories to this Convention. They establish

formal property rights to fisheries within their EEZs through their own legal systems and through the international legal system.

*Indian Government Officials*

In Kerala in Southern India, state officials seek to increase its revenues from coastal fisheries within Indian waters. The strategy of state officials is to increase incentives to exploit coastal fisheries to capture more resource rents (Kurien, 1993:6). Resource rents are economic rents obtained from resources. Church (1982:107) defines economic rent as:

. . . the difference between what people are willing to pay for a resource, or any other good or service (the market price), and the minimum amount owners would be willing to sell it for.

Government officials in Kerala promote investment in the fishing industry by offering subsidies for capital-intensive, more efficient fishing gear. With these subsidies, entrepreneurs, not previously in the fishing industry, purchase purse seine boats (to catch pelagic fish to sell in foreign and domestic markets) and trawls (to catch prawns to sell in Japanese markets). The state also builds and manages harbors and landing facilities for the fishing industry. From 1966 to 1985, the number of trawlers alone in this Southern India region increased from a couple of hundred to 2,800. Both state officials and these entrepreneurs make considerable resource rents from these strategies to exploit the fishery resources owned by the state (Kurien, 1993:6).

### *Philippine Government Officials*

In Lingayen Gulf, Philippines, national government officials create disincentives for fishers who use explosives to catch fish. Presidential Decree 704 as amended by PD 1058, for example, prohibits the use of explosives in Philippine waters. A Memorandum of Agreement among national officials from four agencies -- the Philippine Coast Guard (PCG), Constabulary Offshore Anti-Crime Unit (COSAC), Bureau of Fisheries and Aquatic Resources (BFAR), and the Department of Local Government (DLG) -- commits these agencies to enforcing laws and policies that prohibit the use of dynamite by fishers. BFAR, PCG, and COSAC officials set up detachments in areas where blast fishing is rampant. In addition, BFAR officials train *barangay* captains and community leaders to be deputy fish wardens to help enforce fishery laws against dynamite fishers. Their strategy is to involve more local officials and community leaders in their efforts to protect municipal fisheries and coral reefs by stopping dynamite fishing (Galvez et al., 1989:55).

### **Strategies of Private Property Regimes**

Private property regimes compete with other property regimes for property rights to resources. Although full ownership and exclusion of others from coastal and marine resources are more difficult to establish than private ownership of land, these regimes seek to establish quasi-private property rights that enhance their ability to extract resources. Because resource users in private property regimes make high capital investments to exploit particular resources, they perceive a right to access these resources. The inability of state property regimes to enforce their de jure property rights to control

access to resources often gives private property regimes opportunities to establish quasi-private, de facto property rights. This situation shows the complexity and ambiguity of property rights to coastal resources described by Church (1982:92) in the quote above. The examples below illustrate the strategies of Japanese tuna fishers, commercial trawlers, and dynamite fishers to establish quasi-private, de jure and de facto property rights to fishery resources.

#### *Japanese Tuna Fishers*

The Indonesian government's declaration of ownership of tuna fisheries within its EEZ threatens to take away the de facto property rights of Japanese tuna fishers to fish in Indonesian waters. Japanese tuna fishers claim the right to fish in these waters based on their: (1) discovery of these fisheries; (2) historical use of these fisheries since the turn of the century; (3) development of the fishing techniques they use to exploit these fisheries; and (4) dependence on these fisheries to maintain their fishing operations. Their strategy, with assistance from the Japanese government, is to work out agreements with Indonesian authorities for them to receive quasi-private, de jure property rights to fish in these waters in exchange for paying resource fees to the Indonesian government and for establishing joint ventures with Indonesian tuna fishing companies (Comitini and Hardjolukito, 1986:42-43; and Matsuda and Ouchi, 1984:204-226). Consequently, they have quasi-private, formal property rights to capture these resources, but the Indonesian government maintains state, formal property rights to exclude other resource users.

*Philippine Trawl Fishers*

In San Miguel Bay, Philippines, fishers using trawls and baby trawls seek to establish quasi-private property rights to municipal fisheries. Those that use boats weighing three gross tons or more, large-scale trawlers, obtain commercial fishing licenses from national government officials. These licenses give them de jure property rights to fish in Philippine waters more than seven fathoms deep and more than fifteen nautical miles from the shore. They do not, however, have the right to exclude others from the fishery. Baby trawlers use boats less than three gross tons. They do not need licenses, but they must fish in waters deeper than seven fathoms unless a municipal ordinance permits them to fish in waters deeper than four fathoms. Medium-size trawlers use boats that are three to six gross tons. They often falsely register their boats with municipalities as less than three gross tons to avoid the national government's commercial vessel classification (Pomeroy et al., 1993:4, 12-14).

In practice, as Table 3.1 indicates, trawlers have open access, de facto property rights to nearshore fisheries. They fish in most parts of the bay, regardless of the distance from the shoreline or the depth of the water, even though their practices are illegal according to state law and municipal ordinances. Even without formal property rights, they continue to invest in capital intensive gears to exploit these municipal fisheries. Researchers report, for example, more than a 50 percent (95 to 150) increase in small- and medium-scale trawlers from 1981 to 1986 (Pomeroy et al., 1993:4-6). Thus, they practice open access, de facto property rights, but pursue strategies to establish quasi-private, de facto property rights. Their investment in and use

of commercial fishing gear demonstrate their strategy to establish quasi-private property rights or at least maintain open access rights.

### *Philippine Dynamite Fishers*

In Lingayen Gulf, Philippines, large-scale dynamite fishers also seek to establish quasi-private property rights to municipal fisheries. They, along with small-scale fishers, frequently use this fishing method inside the bay. Using up to 40 sticks of dynamite per day, large-scale dynamite fishers catch enough fish with this technique to make considerable profits -- as much as P30,000 (\$1,200)/week in gross profits. Small-scale, dynamite fishers catch enough fish to maintain a subsistence livelihood (Galvez et al., 1989:53). To establish and maintain property rights, large-scale dynamite fishers: (1) Place fish aggregation devices (FADs) in the water; (2) down play the destruction to the marine environment their technique causes by comparing it to trawl fishing; (3) cultivate acceptance for their fishing technique within the community; and (4) avoid authorities.

Large-scale dynamite fishers use *taksayans*, large fishing boats with drive-in nets, and *ramas*, fish aggregation devices (also called *pulohan* or *payaos*). In February and March, they construct *ramas* out of bamboo poles and coconut leaves. They anchor them in the water by attaching rocks or sacks filled with sand. Once they place the *ramas* in the water, they perceive that they are the only fishers with the right to use dynamite around the *ramas* (Galvez et al., 1989:47). Thus, the use of *ramas* creates quasi-private property rights for these fishers.

In their fishing operations, large-scale dynamite fishers seek to prevent commercial trawls from fishing in municipal waters. They believe that trawl fishing is more destructive than dynamite fishing. They say that their dynamite blasts cover only a five meter radius. They also believe that dynamite fishing does not kill small fish and fish eggs (Galvez et al., 1989:48).

Because poorer fishers in coastal communities may also use dynamite to fish, on a smaller-scale, the level of acceptance of this fishing technique in these communities is high. In some communities, fishers have used dynamite to fish since World War II. Consequently, some communities accept dynamite fishing as a proper fishing technique (Galvez et al., 1989:46). In addition, to gain acceptance for their practices from other fishers, they permit fishers, including trawlers, to share in scooping up the fish after the blast. Trawlers scoop up the majority of the blasted fish. They give half of their catch back to the dynamite fishers. Fishers view this practice as a reciprocal relationship. Dynamite fishers also share their catch with the rest of the community. Other fishers share their catch with the community, but not to the extent that dynamite fisher share their catch (Galvez et al., 1989:48-56). As a result, they receive support for their quasi-private property rights even from trawl fishers and municipal fishers whom they compete with for fishery resources.

Dynamite fishers avoid arrests by having faster boats, posting look-outs, bribing officials, maintaining friendly relations with law enforcers, and exploiting legal loopholes. One year, for example, a Chief of Police conducted foot patrols at night to look for blast fishing paraphernalia in fishing boats. Later, his superiors told him to stop this enforcement practice. Some dynamite fishers said that a high ranking military officer received a new car in return for

stopping this enforcement practice. Other law enforcers report that local politicians discourage them from enforcing the law (Galvez et al., 1989:51-54). Consequently, dynamite fishers receive support for their quasi-private property rights from resource users in state property regimes who benefit from their fishing methods.

### Strategies of Common Property Regimes

Common property regimes seek to establish de jure and de facto common property rights resources. Two important components of common property regimes' strategies are: (1) The knowledge that their members have about the resources and; (2) the knowledge that their members have about the political processes which establish property rights to the resources. The concepts *ethnoecology* and *ethnopolitics* refer to the study of these components respectively.

#### *Ethnoecology and Ethnopolitics*

The knowledge that local resource users have about ecosystems and institutional arrangements for resources plays an important role in determining the strategies they pursue to establish common property rights to resources. Researchers use the prefix "ethno" to refer to a group's own view of knowledge about a subject (Vayda and Rappaport, 1968:489). Thus, ethnoecological knowledge is the knowledge that local, indigenous communities possess about their environment and ecosystems.

Ethnoecological knowledge is the way local resource users organize and classify ecological phenomena and environmental processes (Dunn, 1975:25).

The perceptions, categorizations, and communicative interactions of local resource users are important sources of information of how they relate to, adapt to, and then modify their environment (Dove, 1983:517; and Nietschmann, 1984:334). Ethnoecological studies show that fishers have detailed knowledge of fish species, habitats, and breeding cycles (Acheson, 1981:291). Municipal tuna fishers from the Philippines, for example, look for flocks of birds feeding on fish, sharp fluctuations in water temperature, warm, dark blue water flowing north, northeast, floating wood or debris, and patches of smooth water (Rasalan, 1977:112-113). They may seek to establish common property rights in waters where these conditions often occur. Another example is a visual system of triangulation that the municipal fishers from a Brazilian coastal village use to mark their fishing spots. In this system, the fishers use environmental features such as jutting rocks, stretches of identifiable reefs, and submerged rocks to mark their fishing spots. The fishing spots are common knowledge among fishers. They give fishers temporary common property rights (Foreman, 1967:418-424). Even with significant population growth in a coastal fishing village in Southern Bahia, Brazil, municipal fishers devise sustainable fishing practices based on their ecological knowledge of the fishery (Cordell, 1978:18-19)

Local resource users not only possess important ecological knowledge about ecosystems, they also possess an understanding of their culture and the social norms that influence institutional arrangements to resources. Researchers also use the "ethno" prefix to describe social phenomena such as ethnohistory, a group's conception and understanding of past events; and ethnography, a group's conception and understanding of geographical space

(Fowler, 1977:216). Ethnopolitics is a group's (or community's) perception and understanding of the political arena in which they live.<sup>1</sup>

Ethnopolitics is similar to the term "political culture" that Wildavsky defines as shared values that legitimize social practices and the term "cultural capital" that Berkes and Folke define as the ability of human societies to adapt to and modify social and political institutions (Berkes and Folke, 1992:2; and Wildavsky, 1987:5 quoted in Buck, 1989:102). Clifford Geertz (1973:311) writes "a country's politics reflects the design of its culture." He defines culture as, "a structure of meanings through which men give shape to their experience"; and politics as, "the arena in which such structures publicly unfold" (Geertz, 1973:312). Ethnopolitics is a community's understanding of the political arena in which their culture is located. This knowledge that resource users have about political processes evolves over time (Biersack, 1989:82). Ethnopolitics shows the ways local resource users perceive property rights, competition, equality, and conflicts (Herring, 1990:2). The ethnopolitical knowledge that these individuals have gained over the years through their experiences in the political arena determines the strategies they pursue to establish property rights to common-pool resources. The following case studies from India and the Philippines illustrate the ways municipal fishers in common property regimes use their ethnoecological and ethnopolitical knowledge to establish common, de jure or de facto property rights to resources.

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<sup>1</sup>I wish to thank Jeffery Walters, Ph.D Candidate, Department of Geography, University of Hawaii, for suggesting this term to me and for comments on earlier drafts.

### *Kerala Municipal Fishers*

In Kerala, India, the Kerala Swatantra Malsya Thozhilali Federation (KSMTF) consists of municipal fishers who protect their common, *de facto* property rights to nearshore fisheries. The members of the KSMTF oppose the use of trawls in their traditional fisheries because trawls damage coastal ecosystems. Because of their ethnoecological knowledge, these fishers believe that numerous species of fish spawn during the monsoon months of June to August; therefore, they seek to ban trawls from nearshore waters during this season. They also pursue a permanent ban on trawls and motorized boats in certain fishing spots as well as a total ban on purse-seiners in nearshore fisheries (Kurien, 1993:8).

They pursue their reforms through ethnopolitical strategies by staging fasts, setting up road blocks, and conducting marches before the Capitol. Government officials have responded by passing the Kerala Marine Fisheries Regulation (KMFR) Act, which zones coastal waters and reserves areas for the exclusive use of municipal fishers with non-motorized boats. In some of the areas, the municipal fishers place artificial reefs. They use their ethnoecological knowledge to determine the best areas to place these devices. The fishers establish formal, common property rights to these areas and exclude motorized boats.

### *Philippine Municipal Fishers*

In the Philippines, government agencies and non-government organizations have implemented more than 30 community-based coastal resource management projects. The most important aspect of these projects

is that the project managers recognize that municipal fishers, not state officials, local government officials, or NGO representatives, make the day to day decisions as to how resource users should use coastal resources (Alcala, 1994:1). In other words, they recognize the common, de facto property rights that municipal fishers establish. They work with local resource users to pursue ethnopolitical strategies to revitalize their common property rights. A community-based coastal resource management project on Apo Island illustrates this strategy.

On Apo Island, researchers from Silliman University assist municipal fishers in managing a marine reserve and sanctuary over a coral reef (Figure 4.2). Local fishers and researchers use their ethnoecological and marine biological knowledge, respectively, to establish the boundaries for the reserve and sanctuary. Their goal is protect the coral reef from destructive fishing and overfishing to revive the municipal fishery supported by the reef's ecosystem. With encouragement from the municipal fishers and the researchers from Silliman University, the Municipality of Dauin passed a municipal ordinance that declares the waters around the coral reef as a marine reserve and establishes a marine sanctuary. The municipality recognizes the authority of the MMC to develop and implement rules for the use of the marine reserve and sanctuary. The municipal fishers elect a Marine Management Committee (MMC) to manage the marine reserve (Kalagayan, 1990:3; White, 1988:19-22). This ethnopolitical strategy gives the MMC common formal property rights to the coral reef.

### Dispute Settling Processes

When two or more property regimes pursue different strategies to establish property rights, conflicts occur over which property regimes' rights apply to the resource. To resolve these conflicts, dispute-settling processes exist to determine who has property rights to resources. These processes influence the way resource users establish property rights.

In most political arenas, numerous processes exist to resolve these conflicts. Consequently, the choice of a dispute-settling process becomes an integral part of resource users' strategies to establish and maintain property rights. Albert Church (1982:114) writes:

. . . property rights are defined and changed within legal, legislative, and social systems. As a result, individuals and organized groups of individuals can carry out activities through the court system, lobbying in legislatures, and influencing government bureaucrats and elected officials in various ways in order to change those bundles of rights.

Church refers here to the state's policy process and state's formal legal system in the United States because the state legally owns common-pool resources in coastal areas. Nevertheless, other informal legal systems may exist to resolve disputes over property rights.

Often, resource users may prefer to settle their disputes over property rights to resources through informal processes. Informal rules to resolve conflicts are the basis for informal dispute-settling processes. Knight (1992:172) writes:

Most important, informal rules influence the distribution of resources, which in turn affect the power asymmetries in the conflict over the establishment of formal institutions.

Thus, informal dispute-settling processes play an important role in how resource users resolve conflicts and establish property rights to resources.

Customs, traditions, and normative codes are components of informal legal systems. In non-western countries, these systems often emphasize restoring harmony between the disputants rather than determining win or lose outcomes (Nader, 1989:341). The emphasis on restoring harmony between the disputants leads to more stability within the community. Informal legal systems also give disputants more flexibility in resolving conflicts (Zerner, 1990:55). The ethical code of *respeito* (respect) in Bahia, Brazil, for example, is an intricate part of the way municipal fishers name, own, manage, and resolve disputes over access to fisheries. *Respeito* and the value of reciprocity legitimize the sea tenure system of the resource users in this fishery (Cordell and McKean, 1986:94, 105). As a result, the use of this ethical code to resolve disputes among fishers clarifies property rights to resources.

### Legal Pluralism

Legal systems researchers refer to the coexistence of formal and informal legal systems in the same social field as **legal pluralism** (Merry, 1988:870). The legal pluralism perspective examines relationships among formal and informal legal systems. This perspective defines law as a system of meaning; a symbolic way of interpreting the world (Merry, 1988:886). It also examines the historical context and relationships among law, culture, ideology, and normative systems (Hunt, 1987:12; and Merry, 1988:889). In addition, this

approach explores the interactions among dominant and subordinate groups in dispute and non-dispute situations (Merry, 1988:889). The focus of this perspective is on how legal relations penetrate social relations and vice versa (Hunt, 1987:16).

Customary law, for example, is not an isolated legal system. Customary law evolves and changes within the context of the colonized state (Merry, 1988:875; and Moore, 1989:299). Customary law is linked to the state and present economy as well as to the past and historical traditions (Henry, 1985:323; and Moore, 1989:300). Customary law reflects a compromise between state law and traditional legal systems because neither can eliminate the other, nor can they avoid the influence of the other. Compromise becomes a "politics of survival" for local legal systems being penetrated by the state and a "politics of control" for state legal systems unable to impose direct rule over local areas (Nader, 1989:337-338). The legal tradition of the T' boli, a tribal group in the highlands above Sarangani Bay, is an example of a customary legal system that resists the penetration of state law to a certain extent, but is also influenced by state law and larger economic forces (Non, 1988:188-202).

The Philippines, for example, is a plural legal society where different legal traditions affect social relations and vice versa. G. Sidney Silliman (1982:227) describes three types of legal traditions interacting in a Cebuano folk legal culture including *balaud sa yuta* (the law of the country), *balaud sa Ginoo* (the law of God), and *pamatasan* (custom). Silliman notes that in spite of over 400 years of colonial rule, Filipinos do not uniformly share the norms of the law of the country (Silliman, 1982:225, 228). They rely more on informal systems of

justice based on familiarism and personalism for order and control. These values form the basis of informal dispute-settling processes. They also affect the formal legal system (Wurfel, 1988:2). Disputants in Silliman's study recognize that they should pursue their disputes through the proper channels of the law of the country, yet most disputants discuss their disputes in terms of the law of God and customs, not in terms of law of the country (Silliman, 1982:227-229). Thus, informal legal systems play important roles in determining how disputants resolve their disputes in Silliman's study area.

Informal processes also play an important role in resolving conflicts over property rights to resources. Often, resource users have a choice of which process to use to resolve their conflicts (K. von Benda-Beckman, 1986:132). Melanie Wiber's study (1990:329-338), for example, takes a legal pluralism perspective to examine why disputants choose certain dispute-settling processes to resolve their disputes over property rights. Her study shows that disputants in an upland community in the northern Philippines maneuver among legal systems to pursue economic strategies. They use formal and informal legal systems, sometimes simultaneously, depending on which one is more advantageous for them. Wiber (1990:338) writes that the plurality of legal systems:

. . . injects ambiguity into the definition of property rights, allowing an individual to press claims of dubious legitimacy.

Poorer people from the community successfully use different dispute-settling processes to expand their property rights to valuable rice-producing lands. The plurality of legal systems and normative orders in this community broadens the context of rights, gives dispute settlers more latitude in rendering

settlements, and affects the way officials enforce decisions from dispute settlement processes (Wiber, 1990:338-339).

The interaction among legal systems creates opportunities for disputants from all social classes. Legal systems are tools for disputants to use to establish property rights and convince others of their rights (Milner, 1991:258). Everyday political and social struggles, and the interpretation of these struggles, determine the actions that disputants take to resolve their disputes (Conley and O'Barr, 1990:167; and Milner, 1991:278). In the rest of this section, I apply the legal pluralism perspective to conflicts over property rights to coastal resources.

### **Dispute Settling Processes in the Philippines**

In this study, I describe seven dispute-settling processes that resource users use to resolve conflicts over property rights to coastal resources in the Philippines. Of these seven processes, two are informal systems, one mixes elements of both informal and formal systems, and four are formal systems; however, as the legal pluralism perspective suggests, each of these systems influences, molds, and changes the other systems. Each process contains both informal and formal elements.

#### *Informal Systems*

Informal dispute-settling processes include direct negotiations and traditional processes. Direct negotiations are processes in which the disputants work out their own, informal, property right agreements. The disputants may initially mediate their difference through a third party, a go-

between. The third party reduces the tension between the disputants in order for the mediation process to begin (Silliman, 1985:296-297). Once the negotiation process starts, the two disputants may choose to work out their own agreements. The dynamite fishers from Lingayen Gulf, for example, have informal agreements with trawlers and municipal fishers. Trawlers and municipal fishers tolerate the use of dynamite around *ramas* in exchange for a share in the catch.

Traditional dispute-settling processes depend on village leaders to resolve disputes. They act as the community's mediator for resolving disputes. The authority of these leaders may come from customary law, religion, or ethnicity. In tribal and Muslim communities, for example, the title "*datu*" refers to the leader in the community with spiritual, and often political, authority in the community. *Datus* control access to communal lands, foreshore areas, and nearshore waters. They collect and distribute resources within their communities. In addition, they resolve disputes between community members based on customary laws and normative orders (Acosta, 1994:60-61 and Wurfel, 1988:2-3).

The advantage to these two informal dispute-settling processes is that they seek to secure amicable settlements between the disputants. Because of cultural, social, and economic factors in the Philippines, amicable settlements are important to achieve (Machado, 1979:298-300, 313). Filipinos value dispute-settling processes that *hilot* (heal or repair) personal relationships (Silliman, 1985:296).<sup>2</sup> They prefer processes that will *husay* (settle) differences peacefully (Silliman, 1982:237). It is common for a third party to help

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<sup>2</sup>*Hilot*, literally translated, means "to massage."

disputants *hilot* and *husay* their differences. The third party acts as a buffer to avoid direct confrontation and embarrassment (Silliman, 1985:296-297). Thus, *hilot* and *husay* are important methods in informal dispute-settling processes.

### *The Katarungang Pambarangay System*

The *Katarungang Pambarangay* system is a process that purposefully combines elements of state law with elements of traditional processes. Instituted by Presidential Decree 1508 in 1978 by President Marcos, this system gives government officials at the local level, *barangay* officials, the authority to use traditional dispute-settling methods (e.g., *hilot* and *husay*) to develop amicable settlements between disputants (Silliman, 1985:280).<sup>3</sup> On one hand, this system resembles traditional processes because it relies on community leaders (i.e., *barangay* officials) to resolve conflicts through amicable settlements. Villagers perceive the *barangay* captain as a legitimate mediator for disputes (Silliman, 1985:291). They are often comfortable with this process because the *barangay* captain conducts the hearing in the local language. On the other hand, it resembles formal processes because the settlements agreed to by the disputants are legally binding in the state's formal legal system (Silliman, 1985:284). The *Katarungang Pambarangay* system formalizes mediation as a form of dispute settlement (Bacungan and Tadiar, 1987:177; and Silliman, 1982:237).

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<sup>3</sup>Sections 410-422 of the Local Government Code of 1991 establish the procedures for amicable settlements (RA 7160, 1991:163-166).

### *Formal Systems*

Formal dispute-settling processes for resolving conflicts over property rights to coastal resources include local policy processes, state policy processes, courts, and international law. The Local Government Code of 1991 establishes the first formal process, the local policy process. Local officials include provincial, city, municipal, and *barangay* officials from both the executive and legislative branches. They have authority over the management of municipal fisheries and coral reefs. They also set the procedures and forums to resolve property rights disputes to these resources. Local Development Councils, established by Section 106 of the Local Government Code, establish economic and social policies for the local government unit (Republic Act 7160, 1991).

National officials resolve disputes over property rights to coastal resources through the second formal process, the state's policy process. Officials from the Bureau of Fisheries and Aquatic Resources (BFAR) develop policies for the management of fisheries in national waters. They also assist local officials in managing municipal fisheries and coral reefs. Department of Environment and Natural Resources (DENR) officials develop policies for the protection and use of mangrove areas. BFAR and DENR officials set the procedures and forums to resolve property right disputes. The Philippine Coast Guard, Philippine National Police, and the Philippine Navy assist in the enforcement of state property rights to these resources.

The Philippine Constitution of 1987 establishes the third formal process, the state's formal legal system. It also establishes property rights to coastal resources. The Batasang Pambansa (the Philippine Congress) passes formal

laws regulating the use of resources. Prior to 1987, during the Marcos regime, President Marcos established regulations for the use of resources through Presidential Decrees, which still apply today (e.g., PD 704, the Fishery Code). Municipal Trial Courts, Metropolitan Trial Courts, Municipal Circuit Trial Courts, Regional Trial Courts, and the Supreme Court resolve some disputes over property rights to resources. Municipal Trial Courts are primarily responsible for hearing cases involving property rights to coastal resources. Municipal judges hear formal court cases, deliver judgments, and levy fines and penalties (Bacungan and Tadiar, 1987:169-172). The Philippine's formal legal system is a mosaic of legal traditions influenced by indigenous, Spanish, and American legal systems (Tolentino, 1988:238).

The "Law of the Sea Convention" recognizes state property rights to fisheries within a country's Exclusive Economic Zone. Presidential Decree 1599 expands the Philippine EEZ from 1,666,000 to 2,200,000 square kilometers (Feliciano, 1991:27). Signatories to this Convention may use the United Nations as a forum to resolve property right disputes in their territorial waters and the open seas.

In sum, seven types of dispute-settling processes exist to resolve disputes over property rights to coastal resource in the Philippines -- direct negotiation, traditional, the *Katarungang Pambarangay* system, local government policy processes, national government policy processes, the courts, and international processes. Consequently, resource users often have a choice of which processes to use to resolve their conflicts.

### Choice of Dispute Settling Processes

The case studies below give examples of the dispute-settling processes that resource users use to resolve conflicts over property rights to tuna fisheries, municipal fisheries, and coral reefs. Table 4.2 summarizes the dispute-settling processes that these resource users use. It also shows the predominant property right that prevails as a result of the dispute-settling process.

To maintain access rights to Indonesian tuna fisheries, Japanese tuna fishers negotiate directly with Indonesian officials. These fishers agree to pay fees to the Indonesian government and establish joint ventures with Indonesian fishing companies (Matsudo and Ouchi, 1984:185-186). The result of this process is *de jure*, state property rights for Indonesia and *de jure*, quasi-private property rights for Japanese tuna fishers.

In Kerala, the KSMTF municipal fishers resolve their conflicts with trawlers and purse-seiners over property rights to municipal fisheries in a state policy process and the state formal legal system. In the state policy process, they secure their rights by using their ethnopolitical and ethnoecological knowledge. They lobby state officials to ban fishing with trawls and purse-seiners during the monsoon months when numerous species of fish spawn. They also get state officials to ban fishing with motorized boats in fishing areas sensitive to outside threats. When state officials fail to enforce the ban, the fishers themselves apprehend trawlers and purse-seiners violating the Kerala Marine Fisheries Regulation (KMFR) Act. These fishers file cases in the formal court system against the trawlers and purse-seiners (Kurien, 1993:10). The result is *de jure*, state property rights for Kerala government officials to municipal

fisheries, de facto, common property rights for the KSMTF fishers to municipal fisheries, and de jure, common property rights for municipal fishers with non-motorized boats to specific, ecologically sensitive, fishing spots.

In San Miguel Bay, trawlers, municipal fishers, and government officials use local policy processes to resolve their property right disputes to municipal fisheries. Mayors and *barangay* captains report that they receive numerous complaints about trawling and illegal fishing from members of their community (Pomeroy et al., 1993:9). Of the 32 complaints against trawlers received by these officials, local officials filed only three cases in the Municipal Trial Courts. In nearly half (15) of these complaints, local officials took no action against the trawlers (Pomeroy et al., 1993:26). Respondents in a survey of government and non-government officials with an interest in the fishery believe that local officials lack funds and are ineffective at enforcing fishery laws and regulations (Pomeroy et al., 1993:10). The result is de facto, quasi-private property rights for trawlers. Nevertheless, another survey of stakeholders in the fishery shows that the respondents prefer shared fishery management arrangements among fishers, fishers' organizations, and government officials. They hope to institute these community-based management arrangements (Pomeroy et al., 1993:17-19).

In Lingayen Gulf, large-scale dynamite fishers attempt to avoid dispute-settling processes altogether. In cases where they must appear in state and local policy processes or in the court system, however, they rely on their friendly relations with officials and exploit legal loopholes, respectively. Dynamite fishers often prolong court cases. Once cases have been pending for several years, it becomes difficult for BFAR officials to make a case against

them. Judges dismiss cases because key government officials often move to new positions outside the area. Consequently, they are no longer available to testify (Galvez et al., 1989:54-55). The result is de facto, quasi-private property rights to municipal fisheries for large-scale dynamite fishers.

On Apo Island, the Marine Management Council (MMC) resolves conflicts among resource users over property rights to a coral reef fishery. State and local officials recognize the authority of the MMC to resolve disputes. They assist the MMC in apprehending illegal fishers. The result is de jure, common property rights for the Marine Management Council to the coral reef.

In summary, to settle disputes over property rights to resources in the Philippines, resource users may pursue at least seven different dispute-settling processes. The choice of dispute settlement process becomes an integral part of resource users' strategies to gain property rights to resources. The legal pluralism perspective is a useful tool to examine why resource users choose different processes to resolve their property right disputes. The reasons why resource users choose to resolve their conflicts using a specific dispute-settling process, at a particular time and in a particular situation, reveal the degree to which institutional arrangements are effective.

### Effects of Conflicts Over Property Rights on Property Regimes and Coastal Resources

The results of dispute-settling processes determine the institutional arrangements (i.e., property regimes, property rights, and rules) that will

prevail to a specific resource at a particular time. As Church's (1982:92) quote at the beginning of the chapter indicates, resource users continuously redefine and change property rights through various institutional arrangements. Church (1982:92) continues:

When property rights are ambiguous, they are competed for, and the more ambiguous they are, the greater the likelihood that they can be altered. Furthermore, changes in economic conditions and markets and changes in technology render previous institutions less stable and property rights less certain.

If institutional arrangements for coastal resources are unable to resolve disputes, clarify property rights, and enforce the outcomes from these settlements, open access situations will prevail (Herring, 1990:93; and Sorensen et al., 1984:15). The absence of property rights (open access) often leads to the depletion and degradation of resources. Therefore, in this section, I determine the degree to which property regimes are able to establish and maintain property rights. The criteria I use to measure the effectiveness of property regimes are efficiency and stability. The criterion I use to measure the effects of conflicts over property rights on the supply and condition of resources is sustainability (Gibbs and Bromley, 1989:26; Feeny et al., 1990:5; and Oakerson, 1986:21-22).<sup>4</sup>

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<sup>4</sup>Dani et. al. (1987:39), Gibbs and Bromley (1986:4), and Oakerson (1986:22-25) also use equity as a criterion to measure the performance of a property regime. Equity is the extent to which members of the property regime perceive that the distribution of the benefits from a resource is fair and equitable.

### Efficiency, Stability, and Sustainability

Efficiency is: (1) The degree to which a property regime gets other resource users to respect their property rights and follow their rules; and (2) the relative cost to a property regime to get resource users to respect their property rights and follow their rules (Dani et al., 1987:39; Gibbs and Bromley, 1986:4; Oakerson, 1986:21-22; and Schlager, 1990:208). BFAR officials in Lingayen Gulf, for example, devise various strategies to prevent fishers from using dynamite, but the high cost of enforcing these arrangements makes them less efficient.

Stability is the degree to which a property regime adapts to changes within and outside the regime to maintain or establish property rights. As Church's quote above indicates, rapid economic, environmental, or technological changes affect the stability of property regimes (Church, 1982:92; Gibbs and Bromley, 1986:4; and Schlager, 1990:223). The introduction of a new fishing technology, the baby trawler for example, in the San Miguel Bay municipal fishery dramatically changes the level of fishing effort in the bay. Consequently, this increase in competition for the resources threatens the stability of the informal, cooperative management regimes of traditional fishers (Cruz, 1986:122-126). The regimes of these traditional fishers, like other common property regimes, are encapsulated political systems that must adapt to changes outside their regime to maintain their property rights (Acheson, 1989:368).

Sustainability is the degree to which the present-day use of resources compromises the ability of future generations to use the resources (Feeny et al., 1990:5). Resource users use coastal resources sustainably when the supply

of resources is consistent over a long period of time. Because property regimes determine the patterns of resource use through incentives and disincentives, institutional analysts may evaluate them in terms of the degree to which they maintain the sustainability of the common-pool resources (Thomson, 1992:v). The vignette at the beginning of the chapter, for example, shows that the *baling* net these fishers use catches fish as well as other aquatic species (by-catch). The fishers dump the aquatic species with no economic value along the shore. These marine organisms, along with the small fish that they catch, play an important role in replenishing the fishery. Thus, the use of this fishing technique threatens the sustainability of the fishery because fishers do not return the by-catch to the sea.

### Case Studies

The case studies from earlier in this chapter illustrate the effects of conflict over property rights on institutional arrangements and resources. Although the authors of these case studies do not evaluate the effectiveness of institutional arrangements using the efficiency, stability, and sustainability criteria, I apply these criteria to the institutional arrangements described by these authors. Table 4.3 summarizes my evaluation of the effects of conflicts over property rights on the property regimes and coastal resources in these case studies.

In Indonesian tuna fisheries, Indonesia officials enforce their EEZ boundaries and develop arrangements with private property regimes to exploit tuna fisheries. Direct negotiations among Indonesian officials and Japanese tuna fishers lead to efficient and stable institutional arrangements. Indonesian

officials get Japanese tuna fishers to recognize their de jure, state property rights. Japanese tuna fishers are able to secure quasi-private property rights to continue their historical exploitation of these fisheries. Nevertheless, the impact of these arrangements on the sustainability of tuna fisheries is unclear because these arrangements do not decrease fishing effort. No study exists to determine, definitively, if the fishery is beyond its maximum sustainable yield.

In Kerala municipal fisheries, government officials establish specific laws (e.g., KMTF Act) and rules to regulate their use. Nevertheless, state and local policy processes and the court system, which resource users use to resolve conflicts, do not clarify property rights. Trawlers and KSMTF fishers still compete for property rights to fisheries. Consequently, the state property regime is somewhat efficient because it retains de jure, state property rights by passing new regulations to address problems; but it is unable or unwilling to enforce these regulations. The state property regime is a stable regime because state and local policy processes and the courts continue to be the forums in which resource users choose to resolve disputes over property rights. KSMTF fishers are a somewhat efficient common property regime because they are able to establish de jure, common property rights to specific fishing spots; yet they still compete with commercial fishers for de facto property rights to other fishing areas. Their regime is somewhat stable because it has been active in fishery management for more than a decade.

The competition for Kerala municipal fisheries threatens the sustainability of the fisheries. Increases in fish catch in 1990 and 1991, followed by a significant decrease in 1992 shows that, according to Kurien (1993:11), Kerala fisheries appear to be "lurching towards a crisis." The only sustainable fishing

practice that resource users implement is the protection of specific fishing spots from motorized boats. Thus, the fishing effort in Kerala fisheries, resulting partly from ambiguous property rights and the lack of enforcement of fishery laws, is unsustainable.

In San Miguel Bay and Lingayen Gulf municipal fisheries, the state property regime pursues strategies to stop trawling and dynamite fishing in municipal waters through state and local policy processes and the court system. Trawlers and dynamite fishers effectively avoid these dispute-settling processes. When government officials apprehend them, state and local policy processes and the court system fail to deter their practices. Trawlers, large-scale dynamite fishers, and municipal fishers still compete for de facto property rights to municipal fisheries. Consequently, the state property regime is somewhat efficient because they retain formal state property rights, but they are unable or unwilling to enforce state property rights which result in de facto, quasi property rights for trawlers and dynamite fishers. The state property regime is stable because it remains a major actor in fishery management. Trawlers and dynamite fishers are somewhat efficient private property regimes because they retain de facto, quasi-private property rights, but exert a considerable amount of effort to avoid enforcement authorities. Their regimes are somewhat stable because they continue to use these fishing gears even though tougher enforcement of fishery laws by government officials could eliminate their de facto property rights to municipal fisheries.

In a survey of municipal and *barangay* officials from San Miguel Bay, nearly ninety percent indicate a decline in the productivity of the fishery. Fish stock assessments from Lingayen Gulf indicate that biological overfishing is

occurring (Calud et al., 1989:17; and Ochavillo et al., 1989:42; and Pomeroy et al., 1993:9). Although trawlers primarily catch shrimp, croakers, anchovies, sardines, and mullets, their method also catches other fish and marine life that may or may not have a market value for the trawl fishers (Cruz, 1986:119). They dump the marine species with no market value at sea (Smith, 1979:13). This method disrupts aquatic food chains. In addition, fishers using trawls and dynamite damage the marine environment, principally coral reefs (Cruz, 1986:127). Consequently, the fishing effort in the municipal fisheries of San Miguel Bay and Lingayen Gulf is unsustainable.

On Apo island, the MMC property regime successfully keeps most unauthorized users out of the marine reserve. The cost of enforcement is not too high because national, local, and Silliman University officials support the de jure, common property rights of the MMC (Walter, 1994:12-13). The MMC's use of its collective ethnopolitical knowledge to resolve conflicts over property rights has enabled the regime to manage the reserve for nearly a decade. Thus, it is an efficient and stable regime. Furthermore, the MMC uses the collective ethnoecological knowledge of the local fishers to manage the marine reserve. Fish assessment studies show increases in fish and coral in the reserve and an increase in the number of fish caught just outside the reserve (Alcala, 1988:196, White, 1988:21-22). Consequently, the Apo Island marine reserve is a sustainable fishery.

In sum, conflicts over property rights resolved in informal processes may produce settlements that lead to the sustainable use of the resource. The MMC at Apo Island uses traditional dispute-settling methods to resolve disputes. Furthermore, this process allows the ethnoecological knowledge of

municipal fishers to enter the process. Similarly, the KSMTF fishers use an ethnopolitical strategy to allow their ethnoecological knowledge to enter dispute-settling process. As a result, fishers protect fishing spots over sensitive ecological areas from the encroachment of motorized boats. The other conflicts that rely on government policy processes and the courts to resolve property right disputes are unable to produce settlements that lead to the sustainable use of resources.

### Summary

Resource users choose different strategies to establish property rights to common-pool resources. Conflicts occur when resource users compete for the same resources or compete to use the resources for different purposes. To resolve these conflicts, resource users employ a variety of dispute-settling processes. Selection of dispute-settling processes becomes an integral part of the strategies of resource users to secure property rights to resources. Case studies from Indonesia, India, and the Philippines illustrate how resource users establish property rights to resources.

The results of dispute-settling processes affect institutional arrangements and the supply and condition of the resources. The criteria I use to evaluate the effects these conflicts on property regimes are efficiency and stability. The criterion I use to evaluate the effects of conflicts on resources is sustainability. The case studies from Indonesia, India, and the Philippines show the applicability of these criteria.

Because these case studies are only snapshots drawn from the literature, the next two chapters examine more closely conflicts over property rights to resources in Sarangani Bay, Philippines. These chapters apply the theoretical concepts I describe in Chapters Three and Four to conflicts over property rights to coastal resource in Sarangani Bay, Philippines. Chapter Five describes the institutional arrangements for the bay's coastal resources. It describes how the resource users from the bay establish property rights to resources. It illustrates why property rights to tuna fisheries, municipal fisheries, coral reefs, and mangroves are ambiguous. Chapter Six examines the conflicts over property rights and the dispute-settling processes that the resource users use to resolve these conflicts. It also examines the effects of these conflicts on property rights and the resources.

Table 4.1. Strategies of State, Private, and Common Property Regimes

Property Regime	Resource	Property Right	Strategy
<b><u>State</u></b>			
Indonesian Gov't Officials	Tuna Fisheries	State	Establish and enforce Exclusive Economic Zone boundaries.
Indian Gov't Officials	Nearshore Fisheries	State	Create incentives to exploit fishery resources through infrastructure projects and subsidies for entrepreneurs.
Philippine Gov't Officials	Municipal Fisheries	State	Create disincentives to exploit fisheries with destructive gears by enforcing laws and regulations.
<b><u>Private</u></b>			
Japanese Tuna Fishers	Tuna Fisheries	Quasi-private	Negotiate agreements with Indonesian authorities to maintain property rights.
Trawlers	Municipal Fisheries	Quasi-private	Invest in capital intensive fishing gear to fish in shallow municipal waters.
Dynamite Fishers	Municipal Fisheries	Quasi-private	Place fish aggregation devices, induce acceptance in the community, and avoid authorities.
<b><u>Common</u></b>			
KSMF Fishers, Kerala, India	Nearshore Fisheries	Common	Establish fishing zones based on ethnoecological knowledge where only fishers using non-motorized boats may fish. Establish a close season for trawls during the spawning season.
Marine Mgm't Council, Apo Is.	Coral Reef Fisheries	Common	Establish and protect a marine reserve based on their ethnoecological and ethnopolitical knowledge.

Table 4.2. Choice of Dispute Settling Processes

Resource	Disputants	Dispute Settling Process	Predominant Property Right
Indonesian Tuna Fisheries	Indonesian Officials, Japanese Tuna Fishers	Direct Negotiation	De jure, state property rights for Indonesia. De jure, quasi-private property rights for Japanese Tuna Fishers
Kerala Municipal Fisheries	Trawlers, Purse-seiner, and KSMTF Fishers	State Policy Process and the Court System	De facto, common property rights for KSMTF fishers to municipal fisheries and de jure, common property rights for KSMTF fishers with non-motorized boats to specific fishing spots.
San Miguel Bay Municipal Fisheries	Trawlers and Municipal Fishers	Local Policy Processes	De facto, quasi-private property rights for trawlers
Lingayen Gulf Municipal Fisheries	Large-scale Dynamite Fishers and Government Officials	State and Local Policy Processes and the Court System	De facto, quasi-private property rights for large-scale dynamite fishers
Apo Island's Coral Reef	Marine Management Council, Municipal Fishers, and Commercial Fishers	Traditional Process and Local Policy Process	De jure, common property rights for the Marine Management Council

Table 4.3. Evaluation of the Effects of Conflicts over Property Rights on Property Regimes and Coastal Resources

<u>Property Regime</u>	<u>Efficient</u>	<u>Stable</u>	<u>Sustainable</u>
<u>Indonesian Tuna Fisheries</u>			unclear
Indonesian Government Officials	efficient	stable	
Japanese Tuna Fishers	efficient	stable	
<u>Kerala Municipal Fisheries</u>			unsustainable
Kerala Government Officials	somewhat	stable	
Commercial Fishers	somewhat	somewhat	
KSMTF Fishers	somewhat	somewhat	
<u>San Miguel Bay Municipal Fisheries</u>			unsustainable
Philippine Government Officials	somewhat	stable	
Trawlers	somewhat	somewhat	
<u>Lingayen Gulf Municipal Fisheries</u>			unsustainable
Philippine Government Officials	somewhat	stable	
Large-scale Dynamite Fishers	somewhat	somewhat	
<u>Apo Island Coral Reef</u>			sustainable
Marine Management Council	efficient	stable	

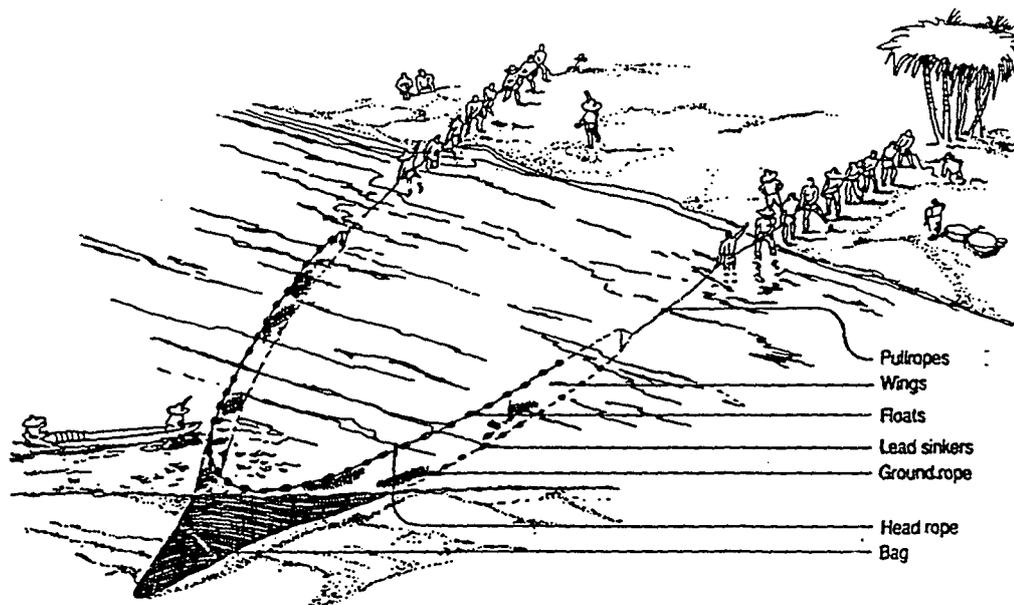


Figure 4.1. Beach Seine  
(Source: Smith et al., 1980:32)

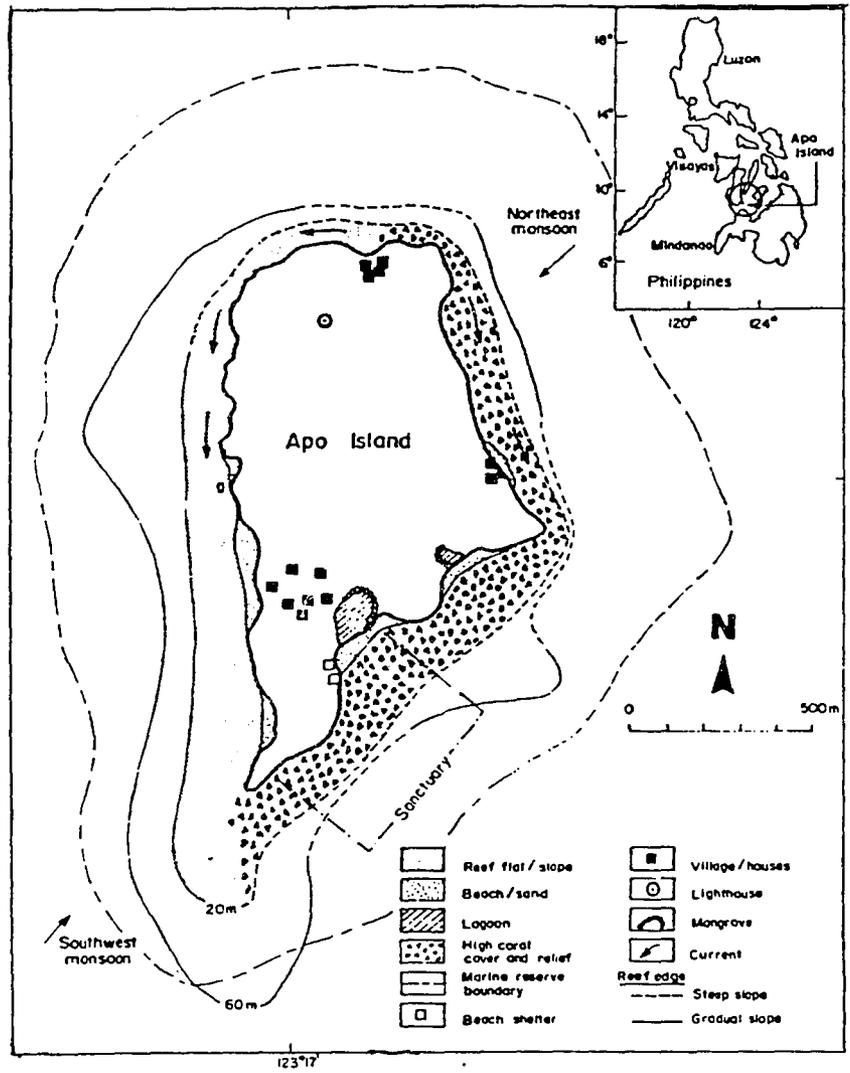


Figure 4.2. Apo Island Marine Reserve  
 (Source: White, 1988:20)

## CHAPTER FIVE

## Property Rights to the Coastal Resources of Sarangani Bay

The first light of dawn appears over the mountains in the east. The fishers aboard a twenty-ton catcher boat, equipped with a manpowered ring net, awaken and move into their respective positions. The roar and smell of the generator started by the fishers abruptly breaks the fresh morning air. A peaceful night, where only the splashing of dolphins and the laughs of some fishers playing cards were heard, quickly turns into an orderly, yet frantic fishing operation. Off the bow of the catcher boat sits a carrier boat waiting for the morning's catch. A short distance away, fishers aboard three pumpboats, not part of the fishing operation, watch the proceedings.

Several hours before, the captain had tied his commercial vessel to a *payao* located in Sarangani Bay about five kilometers off the west coast of General Santos City. The previous evening, fishers aboard a light boat tied their boat to the same *payao*. After spending the whole night waiting for the fish to congregate in the shadows created by the lights penetrating through the *payao*, the fishers ready themselves to lower the net.

At the captain's signal, the fishers aboard the catcher and light boats detach their boats from the *payao*. The captain orders his crew to lower the net into the water. A diver enters the water and sets a coconut husk on fire to indicate the end of the net. The catcher boat circles the light boat while setting the net. Within minutes, the fishers close the nets and haul in the fish

they waited for all night. The divers, in the middle of the net, inspect the catch. They signal the captain to let him know that the net is ready to hoist. Once on board the catcher boat, the fishers quickly transfer the catch, which consists mostly of moonfish, to large ice boxes in the hull of the carrier boat.

Some of the fishers aboard the commercial boat take small nets full of fish to the three pumpboats waiting nearby. The commercial fishers call these fishers on the pumpboats "askers" because they ask the commercial fishers to share part of their catch. The askers are often municipal tuna fishers picking up food to help sustain them during their two week fishing trips.

Municipal commercial fishers conduct this type of fishing operation in Sarangani Bay almost every night. At the beginning of this study, eleven municipal commercial fishing companies fished in Sarangani Bay. Two years later, fifteen companies fished in Sarangani Bay with this fishing technique. Letter of Instruction (LOI) 1328 prohibits the use of ring nets, which these fishers use, in waters within seven kilometers of shore. Nevertheless, over the past decade, national and local officials have issued few fines to these companies.

The presence of municipal commercial fishers in the bay indicates that these fishers practice some sort of property right to fish in the bay. Other resource users, government officials and municipal non-commercial fishers, may recognize or practice different property rights to fish in the bay. In Chapter Three, I quoted Albert Church (1982:131) who writes that when numerous groups of resource users compete for property rights, property rights often become ambiguous. Thus, in this chapter I describe the resource users of Sarangani Bay's coastal resources and types of institutional arrangements --

property regimes, property rights, and rules -- that exist to control the practices of resource users. Furthermore, I describe the strategies that resource users pursue to establish property rights to resources. The central question I answer at the end of the chapter is: Why are property rights to the coastal resources of Sarangani ambiguous?

### Resource Users

In Chapter Three, I defined resource users as individuals who extract, produce, manage, or control the use of Sarangani Bay's coastal resources. They include national government officials, local government officials, fishing magnates, tuna exporters, municipal commercial fishers, fish pond owners, prawn farm operators, salt farm owners, beach-resort owners, municipal tuna fishers, and municipal fishers. Other resource users exist, such as tourists, farmers, fish retailers, and shipping companies, but this analysis focuses only on the resource users mentioned above. Table 5.1 lists Sarangani Bay's resources users, resources, and property regimes.

#### **Government Officials**

Government officials are resource users because they provide incentives and disincentives to access coastal resources. Although they do not extract resources, they do regulate and manage access to resources. The Republic of the Philippines contains two levels of government -- national and local. The national government includes the executive branch (the Presidency and national

government agencies), the legislative branch (the *Batasang Pambansa*, a bicameral legislature with the House of Representatives and the Senate), and the judicial branch (the Supreme Court, Court of Appeals, Regional Trial Courts, and Municipal Trial Courts). Local Government Units (LGUs) include provinces, cities, municipalities, and *barangays*. Municipalities make up provinces. Cities, such as General Santos, are separate entities from provinces. Cities and municipalities are divided into *barangays*, the basic political units. Although both national and local officials are state property regimes, they each pursue different strategies to establish property rights to resources.

National officials develop and implement laws, regulations, and policies for coastal resources. In Sarangani Bay, officials from the Department of Agriculture (DA) administer fisheries programs. They provide extension services to municipal fishers to construct artificial reefs and fish corrals. They also provide technical assistance to municipal fishers for fish drying and processing. In addition, they regulate commercial fishers by issuing commercial licenses and inspecting fishing gear. DA officials supervise several development projects in the Sarangani Bay area including the construction of a new fish port, the extension of the Makar Wharf, the construction of a new international airport, the pavement of coastal roads, the construction of an agro-processing center, and the development of a coastal resource management program. Bureau of Fisheries and Aquatic Resources officials, also under the DA, conduct research on tuna fisheries. They formulate fisheries policies, plans, and regulations. Philippine Fisheries Development Authority officials collect statistics on the fishing industry in General Santos.

Officials from the Department of Environment and Natural Resources (DENR) manage foreshore areas and mangroves. DENR officials from the community and provincial natural resource offices administer community forestry leases to mangroves and leases to foreshore areas. They are responsible for protecting mangroves and coral reefs from destructive land-based practices. To protect these critical resources, DENR officials administer the Environmental Impact Assessment system. DENR officials share in the management of coral reefs with DA and local officials.

The Philippine Coast Guard and Navy enforce natural resources laws and regulations. Officials from the Philippine Fisheries Development Authority (PFDA) and the Philippine Ports Authority (PPA) collect statistics on the fishing industry and administer fish ports respectively. National officials collect rental fees, licensing fees, taxes, and fines from resource users. They levy penalties and fines against resource users who violate state statutes or rules.

National officials accept assistance from other countries to enhance the economic growth of the Sarangani Bay area. Government officials from other countries design donor assistance programs to encourage private sector use of coastal resources. The Japanese government, through its Overseas Economic Cooperation Fund (OECF), administers a low interest loan for the construction of the fish port. Officials from the United States Agency for International Development (USAID) provide more than \$150 million for the expansion of the Makar Wharf, the construction of the new international airport, the pavement of coastal roads, the construction of the agri-processing center, and an area growth plan. The latter facilitates economic growth through rural enterprise development, land use planning, infrastructure planning,

and environmental projects. The environmental projects include the development of a coastal resource management program (Louis Berger International, Inc., 1992:1-1 to 1-3). Through these infrastructure and economic development projects, national officials provide incentives to private property regimes to use coastal and other resources in the area.

Local officials include elected officials from Sarangani Province and General Santos City -- governor, vice-governor, mayors, vice-mayors, councilors, and *barangay* officials. They also include employees of local government units. The Local Government Code of 1991 authorizes local officials to establish ordinances and policies for the management of municipal fisheries (Republic Act 7160, 1991:11, 12, 71, 72). Philippine National Police (PNP) officials assist local officials in enforcing laws, ordinances, and rules. Local officials assist national officials in regulating the use of coral reefs and mangroves.

Local officials are responsible for managing municipal fisheries. Enforcement of fisheries laws is their primary task. They may draft their own ordinances and policies or enforce national statutes. In addition, local officials implement programs, often in conjunction with the DA, to assist municipal fishers. Sarangani Province, General Santos City, and some of the municipalities of Sarangani Province have a fisheries officer in their agriculture departments. General Santos City also has a cooperative development specialist who administers programs to assist fishing associations.

### Private Businesses

Resource users who own private businesses include fishing magnates, tuna exporters, municipal commercial fishers, fish pond owners, prawn farm owners, salt farm owners, and beach-resort owners. Fishing magnates are fishing entrepreneurs who own 41 fishing companies in General Santos City. They own tuna fishing fleets that include purse-seine vessels, scout boats, and carrier boats. Some of them own *payaos*, private wharves, transport vehicles, and cold storage facilities. Some own fish canneries and commercial fishing vessels for other fisheries; others own pumpboats or finance the fishing operations of fishers aboard pumpboats. They employ more than 4,000 fishers and laborers for their fishing operations. They finance their own operations or receive capital from Japanese investors (Business Resource Center, 1985:55-56 and Business Resource Center, 1994:24). Their fishers fish in the open seas for three to seven months. Carrier boats transport their catch from these operations periodically. Although fishing magnates perceive declines in large pelagic fisheries (tuna and mackerel) in Philippines waters, they believe there are abundant stocks in the Western Pacific. Given the proximity of General Santos City to tuna fishing grounds in the Western Pacific, these fishing magnates believe that they can provide a steady supply of tuna for their companies and fish canneries.

Tuna exporters are fishing entrepreneurs who own pumpboats and finance the fishing trips of municipal tuna fishers. They manage eleven tuna export companies in General Santos City (Philippine Fisheries Development Authority, 1992:1). They buy and trade fresh tuna and marlin in General Santos City. They export fresh tuna and marlin to Japan to sell in the lucrative

Japanese fresh fish auction markets. The fishing trips of their fishers last 10 to 15 days in Philippine, Indonesian, and Malaysian waters -- closer to General Santos City than larger tuna fishing operations. Recent declines in adult yellowfin tuna in Philippine waters over the past few years have caused them to finance fewer fishing trips.

**Municipal commercial fishers** own commercial fishing boats that weigh around twenty gross tons. They equip these boats with ring nets. They also own carrier boats, light boats, and *payaos* (see the example at the beginning of the chapter). They catch mostly small pelagic and demersal fish. They sell their catch in the General Santos City domestic market. Eleven municipal commercial fishing companies conduct their fishing operations from General Santos City. They fish in the municipal waters of Sarangani Bay and Sarangani Province. Some of them finance the fishing operations of municipal fishers. They hire as many as 40 to 60 fishers for each fishing trip. They fish almost every night except during the full moon.

Nearly fifty fish pond owners operate approximately 305 hectares of fish ponds. They raise *bangus* (milkfish) and tilapia in their ponds. In 1993, they produced around 260 metric tons of fish. Eighteen prawn farm owners manage 485 hectares of prawn farms in coastal areas around Sarangani Bay and Sarangani Province. They produced approximately 2,400 metric tons of prawns in 1993 (Business Resource Center, 1994:32-33). The number of ponds in operation changes periodically because of fluctuating prices and harvest problems. The owner of the only salt farm in the bay pumps seawater into open ponds. Once the water evaporates, industrial grade salt remains in the ponds.

Beach resort owners develop foreshore areas into recreational areas. A few years ago, only a dozen or so beach-resorts occupied coastal areas. After a USAID funded project paved the coastal road around the bay, dozens more landowners built beach-resorts. Small resorts have picnic shelters made of bamboo and nipa along a beach cleared of mangroves and rocks. Larger resorts have swimming pools, cottages for overnight guests, and other recreational facilities.

### **Municipal Fishers**

Municipal tuna fishers own or operate pumpboats. Most of them fish from pumpboats owned by tuna exporters and fishing magnates. Nearly 20,000 live around Sarangani Bay (Business Resource Center, 1994:26). Financiers often provide the capital for their fishing trips (Business Resource Center, 1985:55-56). In other cases, municipal tuna fishers form cooperatives. They collectively own pumpboats and finance their operations. Municipal tuna fishers fish around *payaos* with hook and line gear to catch fresh tuna and marlin. The decline in tuna stocks in municipal and nearshore waters forces them to fish in the open sea.

In General Santos City, municipal tuna fishers manage ten cooperatives and associations (Philippine Fisheries Development Authority, 1992:1). Five associations make up the Calumpang Fishermen's Development Cooperative, Inc., (CFDC), the largest tuna fishers' cooperative with over 500 members. Other associations range from 20 to 50 members. Members pay monthly dues to buy pumpboats or finance their fishing trips. Other associations lack sufficient capital. They must rely on financing from, or operate the boats of,

the fishing magnates and tuna exporters. General Santos City officials provide assistance for some of these cooperatives.

**Municipal** fishers primarily fish in municipal waters. More than 12,000 municipal fishers live around Sarangani Bay. Most of them fish inside the bay. They use small motorized or nonmotorized boats less than three gross tons. For the most part, they use less active fishing gear such as hook and line, multiple handline, beach seines, fish corrals, spears, fish traps, and drift gill nets. Some use destructive fishing techniques such as dynamite, poisons, and small-mesh nets.<sup>1</sup> They catch mostly small pelagic and demersal fish. They sell their catch in domestic markets around the bay.

Some municipal fishers finance their own fishing trips; others rely on financiers to help them cover operating expenses. Municipal fishers rely on good relations with middlemen to ensure financing for their fishing trips. Most municipal fishers do not have time to develop marketing skills because they spend so much time fishing. They rely on their wives or their financiers to market their catch (Business Resource Center, 1992b:6, 9).

The level of organization among the municipal fishers from General Santos and Sarangani Province varies widely. Some fishers organize fisher associations. Others organize themselves informally. These groups of

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<sup>1</sup>Although fishers who use destructive fishing methods - dynamite, poisons, fine mesh nets, and piracy - are also municipal fishers pursuing strategies to gain access to resources, I do not describe them in this chapter. Because their practices are illegal, it is difficult for them to discuss their practices with an outsider. Thus, I was unable to interview a significant number of dynamite fishers to substantiate the types of property rights they pursue. Based on the information I did collect, few dynamite fishers operate on a large-scale like those in Lingayen Gulf. It appears that small-scale dynamite fishers account for most of the incidents of dynamite fishing in Sarangani Bay. Some municipal fishers use poisons, but commercial fishers do not. Some commercial and municipal fishers use fine mesh nets. Finally, according to the fishers I interviewed, pirates come from villages outside of Sarangani Province and General Santos City.

municipal fishers consist of fishers from the same community. Traditional leaders, community leaders, and non-government organizations (NGOs) play important roles in organizing municipal fishers.

Several different Muslim communities live around the bay. The Badjaos are Muslim fishers, also known as sea gypsies, sea nomads, and *samul-laud* (people of the ocean), who live in coastal areas. They depend on the sea for their livelihood. Other Muslim groups in coastal areas include the Samals and Maguindanaos. Since World War II, Samals, Maguindanaos, and other Muslim fishers have migrated to Sarangani Bay with their families to avoid armed conflicts on islands in the southwest Philippines. Muslim fishers from Tinoto, for example, came to the southwest coast of Sarangani Bay 40 years ago. Fishers from these villages fish within the bay with passive gear such as hooks and lines and drift gill nets.

In other coastal fishing villages, community leaders play an important role in organizing municipal fishers. In *Barangay* Batulaki, in the eastern part of Sarangani Province, the *Barangay* Captain assists fishers in managing a marine reserve. The fishers manage the reserve. The *Barangay* Captain enforces the rules established by the fishers. On the western side of Sarangani Province, fishers from Kiamba manage their own fishing multi-purpose cooperative. With some assistance from local officials and a loan for the province, these fishers jointly own a fishing boat and fishing gear. They also manage a cooperative store and billiard hall near the pier.

NGOs also play an important role in organizing municipal fishers. These NGOs build on the informal common property regimes already in existence in fishing villages. Table 5.2 summarizes their programs.

One NGO, the Mahintana Foundation Inc. (MFI), assists municipal fishers in managing ten fisher associations around the bay. These ten associations make up a federation. NGO officials selected these ten fishing villages for their program based on the high level of community organization. MFI provides grants for municipal fishers to buy fishing gear including a *sampana* -- a commercial vessel equipped with a ring net. They also provide funds for artificial reef construction, *payao* building, and mangrove planting. In addition, some the municipal fishers in the associations become fish wardens in the *bantay dagat* program. In 1994, a new NGO, the Sarangani Bay Marine and Inland Resource Conservation Foundation, Inc. (SBMIRCFI), took over the management this project.

The Structural Alternatives Legal Assistance for Grassroots (SALAG), a national NGO established by graduates from the Ateneo de Manila Law School, teaches fishers how to use the law to protect their property rights to municipal fisheries. SALAG attorneys conduct trainings and workshops for fishing associations. They support fishery reforms such as changes in PD 704 and land tenure arrangements for fishers along the coast. In 1988, SALAG helped to organize the Maguindanao, Samal, and Badjao Fishermen Association. These fishers fish mostly with hooks and lines. Later, the members converted the association into a cooperative. Internal organizational problems caused the cooperative to split into two in 1991.

The South Cotabato Foundation, Inc., (SCFI) organized several fishing villages around the bay. It provided loans for fishers to buy fishing gear, especially for night fishing, and material for the fishers to construct artificial reefs and *payaos*. Because the fishers paid back less than 50 percent of the

loans, the project ended after two years. A drought in the late 1980's was a major factor in limiting the ability of fishers to repay the loans because they spent the loan money on the immediate livelihood needs of their families instead of fishing gear.

The Fisherfolk Research and Development Center (FRDC) assists municipal fishers on the north coast of the bay. They assist these fishers in filing court cases against landowners who illegally cut mangroves to make room for prawn and salt farms. These cases have been in the municipal court since 1987. FRDC supports a total ban on the commercial vessels fishing inside the bay.

The Business Resource Center (BRC) collects the most up-to-date statistics on municipal fishers. It provides marketing, small business, and health care assistance to fishing communities around the bay.

In sum, there are eleven groups of resource users in Sarangani Bay. These groups form property regimes that establish or attempt to establish property rights to resources. Although a resource user may be a member of more than one property regime, most resource users spend their time and resources furthering the interests of one regime. In the next section I describe the institutional arrangements that these regimes develop to manage resources.

### Institutional Arrangements for Sarangani Bay's Coastal Resources

As discussed in Chapter Three, institutional arrangements define resource users' relationships to resources and the relationships between

resource users (Bromley and Cernea, 1989:5; Gibbs and Bromley, 1989:22; and Sorensen et al., 1984:33). They determine the behaviors of resource users through incentives and disincentives (Thomson, 1992:v). Institutional arrangements consist of property regimes, property rights, and rules. In this section, I describe the property rights and rules of the different property regimes from Sarangani Bay. I also discuss the strategies that these property regimes pursue to establish and maintain property rights to coastal resources.

### **State Property Regimes**

National and local officials have de jure, state property rights to tuna fisheries, municipal fisheries, coral reefs, and mangroves. They develop rules to protect their property rights. Furthermore, they develop strategies to protect their property rights and increase their benefits from the resources.

#### *Property Rights*

When Ferdinand Magellan "discovered" the Philippine islands for Spain in the 16th century, the Crown of Spain usurped all lands under the Regalian Doctrine (Lynch and Talbott, 1988:686). In 1866, the Spanish colonial government declared state ownership of marine resources in the Spanish Law of Waters to prevent industries from contaminating waters and for public health reasons (Feliciano, 1991:5). Three-quarters of a century later, after the Philippines won independence from both Spain and the United States, the Philippine State adopted the Regalian Doctrine into the 1935 Constitution. The Constitution vested ownership of natural resources in the state (Cristobal, 1990:49 and Feliciano, 1991:10). Similar provisions remain in the 1987

Constitution (La Viña, 1991:20-21). According to the Constitution, the state may grant access to these resources through leases and licenses. Only citizens of the Philippines or corporations and associations with at least 60 percent of the capital controlled by Filipinos may lease the right to fish in Philippine waters, to manage mangrove forests, or to manage the foreshore area (Kalagayan, 1990:46).

In 1975, then President Ferdinand Marcos, declared Presidential Degree (PD) 704. Known as the Fishery Code, which modified Republic Act 4003 of 1932 adopted during the American colonial government, PD 704 divides fishers into two groups, commercial and municipal (Balagot, 1992:329 and Kalagayan, 1990:47). Commercial fishers are those with vessels weighing more than three gross tons which fish in water more than seven fathoms deep. Municipal fishers are those with boats less than three gross tons (La Viña, 1991:92, 94).

PD 704 establishes three categories of fisheries -- municipal, national, and reserves (Kalagayan, 1990:48; La Viña, 1991:91-99; and Rivera and Cao, 1993:10). Municipal waters extend from the shore seaward to seven kilometers and national waters from this point to the Exclusive Economic Zone (EEZ) boundary. PD 1599 established the Philippine EEZ based on the United Nation's Law of the Sea Conference. This Conference permits countries to claim national waters from their coastline seaward to 200 miles or the midpoint in waters separating two countries. With the adoption of PD 1599, the marine waters of the Philippines expanded to 2,200,000 square Kilometers (Feliciano, 1991:27). Marine reserves are areas declared by the state where no fishing or only certain kinds of fishing may occur.

PD 704 calls for the state to accelerate and promote the development of the fishing industry; conserve and protect fishery resources; and promote private investment in the fishing industry to exploit fishery resources. In Sarangani Bay, the state promotes private investment, primarily in the tuna fishing industry, to exploit fisheries in national waters. The fishing magnates and municipal commercial fishers pay fees to national officials for their commercial licenses. There is no limit to the number of commercial licenses that national officials from Sarangani Bay may issue.

The Forestry Code of the Philippines (PD 705) regulates the use of public lands classified as forests, including mangrove forests. National officials issue community forestry leases to communities committed to protecting and rehabilitating mangrove areas.

DENR officials also regulate activities in the foreshore area. The foreshore area is the area that is alternately covered and left dry by the ordinary flow of the tides. The state may lease these areas to individuals or companies for a fee. The owner of the land adjacent to the foreshore area has first priority to obtain these leases. DENR officials or other state officials must approve any construction in the foreshore area by a lessee.

The Philippine State recognizes the preferential rights of municipal fishers to fishery resources in the 1987 Constitution (Feliciano, 1991:13). The Local Government Code of 1991 (the Code) devolves management responsibilities for municipal fisheries to Local Government Units (LGUs). The Secretary of the Department of Agriculture must approve all LGU ordinances pertaining to fisheries (Feliciano, 1991:29 and Kalagayan, 1990:49). Local officials may choose to require fishers to obtain licenses to fish in municipal waters. To

date, some local officials from Sarangani Bay require only milkfish fry fishers to obtain concessions through a competitive bidding process.

On the basis of PD 704, most of Sarangani Bay is municipal waters. The Code permits LGUs to extend municipal waters from seven kilometers from the coastline out to fifteen kilometers (Tabunda and Galang, 1992:59). If all of the LGUs around Sarangani Bay extended municipal waters out to fifteen kilometers, the entire bay would be municipal waters under their jurisdiction. Local officials from Sarangani Bay indicate their intent to extend municipal waters.

### *Rules*

To protect state property rights to resources, national and local officials develop regulations and rules. PD 704 prohibits fishing with the use of explosives, poisons, and electricity to protect municipal fisheries and coral reefs. PD 704, supplemented by Fisheries Administrative Order (FAO) 115, prohibits the use of nets with mesh less than three centimeters between two knots when stretched (Kalagayan, 1990:50; La Viña, 1991:105; and Rivera and Cao, 1993:10).<sup>2</sup> PD 704 also prohibits the discharge of pollutants into coastal waters (La Viña, 1991:94 and Rivera and Cao, 1993:10). Fishery Administration Orders 163 and 129 prohibit *muro-ami* and the catching of milkfish larger than 60 centimeters respectively (Rivera and Cao, 1993:11). PD 1058 increases the penalty for destructive fishing activities such as dynamite, poisons, and electricity (Balagot, 1992:334).

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<sup>2</sup>Please note that Kalagayan (1990:50) cites FAO 115 and Rivera and Cao (1993:10) cite FAO 155.

PD 704 prohibits commercial boats from fishing in water less than seven fathoms (La Viña, 1991:98). In addition, Letter of Instruction (LOI) 1328 prohibits commercial trawling and purse seining in waters less than seven fathoms deep and seven kilometers from shore (Kalagayan, 1990:49 and Rivera and Cao, 1993:10). DA officials consider the ring nets owned by the municipal commercial fishers to be a type of purse-seine net; therefore LOI 1328 applies to them.

To protect mangrove forests, PD 705 Section 43 of the Philippine Forestry Code prohibits the clearing of mangrove swamps that protect the shoreline and coastal communities (Kalagayan, 1990:51 and La Viña, 1991:142). The Forest Code permits the construction of prawn or fish ponds only in mangrove swamps more than 40 meters wide and 100 meters long (Kalagayan, 1990:53).

PD 1219 entitled, "Providing for the Exploration, Exploitation, Utilization and Conservation of Coral Resources," recognizes coral reefs as natural breeding grounds for marine species (Balagot, 1992:334; La Viña, 1991:109-112; and Rivera and Cao, 1993:11). It prohibits the gathering and exporting of precious and semiprecious coral and the use of coral as building materials (Kalagayan, 1990:50).

National officials further protect coral reefs and mangrove forests under the Philippine Environmental Code. The Local Government Code of 1991 requires DENR officials to share the responsibility of protecting the environment with LGUs. LGUs may implement legislation to establish penalties for fishers using destructive fishing methods that damage coral reefs. DENR officials supervise and review LGU environmental management programs to ensure that their

provisions are consistent with DENR policies (Feliciano, 1991:19-20; Republic Act 7160, 1991:181-188, 199-207, 219-232; and Tabunda and Galang, 1992:19, 20, 38, 39).

General Santos City officials manage the fish landing at the Poblacion near the public market. Municipal commercial fishers and municipal fishers land their catch at this landing. This fish landing has permanent facilities, water supply, and a cemented area for fish trading and ice packaging. City officials also manage the tuna and marlin fish landing at Lion's beach, a half kilometer west of the Poblacion fish landing. Tuna exporters and municipal tuna fishers land their catch here. City officials do not permit permanent structures at this fish landing. Tuna fishers will move their operations to the new fish port in 1996, which national officials will manage.

#### *Strategies of National Officials*

National officials create incentives and disincentives for resource users to exploit the coastal resources of Sarangani Bay. The main strategy of national officials is to greatly increase the volume of fish landed in General Santos City by constructing a new fish port. National officials expect commercial tuna fishers fishing in the Western Pacific Ocean to land their catch in General Santos instead of Thailand, Korea, Taiwan, and other foreign ports because of General Santos City's proximity to fishing grounds. In addition, national officials believe that the infrastructure and economic development projects -- paved coastal roads, Makar Wharf expansion, a new international airport, an area growth plan, and improved telecommunication facilities -- will create more incentives for companies to invest in the area and use the area's natural resources.

National officials also believe that the fish port will increase revenues for the state. Thus far, national and local officials' attempts to collect taxes and revenues from fishing companies in General Santos have failed. The fish port will permit national officials to charge local and foreign fishing companies fees for the use of the fish port's facilities. As a result, national officials will receive revenues from fisheries resources inside and outside of Philippine waters.

National officials also create disincentives for tuna fishers who catch juvenile tuna. DA officials propose a new Fishery Administrative Order (FAO) that will increase the minimum mesh size for purse-seine nets from three centimeters to four inches.

Because of numerous complaints from commercial and municipal tuna fishers about piracy, national officials provide fishers from Sarangani Bay with para-military personnel called Citizen Armed Forces Geographical Units (CAFGU). These guards accompany commercial vessels and some of the pumpboats owned by the tuna exporters on fishing trips.

National officials implement the *bantay dagat* (watch the sea) program to prevent fishers from using illegal fishing methods that destroy fish habitats (e.g., coral reefs). They hope to expand their enforcement capabilities by training and deputizing local *barangay* officials and municipal fishers as fish wardens. These fish wardens have the authority to arrest illegal fishers. The DA officials' strategy is to get municipal fishers to help national and local officials protect coastal resources.

National officials create incentives for communities to rehabilitate mangrove areas. To make up for the loss of mangroves from fish pond, prawn farm, salt farm, beach-resorts, and infrastructure construction in

coastal areas, DENR officials attempt to plant and rehabilitate mangrove forests by awarding common property regimes 25 year community forest leases. Unfortunately, the survival rate of the mangroves planted by municipal fishers around the bay has been low. DENR officials have been unable to match the correct mangrove species with specific ecological factors such as wave pressures, soil nutrients, and fresh water flow through these areas.

### *Strategies of Local Officials*

Local officials from General Santos City and Sarangani Province establish incentives for the use of municipal fisheries. They manage milkfish fry fisheries, for example, by establishing concession zones. Individuals, corporations, and cooperatives bid for the right to fish in these zones. Local officials earn revenues by charging a fee for these concessions.

Local officials create disincentives for fishers using illegal fishing methods. They pass ordinances banning the use of certain fishing methods in municipal waters. Most of these ordinances merely duplicate national laws already in place. Local officials acknowledge that stopping illegal fishers, especially fishers using dynamite, poisons, and small mesh nets, is very difficult. Local officials say that they lack patrol boats fast enough to catch these fishers. Fishers using poisons are difficult to apprehend because by the time local officials detect the use of poisons in a certain area, the fishers have already left.

Local officials also have difficulty apprehending commercial fishers using ring nets and superlights in municipal waters. They say that apprehending these fishers is dangerous because these fishers sometimes carry weapons

with them. In a few cases, local officials have arrested, with the assistance of PNP officials, and fined the fishers aboard the commercial vessels.

Local officials from General Santos City and Sarangani Province pursue different strategies towards regulating commercial fishers in Sarangani Bay. Officials from both jurisdictions want to keep commercial fishers from other parts of the Philippines out of the bay. Nevertheless, General Santos City officials want to permit the municipal commercial fishers from General Santos to continue to fish in the bay. City officials and municipal commercial fishers receive most of the income from the fish caught inside Sarangani Bay. Provincial officials want to keep all vessels over three gross tons out of the bay. Because more than 70 percent of the bay is within the Province's jurisdiction, provincial officials want the municipal fishers from Sarangani Province to catch the fish. To do so, they plan to pass a provincial ordinance banning all commercial vessels from the bay. To date, this ordinance is in its third reading. Nearly a year has passed since a Provincial Board Member introduced the ordinance to the Provincial Board. Although LOI 1328 already bans these vessels from municipal waters, the provincial ordinance specifically prohibits the use of ring nets and all other nets by fishers aboard boats more than three gross tons.

### **Private Property Regimes**

Private property regimes establish de facto, quasi-private property rights to tuna fisheries, municipal fisheries, coral reefs and mangroves. They, too, develop rules to protect their property rights. Furthermore, they develop strategies to establish or maintain their property rights.

### *Property Rights*

Fishing magnates establish de facto, quasi-private property rights to tuna fisheries by placing *payaos* in the sea. They attach transmitters to the *payaos* to enable them to locate these *payaos* at a later date. In some cases, they station patrol boats near *payaos* to ensure that no other fishers fish near them. They also obtain commercial licenses from national officials to fish in Philippine waters. Tuna exporters do not own *payaos* or pay fees to fish around *payaos*. In some cases, they have de facto, quasi-private property rights because they make agreements with fishing magnates to allow their fishers to fish around *payaos*. Municipal commercial fishers establish de facto, quasi-private property rights to municipal fisheries by placing *payaos* in Sarangani Bay. Once in place, a *payao* creates a quasi-private property right for the *payao* owner. They also obtain commercial fishing licenses from national officials.

Fish pond, prawn farm, salt farm, and beach-resort owners operate their businesses on private land. They lease the foreshore area from national officials. These arrangements give them de jure, quasi-private property rights. In some cases, they own private land titles to the foreshore area even though the foreshore area is state property.

### *Rules*

Fishing magnates establish arrangements with their fishers in which they split the net income 50-50 after subtracting fees and operating expenses from gross income. Included in the fees are percentage shares given to brokers (10

percent), *payao* owners (25 percent), service boat owners (40 percent) and labor (3 percent). The fishing magnates subtract these shares in succession from the gross income. For example, they first subtract the 10 percent broker share from the gross income total. From the remaining total, they subtract 25 percent for the *payao* fee. From this total, they subtract 40 percent for the service boat fee. From the remaining total, they subtract the labor fee. Finally, from the remaining total, they subtract operating expenses.<sup>3</sup> Considering that the fishing magnates are often the brokers and that they usually own the *payaos* and the service boats and pay the labor fees, they distribute most of these deductions within their own companies. In other words their companies may receive 85 to 90 percent of the gross income.

Tuna exporters finance fishing trips for about 10,000 *pesos* (\$400) to 18,000 *pesos* (\$720) for each fishing trip, depending on the distance and the time at sea. Financiers receive 10 to 15 percent of gross income. After the sale of the catch, tuna exporters subtract operating expenses from gross income. Tuna exporters receive all of the net income or split this income with the financier. They pay the fishers between 20 to 25 percent of gross income for only the fish they catch individually. They pay the operators 50 percent of the gross income for the fish they catch. Thus, if the tuna exporter owns the pumpboat and finances the fishing trip, his percentage share of the income is higher.

Municipal commercial fishers have similar sharing arrangements as the fishing magnates. From total gross sales, they subtract brokers' shares (10

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<sup>3</sup>This information comes from personal interviews and Therese Gladys Hingco(1993) "A Case Study on Tuna Commercial Fishing Operations," unpublished draft, Tambuyog Development Center, pp. 28-32.

percent), *payao* owners' shares (25 percent), carrier boat owners' shares (30 percent) and labor fees (3 percent) in succession. They divide the remaining net income 50-50 with the fishers. The fishers divide their shares based on their rank and experience (Business Resource Center, 1985:56-59 and IBON, 1981:5).

They also finance the fishing trips of municipal fishers in exchange for guarantees that these fishers will sell only their catch to them. They determine where to sell their fish depending on the prices offered each day. They may sell their fish in the local market or to fish retailers who will sell them in other markets in Mindanao, Manila, or possibly for export to other countries (Business Resource Center, 1985:51-55).

Some prawn farm, salt farm, and beach resort owners build fences and walls in the foreshore area to keep other resource users out of the foreshore area. Although these structures are not legal, they protect the de jure, quasi-private rights of these owners to the foreshore area. Security guards also keep unauthorized resource users from these areas.

### *Strategies of Private Property Regimes*

**Fishing magnates:** The main strategy of the fishing magnates is to protect their quasi-property rights to tuna fisheries. The fishing magnates use their association, the South Cotabato Purse Seiners Association (SOCOPA), to pursue their strategy. Thirty-seven of the fishing magnates who together own 90 purse-seine vessels belong to SOCOPA. SOCOPA members establish rules for their members. For example, they agree to place their *payaos* at least five nautical miles from each other. Each company may fish only around the

*payaos* they own. Violators of this agreement are subject to dismissal from the association.

The fishing magnates lobby against national officials' efforts to increase the minimum mesh size of purse-seine nets from three centimeters to four inches. They say that the new policy is coming at a time when the industry is still hurting from the drought in 1991 and 1992. According to them, their fishing companies collectively lost two million pesos/day (\$80,000) for eight months during the drought. They say that before the drought they landed 300 to 400 tons/day of fish, but during the drought, they landed only 100 tons/day. Furthermore, they say that the new policy will place them at a disadvantage versus other foreign fishing fleets. The minimum mesh size for tuna fishing fleets from Indonesia and South Pacific countries, for example, is only 3.5 inches. They believe that if they do not catch the smaller tuna, some other fishing vessel will catch them. In addition, they say the increase in minimum mesh size will be costly because a new purse-seine net cost two million pesos (\$80,000).

The fishing magnates discourage municipal tuna fishers from fishing around their *payaos*. They believe that municipal tuna fishers damage *payaos*. When the fishing magnates first designed steel *payaos*, they used flat pieces of metal. Later, they discovered that municipal tuna fishers used the flat surface of the *payaos* for cooking and resting. The fishing magnates believed that these practices deteriorated the *payaos*; therefore, they constructed cylinder-shaped *payaos* to discourage these practices (Business Resource Center, 1994:7). Furthermore, they believe that when municipal tuna fishers tie their

pumpboats to *payaos* during rough seas, the additional stress on the *payaos* causes the *payaos* to deteriorate more rapidly.

Fishing magnates conflict with Indonesian officials over property rights to Indonesian fisheries. Indonesian officials arrest Filipino fishers fishing in Indonesian waters and confiscate their boats. The fishing magnates, along with the tuna exporters, appeal to national and local officials to help them negotiate with Indonesian officials. They seek to place their *payaos* in Indonesian waters to establish quasi-private property rights.

Finally, the fishing magnates seek to protect their fishing operations from pirates. In response, national officials provide CAFGU personnel for their boats to discourage pirate attacks. Other strategies that the fishing magnates pursue to protect their rights to tuna fisheries include requesting national officials to pressure the Japanese government to stop the use of drift nets in the Western Pacific Ocean and lobbying government officials to limit commercial fishing in tuna spawning areas near the mouth of Sarangani Bay.

**Tuna Exporters:** The tuna exporters, like the fishing magnates, use their organization, the General Santos Traders and Tuna Exporters Organization, Inc. (GSTTEOI), to pursue their strategy to establish de facto, quasi-private property rights to tuna fisheries. Because of the high cost of constructing *payaos*, they seek to establish agreements with SOCOPA to give their fishers quasi-property rights to fish around the *payaos* owned by the fishing magnates. They also seek loans and other government support for their fishing operations. Eleven tuna export companies operate their businesses in General Santos City. Around 100 tuna producers, traders and exporters make up the GSTTEOI.

Because the fishing magnates place some of their *payaos* in Indonesian waters, the tuna exporter fishers must enter Indonesian waters to get to these *payaos*. In some cases, Indonesian officials arrest their fishers and confiscate their pumpboats. Often, they are not able to recover their pumpboats from Indonesian officials. Consequently, tuna exporters seek to have access rights to Indonesian waters. They request the support of local and national officials to help them to establish property rights to Indonesian fisheries.

They also request national officials to protect them from pirates. Because their pumpboats are small and their catch is high in value, they are vulnerable to pirates from other parts of the Southern Philippines. The CAFGU program provides armed guards for their pumpboats to protect them from pirates.

**Municipal Commercial Fishers:** Municipal commercial fishers work through their two fishing associations -- Sarangani Small Fishermen's Association, Inc. (SASFA) and the Umbrella Fish Landing Association (UFLA) -- to protect their de facto, quasi-private property rights to the *payaos* they place in the bay. Although only eleven companies operate municipal commercial vessels, these associations are open to fish producers, brokers, laborers, traders, and scalers. Total membership in these associations is more than 300. They manage their fishing operations from the *poblacion* fish landing in General Santos near the public market or from the bustling coastal *barangays* of Bula and Calumpang in General Santos City. In addition, they serve on city task forces which recommend policies for pollution prevention and fisheries management.

To protect their de facto property rights, they have an agreement with SOCOPA to ban large purse-seine vessels from fishing in the bay. Although

municipal commercial fishers own commercial vessels, they consider their vessels to be medium-size compared to purse-seine vessels. The members of SOCOPA made the agreement because: (1) there are few tuna left in the bay; (2) they want to protect tuna spawning areas in the bay from large-scale fishing operations; and (3) some of SOCOPA's members are also members of SASFA and UFLA.

Municipal commercial fishers file formal complaints with the Secretary of Agriculture against commercial vessel fishing with high powered light bulbs (superlights) in Sarangani Bay (Reblando, 1991:4). Municipal commercial fishers use 200 watt bulbs around their *payaos*; superlight fishing vessels use 1,000 to 2,000 watt light bulbs. Municipal commercial fishers believe that this technique attracts fish away from their *payaos*. They also believe that these fishers may be using nets with mesh sizes smaller than three centimeters (Louis Berger International, Inc., 1993:4-3).

Municipal commercial fishers also protect their property rights by pursuing strategies that protect fish habitats. They serve on General Santos City's task force to address pollution problems, for example, because they fear that fish habitats may become polluted by prawn farms, fish canneries, piggeries, and domestic sewage lead. They request local officials to enforce laws against fishers who use dynamite, poisons, and small mesh nets.

To maintain their de facto, quasi-private property rights to fish in the bay, municipal commercial fishers try to convince local officials that their operations are legal. Although they acknowledge that they fish with vessels more than three gross tons and with nets with mesh size slightly less than three centimeters in municipal waters, they argue that they need these gear to

catch the species they target, namely moonfish and scads. According to them, they are municipal fishers because most of the fishers in their associations are municipal fishers. Consequently, they argue that they represent the interests of municipal fishers. Furthermore, they share part of their catch with "askers" to induce a certain level of tolerance from municipal fishers for their commercial fishing operations (Louis Berger International, Inc., 1993:4-4).

These municipal commercial fishers go to great lengths to protect their property rights. When the provincial ordinance banning fishing vessels more than three gross tons from fishing in Sarangani Province's municipal waters reached its third reading, municipal commercial fishers organized a march from General Santos City to the capital of Sarangani Province. Observers estimate that 800 people joined the march; most of them were municipal fishers from General Santos City. SOCOPA members also joined the marchers. The leaders of UFLA and SASFA presented a position paper to the Provincial Board listing their legal reasons why they oppose the ordinance. The position paper cites references to the Local Government Code of 1991 which devolves management duties and functions for municipal fisheries to municipalities, not to provinces; therefore, allowing only municipalities to pass this type of ordinance. The position paper further argues that because these fishers were subsistence fishers before the passage of PD 704 in 1975, they have a private property right to continue their operations. The authors of the position paper write:

Implement PD 704 and you [the Provincial Board] would deprive them [municipal commercial fishers] of their source of trade or calling, their private property without due process of law (SASFA, SOCOPA, and UFLA, 1994:9).

Later, at a public hearing about the ordinance at General Santos City Hall, the municipal commercial fishers cited social and economic reasons why they oppose the ordinance. They argued that passage of the ordinance would put hundreds of municipal fishers out of work. They further argued that banning their operations from the bay would deprive inland communities of an important source of food. They said that municipal fishers would not be able to catch the small pelagic fish municipal commercial fishers catch without the use of commercial fishing gear. They requested parish priests from a coastal barangay in General Santos to confirm the social and economic impacts that this ordinance would have on their fishing communities. Finally, they argued that other illegal fishers, such as those who use dynamite and poisons, pose greater risks to the bay's fisheries than their fishing methods. They want to see local officials from the province and the city stop these fishing methods before stopping their operations.

**Fish Pond, Prawn Farm, Salt Farm, and Beach Resort Owners:**  
The main strategy of fish pond, prawn farm, salt farm, and beach-resort owners is to establish private property rights to coastal lands and quasi-private property rights to the foreshore area. They purchase and receive titles to coastal land. Once they own the titles, they may apply for foreshore leases. After obtaining foreshore leases, some owners choose to clear some or all of the mangroves in the foreshore area to make room for their facilities.

### **Common Property Regimes**

Common property regimes seek to establish or maintain de facto and de jure common property rights to tuna fisheries, municipal fisheries, coral reefs

and mangroves. They also pursue a number of different strategies to establish or maintain their property rights. They seek to develop arrangements where members of their regime share access to a resource, but exclude others from outside their regime from the resource. They develop rules to protect their common property rights.

### *Property Rights*

**Municipal tuna fishers:** Municipal tuna fishers have no formal property rights to tuna fisheries. At the same time, there are few rules restricting their access to tuna fisheries. Because their boats are less than three gross tons, national officials do not require them to obtain licenses. Because they fish outside of municipal waters, local officials have no authority to regulate their practices. In addition, they pay no fees to fish around *payaos*. Only *payao* owners and Indonesian officials occasionally restrict their access to tuna fisheries. *Payao* owners impose restrictions because they believe that municipal tuna fishers damage their *payaos*. Indonesian officials arrest municipal tuna fishers fishing in Indonesian waters. Nevertheless, municipal fishers contest these restrictions by continuing to fish around *payaos* and in Indonesian waters.

Municipal tuna fishers believe that fishing magnates should share access to *payaos* with them. Because their hook and line methods do not interfere with the catch of purse-seine vessels, they believe that the fishing magnates should not limit their access to *payaos*. A president of a municipal tuna cooperative said that it is unfair that the fishing magnates do not look out for the welfare of municipal tuna fishers. He said, "*wala man ning dako kon wala*

*ang gagmay*" (the big will not exist without the small). Because he believes that municipal tuna fishers helped the fishing magnates to build the fishing industry in General Santos, the municipal tuna fishers and the fishing magnates should continue to cooperate with each other, not compete against each other. In other words, these fishers continue to practice common property rights to *payaos* that they shared with the fishing magnates when the tuna fishing industry began to grow in the 1980's. They do not recognize the quasi-private property rights that the fishing magnates attempt to enforce.

**Municipal fishers:** Some municipal fishers own de jure, common property rights to coral reefs and municipal fisheries. Local government units formally recognize two marine reserves established by municipal fishers -- one in Bay Bay Kawas on the northeastern coast of the bay and the other in Batulaki on the southeastern coast of Sarangani Province. Municipal fishers manage more than eight other marine reserves throughout Sarangani Bay and Sarangani Province that local officials are likely to formally recognize.

Marine reserves consist of a marine sanctuary over a coral reef where municipal fishers permit no fishing. Outside of the sanctuary, the fishers establish a buffer zone where they permit fishers to use only hook and line gear. The fishers established the boundaries for these reserves based on their ethnoecological knowledge. They mark the boundary of the marine sanctuary, for example, by determining where important fish habitat, spawning areas, and feeding areas exist. In some cases, marine scientists assist the fishers in determining these boundaries. Nevertheless, municipal fishers make the final decision as to where to establish the boundary. They mark this boundary with buoys made of rocks, rope, bamboo, coconut leaves, and other indigenous

material. They collaborate with NGO representatives and use their ethnopolitical knowledge to develop a cooperative process among fishers, NGOs, local officials, and national officials to establish these reserves. These fishers report significant increases in fry, squids, crabs, lobsters, shrimps, oysters, shells, and aquarium fish as a result of establishing these marine reserves.

Other municipal fishers do not own *de jure*, common property rights to municipal fisheries, although the Constitution of 1987 does give them preferential rights to fish in these waters (Feliciano, 1991:13). Many municipal fishers do, however, practice *de facto* common property rights based upon their ethnopolitical and ethnoecological knowledge. Municipal Muslim fishers, for example, practice *de facto*, common property rights to some nearshore waters. They recognize the authority of their *datu* in establishing fishing rights and rules in these areas. They substantiate these common property rights based on customary practices over several decades. In Lasang, on the east coast of the bay, fishers indicate that their fishery extends about 300 meters from the coast. In Tinoto on the southeast coast of the bay, fishers practice *de facto*, common property rights to the milkfish fry fishery next to their village. In addition, fishers from both of these villages try to protect their fisheries from fishers using dynamite.

Fishers from the Jolohano Fishermen's and Farmers Association (JOFFA) establish *de facto*, common property rights by placing fish shelters in nearshore waters. JOFFA fishers require each member to construct five artificial reefs. They attach 40 artificial reefs to make a fish shelter. According to these fishers, their fish shelters increase the number of fish in the area. They

also construct fish cages to raise *danggit* (a small flat fish), siganids, and other small fish. Every new moon, these fishers catch fish fingerlings for four days to stock their fish cages. JOFFA fishers say that these fishing techniques keep their harvests relatively constant.

The MFI and SCFI projects assist fishers in building artificial reefs and *payaos*. These devices create common property rights to the areas where the fishers place them, usually within 50 meters from shore. One group of fishers said that anybody may fish around their artificial reefs so long as they fish properly (*husto nga pagpanagat*). The fishing methods they do not permit include *guyod-guyod* (trawling), dynamite fishing, *baling* (use of fine mesh nets), and the use of poisons. Fishers and national officials from the DA exchange scientific and ethnoecological knowledge to determine the best place for these devices. DA officials, for example, conduct scientific surveys of the coral and fisheries in the area. Afterward, they share and discuss the result of the surveys with the fishers. Together, the fishers and DA officials exchange their knowledge of the fishery in the area. On the basis of these discussions, the fishers determine where to place artificial reefs and *payaos*. In addition, the DA officials train these fishers to be fish wardens. Nevertheless, these officials do not formally recognize the fishers' common property rights to fish in these areas even though these projects reinforce the fishers' de facto, common property rights. Furthermore, the fishers report that they have trouble excluding other fishers from fishing around their artificial reefs and *payaos*. They report that they have no authority to keep other fishers out unless these fishers use destructive fishing methods.

On the basis of their ethnoecological knowledge, municipal fishers from several fishing villages in the Sarangani Bay area recognize the importance of mangrove forests to sustainable fisheries. These fishers classify four species of mangroves around the bay -- *Bakhaw lalaki*, *bakhaw babae*, *bakhaw-bakhaw* and *pagatpat*.<sup>4</sup> With assistance from NGOs and *barangay* officials, they apply for and receive community forestry leases from DENR officials. Through these leases, DENR officials recognize the de jure, common property rights of fishers to protect and rehabilitate these forests.

#### *Rules*

**Municipal tuna fishers:** Municipal tuna fishers form fishing associations and cooperatives to gain access to markets and capital. They write by-laws for their cooperatives. They elect a board of directors to set policies and ensure that the members follow the rules. The leaders of cooperatives seek loans from banks and government officials. They require members to pay annual or monthly dues and attend monthly meetings. Officers of the cooperative set aside income from the catch to finance future fishing trips and make payments on pumpboats. Although they hope to establish direct linkages with Japanese markets, they currently sell their catch to tuna exporters, fishing magnates, and other local fish buyers.

Municipal fishers in associations or cooperatives divide the net income from their catch equally among the crew or according to rank. They usually keep part of the catch for their own consumption and for their families. The Kiamba Fishermen Multi-purpose Cooperative, for example, shares the income

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<sup>4</sup>Throughout this dissertation, I occasionally give direct quotes from resource users in the language they spoke them in. These quotes may be in Tagalog or Cebuano.

from the flying fish they catch. With a loan from the Province, they jointly own a fishing net and boat. Their membership dues provide the collateral needed to obtain the loan. They divide 50 percent of their net income among their members. They use the other 50 percent to pay off the loan.

Municipal fishers in the Federation started by MFI must undergo training and attend seminars before joining one of the ten associations. They receive training in several areas including artificial reef construction, legal assistance, and financial management. The Federation divides the income from the fish caught by the *sampana* among the associations. The Federation sets aside ten percent of the earnings for future coastal rehabilitation projects. In addition, project administrators contribute five *pesos* (20 cents) towards the payment of the *sampana* for every mangrove planted by the fishers. They also pay fishers to build artificial reefs and *payaos*.

The municipal fishers who establish marine reserves also create their own rules. The municipal fishers from Batulaki, for example, do not allow fishing in the sanctuary. In the buffer zone, they permit only fishers to use passive gear such as hooks and lines. They place no restriction on the number of fishers who may fish in the buffer zone. The fishers report increases in the amount of fish in the buffer zone; however, they have not increased their catch because of the increase in the number of fishers fishing in the buffer zone. They say that they can prevent only fishers using active gear (e.g., motorized boats with nets, fishers diving with compressors<sup>5</sup>) or destructive methods out of the buffer zone. Nevertheless, because they do not have a patrol boat, they

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<sup>5</sup>Fishers attach a long hose to a compressor and breath from the hose underwater. Once underwater, they use spear guns and poisons to catch fish.

occasionally have problems keeping destructive fishers out of the buffer zone. Fishers from the Cabug marine reserve report similar experiences.

### *Strategies of Common Property Regimes*

**Municipal Tuna Fishers:** Municipal tuna fishers pursue strategies to establish common property rights to tuna fisheries and to protect themselves from pirates. Through their cooperatives, they seek loans to buy pumpboats equipped with refrigerated storage areas, to construct *payaos*, and to finance their own fishing trips. The members of the Calumpang Fishermen's Development Cooperative Inc. (CFDCI), the largest municipal tuna fishers cooperative, seek to buy pumpboats equipped with refrigeration facilities. Refrigerated storage facilities would keep their fish fresher during their two-week fishing trips. They also seek to construct and place their own *payaos*. This would break their dependence on the *payaos* of the fishing magnates. Once they place their own *payaos*, they plan to take turns fishing around their *payaos*. By keeping at least one pumpboat around their *payaos*, they believe that they can keep other fishers from damaging their *payaos*. In effective, this ethnopolitical strategy would help these fishers to protect their de facto, common property rights to tuna fisheries. Furthermore, according to the president of the cooperative, this strategy would resolve their problem with Indonesian authorities. Instead of having to fish where the fishing magnates place their *payaos*, they would be able to place their *payaos* exclusively in Philippine waters.

In addition, they plan to share the income from their catch with all of the members of the cooperative. A certain percentage of the catch would go to a

loan payment. They also plan to use the facilities at the new fish port to help them market their fish and store the fish on ice until they can obtain good prices. They believe that this strategy would end their dependence on financiers, tuna exporters, and the fishing magnates. It would also end their dependence on fishing around the *payaos* owned by the fishing magnates.

Unfortunately, the CFDCI cooperative has not realized these plans because of a fraudulent incident. Several years ago, two members of a consulting firm approached the leaders of the CFDCI cooperative. They convinced the leaders that they could help the cooperative obtain a loan from a bank to buy pumpboats equipped with a new refrigeration system. They stated that the refrigeration system would be cold enough to freeze tuna for long periods of time, maintaining the quality of the fish throughout the fishing trip. The consultants proposed to build and install the refrigeration systems. They also promised to connect the cooperative with a Japan company who would buy their fish at good prices. They guaranteed the cooperative that it would receive at least 70 pesos (\$2.80) and possibly more than 100 pesos (\$4) per kilogram for its tuna and marlin. The consulting firm would receive a fee for their services, 25 percent of net sales, and fees for constructing the refrigeration systems. With these agreements in place, the cooperative applied for and received a 19.5 million pesos (\$780,000) loan. Initially, the bank released 7.5 million pesos (\$300,000).

After receiving the first part of the loan, the cooperative bought 25 pumpboats equipped with the new refrigeration systems and radios for 280,000 pesos (\$11,200) each. In addition, it paid 250,000 pesos (\$10,000)

for the consultants' fees. With the remaining 250,000 pesos (\$10,000), it financed the fishing trips of its members.

The fishers in the cooperative soon discovered that the new refrigeration systems were no better than the ice boxes on other pumpboats. They were poorly built and never performed like the model the consulting firm first showed them. Furthermore, the marketing agreement forged by the consulting firm with a Japanese company fell through. The Japanese company no longer wanted to do business with the consulting firm. Finally, the price for fresh tuna dropped to 40 pesos (\$1.60) per kilogram. As a result, the consulting firm closed down and left town leaving the cooperative to fend for itself with the bank. Because the cooperative was unable to make their loan payments, the bank repossessed their pumpboats.

As a result of this incident, the cooperative, as well as other municipal tuna fishing cooperatives, are no longer able to obtain new loans. The cooperative, not the firm, was liable for repaying the loan. The cooperative had no legal recourse against the firm. With its boats impounded, it had no chance of repaying the loan. The best alternative left for municipal tuna fishers is to support the fish port project. They hope that the new facilities at the fish port will enable them to store their fish longer and obtain better prices. Despite these setbacks, they remain hopeful that someday they will implement their strategy. One fisher said, "gikan sa init naay gabugnaw" (from heat, there is cooling), and "unsa ka dako sa balod, adunay kalinaw" (however big the waves, there will be calm).

**Municipal fishers:** Municipal fishers seek to establish common property rights to municipal fisheries, coral reefs, and mangroves. First, they

attempt to generate capital to buy fishing gear and to finance fishing trips. Surveys conducted by a local NGO in coastal villages around the bay indicate that municipal fishers list the lack of capital as one of their major problems (Business Resource Center, 1992a:11 and 1992b:11). These fishers indicate that most of the financial assistance they receive comes from financiers and middlemen, not from government officials (Business Resource Center, 1991a:11). In other cases, local officials and NGOs provide loans and grants for municipal fishers. By obtaining funds to buy gear and finance fishing trips, municipal fishers may break their dependence on financiers and middlemen.

The Mahintana Foundation's (MFI) project, for example, provided the fishers with materials to construct artificial reefs and *payaos*. The project also provided mangrove seedlings and a commercial vessel. The purchase of the commercial vessel for the fishers is an interesting strategy. Municipal fishers complain about the presence of commercial vessels in Sarangani Bay. Nevertheless, because government officials fail to keep commercial vessels out of the bay, the municipal fishers in this project decided to operate their own commercial vessel in the bay. They shared the income from their boat with all of the fishers in the federation. They put aside ten percent of the income for their ecosystem rehabilitation projects. When local officials from the province questioned the legality of this vessel fishing in the bay, the fishers and NGO representatives argued that because they divide their catch among hundreds of municipal fishers, they are municipal fishers and not commercial fishers. Surprisingly, almost two years after the MFI bought the commercial vessel for the fishers, the municipal fishers reversed their strategy and sold the commercial vessel. Rather than compete directly with the municipal commercial

fishers, they choose to work with local officials to ban commercial vessels from the bay.

In contrast to the MFI project which provided materials in exchange for the fishers' labor and participation in the project, another NGO provided loans, not grants, for the fishers. This project used the loans as an incentive for the fishers to organize themselves. After two years, this program failed; mostly because the fishers did not pay back their loans. According to the fishers, they used the money on more immediate family needs rather than on fishing equipment. The fishers' associations started by the project also disbanded once the project was over.

Some municipal fishers seek to protect and rehabilitate coral reefs and mangroves because they, through their ethnoecological knowledge, recognize the importance of these resources to sustainable fisheries. Surveys conducted by a local NGO in two coastal municipalities indicate that municipal fishers perceive a significant decline of fish in traditional fishing grounds over the past five years (Business Resource Center, 1992a:12 and 1992b:11). The respondents state that destructive fishing methods including the use of dynamite, poisons, fine mesh nets, and commercial gear in the bay cause the depletion of fisheries in the bay. According to these and other municipal fishers interviewed for this study, it is the damage to coral and fish habitats caused by these methods that concerns these fishers, not the fact that these fishing methods catch too many fish. This indicates that these municipal fishers base their de facto, common property rights to coral reefs on their ethnoecological knowledge of coral reef habitats and the importance of these habitats to fisheries. Furthermore, municipal fishers say that commercial vessels catch

*awa* or *sabalo* (spawning milkfish) which municipal fishers believe leads to a decrease in milkfish fry.

Some municipal fishers participate in the *bantay dagat* program because it gives them authority to apprehend fishers using dynamite, poisons, fine mesh nets, and commercial gear in the municipal waters near their communities. When they observe a destructive fishing method, they report the incident to government officials; or they rouse these officials to force them to apprehend the illegal fishers. One community of municipal fishers, for example, reported a commercial vessel fishing near their village one night to their mayor. The mayor, PNP officers, and coast guard officers apprehended the fishers aboard the vessel. They put the fishers in jail for three days. In another community, municipal fishers, with the assistance of an NGO, filed court cases against prawn and salt farm owners who had cut mangroves without receiving a clearance from DENR officials. Without the commitment of these municipal fishers to protect their de facto, common property rights, government officials would not make these arrests or pursue these court cases.

Despite these actions taken by municipal fishers against fishers using destructive methods, it is important to point out that municipal fishers do tolerate some of these practices. The vignette at the beginning of Chapter Four described fishers using fine mesh beach seine nets in shallow, coastal waters. Most municipal fishers and local officials tolerate the use of these nets because these fishers are from their communities. They know that these fishers are poor. If they stopped these fishers, they would deprive them of their only source of livelihood.

Besides protecting ecosystems important to municipal fisheries from destruction, municipal fishers also rehabilitate ecosystems. With the assistance of NGO, DA, and DENR officials, they plant mangroves and sea grass and build artificial reefs and fish corrals. According to the project administrators, fishers participate in these projects because: (1) the projects rehabilitate critical ecosystems; and (2) these projects give municipal fishers management authority in these areas. DENR officials, for example, issued nine, 25 year stewardship certificates to municipal fishers from Lasang Malapatan for them to exclusively manage mangrove areas in their community. These stewardship certificates give them de jure, common property rights to these mangrove areas.

Finally, some municipal fishers use their ethnopolitical knowledge to establish marine reserves. Marine reserves enable municipal fishers to achieve the objectives mentioned above. More importantly, by establishing marine reserves, municipal fishers gain recognition of their common property rights to the fisheries, coral reefs, and mangroves near their communities from government officials.

In sum, resource users in the three types of property regimes -- state, private, and common -- pursue strategies to establish or maintain their de jure or de facto property rights. Table 5.3 summarizes the property rights and strategies of each of these property regimes in Sarangani Bay. Often, they compete with other resource users for property rights to same resources. Consequently, as Church (1982:131) indicates, property rights become ambiguous.

### Why Property Rights are Ambiguous

For the coastal resources of Sarangani Bay -- tuna fisheries, municipal fisheries, coral reefs, and mangroves -- a number of different sets of de jure and de facto property rights exist. In this section, I summarize the de jure and de facto property rights of resource users from Sarangani Bay. I explain why property rights to the bay's coastal resources are ambiguous. Table 5.4 summarizes the different types of property rights for each resource.

#### Tuna Fisheries

The Philippine State owns de jure property rights to tuna fisheries in Philippine waters. It leases these rights to tuna fishing companies by requiring them to obtain licenses from DA officials for their purse-seine vessels and other vessels over three gross tons. The Indonesian State has de jure property rights to tuna fisheries in Indonesian waters. Philippine national officials regulate tuna fishing through rules establishing minimum net sizes. Indonesian authorities protect their property rights to tuna fisheries by arresting and confiscating the boats of Filipino fishers fishing illegally in Indonesian waters.

Fishing magnates establish de facto, quasi-private property rights by placing *payaos* in open seas. Ownership of *payaos* gives them quasi-private property claims to the fish beneath the *payaos*. Tuna exporters and municipal tuna fishers seek to establish de facto, quasi private property rights and de facto, common property rights, respectively, to tuna fisheries. Because they

do not place their own *payaos*, they rely on access to the *payaos* owned by the fishing magnates. Thus, property rights to *payaos* are contentious.

Despite scientific studies conducted by BFAR officials that indicate tuna fisheries in Philippine water are in decline partly because of the catching of juveniles, national officials choose not to impose regulations on tuna fishers. This situation allows for tuna fishers to develop de facto property rights. National officials choose not to regulate the industry partly because they do not have the capability to enforce regulations. Nevertheless, a more important reason is that tuna fishing is a large, exporting business. National officials receive benefits by allowing tuna fishers to fully exploit tuna fisheries. Rather than regulate the industry, national officials choose to construct a fish port. The fish port will bring in income for national officials. It will stimulate the local and national economy. State property regimes choose to relinquish de jure, state property rights in return for economic benefits. Consequently, the competition among tuna fishers to establish de facto property rights increases. The result is contentious property rights to tuna fisheries.

### **Municipal Fisheries**

State property regimes, through local government units, have de jure property rights to municipal fisheries in Sarangani Bay. The Local Government Code charges local officials, with the assistance of national officials, to regulate the use of municipal waters. Municipal commercial fishers establish de facto, quasi-private property rights to municipal fisheries by placing *payaos* inside the bay. A large number of municipal fishers practice de facto, common property rights to municipal fisheries. Their common property regimes establish

property rights and rules, based on their ethnoecological and ethnopolitical knowledge, to regulate the use of coastal resources near their villages. In some cases, they establish marine reserves where local officials recognize their *de jure*, common property rights. In other cases, municipal fishers have few restrictions on their access to municipal fisheries. They practice *de facto*, open access property rights.

According to PD 704, local officials should prevent commercial vessels more than three gross tons as well as fishers using dynamite, poisons, and fine mesh nets from fishing inside Sarangani Bay. The three gross ton limit is a purely arbitrary definition for commercial fishing. Originally, officials instituted it primarily for taxation and licensing purposes -- not to limit catch (Dalzell and Corpuz, 1990:32).

In Sarangani Bay, municipal commercial fishers catch a significant amount fish in the bay. This stimulates the local economy. Local officials debate whether or not to permit these fishers to continue fishing inside the bay. This debate shows that local officials have limited capabilities to enforce regulations. At the same time, this debate shows that local officials have a great deal of discretion in how they choose to enforce national and local regulations. This discretion permits them to weigh the advantages and disadvantages of banning commercial fishers from the bay. In addition, local officials have limited capabilities and a great deal of discretion in enforcing laws against fishers who use illegal fishing gear. In sum, this high degree of discretion allows local officials to selectively favor the property rights of one regime over another, depending on which is more advantageous to local officials. While local officials manipulate property rights to their advantage,

fishers continue to establish and follow their de facto property rights. As the number of commercial and municipal fishers continues to increase, competition for property rights also increases. Thus, property rights to municipal fisheries remain contentious.

### **Coral reefs**

National and local officials have de jure, state property rights to coral reefs. In some cases, they formally recognize the de jure, common property rights of municipal fishers who manage marine reserves that include coral reefs. In other cases, municipal fishers have de facto, common property rights. They construct and place artificial reefs to rehabilitate damaged coral reefs. Other municipal fishers practice de facto, open access rights. Although state property regimes have laws that identify coral reefs as critical resources to protect, national and local officials have a great deal of discretion in implementing these laws. The large number of resource users with numerous types of fishing methods, coupled with the limited capabilities of state property regimes, make it difficult for government officials to enforce coral reef regulations. This leaves room for municipal fishers to compete with other fishers to establish property rights and rules for coral reefs. As a result, property rights to coral reefs are contentious.

### **Mangroves**

State property regimes have de jure property rights to mangrove forests. Local and DENR officials are primarily responsible for controlling access to mangroves. The Forestry Code (PD 705) and the Philippine

Environmental Code (PD 1151 and PD 1152) establish the policies and regulations to control access to mangroves. In contrast, according to the resource users of Sarangani Bay, there is ambiguity as to which laws and policies regulate foreshore areas.

A significant source of the ambiguity over property rights to mangroves lies within the legal definition of the foreshore area. National officials, local officials, NGO officials, private land owners, and municipal fishers all have different definitions of the foreshore area. Most resource users agree that the foreshore area includes the portion of the shore covered and uncovered by the movements of the tide. This definition was first formalized in the Spanish Law of Waters, 1866. Article 1(3) states:

. . . the space covered and uncovered by the movement of the tide. Its interior or terrestrial limits is the line reached by the highest equinoctial tide (quoted in Feliciano, 1991:22).

The ambiguity begins at the high tide mark. Resource users disagree over how far inland from the high tide mark state de jure property rights extend. Interviews with more than a hundred resource users, including lawmakers and DENR officials, reveal the range of opinion to be from the highest equinoctial tide to 60 meters inland from the highest high tide mark. Attempts to find the actual formal law from national officials produced references to the Public Land Act and a citation from "Law on Natural Resources," by Z. Castrillo that define the foreshore area as the place between the lowest low tide of the year and the highest high tide. Feliciano (1991:22) cites a Supreme Court case -- Republic v. Court of Appeals, G.R. Nos. 43105 and 43190, August 31, 1984, 131 SCRA 532, 539 (1984) -- in which the Court wrote:

Foreshore land is that strip of land that lies between high and low water marks and that is alternatively wet and dry according to the flow of the tide.

Even with these references, most resource users believe foreshore areas extend some meters inland from the high tide mark. To further complicate matters, government officials in the past issued private land titles to some people to lands in the foreshore area.

Fish pond, prawn farm, salt farm, and beach-resort owners have private property de jure rights to the lands adjacent to foreshore areas not owned by the state. National officials give them first priority to receive de jure property rights to the foreshore areas adjacent to their property through foreshore leases. In some cases, they practice de facto, private property rights to mangrove forests because they clear mangrove areas, without state approval, to make room for their private businesses.

Another ambiguity exists over what constitutes proper use of the foreshore area. National officials permit private landowners with foreshore leases to make improvements to the foreshore area. These improvements may include wharves, beach clearings, and seawalls. Thus, some national officials and private landowners perceive improvements to be an increase in the economic value of the area. In contrast, municipal fishers perceive these improvements to be barriers to their access to foreshore areas and damaging to coastal ecosystems.

Some municipal fisheries practice de facto, common property rights to mangroves. Others receive de jure, common property rights to mangroves

through community forestry leases. Still others practice de facto, open access rights to mangroves because no one limits their access.

In conclusion, although state property regimes own de jure property rights to tuna fisheries, municipal fisheries, coral reefs, and mangrove forests, resource users compete to establish de jure and de facto quasi-private property rights, common property rights, and open access rights. Consequently, property rights to Sarangani Bay's coastal resources are ambiguous because they are highly contentious.

The institutional arrangements of the different property regimes simultaneously influence the behaviors of resource users. Resource users compete with other resource users to establish property rights to resources. The next chapter describes the dispute-settling processes that resource users use to resolve their conflicts over property rights. It examines the impact that these conflicts over property rights have on institutional arrangements and the resources.

Table 5.1. Sarangani Bay's Resource Users, Resources, and Property Regimes

Resource Users	Resources	Property Regime
National officials: DA, BFAR, DENR, PFDA, PMU, PPA, Coast Guard, Navy, PNP	Tuna fisheries Coral reefs Mangroves	State
Local Officials: Provincial, City, Municipal, and <i>Barangay</i>	Municipal fisheries Coral reefs	State
Fishing Magnates	Tuna fisheries	Private
Tuna Exporters	Tuna fisheries	Private
Municipal Commercial Fishers	Municipal fisheries	Private
Fish Pond, Prawn Farm, Salt Farm, and Beach Resort Owners	Mangroves	Private
Municipal Tuna Fishers	Tuna fisheries	Common
Municipal Fishers	Municipal fisheries Coral reefs Mangroves	Common

Table 5.2. Sources of NGO Assistance for Common Property Regimes

NGO	Target Groups	Type of Assistance	Main sources of funds for coastal resource projects
MFI, SBMIRCFI(a)	Municipal fishers	grants; technical and organizational assistance	Dole Philippines and USAID (f)
SALAG (b)	Municipal Muslim fishers	loans; legal and organizational assistance	Law graduates from Ateneo de Manila
SCFI (c)	Municipal fishers	loans; technical and organizational assistance	USAID and international church groups
FRDC (d)	Municipal fishers	research; legal and organizational assistance	AASAI (g) and Pamalakaya Pilipinas
BRC (e)	Municipal fishers	loans; research; financial management assistance	USAID and Notre Dame of Dadiangas College

(a) Mahintana Foundation, Inc. now called Sarangani Bay Marine and Inland Resource Conservation Foundation, Inc.; (b) Structural Alternative Legal Assistance for Grassroots; (c) South Cotabato Foundation, Inc.; (d) Fisherfolk Research and Development Center; (e) Business Resource Center; (f) United States Agency for International Development; (g) Agro-Aquatic Services Association Inc.

Table 5.3. Strategies of State, Private, and Common Property Regimes

Property Regime	Property Right	Strategies
National Government Officials	SPR(a) to tuna fisheries and mangroves	Provide an incentive for tuna fishers to land more fish by constructing a fish port. Protect tuna fishers from piracy. Create disincentives for tuna fishers who catch juvenile tuna and fishers who use destructive fishing gear. Establish incentives for communities to rehabilitate mangrove areas.
Local Government Officials	SPR to municipal fisheries and coral reefs	Establish concession zones for milkfish fry fisheries. Develop disincentives for fishers who use destructive fishing gear. Debate the use of commercial gear inside the bay.
Fishing Magnates	Q-PPR (b) to tuna fisheries	Protect quasi-private property rights to fish around <i>payaos</i> . Establish quasi-private property rights to Indonesian tuna fisheries.
Tuna Exporters	Q-PPR to tuna fisheries	Establish quasi-private property rights to <i>payaos</i> owned by the fishing magnates. Protect their fishers from pirates. Establish access rights to Indonesian fisheries.
Municipal Commercial Fishers	Q-PPR to municipal fisheries	Protect their quasi-property right to fish around <i>payaos</i> in the bay from other commercial fishers. Prevent local officials from banning the use of their commercial vessels inside the bay.
Fish, Prawn, Salt ponds and Beach-resorts	Q-PPR to foreshore areas	Establish quasi-private property rights to foreshore areas.
Municipal Tuna Fishers	CPR to tuna fisheries	Establish common property rights to fish around <i>payaos</i> .
Municipal Fishers	CPR to fisheries, coral reefs, mangroves	Establish common property rights to marine reserves. Construct and place artificial reefs. Obtain community forestry leases to manage mangrove areas.

(a) SPR - state property rights; (b) Q-PPR - quasi-private property rights; and (c) CPR - common property rights

Table 5.4. Contentious Property Rights

Resource	Existing and Competing Property Rights
Tuna Fisheries	<p>Philippine State owns de jure, SPR (a) in Philippine water. Indonesian State owns de jure, SPR in Indonesian waters. Fishing Magnates practice de facto, Q-PPR to fish around <i>payaos</i>.</p> <p>Tuna exporters seek to establish de facto, Q-PPR (b) to fish around <i>payaos</i>.</p> <p>Municipal tuna fishers seek to establish de facto, CPR (c) to fish around <i>payaos</i>.</p>
Municipal Fisheries	<p>Local officials have de jure, SPR.</p> <p>Municipal commercial fishers practice de facto, Q-PPR to fish around <i>payaos</i>.</p> <p>Some municipal fishers have de facto, CPR to nearshore fisheries, <i>payaos</i>, fish cages, and fish corrals.</p> <p>Some municipal fishers practice de facto, open access rights.</p>
Coral Reefs	<p>National and local officials have de jure, SPR.</p> <p>Some municipal fishers have de jure, CPR to marine reserves.</p> <p>Some municipal fishers have de facto, CPR to marine reserves.</p> <p>Some municipal fishers have de facto, CPR to artificial reefs.</p> <p>Some municipal fishers have de facto, open access rights.</p>
Mangroves	<p>National officials have de jure, SPR.</p> <p>Fish pond, prawn farm, salt farm, and beach resort owners have de facto, QPPR.</p> <p>Some municipal fishers have de jure, CPR.</p> <p>Some municipal fishers have de facto, CPR.</p> <p>Some municipal fishers practice de facto, open access rights.</p>

(a) SPR - state property rights; (b) Q-PPR - quasi-private property rights; and (c) CPR - common property rights

## CHAPTER SIX

### Resource Depletion or Sustainable Management: The Effects of Conflicts Over Property Rights on Sarangani Bay's Coastal Resources

Studies conducted by BFAR officials show that purse-seine vessels from the Philippines catch large quantities of juvenile tuna. Consequently, Department of Agriculture officials drafted a Fisheries Administration Order (FAO) to change the minimum mesh size for purse-seine nets from three centimeters to four inches. Regional DA officials, in conjunction with the BFAR and the National Agriculture Fisheries Commission, conducted public hearings around the Philippines to gather information regarding the impacts of this new regulation from the fishing industry sector. They chose General Santos City as a site for one of these hearings. DA officials invited purse-seine vessel owners to attend. Ring net owners, local officials, the media, and consultants from a USAID project also attended.

Although the hearing was to gain public comments into the new regulation to increase in the minimum mesh size for purse-seine nets involved in tuna fishing, participants and state officials first discussed the mesh size of ring nets used in municipal waters. It was clear from the start of the meeting that this may have been the first time fishers from General Santos City discussed the mesh size of commercial fishing nets in a public forum with national officials. The participants spent a great deal of time arguing over the

differences between purse-seine nets used for tuna fisheries and ring nets used by municipal commercial fisheries. One participant drew a picture of a commonly used ring net on the blackboard. The size of the mesh on the outer portion of the net was three centimeters. The middle of the net was 2.33 centimeters, which, according to PD 704, makes it illegal. After acknowledging that this type of net is illegal, yet widely used by commercial fishers, the ring nets owners were relieved when the state officials reminded the participants that the new regulation pertains only to purse-seine nets. They reminded the participants that the regulation of municipal fisheries is now under the jurisdiction of local government units.

Next, the participants discussed the mesh size for purse-seine nets. The fishing magnates argued that Pacific Island countries and Indonesia have a 3.5 inch minimum mesh size; therefore, this new regulation would put them at a disadvantage versus fishers from other countries. They also argued that the tuna fishing industry in General Santos is different from the tuna fishing industry in Manila because local tuna fishing companies use *payaos*. *Payaos*, they argued, permit them to fish with smaller boats and in waters closer to their private wharves and fish canneries. They urged state officials to make a distinction between their "medium-size" tuna fishing operations and those of other "large-size" tuna fishing companies in the Philippines. They recommended that minimum mesh size for nets should correspond with vessel size. They suggested that the minimum mesh size for vessels three gts (gross tons) to 100 gts should be three centimeters; vessels 101 gts to 200 gts should be 2.7 inches; and vessels 200 gts or more should be 3.2 inches. None of the purse-seine vessels from General Santos City are more than 150 gts and most are

less than 100 gts (PFDA, 1992:A-2). State officials recorded these comments. They promised to present these concerns to the national office.

This example demonstrates one process that resource users use to resolve their conflicts over property rights. National officials choose a state policy process, a public hearing, to get comments from the industry. The fishing magnates choose to participate in this process. Either of these resource users could choose more confrontational dispute-settling processes. National officials, for example, could adopt the policy and strictly enforce it. This would force the fishing magnates to either comply with the new policy, file a case against the policy in the formal legal system, or ignore the new law and risk getting caught by national officials. In this case, both parties prefer to resolve the dispute through the state's public hearing process.

The results of this dispute-settling process affect institutional arrangements and tuna fisheries. Because BFAR officials have *de jure*, state property rights to tuna fisheries, they choose to protect these resources by increasing the minimum mesh size for purse-seine nets. Nevertheless, they recognize the need to consult these fishers, who have *de facto*, quasi-private property rights to tuna fisheries, before adopting a new policy. They understand that enforcement of the new policy would be difficult without the cooperation of tuna fishing companies.

To date, DA officials have not adopted the new regulation. The fishing magnates and other tuna fishing companies around the Philippines continue to fish with the same gear. The outcome of this dispute strengthens the *de facto*, quasi-private property rights of the fishing magnates and weakens the *de jure*,

state property rights of national officials. The level of fishing effort in Philippine tuna fisheries continues to be beyond sustainable levels.

In Chapter Five, I demonstrated how resource users from different property regimes establish property rights to Sarangani Bay's coastal resources. I showed that property rights to the bay's coastal resources are ambiguous because resource users compete for a number of different types of property rights. In this chapter, I answer the following questions: (1) What kinds of property rights conflicts exist in Sarangani Bay? (2) What types of dispute-settling processes do resource users use to resolve their conflicts over property rights? (3) To what extent do current dispute-settling processes and other institutional arrangements lead to the depletion and degradation of coastal resources in Sarangani Bay?<sup>1</sup>

### Choice of Dispute Settling Process

Competing claims to de jure and de facto property rights to coastal resources lead to conflicts. Resource users have a number of different dispute-settling processes to use to resolve their conflicts (see Chapter Four). The choice of dispute-settling process often has more of an impact on property rights than a particular resource management decision because each process narrows the possible outcomes resulting from the dispute. In this section, I discuss the dispute-settling processes resource users use to resolve conflicts over property rights to tuna fisheries in Philippine waters, tuna fisheries in

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<sup>1</sup>See von Benda-Beckman (1986:132) for similar questions to ask for this kind of an analysis.

Indonesian waters, municipal fisheries, coral reefs, and mangroves. Table 6.1 summarizes these conflicts over property rights, the dispute-settling processes that resource users use, and the predominant property rights that prevail as a result of the dispute-settling process.

### **Tuna Fisheries in Philippine Waters**

In Philippine tuna fisheries, the major conflicts between resource users from Sarangani Bay are over the catching of juvenile tuna and property rights to *payaos*. Resource users use a state policy process and direct negotiations to resolve these conflicts.

#### *Property Rights to Catch Juvenile Tuna*

The beginning of this chapter describes the state policy process where national officials and fishing magnates discuss and debate the state's proposal to increase the minimum mesh size for purse-seine nets. The fishing magnates oppose the new regulation. They emphasize that the new regulation is coming at the wrong time. According to them, their businesses are still recovering from the effects of the 1991-1992 El Niño. They believe that warmer ocean temperatures, not the catching of juveniles, leads to depletion of tuna stock in Philippine waters. They urge national officials to consider the importance of their industry to the local economy.

These arguments made by the fishing magnates are difficult to dispute. No one knows just how much fish the fishing magnates catch because they do not permit anyone to monitor their catch. Many of them own private fishing wharves. During tax disputes, they report low volumes of fish landed. When

lobbying for the fish port, they report higher volumes of fish landed. They want the fish port because it will increase their business opportunities. Nevertheless, they do not want to publicize how much fish they catch because they do not want more companies entering into the business. It works to their advantage to conceal their profits and the volume of fish that they catch. The state's dispute-settling process does not clarify any of these discrepancies.

National officials are not the only resource users who believe that the catching of juvenile tuna by purse-seine nets leads to declines in tuna fisheries. Tuna exporters and municipal tuna fishers also believe this to be true. They have more to lose than national officials because their businesses and livelihoods depend on tuna fisheries. According to these fishers, the large number of juvenile tuna that fishers aboard purse-seine vessels catch decreases the amount of adult tuna available for them to catch. They believe that purse-seine nets catch tuna before they reach their reproductive stage. Although they acknowledge that warmer ocean temperature may have some affect on tuna migratory patterns, they believe that the catching of large quantities of juvenile tuna by purse-seine nets is the primary reason Philippine tuna fisheries are in decline.

Surprisingly, even though the tuna exporters attended the public hearing to discuss the mesh size of purse-seine nets, they did not speak out in favor of the new regulation. The fishing magnates had persuaded the leaders of the GSTTEOI not to speak in favor of the new regulation at the public hearing. At the time of the public hearing, national officials in Manila were debating whether or not to accept the Japanese loan for the fish port in General Santos. To receive the loan, the Philippine government would have to provide counterpart

funds. The fishing magnates and tuna exporters were lobbying national officials to commit these counterpart funds for the fish port. The fishing industry leaders and local officials from General Santos wanted to show a united front in favor of the fish port. The fishing magnates did not want the tuna exporters to show that there was dissension in the General Santos City fishing industry. Because the tuna exporters desperately need the fish port for permanent landing, storage, and communication facilities, they agreed not to speak out. In sum, the fishing magnates maintained their *de facto*, quasi-private property rights to catch juvenile tuna by: (1) convincing national officials, through a state policy process, that the new regulation will hurt their industry; and (2) negotiating directly with tuna exporters.

#### *Property Rights to Payaos*

The dispute over the catching of juvenile tuna also plays a role in the dispute over property rights to *payaos*. If tuna exporters and municipal tuna fishers push for an increase in the mesh size of purse-seine nets, the fishing magnates may take more forceful steps to prevent them from fishing around *payaos*. On the basis of these circumstances, tuna exporters and municipal tuna fishers choose not to antagonize the fishing magnates.

As a compromise, the tuna exporters agree to have their fishers help to keep other fishers away from the *payaos* in exchange for the right to fish around *payaos*. They work out these agreements by directly negotiating with the fishing magnates. This is not the case for municipal tuna fishers. Municipal tuna fishers try to work out agreements with fishing magnates, but they report that the fishing magnates are not willing to talk with them. One municipal tuna

fisher said, "halos dili na man nimo madu-ulan," (you almost cannot approach them). Nevertheless, because of the large numbers of *payaos* placed by fishing magnates, the fishing magnates cannot patrol most of them. Municipal tuna fishers usually can find *payaos* to fish around.

In sum, resource users choose state policy processes and direct negotiations to resolve disputes over tuna fisheries in Philippine waters. National officials foster close consultation with the fishing magnates from General Santos on issues affecting the area, such as the fish port and the proposed increase in the minimum mesh size for purse-seine nets. Although the state's policy process brings in the scientific knowledge that national officials have regarding tuna fisheries and the knowledge that the fishing magnates possess, it does not bring in the ethnoecological knowledge of tuna exporters and municipal tuna fishers. As a result, the fishing magnates successfully persuade national officials not to increase the minimum mesh size for purse-seine nets. The fishing magnates retain their de facto property rights (see Table 6.1). They also continue to deplete Philippine tuna fisheries.

The conflict over property rights to *payaos* also excludes the ethnoecological knowledge of municipal tuna fishers. Although tuna exporters are able to work out agreements (to fish around *payaos*) directly with the fishing magnates, municipal tuna fishers are not able to work out similar agreements. Because government officials do not recognize the de facto, quasi-private property rights of the fishing magnates who own *payaos*, municipal tuna fishers cannot use state and local processes to resolve this dispute. To establish common property rights to *payaos*, they must either negotiate directly with the fishing magnates, build and place their own *payaos*,

or avoid being caught by the fishing magnates. Because they have tried the first two options and failed, they continue to fish around the fishing magnates' *payaos* and try to avoid being caught. Consequently, property rights to *payaos* remain contentious (see Table 6.1).

### Indonesian Tuna Fisheries

Tuna fishers from Sarangani Bay conflict with Indonesian authorities over property rights to Indonesian tuna fisheries. According to the tuna fishers, since 1990, Indonesian authorities have arrested fishers and confiscated their fishing gear for fishing in Indonesian waters. The initial response of the fishing magnates and tuna exporters was to urgently appeal to local and national officials to get their fishers released by Indonesian authorities. The response of these officials was slow. The Philippine Navy and Coast Guard officials negotiated the release of the fishers, but this took months to achieve. In many cases, the tuna exporters never recovered their confiscated pumpboats.

When this strategy did not work, the fishing magnates went directly to Indonesian officials to negotiate access rights to Indonesian waters. Although national officials helped to facilitate these negotiations, they settled the dispute outside of the state's policy process. In the agreements, Indonesian officials agree to permit the fishing magnates to place *payaos* and fish in Indonesian waters in exchange for the payment of fees. The fishing magnates also agree to build two fish canneries in Manado, Indonesia. Indonesian authorities require the purse-seine vessels of the fishing magnates to supply these canneries with fish. Furthermore, the fishing magnates must start joint ventures between their companies and Indonesian fishing companies. More than half of the tuna fishing

companies owned by the fishing magnates now operate under these arrangements (Business Resource Center, 1994:20).

Because this agreement includes high rental fees and joint venture arrangements among Philippine and Indonesian tuna fishing companies, the tuna exporters and municipal tuna fishers cannot afford to make similar agreements. Furthermore, municipal tuna fishers believe that since 1992, the warmer ocean temperatures have subsided. Tuna are now closer to the surface. They believe there are more tuna to catch in Philippine waters. Nevertheless, although these fishers prefer to fish in Philippine waters, they rely on fishing around the fishing magnates' *payaos*. Because the fishing magnates place many of their *payaos* in Indonesian waters, tuna exporters and municipal tuna fishers must fish in Indonesian waters. In doing so, they risk being arrested by Indonesian authorities.

In sum, Indonesian officials have de jure, state property rights to Indonesian fisheries. They allow the fishing magnates to establish de jure, quasi-private property rights in exchange for the payment of fees, joint ventures, and fish canneries. Tuna exporters and municipal tuna fishers continue to practice de facto property rights to Indonesian fisheries, although recent efforts by Indonesian authorities to prevent their access curtail their fishing operations. Thus, on one hand, direct negotiations among the fishing magnates and Indonesian officials clarify property rights to Indonesian fisheries. On the other hand, the lack of an effective dispute-settling process among tuna exporters, municipal tuna fishers, and Indonesian officials causes property rights to remain somewhat contentious (see Table 6.1).

### Municipal Fisheries

The major property rights disputes among resource users of municipal fisheries are the use of illegal fishing techniques and commercial vessels in municipal waters. In cases where fishers using illegal fishing methods come from the same *barangay*, municipal fishers usually settle these disputes through traditional dispute-settling processes or the *Katarungang Pambarangay* system (the *barangay* system). In a Muslim fishing village on the east coast of the bay, for example, the *datu* of the community works with municipal fishers to stop the use of illegal fishing methods near their village. For fishers he is unable to stop, he brings in the police to arrest the illegal fishers. In a Muslim village on the west coast of the bay, fishers also present their complaints to their *datu*. The *datu* resolves cases involving fishers from his community who use dynamite through their tradition dispute-settling process. In this community, the *datu* is reluctant to bring people from outside his community, like the police, to help to resolve the dispute. In a Christian fishing village on the north coast, the fishers use the *barangay* system to stop fishers using dynamite. They report fishers they catch with sacks full of poisoned fish to *barangay* officials. *Barangay* officials from this village and other fishing villages around the bay report that the *bantay dagat* program, in conjunction with NGO programs, helps them to enforce fishery laws better. In sum, municipal fishers, traditional leaders, and *barangay* officials protect both de jure, state property rights and de facto, common property rights to municipal fishers.

The ethnoecological knowledge of municipal fishers plays an important role in resolving these disputes. Municipal fishers from organized common property regimes (i.e., those with marine reserves, associations, or

cooperatives), traditional leaders, and *barangay* officials report that the emphasis in these disputes is to educate the fishers using illegal methods about the damage these methods cause. They understand that some of these fishers resort to illegal methods because they are poor. Municipal fishers say that they prefer to educate fishers from their communities who use illegal methods, instead of punishing them. In a fishing village on the northeast coast, for example, fishers from a fishing association resolve their own disputes. They place artificial reefs in the coastal waters near their village. They permit fishers who are not members of their fishing association to fish near the artificial reefs. These fishers say that, although it is difficult to implement fishery rules because of the *pare*, *maninoy*, and *palakasan* systems (i.e., good relationships and social ties among fishers using illegal fishing gear and local officials), they believe that the solution is to educate destructive fishers to change their attitudes. Consequently, if fishers use illegal methods to catch fish, the association attempts to educate the fishers first before reporting them to *barangay* officials. Their association also conducts seminars in the area on illegal fishing. They report that this process, which I categorize as an ethnopolitical process, significantly reduces the number of fishers fishing in the area with illegal fishing methods, especially dynamite fishers. Furthermore, municipal fishers who manage marine reserves around the bay report similar dispute settlement strategies. These dispute-settling processes focus on healing the relationships among the fishers.

In cases where fishers using illegal methods come from different *barangays* or different parts of the bay, municipal fishers are more likely to report them to municipal, city, and national officials. Municipal fishers say that

these *dayuhan* fishers (foreigners or fishers from another village) are *hakog* (greedy). Because local and national officials have trouble apprehending these fishers, it is difficult for municipal fishers to resolve these disputes. They report that the *bantay dagat* program is ineffective because they do not have boats fast enough to catch the fishers using illegal methods. Furthermore, none of the local government units around the bay have an enforcement strategy to deter illegal fishers.

To stop commercial fishers from other parts of the Philippines from fishing in Sarangani Bay, municipal commercial fishers choose to pursue a state policy dispute-settling process. They report these fishers to regional DA officials and to the Secretary of Agriculture. DA officials issue warnings to these fishers, but do not apprehend them. The leaders of UFLA and SASFA wonder if the influence of these fishers in state policy processes prevents DA officials from stopping these fishers (Reblando, 1991:4). National officials indicate that the presence of commercial vessels in municipal waters is a local government problem, not a national government problem. Two Cabinet level Secretaries, for example, say that local officials must take the lead in municipal fisheries management.<sup>2</sup> Thus, national officials push disputes involving commercial fishers in municipal waters into local government dispute-settling processes.

Municipal fishers pursue local policy processes to resolve conflicts over commercial fishers fishing in the bay. Some municipal fishers report commercial vessels in municipal waters to local officials. They often turn to *barangay*

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<sup>2</sup>Secretary Sebastian, Department of Agriculture, Area Development Board Meeting, General Santos City, July 20, 1994; and Secretary Alcala, Department of Environment and Natural Resources, personal interview, July 5, 1993.

officials for assistance in stopping commercial fishing near their communities. They also complain to municipal and provincial officials. Fishers from the east coast, for example, once escorted the mayor of their municipality and PNP officers out to apprehend a commercial vessel fishing near their village. Municipal fishers also complain to provincial officials. As a result of these complaints, the Sarangani *Sangguniang Panlalawigan* (Provincial Board) drafted an ordinance to ban commercial vessels from the municipal waters of the province.

Other municipal fishers choose to directly confront commercial fishers. The fishers from the federation of fishing associations participate in the DA's *bantay dagat* program and become deputy fish wardens. They chase commercial vessels fishing near their village away or they alert local officials or PNP and Coast Guard officers. They accompany these officials to arrest the fishers aboard the commercial boat. This practice can be risky because some commercial fishers, especially at night, have weapons aboard. Nevertheless, one fisher said “*kung gobyerno ang aasahan mo, walang mangyayari*” (if you depend on the government, nothing will happen).

In sum, municipal fishers take a more active role in protecting their *de facto*, common property rights than government officials do in protecting *de jure*, state property rights. Only the *bantay dagat* program, which relies on municipal fishers to protect state property rights, occasionally leads to the arrest or deterrence of a commercial vessel in municipal waters. Nevertheless, this program is ineffective in stopping commercial vessels using trawls and ring nets in municipal waters. PNP and Coast Guard officials usually do not apprehend vessels unless local officials urge them to act. Local officials speak

out against commercial fishing in municipal waters, but they apprehend few commercial fishers. Although the ordinance before the Provincial Board, which would ban commercial boats from the bay, is the boldest step to date by local officials to resolve this conflict, officials still have not passed it. The municipal commercial fishers from General Santos lobbied aggressively to prevent the Board from passing it. Furthermore, provincial officials already have the authority to apprehend commercial fishers fishing with purse-seine nets and trawls in municipal waters by virtue of LOI 1328. The new ordinance merely adds that the province would not permit any boats more than three gross tons to fish in municipal waters. Thus, local officials already have the de jure right to stop commercial fishing in the bay, but it is municipal fishers, who attempt to protect their de facto, common property rights, that take measures to stop commercial fishers. Nevertheless, because state officials do not enforce de jure, state property rights, and municipal fishers have limited capabilities to protect their de facto, common property rights, municipal commercial fishers continue to practice de facto, quasi-private property rights to municipal fisheries.

In regard to fishers who use the "superlight" fishing technique, both municipal commercial fishers and municipal fishers pursue local policy processes to resolve this conflict. Municipal commercial fishers say that the high-powered light bulbs attract fish away from their *payaos*. Municipal fishers say that these vessels attract fish away from coastal waters. They also say that these fishers catch spawning milkfish. Local officials say that they cannot arrest superlight fishers because there is no law against fishing with high-powered light bulbs. Nevertheless, superlight fishers appear to break other laws that do

apply to their fishing method. If they fish with vessels more than three gross tons equipped with trawls or purse-seine nets (ring nets), then they are already illegal (PD 704 and LOI 1328). If they fish with fine mesh nets, as municipal fishers report, then they are illegal (PD 704). Furthermore, if they catch spawning milkfish, as municipal fishers also report, and do not throw the milkfish back into the sea, then they violate laws and ordinances against catching spawning milkfish. Still, local officials are reluctant to apprehend superlight fishers.

In sum, resource users from Sarangani Bay pursue a number of different dispute-settling processes to resolve conflicts over property rights to municipal fisheries. These include traditional systems, *barangay* systems, and local policy processes. Municipal fishers tend to pursue traditional and *barangay* systems when the conflict is between resource users from the same *barangay*. There is an ethnopolitical dimension to their selection of dispute-settling process. They prefer processes where they can educate illegal fishers and heal relationships. For conflicts among resource users from different *barangays*, municipal fishers tend to pursue local policy processes. Resource users resolve very few of their conflicts over property rights to municipal fisheries in the formal legal system. National officials, especially enforcement officials, try to push these disputes into local policy processes. Resource users resolve few of their disputes through direct negotiation. Furthermore, few of these dispute-settling processes lead to settlements where resource users agree to recognize specific property rights to municipal fisheries. As a result, property rights remain contentious (see Table 6.1).

## Coral Reefs

Resource users conflict over property rights to coral reefs. Municipal fishers from common property regimes seek to prevent fishers from using dynamite, poisons, and commercial gear over coral reefs. For the most part, they use similar dispute-settling processes as those discussed above with one important difference: fishers from regimes that manage marine reserves attempt to resolve disputes with illegal fishers that come from other *barangays* or municipalities within their own dispute-settling process. Like other municipal fishers, fishers managing marine reserves use their own management regimes to resolve disputes among fishers from their own village. In disputes with fishers from other areas, they receive support from local officials because these officials recognize their authority to manage the reserve. The difference is that these fishers' regimes initiate the dispute-settling processes with the support of local officials. Often, in local policy processes, fishers report illegal fishers to local officials. Local officials then choose whether or not to initiate the dispute-settling process. In contrast, fishers managing marine reserves ensure that local officials take action. They persuade local officials to help them bring fishers from outside their community into their dispute-settling processes.

In one marine reserve, for example, the barangay captain aggressively pursues illegal fishers and commercial vessels fishing near the reserve. He enforces the rules of the marine reserve for the marine reserve management regime, not for the local government. When the fishers from this marine reserve and the other marine reserves apprehend illegal fishers, they choose to educate the illegal fishers, on the basis of their ethnoecological knowledge,

instead of filing cases in the *barangay* system or the formal legal system. Although these fishers apprehend and educate only a few illegal fishers, they report that their dispute-settling processes significantly decrease the incidents of illegal fishing in or near the marine reserves. Thus, these fishers protect their *de jure*, common property rights to the marine reserve.

In another marine reserve, fishers successfully keep fishers away who use illegal fishing methods. Their only problem has been trying to stop fishers from their own *barangay* from fishing with poisons in the buffer zone. The fishers who use poisons fish at night with a compressor. A fisher goes under water and breathes through a hose connected to a compressor on a boat. After he locates a school of fish, he scatters a poisonous substance on them. The fishers from the marine reserve chase them away, but the fishers keep coming back. The fishers from the marine reserve fear that the fishers using the poisons may have weapons aboard their boat. Because they fish at night, the fishers from the reserve are afraid to approach them. In another reserve, municipal fishers exclude most illegal fishers from fishing in the buffer zone. Nevertheless, they are unable to apprehend these fishers because they do not have a patrol boat. Their strategy is to persuade local officials to buy a patrol boat for their reserve. Consequently, these fishers who manage these marine reserves are able to protect their *de jure* and *de facto*, common property rights to the marine reserve from some illegal fishers, but not all.

Although marine reserve fishers keep most fishers from fishing inside the sanctuary, they do not limit access to buffer zones. Any fisher using hook and line gear may fish in the buffer zone. Fishers from these marine reserves report an increase in the amount of fish. Nevertheless, their catch remains the

same because more fishers fish in the buffer zone. According to these fishers, they are also reluctant to dissuade other municipal fishers from fishing in the buffer zone because they know that these other fishers are poor and need to fish for their livelihood. Consequently, fishers who manage marine reserves protect their de jure common property rights to coral reefs from fishers using illegal gear. Nevertheless, they do not stop fishers outside their regime from fishing with passive fishing gear.

### **Mangroves**

Municipal fishers conflict with fish pond, prawn farm, salt farm, and beach-resort owners over property rights to mangrove forests. These resource users pursue the *barangay* system, state policy processes, and the formal legal system to resolve these conflicts. When a beach-resort owner began to bulldoze a mangrove area near a marine reserve, for example, the municipal fishers from the marine reserve management regime reported the incident to their *barangay* captain. The *barangay* captain forced the landowner to stop bulldozing. He brought in DENR officials in to investigate. DENR officials filed a report documenting the violations of the landowner. These officials said that they will file a court case against the landowner. In addition, these officials recommended that the fishers from the marine reserve management regime also file a case in court against the landowner. Nevertheless, while national officials prepared a case against the landowner, the landowner began to bulldoze another part of the beach, just 400 meters away. The beach resort owner, in this example, maintains his de facto, quasi-private property rights to the foreshore area adjacent to his land.

In another fishing village along the eastern coast of the bay, fishers replant mangrove, but only in areas where they have a community forestry lease from the DENR. They choose not to plant mangroves in areas where there are property rights conflicts. According to these fishers, projects in areas where they have disputes with private landowners over property rights usually fail. Without recognition of their property rights by national officials, they say that they have difficulty preventing landowners from removing mangroves. Thus, municipal fishers are unable to protect their de facto, common property rights to mangroves unless national officials award them de jure, common property rights through community forestry leases.

On the northeast coast of the bay, municipal fishers file court cases against prawn farm and salt farm owners for cutting mangroves in the foreshore area. With the assistance of an NGO, these fishers bypass barangay, local, and state dispute-settling processes and file cases in the formal legal system. The judge orders DENR officials to investigate these cases and file reports. The prawn and salt farm owners seek to protect their de facto, quasi-private property rights to the foreshore area adjacent to their property by delaying rulings in these cases. To date, these cases have remain unresolved for more than six years. As a result, property rights to mangroves in this area remain contentious (see Table 6.1).

In these examples, resource users use three dispute-settling processes to resolve their conflicts over property rights to mangroves -- the *barangay* system, state policy processes and the formal legal system. Those processes that lead to de jure, common property rights for municipal fishers get other resource users to recognize these rights. Other processes, especially the

formal legal system, fail to resolve these disputes. In these mangrove areas, private landowners and organized municipal fishers continue to compete for de facto, quasi-private and de facto, common, property rights respectively. Other municipal fishers continue to practice de facto, open access property rights to mangroves (see Table 6.1).

### Key Factors in Resolving Disputes over Property Rights

In Table 6.2, I summarize the key factors in resolving property rights disputes. These key factors include the degree of organization among the property regimes involved in the dispute; the assets available to each property regime to resolve the dispute (i.e., economic, social, cultural, and political); the degree to which the disputants have opportunities to debate and share their knowledge of the resources; and the degree to which the disputants agree to recognize specific property rights.

In the two disputes where the dispute-settling process does not change property rights, the property regimes involved in the dispute are organized. One of these disputes is confrontational. The other allows the disputants to debate and share their knowledge of the resources. In each dispute, the property regime that maintains property rights has significantly more economic or political resources than the other regime. Fishing magnates and national officials, for example, are well-organized regimes. Although they exchange their knowledge about the effects of purse-seine nets on tuna fisheries, the economic resources of the fishing magnates enable them to maintain their quasi-private property rights to tuna fisheries. Tuna exporters and Indonesian officials are also organized regimes. Nevertheless, the political resources of Indonesian

officials enable them to protect their de jure, state property rights. Tuna exporters lack the political and economical resources necessary to negotiate agreements with foreign governments.

In the four conflicts where property rights are contentious, the common factors are the confrontational nature of these disputes and the limited opportunities for the resource users to debate and exchange their knowledge of the resources. The first conflict is over property rights to *payaos*. It involves an organized regime, SOCOPA, versus several somewhat organized municipal tuna fishers' associations. The vast economic and political resources of the fishing magnates allow them to avoid debating and discussing property rights to *payaos* with the municipal tuna fishers. Municipal tuna fishers are unable to negotiate agreements with the fishing magnates.

The second conflict is over property rights to municipal fishers. It involves two organized property regimes. The municipal commercial fishers have the economic resources to maintain their de facto, quasi-private property rights. Provincial officials may use their political resources to enforce their de jure, state property rights. The confrontational nature of this dispute and the lack of dialogue among these resources users leads to contested property rights. Only recently have the resource users from these regimes started to debate and exchange their knowledge about the impact of commercial vessels on municipal fisheries.

The conflict over property rights to mangroves is the third conflict where property rights are contentious. It involves organized regimes. Because of the lack of opportunities to confront prawn farm, salt farm, and beach resort owners who remove mangroves, municipal fishers file court cases against them.

Nevertheless, the economic and political resources of these land owners enable them to keep these cases pending in the courts. Furthermore, the court system does not provide opportunities for the resource users to exchange their knowledge about the impacts of their resource use practices.

The fourth conflict is over property rights to municipal fisheries. It involves unorganized municipal fishers' regimes and illegal fishers. These resource users have limited opportunities to debate and share their knowledge about the impacts of their resource use practices. Unorganized municipal fishers often lack the economic, political, social, and cultural resources to force fishers using illegal gear into a dispute-settling process.

In the three disputes where resource users recognize specific property rights to resources, organized property regimes have opportunities to debate and share their knowledge about resources. The fishing magnates and tuna exporters, for example, work out an agreement together to clarify property rights to *payaos*. The fishing magnates also use their economic resources to work out agreements directly with Indonesian officials to give them quasi-private property rights to Indonesian fisheries. Finally, municipal fishers who manage marine reserves use their political, social, and cultural resources to get other resource users to recognize their property rights to coral reefs. The dispute-settling processes they use permit fishers using destructive gear and fishers who manage the reserves to discuss the impacts of destructive fishing gear on the resources.

The results of dispute-settling processes not only affect property rights, but they also affect other institutional arrangements and the resources. In the

next section, I discuss the effects of conflicts over property rights on institutional arrangements and coastal resources.

### Effects of Conflicts Over Property Rights on Institutional Arrangements and Coastal Resources

Conflicts over property rights to coastal resources affect institutional arrangements. These conflicts, and the dispute-settling processes that resource users use to resolve their conflicts, affect the ability of property regimes to establish or maintain property rights to resources. They also affect the supply and condition of the resources.

In Chapter Four, I introduced criteria to measure the effects that conflicts among resource users have on the ability of property regimes to establish or maintain property rights to resources. The criteria to measure the effectiveness of property regimes include efficiency and stability. The criterion to measure the affects of conflicts on resources is sustainability. In this section, I use these criteria to describe the impacts that conflicts over property rights have on property regimes and coastal resources in Sarangani Bay.

#### **Efficiency**

In Chapter Four, I defined efficiency as (1) the degree to which resource users maintain their property rights; and (2) the relative cost for resource users to maintain their property rights. On the basis of the outcomes from the

dispute-settling processes that resource users use to resolve their conflicts, I determine if each property regime is not efficient, somewhat efficient, or efficient in maintaining their property rights to resources. Table 6.3 summarizes this information.

### *State Property Regimes*

National officials in some cases protect their de jure, state property rights to resources. In other cases, other resource users maintain their de facto property rights. Although purse-seine vessels catch large quantities of juvenile tuna, national officials choose not to adopt a new policy that would increase the minimum mesh size for purse-seine nets. Because the national government's fish port will rely on commercial fishers to land large quantities of fish, they choose to allow them to continue to have de facto, quasi-private property rights to tuna fisheries. National officials are also reluctant to get involved in the dispute over the use of commercial vessels in the bay because it is highly controversial. In some mangrove areas, national officials protect their de jure, state property rights by granting de jure, common property rights through community forestry leases. In other mangrove areas, de facto, quasi-private, common, and open access property rights prevail. Finally, through the *bantay dagat* program, national officials, with the assistance of NGOs, protect their de jure property rights to municipal fisheries by supporting the de facto property rights of municipal fishers. Nevertheless, municipal fishers who participate in the program rely more on traditional processes and the *barangay* system, not state policy processes, to resolve these property rights conflicts.

The cost of getting resource users to observe state property rights and regulations is high. National officials protect fishers from pirates through the CAFGU program. They rely on the Coast Guard, with limited funds, to enforce other fishery regulations. Although the *bantay dagat* program is somewhat successful, it still relies heavily on the cooperation of NGOs, local officials, and municipal fishers. Thus, national officials are "somewhat efficient" in maintaining their de jure, state property rights.

Local officials do not fully protect their de jure, state property rights to municipal fisheries. The Local Government Code provides local officials with the opportunity to control access to municipal fisheries, but local officials have yet to develop and implement new rules and regulations. Local officials pass ordinances against illegal fishers; however, they usually apprehend illegal fishers only when municipal fishers persuade them to take action. Furthermore, the Code creates competition among local government units for de jure, state property rights to municipal fisheries. General Santos City officials and Sarangani provincial officials, for example, conflict over the use of commercial vessels in Sarangani Bay.

The high cost of enforcement limits the effectiveness of local officials to get resource users to comply with their de jure, state property rights. The cost of equipment and personnel limit their enforcement capabilities. Furthermore, local officials often gain more benefits by allowing de facto property rights to prevail. Because they rely on the financial and political support from certain groups of resource users, they choose to support de facto, quasi-private and common property rights instead of de jure, state

property rights. On the basis of these results, local officials are "somewhat efficient" in maintaining their de jure, state property rights.

### *Private Property Regimes*

The fishing magnates, for the most part, maintain their de facto, quasi-private property rights to tuna fisheries. The CAFGU program helps the fishing magnates to deter pirates. Their agreements with Indonesian officials enable them to maintain quasi-private property rights to Indonesian fisheries. Only the municipal tuna fishers, who continue to fish around their *payaos*, contest their property rights

The cost to get other resource users to recognize their property rights is moderate. National officials shoulder the cost for the CAFGU program. The fishing magnates successfully persuade national officials not to increase the minimum mesh size for purse-seine nets. Although their agreements with Indonesian officials are costly, their ability to fish in Indonesian waters greatly increases their catch. On the basis of these results, the fishing magnates are "somewhat efficient" in maintaining their de facto, quasi-private rights to tuna fisheries.

Tuna exporters are, to a certain extent, able to maintain their de facto property right to tuna fisheries. The CAFGU program protects their fishers from pirates. They successfully lobby with the fishing magnates and local officials to get national officials to build the fish port, which will provide important facilities for them. Nevertheless, even though they believe that purse-seine vessels catch large quantities of juvenile tuna, they are unable to limit the catch of purse-seine vessels. Instead, they choose to make

agreements with the fishing magnates to permit them to fish around *payaos*. On the basis of these results, tuna exporters are "somewhat efficient" in maintaining their de facto, quasi-private property rights to tuna fisheries.

Municipal commercial fishers, to a certain extent, maintain their de facto, quasi-private property rights to municipal fisheries. They induce a certain level of tolerance from municipal fishers by sharing part of their catch with the municipal fishers who observe their operations. In their dispute with provincial officials over property rights to fish in the bay, they have the support of hundreds of fish workers from General Santos. Because of their importance to the local economy, they persuade national and local officials to allow them to maintain their property rights. Nevertheless, the new provincial ordinance, if passed and enforced, threatens their property rights. On the basis of these results, they are "somewhat efficient" in maintaining their de facto, quasi-private property rights to municipal fisheries.

Fish pond, prawn farm, salt farm, and beach-resort owners maintain their de jure and de facto, quasi-private property rights to foreshore areas. They often remove mangroves from the foreshore areas without penalty. They build structures in the foreshore area to keep other resource users away. Although, municipal fishers file cases against them in court for cutting mangroves, these cases are still pending after years in the court system. The cost to keep these cases in court are significant, but enable them to maintain their property rights. On the basis of these results, they are "somewhat efficient" in maintaining their de facto, quasi-private property rights to foreshore areas.

### *Common Property Regimes*

Municipal tuna fishers struggle to establish de facto, common property rights to tuna fisheries. They are unable to work out agreements with the fishing magnates to allow them to fish around their *payaos*. They also are unable to work out agreements with Indonesian officials to fish in Indonesian waters. They do not participate in the dispute over the minimum mesh size for purse-seine nets. On the basis of these results, they are "not efficient" in establishing de facto, common property rights to tuna fisheries.

Municipal fishers who are unorganized struggle to protect their de facto, common property rights to municipal fisheries. Although some are successful at getting other fishers in their village to recognize their property rights, they cannot protect their property rights from fishers from other places. In contrast, municipal fishers who are organized are able to protect their de facto, common property rights. With the assistance of NGO representatives, they place artificial reefs, fish shelters, fish cages, and *payaos* in coastal waters. They attempt to educate the fishers they catch using destructive fishing methods on the importance of protecting fish habitats. Thus, on the basis of these results, unorganized municipal fishers are "not efficient" in maintaining their de facto, common property rights to municipal fisheries; organized municipal fishers are "somewhat efficient" in maintaining their de facto, common property rights to municipal fisheries.

Municipal fishers who manage marine reserves, or who have community forestry leases, are able to protect their de jure and de facto, common property rights to coral reefs and mangroves respectively. Their property regimes successfully induce other fishers to follow the rules of their regime.

They are, to a certain extent, able to exclude others from these areas. Nevertheless, without the support they receive from local and NGO officials, their ability to protect their property rights would diminish. On the basis of these results, municipal fishers who manage marine reserves or who have community forestry leases are "somewhat efficient" in establishing and maintaining de jure or de facto common property rights to coral reefs and mangroves.

### Stability

As discussed in Chapter Four, stability is the degree to which property regimes are able to adapt to changes within and outside the regime. To maintain their property rights, resource users must adapt to changes in technology, socio-economical conditions, and political conditions. On the basis of how each property regime is able to adapt to these changes, I determine if each property regime is a not stable, somewhat stable, or stable regime. Table 6.3 summarizes this information.

### *State Property Regimes*

National officials play an important role in the rapid economic development of the Sarangani Bay area. On one hand, through loans and grants from other countries, national officials provide the facilities and infrastructure for resource users to exploit coastal resources. The new airport, fish port, and Makar wharf expansion, for example, provide opportunities for fishers to earn more from their catch. The newly paved coastal roads allow beach resort owners to earn more by making it easier for

people to reach their facilities. On the other hand, national officials place few restrictions on resource users. They choose to delay the passage of the FAO to increase the minimum mesh size for purse-seine nets. They choose not to develop policies or laws to regulate the use of new fishing gear, namely *payaos* and artificial reefs. Thus, instead of regulating the use of resources, they choose to increase access to resources. Furthermore, resource users continue to use state policy processes and the formal legal system to resolve some of their resource conflicts. Consequently, national officials have "stable" property regimes.

The passage of the Local Government Code increases the de jure, state property rights of local officials to coastal resources. Similar to national officials, local officials are more active in increasing access to resources than limiting access. Resource users choose to resolve many of the conflicts over property rights in *barangay* and local policy processes. Consequently, local officials may not limit access to resources, but they play an important role in how resource users resolve their conflict over property rights. This role will increase if they fully implement the powers in the Local Government Code. Thus, local officials have "stable" property regimes.

### *Private Property Regimes*

Throughout the rapid development of the fishing industry in General Santos, the fishing magnates have developed successful businesses. They thwart all attempts to limit their access to tuna fisheries. The major threat to the stability of their property regime is the decline in Philippine tuna fisheries.

Nevertheless, their recent agreements with Indonesian officials give them access rights to more tuna fisheries. Thus, their private property regime is "stable."

Technological and political change threatens the stability of the tuna exporters' property regime. The decline in tuna, partly caused by the catching of juvenile tuna in purse-seine nets, limits the catch of tuna exporters. Many of them have gone out of business or cut back on the number of fishing trips that they finance. The political decision by Indonesian officials to limit access to Indonesian fisheries limits the areas where the tuna exporters may fish. Although the facilities of the new fish port will help them, they face an uncertain future because of the decline in adult yellowfin tuna and limited access to Indonesian fisheries. Thus, their property regime is "somewhat stable."

For more than twenty years, municipal commercial fishers have fished inside Sarangani Bay. The economic resources of these fishers made them leaders of the local fishing industry. Nevertheless, several recent technological and political changes threaten the stability of their property regimes. First, fishers using the superlight method attract fish away from their *payaos*. Second, over the past two years, the number of commercial vessels fishing in the bay on a regular basis has increased from eleven to fifteen. Third, on some occasions, municipal fishers persuade local officials to apprehend fishers aboard commercial boats. Fourth, industries continue to pollute important fish habitats despite the efforts of municipal commercial fishers to stop them. Finally, the provincial ordinance, if passed and enforced, will limit their access to fish in the bay. These factors threaten the stability of their property regime. Thus, their property regime is "somewhat stable."

Political and social changes threaten the stability of the property regimes of fish pond, prawn farms, salt farm, and beach-resort owners. Municipal fishers are competing more aggressively with them for access rights to foreshore areas. Some local officials support these municipal fishers. Although the rapid economic growth of the area greatly enhances the businesses of these land owners, the rapid population growth in the area increases demand for access to foreshore areas. Furthermore, the prawn farms around the bay experience a great deal of fluctuation in their harvests. They have not been able to produce a steady supply of prawns. Additionally, the salt farm and beach resorts are new businesses in the area. The stability of these regimes is still being tested. Consequently, taken together, the property regimes of these coastal land owners are "somewhat stable."

#### *Common Property Regimes*

Technical and economic changes threaten the stability of municipal tuna fishers' property regimes. Their attempts to buy pumpboats with improved cold storage facilities, finance their own fishing trips, and place their own *payaos* fail because they lack capital. Since the consulting firm scandal, their cooperatives cannot receive new loans. Their attempts to establish property rights to fish around *payaos* and to fish in Indonesian waters fail. Consequently, the members of these regimes are less active than before. Their property regimes are "not stable."

Technical and socio-economic changes threaten the stability of unorganized municipal fishers' property regimes. Although many of the fishers from these regimes have fished for several decades, their inability to adapt to

technical and socio-economic change decreases the effectiveness of their regimes. They face more and more competition for fishery resources from the large number of people who migrate to the bay. Fishers from unorganized regimes are unable to keep commercial vessel and fishers using illegal fishing methods away from municipal fisheries and coral reefs. In addition, they are unable to prevent private land owners from clearing mangrove areas to make room for their businesses. The property regimes of these fishers are "not stable."

Municipal fishers from organized property regimes must also adapt to technical and socio-economic changes. They have adopted rules and strategies that protect their common property rights. Their ability to protect their property rights has increased in recent years. Through their ethnopolitical strategies, they have, in some cases, changed their de facto property rights to de jure property rights. Nevertheless, commercial fishers continue to fish in the bay, land owners continue to cut mangrove without penalty, and fishers still use destructive fishing gear in the bay. These threats are sufficient to make the property regimes of organized municipal fishers "somewhat stable."

### **Sustainability**

Sustainability is the criterion I use to measure the effects that resource use conflicts have on the supply and condition of coastal resources. In Chapter Four, I defined sustainability as the degree to which the use of resources compromises the ability of future generations to use the resources (Feeny et al., 1990:5). Table 6.4 shows the effects of institutional arrangements and resource use conflicts on resources.

### *Tuna Fisheries*

Resource users from Sarangani Bay report declines in tuna fisheries, especially in adult yellow fin tuna. The fishing magnates acknowledge that they place their *payaos* farther and farther from Sarangani Bay because of the decline in the supply of tuna in waters near Sarangani Bay. Nevertheless, the results from dispute-settling processes show that resource users choose to follow the same institutional arrangements that keep fishing effort at a high level for tuna fisheries. The arrangements made between the fishing magnates and Indonesian officials, coupled with the construction of the fish port in General Santos City, are likely to increase the pressure on tuna fisheries. The tuna exporters and municipal tuna fishers are unable to change institutional arrangements to protect juvenile tuna. As a result, tuna fishers from Sarangani Bay pursue unsustainable tuna fishing practices.

### *Municipal Fisheries*

Resource users from Sarangani Bay report a decline in municipal fisheries over the past five years. Although the results from dispute-settling processes show the ability of some resource users to reduce the number of incidents involving fishers using destructive methods, fishers continue to use destructive fishing techniques in many parts of the bay. Additionally, resource users choose to place few restrictions on fishing effort. Over the past two years, fishing companies added four more commercial vessels that fish in Sarangani Bay on a regular basis. Commercial vessels from other parts of the Philippines also fish in the bay. Unless provincial officials pass and enforce their ordinance

banning commercial vessels from the bay, fishing effort will remain high. Although some fishers adopt sustainable fishing strategies (e.g., those who manage marine reserves), the current level of fishing effort appears to be unsustainable. Nevertheless, there is a lack of base line data to determine the status of fish stocks in the bay. Furthermore, there have been few opportunities for fishers to debate, on the basis of their knowledge, whether or not municipal fisheries are in decline. Consequently, the sustainability of municipal fisheries is unclear.

#### *Coral Reefs and Mangroves*

Resource users report decreases in coral reef and mangrove areas around the bay. Results from dispute-settling processes show the inability of some resource users to prevent other resource users from degrading these resources. Only areas where resource users recognize the common property rights of municipal fishers to manage marine reserves or mangroves show sustainable resource practices. As a result, coral reef and mangrove areas that organized municipal fishers do not manage show unsustainable resource practices. Those that organized municipal fishers' property regimes manage show sustainable uses.

When resource users have an opportunity to share their knowledge about the effects of specific resource use practices on the resources, they are more likely to develop institutional arrangements that lead to sustainable uses. In cases where resource users deplete resources, the dispute-settling processes that resource users use exclude the knowledge of some resource users. In conflicts over property rights to tuna fisheries, for example, state

policy processes do not consider the knowledge that tuna exporters and municipal tuna fishers have about the effects of catching juvenile tuna. In conflicts over property rights to municipal fisheries, local policy processes do not allow commercial and municipal fishers to discuss their knowledge of the effects of commercial fishing on municipal fisheries. Furthermore, in conflicts over property rights to coral reefs and mangroves, local policy processes do not allow resource users to debate the impacts of resource practices on these resources. Only traditional and *barangay* systems allow resource users to express their ethnoecological knowledge in disputes over the use of dynamite and poisons. Consequently, the inability of resource users to resolve their conflicts over property rights to the bay's resources leads to unsustainable resource use practices.

In sum, state property regimes are somewhat efficient, stable regimes. Although resource users often follow de facto property rights rather than de jure, state property rights, they are more likely to use state dispute-settling processes -- *barangay* systems, local policy processes, state policy processes, and the formal legal system -- to resolve their conflicts over property rights to resources. Private property regimes are somewhat efficient regimes because of their ability to maintain their de facto, quasi-private property rights. All of them have somewhat stable regimes except for the fishing magnates who have stable regimes. Unorganized, common property regimes are inefficient and unstable regimes because of their inability to establish de facto property rights. Organized common property regimes are somewhat efficient and somewhat stable because of their ability to establish de facto and de jure, common

property rights. Only the property regimes of organized municipal fishers have shown the ability to manage resources, to a certain degree, sustainably.

In conclusion, the results from dispute-settling processes answer the question I pose at the beginning of the chapter: To what extent do current dispute-settling processes and other institutional arrangements lead to the depletion and degradation of coastal resources in Sarangani Bay? The answer is that to a significant extent they lead to the depletion and degradation of Sarangani Bay's coastal resources. I identify three reasons why current institutional arrangements are inadequate. First, resource users rely on local officials to resolve many of their conflicts over property rights. In some cases, local officials lack the capabilities and resources to adequately resolve these disputes. In other cases, the benefits from resources concern local officials more than sustainable management. Thus, some local officials selectively support the property rights of property regimes that provide the most political or economic support. Second, resource users contest a number of different types of property rights. This competition for property rights leads to more intensive resource uses. Third, resource users lack opportunities to debate and share their knowledge about the effects of their resource use practices on the resources. In the next and final chapter, Chapter Seven, I discuss the implications of these results.

Table 6.1. Choice of Dispute Settling Processes

Conflict	Process	Predominant Property Right
Fishing magnates v. National officials, tuna exporters, and municipal tuna fishers: Property rights to catch juvenile tuna	National policy process and Direct negotiation	Unresolved: Fishing magnates maintain de facto, quasi-private property rights.
Fishing magnates v. Municipal tuna fishers: Property rights to <i>payaos</i>	None	Unresolved: Fishing magnates maintain de facto, quasi-private property rights.
Fishing magnates v. Tuna exporters: Property rights to <i>payaos</i>	Direct negotiation	Resolved: Fishing magnates and tuna exporters share de facto, Q-PPR.
Fishing magnates v. Indonesian officials: Property rights to Indonesian fisheries	Direct negotiation	Resolved: Indonesia retains de jure, SPR and the fishing magnates establish de jure, Q-PPR.
Tuna exporters and municipal tuna fishers v. Indonesian officials: Property rights to Indonesian fisheries	None	Unresolved: Indonesian officials maintain their de jure, state property rights.
Commercial fishers v. Municipal fishers: Property rights to municipal fisheries	Local policy processes	Pending: Commercial retain de facto, quasi-private property rights while local officials debate the issue.
Unorganized municipal fishers(a) v. Fishers using illegal gear: Property rights to municipal fisheries	<i>Barangay</i> and local processes	Unresolved: Fishers using illegal gear retain de facto, open access property rights.
Organized municipal fishers (b) v. Fishers using illegal gear: Property rights municipal fisheries and to coral reefs	Traditional and <i>Barangay</i> processes	Resolved: Marine reserve fishers maintain de jure, common property rights.
Prawn farm owners v. Municipal fishers: Property rights to mangroves	Courts	Pending: Prawn farm owners retain de facto, quasi-private property rights.

(a) Municipal fishers not part of a common property regime (CPR). (b) Municipal fishers from a CPR (i.e. marine reserves, fishing associations, or cooperatives)

Table 6.2. Key Factors in Disputes

Conflict	Key Factors	Results
Fishing magnates v. National officials: Property rights to Philippine fisheries	Organized regimes; process allows disputants to debate rules and regulations.	No change in property rights
Tuna exporters v. Indonesian officials: Property rights to Indonesian fisheries	Organized regimes; confrontational without much dialogue among the disputants.	No change in property rights
Fishing magnates v. Municipal tuna fishers: Property rights to <i>payaos</i>	Municipal tuna fishers only somewhat organized; no dialogue.	Property rights are contentious
Commercial fishers v. Local officials and Municipal fishers: Property rights to municipal waters	Organized regimes; confrontational, although recently cooperative dialogues have begun.	Property rights are contentious
Prawn farm and beach resort owners v. Municipal fishers (b): Property rights to mangroves	Organized regimes; confrontational with no dialogue.	Property rights are contentious
Unorganized municipal fishers(a) v. Fishers using illegal gear: Property rights to municipal fisheries	Unorganized regimes; limited opportunities for dialogues among disputants.	Property rights are contentious
Fishing magnates v. Tuna exporters: Property rights to <i>payaos</i>	Organized regimes; process allows disputants to share knowledge and cooperate.	Recognized property rights
Fishing magnates v. Indonesian officials: Property rights to Indonesian fisheries	Organized regimes; at first, confrontation; later, negotiations led to cooperative arrangements	Recognized property rights
Organized municipal fishers (b) v. Fishers using illegal gear: Property rights to municipal fisheries and coral reefs	Organized and somewhat organized regimes; confrontational at first; later the use of ethnopolitical and ethnoecological knowledge helps to resolve disputes.	Recognized property rights

(a) Municipal fishers not part of a common property regime (CPR). (b) Municipal fishers from a CPR (i.e. marine reserves, fishing associations, or cooperatives)

Table 6.3. Evaluation of the Effects of Conflicts over Property Rights on Property Regimes

Property Regime	Organized	Efficient	Stable
<u>Tuna Fisheries</u>			
National officials	organized	somewhat	stable
Fishing magnates	organized	somewhat	stable
Tuna exporters	organized	somewhat	somewhat
Municipal tuna fishers	somewhat	not efficient	not stable
<u>Municipal Fisheries</u>			
Local Officials	organized	somewhat	stable
Commercial fishers	organized	somewhat	somewhat
Municipal fishers	unorganized	not efficient	not stable
Municipal fishers (with assistance from NGOs)	organized	somewhat	somewhat
<u>Coral Reefs</u>			
National and local officials	organized	somewhat	stable
Municipal fishers	unorganized	not efficient	not stable
Municipal fishers (with marine reserves)	organized	somewhat	somewhat
<u>Mangroves</u>			
National and local officials	organized	somewhat	stable
Fish, prawn, and salt pond owners and beach-resorts	organized	somewhat	somewhat
Municipal fishers (with assistance from NGOs)	organized	somewhat	somewhat
Municipal fishers (with marine reserves)	organized	somewhat	somewhat

Table 6.4. Evaluation of the Effects of Institutional Arrangements on Coastal Resources

Resource	Sustainable	Type of Knowledge Used in the Dispute-settling Processes
Tuna fisheries	unsustainable	National officials' scientific knowledge presented.
Municipal fisheries	unclear	Scientific and ethnoecological knowledge presented in disputes over the use of destructive gear (i.e. dynamite, poisons, and fine-mesh nets), but not in disputes over commercial fishing in the bay.
Coral reefs (in general)	unsustainable	National officials' scientific knowledge presented.
Coral reefs (marine reserves)	somewhat	Municipal fishers' ethnoecological knowledge and NGO and government officials' scientific knowledge presented.
Mangroves (in general)	unsustainable	National officials' scientific knowledge presented.
Mangroves (community forestry leases)	somewhat	National officials' scientific knowledge and municipal fishers' ethnoecological knowledge presented.

## CHAPTER SEVEN

### Institutional Change in Sarangani Bay

It is often said that one of the primary causes of conflict over property rights is that technology and market changes occur rapidly, whereas institutional structure and legal definitions of ownership change slowly. For this reason, institutions are inevitably years or decades behind economic and social reality (Church, 1982:113).

Institutional change is a complex process that is difficult to analyze and describe. Church (1982:113), in the quote above, states that conflicts over property rights to resources are the result of the inability of resource users to change institutional arrangements fast enough to keep pace with changes in technology and markets. Consequently, these unresolved conflicts often lead to the depletion and degradation of resources.

Certainly, this is the case in Sarangani Bay where the demand for fresh tuna, marlin, and prawns in Japanese and other overseas markets greatly changes the way resource users compete for Sarangani Bay's resources and surrounding fisheries. Furthermore, the introduction of new fishing technologies, namely purse-seine nets, ring nets, and prawn operations, by fishing entrepreneurs significantly change the way resource users extract the resources. But are technological and market changes the leading causes of conflicts over property rights to coastal resources in Sarangani Bay? Are they the reasons why current institutional arrangements lead to the degradation

and depletion of resources? Do they cause institutional change in Sarangani Bay?

In this chapter, I argue that although changes in markets and technology may lead to conflicts, resource depletion, and institutional change, they are not the only causes. I argue that an analysis of the way resource users resolve their conflicts over property rights reveals other important factors as to why conflicts, resource depletion, and institutional change occur. I also argue that these additional factors show that institutions do not necessarily have to be "years or decades behind" technological and market changes. Some dispute-settling processes show that resource users have the ability to effectively respond to socio-economic change.

In the previous chapter, I showed that, on one hand, most institutional arrangements for Sarangani Bay's coastal resources fail to adequately resolve conflicts over property rights. As a result, resource users degrade and deplete the bay's coastal resources. I concluded that the results from the dispute-settling processes show: (1) a reliance on local officials to resolve many of these disputes; (2) intense competition for property rights to resources; and (3) the lack of opportunities for resource users to debate and share their knowledge about the effects of resource use practices on the resources.

On the other hand, I pointed out that the results of some dispute-settling processes show that resource users effectively change institutional arrangements in ways that lead to more sustainable management of the resources. These resource users institute arrangements and dispute-settling processes where they take more responsibility for resolving their conflicts, work to get other resource users to recognize their property rights, and provide

opportunities for resource users to share their knowledge about the impacts of resource uses on the resources.

Therefore, in this chapter, I argue that to improve resource management, institutional analysts should examine the ways resource users resolve conflicts. To illustrate this point, I first examine why resource users often choose to have local officials resolve their disputes. Second, I discuss why property rights are contentious. Third, I discuss the important factors in dispute-settling processes that lead to more effective management practices.

### Reliance on Local Officials

In Chapter Six, I concluded that resource users often rely on local officials to resolve or attempt to resolve their conflicts over property rights to coastal resources. This situation is not surprising because local officials are physically, politically, and socially close to resource conflicts (World Bank, 1989:53).

Another observation I make is that the resource users that represent the local elites -- fishing magnates, municipal commercial fishers, and prawn and salt farm owners -- effectively keep conflicts from being resolved unless they can work out agreements directly with whom they conflict. These results should also not be surprising to researchers who study natural resource management in the Philippines. Elites, through political and economic connections with state officials, control property rights to natural resources in the Philippines (Broad and Cavanagh, 1993:46; Kummer, 1992:154; and Porter

and Ganapin, 1988:13). The formal legal system reflects this situation because property rights cases filed against elites usually end up unresolved. One study, for example, showed that 66 out of 70 environmentally related cases in the Philippines taken to court are still pending, mostly because it is to the defendants (usually elites) advantage to keep them pending (Lynch and Talbott, 1988:708). In Sarangani Bay, this trend continues. The court case filed by municipal fishers against a prawn farm operator who removed mangroves from the foreshore area is still pending.

Thus, in this section, I seek to answer two questions: (1) How do the results of this study fit into theories on Philippine politics? (2) Why do resource users depend on local officials to resolve their dispute over property rights to coastal resources?

### **Philippine Politics**

Social scientists offer three social conflict models for Southeast Asian countries like the Philippines -- the patron-client model, the primordial model, and the class conflict model (Scott, 1972:91-92). Applying these models to competition for property rights to coastal resources, the patron-client model describes conflicts as competition among resource users from different factions. Patron-client relationships link people from different social classes to form a faction. The primordial model describes conflict as competition among resource users from different clans. A common language, ethnicity, religion, and legal code unite individuals within each clan, or tribe. The class conflict model describes conflicts as competition among resource users from different social classes. This model suggests that people from lower social classes

compete with people from higher classes for property rights (Scott, 1972:91-92). Do these models apply to conflicts over property rights to Sarangani Bay's coastal resources? Do they explain why resource users rely on local officials to resolve their disputes? Below, I seek to answer these questions.

### *Inter-faction Competition*

The patron-client model partly explains why resource users choose local officials to resolve their disputes. This model, also called the factional model, describes Philippine political relations as dyadic, vertical linkages among people from different social classes. Dyadic alliances are mutual exchanges of benefits and favors among people of different social classes (Landé, 1968:95). In patron-client relations, individuals develop their relationships on the basis of mutual trust. *Utang na loob* (debt of gratitude) is a Filipino cultural trait that requires people to return the favors of someone who helps them when they are in need. People refer to those who do not return these favors as being *walang hiya* (without shame) (Wurfel, 1988:34). Individuals develop their patron-client networks through family ties, which are central to Filipino society. They also use the *kumpane* system, which links the sponsors for baptisms and weddings to the family, to expand their networks (Wurfel, 1988:35).

Through patron-client relationships, Filipinos practice pragmatic politics. Individuals assess how developing a patron-client relationship will support their self-interests in the short-term. Ideological political ties exist, but they are not that prevalent compared to pragmatic political ties (Landé, 1965:10; and Wurfel, 1988:36). Clients, who are usually from poorer social classes, provide personal services and loyalty as well as votes during elections to patrons, who

usually come from wealthier social classes (Wurfel, 1988:35). Political candidates, for example, develop extensive networks through patron-client relations. In exchange for votes, candidates, if elected, spread the spoils of the election -- employment, government permits and licenses, and protection from legal problems or penalties -- to individuals in their networks (Landé, 1968:94). These networks link rural villagers, city dwellers, local elites, local politicians, national elites, and national politicians into the same faction (Landé, 1977:86).

Because of patron-client politics, personal interests concern people more than class interests (Landé, 1968:95). Their vertical relationships stifle collective action among people of the subordinate classes (Landé, 1977:86). The most intense rivalries are among people from the same social class competing for the spoils from elections (Landé, 1977:95). As a result, patron-client relationships minimize interclass hostilities and reduce the hostilities among organized groups. The factional model produces a political system that has high distributive capabilities but low regulatory capabilities (Landé, 1977:88).

Because local officials have control over resources, they may support and protect the practices and property rights of resource users in their factions. In return, they may receive benefits from these resource users in the form of financial or political support. At the same time, they have limited abilities to formulate and implement effective resource management programs. This inhibits their ability to limit access to resources. It is up to the resource users, whose practices local officials support, to limit access to resources. In other words, the resource users who practice de facto property rights must limit access without relying on the resources and actions of local officials.

Because patron-client politics minimizes interclass competition, competition for resources comes from people from different factions and not from organized groups of individuals who come from the same social class. Consequently, economic elites develop patron-client relations to control property rights to resources (Porter and Ganapin, 1988:44).

In Sarangani Bay, for example, the fishing magnates maintain their *de facto* property rights to tuna fisheries partly through patron-client relationships. Their economic resources help them to build strong factional networks that some national officials, who want to limit their catch of juveniles, cannot compete against. These state officials cannot implement a resource management strategy that may go against the property rights of the fishing magnates. Nevertheless, Indonesian officials, who are outside the control of the magnates' factional networks, can limit the practices of the fishing magnates in Indonesian waters.

The conflict over commercial fishing in the bay has developed partly because of factional politics. The patron-client relationships that extend between General Santos City officials, the municipal commercial fishers from General Santos, and the fish workers who depend on the municipal commercial for employment, are being challenged by a faction made up of provincial officials and municipal fishers. In another conflict, these adversarial resource users join to form a faction to contest fishers who use superlights in the bay. Both of these cases show that conflicts over property rights to municipal fisheries involve local officials through their client-patron relationships and their legal authority.

The factional model also helps to explain why disputes over the use of destructive fishing gear pit municipal fishers from lower social classes in competition against one another for de facto property rights. Fishers using destructive gear use their factional ties with government officials to encourage officials not to stop their practices. Several different groups of municipal fishers said that the *kumpare* and *palakasan* systems keep local officials from enforcing fishery regulations against certain fishers using illegal fishing gear. Other municipal fishers use their dyadic links to encourage local officials to stop these fishing practices. In both cases, local officials support the de facto property rights of the fishers within their factions, not state property rights.

#### *Inter-clan Competition*

The primordial model helps to partly explain the dynamics of some municipal fishers' common property regimes. Resource users who share a common language, religion, and ethnicity have migrated to Sarangani Bay from the Visayan Islands, Mindanao and the Sulu Islands chain. Because these migrants mix with other residents of the bay, most fisherfolk speak Cebuano even though their native dialect may be another language. Therefore, religion and ethnicity are the factors that, in some cases, divide resource users -- most notably Muslims and Christians.

Although conflicts among Muslim and Christian resource users are more intense over property rights to land, these conflicts still affect property rights to coastal resources. Piracy, the use of destructive fishing gear, and squatters on coastal lands are the major coastal resource conflicts between these groups. National officials, through the CAFGU program, play a role in resolving

the piracy problem by using force. In the latter two conflicts, local officials play an important role. Even though most local officials identify with one of these religious groups, they are more likely to resolve these disputes cautiously because of the tension among Muslims and Christians. They try to avoid intensifying a conflict among these groups out of fear that the conflict may become violent. Thus, local officials are more likely to support the de facto property rights of an ethnic clan, than impose state property rights on them.

### *Interclass Competition*

The class conflict model examines why there is cooperation and conflict among people from different social classes over the distribution and use of resources. It contrasts with the factional model because it describes relationships among people from different social classes as being more contentious and antagonistic than what the factional model describes. Local politics in the Philippines, according to this social conflict model, includes both vertical ties among those of different social classes and ties among those of the same social class (Kerkvliet, 1990:244-245).

Kerkvliet (1990:16) writes:

Individually and in groups, in cooperation and in opposition, people invest considerable energy and time deliberating over how these resources can and should be used and by whom. They are the central issues in everyday politics among people in different class and status positions.

The resources to which he refers are those that villagers from a small agricultural village in Luzon compete for and use. These resources range from land use and credit terms to livelihood and people's treatments of each other

(Kerkvliet, 1990:15). In Sarangani Bay, resource users also spend a considerable amount of time, energy, and resources (social, cultural, economic, and political) determining who should and who should not have property rights to coastal resources. Municipal tuna fishers, for example, have spent a great deal of time and resources attempting to establish common property rights to tuna fisheries and challenging the de facto property rights of the fishing magnates. Although patron-client ties exist between these fishers and the fishing magnates, these ties are breaking down. There is evidence of antagonism and resentment among these groups, not friendly and cooperative relationships as the factional model would suggest.

Broad and Cavanagh (1993:133-135) give other examples of cooperation among people from the same social class to establish property rights to resources. They describe the emergence of four types of community-based development approaches which seek more democratic control of natural resources and sustainable and equitable development in the Philippines. First, they describe large, mass-based people's organizations, set up along sectoral lines, who adopt a sustainable development agenda. Second, they describe the process of national and local environmental NGOs joining local resource users to establish and protect the property rights of poorer resource users. Third, they discuss examples of local resource users from the lower social class who spontaneously unite to protect their property rights. Fourth, they show how environmental organizations unite with people's organizations, environmental NGOs, and people from the middle and upper classes to promote sustainable and equitable development.

According to the class conflict model, ideology, which the factional model undermines, binds people from the same social class together. In the Philippines, according to Broad and Cavanagh, the ideology that binds resource users from the same social class together is the notion that their community should redistribute resources among the members of the community (Broad and Cavanagh, 1993:138). They describe the environmental movement in the Philippines as "a struggle for equity in the control and management of natural resources." They add that, "the struggle for environment and for control of resources requires a far more participatory notion of development" (Broad and Cavanagh, 1993:139). Indeed, a primary goal of many environmental NGOs in the Philippines is to effectively manage resources by democratizing access to resources and protecting the common property rights of local resource users (Magno, 1993:17).

Of the community-based development approaches that Broad and Cavanagh describe, the second process, NGOs assisting local resource users in establishing and protecting property rights, is the most prominent in Sarangani Bay. Organized municipal fishers develop their own property rights to marine reserves, artificial reefs, mangroves. They establish property rights through collective actions with assistance from NGO officials. Although patron-client relationships and ethnic group identity may play a role in binding these fishers together, it is their collective actions that encourage local officials to recognize their property rights. In other words, the relationship among organized fishers and local officials is not merely one of mutual exchange of benefits (patron-client), nor one of clan identity (village/religious leaders and followers); rather, it is one of cooperation among organized fishers and local officials to establish

common property rights. These fishers use their collective ethnopolitical knowledge to establish and protect their property rights.

### Control Over Resources

As the examples above show, all three social conflict models apply to Sarangani Bay. Resource users from the three types of property regimes maneuver in and out of the different types of social relationships in an attempt to establish and protect their property rights. A resource user, for example, may be part of an ethnic clan, a patron-client network, and a class-based organization all at the same time. Successful politicians often cultivate social, economic, and political ties that have elements of each type of social relationship to expand their power base. What is significant about these relationships is that resource users and local officials base them on informal ties, not formal linkages through state organizations. Even though the Local Government Code gives local officials more formal control over coastal resources, they resolve most property rights disputes through informal processes, not through the formal, state apparatus.

Informal control over resources is more important than formal control because of the weak capacities of the Philippine state. Migdal (1988:4) describes weak states as those with limited ability to "penetrate society, regulate social relationships, extract resources, and appropriate or use resources in determined ways." Compared to other states, some scholars consider the Philippines to be a relatively weak state (Wurfel, 1988:327). In a weak state context, when state formal rules conflict with informal rules

developed by other social organizations, informal rules are more likely to control the behavior of local resource users (Migdal, 1988:261-263).

What is extraordinary about the reliance on local officials to resolve disputes is that resource users do not expect local officials to resolve these disputes objectively. Because of the informal ties they cultivate with local officials through patron-client, clan, or class relationships, they expect local officials to favor their property rights and resource use practices. Resource users seek processes where the local officials who are most likely to recognize and support their property rights play a major role in resolving the conflict. In other words, resource users do not seek objective mediators of disputes; rather, they seek dispute-settling processes where the officials involved in resolving the dispute favor their property rights. Consequently, the competition among resource users over which dispute-settling processes to use to resolve a conflict is great because resource users seek processes where the mediators are most likely to support their property rights.

Furthermore, dispute-settling processes where local officials assist in resolving the disputes often lead to settlements where the resource users themselves, not local officials, enforce the agreements. Local officials may broker agreements to allow some resource users practices to prevail, but the resource users themselves must take the lead in protecting their property rights.

### **Institutional Change and the Impact on Resources**

In sum, local officials play an important role in resolving disputes through their patron-client, clan, and class relationships with resource users. Their

formal control over access to resources through the state organization does not impact property rights disputes as much as their informal control. Local officials are not neutral arbitrators of disputes; rather resource users use their mélange of informal relationships with local officials to gain access to resources or keep others away.

Formal institutional changes, such as the Local Government Code, provide opportunities for resource users to re-examine property rights to municipal fisheries, coral reefs, and mangroves. Nevertheless, the processes to change or reinforce property rights are likely to be informal. Organized groups of resource users are more likely to establish or maintain de facto property rights than state officials are likely to exercise their formal control over resources. In other words, formal institutional change is not as likely to affect resource management as much as informal institutional change.

What impacts do these institutional arrangements, which rely on local officials to resolve property rights disputes through informal processes, have on the resources? The results from Table 6.4 show that few sustainable resource management practices take place in Sarangani Bay. Only the marine reserves that municipal fishers manage with the support and cooperation of local officials show signs of sustainable management.

Without cooperation among resources users, institutional change is likely to adapt slowly to technological and market changes. Nevertheless, the ability of resource users to use their patron-client, ethnic, and class relationships, to maneuver among legal systems, and cooperate with each other, leaves open possibilities for them to adjust institutional arrangement to adapt to technical and market changes in effective ways. Local officials will play an important role

in this process, but other resource users are likely to develop processes that lead to more sustainable management of coastal resources. These results suggest that Broad and Cavanagh (1993:139) and Magno's (1993:7) descriptions of sustainable resource management coming through more participatory approaches may apply to Sarangani Bay.

### Contested Property Rights

An institutional model must begin by establishing the initial conditions from which changes will be described. This is a difficult task in itself because of the large number of institutions and how they determine the prevailing property rights. In a complex society, legally defined and pragmatic politics and social relationships make it difficult to discern what property rights actually prevail. This complexity also means that many people and organizations are able to exercise property rights so that a large number of special interests would have to be described. Another result is that participants are also unsure about the structure of property rights, which makes the entire structure itself uncertain. The perceived and actual uncertainty enhances the incentives for various participants to seek to shift the structure of property rights to their benefit, and it is from this competition that changes ultimately occur. Thus the quest to identify and capture economic rents is ongoing, and the public sector becomes an important instrument in the process (Church, 1982:131).

In Chapter Three, I used this quote from Church (1982:131) to illustrate why property rights to common-pool resources are often ambiguous. I concluded in Chapters Five and Six that resource users from Sarangani Bay contest a number of different types of property rights to coastal resources, which leads to ambiguity as to which property rights prevail. But is the failure

of state property regimes to enforce state, de jure property rights the cause of ambiguity over property rights? Does this situation lead to open access property rights and, therefore, lead to the depletion and degradation of coastal resources? Is co-management of resources, where state property regimes work together with private and common property regimes to develop resource management systems, the solution to open access property rights? These are the central questions I seek to answer in this section.

### **Open Access or Competition for Property Rights?**

Although it is common for researchers to declare coastal resources, particularly fisheries, in the Philippines as open access because state property regimes fail to enforce their de jure property rights, the results of this study suggest that this is not necessarily the case for the coastal resources of Sarangani Bay (Cruz, 1986:123 and Ferrer, 1989:157). In Chapter Three, I defined open access property rights as a situation in which no defined organizations, property rights, or rules exist to regulate the patterns of resource extraction (Feeny et al., 1990:4). The results of this study indicate that a number of different types of property rights exist. Resource depletion and degradation occur, not because there is an absence of property rights (open access), but because of the intense competition for property rights (Marchak, 1987:10). Competition for property rights may reduce the ability of property regimes to efficiently establish and protect their de facto or de jure property rights, but it does not eliminate the implementation of all property rights and rules.

As Tables 5.3 and 6.1 illustrate, resource users from Sarangani Bay pursue strategies and dispute-settling processes to establish and protect their property rights to coastal resources. Because national and local officials do not uniformly enforce state, de jure property rights to these resources, resource users compete for de facto, quasi-private and common property rights. Resource users in these regimes may not want state property rights to prevail, but they do try to get government officials to recognize and support their property rights. Although most of the bay's resources are accessible to any resource user, new resource users must compete with others to access these resources. In doing so, the property rights and rules of some resource users will influence the practices of the new resource users.

These results show that some property rights prevail over others. Conflicts over property rights do not eliminate all property rights and lead to open access rights. Instead, these conflicts show that resource users contest different kinds of property rights to tuna fisheries, municipal fisheries, coral reefs, and mangroves.

### **Co-Management**

To resolve the problem of resource depletion and degradation resulting from more competition among resource users, fishers' organizations and government agencies from some countries have developed agreements to jointly manage or "co-manage" a fishery. In fisheries such as the salmon fishery in the U.S. Pacific Northwest and the James Bay fishery in Canada, for example, fishers' organizations and government agencies develop agreements that specify the roles of each group in fisheries management (Berkes, 1989:190-191

and Cohen, 1989:44). These roles may include data gathering and analysis; logistical harvesting decisions; allocation decisions; habitat protection; enforcement and regulation; long-term planning; and policy development and implementation (Pinkerton, 1989:6). Successful co-management occurs when resource users are organized; cooperate with each other; negotiate as equals; share data; share cost and benefits; jointly develop and implement regulatory mechanisms; and develop appropriate conflict resolution arenas (Pinkerton, 1989:29-30).<sup>1</sup>

In San Miguel Bay, Philippines, researchers document an increase in the number of fishers' organizations over the past fifteen years. Surveys of these fishers' organizations indicate that they are becoming more active in fisheries management for the bay. They prefer to share fisheries management responsibilities with government officials. They believe that shared management would increase the dialogue among fishers and government officials, which would increase the effectiveness of fisheries management programs (Pomeroy, et. al., 1993:17).

Could property regimes from Sarangani Bay develop agreements to stop the depletion and degradation of Sarangani Bay's coastal resources? Resource users from Sarangani Bay already cooperate in some instances to co-management resources (Olive, 1993:83-86, 94). Nevertheless, not all of these cooperative efforts lead to more efficient, sustainable resource practices (see Table 6.4). The fishing magnates and national officials, for example, discuss tuna fishery management and policy options. Both regimes benefit from the high volume of tuna that fishers land in General Santos City. They

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<sup>1</sup> Pinkerton (1989:27-29) also offers 20 preconditions for co-management.

both support the construction of the new fish port. They, along with the tuna exporters, jointly develop strategies to deter pirate attacks on tuna fishers. These cooperative efforts among property regimes may increase the amount of tuna that fishers land in General Santos City in the short-term. Nevertheless, these arrangements do not appear to be sustainable resource management policies.

Other cooperative efforts among resource users do appear to lead to more sustainable management of coastal resources. Marine reserves, for example, show that co-management of nearshore fisheries, coral reefs, and mangroves by state and common property regimes may lead to sustainable resource management (see Table 6.4).

Thus, co-management is not necessarily a new concept in Sarangani Bay. Nevertheless, resource users from Sarangani Bay do not develop co-management agreements on a large-scale. Furthermore, not all of these co-management arrangements lead to sustainable resource management.

### **Institutional Change and Property Rights**

In sum, intense competition for de facto property rights affects resource use practices more than state, de jure property rights. Part of the reason state officials do not enforce state, de jure property rights is because they prefer to support the de facto property rights of other resource users. This leads to ambiguity over property rights. This ambiguity leads to more intense competition for other types of property rights, not to open access rights.

The solution to decreasing competition for property rights to coastal resources is not to impose a new property rights structure or strictly enforce

state property rights. Resource users from Sarangani Bay are already active in resource management; therefore, the solution needs to come from them. Co-management agreements among resource users may reduce competition for property rights; however, the processes that lead resource users towards co-management and sustainable resource management are more important than agreements. What resource users in Sarangani Bay need are dispute-settling processes where they may debate and contest the resource use practices of other resource users. If all resource users are properly represented in these arenas, they may develop community-based institutional arrangements that are more appropriate for the bay.

Thus, the significant institutional change in Sarangani Bay is not the transformation of state de jure property rights to open access property rights. It is the increase in competition for de facto property rights and the inability of resource users to adequately resolve their conflicts over de facto property rights that lead to the depletion and degradation of the bay's coastal resources. In the following section, I discuss the importance of dispute-settling processes in coastal resource management.

### Dispute Settling Processes

As the results from Table 6.2 indicate, in dispute-settling processes where organized property regimes have the opportunity to debate and share their knowledge about effects of resource use practices on the resources, the disputants are more likely to agree on a set of property rights. In this section,

I examine why the opportunity to debate and exchange knowledge among resource users is important for sustainable and equitable resource management. I show why a plurality of legal systems provides both opportunities for resources to share their knowledge of the resources and opportunities for resource users to avoid confrontation. Consequently, the choice of dispute settlement process significantly affects property rights to resources.

### **Contesting Property Rights**

Resource users from Sarangani Bay use a number of different dispute-settling processes to resolve their conflicts over property rights to resources. In some of these processes, resource users contest not only technical problems associated with resource use practices, but they also contest social norms and values. Often, how they resolve their disputes is more important than the outcome of the dispute-settling processes (Lind and Tyler, 1988:241). The way resource users treat each other during the dispute-settling process affects the ability of the disputants to resolve the conflict. Thus, in addition to property rights, resource users from Sarangani Bay contest: (1) the categories that resource users develop to characterize themselves or other resource users; and (2) the effects of different practices on the resources.

#### *Established Categories*

Resource users seek to resolve their conflicts over property rights in dispute-settling processes that they believe provide the best chances for them to establish or maintain their property rights. To improve their chances in

dispute-settling processes, they seek to develop categories that distinguish themselves from other resource users. Edelman (1974:299) states that categorizing is a political tool. He writes:

Categorizing is necessary to science and, indeed, to all perception. It is also a political tool, establishing status and power hierarchies.

In applying categorization to dispute-settling processes, Sloats and Portier, (1986:235) write:

The definition of dispute depends on the formulation used by the participant in the dispute process in its different stages. The participants continuously try to rephrase the dispute by imposing established categories for classifying events and relationships or by developing a framework that challenges established categories.

Often, resource users with more economic and political resources seek to resolve conflicts in processes where other resource users cannot challenge the categories they develop. Resource users who lack significant economic and political resources seek processes where they can challenge the categories that others impose on them.

In the conflict over the catching of juvenile tuna by purse-seine nets, for example, the fishing magnates claim that they need small-mesh nets to keep a steady of supply of fish for their businesses. They argue that their businesses are important to the local economy. Municipal tuna fishers contest these claims. Municipal tuna fishers believe that government officials and the fishing magnates do not give municipal tuna fishers enough credit for their contributions to the local fishing industry. As a result, it is difficult for them to obtain the resources they need to establish property rights to tuna fisheries, such as access to capital to finance their fishing trips and to buy pumpboats

and *payaos*. Although they respect the success of the fishing magnates, municipal tuna fishers believe that the "hands of the small fishermen" made General Santos a "Boom City." One fisher said, "*wala man ning dako kon wala ang gagmay*" (the big will not exist without the small). Nevertheless, municipal tuna fishers have few opportunities to publicly establish that their fishing practices are also important to the local fishing industry.

In conflicts over property rights to municipal fisheries, some resource users categorize Muslim fishers as fishers who use destructive fishing gear or as pirates. There are few public forums where Muslim fishers can contest these categorizations. Most of them do not fish with destructive gear, nor are most of them pirates. Many Muslim fishers seek to protect their de facto, common property rights. Nevertheless, the lack of opportunities to contest these categorizations limit their ability to protect their property rights to municipal fisheries.

The conflict over property rights to Indonesian fisheries also shows the value of providing opportunities for resource users to contest the categories imposed on them by other resource users. Indonesian authorities categorize Filipino fishers as pirates and intruders. Filipino fishers reject these categorizations, but they do not have dispute-settling processes where they can contest them. The fishing magnates, through direct negotiations, challenge these categories. They work out agreements to establish property rights to Indonesian fisheries. Nevertheless, Indonesian officials still apply these categories to Filipino municipal tuna fishers. These fishers cannot afford to negotiate with Indonesian official and contest these categorizations.

In sum, the lack of political and economic resources prevents some resource users, such as municipal tuna fishers and Muslim municipal fishers, from contesting the categories other resource users impose on them. Without dispute-settling processes where these municipal fishers may contest and change the way other resources characterize them, they will continue to struggle to establish property rights to resources. There is a need for dispute-settling processes where open debate and discussion may occur among resources users, especially those with vast differences in economic and political resources.

#### *Opportunities for Knowledge Exchange*

Dispute settling processes that allow for more open debate and dialogue among resource users also provide opportunities for resource users to exchange their knowledge about the effects of resource use practices on the resources. Traditional dispute settlement processes often provide these opportunities. Resource users who resolve their disputes through traditional methods report that these processes provide them with a chance to educate the resource users with whom they conflict. In other words, these resource users value the opportunity to settle their property rights disputes in face to face dialogues. Traditional methods provide the disputants with opportunities to heal their relationships, to express their point of view, and to resolve their conflicts amicably.

Traditional methods often change the dispute from a dispute over the technical distinctions in fishing gear to a dispute over what constitutes proper resource management. Traditional methods allow resource users to express

their ethnoecological knowledge of resources and their knowledge about the ecosystems that support these resources. Fishers who manage marine reserves, for example, report that they do not want fishers who use destructive gear to stop fishing. Rather, they want these fishers to use passive gear instead of destructive gear. Through their dispute-settling processes, they have the opportunity to inform these fishers that this is their intention. Thus, these resource users do not debate the legality of one gear over another; nor do they debate who has a right to fish and who does not have a right. Instead, they discuss the effects of specific fishing methods that destroy fish habitats. Furthermore, they discuss the need for fishers to protect fish habitats to ensure that they will continue to catch fish in the future.

Dispute settling processes that provide opportunities for resource users to express their ethnopolitical and ethnoecological knowledge offer a number of advantages for resource users. The ethnopolitical and ethnoecological knowledge of municipal fishers are important sources of information that may lead to a better understanding of resource use conflicts and practices (Bellon, 1991:390-391; Jamieson, 1984:19; and Vayda and Rappaport, 1968:490). This knowledge enables local resource users to adapt to socio-economic and technology changes in society (Thrupp, 1989:15). Because state officials lack the financial resources to conduct scientific studies, they may build upon the knowledge that local resource users possess about environment and social systems (Thrupp, 1989:21).

Nevertheless, many of the dispute-settling processes that resource users use to resolve their disputes exclude ethnopolitical and ethnoecological knowledge from the process (Dove, 1988:23). Resource users at formal public

hearings, such as the one to discuss the mesh-size of purse-seine nets, discuss only the scientific knowledge that national officials present and the knowledge that the fishing magnates possess. Excluded from this dispute-settling processes is the knowledge that municipal fishers have about the effects of small-mesh purse-seine nets on tuna fisheries.

In addition, the formal legal system inhibits the use of ethnoecological knowledge to resolve conflicts over property rights to mangroves. Although judges consider the information that DENR officials present, they do not provide opportunities for municipal fishers to express their ethnoecological knowledge about the importance of mangroves (see Table 6.4).

In the conflict over superlight fishing, local and state dispute-settling processes also do not bring together the resource users involved in this conflict to discuss the impacts of this fishing technique on municipal fisheries. There are no opportunities for the resource users to debate the appropriateness of this new fishing technique.

In contrast, municipal fishers link the outcomes of several different dispute-settling processes to get municipal commercial fishers, local officials, and themselves to discuss the use of commercial fishing gear in the bay. Through traditional processes, they establish marine reserves to keep commercial fishers and fishers who use destructive gear away from coral reefs. Through local government processes, they force *barangay* and municipal officials to keep commercial vessels away from fishing areas near their villages. The outcomes from these dispute-settling process are part of the reason provincial officials wrote a draft ordinance to ban commercial vessels from the bay. Although highly contested, this draft ordinance brings municipal fishers

and commercial fishers together for the first time to debate the impacts of commercial gear on the bay's fisheries.

At a workshop on coastal resource management sponsored by a USAID project, municipal commercial fishers, local officials, beach resort owners, NGO representatives, and municipal fishers had the opportunity to discuss resource management issues for the bay. Although the issues discussed by the participants were contentious, these resource users agreed to implement two important resource management initiatives. First, they agreed to jointly seek funding to conduct a fish stock assessment in the bay. The fish stock assessment will provide more accurate information on the status of the bay's municipal fisheries and the impact of commercial gear on the bay's fisheries. Second, after the participants concluded that they all want to protect the bay's fisheries, they agreed to jointly promote the establishment of more marine reserves around coral reefs to replenish fisheries. The participants agreed to a process whereby local officials, NGO representatives, beach resort owners, and municipal fishers would jointly establish marine reserves for municipal fishers to manage. Nearly a year later since the participants started these initiatives, national officials have begun the fish stock assessment. Furthermore, these resources users have established more than ten marine reserves in General Santos City and Sarangani Province. Thus, over a period of several years, municipal fishers have used a series of dispute-settling processes to go from a situation in which they were unable to confront commercial fishers to a situation where they now have begun to work with commercial fishers on resource management issues.

In sum, traditional dispute-settling processes provide resource users with the opportunity to debate not only the legality of resource use practices, but what is more important, the impacts of these practices on the resources. Although the applications of these processes make it difficult to resolve disputes among resource users from different *barangays* and municipalities, some resource users successfully apply these techniques in disputes with people other parts of the bay. Municipal fishers who manage marine reserve, for example, use a combination of different dispute-settling processes to protect their property rights to municipal fisheries. These fishers have used the outcomes of a series of dispute-settling processes to initiate a public debate on the use of commercial gear in the bay.

### **Institutional Change and Dispute Settling Processes**

Institutional change is a competitive process. There is a great deal at stake for the resource users who compete for property rights. Problems with institutional arrangements occur because of the large number of resource users, competition for property rights to the resources, and inadequate conflict-resolution mechanisms (Ostrom, 1990:145). Thus, how resource users resolve their conflicts is an important variable in the ability of resource users to change institutional arrangements.

The plurality of dispute-settling processes available for resource users from Sarangani Bay to use both constrains and enhances their ability to change institutional arrangements. Resource users who benefit from current institutional arrangements have opportunities to avoid processes where other resource users may contest their property rights. At the same time, resource

users who seek to change institutional arrangements have opportunities to apply processes where they may contest the property rights of other resource users. Thus, there is competition over which dispute-settling processes to apply to conflicts over property rights to resources.

If the goal for Sarangani Bay is to change institutional arrangements to improve resource management, there is a need for forums where resource users may contest the resource use practices of other resource users on an equal basis. The results of this study indicate that dispute-settling processes that provide opportunities for resources users to debate and exchange their knowledge about the resources lead to more sustainable resource use practices. Nevertheless, new forums will still benefit some resource users over others. There will be competition among resource users for representation in these forums. Resource users with more economic and political resources are likely to dominate these forums unless other resource users can push for more equitable representation. In other words, developing forums where resource users may debate and exchange their knowledge about the resources on an equal basis is not a simple task. These forums will work only if resource users are able to build trust and respect in their relationships. A resource management project where competing resource users work together to develop and manage the project (e.g., a marine reserve) is one of several ways for resource users to build trust and respect in their relationships. If relationships among resource users mature to this level, they will have the opportunity to develop equitable and sustainable resource management systems.

In conclusion, the reliance on local officials to resolve property rights' disputes on the basis of their informal relationships with resource users, the increase in competition for de facto property rights, and the existence of multiple legal systems in the same social field limit the effectiveness of current institutional arrangements for Sarangani Bay's coastal resources. Nevertheless, these factors also provide opportunities for resource users to effectively change institutional arrangements. If, local officials -- with their formal legal authority from the Local Government Code, their informal relationships with resource users, and their ability to apply traditional dispute settlement techniques to conflicts -- work closely with the different groups of resource users, effective institutional change is possible. They have the potential to develop arrangements with resource users that would not only get local resource users to agree on sets of property rights to resources, but would also spread resource management responsibilities among resource users. A community-based process that involves more resource users in resource management decisions provides opportunities for resource users to share their knowledge as to what constitutes proper resource management. This exchange of knowledge (i.e., scientific, political, socio-economic, cultural, and ethnoecological) among resource users builds a knowledge base that resource users may use to make effective changes in institutional arrangements.

## EPILOGUE

As a result of this study, I found that coastal resource users from Sarangani Bay contest three main areas: (1) Resource use practices and forms of de facto access rights; (2) forms of capitalism; and (3) arenas where resource users resolve their conflicts. Of these areas, I believe that the only issue my theoretical framework adequately addressed was the third area. Thus, in this concluding section, I reflect on why some of the theoretical concepts I develop and use in this study limited the effectiveness of my analysis in regard to the first two issues.

### **Resource Use Practices and Forms of de Facto Access Rights**

The common property theoretical concepts and categories that I discussed in Chapters Three and Four limited my analysis in a number of ways. I found that the terms "property rights" and "property regimes" carry a Western bias when applied to the Philippines. Resource users from Sarangani Bay contest resource uses and extraction techniques more than they contest property rights, territories, or formal, de jure rights. They also organize themselves in complex social, economic, and political relationships. This makes it difficult for a researcher to categorize individual resource users into property regimes.

### *Property Rights*

I found that the concept of "property rights" does not fully explain why subsistence, municipal fishers pursue some of their resource management strategies. The type of gear that fishers use concerned most of the municipal fishers that I interviewed more than excluding others from fishing in particular areas. They did not use terms in their local language that translated into property rights or the right to exclude others from extracting the resources. Instead, the right to a livelihood concerned them more. They did express the notion that, collectively, each person from their village or nearby villages had the right to fish so long as they fish with nondestructive gear. A better category than property rights (i.e., the right to extract a resource and exclude others from extracting the resource) would be what a group of resource users constitutes as proper or acceptable resource uses or practices. Perhaps there is an indigenous concept that I was unable to uncover that would more accurately describe their resource management systems. Moreover, because of the competing languages, discourses, ethical codes, and values in this area, another research project may find several interrelated indigenous concepts that describe resource management systems.

I also found that de jure rights and state property rights do not have much meaning in the Philippine context. Because de jure rights are rarely enforced, there is not much competition for these types of rights. Resource users spend most of their time and resources (i.e., economic, social, and political) contesting de facto access rights or resource uses. In other words, resources users are not competing for either de jure rights or de facto rights; rather, they are competing for a number of different types of access rights

and resource uses. De jure rights are just one of many different types of rights and uses that they contest. Consequently, state property rights do not have much of an impact on coastal resource management. How individuals benefit from resource uses interests some of those responsible for protecting state property rights (i.e., politicians, national officials, and local officials) more than how the state benefits from state property rights. Once again, this shows that resource practices and uses interest resource users more than property rights.

These are important distinctions. Some of the common property literature draws attention to the importance of common property rights and promotes formal, de jure recognition of common property rights. In other words, it promotes the transition of state, de jure rights to common, de jure rights. But if de jure rights do not have much of an impact on the practices of the resource users from Sarangani Bay, will converting common, de facto rights to de jure rights have much of an effect on resource uses? Converting common, de facto rights to de jure rights may be a step in the process to achieve community-based resource management and sustainable resource management, but this conversion of rights is not the major goal of most resource users. Protecting their resource use practices concerns them more. They seek (or avoid) forums (i.e., dispute-settling processes) where resource users may contest resource practices, not de jure rights.

### *Property Regimes*

I found it difficult to categorize resource users under the property regimes described in the common property literature -- state, private, and

common. I encountered two major, interrelated problems with these categories. First, these categories make it difficult to account for individuals who may associate themselves with more than one group of resource users. I found that resource users organize themselves in complex and dynamic social relationships. An individual may be a member of a formal organization, such as an association or a cooperative, but they may not always support the resource management strategies of the formal group. Furthermore, the formal group is one of many social relationships that may influence the practices of a resource user.

Second, government officials were difficult for me to categorize into a state property regime. Government officials rarely act as a coordinated "state property regime." They are more likely to support the practices of a specific group of resource users. In addition, they may support one group during a particular conflict and the rival group in another conflict. Sometimes, they support both sides in a conflict over the use of resources. Zerner (1994) describes a similar political arena in an Indonesian coastal area.

Simplistic dichotomies between government officials and private sector actors, on the one hand, and NGOs and communities, on the other hand, inadequately describe the field in which action is taking place. While governmental agencies are often pitted against local communities, complex and nonadversarial relationships are also part of the highly politicized landscape of resource control and claims (Zerner, 1994:1115).

Government officials, whether elected officials or bureaucrats, have complex and dynamic, informal relationships with other resource users. Thus, I found it awkward to categorize them into state property regimes.

Perhaps, this is an indication that the state property regime category may not apply in countries with relatively weak states. In Chapters Five, Six, and Seven, I showed that state officials are unable to control the use of resources. What is more important, state officials rarely develop and implement state resource management strategies. They align themselves in complex ways with other resource users, not as a state property regime. They can exert their power more effectively through informal relationships than they can through a formal state property regime. Because they do not act as a state property regime, the state property regime category may not be appropriate for relatively weak states like the Philippines. The "state property regime" concept is difficult to apply when relationships among resource users are fluid, complex, informal, and dynamic.

Because the state property regime category may not be relevant in a weak state context, a co-management resource management strategy may also not be applicable. The successful co-management programs that I have come across in the literature are mostly in a context where there is a relatively strong state. The results of my case study indicate that government officials play an important role in resource management through their informal positions, not through their formal positions within the state. If the state property regime exists only on paper and not in practice, then co-management strategies between common and state property regimes may not be appropriate. Perhaps other forms of community-based resource management are more appropriate.

Furthermore, because I found it awkward to categorize resource users into property regimes, I also found it awkward to compare and contrast

property regimes using the criteria of efficiency and stability. If I categorize state officials into a state property regime, for example, I would consider them to be inefficient regimes because they fail to protect state property rights. Nevertheless, some state officials are efficient when it comes to protecting various types of resource uses. Moreover, resource users do not use these terms when they compare and contrast their resource management practices with the practices of other resource users. Consequently, applying these exogenous categories to the data I collected did not enhance my analysis. They did not lead me to additional insights.

### Forms of Capitalism

An alternative to categorizing resource users by the way they compete for property rights, is to categorize them by the way they contest forms of capitalism. Capitalism, where a society bases development on accumulating and reinvesting profits, is the overarching political-economic system in this area. Forms of capitalism include state capitalism, market capitalism, and modified capitalism. Resource users from Sarangani Bay contest the degree to which these forms of capitalism should determine how resource users use coastal resources.

The fish port in General Santos City is an example of state capitalism. The Philippine government received a loan from the Japanese government to build it. The Philippine state believes that the fish port will stimulate investment in the private sector and generate revenues for the state from taxes and fees. These types of projects, where the state receives loans from foreign countries or international institutions (i.e., the Asian Development Bank, World Bank, etc.)

to promote export-oriented activities, are common in developing countries like the Philippines (Hawes, 1987:137). These projects encourage investment in resource extraction enterprises such as tuna fishing.

Because the fish port will benefit some resource users and hurt others, some resource users do not support the project. They resist the state's effort to accumulate capital for the state. Some of them, for example, contest the state's share of economic rents from fishery resources. They believe that state taxes and fees should be low to allow the private sector and cooperatives to maximize profits. Other believe that the fish port will increase the fishing effort for already overfished tuna stocks. This in turn will decrease the amount of tuna available for municipal tuna fishers. Thus, resource users who favor market capitalism and modified capitalism contest state capitalism.

Most of the businesses managed by the fishing magnates, tuna exporters, municipal commercial fishers, and prawn farm operators are market capitalism operations. Their primary concern is the profitability of their resources practices. Their market capitalist enterprises extract and sell resources more cost efficiently than other forms of capitalist enterprises. They seek to accumulate capital for their own companies. They believe that the benefits from coastal resources should go to the private sector. These business owners use the profits generated from resource extraction activities to expand their business or invest in other businesses.

Some municipal fishers seek modified forms of capitalism. They pursue strategies to restrain capitalism so that resource users can meet the basic needs of their families before they accumulate capital. They resent individuals who deplete and degrade resources that others need to sustain their

livelihoods. They seek equal access to resources for all resource users whose practices do not degrade or deplete resources. They pursue resource management strategies to modify the competitive nature of capitalism.

Individual resource users often engage in more than one form of capitalism. The resource users that I describe in this dissertation may pursue different forms of capitalism depending on the situation. Municipal tuna fishers, for example, sometimes pursue strategies to maximize individual profits from fresh tuna; other times they pursue strategies to redistribute their income among the members of their cooperatives. Furthermore, if I had applied this model to my case study, I expect that I would have found a number of variations within the forms of capitalism practiced by these resource users. Perhaps I would have identified other forms of capitalism or even other competing economic systems.

## Conclusion

Categorizing resource users on the basis of the way they compete for forms of capitalism is an alternative theoretical framework to categorizing resource users on the basis of the way they compete for property rights. Nevertheless, researchers must take into account that both capitalism and property rights originate from Western economic systems that Western societies largely imposed on the Philippines. What has evolved in the Philippines are forms of capitalism that are different from the forms of capitalism found in Western economic systems. We, as researchers, need a local understanding of "rights" and "political-economic systems" to determine why resource users deplete and degrade resources.

The results of my study suggest that we not only need to determine why resource use practices occur, but what is more important is for us to determine what processes are available for resource users to change their resource practices that degrade and deplete resources to resource uses that are sustainable. In other words, how resource users resolve their conflicts over what constitute appropriate resource management practices should be the focus of further research.

## APPENDIX A

Philippine National Laws and Regulations Pertaining to  
Coastal Resource Management

Philippine Constitution of 1987, Article XII, Section 2:

All lands of the public domain, waters, minerals, coal, petroleum, and other mineral oils, all forces of potential energy, fisheries, forests or timber, wildlife, flora and fauna, and other natural resources are owned by the State. With the exception of agricultural lands, all other natural resources shall be alienated. The exploitation, development, and utilization of natural resources shall be under the full control and supervision of the State. The State may directly undertake such activities or it may enter into co-production, joint venture, or production sharing agreements with Filipino citizens, or corporation or association at least sixty *per centum* of whose capital is owned by such citizens. . .(cited in La Viña, 1991:20-21).

Philippine Constitution of 1987, Article XII, Section 2:

The State shall protect the nation's marine wealth in its archipelagic waters, territorial sea, and exclusive economic zone and reserve its use and enjoyment exclusively to Filipino citizens (cited in La Viña, 1991:21).

Philippine Constitution of 1987, Article XIII Section 7:

The State shall protect the rights of subsistence fishermen, especially of local communities, to the preferential use of the communal marine and fishery resources, both inland and offshore. . . The State shall also protect, develop, and conserve such resources (cited in Benitez, 1990:18).

Local Government Code of 1991, Section 149 (a):

Municipalities shall have the exclusive authority to grant fishery privileges in the municipal waters and impose rentals, fees, or charges thereof in accordance with the provisions of this Section (Republic Act 7160, 1991:71).

Local Government Code of 1991, Section 149 (b):

(1) Grant fishery privileges to erect fish coral, oyster, mussels, or other aquatic beds or *bangus* fry areas, within a definite zone of the municipal waters, as determined by it: Provided, however, that duly registered organizations and cooperatives of marginal fishermen shall have the preferential right to such fishery privileges. . .

(2) Grant the privilege to gather, take or catch *bangus* fry, prawn fry or *kawag-kawag* or fry of other species and fish from the municipal waters by nets, traps or other fishing gears to marginal fishermen free of any rental, fee, charge or any other imposition whatsoever.

(3) Issue licenses for the operation of fishing vessels of three gross tons or less. . .(Republic Act 7160, 1991:71-72).

Presidential Decrees (PD):

PD 704 - Fisheries Code

PD 705 - Forestry Code

PD 1058 - Penalties for destructive fishing activities

PD 1151 - Philippine Environmental Policy

PD 1152 - Philippine Environmental Code

PD 1219 - Exploration, Exploitation, Utilization and Conservation of Coral Resources

PD 1586 - Environmental Impact Statement (EIS) System

PD 1599 - Philippine Exclusive Economic Zone (EEZ)

Letters of Instruction (LOI):

- LOI 550 - Deputizes barangay captains as fish wardens
- LOI 1328 - Prohibits commercial trawling and purse seining in waters less than seven fathoms deep and seven kilometers from shore.

Fisheries Administrative Orders (FAO):

- FAO 115 - Prohibits the use of nets with mesh less than three centimeters between two knots when stretched.
- FAO 129 - Prohibits the catching of milkfish larger than 60 centimeters.
- FAO 163 - Prohibits the fishing technique called *muro-ami*.

## GLOSSARY

askers - municipal fishers who receive part of the catch from municipal commercial fishers fishing inside of Sarangani Bay

*awa* -- spawning milkfish

Badjao -- a cultural-linguistic group of Muslims from the southern Philippines

*bakhaw babae* -- a mangrove species

*bakhaw-bakhaw* -- a mangrove species

*Bakhaw lalaki* -- a mangrove species

*baling* -- beach-seine net

*balaud sa Ginoo* -- the law of God

*balaud sa yuta* -- the law of the country

*banca* -- boat

*bangus* -- milkfish

*bantay dagat* -- watch the sea

*barangay* -- the smallest political unit in the Philippines

*bariles* -- adult yellowfin tuna

*Baroto nga na'ay layag* -- a small boat powered by a sail

*basnig* -- bag net

Batasang Pambansa -- the Philippine Congress

B'laan -- a tribal group residing to the north and northwest of Sarangani Bay

*bunsod/baklad* -- fish trap

*busaw* -- B'laan word for colonizers or demons.

*carao* -- juvenile yellowfin tuna

Cebuano -- a Filipino language spoken mostly in the central and southern parts of the Philippines

*datu* -- Traditional and spiritual leader among tribal and Muslim groups

*danggit* -- a small flat fish

*dayuhan* -- foreigner

*de jure* property rights -- property rights that the state recognizes in the formal legal system.

*de facto* property rights -- rights that resource users observe in practice.

ethnoecological knowledge -- the knowledge that local, indigenous communities possess about their environment and ecosystems

ethnopolitics -- a group's (or community's) perception and understanding of the political arena in which they live

*Ga* -- a B'laan word for sea

Gani -- a B'laan warrior who protected the sea

*guyod* -- trawling

*hakog* -- greedy

Hiligaynon -- a Filipino dialect

*hilot* -- Literally to massage. In this context, to heal or repair personal relationships

*hindi ibang tao* -- become a common person in the village

*husay* -- settle differences peacefully

*husto nga pagpanagat* -- to fish properly

Ilokano -- a Filipino language spoken mostly in the northern part of the Philippines

Ilonggo -- a Filipino language spoken mostly in the central and southern parts of the Philippines

*Kano* -- slang for American

*Katarungang Pambarangay* system -- a dispute settling process that gives *barangay* officials the authority to use traditional dispute settling methods to develop amicable settlements between disputants. The formal legal system recognizes settlements from this process as legally binding.

Karay-a -- a Filipino dialect spoken mostly in the central and southern parts of the Philippines

*kindat-kindat* --winking the eyes

*kumpare (pare)* -- godfather or male sponsor of one's child in baptism or marriage

*kung gobyerno ang aasahan mo, walang mangyayari* -- if you depend on the government, nothing will happen

Luzon -- Island in the Philippine archipelago located in the northern part of the country

Maguindanao -- a cultural-linguistic group of Muslims from the southern Philippines

*maninoy* -- godfather

*marang* -- marlin

*muro-ami* -- a fishing technique in which fishers lower a weighted net then pound the reef with poles and weights to scare fish into the net

*pagatpat* -- a species of mangrove

*pakikibagay* -- do things the way local residents do them

*pakikilahok* -- participate in people's activities

*pakikipagpalagayang loob* -- build the trust and confidence of the local people

*pakikiramdam* -- show sensitivity and perceptiveness

*pakikisama* -- make friends and accompany residents in their daily activities

*palakasan* -- system of promotion or advancement based on personal relationships, not merit

*palangre* -- multiple hand line

*pamatasan* -- custom

*pana* -- spears

*Panunuluyan* -- an indigenous research method that uses and observes aspects of Filipino social relations

*patuloy* -- drift gill net

*Payao* -- fish aggregating device fishers use to attract tuna

Pilipino -- The national language of the Philippines

*pirit* -- frigate mackerel

pumpboats -- small motorized boats made of wood with bamboo outriggers

*ramas* -- fish aggregation devices (also called *pulohan* or *payaos*)

*respeito* -- literally "respect." An ethical code of fishers from Bahia, Brazil, that is an intricate part of the way municipal fishers name, own, manage, and resolve disputes over access to fisheries

*sabalo* -- spawning milkfish

Samal -- a cultural-linguistic group of Muslims from the southern Philippines

*sambagon* -- skipjack tuna

*sampana* -- a commercial vessel equipped with a ring net.

*samul-laud* -- people of the ocean

*Sangguniang Panlalawigan* -- Provincial Board

*Sarang* -- the shield of Gani, a B'laan warrior

Sarangani -- B'laan word which means protector of the sea

*sensoro* -- ring nets

*siko* -- elbow touch

*sudsud* -- push nets

*suki* -- regular customer or client

superlight -- fishing method that uses highpowered light bulbs (> 500 watts) to attract fish

*taksayan* -- large fishing boats with drive-in net

Tausog -- a cultural-linguistic group of Muslims from the southern Philippines

T'boli -- a tribal group in the mountainous areas around Sarangani Bay

*Utang na loob* -- debt of gratitude

Visayan Islands -- Islands located in the central part of the Philippines

*yapak* -- stepping on one's foot

*walang hiya* -- without shame

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