Mangrove Management Handbook

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COASTAL RESOURCE MANAGEMENT PROJECT

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MANGROVE MANAGEMENT HANDBOOK

by

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Front cover: Background: A portion of a multi-age and multi-layered canopy of mangrove plantation in Banacon Island, Getafe, Bohol, Philippines, using Rhizophora stylosa. The tree is focused on the lower left corner of the cover. Center: Coastal community members in Tambobo Bay, Siit, Siaton, Negros Oriental – fishing on the river with intact natural mangrove vegetation. Back cover: Left: School children with mangrove propagules before planting to protect their school building from strong waves, Inabanga, Bohol, Philippines. Right: Participants in a mangrove trainors training during a practicum on mangrove plantation establishment in Sta. Cruz, Davao del Sur, Philippines. Photos by C.E. Yao.

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List of acronyms

AWP/RUP Annual Work Plan/Resource Use Plan

ANR Assisted Natural Regeneration

BFAR Bureau of Fisheries and Aquatic Resources

CBFMA Community-Based Forest Management Agreement

CDA Cooperative Development Authority

CDF Countryside Development Fund

CENRO Community Environment and Natural Resources Office

CIDA Canadian International Development Agency

CO Community Organizer

CRMF Community Resource Management Framework

CRMP Coastal Resource Management Project

CSC Certificate of Stewardship Contract

DA Department of Agriculture

DAO Department Administrative Order

DENR Department of Environment and Natural Resources

DILG Department of Interior and Local Government

DOLE Department of Labor and Employment

EO Executive Order

FLA Fishpond Lease Agreement

GIS Geographic Information System

GPS Global Positioning System

HHW Higher High Water

IRA Internal Revenue Allotment

IRUP Interim Resource Use Permit

ISFP Integrated Social Forestry Program

LGU Local Government Unit

LLW Lower Low Water

MAO Municipal Agricultural Officer/Municipal Agriculture Office

MC Memorandum Circular

MFA Mangrove-Friendly Aquaculture

MHHW Mean Highest High Water

MLLW Mean Lowest Low Water

MMC Mangrove Management Component

MPDC Municipal Planning and Development Council

MSA Mangrove Stewardship Agreement

NAMRIA National Mapping and Resource Information Agency

NGO Nongovernment Organization

PCRA Participatory Coastal Resource Assessment

PENRO Provincial Environment and Natural Resources Office

PO People's Organization

PPDO Provincial Planning and Development Officer

SB Sangguniang Bayan

SEAFDEC Southeast Asian Fisheries Development Center

SEC Securities and Exchange Commission

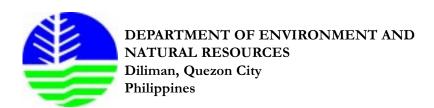
TWG Technical Working Group

Foreword

The Department of Environment and Natural Resources (DENR) takes pride in producing this *Mangrove Management Handbook* as the accepted Philippine government information guide to assist coastal communities in the rehabilitation, management, protection and maintenance of the mangrove forests of the country and the coastal environment as a whole. This handbook will strengthen our capability to enhance the mangrove forests, thereby contributing positively in the productivity and maintenance of coastal ecosystems. It clearly identifies the roles and responsibilities of the communities, the local government units, the field personnel of the department and the other partners in mangrove management and development.

The DENR enjoins all users of this handbook to work together for the sustainable management of our mangrove forest resources.

To this end, the DENR conveys gratitude and appreciation to the Coastal Resource Management Project and the unwavering support of the United States Agency for International Development, for without them this publication would not have been possible.



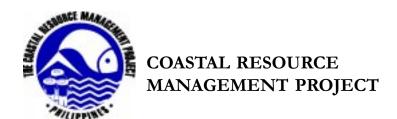
Preface

This Mangrove Management Handbook is comprised of six chapters packed full of useful information on how to protect and manage mangroves as a natural and productive resource. It is intended to help people anywhere who wish to become stewards of mangrove forest resources. People's organizations, nongovernment organizations and local government are the primary audience but of course others can benefit from the information presented in this volume.

The mangrove forest resources of the Philippines have deteriorated significantly during the last 50 years. The country now has less than 120,000 hectares of mangroves remaining and much of that is only secondary growth and by no means pristine. The culprits in the decline of mangroves are many but the primary one is conversion to aquaculture ponds and more recently conversion to urban land reclamation and other land uses. If this trend continues, there will be virtually no mangroves left in the Philippines after another 50 years.

The natural ecological and economic benefits lost with mangrove loss are significant and non-retrievable. One hectare of healthy mangrove forest supports fisheries alone worth at least P20,000 (US\$500) per year. In addition, there are values for wood, erosion control and waste absorption that vary from site to site but are minimally worth more than the fisheries value. This means that direct economic revenues from a healthy mangrove forest covering one hectare is conservatively P40,000 (US\$1,000). It is difficult to find a natural system that produces this kind of revenue without any investment except protection, and that has practical and economic values at the same time. As we lose these benefits, we as a society, will pay many times more than the cost of this destruction.

This volume holds many answers about how we can protect and manage our mangroves and how we can increase the area of healthy mangrove forest in the country. These are simple procedures understandable by most people. The key is finding the will power to put them into practical use. Here, political and personal support will make the difference. Let us start saving our mangrove forests now!



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- " CBFMA Application Guide

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List of scientific names, local terms and glossary of technical terms

LOCAL NAME

SCIENTIFIC NAME

Api-api Avicennia officinalis Bakauan babae Rhizophora mucronata Bakauan bato Rhizophora stylosa Bakauan lalaki Rhizophora apiculata Bakauan Rhizophora spp. Bungalon puti Avicennia alba Bungalon Avicennia marina Busain Bruguiera gymnorrhiza Buta-buta Excoecaria agallocha Diluario Acanthus ebractcatus Dungon-lati Heritiera littoralis Kulasi Lumnitzera racemosa Lagolo Acrostichum aureum Langarai Bruguiera parviflora Nilad Scyphiphora hydrophyllacea

Nipa - Nypa fruticans

Pagatpat - Sonneratia alba (Gedabu)

Sonneratia ovata Pagatpat baye Pedada Sonneratia caseolaris Piapi Avicennia lanata Pototan lalaki Bruguiera cylindrica Pototan Bruguiera sexangula Saging-saging Aegiceras corniculatum Tabau Lumnitzera littoria Tabigi Xylocarpus granatum Tangal Ceriops tagal

LOCAL TERMS

Tingloy

Amatong - Fish aggregating device made of piled logs/rocks that serve as a niche to marine life

Bahalina - Local wine made of coconut sap or juice fermented with tangal bark

Banca - Dugout canoe/boat

Bantay-dagat - Multisectoral team assigned to check illegal fishing

Acanthus ilicifolius

Groundtruthing

Bantay-bakauan - Multisectoral team assigned to check illegal cutting of mangroves in the coastal area

Barangay - Barrio
Dagami - Rice stalk
Darak - Rice hull

Kagawad - Representative of the municipal council (Sangguniang Bayan)

Sangguniang Bayan - Municipal council

GLOSSARY OF TECHNICAL TERMS

Aquasilviculture - Raising mudcrab/shrimp adjacent or under mangroves. Also known as silvofishery

Detritus - Mangrove leaf particles coated with microorganism in the process of decomposition

Enhancement - Rehabilitation by increasing the number of seedlings of planting desirable species

Hardening - The conditioning of seedlings through gradual exposure to sunlight and controlled watering prior to outplanting

Verifying map data on the ground

Propagules - The germinating seeds of the Family Rhizophoraceae while still attached to the mother

tree. Also known as viviparous seeds

Wildlings - Propagules/seeds that germinate and grow naturally on the forest floor, the

characteristic of which resembles that of the seedings/propagules being raised in the nursery. These are sometimes collected using spade (earth-balled or bare-root) and

potted in the nursery

Pericarp - The walls of ripened ovary of the fruit