

Japan International Cooperation Agency  
Ministry of Marine Affairs and Fisheries  
Government of Indonesia  
Regional Planning, Research and Development Agency  
North Sulawesi Province

# The Study on the Integrated Coral Reef Management Plan in North Sulawesi in the Republic of Indonesia

Final Report  
Volume II  
Master Plan

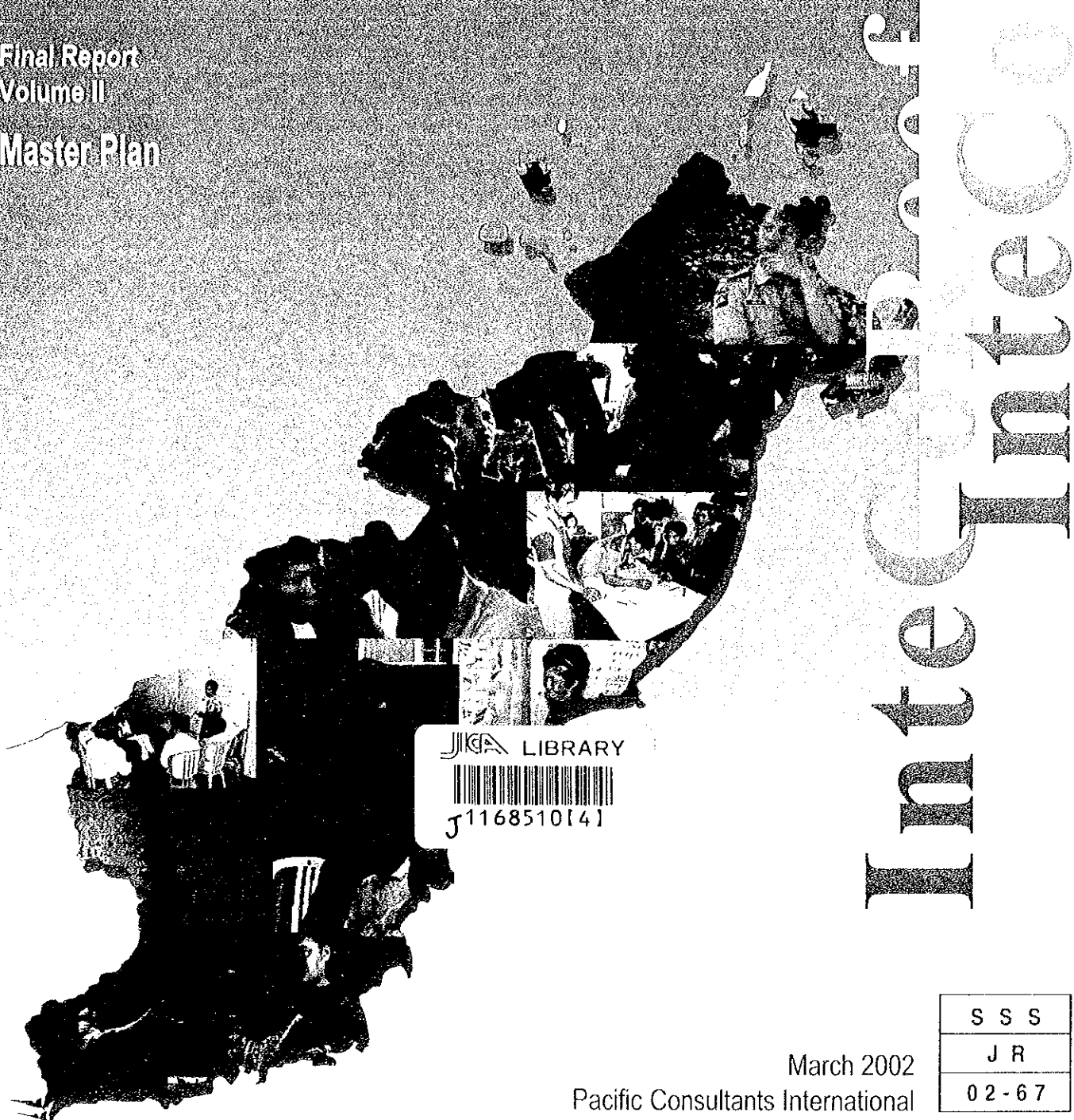
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The Study on the Integrated Coral Reef Management Plan  
in North Sulawesi in the Republic of Indonesia

Final Report  
Volume II

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March 2002

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Pacific Consultants International



1168510{4}

**The following foreign exchange rate is applied in the study :**  
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## PREFACE

In response to a request from the Government of Republic of Indonesia, the Government of Japan decided to conduct the Study on the Integrated Coral Reef Management Plan in North Sulawesi in the Republic of Indonesia and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Dr. Akinori Sato of Pacific Consultants International to the Republic of Indonesia, 4 times between March 2000 and March 2002.

In addition, JICA set up an advisory committee headed by Mr. Masahiro Ohta, Senior Advisor of JICA between March 2000 and March 2002, which examined the study from specialist and technical point of view.

The team held discussions with the officials concerned of the Government of Republic of Indonesia and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Republic of Indonesia for their close cooperation extended to the Team.

March 2002



Kawakami Takao  
President

Japan International Cooperation Agency

March 2002

Mr. Takao Kawakami  
President  
Japan International Cooperation Agency  
Tokyo, Japan

### Letter of Transmittal

Dear Sir,

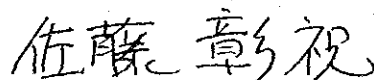
We are pleased to formally submit herewith the Final Report of "The Study on The Integrated Coral Reef Management Plan in North Sulawesi in The Republic of Indonesia".

This report compiles the result of the Study, which was undertaken in the Republic of Indonesia from March 2000 through March 2002 by the Study Team, represented by Pacific Consultants International.

We had been assisted by many people for the accomplishment of the Study, and we would like to express our sincere gratitude and appreciation to all those who extended their kind assistance and cooperation to the Study Team, in particular, Ministry of Marine Affairs and Fisheries who acted as the counterpart agency and Regional planning, Research and Development Agency North Sulawesi Province who acted as the local counterpart agency.

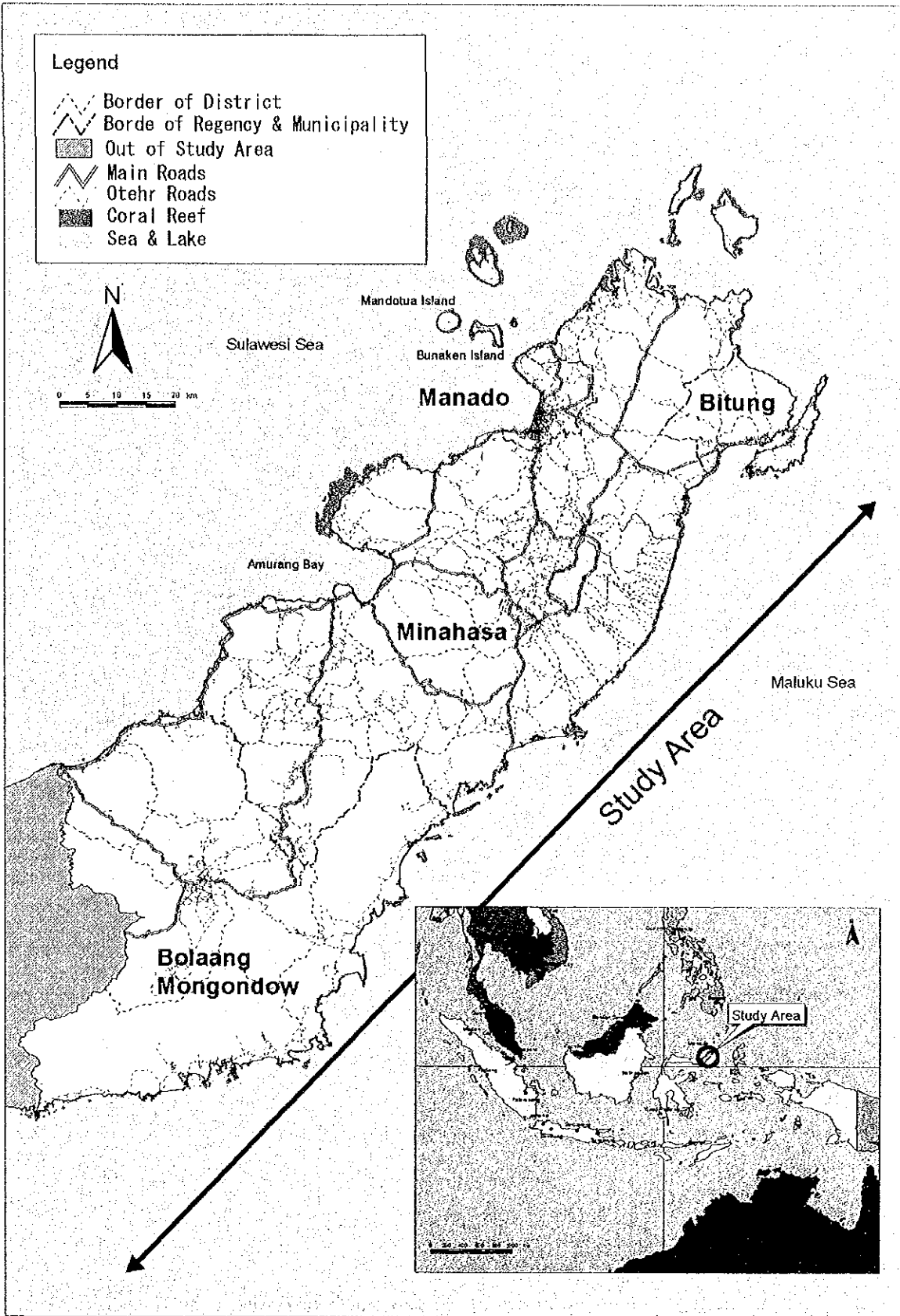
Also, we acknowledge the effective assistance by all the officials of your Agency and the Embassy of Japan in the Republic of Indonesia.

We hope that the report will be able to contribute to formulate appropriate policies and measures for the future prosperity of Indonesia and North Sulawesi Province.



---

Akinori Sato  
Team Leader,  
The Study on The Integrated Coral Reef  
Management Plan in North Sulawesi in  
The Republic of Indonesia



Study Area

**THE STUDY ON  
THE INTEGRATED CORAL REEF MANAGEMENT PLAN  
IN NORTH SULAWESI**

FINAL REPORT

**VOLUME II    MASTER PLAN**

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## FORMATION OF THE REPORTS

This Report consists of 5 volumes as follows ;

- Volume I : Summary**
- Volume II : Master Plan**
- Volume III : Coastal Environmental Conditions and Coastal Management System**
- Volume IV : Proposed Projects and Programs**
- Volume V : Project Activities**

Volume I, Summary Report, contains the outline of the results of the study including identification of coastal problems and the Master Plan.

Volume II, Master Plan Report, is a main report which contains the existing conditions, identification of coastal problems, detail contents of the Master Plan and recommendations.

Volume III, Coastal Environmental Conditions and Coastal Management System, contains the existing environmental conditions and Indonesian and North Sulawesi coastal management system. This volume was edited aiming to be utilized for administrative work such as coastal management, development permit, Environmental Impact Assessment, etc.

Volume IV, Proposed Projects and Programs, contains a list of proposed projects and programs based on the Master Plan.

Volume V, Project Activities, contains the activities implemented by the Study Team through two years. This volume explains the reason why the Study Team conducted a lot of activities and how reflect the result of the activities into the Master Plan.

## GLOSSARY

<u>Abbreviation</u>	<u>Indonesian</u>	<u>English</u>
ADB	Bank Pembangunan Asia	Asian Development Bank
AMDAL	Jenis Usaha atau Kegiatan Yang Wajib Dilengkapi Dengan Analisis Mengenai Dampak Lingkungan	Environmental Impact Assessment
APBD	Anggaran Pendapatan dan Belanja Daerah	Provincial Budget of GOI
APBN	Anggaran Pendapatan dan Belanja Negara	National Budget of GOI
APPKD	Anggaran Pendapatan dan Perbelanjaan Keuangan Desa	-
a.s.l.	-	above sea level
ASPISIA	Asosiasi Penyelam Ilmiah Indonesia	Indonesian Scientific Divers Association (name of NGO)
AusAID	-	Australian Agency for International Development
B/C	-	Benefit - Cost Ratio
BAKOSURTANAL	Badan Koodinasi Survei Dan Pemetaan Nasional	-
BAPEDAL	Badan Pengendalian Dampak Lingkungan	Environmental Impact Management Agency
BAPPEDA	(Old) Badan Perencanaan Pembangunan Daerah (New) Badan Perencanaan Pembangunan Daerah Kota/ Daerah Kabupaten	Regional Development Planning Board
BAPPEDALDA	Badan Pengendalian Dampak Lingkungan Daerah	Local Environmental Impact Management Agency
BAPELITBANG	Badan Perencanaan, Penelitian dan Pengembangan (Propinsi Sulawesi Utara)	Regional Planning, Research, and Development Agency (North Sulawesi Province)
BAPPENAS	Badan Perencanaan Pembangunan Nasional	National Planning and Development Agency
BIPHUT	Balai Informasi dan Penyuluhan Pertanian	Forest Inventory and Mapping Office
BKB	Balai Kesehatan Balita	-
BKIA	Balai Kesehatan Ibu and Anak	-
BKPRS	-	-
BKSDA	Balai Konservasi Sumberdaya Alam	Natural Resources Conservation Agency
BLK	Bali Latihan Kerja	-
BMG	Badan Meteorologi dan Geofisika	Meteorological and Geophysical Agency



BNI	Bank Negara Indonesia	Indonesian State Bank
BOD	-	Biological Oxygen Demands
BPD	Badan Perwakilan Desa (berdasarkan UU, No.22 Tahun 1999)	Village Parliament
BPD	Bank Pembangunan Daerah	Regional Development Bank
BPN	Badan Pertanahan Nasional	National Landuse Board
BPPT	Badan Pengkajian dan Penerapan Teknologi	Analysis and Applied Technology Board
BPS	Biro Pusat Statistik	Central Bureau of Statistics
BRLKT	Balai Rehabilitasi Lahan dan Konservasi Tanah	Office of Land Rehabilitation and Soil Conservation
BSP Kemala	-	Biodiversity Support Program (RP3 of NRM II Program)
C/N Ratio	-	Carbon / Nitrogen Ration
CCMRS	-	Center for Coastal and Marine Resources Studies of the Bogor Agricultural University (known locally as PKSPL)
CIDA	-	Canadian International Development Agency
COD	-	Chemical Oxygen Demands
COREMAP	-	Coral Reef Rehabilitation and Management Project - a multilateral initiative to formally commence in 1999
CRC	-	Coastal Resources Center
CRITC	-	Coral Reef Information and Training Center (COREMAP initiatives that also partner CRMP)
CRMP	Proyek Pesisir	Coastal Resources Management Project
CV	Comanditer Venopscap	Limited Company
DAK	Dana Alokasi Khusus	Special Allocation Fund
DAS	Daerah Aliran Sungai	Watershed
DAU	Dana Alokasi Umum	General Allocation Fund
DEPDAGRI	Departemen Dalam Negeri	Ministry of Home Affairs
DEPDIKNAS	Departemen Pendidikan Nasional (sebelumnya disebut Depdikbud)	-
DEPHUB	Departemen Perhubungan dan Telekomunikasi	Ministry of Transportation and Telecommunication
DEPHUTBUN	Departemen Kehutanan dan Perkebunan	Ministry of Forestry and Plantation Estate
Desa	Desa	Village
Ditjen BANGDA	Direktorat Jenderal Pengembangan Daerah	Directorate General for Local Development, Ministry of Home Affairs

Ditjen Pariwisata	Direktorat Jenderal Pariwisata	Directorate General for Tourism
DKP	Departemen Kelautan dan Perikanan	Ministry of Marine Affairs and Fisheries
DPB	Daerah Perlindungan Bakau	Mangrove Sanctuary
DPL	Daerah Perlindungan Laut	Marine Sanctuary
Dusun	Dusun	Hamlet
EIRR	-	Economic Internal Rate of Return
EPIQ/IRG	-	Environmental Policy Indefinite Quality/International Resources Group (PRs 1 and 4 of NRM II Program)
FADs	-	Fish Aggregating Devices
FIRR	-	Financial Internal Rate of Return
GABATA	Gangga Banka dan Talise	-
GBHN	Garis-garis Besar Haluan Negara	National Development Guidelines
GDP	-	Gross Domestic Product
GIS	-	Geographical Information System
GOI	Pemerintah Indonesia	Government of Indonesia
GOJ	-	Government of Japan
GPS	-	Global Positioning System
GRDP	-	Gross Regional Domestic Product
HKM	Hutan kemasyarakatan	Community Forest
HPH	Hak Pengusahaan Hutan	Companies holding a forest concession
HPHTI	Hak Pengusahaan Hutan Tanaman Industri	Concession Rights for Industrial Tree Forest
IDT	Impres Desa Tertinggal	Poor or Non-poor Villages
IKIP	Institut Keguruan dan Ilmu Pendidikan	-
IMA	-	International Marine-life Alliance
IPB	Institut Pertanian Bogor	Bogor Agricultural University
ITB	-	Institute of Technology at Bandung
JARI	Juang Laut Lastari	-
JBIC (ex OECF)	-	Japan Bank for International Cooperation
JICA	-	Japan International Cooperation Agency
JPS	Jaring Pengamanan Social	-
Jubi	Alat menangkap ikan berbentuk panah atau tombak yang biasanya digunakan oleh nelayan tradisional	-
Kab.	Kabupaten	Regency
KANDEP P dan K	Kantor Departemen Pendidikan dan Kebudayaan	-
Kanwil	kantor Wilayah	Local Office
Kec.	Kecamatan	District

Kelola	Yayasan Kelola	Kelola (name of NGO)
KM	Keputusan Menteri	Minister Decree
Kota	Kota	Municipality
KP	Keputusan Presiden	Presidential Decree
LIPI	Lembaga Ilmu Pengetahuan Indonesia	Indonesian Institute of Science
LKMD	Lembaga Ketahanan Masyarakat Desa	Institute for Village Community Resilience
LMD	Lembaga Musyawarah Desa	Village Council
LP3M	Lembaga Pengkajian Pedesaan, Pantai dan Masyarakat	-
LREP	-	Land Resources Evaluation and Planning Project (ADB supported)
LSM	Lembaga Swadaya Masyarakat	Non Governmental Organization
MCK	Mandi Cuci Kakus	-
MREP/MAREMAP	-	Marine Resource Evaluation and Planning concluded in 1998/Marine Resource Evaluation and Management Project-second stage of MREP in design (both ADB supported)
NGO	Lembaga Swadaya Masyarakat	Non Governmental Organization
NKLHD	-	Regional Environmental Quality Scale
NPV	-	Net Present Value
NRM II	-	Natural Resources Management II
NSDA	-	Regional Natural Resources Scale
O & M	-	Operation and Maintenance
PDAM	Perusahaan Daerah Air Minum	Local Water Company
PJP	Proyek Jangka Panjang	Long term National Development
PKK	Peningkatan Kesejahteraan Keluarga	Family Welfare Program
PLN	Perusahaan Listrik Negara	National Electric Company
PNBP	Penerimaan Negara dari Bea Perolehan Hak atas Tanah dan Bangunan	Non Tax National Income
PP	Peraturan Pemerintah	Government Regulation
PPI	Pangkalan Pendaratan Ikan	Fish Landing Office
PPTA	Pusat Penelitian Tanah dan Agroklimat	-
Prona	Proyek Nasional	-
PU	Pekerjaan Umum	Public Works
Repelita	Rencana Pembangunan Lima Tahun	Five Year Development Plan
RKL	Rencana Pemantauan Hingkgungan	Environment Monitoring Plan
RPL	Rencana Pengelolaan hingkgungan	Environment Management Plan
RRA	-	Rapid Rural Appraisal
RTRW	Rencana Tata Ruang Wilayah	Spatial Plan

SD	Sekolah Dasar	-
Senso	Mesin pemotong kayu yang istilah umumnya chainsaw	-
SIUP	Surat Izin Usaha Perikanan	Permission Application for Fishing Business
SLTA	Sekolah Lanjutan Atas	High School
SMP	Sekolah Menengah Pertama	Junior High School
SULUT	Sulawesi Utara	North Sulawesi
Tibo-tibo	Pedagang pengumpul	Wholesale broker
TNB	Taman Nasional Bunaken	Bunaken National Park
TPI	Tempat Pelelangan Ikan	Fishing Auction Market
UCE	-	University Consortium on the Environment
UGM	-	Gadjah Mada University
UI	-	University of Jakarta
UKL	Unit Pemantauan Hingkungan	Environment Monitoring Unit
UNSRAT	Universitas Sam Ratulangi	University of Sam Ratulangi
UPL	Unit Pengelolaan Hingkungan	Environment Management Unit
URI	-	University of Rhode Island
USAID	-	United States Agency for International Development
USLE	-	Universal Soil Loss Equation
UW	-	University of Waterloo
WB	-	World Bank
WTP	-	Willingness to Pay
YU	-	York University
-	Assisten	Assistant (or Deputy Director)
-	Badan	Local Board (or Agency)
-	Balai	Office (or Authority, Agency)
-	Balai Taman Nasional Bunaken	Bunaken National Park Authority
-	Bupati (Kepara Kabupaten)	Head of Regency
-	Cabang Dinas	Branch Office
-	Camat	Head of District
-	Dana Perimbangan	Balancing Fund
-	Dana Reboisasi	Reforestation Fund
-	Dewan	Council
-	Dewan Pengelolaan Taman Nasional Bunaken	Bunaken National Park Management Council
-	Dewan Perwakilan Rakyat Daerah	Regional Peoples representative Assembly

-	Dinas	Governmental (Service) Office
-	Dinas Kehutanan	Forestry Office
-	Dinas Pengairan	Water Irrigation Office
-	Dinas Perikanan	Fisheries Office
-	Hukum Tua	Head of Village (in Minahasa Regency)
-	Kasie (kepala Seksi)	Head of Section
-	Kawasan Pelestarian Alam	Natural Preservation Area
-	Kawasan Perlindungan Setempat	Local Geographically Categorized Protection Area
-	Kawasan Rawan Bencana Alam	Natural Disaster Risk Area
-	Kawasan Suaka Alam	Natural Conservation Area
-	Kawasan Suaka Alam dan Cagar Budaya	Natural Conservation and Cultural Preservation Area
-	Kepala Desa	Head of Village
-	Keputusan	Decision / Decree
-	Kesepakatan	Mutual Agreement
-	Ketentuan	Regulation under Peraturan
-	Ketetapan	Decision/Decree under Keputusan
-	Konservasi	Conservation
-	Lindung	Protection
-	Pantai	Sea Shore
-	Pengelolaan	Management
-	Perangkat Desa	Village Government
-	Peraturan	Regulation
-	Pesisir	Coastal
-	Seksi	Section
-	Sub-Dinas	Sub-office
-	Taman Hutan Raya	Grand Forest Park
-	Taman Nasional	National Park
-	Taman Wisata	Natural Recreation Park
-	Undang Undang	Law
-	Wali Kota	Mayor