

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 I

Summary

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The following foreign exchange rate is applied in the study :
US\$ 1.00 = (Indonesian Rupiah) Rp. 10,000 (as of December 2001)

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.

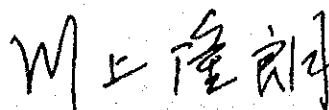
In addition, JICA set up an advisory committee headed by Mr. Masahiro Ohta, Senior Advisor of JICA between March 2000 and March 2002, which examined the study from specialist and technical point of view.

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.

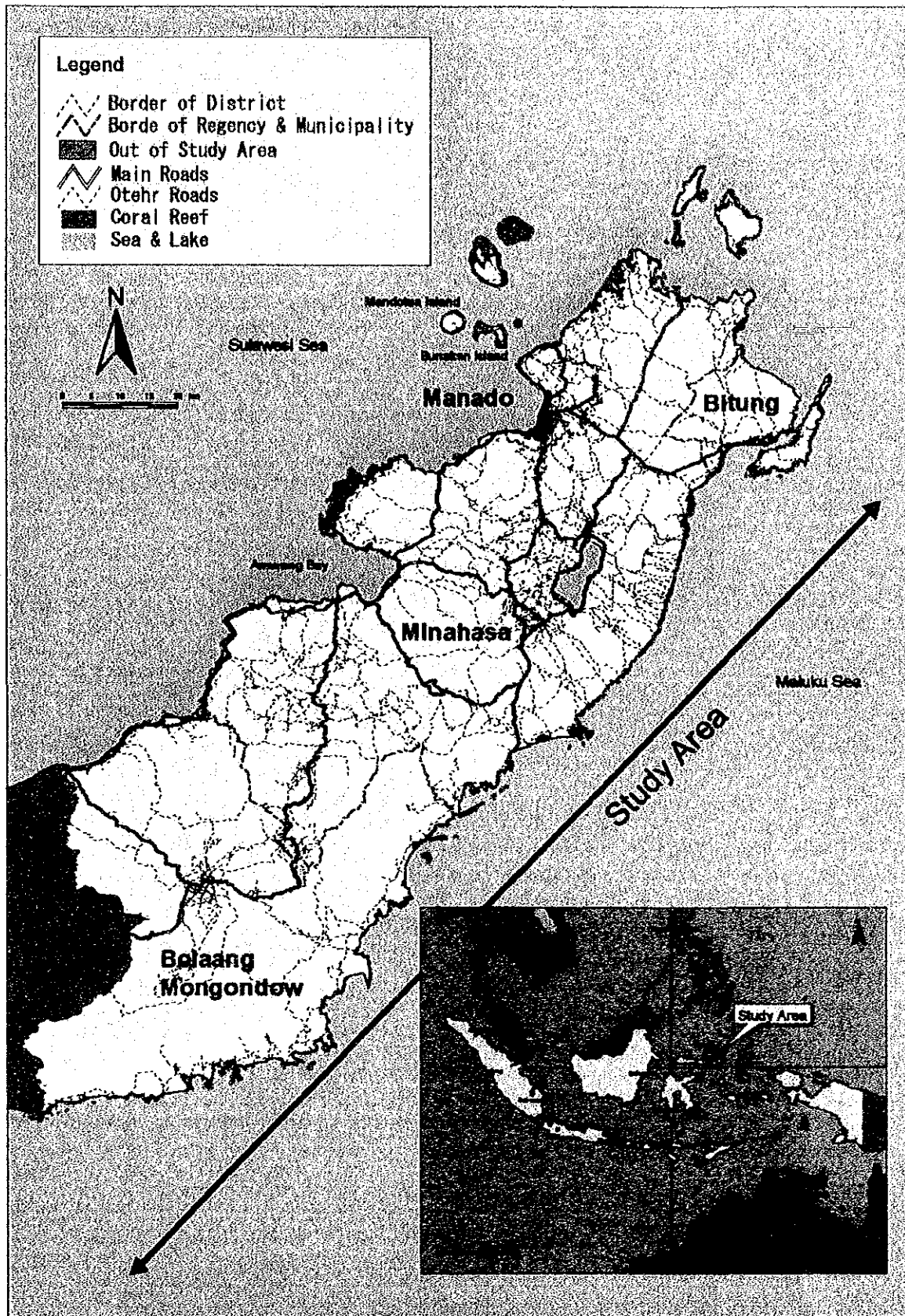
We had been assisted by many people for the accomplishment of the Study, and we would like to express our sincere gratitude and appreciation to all those who extended their kind assistance and cooperation to the Study Team, in particular, Ministry of Marine Affairs and Fisheries who acted as the counterpart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

佐藤 彰 祝

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 I SUMMARY

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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 Linkungan	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 Linkungan 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
BPJ	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	Departmen 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 Marin-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
Replita	Rencana Pembangunan Lima Tahun	Five Year Development Plan
RKL	Rencana Pemantauan Hingkungan	Environment Monitoring Plan
RPL	Rencana Pengelolaan hingkungan	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 (<i>kepala Seksi</i>)	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

OUTLINE OF THE STUDY

1. Natural Resources and Life of the People in the Coastal Area of North Sulawesi

More than 49% of the population in the North Sulawesi region lives in the coastal area, which consists of 33% in the urban area and 16% in the rural area. The tourism industry is one of the dominant economic sectors in the region. Bunaken and other marine areas attract 30,000 and 400,000 foreign and domestic tourists respectively every year. The income from tourism was estimated at Rp. 418 billion, which is 4% of the total GDP of the province in the year 2000.

Most of the rural villages in the coastal area rely on the coastal resources, such as fishes, mariculture and mangrove, for subsistence. Fishery production was nearly 5% of total GDP. The production in the reef flat area covers nearly 30% of total fishery production. Mangrove, sea-grass, and other marine ecosystems provide economic value as well. This JICA Study identified that the total economic value of these natural resources would amount to Rp. 34 trillion/year.

2. The Critical Current Condition of the Coastal Area in North Sulawesi

The coral reef and other valuable marine resources have been degraded and destroyed already. According to the aerial photo analysis and field study undertaken by the Study, almost 98% of coral reef has been damaged (poor and fair conditions), as shown the table below.

Cover Ratio of Live Coral in the Study Area

Classification	Poor	Fair	Good	Excellent	Total
Live coral ratio (%)	0 – 25 %	26 – 50 %	51 – 75 %	76 – 100 %	
Cover Area (km ²)	198.2	20.2	3.9	0.4	222.7
Cover ratio (%)	89.0	9.1	1.7	0.2	100

Source: The JICA Study Team

Coastal problems can be divided into five as follows:

- inappropriate coastal spatial use
- inappropriate coastal resources use
- inappropriate land use

- population concentration and industrialization
- no protection of marine wildlife

If no action is taken urgently, the property, which could produce Rp.19 trillion every year, will disappear in the very near future and the tourism industry in North Sulawesi will be seriously damaged.

3. Responsibility in Line with the Role & Function under the Autonomous Policy (Undang Undang No.22&25/1999)

Coastal resource management, especially marine resources within 12 miles from shoreline, should be managed by the Provincial Government, according to the law for decentralization and the Presidential Decree. In performing the responsibility of the provincial government, the Provincial Regulation (Peraturan Daerah: PerDa) should be enacted by the Provincial Assembly (DPRD).

In enforcing PerDa, the provincial government requires a small office called the Provincial Integrated Coastal Management Office (PICMO). At the Kabupaten/Kota level, Kabupaten/Kota Integrated Coastal Management Offices (KICMOs) have to be established, in order to enforce the PerDa.

4. Outputs of JICA Study

The Study Team consisting of 17 specialists and professionals worked together with officials of the Provincial Government, Regency and Municipal (Kabupaten/Kota) Governments, Village (Desa), and village people together with NGOs. Environmental survey, socio-economic survey, and other necessary surveys and Pilot Projects were conducted at the cost of Rp. 33.5 billion or \$ 3.34 million from April 2000 to March 2002.

The major outputs are as follows:

(1) Taking Aerial Photos

More than 1,000 aerial photos covering 2,800 km, including 1:50,000 in black/white and 1:20,000 in color which covers 1,056 km of shoreline, and 7,800 km² land area were taken. This is a first experience of aerial photography for coastal resource and spatial analysis in Indonesia. As a result of the aerial photo analysis, the distribution of corals

and their condition (excellent, fair, good and poor) as well as the causes of degradation and destruction are identified for the first time.

Moreover, it is the first time in Indonesia that distribution, condition and cause of degradation of marine resources are identified along almost 1000km of coastline.

(2) Implementation of Pilot Project

The Provincial Steering Committee selected 4 communities, namely, Manado Tua, Rap rap, Basaan and Basaan-I for the Pilot Project on Community Based Coastal Management (CBCM). The Pilot Project included measures to empower communities directly, training of Extension Officers (EOs), baseline survey, problem analysis and the community coming up with own solutions. Finally, Village people formulated Community Coastal Management Plans, following a long discussion and analysis of coastal management problems.

(3) Community Artificial Reef Establishment

The Study Team developed and supported the installation of artificial reefs for community people in Basaan and Basaan-I. Forty-five (45) days after the establishment of artificial reefs, which had been produced and set on sea bottom by the village people, lots of fishes and shrimp were found gathered around the artificial reefs, and the community people were convinced that the artificial reef was most effective in rehabilitating the damaged resources.

(4) Working Together

The Provincial Steering Committee established five Sub-Steering Committees. They worked together with the Study Team. The working-together policy was effective in disseminating information on marine resources, improving working style for resource management and familiarizing themselves with the Community Based Coastal Management (CBCM).

5. Actions to be taken by the Provincial Government

Enactment of PerDa by DPRD is the first step, which means that the Provincial Government announces the coastal resource management and its sustainable use becomes the top priority among other matters in North Sulawesi.

Establishment of PICMO and KICMOs is the second step. Third step is to develop the Provincial Coastal Spatial Use Plan, which will be authorized by DPRD, according to PerDa.

The Study Team recommended 43 projects for implementation until 2015. However, seven projects and programs were picked-up for the priority as follows:

- 1) Establishment of Provincial Coastal Management Regulation (PerDa);
- 2) Establishment of Provincial Integrated Coastal Management Office (PICMO) and Kabupaten/Kota Integrated Coastal Management Office (KICMO);
- 3) Human Resources Development for local governments of PICMO, KICMO, Village Government (Desa) and EO;
- 4) Formulation of Provincial and Municipal/Regency Coastal Spatial Use Plan;
- 5) Establishment of Provincial Protected Area;
- 6) Establishment of Community Coastal Resources User Right; and
- 7) Supporting Program for Community Based Coastal Management (CBCM).

In general, budget allocation for Environmental Management among the developed countries is 1 to 2% of the GDP.

(Ref.: 1 to 2% from North Sulawesi Provincial GDP in the Year 1999 was 107.8 to Rp. 216.5 Billion)

At this moment, there is no specific budget allocation for environmental management except Reforestation (Reboisasi) from the Current Annual Budget (APBD). The North Sulawesi Provincial Government should make an effort to allocate even a minimum amount from its budget for the conservation of valuable coastal resources.