

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 III

## Coastal Environmental Conditions and Coastal Management System

JICA

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

Final Report  
Volume III  
Coastal Environmental Conditions  
and Coastal Management System

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March 2002  
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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 III**

**Coastal Environmental Conditions  
and Coastal Management System**

March 2002  
Pacific Consultants International



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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.

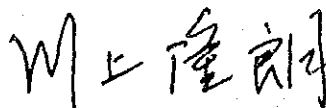
In addition, JICA set up an advisory committee headed by Mr. Masahiro Ohta, Senior Advisor of JICA between March 2000 and March 2002, which examined the study from specialist and technical point of view.

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.

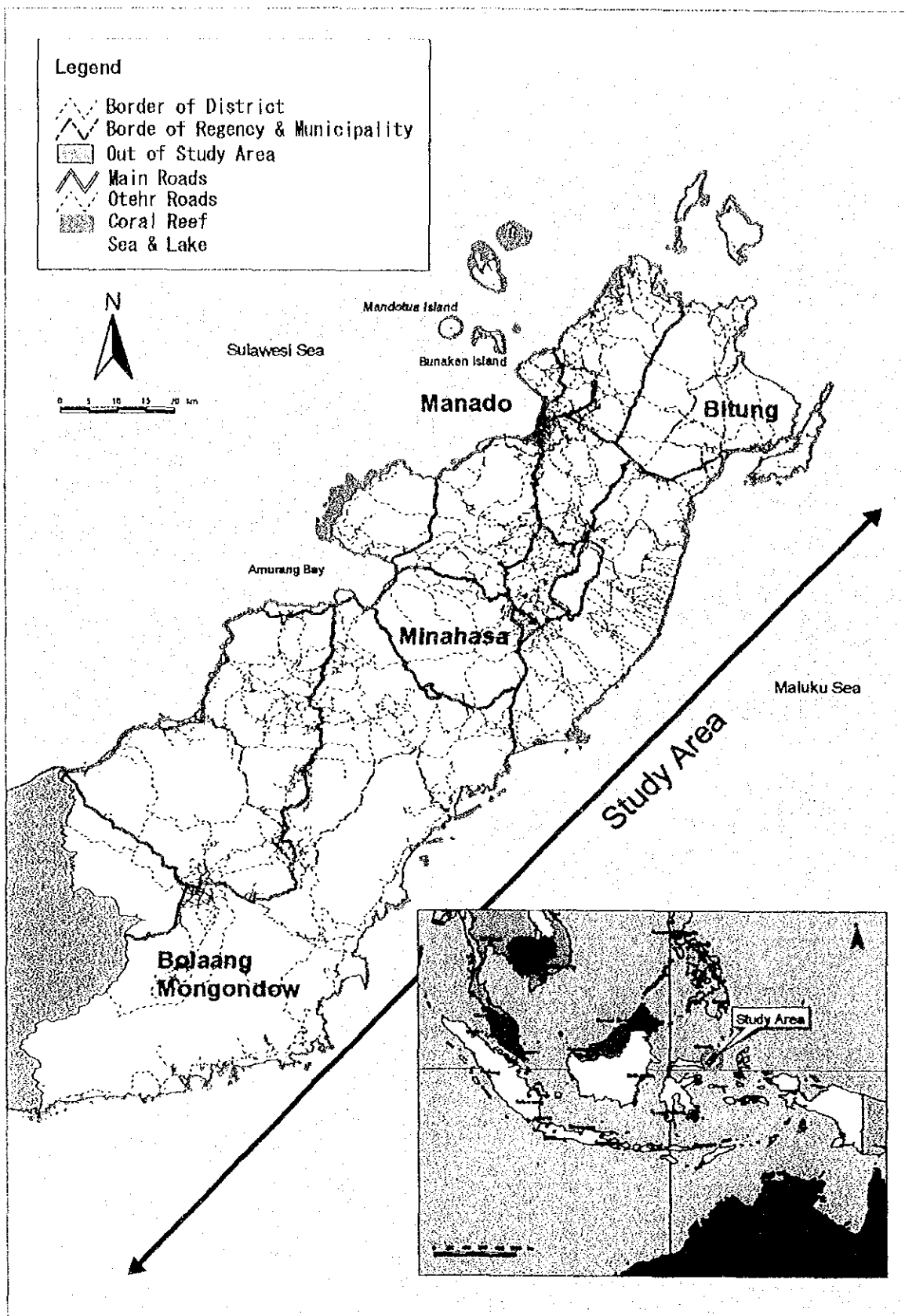
Also, we acknowledge the effective assistance by all the officials of your Agency and the Embassy of Japan in the Republic of Indonesia.

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 III COASTAL ENVIRONMENTAL CONDITIONS AND**

**COASTAL MANAGEMENT SYSTEM**

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## FORMATION OF THE REPORTS

This Report consists of 5 volumes as follows ;

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| <b>Volume I</b>   | <b>:</b> | <b>Summary</b>  |
| <b>Volume II</b>  | <b>:</b> | <b>Master Plan</b>  |
| <b>Volume III</b> | <b>:</b> | <b>Coastal Environmental Conditions and Coastal Management System</b> |
| <b>Volume IV</b>  | <b>:</b> | <b>Proposed Projects and Programs</b>                                 |
| <b>Volume V</b>   | <b>:</b> | <b>Project Activities</b>   |

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<br>(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 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 (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   |