No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF HIGHWAYS

THE STUDY ON ARTERIAL ROAD NETWORK DEVELOPMENT PLAN FOR SULAWESI ISLAND AND FEASIBILITY STUDY ON PRIORITY ARTERIAL ROADS IN SOUTH SULAWESI PROVINCE

FINAL REPORT

VOLUME 1 : MASTER PLAN STUDY

MARCH 2008

NIPPON KOEI CO., LTD.
KRI INTERNATIONAL CORP.
ALMEC CORPORATION

INO
JR
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COMPOSITION OF FINAL REPORT

Volume 1: Master Plan Study (Summary and Main)
Volume 2-1: Feasibility Study (Summary and Main)
Volume 2-2: Feasibility Study (Drawings)
Volume 2-3: Feasibility Study (EIA & Public Consultation)

CURRENCY EXCHANGE RATE

Following currency exchange rates were adopted in this report unless otherwise stipulated.

(1) Indonesia Rupiah vs. US Dollar
Selling rate of Bank Indonesia on May, 16 2007
USD 1= IDR 9,322

(2) Indonesia Rupiah vs. Japanese Yen
Selling rate of Bank Indonesia on May, 16 2007
JPY 1 = IDR 77.55

Preface

In response to the request from the Government of Republic of Indonesia, the Government of Japan decided to conduct the Study on Arterial Road Network Development Plan for Surlawesi Island and the Feasibility Study on Priority Arterial Roads in South Sulawesi Province, and entrusted the Study to the Japan International Cooperation Agency (JICA).

JICA sent the Study team, headed by Mr. Hiroki SHINKAI of Nippon Koei Co., Ltd. and organized by Nippon Koei Co., Ltd., KRI International Corporation, and ALMEC Corporation to Indonesia four times from December 2006 to March 2008.

The Study team had a series of discussions with the officials concerned of the Directorate General of Highways (Bina Marga), Ministry of Public Works and Regional Planning and Development Agency (Bappeda), South Sulawesi Province and conducted related studies. After returning to Japan, the Study team conducted further studies and completed this final report.

I hope that this report will contribute to the promotion of the plan and to the enhancement of amity between two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Indonesia, especially the counter part agencies of Directorate General of Highways, Ministry of Public Works and Regional Government of South Sulawesi Province for their close cooperation throughout the Study.

March, 2008

Takashi KANEKO

Vice President

Japan International Cooperation Agency

March 2008

Mr. Takashi KANEKO
Vice President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Submittal

Dear Sir,

We are pleased to submit to you the report on the Study on Arterial Road Network Development Plan for Sulawesi Island and Feasibility Study on Priority Arterial Roads in South Sulawesi Province in Indonesia. The report compiled all findings obtained through the study from December 2006 to March 2008 in Indonesia conducted by Nippon Koei Co. Ltd., KRI International Corporation and ALMEC Corporation in accordance with the contract with Japan International Cooperation Agency (JICA).

The Study consists of the master plan study on road network development covering 6 provinces in Sulawesi Island and the feasibility study on priority arterial roads in South Sulawesi Province.

The master plan formulates the comprehensive road network system based on the analysis of existing and future socio/economic framework, environment and road conditions in Sulawesi and proposes the realistic and practical implementation plan, taking into consideration possible financial plan aiming at the year of 2024.

The feasibility study on the high priority 5 project roads, including Trans Sulawesi Mamminasata Road from Maros to Takalar, concludes that the projects will be technically and economically feasible and acceptable from the environmental aspects and will contribute to the enhancement of economic development of South Sulawesi. Therefore, the Study team recommends earlier implementation of the projects.

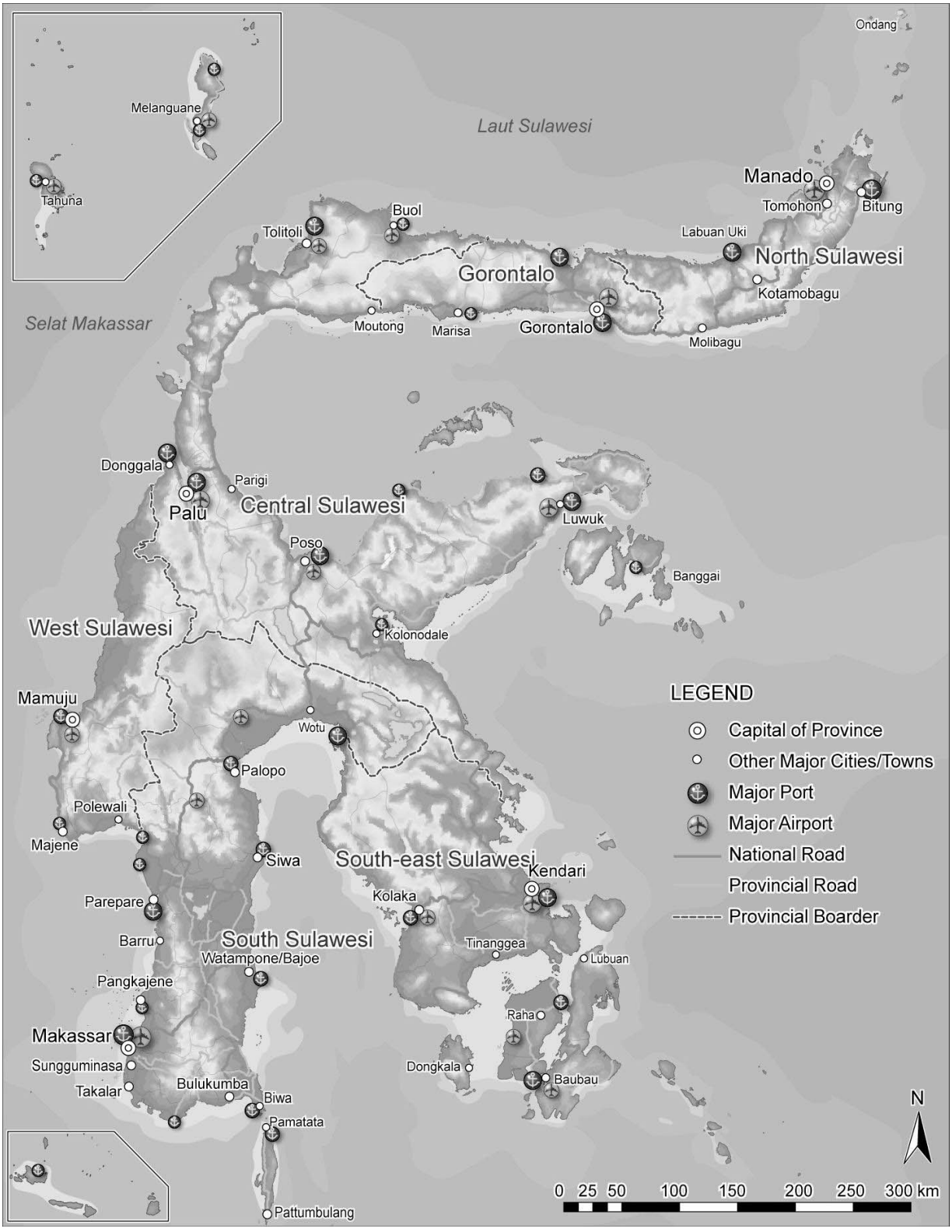
We wish to express our sincere gratitude to your agency, including the JICA experts concerned, and also wish to express our deep appreciation to the government of Indonesia, especially the counterpart agencies of the Directorate General of Highways of Ministry (Bina Marga), Public Works and Regional Planning and Development Agency (Bappeda) of South Sulawesi Province for their close cooperation and assistance extended to us during the study.

We hope this report will contribute to the development of the Republic of Indonesia.

Very truly yours,

Hiroki SHINKAI

Leader of the Study Team



The Study on Arterial Road Network Development for Sulawesi Island and Feasibility Study on Priority Arterial Road Development for South Sulawesi Province

LOCATION MAP (M/P)

Study Road Length (km)

YEAR	2005	2024
National Road	7,092	8,141
Provincial Road	4,976	4,785
Total	12,068	12,926

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LIST OF ABBREVIATIONS

A

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Office
AC	Asphalt Concrete
ADB	Asian Development Bank
ADSRP	Abdullah Daeng Sirua Road Project
AMDAL	Analisis Mengenai Dampak Lingkungan Hidup
ANDAL	Analisis Dampak Lingkungan (Environmental Analysis)
AP	Angkasa Pura (*Aviation Service*)
APBD	Anggaran Pendatapatan dan Belanja Daerah (*Local Budget of Income and Expenditure*)
APBN	Anggaran Pendatapatan dan Belanja Nasional (*National Budget of Income and Expenditure*)
ASDP	Angkutan Sungai, Danau dan Penyeberangan (*Inland Ferry Service*)
ASEAN	Association of Southeast Asian Nations
ASTM	American Society for Testing and Materials
AusAID	Australian Agency for International Development

B

BALAI BESAR	Regional Office of DGH
BAPEDALDA	Badan Pengelolaan dan Pengendalian Dampak Lingkungan Daerah (Environmental Impact Management Agency)
BAPPEDA	Badan Perencanaan Pembangunan Daerah (Regional Planning and Development Agency)
BAPPEDAL	Badan Pengendalian Dampak Lingkungan
BAPPENAS	Badan Perencanaan dan Pembangunan Nasional (National Planning and Development Agency)
B/C	Benefit/Cost Ratio
BDF	Bio-Diesel Fuel
BINA MARGA	Directorate General of Highways
BKSPMM	Badan Kerja Sama Pembangunan Metropolitan Mamminasata (Mamminasata Metropolitan Development Cooperation Body)
BMS	Bridge Management System
BOT	Built-Operate-Transfer

BP	Bypass
BPN	Badan Pertanahan Nasional (National Land Agency)
BPS	Badan Pusat Statistik (Central Bureau of Statistics)

C

CBD	Central Business District
CBR	California Bearing Ratio
CCC	Celebes Convention Center
CESA	Cumulative Equivalent Standard Axle
CNO	Crude Coconut Oil
CPB	Cocoa Pod Borer

D

DAK	Special Allocation Fund (Dana Alokasi Khusus)
DAU	General Allocation Fund (Dana Alokasi Umum)
DCP	Dynamic Cone Penetrometer
DGAC	Directorate General of Air Communication
DGH	Directorate General of Highways
DGLT	Directorate General of Land Transportation
DINAS PRASWIL	Regional Infrastructure Agency
DINAS PU	Dinas Pekerjaan Umum (Regional Public Works)
DP	Development Plan

E

EIA	Environmental Impact Assessment
EINRIP	Eastern Indonesia National Road Improvement Project
EIRR	Economic Internal Rate of Return
EIRTP	Eastern Indonesia Region Transportation Project
ESAL	Equivalent Standard Axle
ESCAP	Economic and Social Commission for Asia and Pacific
EU	European Union

F

FAO	Food and Agriculture Organization (of the United Nations)
FEZ	Free Economic Zone
FIRR	Financial Internal Rate of Return
FOB	Free on Board
FS or F/S	Feasibility Study

G

GBHN	Garis Besar Haluan Negera (State Policy Guideline)
GDP	Gross Domestic Product
GIS	Geographical Information System
GMTDC	Gowa Makassar Takalar Development Center
GOI	Government of Indonesia
GOJ	Government of Japan
GRDP	Gross Regional Domestic Product
GT	Gross Ton

H

Ha	Hectare
HCM	Highway Capacity Manual
HLRIP	Heavy Loaded Road Improvement Project
HRP	Hertasning Road Project
HSD	High Speed Diesel

I

IBRD	International Bank for Reconstruction and Development
IC	Interchange
IEE	Initial Environment Examination
IHCM	Indonesian Highway Capacity Manual
IMF	International Monetary Fund
IRMS	Integrated Road Management System

J

JBIC	Japan Bank for International Cooperation
JC	Junction
Jembatan	Bridge
JICA	Japan International Cooperation Agency
JKT	Jakarta
JL	Jalan (Road / Street)
JST	JICA Study Team

K

K A-ANDAL	Kerangka Acuan – ANDAL
KAB or Kab.	Kabupaten (Regency)
KANWIL	Kantor Wilayah (Regional Office)
KAPET	Kawasan Pengembangan Ekonomi Terpadu (Integrated Economic Development Area)
KEC, or Kec.	Kecamatan (District)
KIROS	Kawasan Industri Maros (Maros Industrial Estate)

KIMA	Kawasan Industri Makassar (Makassar Industrial Estate)
KITA	Kawasan Industri Takalar (Takalar Industrial Estate)
KIWA	Kawasan Industri Gowa (Gowa Industrial Estate)

L

LRT	Light Rail Transit

M

MB	Mamminasa Bypass
MBP	Mamminasa Bypass Project
MCA	Multi Criteria Analysis
MDGs	Millennium Development Goals
MOC	Ministry of Communication
MOT	Ministry of Transport
MoU	Memorandum of Understanding
MPW	Ministry of Public Works
MRR	Middle Ring Road
MRT	Mass Rapid Transit
MSRI	Ministry of Settlement and Regional Infrastructure
MST	Muatan Sumbut Terbulat (Maximum Axle Load)
Mt.	Mountain (Gunung)

N

NAC	National Activity Center
NGO	Non-Governmental Organization
NPV	Net Present Value

O

O/D	Origin/Distination
OD	Origin/Development
ODA	Official Development Assistance
OR	Outer Ring

P

P2JJ	Design and Supervision Road/Bridge (Perencanaan dan Pengawasan Jalan dan Jembatan)
PA	Prioritized Area
PC	Pre-stressed Concrete
PC	Public Consultation
PCC	Portland Cement Concrete
PCU	Passenger Car Unit
PDAM	Perusahaan Daerah Air Minum (Regional Water Supply Company)
PFI	Private Finance Initiative

PIU	Project Implementation Unit
PKL	Pusat Kegiatan Lokal
	(Local Activity Center)
PKN	Pusat Kegiatan Nasional
	(National Activity Center)
PKW	Pusat Kegiatan Wilayah
	(Regional Activity Center)
PMU	Project Management Unit
PPP	Public Private Partnership
PRASWIL	Infrastructure Agency
Pre-FS	Pre-feasibility Study
PROPENAS	Program Pembangunan Nasional
	(National Development Program)
PT	Perseroan Terbatas
	(Company Limited)
PT. PELINDO	PT. Pelabuhan Indonesia
	(Indonesian Port Service Company)
PT. PELNI	PT. Pelayaran Nasional Indonesia
	(Indonesian National Shipping Company)
PU	Department of Public Works

R

RAC	Regional Activity Center
RC	Reinforced Concrete
Rd.	Road
RDB	Red Data Book
RDS	Road Design System
RKL	Rencana Pengelolaan Lingkungan
RKP	Rencana Kerja Pemerintah
	(Government Action Plan)
RoRo	Roll on, Roll Off
ROW	Right of Way
RPJM	Rencana Pembangunan Jangka Menengah
	(Mid-term Development Plan)
RPJMD	Rencana Pembangunan Jangka Menengah Daerah
	(Mid-term Regional Development Plan)
RPJMN	Rencana Pembangunan Jangka Menengah Nasional
	(Mid-term Nasional Development Plan)
RPJP	Rencana Pembangunan Jangka Panjang
	(Long-term Development Plan)
Rp	Rupiah (Indonesian Currency)
RPL	Rencana Pemantauan Lingkungan

RRSP	Road Rehabilitation Sector Project
RSP	Regional Spatial Plan
RTR(WN)	Rencana Tata Ruang (Wilayah Nasional) ((National) Spatial Plan)

S

SEA	Strategic Environmental Assessment
SITRAMP	The Study on Integrated Transportation Master Plan for Jabotabek
SPT	Standard Penetration Test

T

TEU	Twenty-foot Equivalent Unit
TOR/EIA	Terms of Reference EIA
TPA	Tempat Pembuangan Akhir (Land Fill Site)
TSMR	Trans-Sulawesi Mamminasata Road
TSMRP	Trans-Sulawesi Mamminasata Road Project
TSSS	Transport Sector Strategy Study
TTC	Travel Time Cost

U

UN	United Nations
UPTD	Unit Pelaksana Teknis Dinas (Technical Implementor Unit Agency)

V

VAT	Value Added Tax
VDF	Vehicle Damage Factor
VOC	Vehicle Operation Cost
VSD	Vascular Streak Dieback

W

WB	World Bank

EXECUTIVE SUMMARY

(1) Background of the Study

Development of Eastern Indonesia (KTI) has been one of the priority policy of the GOI to reduce the disparity between Western Indonesia (KBI) and KTI. To support the regional development in KTI, strategic importance of infrastructure has been identified as one of the priority measures for linking different regions and for poverty reduction.

The GOI requested the GOJ to provide technical assistance in carrying out "The Study on Arterial Road Network Development Plan for Sulawesi Island and Feasibility Study on Priority Arterial Road Development for South Sulawesi Province". In response to this request, the GOJ conducted the Study in line with "The Northeastern Indonesia Regional Development Program" and "The South Sulawesi Province Regional Development Program" undertaken by JICA.

The Study has been implemented with the following objectives:

i) To formulate the Sulawesi Island Arterial Road Master Plan (Master Plan).
ii) To prepare an action plan for implementation of the arterial road development.
iii) To conduct Feasibility Study on Priority Arterial Roads in South Sulawesi Province.

(2) Sulawesi Island Arterial Road Master Plan

The target year of Master Plan is set as the year of 2024 covering 17 years in accordance with the new Law (No. 17 of 2007) of "National Long-term Development Plan in 2005-2025", and time frame of master plan is as shown below:

Short-term Plan	; 2008 – 2014 (7 years)
Medium-term Plan	; 2015 – 2019 (5 years)
Long-term Plan	; 2020 – 2024 (5 years)

The study area for the Sulawesi Island arterial network development plan covers the entire Sulawesi Island which consists of six (6) provinces, that is, North Sulawesi Province, Gorontalo Province, Central Sulawesi Province, West Sulawesi Province, South Sulawesi Province and Southeast Sulawesi Province. The study covers all arterial roads (national road, provincial road and other important routes for economic and regional development).

(3) Regional Development Needs and Potential

As the spearhead of development in East Indonesia, the development of Sulawesi is expected to contribute to the total prosperity of Indonesia, especially since a balanced economic development throughout Indonesia as well as the urgent development of eastern Indonesia, specifically Maluku and Papua, is dependent on the success of Sulawesi's development.

The items that are necessary to promote the regional development in Slawesi Island are as shown

below:

a. Enhancement of Processing Industries for Potential Agricultural Resources
b. Improvement of Quality and Value of Cash Crops
c. Paradigm Shift to Sustainable Development
d. Environmental Protection and Conservation
e. Development of Potential Resources

Table S.1 summarized the prospective industries for Sulawesi on the category-wise analysis of global market trends, global and domestic competitiveness of Sulawesi products and production capacity of Sulawesi

Table S.1 Prospective Industrialization in Sulawesi

Category of Industry	Prospective Product/Market	Prospective Source Area	Development Phase	
			Short Term	Med/Long Term
1) Agricultural Processing	Biodiesel fuel for domestic fuel consumption in Sulawesi.	Coconut production areas such as Manado, Makassar, Palu.	○	
	Food processing of cacao, copra, coffee, vanilla, clave, vegetable, cashew nuts, etc. for foreign markets, especially China.	• Processing and trading centers of agricultural and fishery products such as Manado, Makassar, Palu, and other provincial capitals. • Consolidated food processing centers (CFPC) are recommended. • Residual processing in CFPCs for animal feeds/ organic fertilizers, etc. for domestic livestock industries	○	○ (final Processing)
2) Livestock/Meat Processing/Animal Feed Processing	(Halal) meat for the Middle East market/Kalimantan, etc. Animal feeds from copra, maize, cassava, soybean, and fish residuals for domestic livestock breeders.		○	○ (final Processing)
3) Fishery and Marine Product Industry	New products such as Milkfish for the export/domestic market Promotion of processing of Tuna, Sea weeds, etc. for export		○	○ (final Processing)
4) Mining Industry	Development of oil and natural gas for export and domestic market. Enhancement of Nickel, Asphalt, Gold, etc. for export and domestic market	On-site production and primary processing in Southeast .Sulawesi, etc.	○	
5) Construction Materials Industry	Gravel, stone, cement export to development areas in Kalimantan and Luwuk.	Central and South Sulawesi.	○	
6) Light Industry	Labor-intensive manufacturing such as wood materials, plywood, furniture, garment, shoes, etc. for export.	Processing and trading centers such as Manado, Makassar, Palu, and Kendari.	○	○ (final Processing)
7)Tourism Industry	Marine eco-tourism.	Manado and the remote islands of Wakatobi in Southeast Sulawesi and Bantaeng in South Sulawesi.	○	○

Source: JICA Study Team

(4) Development Strategies and Concepts

Based on the analysis of current conditions, potentials, and existing development plans, the development goals and strategies for an integrated regional development for Sulawesi Island were formulated and summarized.

1) Regional Development Goals

Goal 1:	Development of Sulawesi as the Leading Island in East Indonesia as the Gateway to the Other Islands of Indonesia and Asian Countries, and
Goal 2:	Development of Environmentally Friendly Sulawesi with Poverty Reduction

2) Regional Development Strategies

To attain the development goals, the following regional development strategies are proposed:

Strategy 1: Economic growth through industrial development
Strategy 2: Economic growth in activity centers
Strategy 3: Alleviation of Social and Economic Disparities
Strategy 4: Development of Sulawesi with due Consideration on Environment, and Safety for Disaster

3) Concept of Land-use Plan for Sulawesi in 2024

Figure S.1 shows the concept of land-use for Sulawesi Island in 2024, which has been developed taking into consideration Development of National/Regional Activity Centers, Enhance of Industrial Clusters and Development of Coordinated Transport System.

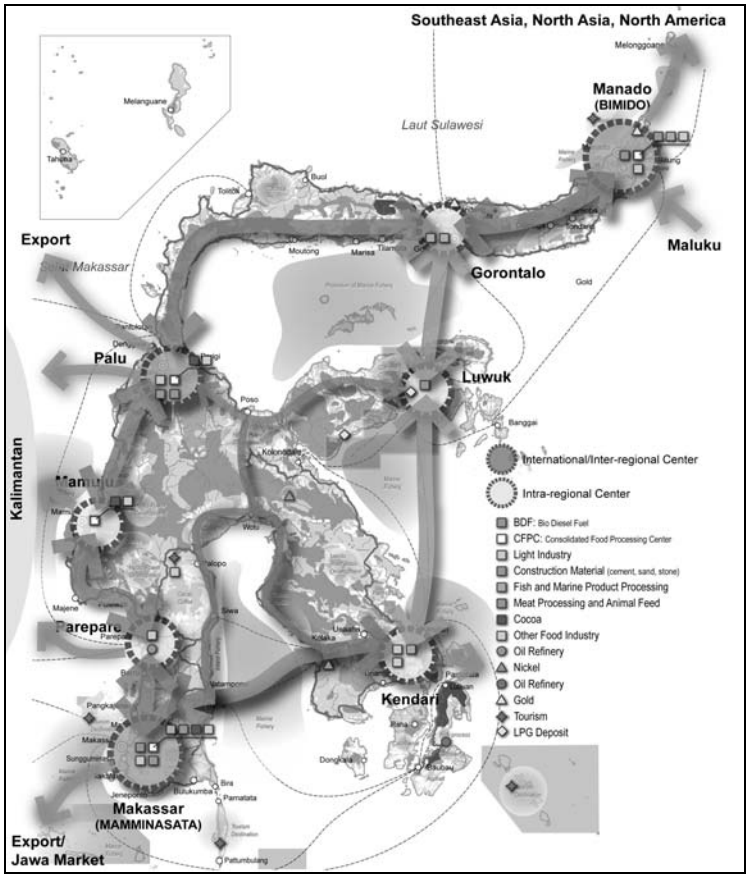


Figure S.1 Land-use Framework for Sulawesi Island in 2024

(5) Setting Socio-economic Frame

The forecasts were made based on the 2005 Inter census and covered for the period 2006 - 2025. The total population of Sulawesi is estimated to reach 19.7 million by 2024, increasing by approximately 4.0 million from the 15.7 million in 2005. The labor force in Sulawesi was forecasted to increase from 6.3 million to 9.8 million during 2005 - 2024, with an annual growth rate of 2.33%.

Long-term GRDP forecasts by regency was forecasted to increase from Rp. 73,089 billion in 2005 to Rp. 265,150 billion in 2024 with an annual average growth rate of 7.02% as shown in Table S.2.

Table S.2 GRDP by Agricultural and Nonagricultural Sectors

	2005 (billion Rp.)				2024 (billion Rp.)			
	Agri'l (A)	Nonagri'l (B)	Total (C)	A / C	Agri'l (A')	Nonagri'l (B')	Total (C')	A'/C'
North Sulawesi	2,778	9,967	12,745	21.80%	5,377	38,236	43,614	12.33%
Central Sulawesi	5,348	5,808	11,156	47.94%	14,507	31,852	46,359	31.29%
South Sulawesi	11,032	25,392	36,424	30.29%	22,771	103,903	126,674	17.98%
Southeast Sulawesi	2,798	4,682	7,480	37.41%	8,024	21,228	29,252	27.43%
Gorontalo	624	1,401	2,025	30.83%	1,431	6,008	7,439	19.24%
West Sulawesi	1,727	1,532	3,259	52.99%	3,546	8,267	11,813	30.02%
Sulawesi Total	24,307	48,782	73,089	33.26%	55,656	209,494	265,150	20.99%

Source: JICA Study Team

(6) Direction of Transport Network Development

Prior to the formulation of road development plan for Sulawesi, existing national transport development plans were reviewed. The basic directions and policies stated there form an integral part of the road network development plan to be proposed in this study.

Based on the existing transport development plans described above and various analyses conducted earlier, the following directions have been identified to establish an integrated transport network for the entire island of Sulawesi:

(1) International linkage proposed in the concept of BIMP-EAGA should be strengthened

(2) Road network should be developed focusing widening, rehabilitation, maintenance and some new projects with strategic importance

(3) Energy-saving marine transport should be effectively incorporated in the road network

(4) Long- and medium-distance passenger travel by air will grow in the light of lowering airfares and airport development should be promoted

(5) Railway development should be better be studied in the future when inter-city road capacity has been reached

(7) Development Policy for Sulawesi Road Master Plan

The Study team established road development policies in order to formulate the road master plan taking into consideration existing road conditions, regional economic development strategy and transport development policy as shown below:

Table S.3 Road Development Policy to be applied for Road Master Plan

Development Goal	Regional Development Strategy	Road Developemnt Policy
[Goal 1] Development of Sulawesi as the Leading Island in East Indonesia and as the Gateway to other Asian Countires	[Strategy 1] Effective Economic Growth by Strengthening Inter-regional Linkages not only in Sulawesi but also with other Asian Countries [Strategy 2] Economic Growth through Development of Processing Industry on the Basis of Potential Resources of Sulawesi	[Policy 1] Strengthening inter-regional transport network of six provinces in Sulawesi [Policy 2] Accommodation of increasing large traffic volume and heavy vehicle [Policy 3] Improvement of accessibility to the potential resources areas
[Goal 2] Development of Sulawesi as an Environmentally Friendly Island with Poverty Reduction	[Strategy 3] Alleviation of Social and Economic Disparities in Rural Area by Strengthening Public Administration Services through Integration of Prioirty Regional Center and Cities [Strategy 4] Development of Sulawesi with due Consideration on Environment, Safety and Human Resources	[Policy 4] Strengthening the road network in rural area and isolated island [Policy 5] Reduction of environmental load in transport sector [Policy 6] Enhancement of Traffic Safety and Capacity of Suburban Arterial Roads [Policy 7] Development of road network paying due consideration on environment [Policy 8] Strengthening the road management including maintenance system

(8) Staged Application of New Road Standard Regulation

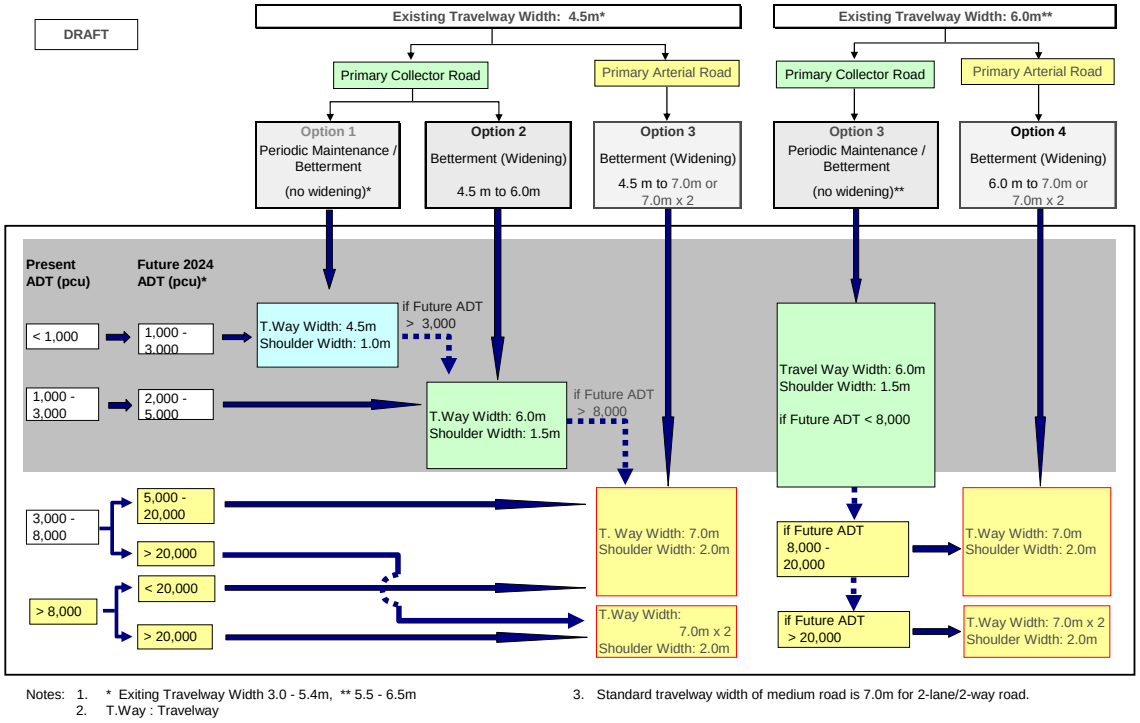
The Study team prepared the proposal on "Stage-wised Road Development of Standard 7m Travel-way Specified in New Road Regulation (PP Mo 34 Year 2006) for Arterial Road and Collector Roads in Sulawesi Island" and submitted it to the Bina Marga as the Discussion Paper on October 5, 2007, for this study

Figure S.2 shows the proposed stage-wised application on new road standard by type of existing road width, road classification and proposed improvement measures based on the present and future traffic demands and the following is the summary of recommendations:

* Primary arterial roads should be widened to the standard 7.0m travel-way by the target year of 2024

* Primary collector roads should be widened to 7.0m by stages based on the present and future traffic demand.

Periodic and routine maintenance should be given the first priority to sustain the national and provincial road assets.



Notes: 1. * Exiting Travelway Width 3.0 - 5.4m, ** 5.5 - 6.5m
2. T.Way : Travelway
3. Standard travelway width of medium road is 7.0m for 2-lane/2-way road.

Figure S.2 Proposed Stage-wised Application on New Road Standard

(9) Traffic Demand Forecast

All vehicle trips will be about more than 1.5 times in year 2024 as compared to the present, however, vehicle trips in cities will be growing more quickly up to about 2 times in the future, since usually intra zonal trips increase more quickly.

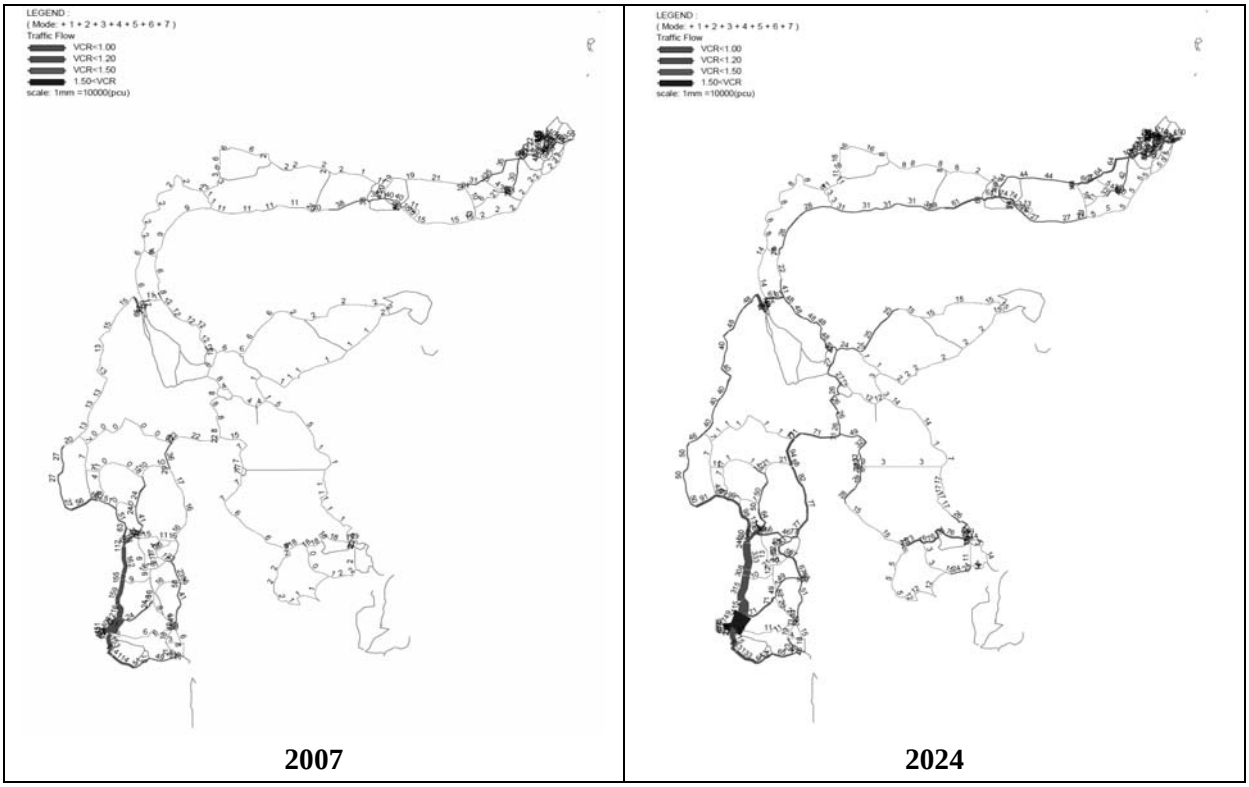


Figure S.3 Result of Traffic Assignment ("Do-all" Case with 19 Projects)

(10) Sulawesi Road Master Plan in 2024

The Study team examined the road improvement plan taking into account the necessity on up-grading of road classification, needs of capacity expansion and needs of pavement improvement based on the existing road and traffic conditions. Improvement measures are consisted of three categories, namely, new road construction, betterment and periodic and routine maintenance.

Sulawesi Road Master Plan in 2024 has been formulated based on the development concept as shown in Table S.4 and illustrated in Figure S.4. Upon completion of the road network system in 2024, following benefits would be expected;

i) Harmonized Economic development in Sulawesi would be expected by strengthening of economic linkage between six provinces through completion of Trans Sulawesi Road with a high standard of all weather road condition.

ii) Improvement of basic human needs as well as poverty alleviation would be expected in rural areas and isolated islands through strengthening road network system by completion of missing roads.

iii) Development of processing industries utilizing potential resources in Sulawesi would be expected by increasing accessibility to the potential areas.

iv) Natural environment and isolated culture community would be properly protected by road development with due consideration of environment.

v) Increase of environmental load in Sulawesi would be minimized through incorporation of energy-saving transport ferry service in the road network system and strengthening the nautical highway network.

Table S.4 Development Concept of Sulawesi Road Master Plan

Road Classification			Road Structure		Development Concept of Sulawesi Road Master Plan
			Nos. of Lane	Pavement Width	
I	Nationa Road	Arterial Road	2 lanes	7.0 m	All arterial national road become 7.0m road regardless of traffic volume and will be improved to be all weather condition with sufficient capacity and standard
		Collector Road (K-1)	2 lanes	6.0m – 7.0 m	The road carrying the traffic more than 3,000 p.c.u/day – 8,000 p.c.u/day become 6.0 m road and the road more than 8,000 p.c.u/day become 7.0m road
			1.5 lanes	4.5m (3.5m-5.4m)	The road carrying the traffic less than 3,000 p.c.u/day will be the l.5 lanes road but improved to be all weather condition road with asphaltic concrete
II	Provincial Road	Collector Road (K-2&3)	2 lanes	6.0m – 7.0 m	Same as Collector K-1 Road
			1.5 lanes	4.5m (3.5m-5.4m)	Same as Collector K-1 Road

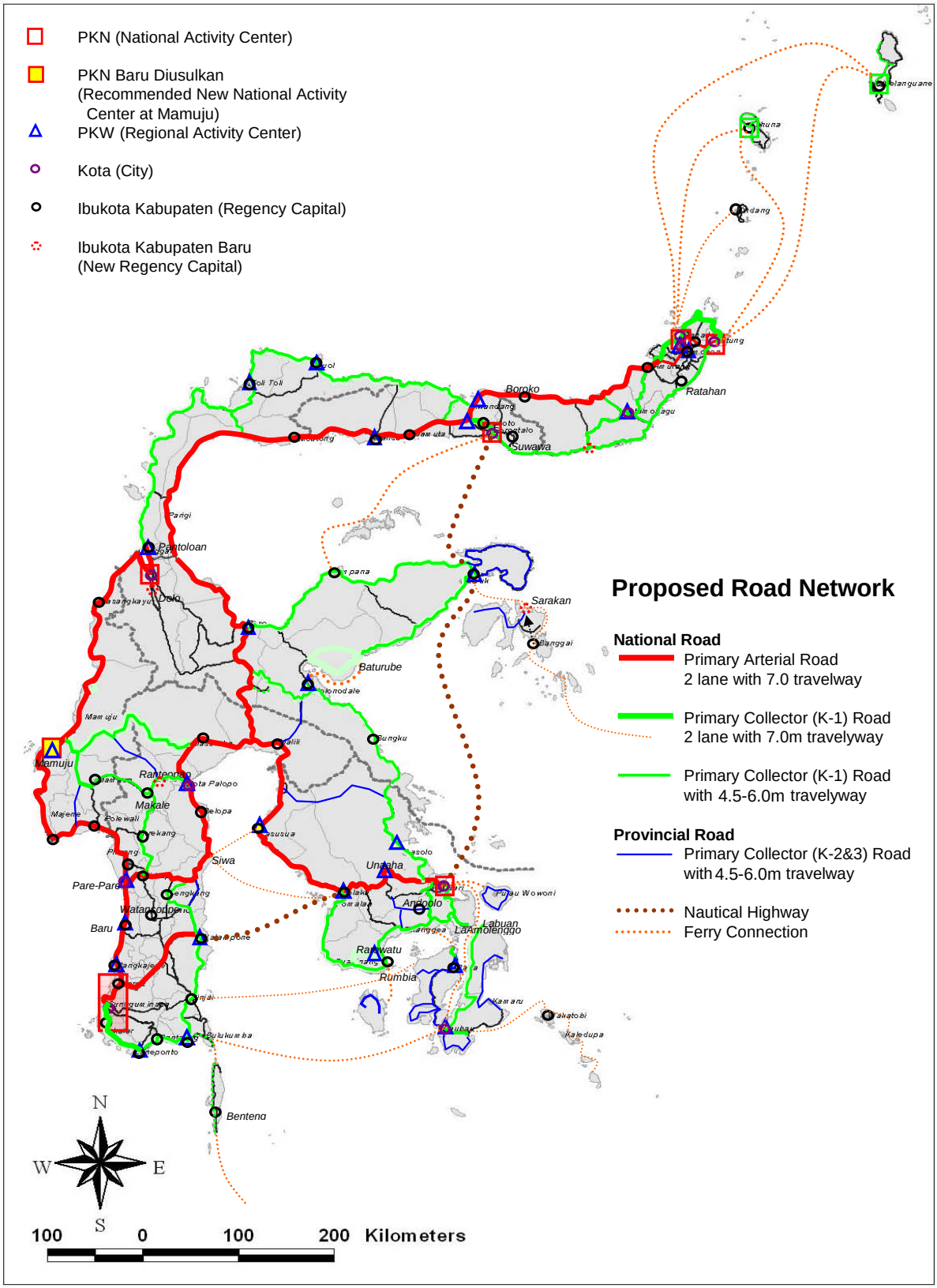


Figure S.4 Sulawesi Road Master Plan in 2024 (SRMP)

(11) Implementation Plan

To establish the realistic and effective implementation plan, the following concept was applied:

(i) Completion of on-going project in the short-term

(ii) Implementation of "Urgent Bridge Repair Program" in the short-term plan

(iii) Allocation of the project in accordance with priority order

The Study team prepared the road investment plans with the three alternatives as follows:

Case 1: Equal Investment Plan (Development cost is allocated equally in the short-term, medium-term and long-term

Case 2: Intermediate Investment Plan between Case 1 and Case 3

Case 3: Early Investment Plan (60% of development cost is allocated positively in the short-term plan)

The maintenance cost is allocated into the short-term (20%), medium-term (30%) and long-term (50%) taking into consideration the progress of road improvement work by new construction and betterment. The above distribution pattern of maintenance cost applied to all cases in the same way. The Study team recommends that Case 3 as the most realistic and effective investment plan for the master plan taking into account that the investment cost and budget is balanced in all period as shown in Table S.5.

Table S.5 Proposed Investment Allocation and Financing Plan
(Case 3: Early Investment Plan)

(1) Proposed Investment Allocation Plan

US$1.0 = Rp. 9,322, Rp 1.0 = ¥ 0.013

Improvement measures	Total Project Cost				Short-term (2008-2014)			Medium-term (2015-2019)			Long-term (2020-2024)			Remarks
	Arterial Road	Collector Road	Total	Amount	Length		Amount	Length		Amount	Length		Amount	
	(km)	(km)	(km)	Rp Billion	(km)	(%)	Rp Billion	(km)	(%)	Rp Billion	(km)	(%)	Rp Billion	
A. National Road (Arterial road + Collector (K-1) road)														
Development Cost	3,123	2,946	6,069	13,644	3,641	60%	8,402	1,821	30%	3,878	607	10%	1,364	Rp.431Billion of Urgent Bridge Repair on National Road (345Nos or 6,000m) is included in the short-term plan
Periodic and Routine Maintenance Costs	3,256	4,885	8,141	10,127	1,628	20%	2,025	2,442	30%	3,038	4,071	50%	5,064	Urgent overlay of pavement (675km) is required in the short-term
Total A				**23,771**	5,270		**10,428**			**6,916**			**6,428**	
B. Provincial Road (Collector road K-2 & K-3)														
Development Cost	0	2,342	2,342	5,249	1,405	60%	3,376	703	30%	1,348	234	10%	525	Rp.431Billion of Urgent Bridge Repair on Provincial Road (397Nos or 6,500m) is included in the short-term plan
Periodic and Routine Maintenance Costs	0	4,785	4,785	6,179	957	20%	1,236	1,436	30%	1,854	2,393	50%	3,090	Urgent overlay of pavement (982km) is required in the short-term
Total B	0	7,127	7,127	**11,428**	2,362		**4,612**			**3,201**			**3,614**	
Total A+B				**35,199**	**15,040**			**10,117**			**10,042**			

(2) Prospect of Road Budget

Expected Budget			Short-term (2008-2014)	Medium-term (2015-2020)	Long-term (2020-2024)	Remarks
			Total Amount	Total Amount	Total Amount	
A. National Road	Development Budget	15,968	8,631	4,316	3,021	
	Difference (surplus /▲shortage)		229	**438**	**1,657**	
	Maintenance Budget	14,926	4,760	4,420	5,746	
	Difference (surplus /▲shortage)		2,735	1,382	683	
	Total (A)	**30,894**	**13,391**	**8,736**	**8,767**	
	Difference (surplus /▲shortage)		**2,963**	**1,820**	**2,339**	
B. Provincial Road	Development Budget	2,396	1,295	648	453	
	Difference (surplus /▲shortage)		▲ 2,081	▲ 700	▲ 72	
	Maintenance Budget	2,107	672	624	811	
	Difference (surplus /▲shortage)		▲ 564	▲ 1,230	▲ 2,279	
	Total (B)	**4,503**	**1,967**	**1,272**	**1,264**	
	Difference (surplus /▲shortage)		▲ 2,645	▲ 1,929	▲ 2,350	
Total A+B		**35,397**	**15,358**	**10,008**	**10,031**	
Difference (surplus /▲shortage)		198	318	▲ 109	▲ 11	

Implementation plan of Proposed Project in Road Master Plan is developed based on the above concept and cost allocation plan as shown in Figure S.5.

Figure S.5 Summary of Proposed Implementation Plan

Project	Package No.	Location	Priority by EIRR	Length	Const. Cost	Implementation Schedule (Rp.Billion)															
						Short-term							Medium-term					Long-term				
				km	(Rp.Billion)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
(I) Road Development Project																					
1. Proposed Project																					
TS-1 TS Main Corridor (West south Corridor) including connected provincial roads	TS-1-1	Jeneponto – Makassar – Parepare	1	658	2,742	(AusAID, APBN included)															
	TS-1-2	Parepare – Mamuju	4	692	1,111																
	TS-1-3	Mamuju – Palu	12	387	890	(WB)															
Crossing Road	TS-1-4	Maros – Bajoe	5	144	157																
	TS-1-5	Parepare – Palopo	6	290	414																
	TS-1-6	Wonomulyo – Kaluku	3	200	372	(APBN included)															
TS-2 TS Main Corridor (West-North section) including connected provincial roads	TS-2-1	Palu – Kwandang	7	1,019	465																
	TS-2-2	Kwandang – Manado – Bitung	8	1,399	2,109	(APBN included)															
Crossing Road	TS-2-3	Molibagu – Worotican	14	184	331																
TS-3 TS Main Corridor (Central south section) including connected provincial roads	TS-3-1	Jeneponto – Watampone – Wotu	2	1,452	1,892	(Aus AID included)															
	TS-3-2	Wotu – Poso – Toboli	17	1,069	1,346	(WB)															
TS-4 TS Main Corridor (Central north section) including connected provincial roads	TS-4-1	Toboli – Gorontalo	10	973	1,785																
	TS-4-2	Gorontalo – Bitung	9	893	1,052	(AusAID, APBN)															
TS-5 TS Main Corridor (East Corridor) including connected provincial roads	TS-5-1	Wotu – Kolaka	15	435	972																
	TS-5-2	Kolaka – Tinanggea – Kendari	18	1,060	902	(AusAID/APBN)															
	TS-5-3	Kendari – Tondoyondo	16	373	547	(AusAID)															
	TS-5-4	Tondoyondo – Luwuk – Poso	13	1,235	709																
Crossing Road	TS-5-5	Kolaka – Kendari	11	312	440	(WB)															
	TS-5-6	Landawe – Tolala	19	150	660																
2. On-going or committed projects in the Short-term Plan																					
EINRIP by AusAID, EIRTP by WB																					
Other Road Improvement by APBN Multi Year Contract (2007 – 2009)																					
Manado Bypass, Gorontalo Bypass and other Priority Roads																					
3. Recommended priority projects proposed in the Master Plan																					
Urgent Bridge Repair Program (Repair of Bridges in Grade 4, Grade 5 and Wooden Bridges)																					
Priority Roads Projects proposed in this Master Plan Study (Expected finance: Yen Loan, APBN, APBD and others)																					
Trans Sulawesi Mamminasata Maros – Takalar Section (Expected finance: Yen Loan, APBN and others)																					
Priority urban roads in Mamminasata including Hertasning Road, Abdullah Daeng Sirua Road, Mamminasa Bypass, Tg Bunga-Takalar Road and other important roads																					
Bridge Reconstruction Projects in Southeast Sulawesi Province and others																					
Total Road Development Cost (I)				**12,925**	**18,894**	1,689	2,231	1,821	1,789	1,581	1,344	1,322	1,146	1,206	1,213	964	698	436	491	302	330	330
								11,778							**5,227**					**1,889**		
II. Road Maintenance*																					
Urgent Pavement Repair Program (Repair of Pavement in Class III and Class IV)						Urgent Repair of Deteriorated Pavement															
Routine and Periodic Maintenance						Routine & Periodic Maintenance							Routine & Periodic Maintenance					Routine & Periodic Maintenance				
Total Road Maintenance Cost (II)				**12,925**	**16,305**	300	350	450	500	511	550	600	750	900	1,000	1,100	1,140	1,250	1,400	1,650	1,800	2,054
								3,261							**4,890**					**8,154**		
Grand Total (I)+(II)				**12,925**	**35,199**	1,989	2,581	2,271	2,289	2,092	1,894	1,922	1,896	2,106	2,213	2,064	1,838	1,686	1,891	1,952	2,130	2,384
								15,039							**10,117**					**10,043**		

Notes 1: * Bad conditioned road links (Class IV) will be given higher priority under the road maintenance programs irrespective of EIRR.
2: * Road maintenance program could be changed to betterment program at the time of detailed project planning under IRMS by reviewing the validation of each road link on both economical, technical and other aspects.
Source: JICA Study Team

As a result of economic analysis for implementing Case 3, it was recognized that the project is economically feasible and viable with a high economic EIRR at 21.5%, a B/C ratio at 1.58 and an NPV at Rp. 6,475 Billion.

(12) Environmental Consideration

As the result of the multi-criteria analysis under the Strategic Environmental Assessment (SEA), the road network improvement including the ferry improvement “Option 3” was selected as the best solution for the Master Plan.

“Option 3” focused on the improvement of road network together with the improvement of accessibility through marine transport, therefore, it is more environmentally friendly than “Option 2” which was focused the road network development only.

(13) Recommendations

1) Regional Development

It is recommended that the industrial development should focus on the agro-processing industries in order to enhance value added in Sulawesi and secure employments especially for the younger generations who would flow out from the rural villages in the course of the planned period. Trade should also be promoted more aggressively for exports of processed products, particularly to the ASEAN and BRIC countries. Transfer trade and inter-regional trade should also be promoted as a center for development of Eastern Indonesia.

For regional development as well as for industrial and trade development, clusters should be formed not only at the provincial level but also at the regional and island levels. Special attention should be paid to the BDF clusters, as they would promote linkages among the agricultural and industrial sectors as well as contribute to the reduction of pollutant emission that would otherwise increase in Sulawesi.

It is also recommended that the proposed regional development would be implemented together with capacity development, inclusive of institutional building.

2) Transport Development

The international linkage proposed in the concept of BIMP-EAGA should be strengthened by improving air and shipping services between northern Sulawesi (Manado and Gorontalo) and Mindanao (Davao and General santos) of the Philippines. The arterial road network of Sulawesi should be considered as an integral part of the global transport network such as Asian/ASEAN Highways in the future.

Energy-saving maritime transport should be effectively incorporated in the road network considering the long winding coastlines. Port facilities should be improved together with the feeder roads to/from the ports. In addition, an inter-peninsula nautical highway using high-speed low-cost RoRo ships should be developed.

Long- and medium-distance passenger travel by air will grow rapidly in the light of lowering airfares due to the proliferation of LCCs (low-cost carriers), therefore, airport development should be promoted as proposed in the National Spatial Plan.

There are some railway projects proposed for Sulawesi, however, the estimated traffic demand for these railways is generally small, and their financial viability is quite doubtful in the absence of financial analyses in past studies. Since inter-city roads have enough capacity at present to absorb increasing traffic demand, the implementation of railway projects should better be studied in the future when road capacity has been reached.

3) Road Development and Sulawesi Road Master Plan

It is advised that the feasibility of each project in terms of EIRR, B/C etc. should be evaluated again to justify the project viability at the time when the project is implemented.

Overloaded vehicle is one of the critical issues which will shorten the pavement life significantly, therefore, in addition to the ordinary improvement measures, the Study team recommends introducing a computer-assisted system at weighing stations.

Insufficient budget is still the most critical issue for both provincial and regency roads. In order to overcome the shortage of road budget, the road fund is one of the instruments that generally become the main source of finance for road maintenance and other road expenditures. Some of the road fund could be used for road safety, overload control and others, including road asset management activities.

The Study team recommends the early implementation of "Trans Sulawesi Mamminasata Road (Maros-Takaral) since the project was confirmed to be economically feasible with a high economic internal rate of return and Environmental Impact Assessment was already completed in accordance with the JBIC guideline.

Since the collapse of a bridge and deteriorated pavement on major roads would have an adverse impact on local socio-economic activities, it is recommended that these bridges which are identified as the condition of Grade III "Poor", Grade IV "Bad" and Grade V "Impassable" including wooden bridge and deteriorated pavement (Class III "Poor" or Class IV "Bad") should be improved in the short-term plan and reconstructed as urgent rehabilitation measures in the short-term plan.

Integrated road projects and programs should be implemented for national, provincial and local roads for attaining synergy effects on regional development. The program should include capacity development in management, planning, execution and maintenance.

The development and use of natural asphalt (Asbuton) will make contribution to both national and regional economy. The central government should make an appropriate policy on use of Asbuton to assure the domestic demand, especially for road pavement material, and laws for inducing foreign investments as Asbuton refinery project.

In order to realize the projects proposed in the master plan, the Study team recommends that the Indonesian government should take an appropriate action to arrange the financial assistance of Japan and/or other donor agencies in addition to an Indonesian budget.

CHAPTER 1 INTRODUCTION

1.1 Background

In Indonesia, the quality of life and social welfare has been significantly improved due to the recent development policies, while regional disparity has appeared as a new issue. Particularly between Western Indonesia (KBI) and Eastern Indonesia (KTI), the disparity is quickly getting serious being one of the major issues for the Government of the Republic of Indonesia (hereinafter referred to as "GOI") to tackle. The development of KTI has been advocated in the past National Development Plans and also in the new National Mid-Term Development Plan 2005-2009. To support the regional development in KTI, strategic importance of infrastructure has been identified as one of the priority measures for linking different regions and for poverty reduction.

For entire Sulawesi, a master plan for arterial road development is needed to support the sustainable economic development of the island. The plan should include an investment plan with a balance between new construction and maintenance of existing facilities considering the limited resources, and efficient and effective policies for transport network development.

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For entire Sulawesi, a master plan for arterial road development is needed to support the sustainable economic development of the island. The plan should include an investment plan with a balance between new construction and maintenance of existing facilities considering the limited resources, and efficient and effective policies for transport network development.

Addressing to the above, the Government of the Republic of Indonesia (hereinafter referred to as "GOI") requested the Government of Japan (hereinafter referred to as "GOJ") to provide technical assistance in carrying out "The Study on Arterial Road Network Development Plan for Sulawesi Island and Feasibility Study on Priority Arterial Road Development for South Sulawesi Province" (herein after referred to as the "Study"). In response to this request, the GOJ decided to conduct the Study and entrusted its execution to the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the GOJ. JICA dispatched a Study Team (hereinafter referred to as the "JICA Study Team") in December 2006 to conduct the Study in close cooperation with the relevant authorities from the GOI.

1.2 Study Objectives

The major objectives of the Study are:

i) To formulate the Sulawesi Island arterial road master plan

ii) To prepare an action plan for implementation of the arterial road development.

iii) To conduct Feasibility Study on Priority Arterial Roads in South Sulawesi Province.

The Study should be conducted in accordance with the objectives of "Northeastern Indonesia Regional Development Program" and "The South Sulawesi Province Regional Development Program" undertaken by JICA. In particular, the Study is expected to contribute to the acceleration of economic and social development (poverty reduction) in the region.

1.3 Target Year of Master Plan

The Study team proposes the new target year of Master Plan in 2024 covering 17 years in accordance with the new Law (No. 17 of 2007) of "National Long-term Development Plan in 2005-2025", instead of the target year in 2023 based on the Sulawesi Island Spatial Plan.

New time frame of master plan study is as shown below:

Short-term Plan	; 2008 – 2014 (7 years)
Medium-term Plan	; 2015 – 2019 (5 years)
Long-term Plan	; 2020 – 2024 (5 years)

1.4 Study Area

The study area for the Sulawesi Island arterial network development plan covers the entire Sulawesi Island which consists of the following six (6) provinces:

- North Sulawesi Province.
- Gorontalo Province.
- Central Sulawesi Province.
- West Sulawesi Province.
- South Sulawesi Province.
- Southeast Sulawesi Province.

The study area covers all arterial roads (national roads and other important routes for economic and regional development).

1.5 Study Progress

The master plan study on arterial road network development will be conducted in accordance with the work flow chart of **Figure 1.5.2**. The detailed study progress up to this writing is shown in **Figure 1.5.1**.

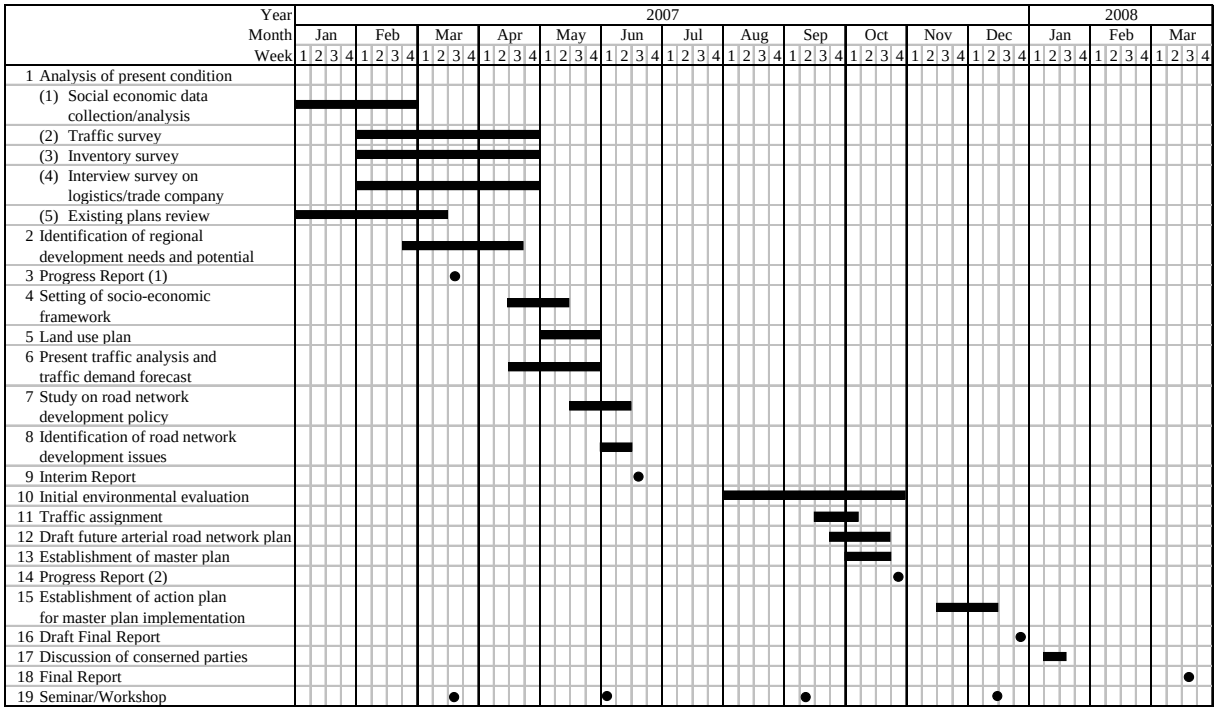
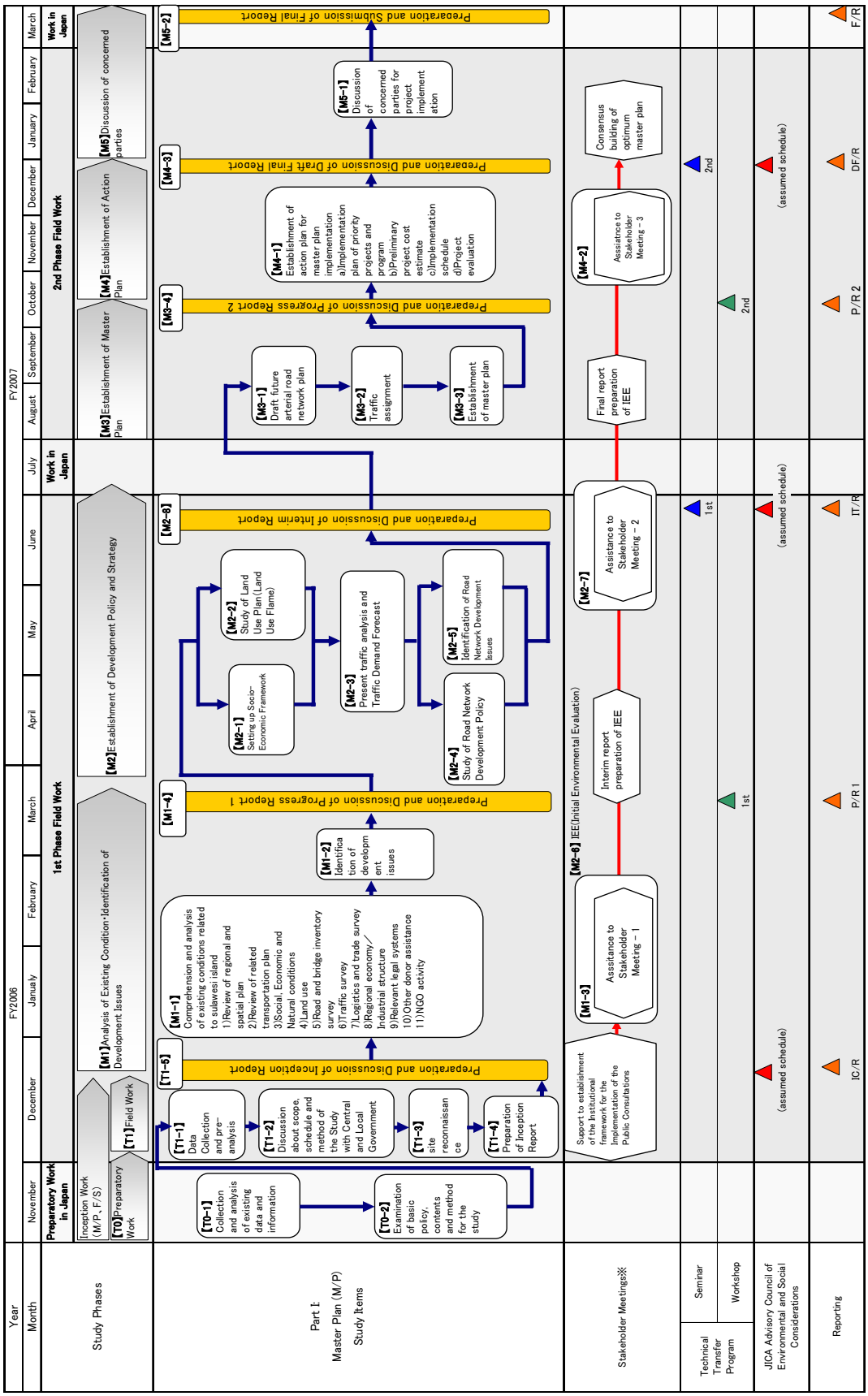


Figure 1.5.1 Detailed Work Progress



Note: ※Subject to change based on discussion and clarification with Directorate General of Highways and other concerned agencies.

Figure 1.5.2 Detailed Study Flow of the Master Plan

1.6 Organization for the Study

1.6.1 Organization

The Study organization was established as shown in the following figure. Technical Committee of GOI was formed for the Study to ensure its efficient conduct under the initiative of the Indonesian side. Working teams was established in relation to the M/P and the F/S as the Study executing body as well.

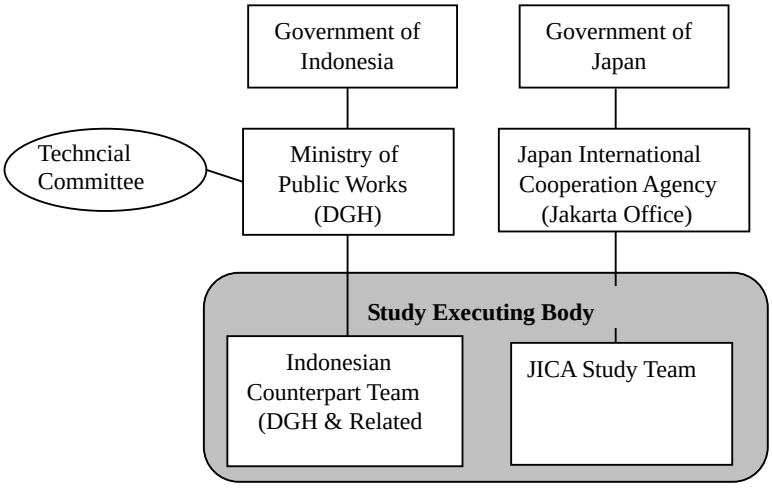


Figure 1.6.1 Organization of the Study

1.6.2 Study Team

The JICA Study Team is composed of the following members:

Mr. Hiroki Shinkai	**Team Leader**/Transport Planning
Mr. Isamu Asakura	**Deputy Team Leader**/Regional Development
Mr. Takashi Shoyama	Road Planning 1
Mr. Takashi Shimizu	Road Planning 2
Mr. Naoaki Sonobe	Road Planning 3
Mr. Hajime Koizumi	Development Strategy/Spatial Development Planning
Mr. Kenji Tanaka	Urban Planning/Land use Planning
Mr. Takeshi Yamashita	Regional Economy
Mr. Takuya Okada	Industrial Promotion
Mr. Isamu Koike	Trade/Distribution
Mr. Shubun Endo	Transport Facility Survey
Mr. Hideo Arikawa	Traffic Demand Forecast
Mr. Jamaluddin Rahim	Traffic Survey
Mr.Yuichi Koda	Environmental & Social Consideration 1
Mr. Takehiko Ogawa	Environmental & Social Consideration 2
Ms. Akiko Urago	Environmental & Social Consideration 3
Ms. Keiko Nagai	Public Consultation 1
Ms. Dorothea Agnes Rampisela	Public Consultation 2
Mr. Shigeru Konda	**Deputy Team Leader**/Road Planning 2/Maintenance
Mr. Narihiro Morisaki	Natural Condition (Hydraulics/Hydrology)

Mr. Takayasu Nagai	Road Design 1/Natural Condition (Topography)
Mr. Sthapit Naresh	Road Design 2
Mr. Takeshi Yoshida	Bridge Design/Natural Condition (Geology)
Mr. Masayoshi Iwasaki	Implementation Planning /Funding/Institutional Study
Mr. Masahito Homma	Economic & Financial Analysis
Mr. Ippei Iwamoto	Construction Planning/Cost Estimation/Coordination 1
Mr. Hiroaki Ueyama	Construction Planning/Cost Estimation/Coordination 2

1.6.3 Technical Committee

The Technical Committee consisted of the following officials from the respective ministries and agencies:

Chief: Ir. Sri Apriatini Soelardi, MM/Ir. Taufik Widjoyono, MSc. Director of Planning, Directorate General of Highways, Ministry of Public Works

Secretary: Ir. Harris H. Batubara, MEng/Dr. Max Antameng, MA. Sc. Chief of Sub-Directorate of General Planning, Director of Planning, Directorate General of Highways, Ministry of Public Works

Member: Ir. Nurden Manurung, MM. Director of Freeways and Urban Roads, Directorate General of Highways, Ministry of Public Works

Ir. Frankie Tayu, Director of Technical Guidance, Directorate General of Highways, Ministry of Public Works

Ir. R.Bambang Goeritno Soekamto, MSc, MPA. Chief of Planning and Foreign Cooperation Bureau, Ministry of Public Works

Ir. U.Hayati, Triastuti, MSc, Director of Transportation, National Development Agency

Ir. Arifin Rudiyanto, MSc, Ph.D. Director of Regional Development 1, National Development Agency

Drs. Suroyo Alimoeso, Director of Road Transportation Traffic, Directorate General of Land Transportation, Ministry of Transportation

Dr. H.S.Ruslan, SE. Chief of Regional Development Planning Agency, South Sulawesi Province*

Ir. H. Iriantosyah Kasim DM, MSi, Chief of Provincial Infrastructure Agency, South Sulawesi Province*

Note:* only for the feasibility study on Priority Arterial Roads for South Sulawesi Province

1.6.4 Working Team

The JICA Study team and Indonesian counterpart jointly conducted the Study. In this context, DGH established the Working Team consisted of the following officials from the concerned agencies:

Coordinator: Ir. Harris H. Batubara, MEng. Sc. Chief of Sub-Directorate of General Planning, Directorate General of Highways, Ministry of Public Works

Secretary: Drs. Edi Prasetyo Hs. Section Chief of Road Network Development, Sub-Directorate of General Planning, Directorate General of Highways, Ministry of Public Works

Member: Ir. Arief Witjaksono, MEng.Sc. Chief of Sub-Directorate of Urban Road and Bridge Planning, Directorate of Freeways and Urban Roads, Ministry of Public Works

Ir. Jany Augustin, MSc. Chief of Sub-Directorate of Environmental Engineering, Directorate of Technical Guidance, Directorate General of Highways, Ministry of Public Works

Ir. Sumito, Chief of General Planning, Planning and Foreign Cooperation Bureau, Ministry of Public Works

Ir. Aryawan S.P, MSi, Chief of Sub-Directorate of Road Transportation, National Development Agency

Ir. Abdul Muis, MEng Sc. Chief of Sub-Directorate of Road Transportation Traffic, Directorate General of Land Transportation, Ministry of Transportation

Ir. H. Nurdin Samalia, Msi. Chief of Sub-Agency of Technical Affairs, Infrastructure Agency, South Sulawesi Province*

Note:* only for the feasibility study on Priority Arterial Roads for South Sulawesi Province

1.6.5 Provincial Working Team for Feasibility Study on Priority Roads for South Sulawesi

The Working Team established in South Sulawesi Province for Feasibility Study consisted of the following agencies and members:

Coordinator: Dr. H. S. Ruslan, SE, MS, Chief of Regional Development Planning Agency, South Sulawesi Province

Secretary: Ir. H. Iriantosyah Kasim, DM, MSi, Chief of Provincial Infrastructure Agency, South Sulawesi Province

Member: Ir. H. Syarifuddin Pattiwiri, MSi, Chief of Spatial Planning Bureau, South Sulawesi Province

Ir. H. Tan Malaka Guntur, MSi, Chief of Bappedalda, South Sulawesi Province

H. M. Anis Kama, SH, MH, MSi, Chief of Bappeda, Kota. Makassar

Ir. H. Kusaiyyeng, MSi, Chief of Public Works, Kota Makassar

Drs. H. M. Thamrin Ramli, MSi, Chief of Bappeda, Kab. Maros

Drs. H. Anshar Syarif, MM, Chief of Public Works, Kab. Maros

Drs. H. Baharuddin Mangka, MSi, Chief of Bappeda, Kab. Gowa

Ir. H. Muh. Amin Yacct, MSi, Chief of Public Works, Kab. Gowa

Ir. H. A. Jen Syarif Riva, MSi, Chief of Bappeda, Kab. Takalar

Ir. H. Nirwan Nesrullah, MSi, Chief of Public Works, Kab. Takalar

Ir. H. M. Nasser Parawarsa, Chief of Directorate of Natural Resources Development and Regional Infrastructure

Ir. H. Faisal Lukman, MT, Chief of Sub-Bureau of Regional Infrastructure

CHAPTER 2 PRESENT CONDITION OF THE STUDY AREA

2.1 Natural Conditions

2.1.1 Geographical Conditions and Administrative Region of Sulawesi

Sulawesi Island, previously known as Celebes (its old Portuguese name), lies in the middle of the Malay archipelago between Kalimantan and Maluku. It shares a common border with the

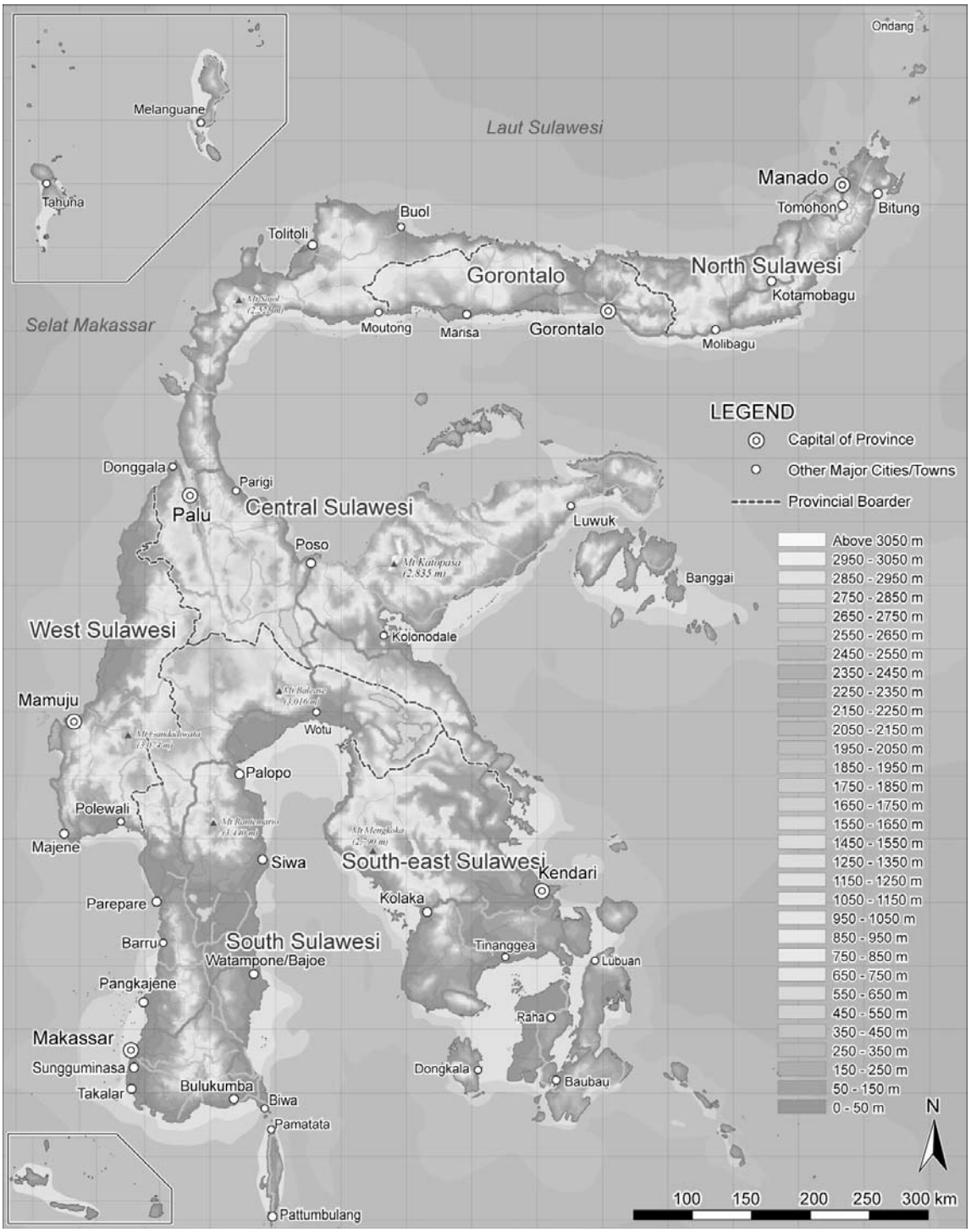


Figure 2.1.1 Topographic Map of Sulawesi Island

Philippines to the north. Sulawesi, which covers a total land area of 174,600 km² is the world's eleventh-largest island and is Indonesia's fourth-largest island

It has a very distinctive shape, dominated by four large peninsulas (south peninsula, Minahassa Peninsula in the north, east peninsula, and southeast peninsula) separated by three gulfs─Tomini in the northeast, Tolo in the southeast, and Bone in the south.

The terrain is almost mostly mountainous, with many active volcanoes. Mt. Rantemario (3,440m) in the northern part of South Sulawesi is the highest peak in the island. All four peninsulas have mountains standing more than 2,500m above sea level. Due to its topography, the island has limited plains which are mostly scattered along coastlines. These plains are separated by precipitous mountains, gulfs, and the sea. Flat lands (below 50m) account only for 10.3% of the total land area thus limiting the expansion of agricultural land.

Sulawesi is comprised of six provinces, namely: South Sulawesi (capital: Makassar), North Sulawesi (capital: Manado), Southeast Sulawesi, (capital: Kendari), Central Sulawesi, (capital: Palu), Gorontalo (capital: Gorontalo), and West Sulawesi (capital: Mamuju).

These provinces have 10 cities: Manado, Bitung, and Tomohon in North Sulawesi; Palu in Central Sulawesi; Makassar, Parepare, and Palopo in South Sulawesi; Kendari and Baubau in Southeast Sulawesi; and Gorontalo in Gorontalo plus 52 regencies.

Gorontalo and West Sulawesi are new provinces. The first from parts of North Sulawesi was established in 2000 and the latter in 2004 from parts of South Sulawesi.

Source: BAKOSRTANAR

Figure 2.1.2 Administrative Area of Sulawesi

2.1.2 Climate and Meteorological Conditions

Like that in the whole country, Sulawesi has two seasons. The dry season is from May to October and the rainy season is from November to April. Heavy downpours happen from January to February.

Figures 2.1.3 and 2.1.4 show the distribution of annual precipitation, and agro-climatic area, respectively. As shown in the figures, precipitation drastically varies across the region. The dynamics of precipitation are driven by changes in the prevailing air masses, coming from the northeast during the rainy season and from the southeast in the dry season. Due to interactions of the air masses with the ridges of the mountains, the zonal climate becomes heavily modified. Generally, Sulawesi has sufficient rainfall for practicing agriculture. Particularly, the Maminasata area, Manado, as well as the mountainous region in Central Sulawesi have ample rainfall at more than 2,500 mm per annum.

On the other hand, Gorontalo, Palu, Kendari, Majene, Luwuk, and their surrounding areas receive lower rainfall (annual rainfall is less than 1,600 mm). Particularly, the coastal region around Palu with an annual sum of precipitation of only 600 mm belongs to the driest regions of Indonesia.

Since the Island is located on and near the equator, seasonal variations in temperature are more or less stable. Temperatures in the lowlands range from 21ºC to 35ºC, and those in the highlands vary from 15ºC to 30ºC. The average temperature in the lowlands throughout the year is around 27ºC.

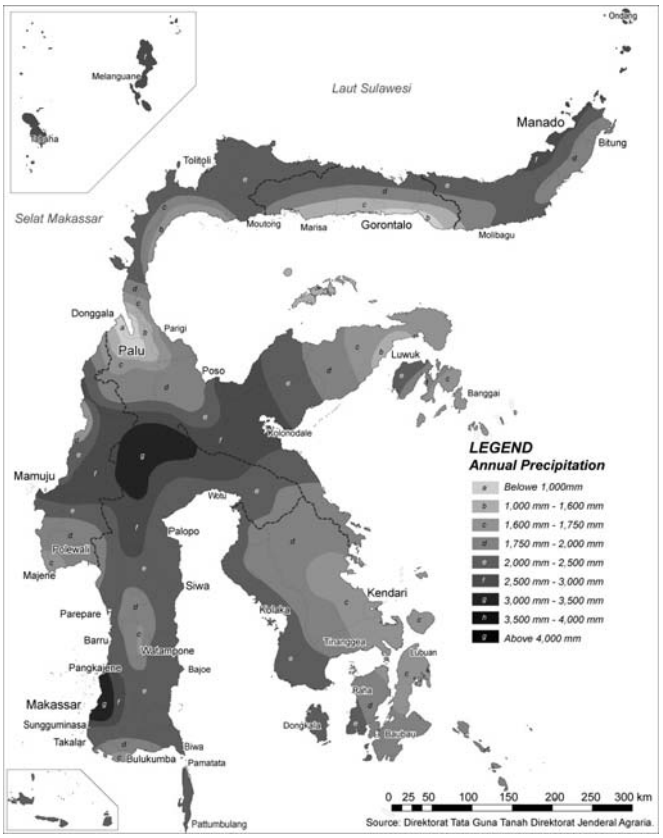


Figure 2.1.3 Distribution of Annual Rainfall

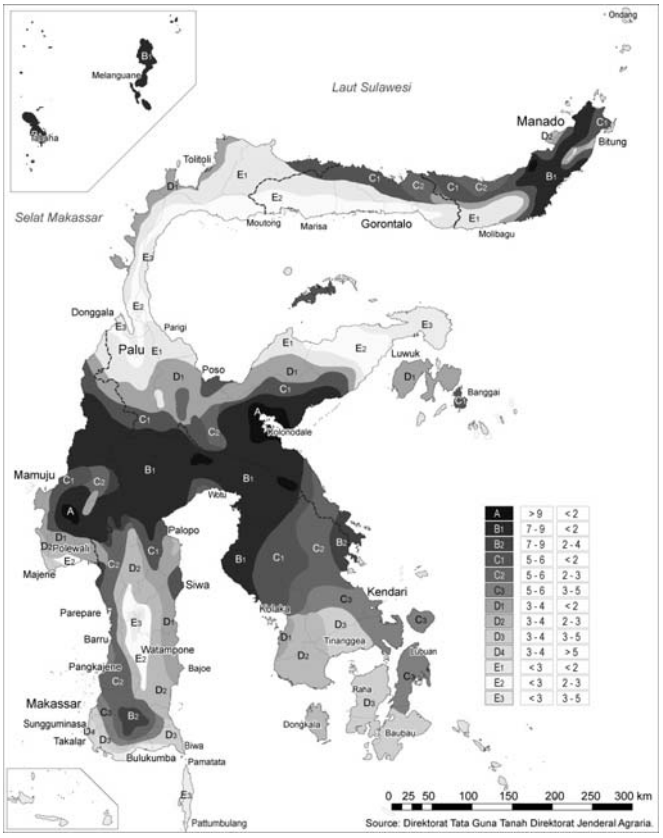
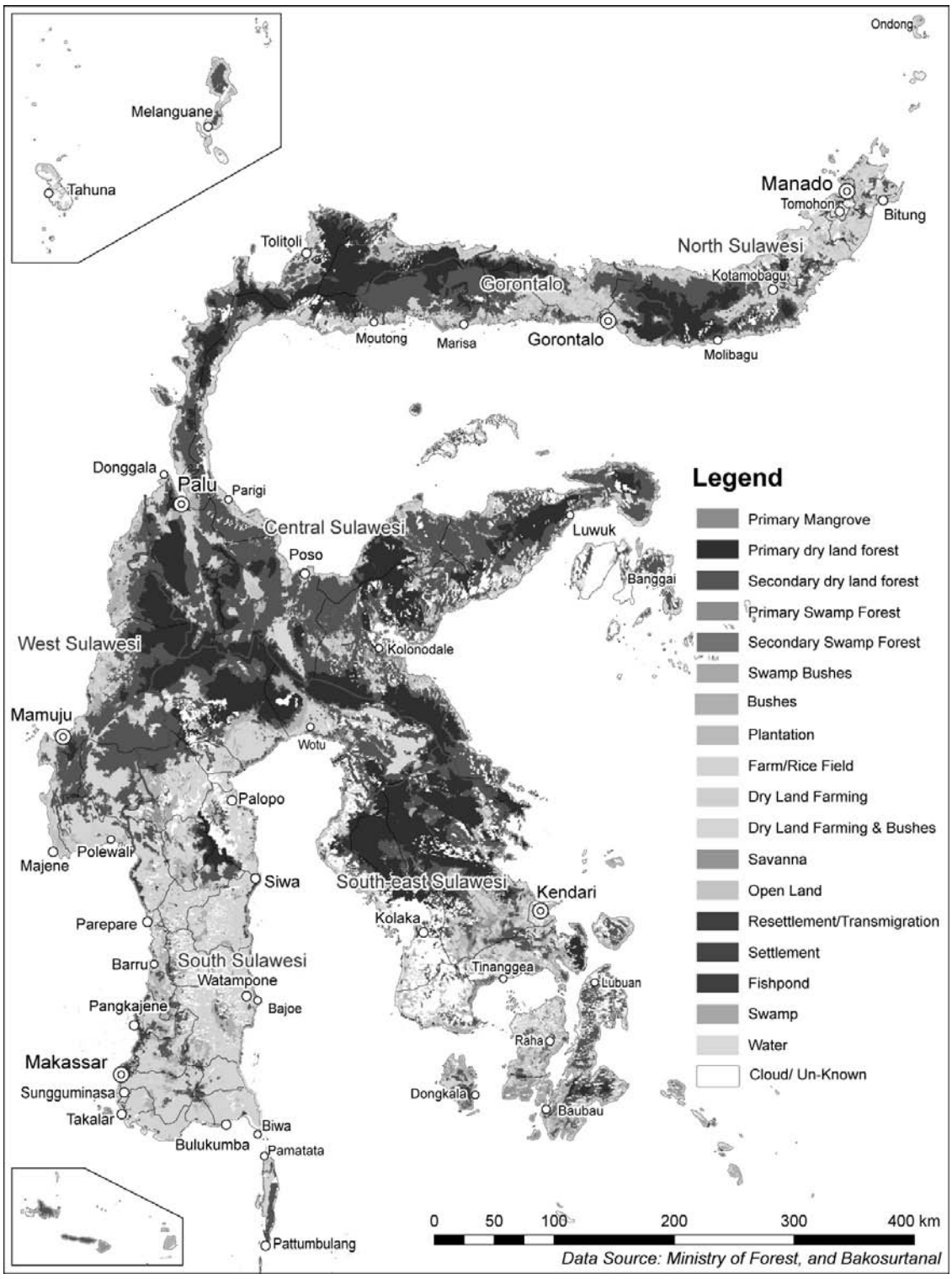


Figure 2.1.4 Agro-climatic Map of Sulawesi

2.1.3 Present Land Uses

Figure 2.1.5 shows land-use patterns in Sulawesi Island. Around 53% of the land area in Sulawesi is covered with forest. Land for settlements and agriculture (including rice fields, plantations, and dry land farming) accounts for only 0.4% and 26.1% of the total land area, respectively



Source: Ministry of Forest

Figure 2.1.5 Land Uses in Sulawesi Island

Land-use pattern in South Sulawesi is quite different from other provinces. Half of the total land area in South Sulawesi is used for agriculture, of which rice fields are predominant (refer to Figure 2.1.7). As shown in Figure 2.1.9, the coastal areas of South Sulawesi are mainly utilized for fish pond cultivation (2.2% of total land area). Aggregated area used for economic activities (agriculture, settlement, fish pond, ports/airports, and mining) account for about 60% of available land area [1] of South Sulawesi. As a result of such development activities, forest areas in the province cover only 31.5% of the total land area, which is considerably smaller than in the other provinces (60.4%).

Since most land areas in South Sulawesi is developed with the exception of steep mountainous regions, the expansion of plantations, farmlands, and fish ponds is less expected.

Table 2.1.1 Land Area by Land Use

Land Use	Area (ha)	Percentage (%)
Forest	14,205.5	53.35
Primary Mangrove	132.1	0.50
Primary Dry Land Forest	5,153.0	19.35
Secondary Dry Land Forest	8,602.2	32.30
Primary & Secondary Swamp Forest	318.2	1.19
Cultivated/ Developed Area	4,348.7	26.46
Plantation	253.5	0.95
Rice Field	730.5	2.74
Dry Land Farming & Bush	4,348.7	16.33
Dry Land Farming	1,427.9	5.36
Settlement	96.4	0.36
Settlement (Transmigration)	11.5	0.04
Fish Pond	178.4	0.67
Others	3,351.9	13.26
Savanna	356.8	1.34
Open Land	188.9	0.71
Swamp Bushes	77.8	0.29
Bushes	2,452.3	9.21
Swamp, and Swamp Bush	101.2	0.38
Water	354.9	1.33
Cloud/Unknown	1,843.9	6.92
Total	26,628.0	100.00

Source: Calculated by JICA Study Team based on the GIS Data of Ministry of Forest

[1] Excluding primary dry land forest, primary swamp forest, water, swamps, swamp bush, and mangrove. Protected areas (such as national reserves and protected forests) are not taken into consideration.

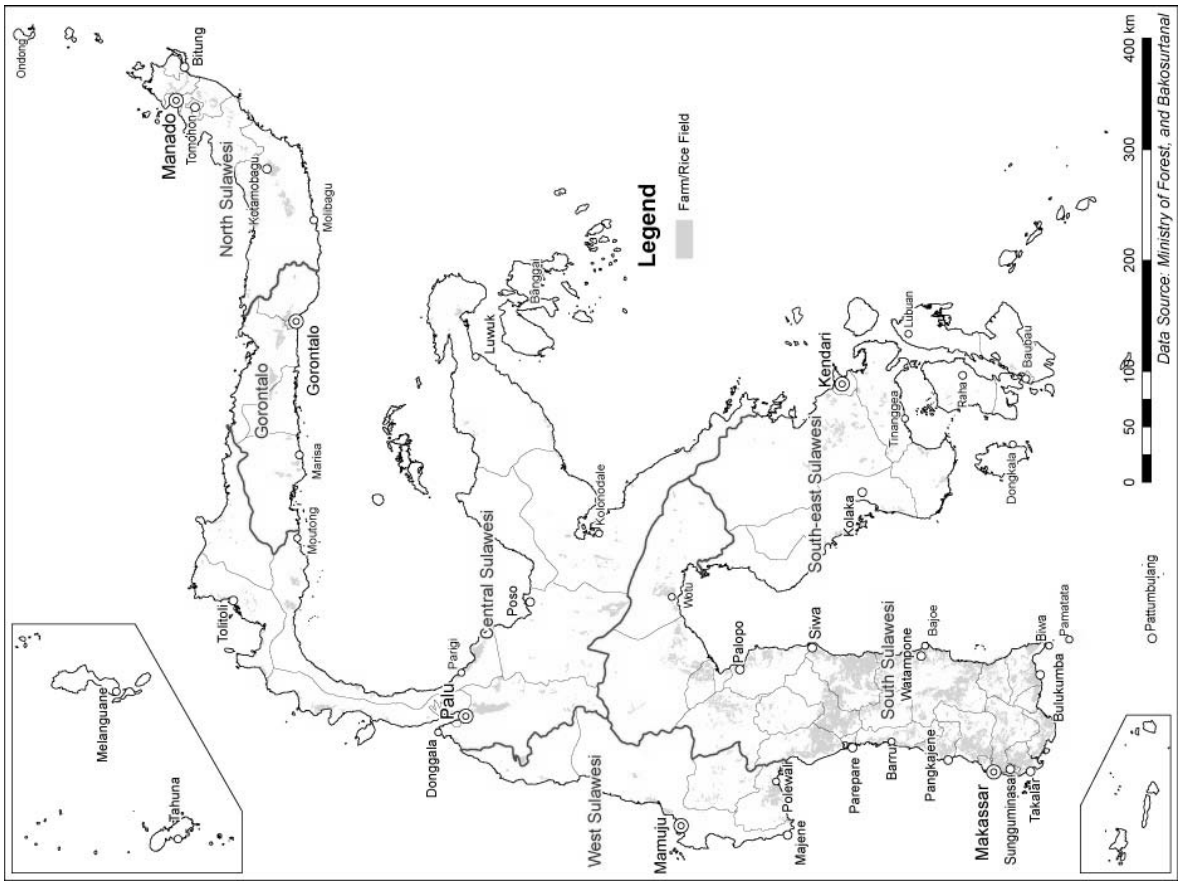


Figure 2.1.7 Distribution of Rice Fields

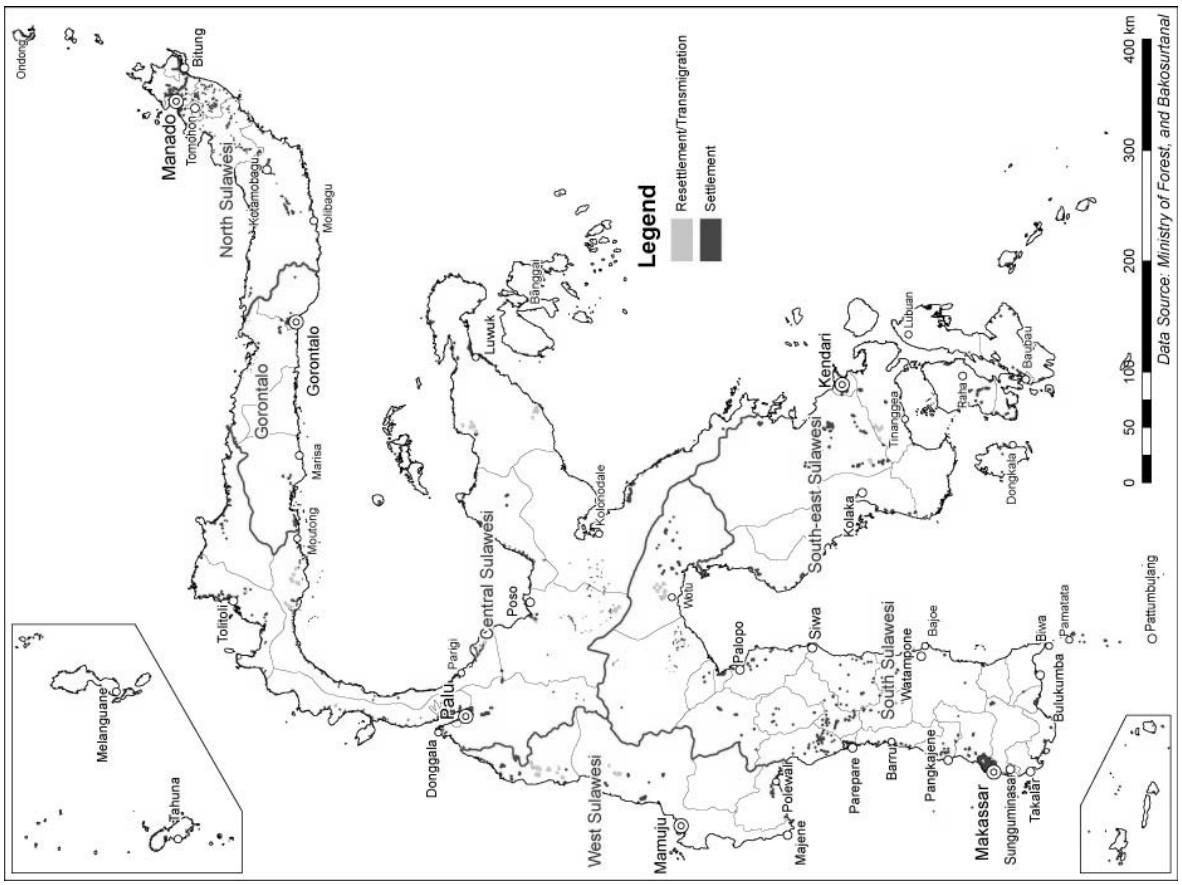


Figure 2.1.6 Distribution of Settlement Areas

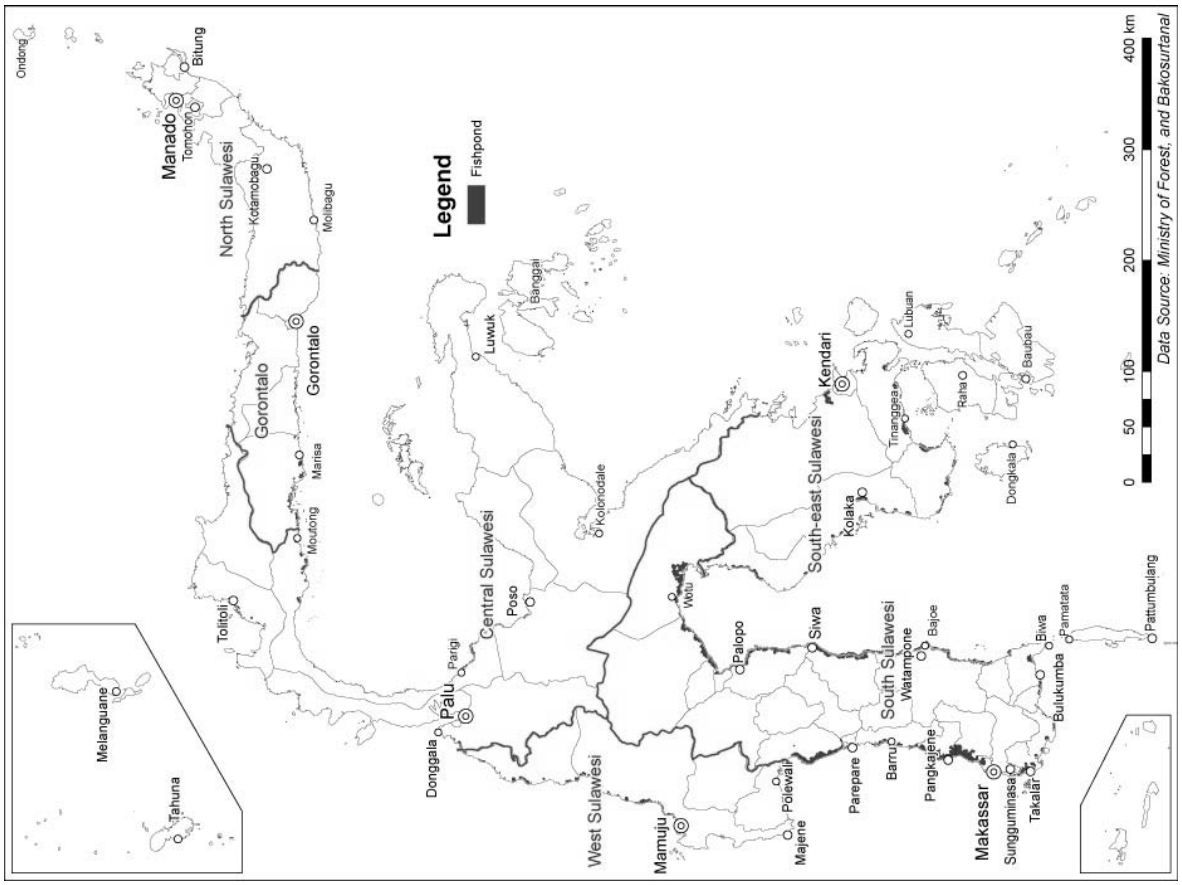


Figure 2.1.9 Distribution of Fish Ponds

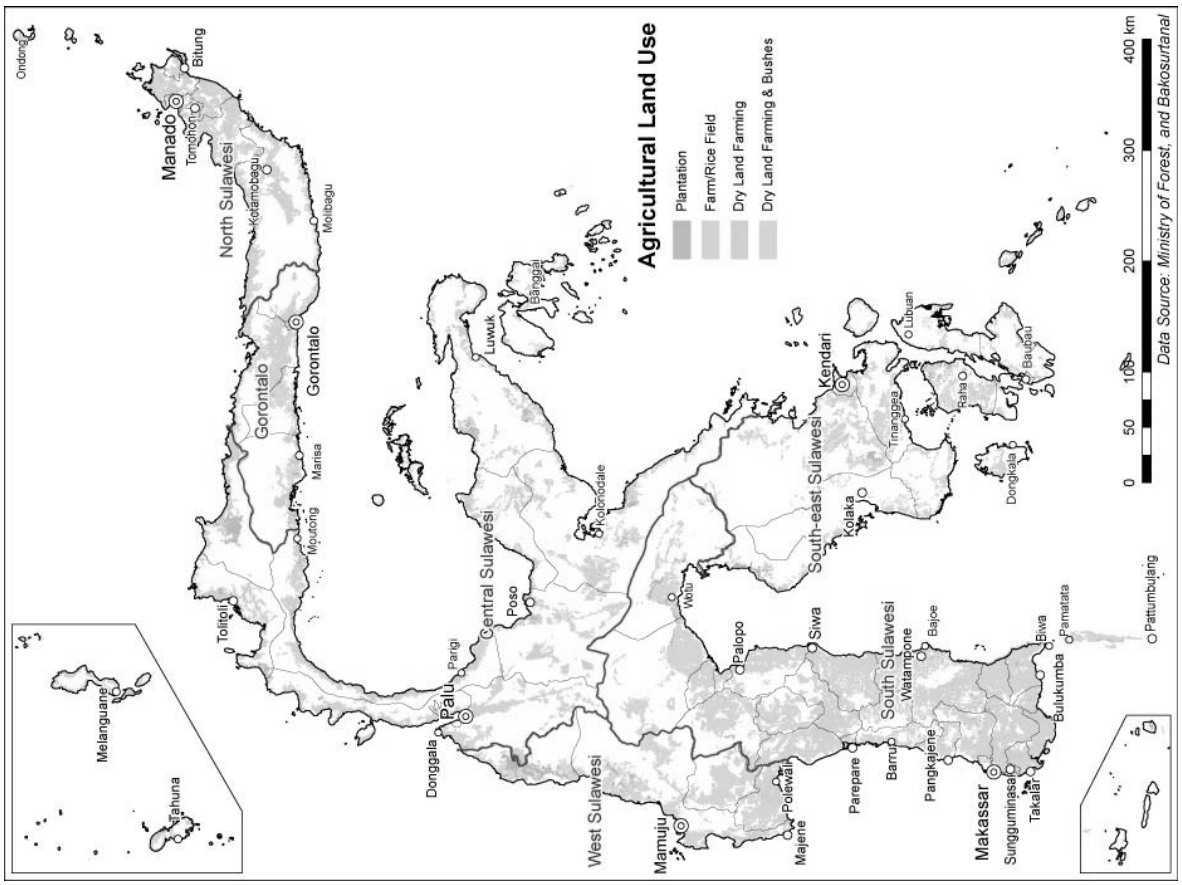


Figure 2.1.8 Cultivated Areas (Rice Fields, Plantations, Dry Land

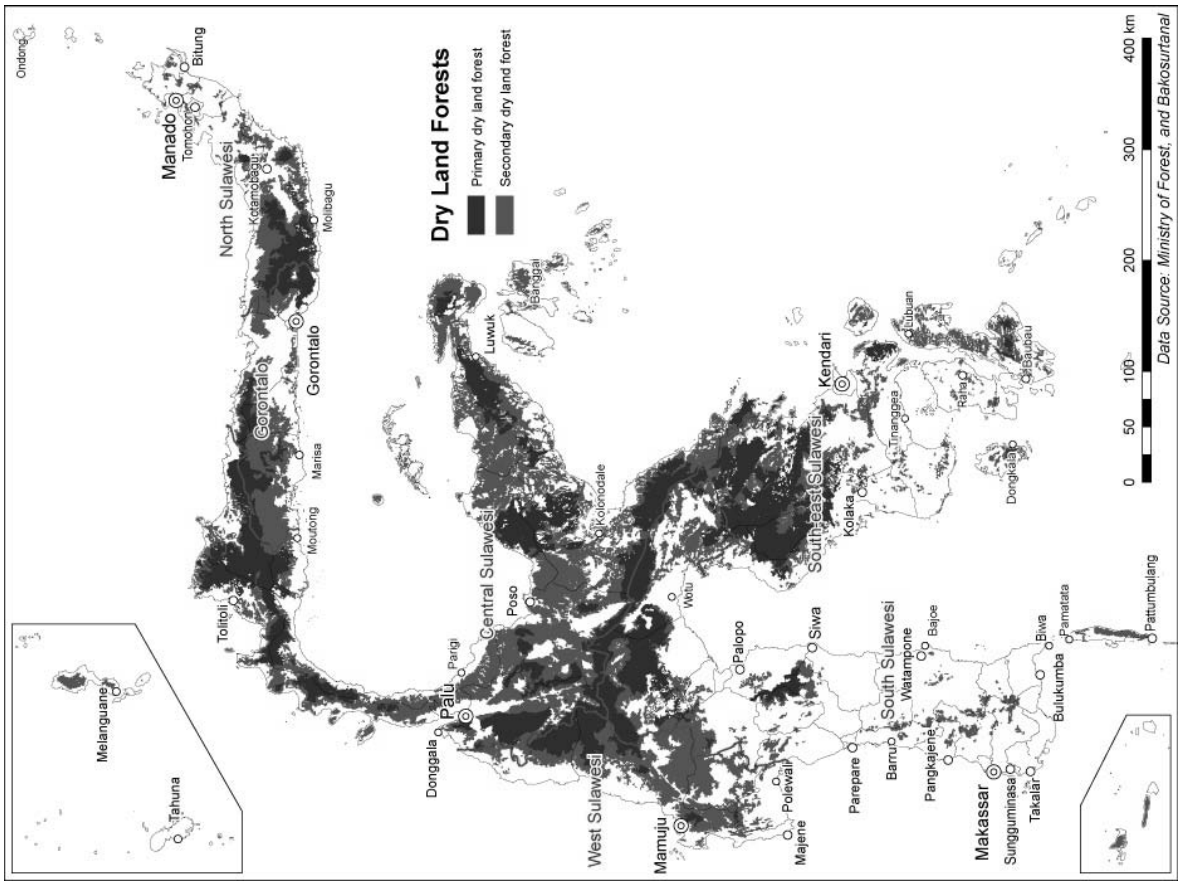


Figure 2.1.11 Dry Land Forests

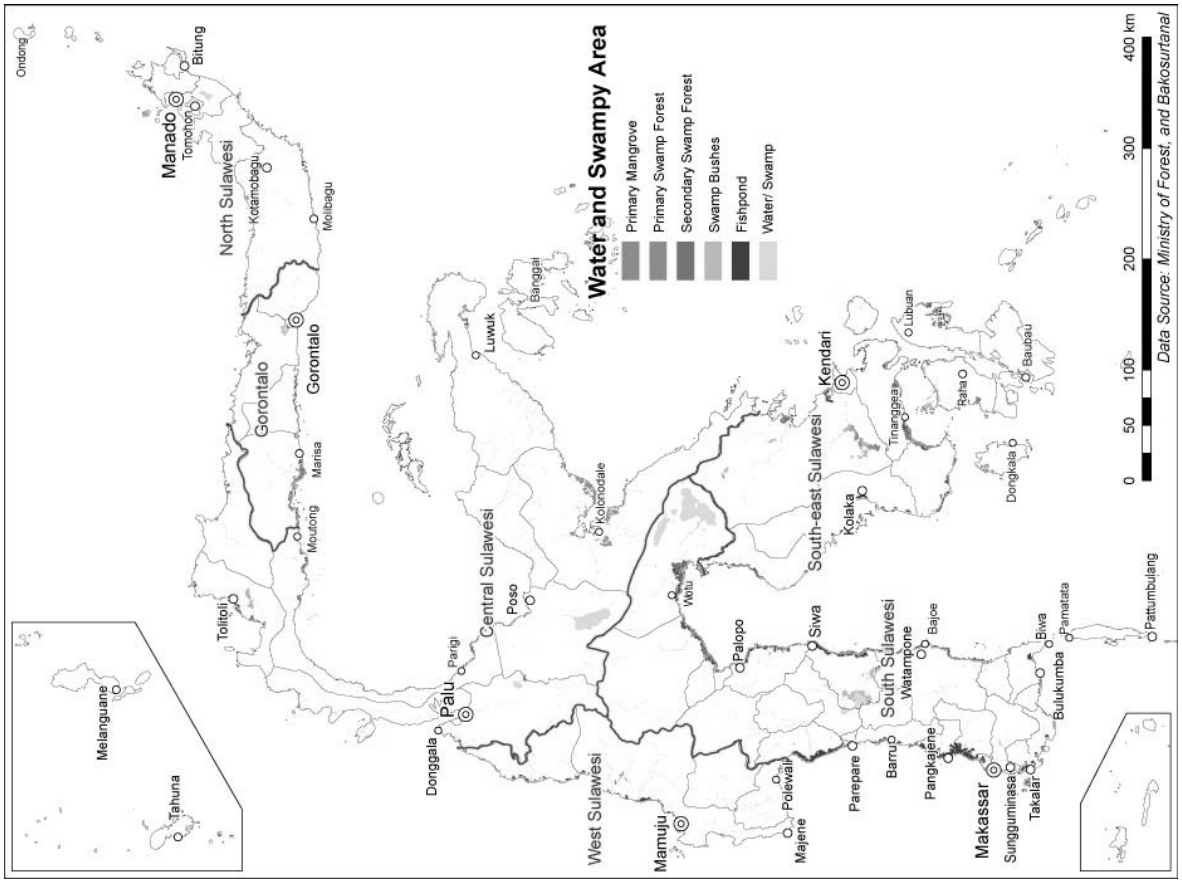


Figure 2.1.10 Swamps Mangroves, and Water Bodies

2.2 Socio-Economic Condition

2.2.1 Social Framework

(1) Population

In 2005, the population of Sulawesi was 15,981,056, which is about 7.30% of Indonesia's total population. Population density in the island was 81.2 /km^2, lower than the national average of 115.8 /km^2 and higher than the outer-island[2] average of 51.3 /km^2. Makassar is the biggest city in Sulawesi with a population of 1,195 thousand, followed by Manado with 406 thousand, Palu with 291 thousand, Kendari with 236 thousand, Gorontalo with 153 thousand, and Palopo with 129 thousand. Since there are limited plains in the island, the aggregate urbanization ratio in the island (27.5%) is still lower than the national average (42.1%) (refer to Figure 2.2.2).

Figure 2.1.1 illustrates the population density (person/km^2) in each district in 2005. While population density was particularly higher in the southern part of South Sulawesi and the eastern part of North Sulawesi, it was lower in Central Sulawesi and Gorontalo. Makassar City had the highest population density with 7,749/km^2, followed by Gorontalo City with 2,557/km^2 and Manado City with 2,440/km^2.

The annual average population growth ratio of Sulawesi progressively diminished from 2.24% (1971-80), 1.86% (1980-90), 1.86% (1990-1995), 1.62% (1995-00), and to 1.19% (2000-05). Its annual average growth ratio in 2000-05 (1.19%) was slightly lower than the national average of 1.30%. However, during this period, the annual growth ratio of Gorontalo (2.04%), Southeast Sulawesi (1.69%), and West Sulawesi (1.52%) was higher, while that of South (0.96%), Central (1.07%), and North Sulawesi (1.25%) was lower than the national average.

(2) Religious Faiths

Islam is the major religion in Sulawesi, approximately practiced by 80% of its population. The conversion of much of the island to Islam occurred during the 15th to 17th centuries. South Sulawesi around the city of Makassar was the first major area of the island to accept Islam. The Gorontalo and Mongondow peoples, in the northern peninsula, largely converted to Islam only in the 19th century. Most Muslims are Sunnis and they can be found in all parts of Sulawesi.

Christians form a substantial minority (about 17%). Most of them are Protestants and Roman Catholics. Christians are concentrated on the tip of the northern peninsula around the city of Manado, which is inhabited by the Minahasa, a predominantly Protestant people, and the northernmost Sangihe and Talaud Islands. The famous Toraja people of Tana Toraja in Central Sulawesi have largely converted to Christianity since Indonesia's independence. There are also substantial numbers of Christians around Lake Poso in Central Sulawesi and among the Pamona-speaking people of Central Sulawesi.

[2] In this Study, outer islands refer to other islands except Java and Bali.

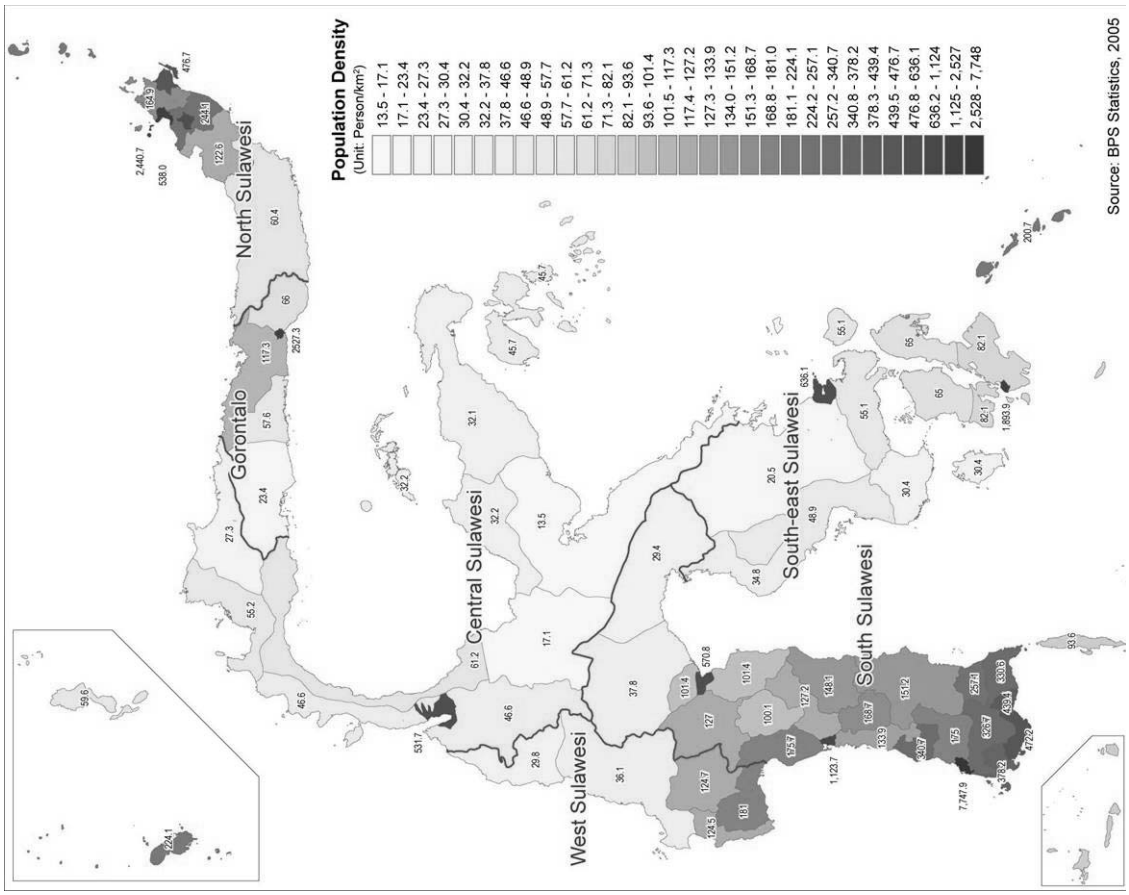


Figure 2.2.1 Population Densities by Regency and City

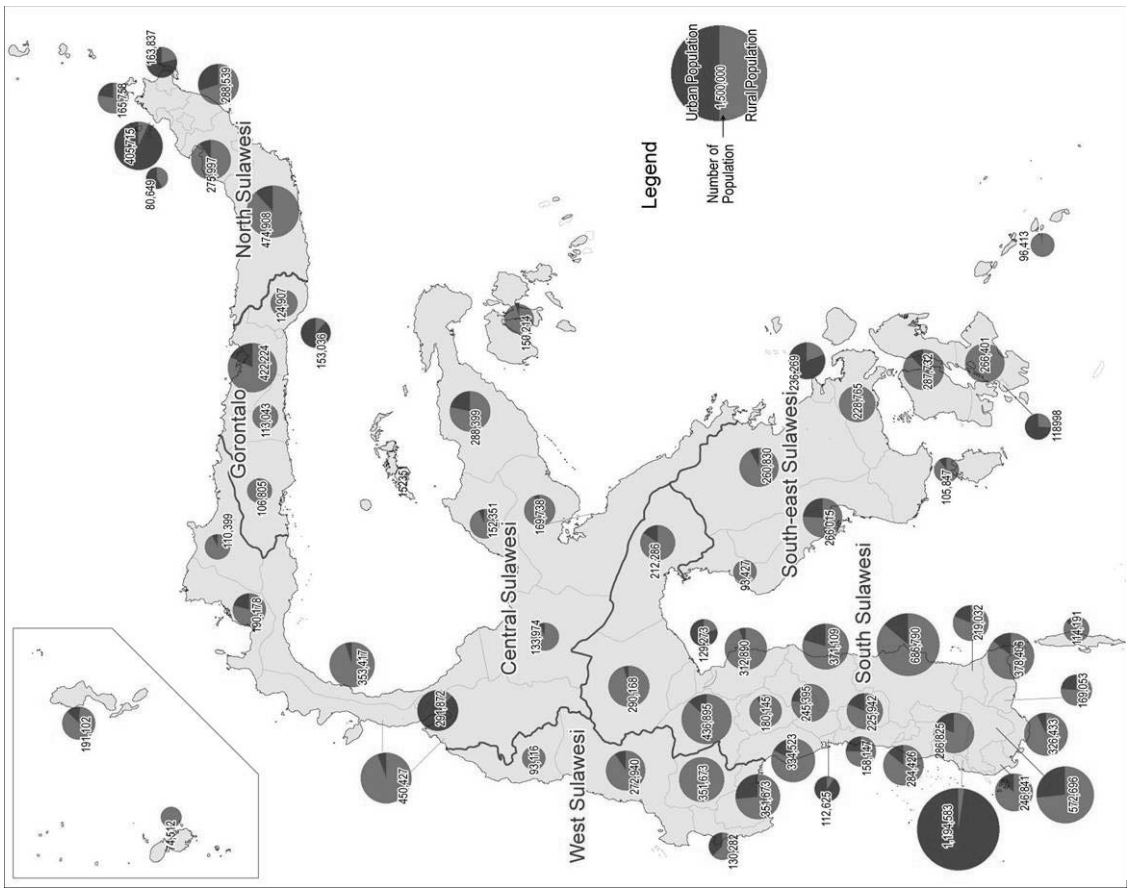


Figure 2.2.2 Urban and Rural Populations of Regencies and Cities

Smaller communities of Buddhists and Hindus (3% in total) are also found on Sulawesi, usually among the Chinese, Balinese, and Indian communities. In recent years, Sulawesi has been plagued by sporadic Muslim-Christian violence mostly in Central Sulawesi.

(3) Ethnic Groups

Most inhabitants of the island are Malayan, except for some ethnic groups in the interior areas. The largest ethnic groups are the Bugis, Makasarese, and Mandarese who live in the southern areas and are renowned seafaring traders. They have mostly converted to Islam. The northern part of South Sulawesi is inhabited by the Torajas whose unique culture is mainly based on animistic beliefs. Minahassans who are dominant in the northern peninsula, are mostly Christians.

(4) Labor Force and Unemployment

Figure 2.2.3 shows the composition of the labor force by type of industry in 2005. Primary industries include agriculture, plantation, fishery, livestock and forestry which substantially contribute in absorbing the labor force in Indonesia and in Sulawesi. Except for North Sulawesi, the primary sector absorbed more than half of the local labor force. The percentage of labor engaged in the primary sector was higher in West Sulawesi (75.1%), Central Sulawesi (65.4%), and Southeast Sulawesi (62.8%). Along with other provinces in Indonesia, in Sulawesi, the secondary sector absorbed only 6.2% - 11.5% of labor force. In North Sulawesi, 44.2% of labor were absorbed by the tertiary sector.

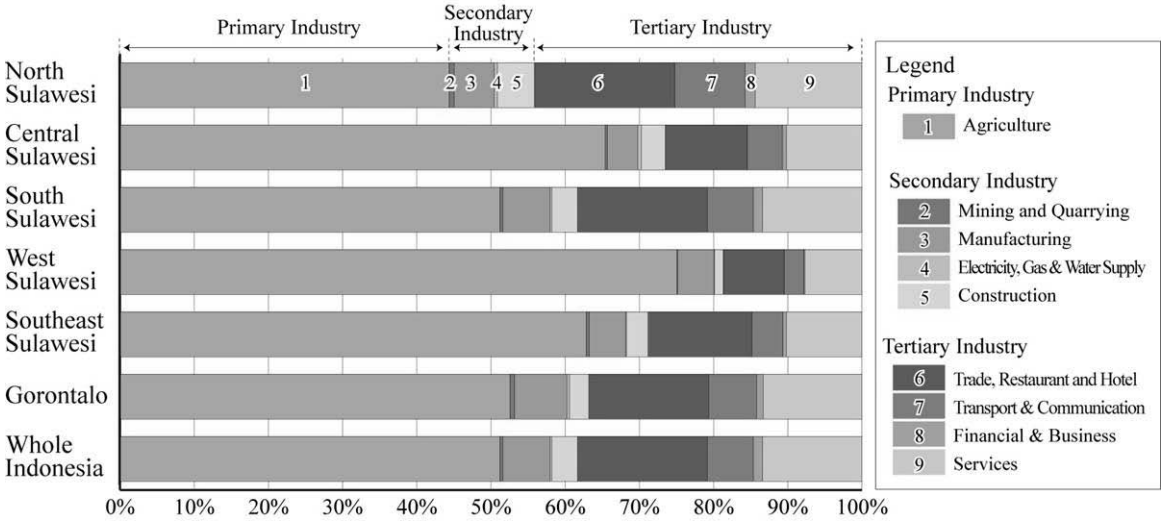


Figure 2.2.3 Sectoral Composition of Labor Force by Province

As of February 2006, unemployment ratios in North Sulawesi (13.7%) and South Sulawesi (12.3%) were higher than the national average (10.5%). On the other hand, Gorontalo (9.8%), Central Sulawesi (8.9%), Southeast Sulawesi (7.4%), and West Sulawesi (4.6%) had lower unemploymemt ratios. Generally, the province had a higher percentage of labor engaged in the primary sector and had lower unemployment ratio. Secondary and tertiary sectors in urban areas were still not enough to absorb population inflow from the rural areas.

2.2.2 Expenditure and Poverty

(1) Distribution of Poverty

According to the National Socio-economic Survey (Survei Social Ekonomi Nasional, hereafter called Susenas) as sampled and compiled by the Bureau of Central Statistics (BPS), the poverty ratio[3] in Sulawesi was 18.9% in 2002, almost similar to the national average (18.2%) for the same year.

Figure 2.2.4 shows the poverty ratios in Central Sulawesi, Gorontalo, southern West Sulawesi, and Southeast Sulawesi as higher than in other areas. Particularly, the poverty ratio in Gorontalo (29.7% on average) was the highest among the provinces in Sulawesi. The poverty ratio in North Sulawesi (11.2% on average) and South Sulawesi (14.7%) was lower than the national average.

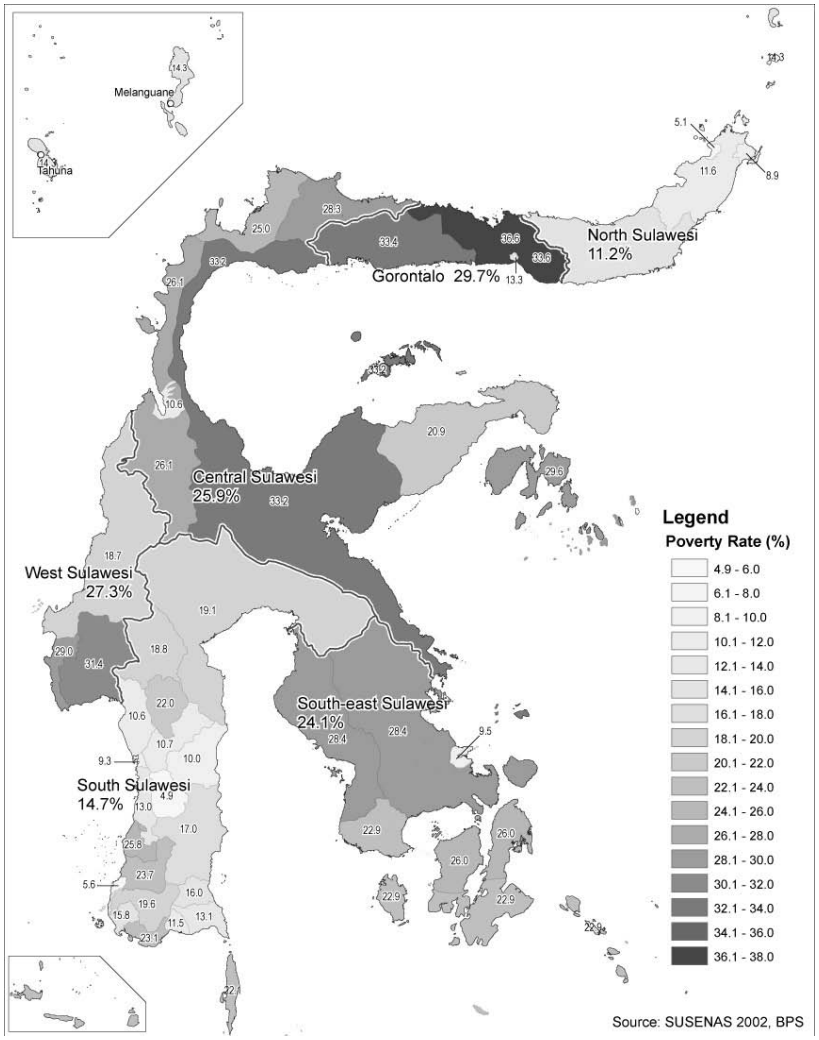


Figure 2.2.4 Poverty Rate in Sulawesi, 2002

Based on Susenas 2002, the degree of inequality in income distribution in the island was generally smaller than the country average because the GINI coefficient[4] in Sulawesi (North: 0.270, Central: 0.283, South + West: 0.301, Southeast: 0.270, and Gorontalo: 0.241) was considerably smaller than the national average of 0.329.

[3] Poverty Ratio indicates that the percentage of the population with a monthly per capita expenditure less than a certain threshold referred to as the 'poverty line', which is calculated based on the cost of the food basket to fulfill 2,100-calorie per day per person.

[4] GINI coefficient is an index showing the degree of equality in income distribution. It represents figures from zero to one, and the larger the figure, the smaller the degree of equality.

(2) Expenditure per Household

Figure 2.2.5 shows the distribution of households according to monthly expenditure in the 6 provinces and the national average. The horizontal axis indicates the monthly expenditure per household, the vertical axis indicates the percentage of household population. South, West, and Central Sulawesi show a similar trend as the national average. However, while the percentage of households with higher monthly expenditures is slightly lower than the national average, the percentage of those with lower monthly expenditure is higher. Such tendency is more apparent in Gorontalo. North Sulawesi is the wealthiest province in Sulawesi with the highest percentage of households in the higher expenditure strata and the lowest percentage of households in the lower expenditure strata.

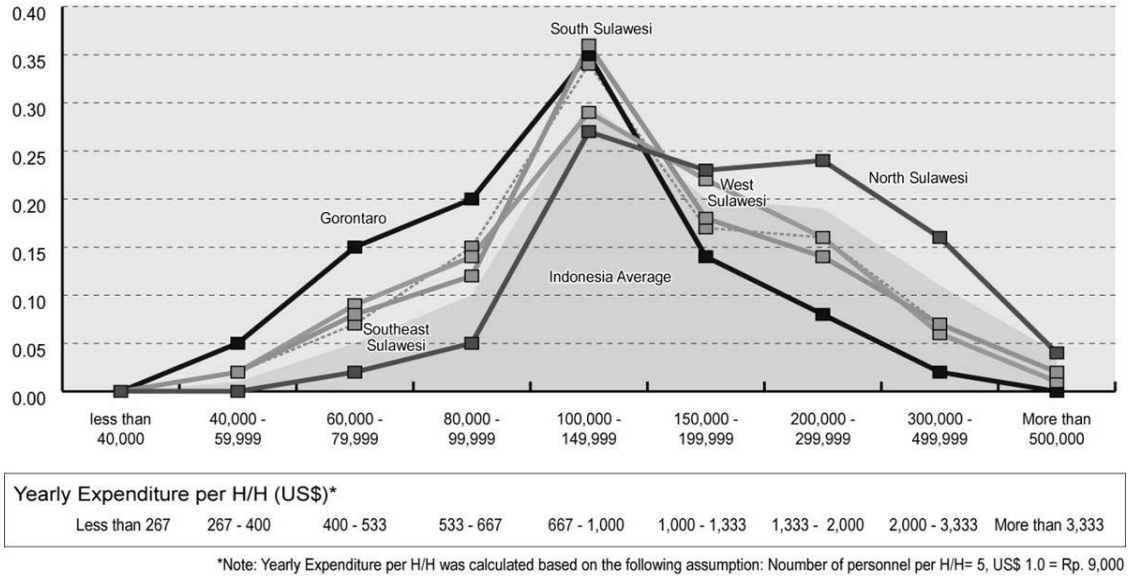


Figure 2.2.5 Distribution of Monthly Household Expenditure by Province

2.2.3 Regional Economy and Industrial Structure

In 2005, total GRDP in the island was Rp. 73,089 billion (in constant prices since 2000) contributing only 4.2% to the country's GDP (Rp. 1,749,546 billion) while its population accounted for 7.30% of Indonesia's total population. Agriculture (including plantations, fishery, forestry, and livestock) plays a vital role in the economy of Sulawesi, contributing 9.7% to the national total for agriculture. On the other hand, manufacturing and financial/business respectively account for only 1.6% and 2.6% of the national total for these sectors.

Table 2.2.1 Sectoral GRDP of Sulawesi and Indonesia, 2005 Current Prices

(Unit: Rp. 1,000)

Sector	Sulawesi (A)	Indonesia (B)	Ratio (A / B)
Agriculture	24,605,974	254,391,300	9.67%
Mining and Quarrying	4,973,952	162,642,000	3.06%
Manufacturing	7,854,917	491,699,500	1.60%
Electricity, Gas and Water Supply	600,151	11,596,600	5.18%
Construction	5,251,014	103,403,800	5.08%
Trade, Restaurant and Hotel	10,706,564	294,396,300	3.64%
Transport and Communication	5,867,008	109,467,100	5.36%
Financial and Business	4,209,374	161,959,600	2.60%
Services	9,020,094	159,990,700	5.64%
Total	73,089,047	1,749,546,900	4.18%

Source: BPS Indonesia, 2005

Figure 2.2.6 illustrates the amount of GRDP for each province and its proportion. The size of the diameter indicates the amount of GRDP. As shown in the figure, the GRDP of South Sulawesi is the most outstanding in Sulawesi. In 2004, its GRDP solely accounted for more than half (57.8%) of the total GRDP of Sulawesi. North Sulawesi had 16.8%, Central Sulawesi 14.36%, and Southeast Sulawesi 10.3%. On the other hand, West Sulawesi and Gorontalo shared only 4.2% and 2.6% of the island's GRDP, respectively.

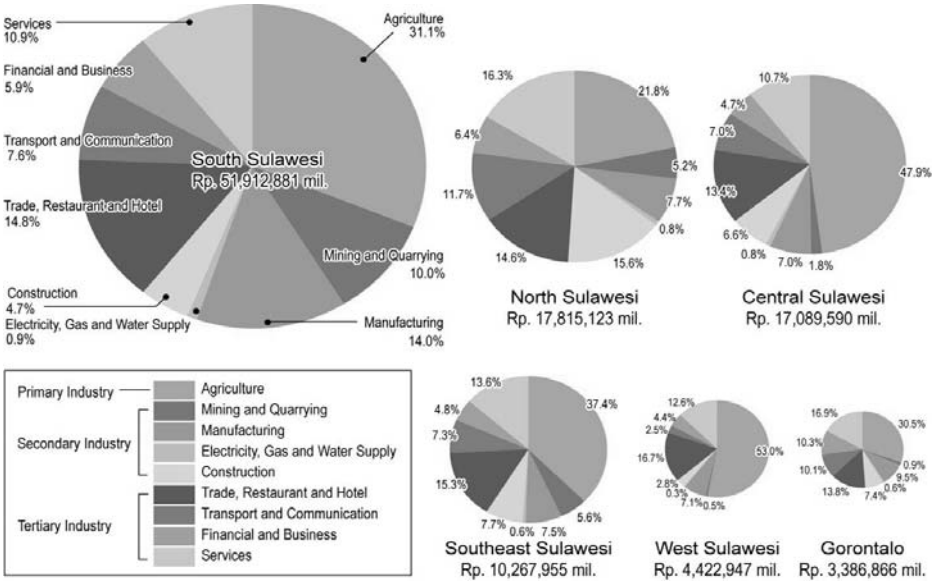


Figure 2.2.6 GRDP of Sulawesi by Province, 2005 Current Prices

(1) Per-capita GRDP

In 2005, the per-capita GRDP of the island (US$ 593.6) was about 60% of the national average (US$ 1,026.9). North Sulawesi had the highest per-capita GRDP (US$ 718.9), next was South Sulawesi (US$ 631.7), and Central Sulawesi (US$ 625.5). On the other hand, Gorontalo had the lowest at US$ 298.1 or less than a third of the national average.

Table 2.2.2 GRDP per Capita of Sulawesi by Province, 2005 Current Prices

Area	GRDP	Population	Per-capita GRDP	
			(Rupiah)	(US Dollar)1
Sumatra Island	488,949,677	45,318,403	10,789,208	1,039.69
Java Island	1,314,077,338	127,035,178	10,344,200	996.81
Bali Island	28,986,596	3,336,869	8,686,765	837.09
Kalimantan Island[2]	205,265,514	11,939,978	17,191,448	1,656.64
Sulawesi Island	**96,136,842**	**15,606,670**	**6,159,984**	**593.60**
Lainnya	73,588,312	12,884,426	5,711,416	550.38
Indonesia Total	2,303,031,449	216,121,524	10,656,187	1,026.87
North Sulawesi	15,690,192	2,103,198	7,460,158	718.89
Gorontalo	2,797,406	904,440	3,092,970	298.05
Central Sulawesi	14,742,578	2,271,071	6,491,464	625.54
South Sulawesi	48,765,946	7,439,597	6,554,918	631.66
West Sulawesi	3,869,686	953,867	4,056,841	390.93
Southeast Sulawesi	10,271,034	1,934,496	5,309,411	511.64

1 Exchange rate used: US$ 1= Rp. 10,377.3 (Source: IMF, 2005 average exchange rate)
2 Per-capita GRDP of Kalimantan and Sumatra is higher than that of other islands with major oil and gas production.
Source: BPS Indonesia

(2) GRDP by Industrial Origin

In 200_, the primary sector, covering agriculture, fishery, plantation, livestock, and forestry, shared only 15.0% of the GDP of Indonesia. However, it is the main "wheel" of Sulawesi's economy, particularly for West Sulawesi (accounting for 55.9% of the provincial GDP), Central Sulawesi (47.9%) and Southeast Sulawesi (37.4%). Sulawesi's primary agricultural products include coconuts, clove, nutmeg, soybean, coffee, rice, cocoa, and cattle. Fishery products are also abundant and Sulawesi is beginning to expand its coastal shrimp and fish ponds.

The secondary sector, which encompasses mining and quarrying, manufacturing, electricity, gas and water supply, and construction, accounted for 44.0% of the national GDP. In Sulawesi, this sector contributed only 25.6% to the GRDP. In South Sulawesi, the mining and quarrying sectors contributed 10.0% to the GRDP of the province due to the area's rich mineral resources such as nickel (Soroako in East Lulu), limestone (in Maros, Jeneponto, and Pangkep), and marble. While the manufacturing sector was expected to support agriculture in terms of agro-industrial inputs, this sector accounted for only 10.8% of the GRDP of Sulawesi, which is quite lower than the 28.1% national figure. The manufacturing sector played a significant role in South Sulawesi (14.0% of the provincial GRDP), although its contribution in the other 5 provinces was quite lower at 7.0 - 9.5%.

The tertiary sector, including trade, restaurant and hotel, transport and communication, financial and business, and other services, accounted for 41.5% and 40.8% of Indonesia's and Sulawesi's GDP, respectively. This sector particularly played an important role in North Sulawesi (49.0%) and Gorontalo (51.1%).

(3) GRDP Growth Ratio and Labor Productivity

Figures 2.2.7~9 compare the GRDP growth ratio during the period 2001- 2005[5] (x-axis), the labor productivity in 2005[6] (y-axis), and the amount of GRDP in 2005 among the 6 provinces in Sulawesi and the Indonesian average (size of circle). The red dotted lines indicates growth ratio and the labor productivity of the whole Indonesia. As shown in these figures, the growth ratio in Sulawesi was generally higher than the national average. In terms of labor productivity, the primary sector's growth ratio was higher than the national ratio, but that of the secondary and tertiary sectors were lower.

While the GRDP of Southeast Sulawesi was smaller than that of the South, North, and Central Sulawesi, labor productivity and GRDP growth ratio were superior to those of the other provinces. In the case of Gorontalo, not only the size of economy but also labor productivity was clearly smaller than those of the other provinces.

Primary Sector

The primary sector plays a vital role in the economy of Sulawesi. Besides the sector occupying a substantial portion of the economy, its labor productivity (Rp. 6.9 million) and growth ratio (4.03%) were higher than the national figures (Rp. 6.1 million and 3.0%). As shown in Figure 2.2.7, Sulawesi's labor productivity in the primary sector is well higher than the national average with the exception of Gorontalo. Also, except for South Sulawesi, the growth ratio of the sector in the other 5 provinces shows higher figures.

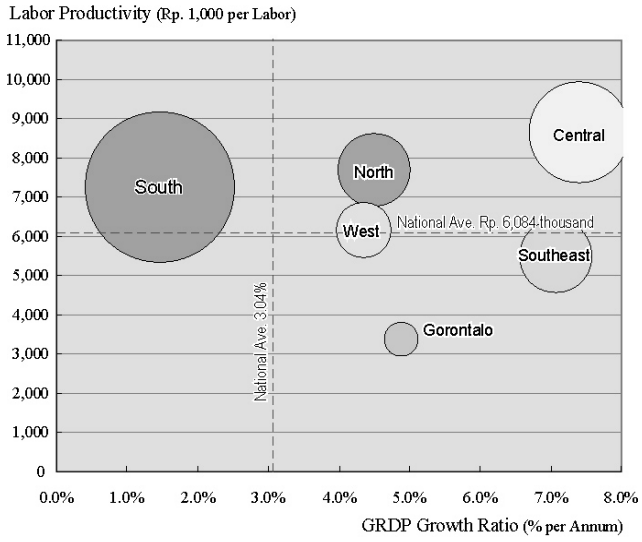


Figure 2.2.7 Economic Performance (Primary Industry)

[5] In the case of South Sulawesi (2001-04), Gorontalo (2002-05), West Sulawesi (2003-05), Southeast Sulawesi (2001-04)
[6] 2000 constant prices.

Secondary Sector

Figure 2.2.8 shows that the growth ratio of the secondary sector in Sulawesi (5.35%) is higher than the country level (4.12%), with the exception of North Sulawesi (2.91%).

However, the labor productivity of the sector in all 6 provinces is still lower than the national average, particularly those of West Sulawesi and Gorontalo which are considerably low.

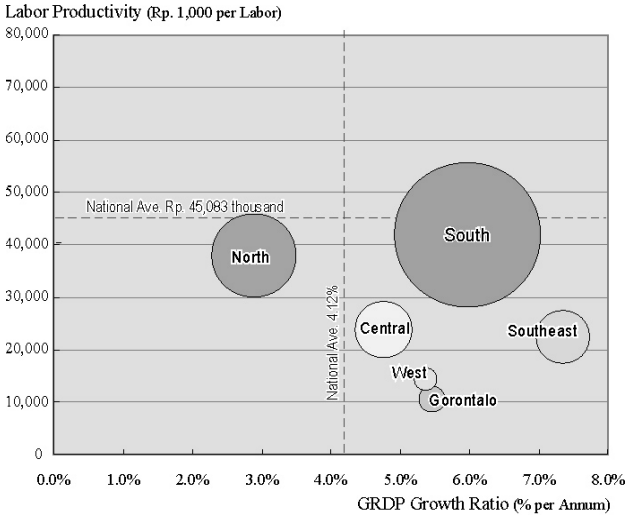


Figure 2.2.8 Economic Performance (Secondary Industry)

Tertiary Sector

The growth ratio of the tertiary sector in Sulawesi (7.4%) like the trends in Indonesia and other countries, is higher than that of the primary (4.0%) and secondary sectors (5.4%).

The labor productivity of the sector in all 6 provinces in Sulawesi is lower than the country average of Rp. 20.1 million. That of Gorontalo (Rp. 8.0 million) is less than half of the national average.

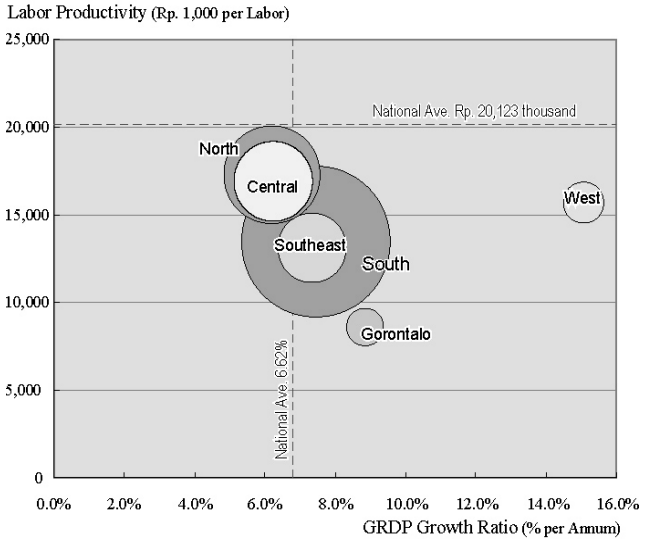


Figure 2.2.9 Economic Performance (Tertiary Industry)

2.2.4 Agriculture, Forestry, and Fisheries

(1) Food Crops

The food crop subsector covers rice (paddy and nonpaddy), maize, cassava, sweet potato, peanuts, and soybeans. In 2005, the production volumes of maize and rice in the island were 11.6% and 9.9% of the total production volume in the country, respectively. South Sulawesi is the most important province in producing food crops not only in Sulawesi but in the entire East Indonesia. In 2005, the province alone produced 63.1% of rice, 48.5% of maize, 49.7% of cassava, 32.8% of sweet potatoes, and 65.4% of soybeans in Sulawesi. Particularly, Bone regency, which is located in the eastern part of South Sulawesi, is a major production center for paddy rice, maize, and soybean.

Rice, maize, and cassava produced in Sulawesi are consumed in both the domestic and regional markets. According to Custom's data in 2003, no rice was exported from Sulawesi. An

exception was Gorontalo's maize export, totaling 91,615 tons or equivalent to US$ 3.93 million in FOB value in 2005. The export value of maize constituted 55.3% of the total exports value in Gorontalo in the same year

Rice/ Paddy

Rice is the staple food of Indonesia and is widely cultivated in Sulawesi on both wet and dry fields. In 2005, the total production volume of paddy in the island was 5,373,561 tons. This was harvested from a 1.20 million hectare area, the largest area planted to one crop, followed by coconuts (0.71 million ha), cocoa (0.68 million ha), and maize (0.45 million ha).

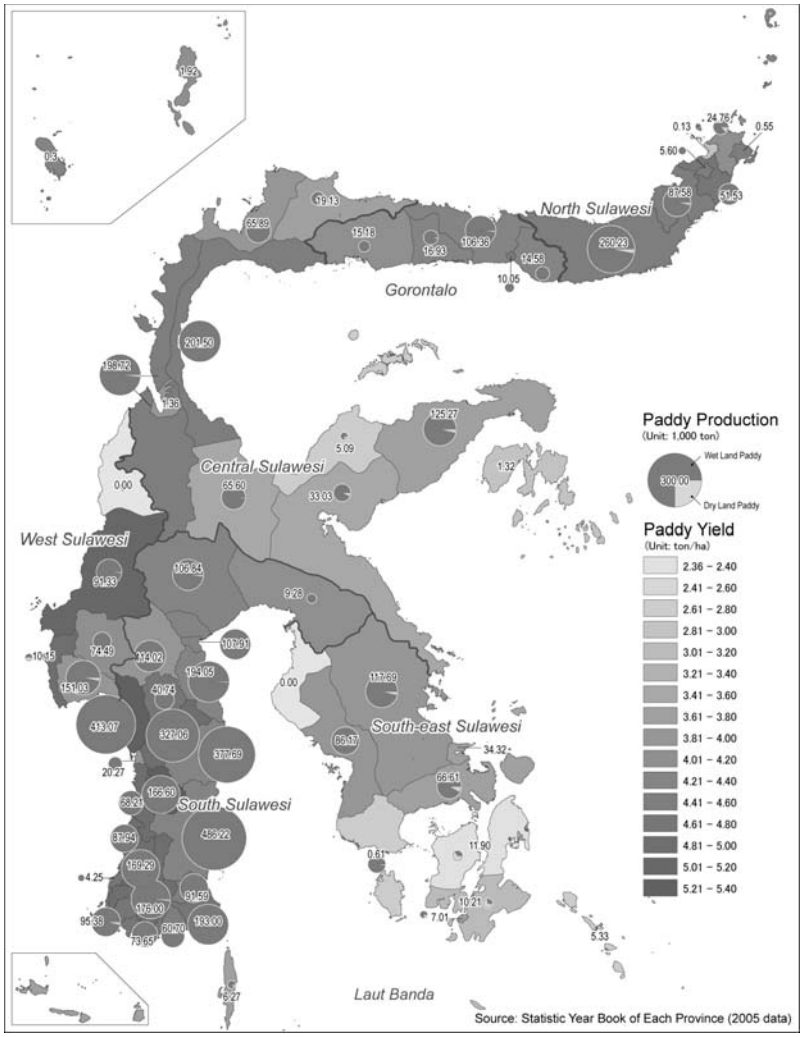


Figure 2.2.10 Production Volume and Unit Yield of Paddy Rice

As shown in Figure 2.2.10, unit yield of paddy rice in South Sulawesi (4.64 ton/ha on average) is generally better than in other provinces. In terms of production volume and cultivated area, the province accounted for 63.1% (3,390,036 tons) and 60.9% (730,602 ha) of Sulawesi total. Pirang, Sidrap, Wajo, and Bone regencies in South Sulawesi and Bolaang Mongondow regency in North Sulawesi are the major rice producers. Most paddy production originates from wet land paddies, with the exception of Mura and Buton Islands in Southeast Sulawesi.

The self-sufficiency ratio for rice in the island is estimated to be 175.7%[7], which means production exceeds demand within the island. While South Sulawesi exports rice to Java and other provinces, North and Central Sulawesi imports it from other provinces as well as abroad. In 2005, these provinces imported 28,500 tons of rice from Vietnam and Thailand.

[7] Calculated based on the 2005 population and Indonesia's per-capita annual rice consumption of 191.4 kg in 2004 (FAO data).

Maize

In Indonesia, maize is the second most important grain crop after rice, in terms of the percentage of area planted to it relative to the total area for all food crops. Maize is mainly cultivated on dry lands through a multiple cropping system. Compared to rice, its cultivation and processing involve lesser labor and capital inputs. In 2005, according to the statistics of the Food and Agriculture Organization of the United Nations (FAO), the total human consumption of maize was about 67.4%, while its use as animal feed and for other purposes was 25.7% and 6.9%, respectively. In the case of North Sulawesi and Southeast Sulawesi, maize, like rice, is a staple food.

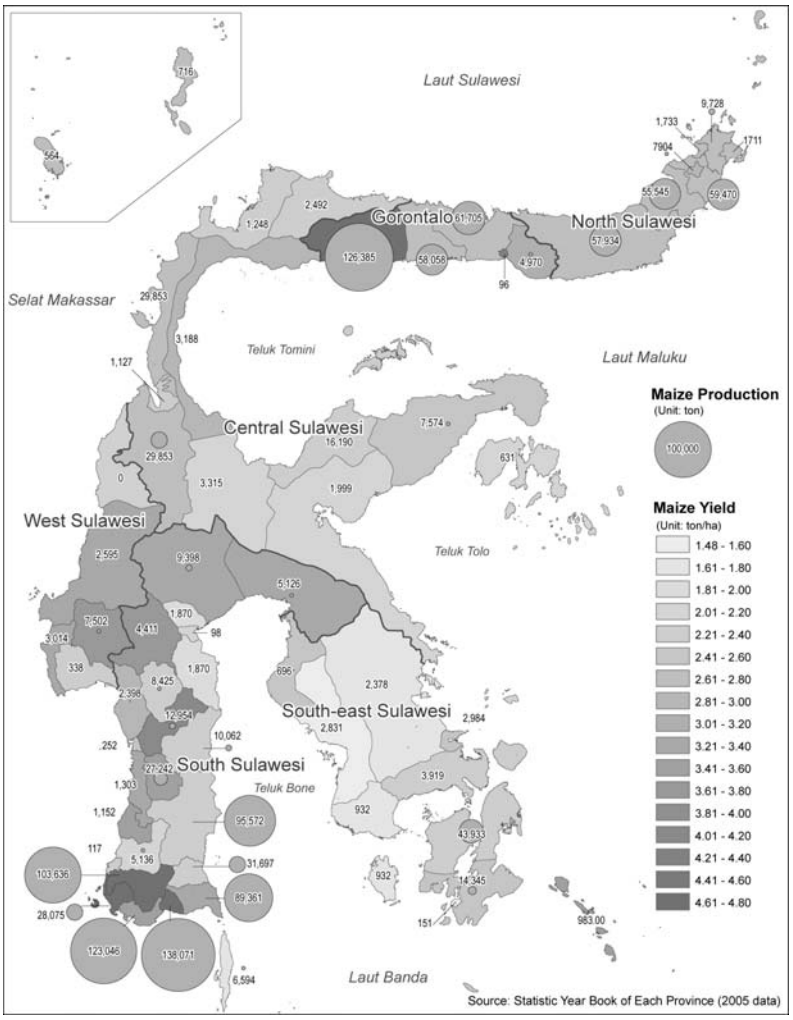


Figure 2.2.11 Production Volume and Unit Yield of Maize

Maize is widely cultivated in western Gorontalo including Pohuwato (126,385ha), Boalemo (58,058ha), and Gorontalo (61,705ha) regencies, and Southern part of South Sulawesi, such as Bantaeng (138,071ha), Jeneponto (123,046ha), Gowa (103,636ha), Bone (95,572ha), and Bulukumba (89,361ha) regencies. Unit yields in Gowa regency in South Sulawesi and Pohuwato regency in Gorontalo exceed 4.7 ton/ha, considerably higher than the national average of 3.5 ton/ha.

Recently, harvested areas, production volumes, and yields of maize in Gorontalo rapidly increased (from 45,718ha, 130,251 tons, and 2.85 ton/ha in 1999 to 107,752ha, 400,046 tons, and 3.71 ton/ha in 2005. In 2005, 91,615 tons (22.9% of production) equivalent to US$ 3.93 million (55.3% of total export value in the province) of maize was exported from Gorontalo.

Cassava

Cassava is the third most important food crop in Indonesia, next to rice and maize. It is used in a variety of food products, such as vegetables in dishes, grated to make pancakes, dried and grounded into tapioca flour, or sliced and made into snack chips. Total production volume in the island was 934,305 tons in 2005, just enough for the island's consumption (self-sufficiency ratio was 104.8%[8]).

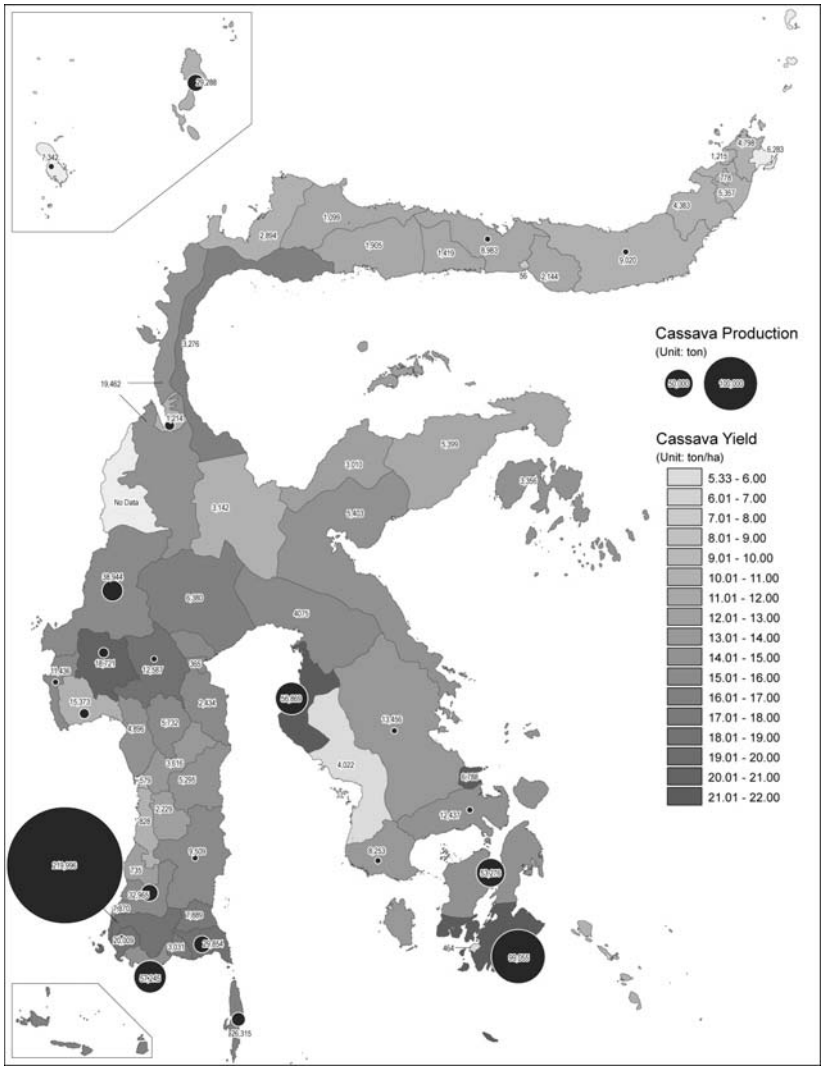


Figure 2.2.12 Production Volume and Unit Yield of Cassava

Gowa regency in South Sulawesi is the single biggest cassava producing area (12,087ha) in Sulawesi, producing 219,996 tons or 23.5% of the cassava in the island. Muna and Buton islands and Kolaka Utara regency in Southeast Sulawesi are also richly cultivated with cassava (refer to Figure 2.2.12). Unit yields in these areas were 18.2~21.2 ton/ha, which well exceeds the national average of 15.9 ton/ha.

[8] Self-sufficiency ratios of cassava are also calculated same methodology of self-sufficiency of rice using 55.8 kg/capita/year.

Soybeans and Other Food Crops

In Indonesia, soybean is consumed in the form of tofu, "tempe", soy sauce, and other manufactured foods. As illustrated in Figure 2.2.13, soybean yields from South Sulawesi (1.66 ton/ha) is higher than other areas of Sulawesi, and is well higher than the national average of 1.30 ton/ha. Bone regency solely produces 10,362 tons or 24.9% of the total production in Sulawesi.

Peanuts and green peanuts are important income sources for farmers in South Sulawesi.

Sweet potato is mainly planted in Mamuju in West Sulawesi, and Talaud Island, a remote northern island of North Sulawesi.

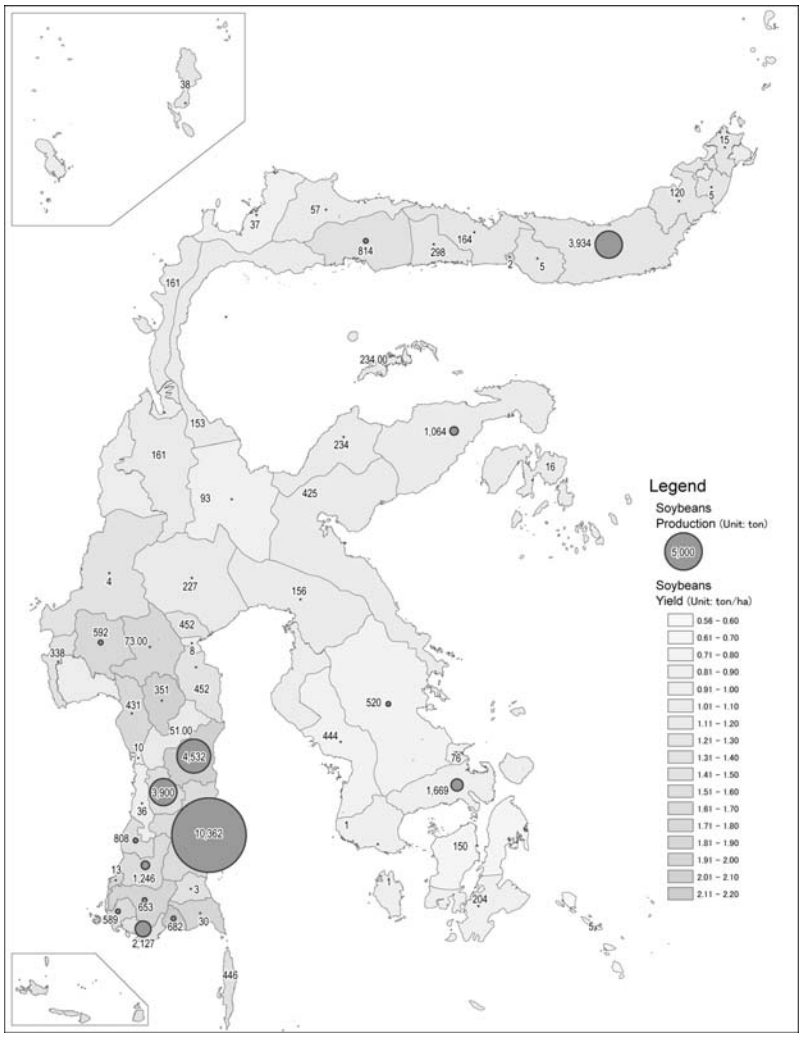


Figure 2.2.13 Production Volume and Unit Yield of Soybeans

(2) Estate Crops

The staple plantation products in Sulawesi are coconuts, cacao, coffee, cashew nuts, vanilla, clove, and tobacco. In 2005, plantations in Sulawesi were mainly planted to coconuts (714,357ha), cacao (683,380ha), cashew nuts (213,851ha), clove (175,197ha), coffee (129,439ha), and vanilla (15,986ha). Particularly, production volumes from cacao in the island accounted for as much as 71.2% of the national production in 2005. Also, cashew nuts and coconut production in the island shared 45.1% and 17.9% of national production volumes, respectively.

Coconuts

Indonesia is the largest producer of coconuts in the world, and copra is one of its more important export commodities. According to FAO statistics, the total production volume in the country in 2005 accounted for 31.6% of the total production in the world. Coconut production in Sulawesi shares 17.9% of the national total. About two-thirds of coconuts in the island are harvested in Central Sulawesi (33.5%) and North Sulawesi (30.8%).

Minahasa Selatan and Bolaang Mongondow regencies in North Sulawesi; Luwuk Banggai and Donggala in Central Sulawesi, as well as Majene in West Sulawesi, are the major coconut-producing areas. In the case of North Sulawesi, most of its coconut trees are aging and thus production volumes have progressively decreased. In addition, their relative tallness adds a constraint in harvesting the crop.

Since practically all parts of it are usable, the coconut is a general-purpose fruit. Husks, coir dust, and shells are reusable residues after the shelled nut are obtained. In the preparation of copra from shelled nuts, additional residue is generated in the form of liquid. Also, as a result of oil extraction from copra, coconut press cake is obtained. Although most coconut husks are wastes, a significant quantity are used for making mats and matting, floor coverings, brushes, ropes, etc. The shells usually serve as fuel for drying copra. In recent years, there has been some interest in using shells to produce activated charcoal. Press cakes derived from coconuts have relatively good nutritive values, and thus serve as a feed ingredient. Also, coconuts have gotten a lot of recent worldwide attention as a source of biodiesel.

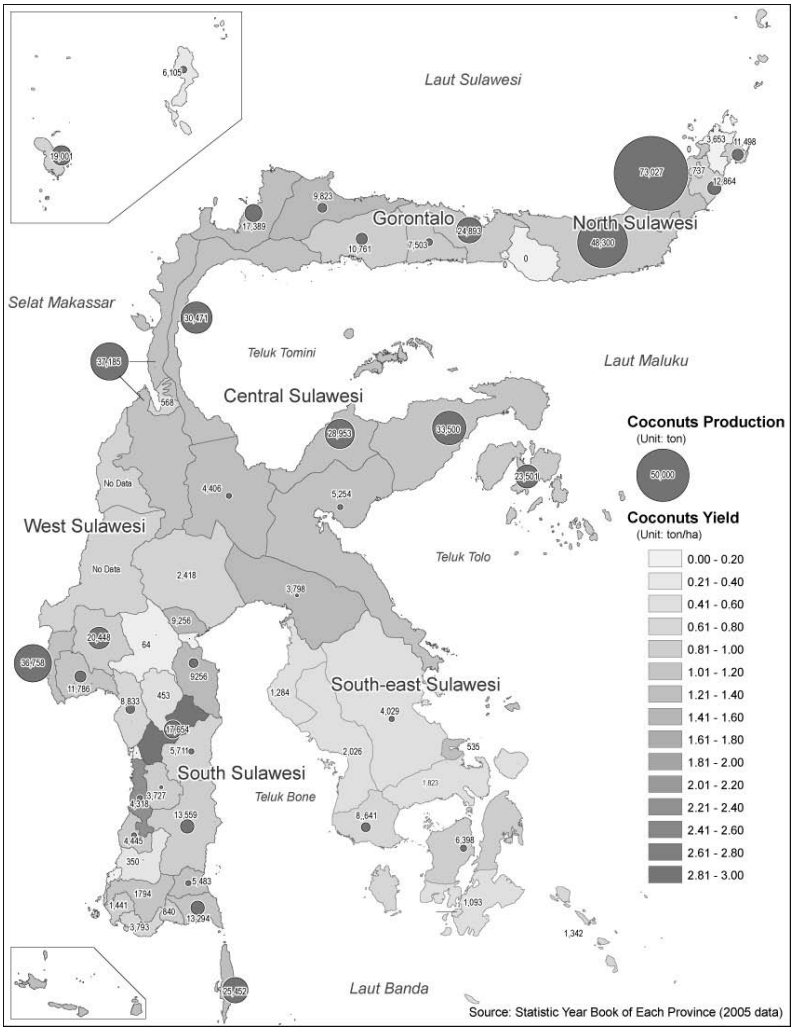


Figure 2.2.14 Production Volume and Unit Yield of Coconuts

Many coconut processing industries are located in KAPET Manado-Bitung, including a coconut fiber

manufacturing, coconut oil factory, dried coconuts processing, coconut charcoal and activated carbon processing, and a coconut wood furniture factory. However, since the production volume of coconuts in North Sulawesi has gradually decreased from about 320,000 tons in 2000 to about 180,000 tons in 2005, factories have to procure about 40% of raw materials from North Maluku.

Cocoa/ Cacao

In 2005, Indonesia was the third-largest producer of cocoa in the world after Ivory Coast and Ghana, contributing 15.9% of the entire world production. Cocoa-producing areas in Sulawesi total 683,380ha. As much as 71.2% of the cocoa in the country came from Sulawesi (417,107 tons). The production center of cocoa is based in the southwestern peninsula of Sulawesi. South Sulawesi produces 51.6% of cocoa in the island, followed by Central Sulawesi (27.0%), and West Sulawesi (20.1%).

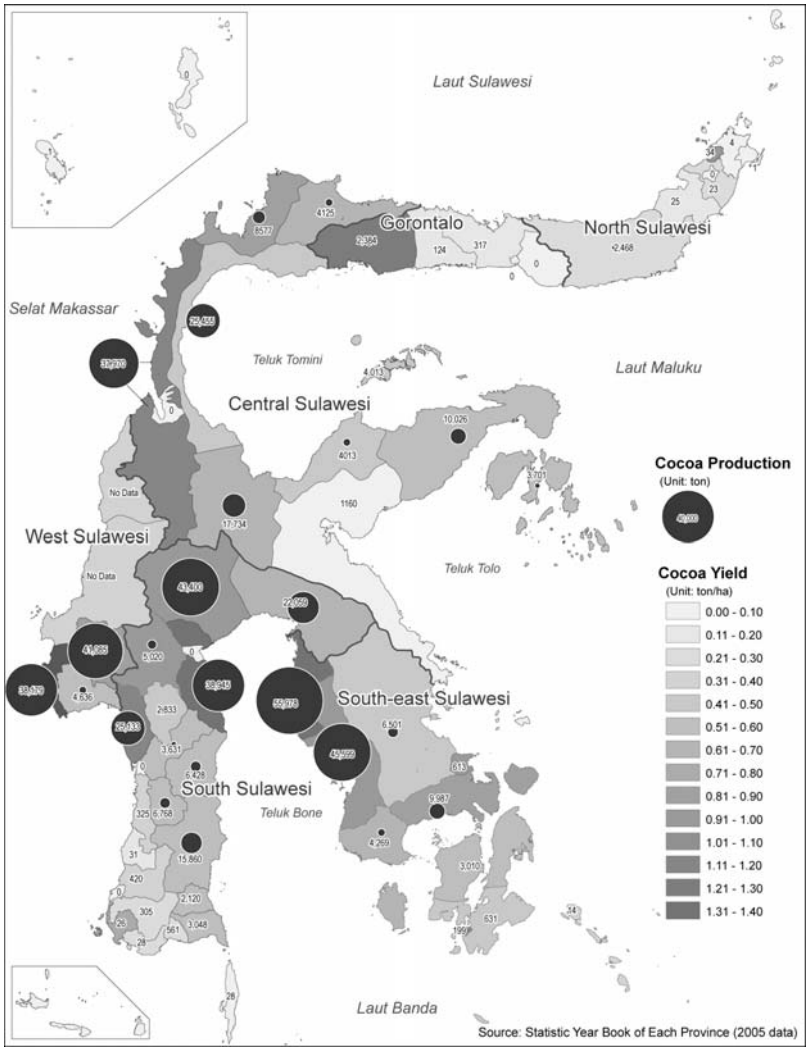


Figure 2.2.15 Production Volume and Unit Yield of Cocoa

Around 86% of total cocoa plantation in Indonesia is cultivated by smallholders (887,700ha). The rest are cultivated in large estates (143,900ha). However, there is an opposite case in South Sulawesi where 222,567ha, or 99.1% of harvested areas, are cultivated by smallholders.

In 2003, Sulawesi exported 217,265 tons with a value of US$ 346.2 million in the form of cocoa bean, butter, cake, liquor, and powder. The cocoa sector strongly contributes to Sulawesi's export earnings. Particularly, 87.6% of the export earnings of Central Sulawesi (US$ 133.6 million) were derived from cacao in 2003.

The major problems faced by the Indonesian cocoa industry are: low productivity and infestation from the cocoa pod borer (CPB) and vascular streak dieback (VSD), as well as low bean quality.

The Indonesian Cocoa and Coffee Research Institute, in collaboration with international institutions and development agencies, has conducted significant researches in the development of superior clones, biological control systems, crop management and post harvest technologies.

The Indonesian Cocoa Commission, which consists of cocoa industry stakeholders that support the development of the cocoa industry in Indonesia, was established in January 2006.

Coffee

Coffee is one of the most important export commodities of Indonesia. In 2005, 442,700 tons, which is equivalent to US$ 497.8 million of coffee, were exported to the United States (27.4% in FOB value), Germany (15.7%), and Japan (12.9%). Production volumes of coffee have increased steadily with an annual growth ratio of 5.25% per annum during the period 1995 - 2005. In 2005, the country ranked third in terms of production volume, next to Brazil and Vietnam, and it occupied 11.5% of total world production.

Sulawesi's coffee, which is called "Sulawesi Toraja" or "Celebes Kalossi", is grown in both plantations and small farmlands. It is wet-processed with a smooth, vibrant texture but relatively low acid content and medium body.

In 2005, harvested areas and production volumes in Sulawesi were 888,900ha and 646,700 tons, respectively. The latter accounted for 8.48% of total production volume in the country. Average coffee yield in the island (423 kg/ha) was considerably lower than the national average of 728 kg/ha. In 2003, 4,168 tons (US$ 7.11 million) of coffee was exported from

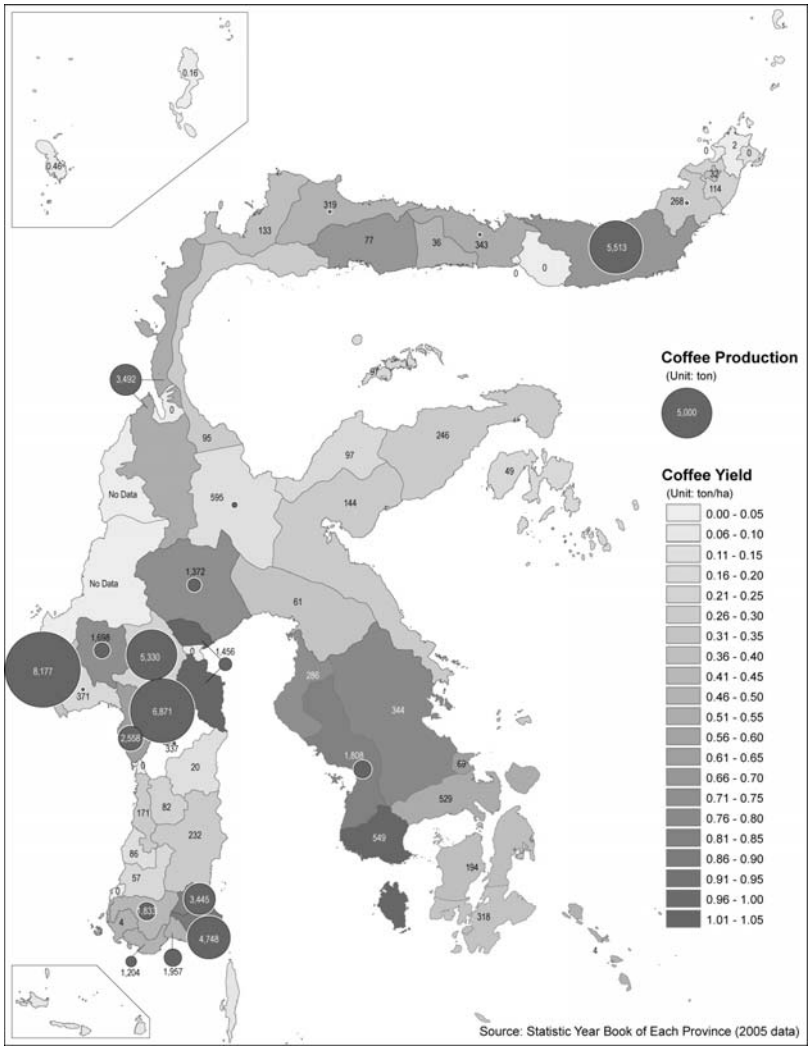


Figure 2.2.16 Production Volume and Unit Yield of Coffee

Sulawesi, of which 4,119 tons was from South Sulawesi. Coffee contributed to 1.26% of the total export value in South Sulawesi.

Coffee is extensively planted in the mountainous regions near the base of the southwestern peninsula, such as Majene (25,547ha), Tana Toraja (21,495ha), and Enrekang (10,721ha). Coffee is also widely planted in the western parts of North Sulawesi and the southeastern tip of South Sulawesi.

Table 2.2.3 Harvested Area, Production Volume and Unit Yield of Major Crops, 2005

		North Sulawesi		Central Sulawesi		South Sulawesi		Southeast Sulawesi		Gorontalo		West Sulawesi		Sulawesi Total	
			Ratio A		Ratio A		Ratio A		Ratio A		Ratio A		Ratio A		Ratio B
Paddy	Harvested Area (ha)	94,946	7.91%	175,489	14.62%	730,602	60.86%	91,585	7.63%	39,110	3.26%	68,820	5.73%	1,200,552	10.14%
	Production (ton)	432,625	8.05%	716,905	13.34%	3,390,036	63.09%	339,846	6.32%	167,153	3.11%	326,996	6.09%	5,373,561	9.92%
	Unit Yield (ton/ha)	4.56		4.09		4.64		3.71		4.27		4.75		4.48	
Maize	Harvested Area (ha)	71,644	15.95%	26,769	5.96%	206,551	45.99%	32,485	7.23%	107,752	23.99%	3,931	0.88%	449,132	12.39%
	Production (ton)	195,305	13.42%	67,617	4.65%	705,996	48.50%	73,152	5.03%	400,010	27.48%	13,449	0.92%	1,455,529	11.62%
	Unit Yield (ton/ha)	2.73		2.53		3.42		2.25		3.71		3.42		3.24	
Cassavas	Harvested Area (ha)	6,695	11.29%	3,597	6.07%	27,558	46.49%	14,820	25.00%	1,048	1.77%	5,559	9.38%	59,277	4.88%
	Production (ton)	68,464	7.33%	48,255	5.16%	464,434	49.71%	256,467	27.45%	12,211	1.31%	84,474	9.04%	934,305	4.84%
	Unit Yield (ton/ha)	10.23		13.42		16.85		17.31		11.65		15.2		15.76	
Sweet Potatoes	Harvested Area (ha)	4,457	26.25%	2,510	14.78%	4,890	28.80%	2,993	17.63%	352	2.07%	1,779	10.48%	16,981	9.52%
	Production (ton)	38,670	23.67%	23,768	14.55%	53,514	32.76%	24,822	15.19%	3,308	2.02%	19,277	11.80%	163,359	8.80%
	Unit Yield (ton/ha)	8.68		9.47		10.94		8.29		9.4		10.84		9.62	
Soybeans	Harvested Area (ha)	3,179	11.07%	2,099	7.31%	16,347	56.95%	3,580	12.47%	2,907	10.13%	594	2.07%	28,706	4.62%
	Production (ton)	4,112	9.89%	2,240	5.39%	27,186	65.38%	3,069	7.38%	4,038	9.71%	934	2.25%	41,579	5.14%
	Unit Yield (ton/ha)	1.29		1.07		1.66		0.86		1.39		1.57		1.45	
Clove	Harvested Area (ha)	69,222	39.51%	47,374	27.04%	46,924	26.78%	7,634	4.36%	2,090	1.19%	1,953	1.11%	175,197	N.A
	Production (ton)	12,672	23.99%	12,417	23.51%	24,848	47.05%	1,601	3.03%	661	1.25%	619	1.17%	52,818	N.A
	Unit Yield (ton/ha)	0.18		0.26		0.53		0.21		0.32		0.32		0.3	
Coffee	Harvested Area (ha)	9,690	7.49%	15,651	12.09%	63,719	49.23%	9,794	7.57%	854	0.66%	29,731	22.97%	129,439	14.56%
	Production (ton)	5,930	10.82%	5,170	9.43%	31,825	58.07%	1,601	2.92%	38	0.07%	10,246	18.69%	54,809	8.48%
	Unit Yield (ton/ha)	0.61		0.33		0.5		0.16		0.04		0.34		0.42	
Cocoa	Harvested Area (ha)	9,683	1.42%	192,834	28.22%	218,775	32.01%	191,855	28.07%	6,452	0.94%	63,781	9.33%	683,380	76.88%
	Production (ton)	2,555	0.61%	112,761	27.03%	215,356	51.63%	1,601	0.38%	933	0.22%	83,900	20.11%	417,107	71.18%
	Unit Yield (ton/ha)	0.26		0.58		0.98		0.01		0.14		1.32		0.61	
Vanilla	Harvested Area (ha)	5,240	32.78%	1,781	11.14%	6,181	38.66%	2,153	13.47%	110	0.69%	521	3.26%	15,986	N.A
	Production (ton)	1,165	28.50%	146	3.57%	1,176	28.79%	1,543	37.77%	42	1.02%	14	0.34%	4,085	
	Unit Yield (ton/ha)	0.22		0.08		0.19		0.72		0.38		0.03		0.26	
Coconuts	Harvested Area (ha)	250,923	35.13%	172,581	24.16%	119,498	16.73%	50,375	7.05%	53,967	7.55%	67,013	9.38%	714,357	19.00%
	Production (ton)	175,185	30.76%	191,050	33.54%	126,685	22.24%	1,601	0.28%	6,029	1.06%	68,992	12.11%	569,541	17.93%
	Unit Yield (ton/ha)	0.7		1.11		1.06		0.03		0.11		1.03		0.8	
Cashew Nut	Harvested Area (ha)	713	0.33%	22,680	10.61%	63,631	29.75%	120,429	56.31%	1,534	0.72%	4,864	2.27%	213,851	39.14%
	Production (ton)	135	0.25%	5,063	9.51%	27,508	51.65%	19,226	36.10%	171	0.32%	1,151	2.16%	53,254	45.13%
	Unit Yield (ton/ha)	0.19		0.22		0.43		0.16		0.11		0.24		0.25	

Source: Statistics Yearbook of each province and Indonesia, BPS. Note: Ratio A: % to Sulawesi total, Ratio B: % to Indonesia total

(3) Fishery

Fisheries play a significant role in increasing export and foreign exchange earnings. It has various qualities not only for providing employment opportunities, local incomes for fishermen and national revenue, but also includes the supply of fish and aquatic products to improve nutritional standards. Fisheries in Sulawesi are more labor-intensive than capital-intensive. There is a huge number of fishermen engaged in the fisheries sector. The main marine commodities in Sulawesi cover tuna, skipjacks, pelagic fishes, seaweeds, shrimps, crabs, sea cucumbers, and lobsters.

Aquaculture, involving pearl shells, shrimps, seaweeds, and sea cucumbers, is a traditional activity along the coasts of many local areas.

Figure 2.2.17 illustrates the fish catches for each regency/city either by marine fisheries or inland fisheries. Fish catches in South Sulawesi account for 46.8% of the Sulawesi total. Bitung has the biggest fish catch (marine fishery + inland fishery) in Sulawesi (136,001 tons), followed by Bone (116,863 tons) and Jeneponto (47,083 tons).

Inland fishery is active along the coast of South Sulawesi. Its production volume of inland fishery accounts for 78.9% of the Sulawesi total. Inland fishery is particularly active in Wajo (21,783 tons), Bone (19,155 tons), Sinjai (17,677 tons), and Pinrang (17,316 tons).

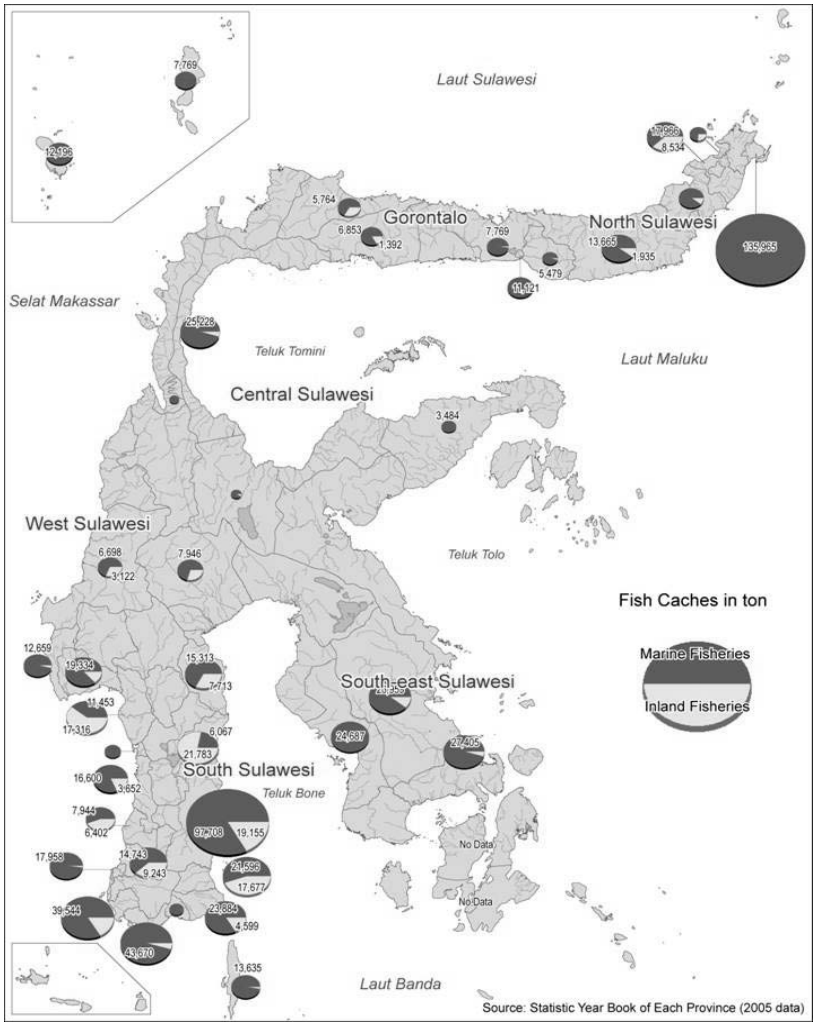


Figure 2.2.17 Fish Catch by Marine and Inland Fishery

Except for South Sulawesi, marine fishery and inland fishery potentials are not fully utilized in other provinces.

(4) Livestock

Livestock commodities in Sulawesi have a potential in either intra-island or export market. Cows and goats are the primary export commodities due to growing demands overseas. However, overseas demand cannot be met due to limited supply.

Cows are mainly raised in South Sulawesi and Gorontalo. Pigs can be seen in non-Muslim areas, particularly in North and Central Sulawesi as well as in Tana Toraja regency in South Sulawesi.

Goats are actively raised in the southern part of South Sulawesi and West Sulawesi.

Broiler and domestic hen are particularly raised in South and Southeast Sulawesi and the southern part of West Sulawesi.

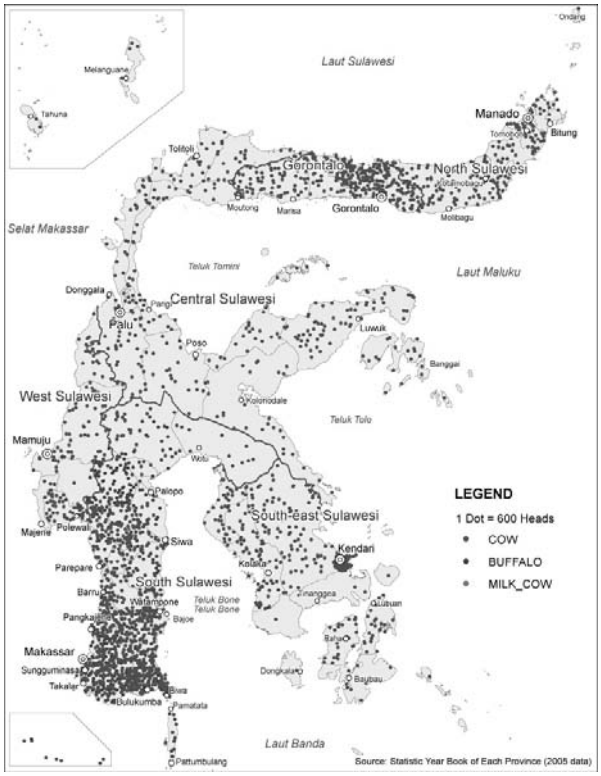
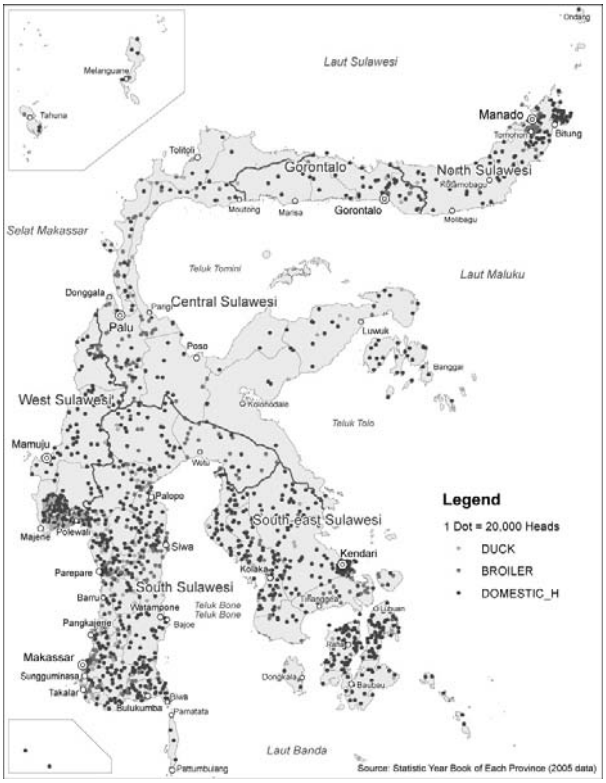


Figure 2.2.18 Distribution of Cattle Raising



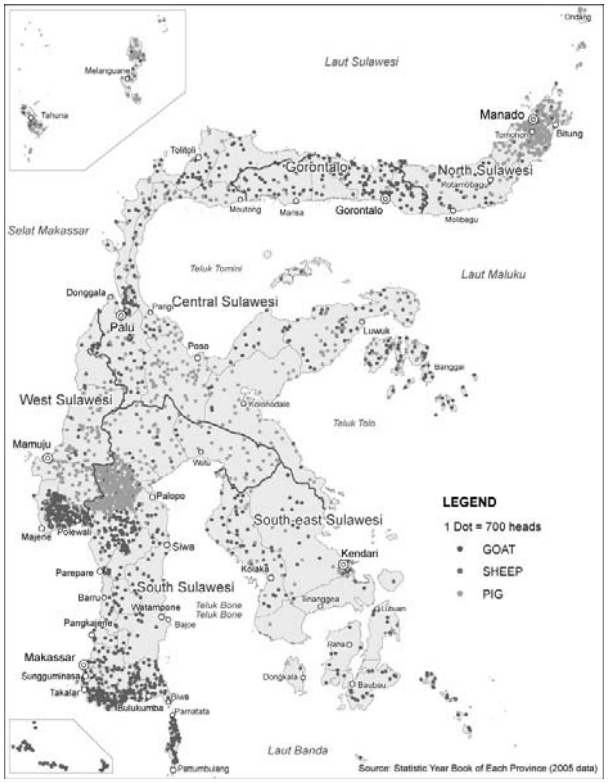


Figure 2.2.19 Distribution of Poultry and Other Livestock Raising

2.2.5 Industries

(1) Major Industries and Economic Development Zones

Industrial activities in Sulawesi are mainly located in Maminasata, Parepare, and the Manado-Bitung areas, except for nickel mining which is concentrated in Soroako in Luwu and Pomalaa in Kolaka. Most activities concentrate on agro-industrial production.

In order to promote industrial activities and help reduce regional development disparities between western and eastern Indonesia, in 1996 the Indonesian Government introduced the Indonesia Integrated Economic Development Zones (Kawasan Pengembangan Ekonomi Terpadu or KAPET). This was followed in 2000 by the creation of the Development Body of KAPET (Badan Pengembangan KAPET). As of now, 12 KAPETs have been established in eastern Indonesia, 4 of which are located in Sulawesi (Batui, Parepare, Bukari, and Bitung).

Entrepreneurs who do business within each KAPET are supported by the government through both fiscal and non-fiscal incentives. Entrepreneurs who run businesses within a KAPET receive partial tax holidays.

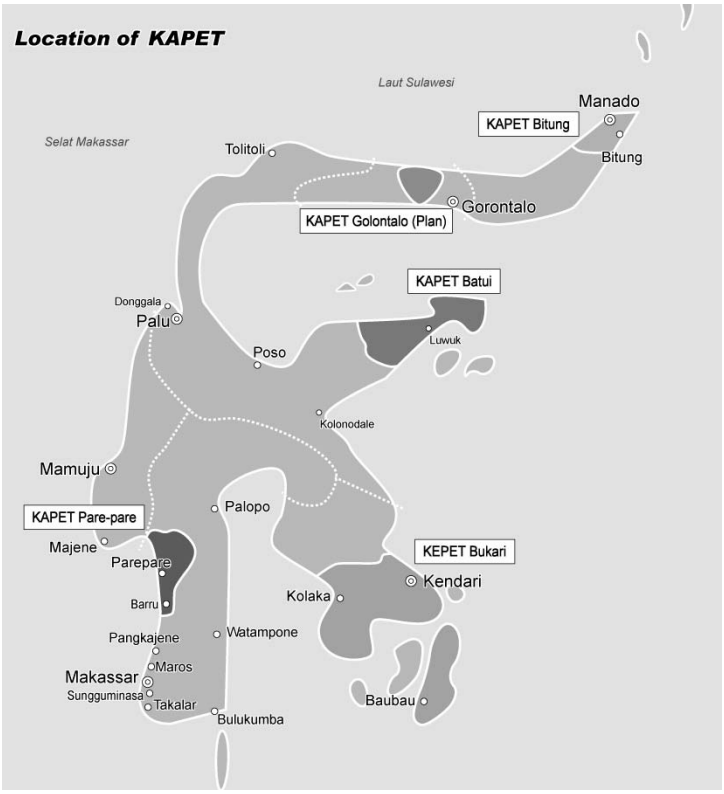


Figure 2.2.20 Location of KAPETs in Sulawesi

However, it has been observed that these new initiatives have achieved little success. According to a report conducted by the executive director of the Development Council of Acceleration of Eastern Indonesian and the Developing Body of KAPET in 2003, two KAPETs in Sulawesi (Parepare and Bitung) showed some achievement but the remaining two KAPETs (Bukari and Batui) were still behind their objectives.

At the inception, management and development costs of a KAPET were paid for by the State budget (APBN), the Regional Budget (APBD), and other valid statutory sources. Since the implementation of regional autonomy, however, fund allocations for KAPETs were no longer supported by the State budget. Because of this, budget sources in support of the KAPET programs have become insufficient.

The regional autonomy also raises the problem of management control of the KAPETs. With

regional autonomy, the control of KAPETs automatically transferred from the central government to the local governments. However, in most of cases, local governments did not have sufficient capacities in managing a KAPET.

Unavailable infrastructure and/or poor facilities are considered to be among the major constraints faced by the KAPETs. The KAPETs in Parepare and Bitung are directly connected to the growth centers of the islands (Makasar and Manado) by road, while the KAPETs in Batui and Bukari (particularly the latter) are located in municipalities/regencies that are far from the main city of the island, which lack infrastructure hubs.

(2) Mining

Sulawesi's principal mineral resources are nickel, gas, gold, cement, marble, oil, and asphalt. Mining provides significant local employment, directly at the mine site and indirectly through the supply of goods and services from local sources. A significant part of Sulawesi remains unexplored; some of these land areas have the most prospects for mineral development. The mining sector could have the potential to become a much larger contributor to the island's economy and to regional development. Figures 2.2.21 and 2.2.22 show the location of current and potential mining areas for metals and nonmetals.

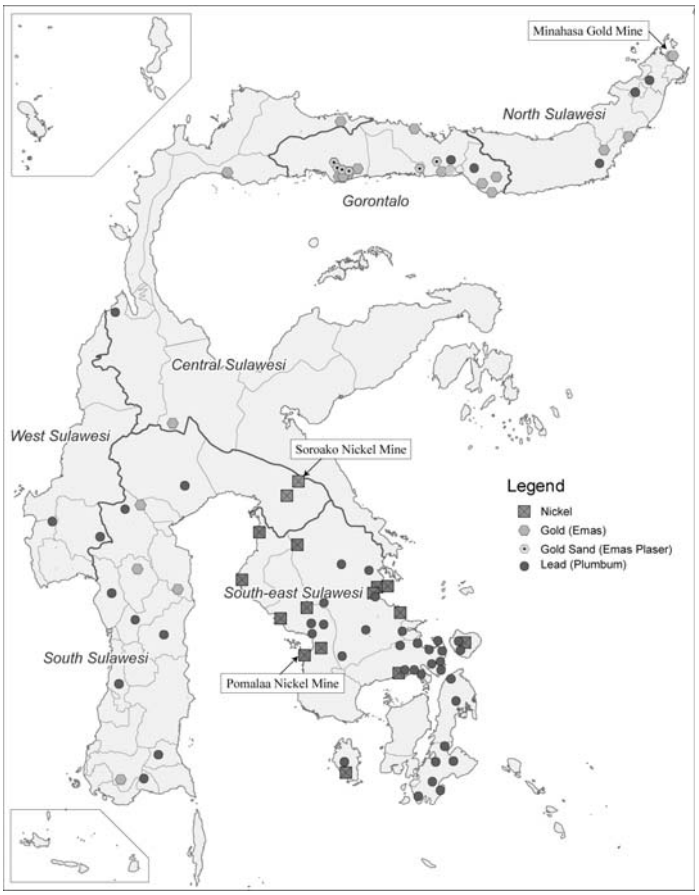


Figure 2.2.21 Mineral Resources (Metal)

Nickel

In terms of employment generation and export value, nickel is the most important mineral resource in South and Southeast Sulawesi, In 2003, 31,301 tons (US$ 190.0 million) and 576,656 tons (US$ 68.4 million) of nickel/ferronickel were exported from South Sulawesi and Southeast Sulawesi, respectively. Nickel exports contributed 78.8% and 33.8% of the total export value of Southeast Sulawesi and South Sulawesi, respectively.

Indonesia's largest nickel mine is in Soroako in South Sulawesi where the Canadian company Inco holds a 61% interest, the Japanese company Sumitomo Metal Mining Co. Ltd. 20%, and other investors 18%. Crude nickel is processed to nickel and ferronickel, then exported to Japan, China,

and South Korea from the company's own port. The firm PT Antam operates a nickel mine in Pomalaa, Kolaka Regency, Southeast Sulawesi. Ore from the mine is sent to the Pomalaa ferronickel smelting plant and the remaining ore is exported, mainly to Japan.

Owing to increased demand, the supply of nickel continues to tighten as China and the Republic of Korea have expanded their stainless steel output capacities. As a result, the price of nickel in the world market has risen rapidly (price of nickel has nearly tripled during the recent 3 years). In order to meet increasing demands, PT Inco plans to increase its nickel-in-matte output capacity by 25% to 91,000 tons/year in Soroako by 2009. PT Inco also plans to develop two nickel deposits in Bahodopi in Central Sulawesi and Pomalaa in Southeast Sulawesi. The company has already submitted its expansion plan for government approval.

Gold

PT Newmont Minahasa Raya (NMR) suspended its operation in Minahasa, North Sulawesi. Gold mining began in 1996 and because of depleted resources, mining operation ceased in October 2001. Since then, activities have been limited to processing ore stocks. In 2004, villagers from Minahasa Regency complained that NMR polluted nearby Buyat Bay. The issue is still in dispute. There are several gold mines in South Sulawesi and Gorontalo which are undeveloped.

Cement

According to the Indonesia Cement Association, domestic demand for cement was 29.77 million tons in 2004, the same consumption level as that for 1997. Of the domestic cement consumption, almost 62% was from Java, 21% from Sumatra, 6% from Sulawesi, 5% from Kalimantan, and 6% from other areas (Jakarta Post, 2005).

Other Mineral Resources

Marble is also an important mineral resource in South and Southeast Sulawesi. Asphalt is mined in Buton Island, Southeast Sulawesi. Mined minerals, including potential one, found in Sulawesi include lead, granite, crystal, toseki, quartz sand, kaolin, and phosphoric.

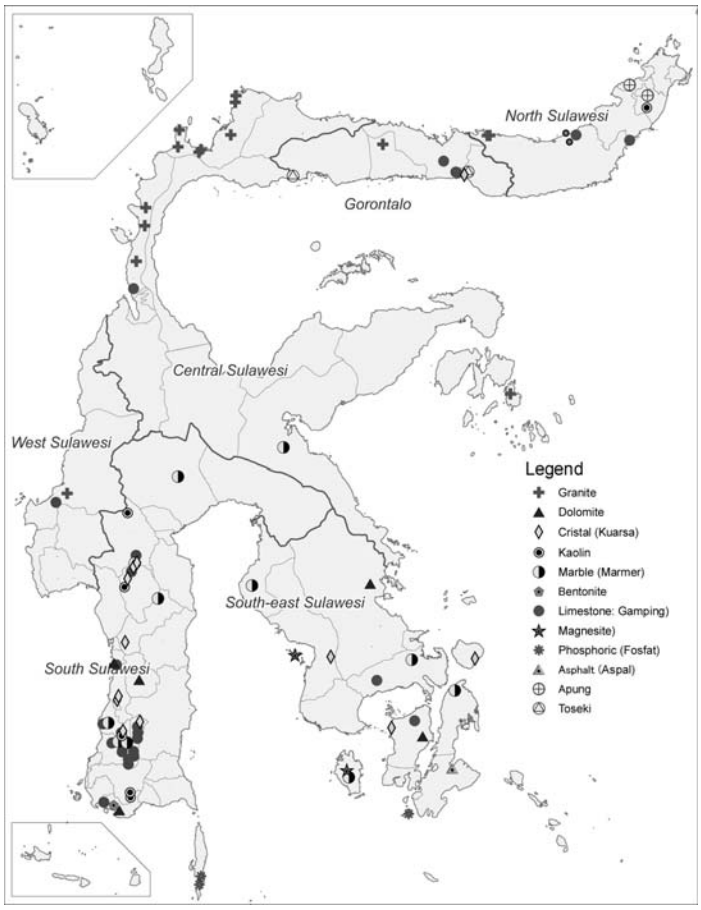


Figure 2.2.22 Mineral Resources (Non-Metal)

2.3 Existing National and Regional Development Plans

In 2004, the Indonesian government issued the National Development Planning System Act. The Act allows the division of development plans into 3 types by target period (long-term: 20 years, mid-term: 5 years, and short-term: 1 year), and also into 3 types by level of target area (national, provincial, and regency/ municipality).

Major development plans consists of the following types: development plan, sectoral plan, and spatial plan, mainly through a hierarchical order (RPJMN: National Mid-Term Development Plan, RPJMD: Regional Mid-Term Development Plan),

Spatial plans are prepared with reference to the concerned development plan. Spatial plans are made at the national, island, provincial and municipality levels. National and island spatial plans are prepared by the National Planning Coordination Board, MPW and the BAPENAS. Provincial and municipality spatial plans are prepared by the Regional Department of Public Works (Dinas PU or Praswil) and the BAPPEDA.

Table 2.3.1 Planning System of Indonesia

Level	National →	Provincial →	Regional
Approval	President	Governor	City Mayor
Development Plan (RP) ↓	National Long-term DP: 20 years (RPJP National) ↓ National Mid-term DP: 5 years (RPJM) ↓ National Annual DP: 1 year (RKP)	Regional Long-term DP: 20 years ↓ Regional Mid-term DP: 5 years ↓ Regional Annual DP: 1 year	Local Long-term DP: 20 years ↓ Local Mid-term DP: 5 years ↓ Local Annual DP: 1 year
Sectoral Development Plan	National Long-term DP: 20 years ↓ National Mid-term DP: 5 years ↓ National Annual DP: 1 year	Regional Long-term DP: 20 years ↓ Regional Mid-term DP: 5 years ↓ Regional Annual DP: 1 year	Local Long-term DP: 20 years ↓ Local Mid-term DP: 5 years ↓ Local Annual DP: 1 year
Spatial Plan (RTR)	National Spatial Plan (RTRWN)	Island Spatial Plan (RTR Pulau) / Provincial Spatial Plan	Municipality Spatial Plan

Source: National Development Planning System Act 2004 and other sources

2.3.1 National Development Plan

(1) Long-term National Development Plan (RPJPN) 2005 - 2025

The Indonesian government has officially unveiled its long-term development plan 2005-2025, which envisages the current high poverty rate falling to 5% and per-capita income soaring to up to 9,000 U.S. dollars by 2025.

The poverty rate stood at about 17% of the country's 220 million people in 2006, according to the Central Statistics Agency (BPS), which officially categorizes people living below the poverty line

as those who earn less than 1.55 U.S. dollars a day. Under the long-term development plan, the government is targeting an increase in per capita income to between 3,000 U.S. dollars and 9,625 U.S. dollars by 2025, which would place Indonesia within the ranks of the middle-income countries.

The long-term economic plan also stresses the need to create an attractive investment climate so as to boost foreign investment and support economic growth.

The plan's targets and priorities are divided into four development periods: Period I (2005-2009), Period II (2010-2014), Period III (2015-2019) and Period IV (2020-2024). It features eight goals, one of which is the creation of a competitive society so as to bring about prosperity and well-being in society.

(2) Mid-term National Development Plan (RPJMN) 2004 - 2009

In accordance with the President's vision and mission, the government's National Medium-Term Development Plan (RPJMN) for the period of 2004 to 2009 has introduced three main development agendas. The targets to be achieved by the Government are in line with the Millennium Development Goals or MDGs. They are:

1. Creating a safe and peaceful Indonesia;
2. Creating a just and democratic Indonesia;
3. Creating a prosperous Indonesia.

Mid-term Development Plan aims to achieve the GRDP growth rate of Sulawesi Island would progressively increase from 5.67% in 2004 to 8.20% by 2009. The GRDP growth rate of Sulawesi is higher than those of Jawa-Bali and Sumatra, and is almost similar to the other islands in Eastern Indonesia, namely Kalimantan and the other islands including Papua, East and West Nusa Tenggara, and Maluku (please refer to the Chapter 6.2).

(3) Annual Government Work Plan (RKP) 2007

Year 2007 is the third year's implementation of Mid-term Development Plan 2005-2009. The government has prepared the Annual Government Work Plan (RKP) 2007. In view of the achievements from the first two years of implementing the Medium-Term Development Plan agendas and the present conditions, and in order to fulfill the RPJM objectives, the RKP 2007 has adopted the following theme: "Increasing Employment Opportunities and Reducing Poverty to Increase the People's Welfare". Based on this theme, we have articulated nine priorities for 2007:

1. Reducing poverty;
2. Increasing employment opportunities, investment and export;
3. Revitalizing of agriculture, fisheries, forestry and rural areas;
4. Increasing accessibility and quality of education and health services;
5. Enforcing the laws, basic human rights, corruption eradication and reform of the

bureaucracy;

6. Improving of defense and security capabilities, maintaining order and improvement of conflict resolution;
7. Rehabilitating and Reconstructing Aceh and Nias (North Sumatra), Yogyakarta and Central Java and Mitigating and Overcoming Disasters;
8. Accelerating infrastructure development;
9. Developing border areas and remote isolated areas.

2.3.2 National Spatial Plan (RTRWN)

The National Spatial Plan (RTRWN) is prepared by the National Spatial Planning Coordination Board, which prepared the plan in 2007 in accordance with Law No. 24 in 1992 and No. 26 in 2007 regarding spatial management, so as to give a sense of direction to national development investments, making it the grand spatial template of the national development program.

The National Spatial Plan gave emphasis on the balance of development between western and eastern Indonesia.

Given the principals, the roles assigned to Sulawesi are defined in Article 10d, to wit: "Development of Sulawesi as an area of national granary, horticulture, plantations, ranchers, natural resources especially, fishery, tourism, plantation with agriculture and maritime industry, oil-gas industry, mining, and processing industry".

(1) Urban Systems of the Sulawesi Island

RTRWN specified important cities in the country into following three hierarchical levels;

1) National Activity Centers (PKN),
2) Regional Activity Centers (PKW), and
3) National Strategic Activity Centers (PKSN)

In Sulawesi, the plan selected 5 national activity centers (PKN), 24 regional activity centers (PKW), and 2 national strategic activity centers (PKSN). Also, RTRWN classified these cities in to following four types;

A: Strategic Cities on Border areas,
B: Production Center for Regional Autonomy,
C: Growth Center for Revitalization and Acceleration on National Development, and
D: Base for Disaster Prevention

In the case of the Sulawesi Island, all the national activity centers and regional activity centers are designated as "C: Growth Center for Revitalization and Acceleration of National Growth". Also, two national strategic activity centers, Melonguane and Tahuna in North Sulawesi, are designated as "A: Strategic Cities on Boarder Area" (see the table 2.3.2).

Table 2.3.2 Urban Systems of the Sulawesi Island

PROVINCE	PKN	PKW		PKSN
North Sulawesi	-Urban Area of Manado Bitung (I/C/1)	-Tomohon (I/C/1) -Tondano (III/C/1)	-Kotamobagu (II/C/1)	-Melonguane (I/A/2) -Tahuna (I/A/2)
Central Sulawesi	-Palu (I/C/1)	-Poso (II/C/3) -Luwuk (II/C/1) -Buol (III/C/1)	-Kolonedale (II/C/1) -Tolitoli (III/C/1) -Donggala (II/C/1)	
South Sulawesi	Mamminisata Metropolitan Area (Makassa- Sungguminasa-Takalar- Maros) (I/C/3)	-Pangkajene (II/C/1) -Jeneponto (I/C/1) -Palopo (I/C/1) -Watampone (II/C/1)	-Bulukumba (I/C/1) -Barru (III/C/1) -Pare-pare (II/C/1)	
Southeast Sulawesi	-Kendari (I/C/1)	-Unaaha (IV/C/1) -Lasolo (III/C/1)	-Bau-bau (I/C/1) -Raha (II/C/1)	
Gorontalo	- Gorontalo (I/C/1)	-Isimu (III/C/2) -Kuandang (III/C/2)	-Tilamuta (II/C/2)	
West Sulawesi		-Mamuju (I/C/1)		

Source: National Spatial Plan 2007

Note I ~ IV in the in parentheses shows stage of development

A: Primary cities on Border areas (A/1: Improvement, A/2: New Development, A/3: Revitalization)

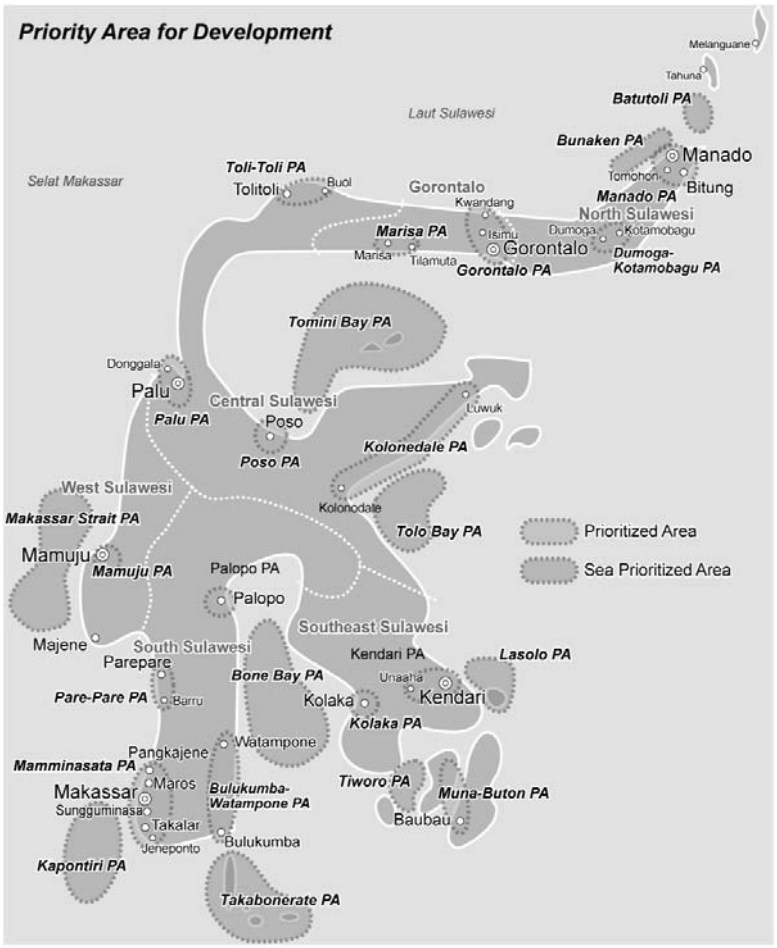
C: Growth Center Cities for National Growth (C/1: Improvement, C/2: New Development, C/3: Revitalization)

(2) Prioritized Areas

The plan designated 156 prioritized areas (PA) for development nationwide based on the following criteria;

(1) GRDP of the area should exceed 0.25% of Indonesia's GDP, (2) population of the area should exceed 3% of the province's total population, (3) infrastructure (such as electricity supply, telecommunication, water supply, and transportation) should be well developed, and (4) rich in natural resources.

Among these areas 26 are located in Sulawesi. Of which, 16 are selected as the priority areas, and remaining 10 are selected as the sea prioritized areas (please refer to table 2.3.3).



Source: National Spatial Plan 2007

Figure 2.3.1 Priority Area for Development

Table 2.3.3 Prioritized Areas for Development under the National Spatial Plan 2007

Province/ Prioritized Area	Superior Sector		
North Sulawesi			
Manado Area and it's surroundings	- Fishery (I) - Mining (II)	- Tourism (I)	- Manufacturing (II)
Dumonga-Kotamabangu Area and it's surroundings (Bolaang Mogondow)	- Agriculture (II)	- Plantation (II)	
Sea prioritized area, Bunaken and it's surroundings	- Fishery (II)	- Tourism (I)	
Sea prioritized area, Batutoli and it's surroundings	- Fishery (III)	- Mining (II)	- Tourism (III)
Central Sulawesi			
Poso Area and it's surroundings	- Agriculture (IV) - Fishery (III)	- Tourism (II) - Industry (III)	- Plantation (II)
Toli-toli Area and it's surroundings	- Mining (II) - Plantation (II)	- Fishery (III) - Tourism (III)	- Agriculture (III)
Kolonedale Area and it's surroundings	- Agriculture (III) - Fishery (II)	- Tourism (III) - Mining (III)	- Plantation (II) - Agro industry (II)
Palu Area and it's surroundings	- Mining (I) - Fishery (I)	- Industry (II) - Tourism (II)	- Agriculture (I) - Plantation (III)
Sea prioritized area of Tolo Bay-Kepulauan Banggai and it's surroundings	- Fishery (II)	- Tourism (III)	
South Sulawesi			
Mamminasata Area and it's surroundings (Makassar, Maros, Sungguminasa, Gowa, Takalar)	- Tourism (I) - Agro industry (I)	- Industry (I)	- Agriculture (II)
Palopo Area and it's surroundings	- Tourism (I)	- Plantation (II)	- Agriculture (II)
Bulukumba-Watampone Area	- Agriculture (II) - Plantation (II)	- Agro industry (II) - Fishery (I)	- Tourism (IV) - Trade (II)
Pare-pare Area and it's surroundings	- Agro industry (II) - Plantation (III)	- Agriculture (III)	- Fishery (II)
Sea prioritized area of Bone and it's surroundings	- Fishery (II)	- Mining (IV)	- Tourism (II)
Sea prioritized area of Singkarang- Takabonerate and it's surroundings	- Fishery (IV)	- Mining (IV)	- Tourism (III)
Sea prioritized area of Kapontiri-Lasalimu and it's surroundings	- Fishery (III)	- Mining (III)	- Tourism (III)
Southeast Sulawesi			
Aselolo/Kendari Area	- Agro industry (III) - Mining (III) - Tourism (III)	- Fishery (I) - Plantation (I)	- Agriculture (III) - Industry (III)
Kapolimu-Patikala Muna-Buton Area	- Agro industry (II) - Mining (I) - Plantation (III)	- Fishery (II) - Agriculture (III)	- Forestry (IV) - Tourism (III)
Mowedong/Kolaka Area	- Agro industry (III) - Mining (II)	- Fishery (III) - Agriculture (III)	- Plantation (II)
Sea prioritized area of Asera/ Lasolo	- Fishery (III)	- Tourism (III)	
Sea prioritized area of Tiworo and it's surroundings	- Fishery (III)	- Mining (III)	- Tourism (IV)
Gorontalo			
Gorontalo Area	- Agriculture (I) - Mining (III)	- Fishery (II)	- Plantation (I)
Marisa Area	- Agriculture (III)	- Plantation (II)	
Tomini Ocean and it's surroundings	- Fishery (I)	- Tourism (III)	
West Sulawesi			
Mamuju Area and it's surroundings	- Plantation (I) - Agriculture (II)	- Forestry (II) - Fishery (II)	- Agro industry (II)
Sea prioritized area of Makassar Strait and it's surroundings	- Fishery (II)	- Tourism (II)	

Source: National Spatial Plan 2007 Note: I – IV in the parentheses indicates development stage

2.3.4 Sulawesi Spatial Plan (RTR Pulau Sulawesi)

The Sulawesi Island Spatial Plan was also prepared based on the National Spatial Plan (RTRWN). The latest available Spatial Plan of the Sulawesi Island was prepared in 2005, based on RTRWN 2004. The plan includes the development of road, railway, and ferry infrastructure, as follows:

(1) Road Network System

1) Development and improvement of the Eastern Corridor (Priority: High)

1-1 Poso - Uekuli - Ampana - Pagimana - Luwuk - Batui - Toili - Baturube - Kolonodale - Bungku - Asera - Andowia - Kendari - Unaaha - Raterate - Kolaka - Lasusua - Malili - Wotu

1-2 Kendari - Tinaggea - Kaspute - Pomala - Kolaka,

1-3 Bitung - Kema - Modayag - Pinolosian - Molibagu

2) Improvement of the Western Corridor (Priority: Medium)

Kwandang - Tolinggula - Buol - Tolitoli - Ogotua - Pantoloan - Palu - Donggala - Pasangkayu - Mamuju - Majene - Polewali - Pinrang - Parepare - Barru - Pangkajene - Maros - Makassar – Sungguminasa - Takalar - Jeneponto - Bantaeng - Bulukumba

3) Improvement of the Central Corridor (Priority: Medium)

Bitung - Likupang - Wori - Manado - Amurang - Kwandang - Isimu - Paguyaman - Marisa - Molosipat - Mepanga - Tobali - Poso - Wotu - Palopo - Tarumpakae - Sengkang - Watampone - Sinjai - Bulukumba

4) Improvement of Transverse Roads (Priority: Medium)

Tumpaan - Kawangkoan – Tomohon - Tondano - Airmadidi, Tondano - Kombi- Kema - Bitung, Tanawangko - Tomohon - Manado, Amurang - Tompaso Baru - Modoinding - Modayag - Kotamobagu, Isimu - Limboto - Gorontalo - Suwawa - Gorontalo, Kolonodale - Tomata - Tentena, Mepanga - Basi, Tobali - Tawaeli, Polewali - Mamasa - Makale - Palopo, Maros - Watampone - Bajoe, Bulukumba - Bira, and Pamatata - Patumbukang.

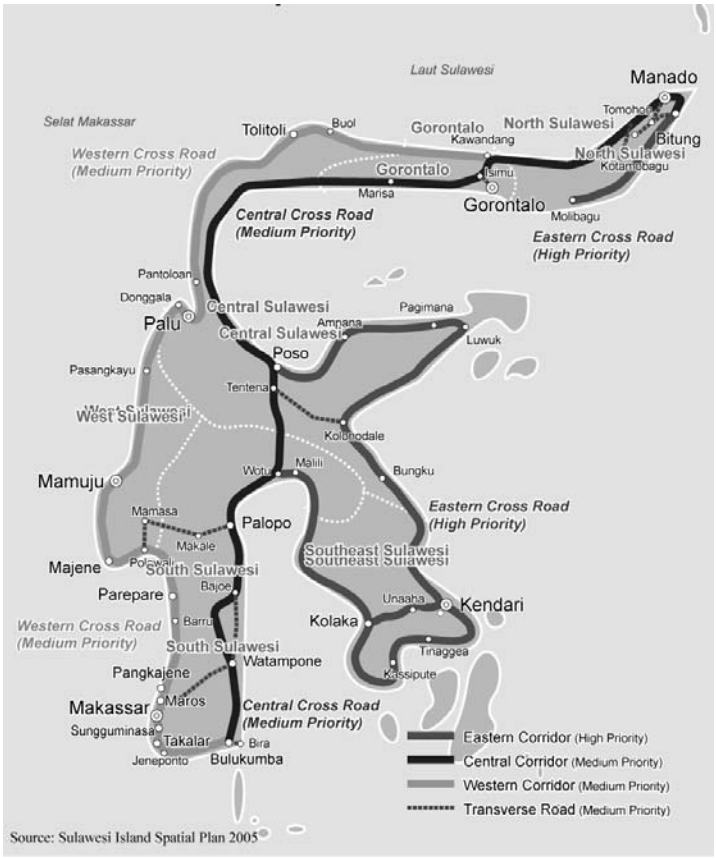


Figure 2.3.2 Road Development Plan

(2) Railway Network System

1) High Priority: Manado - Bitung, Gorontalo - Bitung, and Makassar - Parepare

2) Medium Priority: Palu - Poso, Palu - Mamuju - Parepare, Makassar - Takalar - Bulukumba, and Kendari - Kolaka

3) Low Priority: Bulukumba - Bajoe - Palopo - Poso, Gorontalo - Marisa - Palu, Parepare - Bajoe, Kolaka - Poso, Manado - Wori - Likupang, and Manado - Amurang - Inobonto - Kotamobagu

4) High Priority Railway System within Urban Areas: Makassar - Maros - Sungguminasa - Takalar, Manado and surrounds.

(3) Ferry Network System

1) Interprovincial Network

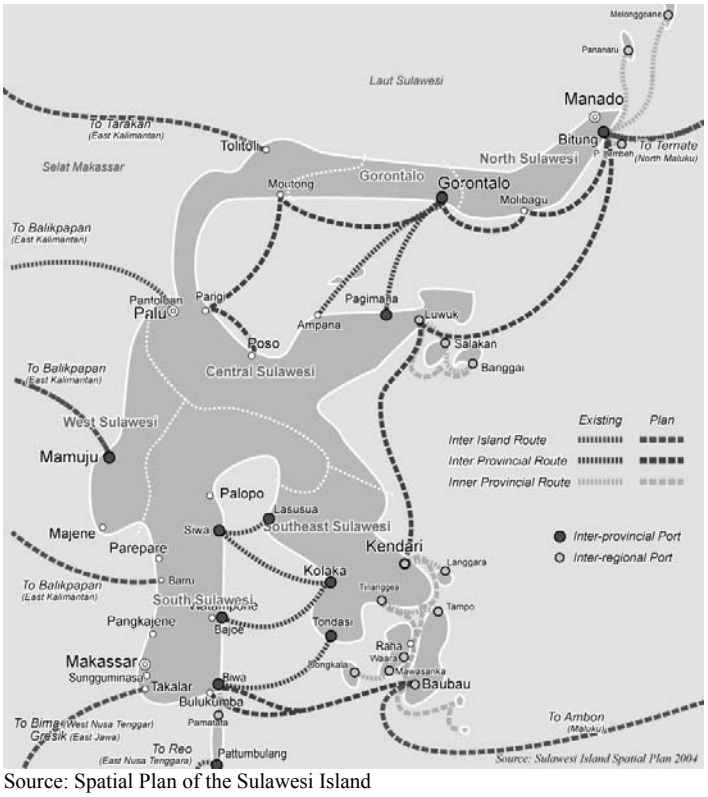
Lasusua - Siwa, Bajoe - Kolaka, Baubau - Bulukumba, Baubau - Bira, Tondasi - Bulukumba, Luwuk - Kendari, Bitung - Luwuk, and Pagimana - Poso - Parigi - Moutong - Gorontalo - Molibagu - Bitung

2) Intraprovincial Network

Bulukumba - Selayar, Bira - Pamatata, Tinanggea - Raha - Baubau, Kendari - Torobulu - Tampo - Raha - Baubau - Wanci - Tomia, Luwuk - Banggai Archipelagok, Bitung - Lembeh, and Manado and Bietung with Sangihe Archipelago - Talaud

3) Interisland Network

Mamuju - Balikpapan (East Kalimantan), Selayar - Reo (East Nusa Tenggara), Takalar - Bima (West Nusa Tenggara) - Gresik (East Jawa), Barru - Batulicin (South Kalimantan), Baubau - Buru - Ambon (Maluku), Tondoyono - Baturube (East Nusa Tenggara), Bitung - Ternate and Melonquane - Morotai (North Maluku), Taipa - Balikpapan (East Kalimantan), and Tolitoli - Tarakan (East Kalimantan)



Source: Spatial Plan of the Sulawesi Island

Figure 2.3.3 Ferry Network Plan under RTR Pulau

2.3.5 The Regional Development Cooperation Board of Sulawesi (BKPRS)

(1) Profile of BKPRS

The Regional Development Cooperation Board of Sulawesi (BKPRS) was established 19 October 2000 by the 6 provincial governments of Sulawesi to realize an integrated development of Sulawesi through joint agreement concerning of vision and mission and development program agreement of Sulawesi.

This board is functioned to help the government by maximizing the role of business field and society to accelerate the regional development of Sulawesi which finally will be increased the economic growth and the society harmony of each province in Sulawesi.

1. To help the duty and function implementation of regional government of all province of Sulawesi in the unitary of Indonesia
2. To help the duty and function of regional government of all province in Sulawesi to support the acceleration of development process and economic strengthening of Sulawesi.
3. To help the regional government of all province in Sulawesi in facilitating the cooperation between provincial government of Sulawesi with the third party to realize the continuously and the harmony development of inter-region in Sulawesi.
4. To help the provincial government of all Sulawesi in regional empowering through the education and training, research, consultation, seminar/workshop activities and etc as the effort to increase the regional development capacity.
5. To help the provincial government of all Sulawesi in implementing regional development of all province in Sulawesi that related with Regional Sulawesi Planning and implementation of development program from each province in Sulawesi.
6. To help the synergy between central and regional government in economic development process, society, politic and social culture.

(2) BKPRS's Major On-going Activities

BKPRS is currently revising the above-mentioned existing Sulawesi spatial plan after new establishment region into 6 provinces and 62 regencies. In addition, BKRPS is implementing and/or planning following subjects. However due to budget constraints and limited human resources, BKPRS has not produced substantive results yet.

1) Formulating the Vision of Healthy Indonesia 2010 (VIS: Visi Indonesia Sehat) for business promotion and partnership.
2) The development of regional information system, which will consists of general information service, investment and cooperation among internal institution and foreign institution.
3) The establishment of following 10 "Sulawesi Board": 1. Business Board, 2. Expert Board, 3.

Research Board, 4. Board of BKPRS Founder, 5. Education Board, 6. Energy Board, 7. Transportation Board, 8. Agro Board, 9. Marine Board, and 10. Industrial Board.

4) Compiling of Master plan Planning
   1. The Gulf Master plan in Sulawesi (Tolo, Tomini & Bone)
   2. Strait Master Plan (Makassar and Buton)
   3. Sea Master Plan (Sulawesi, Flores & Banda)

5) To continue the internal and foreign cooperation with the following program to realize the BKPRS program.

Programs for Cooperation	Agencies for Cooperation
A. Domestic Cooperation	
- Improving the quality of Foodstuff	Local government of DKI Jakarta
- Empowerment of private sector, particularly mining industry and supporting industries	PT. INCO (company operating integrated nickel mine and smelter)
- Improving the quality of rattan and its products	Indonesia Rattan Entrepreneur Association (APRI), and Local government of West Java Province
- Empowering of institution, industry, and entrepreneur	KADIN (Chamber of Commerce and Industry) in Sulawesi
- Financing the preeminent commodity especially the improvement of export quality	BEI (Indonesia Export Bank)
- Support VIS 2010 program and socialization of foreign policy of Indonesia	Foreign Affair Department
- Regional economic development acceleration	KAPETs in Sulawesi (Manado-Bitung, Pare-pare, Bukari, and Batui)
B. International Cooperation	
- Trading, investment, and tourism/culture promotion	Mindanao, the government of south Philippine
- Facilitate Sulawesi information in compiling recommendations and policy to the government	UNSFIR (UN Support Facility for Indonesia Recovery)
- Information service to the public for good governance	UNDP (United Nation Development Program)
- CCB (Celebes Corn Belt) program and energy development	CDI (Cooperation for Development International)
- Development of GIS (Geographical Information System) database	CIDA (Canadian International Development agency)

6) The establishment of Sulawesi Parliament Forum, Sulawesi KAPET Forum, and Finance Institution “Micro” of Sulawesi

7) To facilitate the economic integration process, trading & investment inter region of Sulawesi.

8) The development of bio-diesel using castor oil and sugar cane

9) The establishment of task force for financial consultant of bank partner (Satgas KKMB), and Trade Centre in each Province

10) The empowerment of Builder Board and Consultative Board (Founder, Expert, Business Boards) in planning and strategic programs of BKPRS.

11) The infrastructure development such as:
    1. Land, air, and domestic sea transportation network between major industrial/ agricultural area and sea port/ airport.
    2. Power/Energy supply facilities
    3. Headquarter of National Armed Forced of Indonesia/Navy in Mamuju regency
12) To identify and make the map of preeminent products of Sulawesi which includes: commodity map (agriculture, Fishery, and husbandry), energy and mining potency map, forest commodity map, and Industrial Map.
13) The tourism/culture promotion with Sulawesi through: Annually Expo Sulawesi Program, CCL (Celebes Cruise Line) program, Sport/art tournament, and Sulawesi cultural meeting
14) The capacity building of human resource through following programs: Research, Education (internal/abroad), Seminar/workshop, Sand witch program (internal/abroad), and the expert exchange, etc

Identifying the prospective programs and other cooperation programs in order to develop regional economic of Sulawesi.

2.4 Problems and Constraints in Regional Development

2.4.1 Mountainous Geography, Dispersed Populations, and Weak Economic Linkages

Physical and demographic distributions characterize current land uses in Sulawesi. Since most of its land area is mountainous, available lands for other economic activities are quite limited. For example, paddy and nonpaddy fields (excluding areas with mixed nonpaddy fields and bushes) account for only 8.1% of the total land area. Plantations only represents about 1.0% of the total area. On the other hand, forest cover (inclusive of swamp forests and mangroves) is about 60% of the entire island.

Because of these geographical conditions, Sulawesi's population density of 81.2 /km^2 and urban population rate of 28.0% in 2005 were smaller than the national average (115.8 /km^2 and 42.1% in 2005). Most settlements are scattered along the coasts, separated from other settlements by steep mountains, bays, and seas. In addition, due to the lack of sufficient road infrastructure, the economic linkages among these areas are generally weak.

2.4.2 Lower GRDP and Regional Disparities

The Sulawesi economy remains at the level of about 58% of the national average in terms of per-capita GRDP (US$ 594 in Sulawesi against US$ 1,027 in Indonesia in 2005). Its contribution to the national economy remains at 4.2%, while the Sulawesi population accounts for a mere 7.3% of the national population. Per-capita GRDP is as low as US$ 298 in Gorontalo (29% of the national average) and US$ 391 in West Sulawesi (38% of the national average).

While the poverty rates of North Sulawesi (11.2%) and South Sulawesi (14.7%) are lower than the national average of 18.2%, those of West Sulawesi (27.4%) and Gorontalo (31.6%) are considerably higher than the national average.

Such substantial gaps should be taken into account when adopting policies promoting equity in development.

2.4.3 Greater Dependence on Agricultural Sector and Undeveloped Manufacturing Sector

The relatively low level of the Sulawesi economy is partly attributable to the great dependence on the agriculture sector. More than half of the economically active population is engaged in agriculture, livestock raising, and fisheries. The agricultural population is high in West Sulawesi (75.1% in 2005), Central Sulawesi (65.4%), and Southeast Sulawesi (62.8%). The contribution of the manufacturing sector to the Sulawesi economy is still limited, accounting for a mere 6.2% to 11.5% of employment.

The low productivity in the agricultural sector is another reason for the retarded economic growth in Sulawesi. Although in recent years the labor productivity has increased at a higher rate than the national average (except for Gorontalo) mainly due to extensive improvements in irrigation and other farming practices, and crop diversification has advanced to some extent, major cash crops are

marketed unprocessed, leaving farmers still minimally integrated into the economic growth of Sulawesi. Moreover, the cultivation of coconuts, cacao, and other traditionally diversified crops has not been well managed, and their production has generally degraded in recent years.

2.4.4 Low Utilization of Rich Natural Resources

Sulawesi is rich in fishery resources. The main fishery commodities in Sulawesi are tuna, skipjacks, pelagics, seaweeds, shrimps, crabs, sea cucumbers, and lobsters. Aquaculture, involving pearl shells, shrimps, seaweeds, sea cucumber, etc., is active along the coasts of many areas. However, fishery activities in Sulawesi are more labor-intensive than capital-intensive. Except for South Sulawesi, marine fishery and inland fishery potentials are not fully utilized. Most production volumes of marine and inland fishery products are concentrated in South Sulawesi, accounting for 46.8% and 78.9% of the whole province's production in 2005, respectively.

Sulawesi is also rich in mineral resources, such as nickel, gas, gold, cement, marble, oil, and asphalt. The mining sector has the potential to become a much larger contributor to the island's economy and to regional development. However, the development of the mining sector also remains stagnant, except for the cement industry in South Sulawesi and the Nickel industry in South and Southeast Sulawesi. A significant part of Sulawesi remains unexplored; some of these land areas hold potentialities for mineral development. The development of the mining sector would depend on how and when the natural gas reserve in Central Sulawesi could be developed on a larger scale.

2.4.5 Limited Forest Lands

Ironically, although the island's forests cover 60% of its total land area, its developable forest is quite limited due to environmental factors. Forest preserves occupy a large chunk of its forest lands which include mangroves and swamp reserves, which are scattered throughout the island. Although the island has secondary forest cover, these are commonly utilized for crop harvesting by local farmers. These are the basic factors why the expansion of farm lands in Sulawesi is difficult. Moreover, concerns on deforestation and environmental degradation have placed a premium on the preservation of the island's forest cover and its resources.

2.4.6 Disaster Management

As in all Indonesia, disaster prevention is a priority issue in the island. Although Sulawesi has relatively been spared from such disasters as tsunamis and volcanic eruptions, calamities such as landslides are probable especially among communities in mountainous areas. The development of Sulawesi into a disaster-free island that is properly prepared should be given high priority by the government.