MINISTRY OF PUBLIC WORKS

MAMMINASATA METROPOLITAN DEVELOPMENT
COOPERATION BOARD (MMDCB)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

THE STUDY ON IMPLEMENTATION
OF INTEGRATED SPATIAL PLAN
FOR THE MAMMINASATA METROPOLITAN AREA,
SOUTH SULAWESI PROVINCE IN INDONESIA

INTEGRATED SPATIAL PLAN FOR MAMMINASATA METROPOLITAN AREA

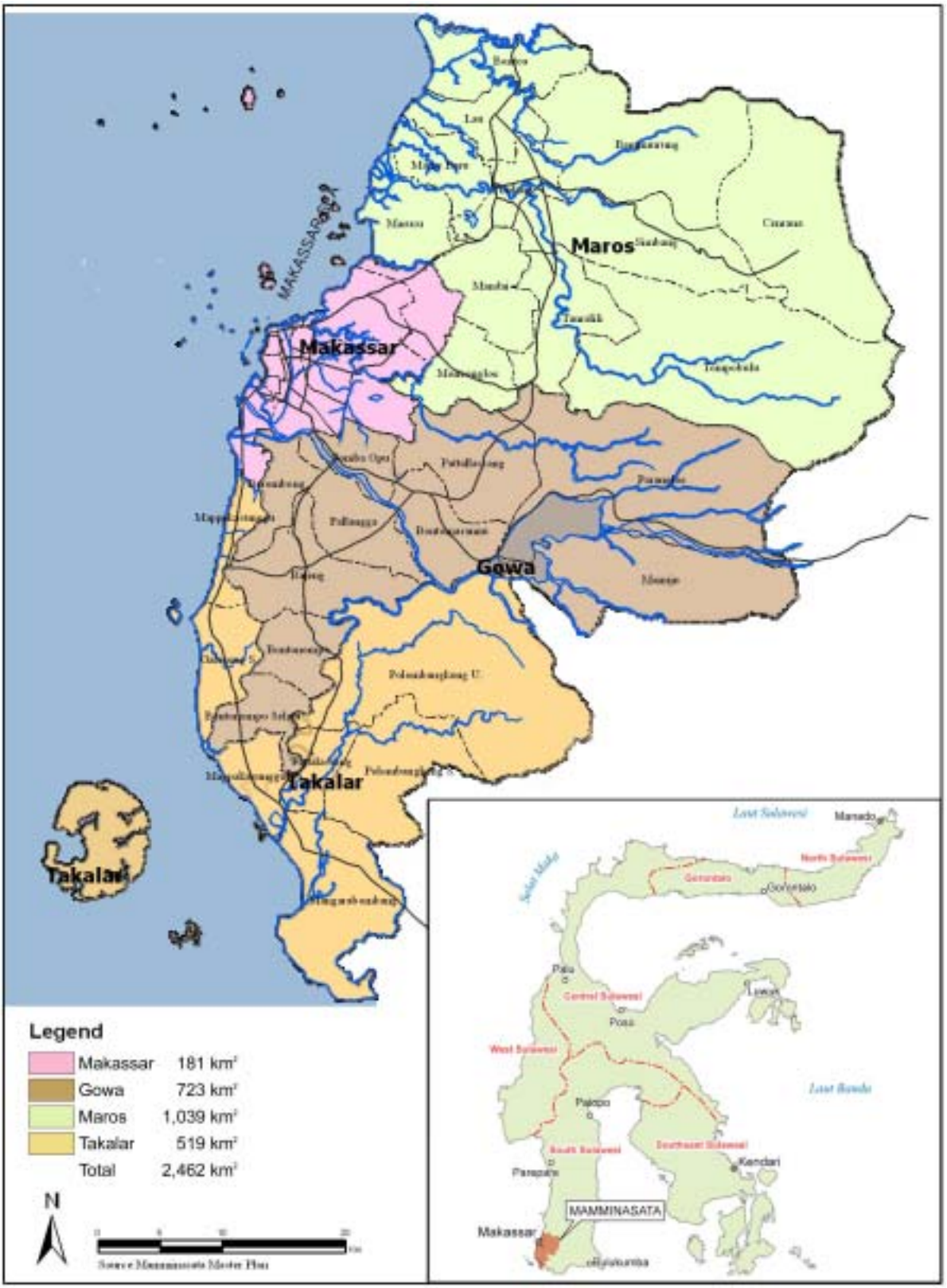
covering
Makassar, Gowa, Maros and Takalar

FINAL REPORT

MAIN REPORT

JULY 2006

KRI INTERNATIONAL CORP.
NIPPON KOEI CO., LTD.



Study Area Map: Mamminasata Metropolitan Area

Final Report

1. SUMMARY
   with electronic version of Summary Report, Main Report, Sector Study Report and Pre-Feasibility Study Report

2. MAIN REPORT
   with electronic version of Main Report, Sector Study Report and Pre-Feasibility Study Report

3. SECTOR STUDY REPORT

4. PRE-FEASIBILITY STUDY REPORT

STUDY ON IMPLEMENTATION OF
INTEGRATED SPATIAL PLAN FOR
THE MAMMINASATA METROPOLITAN AREA,
SOUTH SULAWESI PROVINCE, INDONESIA

FINAL REPORT

MAIN REPORT

Table of Contents

Electronic Version

1. Main Report
2. Sector Study Report
3. Pre-feasibility Study

ABBREVIATIONS

AL	Amenity Level
AP2B	Load Dispatching Center
ASEAN	Association of Southeast Asian Nations
ASKINDO	Asosiasi Kakao Indonesia (Indonesian Cacao Association)
BAPPEDA	Badan Perencanaan Pembangunan Daerah (Regional Planning Agency)
BAPPENAS	Badan Perencanaan dan Pembangunan Nasional (Indonesia's Central Planning Agency)
BDS	Business Development Services
BKSP	Badan Kerja Sama Pembangunan (Development Cooperation Body)
BKSPMM	Badan Kerja Sama Pembangunan Metropolitan Mamminasata (Mamminasata Metropolitan Development Cooperation Body)
BPN	Badan Pertanahan Nasional (National Land Agency)
BPPM	Badan/Biro Pengelola Pembangunan Mamminasata (Mamminasata Development Management Agency/Bureau)
BPPMD	Badan Promosi dan Penanaman Modal Daerah (Regional Promotion and Investment Board)
BPS	Biro Pusat Statistik (Central Bureau of Statistics)
BTS	Base Transceiver Station
CCC or 3C	Creative, Clean, Coordinated
CDM	Clean Development Mechanism
CL	Comfort Level
DC	Double Circuit
DSM	Demand Side Management
FAO	Food and Agriculture Organization (of the United Nations)
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
IPP	Independent Power Producer
ISPs	Internet Service Providers
JICA	Japan International Cooperation Agency
JST	JICA Study Team
KIMA	Kawasan Industri Makassar (Makassar Industrial Estate)
KITA	Kawasan Industri Takalar (Takalar Industrial Estate)
KIWA	Kawasan Industri Gowa (Gowa Industrial Estate)
KSO	Joint Operation Scheme
L&M	Large and Medium Enterprise
MCM	Million Cubic Meter
MDGs	Millenium Development Goals
MICE	Meeting, Incentive, Convention, Exhibition
ML	Minimum Level
MoU	Memorandum of Understanding
MRR	Middle Ring Road

NGO	Non-Governmental Organization
OD	Origin/Development
OECD	Organization for Economic Co-operation and Development
PD	Presidential Decree
PDAM	Perusahaan Daerah Air Minum (Regional Drinking Water Supply Company)
PII	Private Finance Initiative
PIP	Public Investment
PLN	Perusahaan Listrik Nasional (National Electric Company)
PPP	Private-Public-Partnership
R&D	Research and Development
RCA	Revealed Comparative Advantage
ROI	Return on Investment
RRR (3R)	Reduce, Reuse, Recycle
RSP	Regional Spatial Plan
RTEPC (P3ED)	Regional Training and Promotion Export Center (Pusat Pelatihan Promosi Export Daerah)
SAIDI	System Average Interruption Duration Index
SC	Single Circuit
SIMTAP	Sistem Informasi Manajemen Satu Atap (One Stop System Management)
SPC	Special Purpose Company
TDM	Traffic Demand Management
TDS	Total Dissolved Solids
TELKOM	PT. Telekomunikasi Indonesia, Tbk
TIC	Tourism Information Center
TPA	Tempat Pembuangan Akhir (Land Fill Site)
UFW	Unaccounted-for-water
UPT	Unit Pelaksana Teknis (Technical Implementor Unit)
WTO	World Trade Organization

Currency Equivalents

US Dollar 1.00 = Rupiahs 9,700.–

(Average in 2005)

unless otherwise specified

1. INTRODUCTION

This Final Report presents all the results of the Study on Implementation of Integrated Spatial Plan for the Mamminasata Area executed during the period from April 2005 to June 2006. The spatial plan proposed in this report would enable the Indonesian side to proceed with necessary arrangements for the implementation of various improvement projects/programs.

The spatial plan has been formulated from analysis of the existing conditions, review of the existing spatial plans at the provincial and district levels, discussions on the issues, frameworks and strategies, and the subsequent plan formulation. Lessons learned from the trip to Curitiba, Brazil to study environment-friendly urban development have been reflected in the plan. The results of pilot projects are also referred to the action programs and recommendations for implementation.

For the execution of the study, we adopted a participatory approach and invited the stakeholders to join the discussions and plan formulation. Several workshops and seminars have been held for discussion among the stakeholders. Further, over 30 working group meetings have been held so far, as shown in Table 1-1, to exchange views in five groups. Likewise, discussions were held at seminars with university students. High school and middle school students have been invited to the First Painting Contest, in which about 140 paintings showing *"an image of my town in 2020"* have been offered. Such images from younger generations, as well as the results of workshops and working group discussions, have been reflected in the formulation of this spatial plan.

Paintings offered for "an image of my town in 2020"

Since the municipality and regencies in Mamminasata are to finalize their spatial plans, it is expected that this report will be referred to and serve for the finalization of their respective plans, as well as for the central and provincial governments for their necessary actions to proceed with the coordination for the implementation of the integrated spatial plan.

This report has been compiled on the basis of a series of sector studies in respective specialties. The following sector study reports, compiled separately in the electronic files, may be referred to when further details are required for decision-making and study by the provincial and district authorities concerned.

Sector Study Report
(in the enclosed electronic files)

1. Socio-Economic Study
2. Land Use Study
3. Environmental Study
4. Agricultural Study
5. Industrial Development Study
6. Trade and Investment Study
7. Tourism Development Study
8. River Flood Control and Urban Drainage Study
9. Water Supply and Sewerage Study
10. Solid Waste Management Study
11. Power and Telecommunications Study
12. Land Transportation Study
13. Traffic Survey and Demand Forecast
14. Sea Port and Aviation Study
15. Financial Study
16. Institutional Study

Likewise, a pre-feasibility-level study on the following priority projects is presented in a separate volume of the Final Report, as well as in the enclosed electronic file.

1. Improvement of Water Supply System in Maros and Takalar Regencies
2. Improvement of Landfill Site for Solid Waste Management
3. Substation Expansion and Distribution System Rehabilitation
4. Improvement of Perintis-Urip Road

Table 1.1 Workshops, Seminars and Working Group Discussions

Type of Meeting		Date	Topics	Participants
Workshop	Workshop (1)	3-May	Discussion on Inception Report and Study Plan	Government, academics, NGOs, private, JST
	Workshop (2)	21-Jul	Follow Up of Results of Seminar and Workshop I	Government, academics, NGOs, private, JST
	Workshop (3)	22-Sep	Curitiba Field Study	Government, academics, JST
	Workshop (4)	28-Sep	Discussion on Progress Report II	Government, academics, private, JST
	Workshop	1-Dec	High-level discussion on Spatial Plan and Issues	Dinas directors, WG Leaders, JST
	Workshop	7-Dec	Summit Discussion on Spatial Plan	Vice Governor, Major, Regents, JST
	Workshop (5)	15-Feb.06	Discussion on Interim Report	Government, academics, JST
	Workshop (6)	11-May 06	Discussion on Draft Final Report	Government, academics, JST

Type of Meeting		Date	Topics	Participants
Seminar	Seminar	26-Apr	Introduction of the Study of World experiences in urban development	Government staffs, academics, NGOs, private parties, JST
	Seminar for University Students	30-Apr	World experiences in urban development	University students, faculty members, JST
	Seminar	28-Jun	Discussion of BKSP and JICA on Inception Work	Government staffs, JST
	Mini Seminar	6-Sep	Lecture: Framework of Urban Revitalization	Government staffs, academics, private, JST
	Mini Seminar	7-Sep	Lecture: Management and Finance of Urban Development	Government staffs, academics, private, JST
	Mini Seminar	6, 8-Feb	Lecture: Development Control	Government Staff in Jakarta and Mamminasata

Type of Meeting		Frequency of Meeting	Date (Number of Participants)
Working groups	Urban Planning	8	5/19(15), 6/9(10), 6/17(11), 8/4(19), 8/11(25), 8/19(31), 8/31(20), 11/15(15)
	Transportation	6	6/29(16), 7/5(19), 7/25(20), 8/9(15), 8/30(20), 9/15(14)
	Economy Industry	10	5/19(15), 6/10(11), 6/16(11), 6/23(9), 8/2(25), 8/10(20), 8/18(11), 8/29(13), 9/16(8), 11/10(17)
	Environmental Management & Conservation	5	5/23(20), 6/8(13), 7/12(10), 11/18(17), 11/24(12)
	Social & Community Development	3	6/9(30), 7/11(7), 8/30(16)

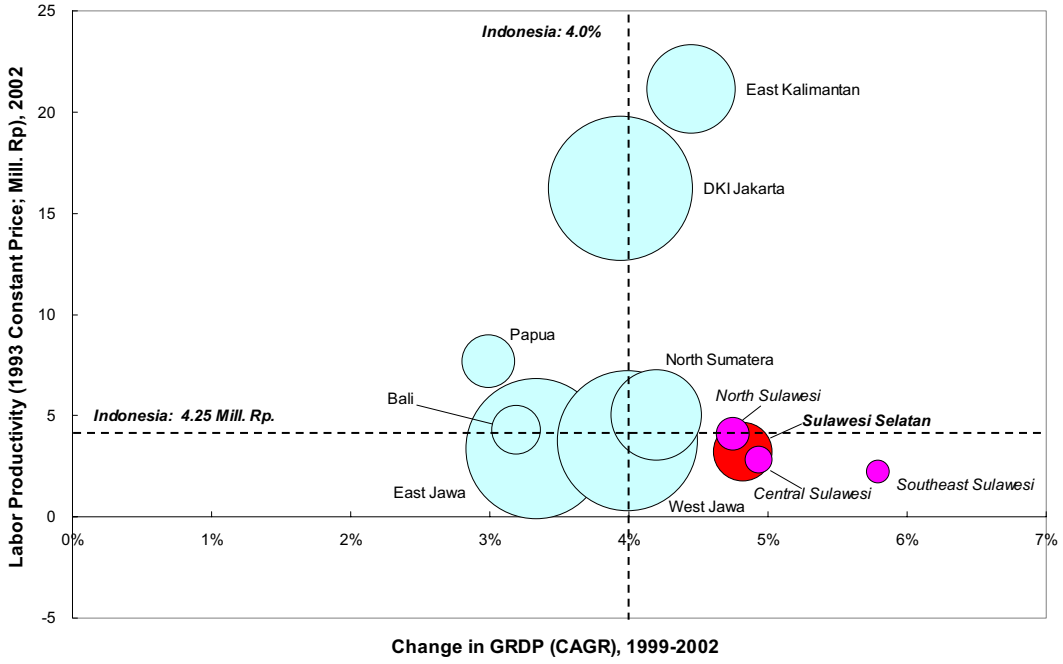
A high school student from Makassar, named Suparman, presents an image of orderly traffic and suburban residential area full of green spaces. 1st prize at the Painting Contest.

2. REGIONAL ISSUES

2.1 Overview [1]

The Mamminasata metropolitan area, or alternatively called Metropolitan Mamminasata, was formed by Makassar City, Maros, Gowa and Takalar regencies under a Decree of the Governor of South Sulawesi province in 2003. The Mamminasata area covers all sub-districts of Makassar City and Takalar regency, but excludes 2 out of 14 sub-districts in Maros and 6 out of 16 sub-districts in Gowa due to their remoteness from the metropolitan area. The Mamminasata area encompasses land of 2,462.3 km^2 (246,230 ha) with a total population of about 2.06 million (2003).

South Sulawesi province is expected to lead the social and economic development of Eastern Indonesia under the central government polity. The economy of South Sulawesi in recent years has shown an appreciable performance, attaining a higher growth in GRDP between 1999 and 2002 (4.8%) than the national average (4.0%). The labor productivity (Rp.3.2 million), however, is lower than the national performance by nearly Rp.1 million. The economic performance of South Sulawesi in recent years is shown in the following figure.



Source: JICA Study Team

Figure 2.1: Economic Performance of South Sulawesi Province (1999-2002)

[1] Refer to Sector Study Report (1) for detail.

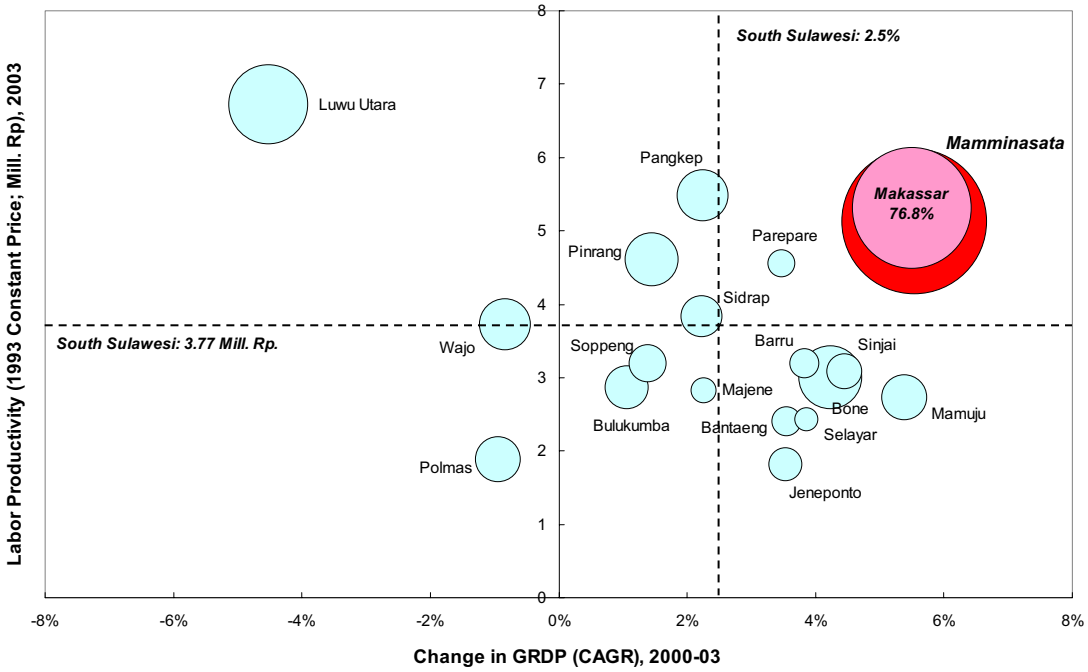
Despite the fact that South Sulawesi province has attained a higher economic growth in recent years, the GRDP per capita in South Sulawesi (Rp.4.41 million in 2002) still remains at a low level, or around 61% of the average GDP per capita in Indonesia (Rp.7.26 million). As shown in the following table, the South Sulawesi GDP represents about 2.3 % of the national GDP, while its population accounts for about 3.8 % of the total population in Indonesia.

Table 2.1 Socio Economic Comparison

	South Sulawesi	Sulawesi Region	Indonesia
Population (2003) ('000)	8,253	15,382	215,276
Population share (Sulawesi)	53%	-	-
Population share (Indonesia)	3.8%	7.1%	-
GRDP (2002) (Rp.million)	36,550,293	69,193,213	1,610,011,612
GRDP share (Sulawesi)	52%	-	-
GRDP share (Indonesia)	2.3%	4.3%	-
GRDP per capita (Rp.)	4,412,138	4,487,962	7,262,048

Source: Statistical Year Book of Indonesia 2003, BPS

Of the South Sulawesi economy, the Mamminasata area is in a leading position in its scale and growth of GRDP, as well as in labor productivity. The Mamminasata area accounts for 36 % of the provincial GDP, while Makassar City contributes nearly 77% of the Mamminasata economy. The following diagram shows the recent economic performance of the Mamminasata area.



Source: JICA Study Team

Figure 2.2: Economic Performance of Mamminasata (2000-2003)

From these diagrams, the roles that Mamminasata should play in economic development of South Sulawesi and Eastern Indonesia are apparent.

Despite such important roles that Mamminasata has to play, the development activities in the Mamminasata area have remained less than dynamic. Although the Mamminasata Metropolitan Development Coordination Board (BKSPMM) has been formed for promotion of balanced and sustainable development in Mamminasata and the Municipality and regency governments are formulating their spatial development plans, there remains much to be done in making Mamminasata dynamic and in fulfilling such expected roles.

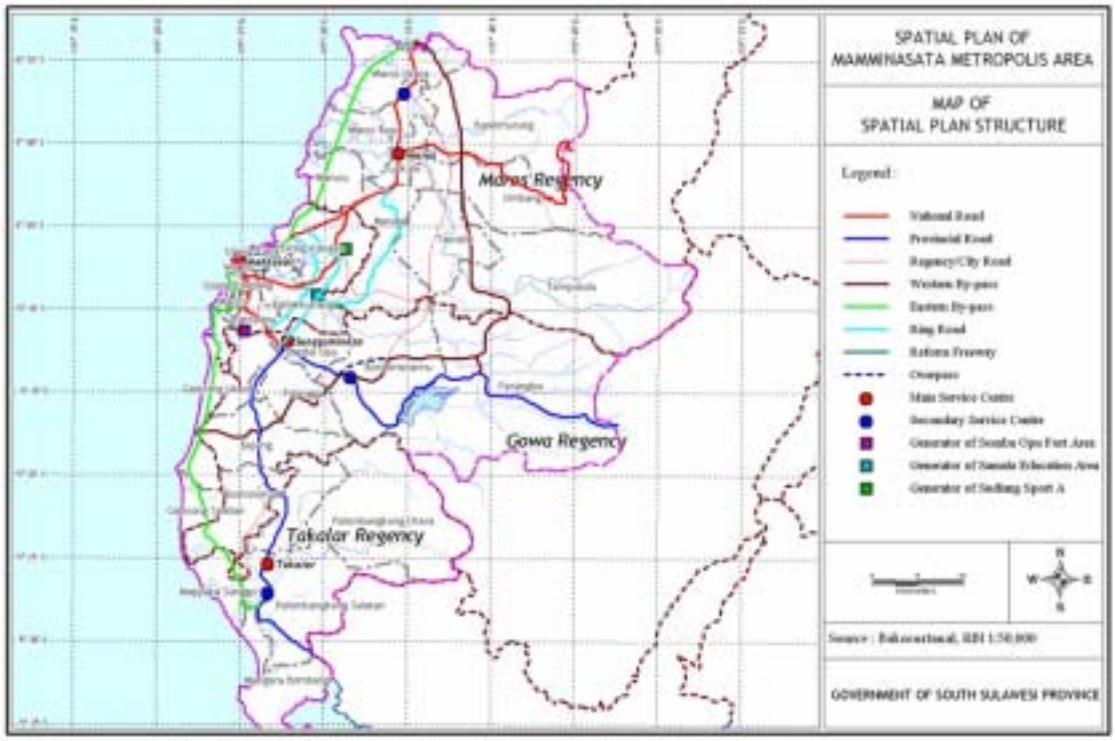
2.2 Regional Spatial Plan for Mamminasata Metropolitan Area

The regional spatial plan for Mamminasata is based on the Island Plan for Sulawesi drafted by the Directorate General of Spatial Planning in 2004. Under the Island Plan, accessibility and networks are to be improved, integrating major urban centers; e.g., Makassar, Manado-Bitung, Kendari, Palu, Gorontalo, Bone and Watampone. Improvement in services to the level of international standards is envisaged for infrastructure and facilities for economic and social development. The quality of the government services is also planned for improvement. The Island Plan proposed to develop the Mamminasata Metropolitan Area (Makassar-Maros-Sungguminasa-Takalar) to attain inter-city joint development. Particular attention has been paid to conservation of clean water, water and solid waste management, and drainage improvement, as well as protection from sedimentation in the Makassar bay where the port is located.

Although the Island Plan has indicated the direction of spatial development in Sulawesi, it has not specified the development frameworks to follow. Likewise, the Plan has paid little attention to the implementability, particularly from the financial viewpoint.

The regional spatial plan (RSP) for Mamminasata (2003-2012) has been formulated by the South Sulawesi provincial government, forming the Mamminasata Metropolitan Area Coordination Board. The RSP aims at creating optimal space use in Mamminasata through synergized economics, social and environment aspects, empowering human resources under a global orientation and local wisdom. Specific attention has been paid to (i) provide basic policy for spatial planning, (ii) create integrity in urban development, (iii) provide programs for inter-sector and inter-regional integration, (iv) provide guidelines for investments, and (v) create a mechanism for implementation by the public and private sectors.

The RSP elaborates sector-wise scenarios and urban structures, and a spatial structure is proposed as shown on the following figure.



Source: BKSP

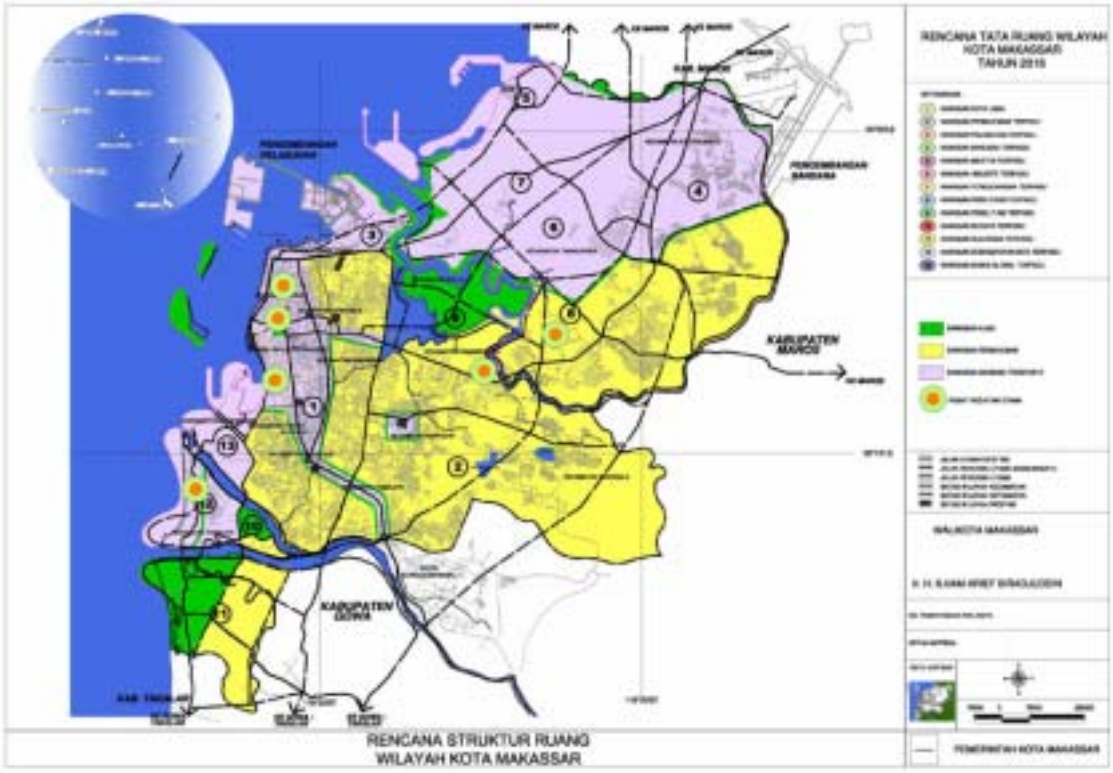
Figure 2.3: Regional Spatial Plan of Mamminasata

2.3 District Spatial Plans

Each district (regency) in the Mamminasata area has its own spatial development plan, in one way or another.

(i) Makassar City Spatial Plan 2005-2015 (final draft)
(ii) Maros Spatial Plan (handout)
(iii) Gowa District Spatial Plan 2003-2013
(iv) Takalar District Spatial Plan (revised)

The most advanced and notable among the district spatial plans is the Makassar City Plan, which is in the final stage of formulation. Although details of the Makassar Plan have not been fully disclosed, a spatial plan has been worked out as shown in the following figure:



Source: Makassar City

Figure 2.4: Regional Spatial Plan of Makassar City (Draft)

From the spatial development viewpoint, the Makassar Plan appears to be well drafted for accelerated economic infrastructure development. For its implementation, however, it has several aspects to be further considered, for instance:

(i) The Makassar Plan lacks consideration of combined development in the Mamminasata area. For instance, networks of urban centers and inter-city transportation should be elaborated further to promote more efficient networks in Mamminasata.

(ii) The Plan envisages reclamation of the Tallo river estuary for industrial and residential use, together with an ambitious expansion plan for Makassar port. (Although the Makassar Plan states that the wetland, coastline and riverside ecology should be preserved, it envisaged a vast reclamation of the wetland in the Tallo river estuary.) Whether to develop the Tallo river flood plain or to reserve it for environmental protection is to be further discussed to provide a better choice for the people in Makassar.

(iii) The land use plan appears to be too general to follow for implementation, as it has not been based on the estimate of land requirements for residential,

industrial and other purposes. For better implementation of the Makassar Plan, it is suggested to review the future land requirements in Makassar.

(iv) The Makassar Plan has allocated less land for green areas, while it has been found that Makassar people expect better amenities for living and hope to transfer it to the future generations. It is suggested that the green space be preserved and urban amenity is promoted further in the implementation of the Makassar Plan.

(v) The Makassar Plan has incorporated the existing development ideas and plans to the maximum extent. For its implementation however, financial aspects should have been taken more into account. As it depends on participation of the private sector, the financial viability of large investment projects should be examined further.

The district spatial plans in Maros, Gowa and Takalar also list a number of projects to be implemented for social and economic development. While the Gowa Plan envisages harmonization with Makassar and urbanization in a more accelerated way, the Maros and Takalar Plans are proposing implementation of various projects in a more unilateral fashion. For instance, Maros and Takalar are willing to have their own port facilities. A huge amount of investments are required if the projects listed by the three districts/regencies are to be implemented.
Despite the fact that the Mamminasata Metropolitan Area Coordination Board has been formed by Makassar, Maros, Gowa and Takalar, little coordination has been pursued among them for the formulation of an integrated spatial plan and respective district spatial plans.

2.4 Regional Issues

The Mamminasata area has diverse natural, social and economic conditions. Physically, it ranges from the coastal land and plains to mountainous terrain in a relatively short distance. Urban centers have been developed, while rural areas, which mainly depend on agriculture, have been stabilized to a certain extent. Industries have been developed over the last two decades, while irrigated agriculture has been developed and substantially contributed to stabilization of the rural areas. On the other hand, the environment in Mamminasata has gradually deteriorated due to increased population and economic activities. The forest and green area has decreased, and urban sprawl is progressing rapidly.

Major issues to be addressed in the regional and district spatial plans are:

(i) More attention to the eco-system, amenities and the environment in the region;

(ii) Enhancement of productivity in every economic activity in the region;

(iii) More integration to pursue overall benefits of regional development;

(iv) Adoption of a demand-oriented service delivery; and

(v) Clearer prioritization in implementation of the conceived projects.

The most critical issue in Mamminasata is the protection of the eco-system and environment. In the event that further deterioration occurs, it will require much higher costs to recover. Some eco-systems may turn out to be un-recoverable. Urban amenities should also be addressed, as the people wish to live in a more comfortable environment and with amenities in their urban and rural lives. Wastes from social and economic activities should be properly managed. The spatial plan for Mamminasata should be implemented with more attention to the eco-system, amenities and the environment in the region.

Another regional issue in Mamminasata is the relatively low productivity in economic activities. Local resources are relatively limited, mainly in the agriculture related area. Most agricultural products are marketed with minimal processing. For instance, most cacaos are exported to Surabaya and foreign markets in the form of cacao beans. Although a number of warehouses are located near the Makassar port, little value is added at warehouses. The port is considered to be a hub port for Eastern Indonesia, but it is not serving as a logistical hub contributing to the economic enhancement of the Makassar area. Consequently, the spatial plan for Mamminasata should be implemented with more attention to the enhancement of value added in the region.

As previously pointed out, the district spatial plans have been and are being formulated rather independently and they are less harmonized in the sense of regional spatial development. Most infrastructure in Mamminasata is to be planned, designed and implemented to contribute to the overall benefits of the people in the region. A basic principle requiring consensus is that such infrastructure is implemented not for the benefit of respective district but for the benefit of all the people in Mamminasata.

It appears that the existing spatial plans are not based on an analysis of the requirements or demand projections for services. For instance, the land requirements for residential and industrial use are not related in any way to the future demand and development policy. In other words, they have been planned solely from the view point of supply-oriented service provision. In the event that the financial resources are limited, implementation of the projects/programs should be based on demand-oriented service delivery. In this context, the spatial plan for Mamminasata should be implemented with more attention to the demand analysis, as well as the demand side management if appropriate.

Another important point observed in the spatial plans formulated by the Mamminasata Board and each district is the fact that various projects conceived by respective authorities in the district and province have been compiled without indicating the priority for implementation. Combined with the demand analysis and the policy of the demand-oriented service delivery, the priority of implementation should be indicated clearly.

3. OBJECTIVES OF MAMMINASATA SPATIAL PLAN

Based on an overview of the existing conditions, existing plans and regional issues, the objectives of the Mamminasata spatial plan are provisionally discussed in this section. The objectives may be modified through discussion with stakeholders, as well as on the basis of strategies and programs to be formulated in the course of this study.

Desirably, the Mamminasata spatial plan will indicate a common direction and target to attain through the efforts of all stakeholders in Mamminasata towards the year 2020. The plan should be formulated for the people and implemented by the people in Mamminasata. It should not be a plan for the public authorities concerned, nor for the specific parties interested in implementation. It is for this reason that this study has been executed applying a participatory approach and exchanging views with as many stakeholders as possible.

Through the workshops held with stakeholders, as well as the seminar discussions with university students, it is understood that the people in Mamminasata wish to transfer a better environment to the future generations. Such a better environment implies that the environment in the region is protected and the amenities are well maintained in good harmony between the nature and the people's activities. Mamminasata is expected to be a convivial or symbiotic society of the people and nature. Harmonization is a mainstay for the spatial plan for Mamminasata.

Preservation of the environment will not always hinder the economic activities if harmony is maintained. Since the poverty level is still high in Mamminasata, regional economy should be activated at the same time. Dynamism, in this context, is a key concept for the Mamminasata spatial plan.

For the regional spatial plan, the return from investments should not be limited to a certain interest group but it should be reasonably distributed to the people that cooperated in their implementation. An attitude of collaboration and partnership should also be built up though the implementation of the spatial plans.

The Mamminasata area still has various risks; e.g. natural disasters, environmental hazards, economic uncertainty, and social conflicts. Such risks should be mitigated as far as possible through implementation of the Mamminasata spatial plan. It is desirable that this principle be clearly defined in the spatial plan and pursued in all phases of the plan implementation.

With the above philosophy, it is proposed that the objectives of the Mamminasata spatial plan would be defined as follows:

Objectives of the Mamminasata Spatial Plan

(i)	To set up a common target and common image for the future of Mamminasata (2020) for the benefit of all the people and stakeholders in Mamminasata;
(ii)	To create a dynamic and harmonized Metropolitan area along with the preservation of the environment and the enhancement of amenities throughout the Mamminasata area;
(iii)	To enhance the standard of living for the people in Mamminasata, ensuring employment and adequate social services, activating the economy and mitigating the risks; and
(iv)	To serve as a model for future development of regional Metropolitan areas in Indonesia.

To attain these objectives, firm commitments must be made by the public, private, academic, and non-governmental organizations, as well as by the citizens in Mamminasata. Every effort must be directed to create **a Metropolitan area that is comfortable to live in for generations**.

Despite the four objectives defined above, it would be convenient for all stakeholders to have a short slogan for the Mamminasata spatial plan. Through discussions with stakeholders at workshops, the following "catch-phrase" is put forward for Mamminasata spatial development;

"Clean, Creative and Coordinated Metropolitan Mamminasata"

Clean, Creative and Coordinated (**CCC or 3C**) Mamminasata will be a common image to be held by all stakeholders. The Mamminasata spatial plan will also be formulated and implemented to follow and realize the Clean, Creative and Coordinated Metropolitan Area in Mamminasata.

4. DEVELOPMENT FRAMEWORKS

As pointed out in Section 2.4, the existing spatial plans have not clearly indicated the frameworks for development. For better implementation of the spatial plans, several development frameworks are discussed herein.

4.1 Demographic Framework [1]

Population in Mamminasata up to the year 2020 has been estimated, as outlined in Progress Report 1, Section 4.2, based on the past trends and projections of fertility, mortality, and migration. The population structure and daytime population have also been estimated provisionally.

Through the subsequent refinement of some factors, the total residential population in Mamminasata is estimated to be 2.48 million in 2010 (2.67 million total population of the four districts) and 2.88 million in 2020 (3.08 million total population of the four districts). The Mamminasata population is predicted to grow at an average annual rate of 1.7% in 2005-2020. Distribution to respective districts has also been refined as summarized in the following table:

Table 4.1: Framework of Residential Population in Mamminasata

Regency	2005	2010	2015	2020	CAGR (%)
Makassar	1,285,443	1,373,588	1,372,212	1,370,651	0.4%
Maros	313,402	339,375	419,452	498,472	3.1%
Gowa	599,323	701,980	799,004	895,687	2.7%
Takalar	247,871	255,755	257,932	314,110	1.6%
Total (4 Regencies)	2,446,039	2,670,698	2,848,601	3,078,919	1.5%
Mamminasata	**2,254,074**	**2,477,639**	**2,654,912**	**2,884767**	**1.7%**

Source: JICA Study Team

It is notable that the population structure would substantially change towards 2020. As illustrated in the following diagrams, the Mamminasata population would become much closer to a typical urbanized pattern with a rectangular shape of population pyramid. The Mamminasata area would have 71.5% working age population (15-64 years old) while only 23.5% will be children (less than 14 yeas old). It does not appear that immigrations to the Mimminasata area is so notable as experienced in Jakarta and Surabaya.

[1] Refer to Sector Study Report (1) for detail.

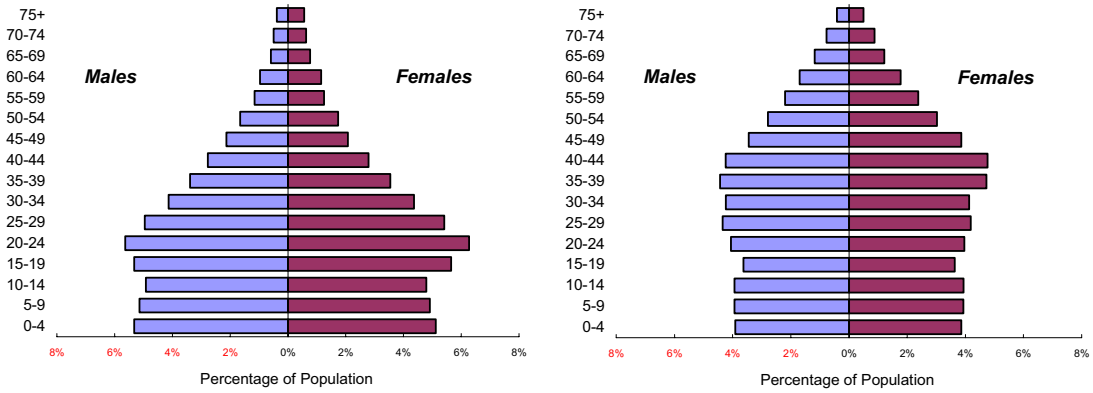


Figure 4.1: Population Pyramid of Mamminasata in 2000 and 2020

It is also noted that the population distribution by districts might change in accordance with the actual development of residential areas, and it is suggested that the population projections be modified in every five years.

4.2 Employment Framework [2]

The national mid-term plan (2005-2009, by BAPPENAS) set a framework so that the unemployment ratio would decrease from 9.5% in 2005 to 5.1% in 2009.

Based on the population projection and economic trends, the working population in Mamminasata is estimated to increase from 838,800 in 2005 to 978,200 in 2010 and 1,238,400 in 2020. The unemployment ratio is generally high in urban centers in Makassar and relatively low in rural agricultural areas. For the whole of Mamminasata, it is estimated to be lowered to around 6.9% in 2010 and 5.1% in 2020, as shown on the following table:

Table 4.2: Working Population and Unemployment in Mamminasata

District	2005	2010	2015	2020
Makassar				
Working Population	415,361	443,843	477,654	477,110
(Unemployment Rate)	11.1%	11.1%	8.7%	8.7%
Maros				
Working Population	107,774	120,297	161,959	192,469
(Unemployment Rate)	5.3%	5.3%	3.1%	3.1%
Gowa				
Working Population	219,402	310,153	379,465	431,209
(Unemployment Rate)	3.1%	3.1%	3.1%	3.1%
Takalar				
Working Population	96,284	103,931	111,438	137,647
(Unemployment Rate)	2.0%	2.0%	2.0%	2.0%
Total*				
Working Population	838,822	978,225	1,130,515	1,238,436
(Unemployment Rate)	7.2%	6.9%	5.4%	5.1%

* Inclusive of non-Mamminasata sub-districts
Source: JICA Study Team

[2] Refer to Sector Study Report (1) for detail.

Needless to say, the unemployment ratio is largely dependent on the economic activities in Mamminasata, and the framework is to be modified in combination with the economic framework for the Mamminasata spatial plan.

4.3 Macro-economic Framework [3]

The national mid-term plan (2005-2009, by BAPPENAS) aims at an average GDP growth rate of 8.7%. On the other hand, the provincial government expects that the GRDP in South Sulawesi would grow at an average annual rate of 7.1% in 2005-2010 and 7.6% in 2010-2020. The expected growth rate is relatively high if compared with the recent trends.

The recent trend of economic activities has been reviewed at the provincial level, as well as for the Mamminasata area. At the same time, the GRDP projection by BAPPEDA South Sulawesi has been reviewed. The BAPPEDA projection (2005-2020) is relatively high with the annual average growth rate of 8.2% up to the year 2020.

In addition to the BAPPEDA projection, two alternative projections have been made in defining the macro-economic framework for the Mamminasata spatial plan. These alternatives are:

(i) High growth case: BAPPEDA projection (original)
(ii) Moderate growth case: Alternative projection
(iii) Low growth case: Based on the past trends

The growth rate by economic sector is tabulated for each alternative, as follows:

Table 4.3: Alternative Macro-economic Framework for Mamminasata (2005-2020)

Regency	High Growth (BAPPEDA Case)	**Moderate Growth (JICA Case)**	Low Growth (Trend Case)
Agriculture	6.0%	**3.0%**	2.3%
Mining & Quarrying	5.9%	**6.2%**	0.2%
Manufacturing	9.8%	**6.3%**	5.2%
Electricity, Gas, Water Supply	7.6%	**7.9%**	3.4%
Construction	7.9%	**7.1%**	2.1%
Trade, Hotel & Restaurant	7.6%	**7.8%**	5.7%
Transportation, Communication	7.3%	**7.6%**	3.2%
Finance, Leasing & Business Service	10.6%	**9.7%**	4.4%
Service	7.6%	**7.5%**	3.0%
Total	8.2%	**7.1%**	4.2%

Source: BAPPEDA and JICA Study Team

[3] Refer to Sector Study Report (1) for details.

Three alternative frameworks have been discussed at the Working Groups. Opinions raised at the meetings are summarized as follows:

(i) Agricultural growth at the average annual rate of 5-6% would hardly be attainable in view of the facts that the cultivable lands are not expandable in Mamminasata and that improvement in productivity cannot be attained at such a high rate.

(ii) Manufacturing growth at the average annual rate of 9-10% would not be probable in view of the facts that potential industries in Mamminasata would mostly be local resource based, and capital-intensive industry would be unlikely to attain such a high growth rate.

(iii) It is expected that more investments will be directed to protect the environment and enhance the amenities in Mamminasata, which would result in a lower economic growth rate.

The low growth scenario appears to be too pessimistic to be a long-term development framework for Mamminasata. Consequently, it is proposed that the macro-economic framework is set to follow the "moderate growth" scenario. Even in this case, the average annual GRDP growth rate is set to be 7.1%, which is still a challenging target for the Mamminasata economy.

Under the moderate growth scenario, the Mamminasata economy would grow as illustrated in the following diagram.

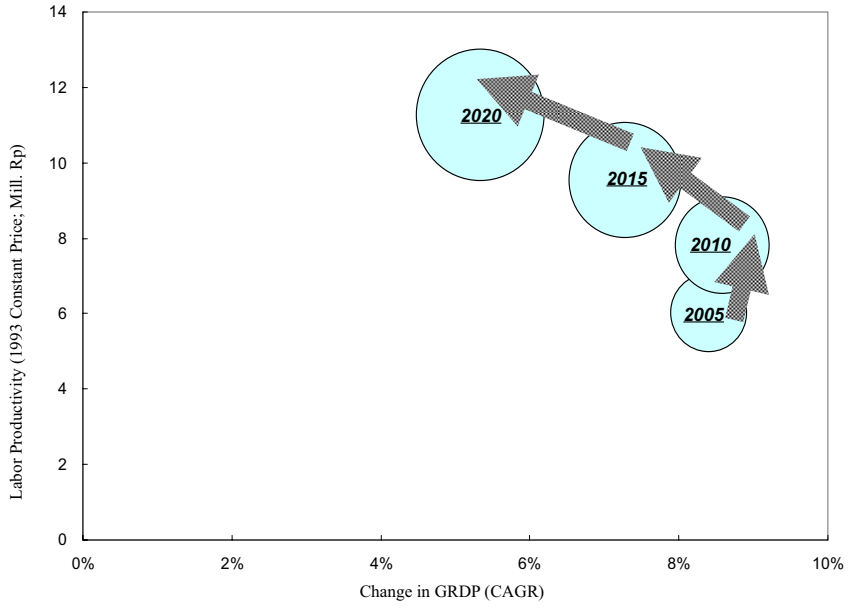


Figure 4.2 Moderate Growth of the Mamminasata Economy

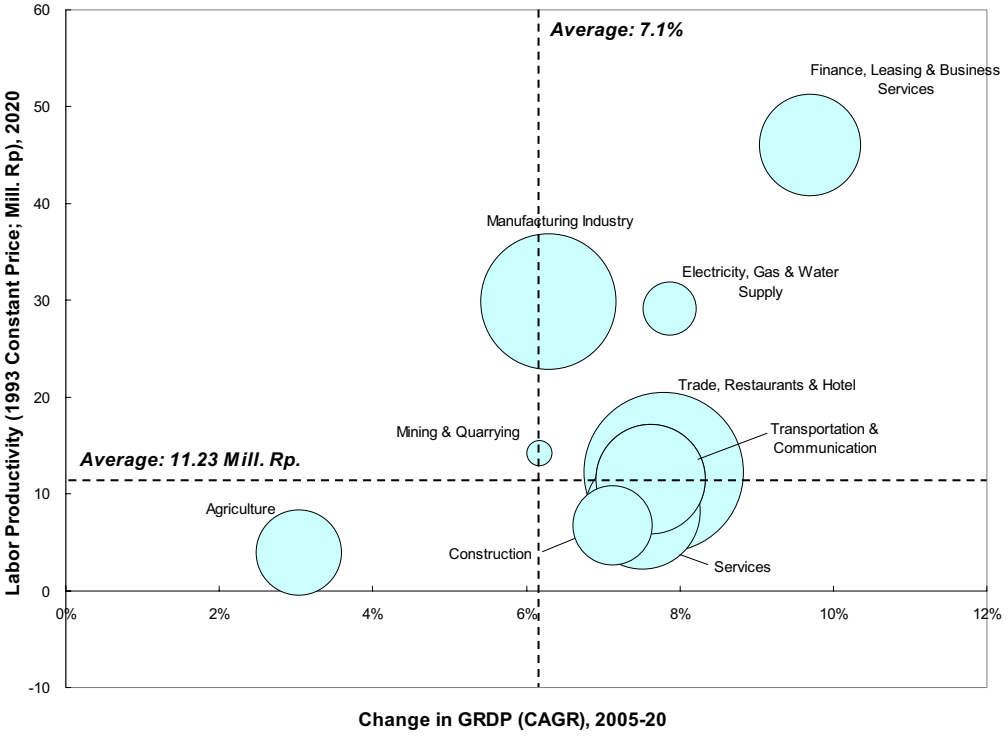
The moderate scenario envisages that the agricultural contribution to GRDP would drop to 7.5%, while the trade and financing sub-sectors would represent 26.4% and 10.6%, respectively, as shown in the following table.

Table 4.4: GRDP Projection: Moderate Scenario (1993 constant price, Million Rp.)

Industry	2005		2010		2020		CAGR
	GRDP	(%)	GRDP	(%)	GRDP	(%)	(%)
Agriculture	665,608	13.3	760,568	10.1	1,043,014	7.5	3.0%
Mining & Quarrying	43,315	0.9	60,255	0.8	106,426	0.8	6.2%
Manufacturing Industry	1,046,325	20.9	1,420,147	18.8	2,616,181	18.8	6.3%
Electricity, Gas & Water Supply	139,965	2.8	214,245	2.8	436,259	3.1	7.9%
Construction	331,526	6.6	748,859	9.9	931,910	6.7	7.1%
Trade, Restaurants & Hotel	1,188,170	23.8	1,862,851	24.7	3,664,500	26.4	7.8%
Transportation & Communication	572,739	11.5	876,742	11.6	1,724,664	12.4	7.6%
Finance, Leasing & Business Services	366,918	7.3	622,097	8.2	1,472,730	10.6	9.7%
Services	643,829	12.9	979,567	13.0	1,910,794	13.7	7.5%
Total	4,998,395	100.0	7,545,331	100.0	13,906,478	100.0	7.1%

Source: JICA Study Team

The following diagram illustrates the projected growth and labor productivity by sub-sector. It is expected that the manufacturing, finance, leasing and business services sub-sectors would play leading roles in the Mamminasata economy to attain the target economic growth.



Source: JICA Study Team

Figure 4.3: Projected Economic Performance of Mamminasata (2005~2020)

4.4 Poverty Reduction and MDG Framework

The mid-term national plan (2005-2009, BAPPENAS) aims at the reduction of the poverty rate from 18.2% in 2002 to the level of 9% in 2015. The poverty rate in South Sulawesi varies by district, and it is around 16% on an average. It is lower in Makassar (5.6% in 2002) and higher in Maros (23.7%) and Gowa (19.6%). It is proposed that the poverty rate will be lowered by up to 3% in Makassar and a maximum of 14% in other districts.

Some social frameworks are additionally proposed to augment the Mamminasata spatial plan, including of primary education participation rate, gender equality, child mortality and access to safe water, as tabulated below.

Table 4.5: Poverty and MDG Framework for Mamminasata

Millennium Development Goals (MDGs)	Indonesia (2002)	South Sulawesi (2002)	Districts in Mamminasata (2002)				**Mamminasata (Target 2015)**
			MKS	Maros	Gowa	Tklr	
Eradicate extreme poverty and hunger [poverty rate: %]	18.2	15.9	5.6	23.7	19.6	15.0	**3-14 varies by regency**
Achieve universal primary education School participation rate for age group 7-12 (%)	96.1	92.5	95.6	92.8	92.5	90.0	**100**
Promote gender equality and empower woman - Female mean years of schooling - Male mean years of schooling	6.5 7.6	6.4 7.3	9.8 10.8	5.4 6.2	5.9 6.7	5.4 6.0	**12 years**
Reduce child mortality [infant mortality rate: per 1,000]	43.5	33.0	22.3	30.7	27.0	40.5	**8-12 varies by regency**
Ensure environmental sustainability [population without access to safety water: (%)]	55.2	58.7	8.0	48.0	41.8	54.0	**5-30 varies by regency**

Source: JICA Study Team, based on BAPPENAS Plan.

4.5 Public Investment Framework

The national mid-term plan (2005-2009) sets a framework so that the public investment (PIP) would be limited to around 3-4% during the plan period in order to maintain a sound macro-economic situation. Since the central government set such a target, the provincial government will have to follow this framework.
In the event that the Mamminasata spatial plan has to follow this framework, the total PIP in the plan period and annual average PIP would be limited to the following:

Table 4.6: Public Investment Framework

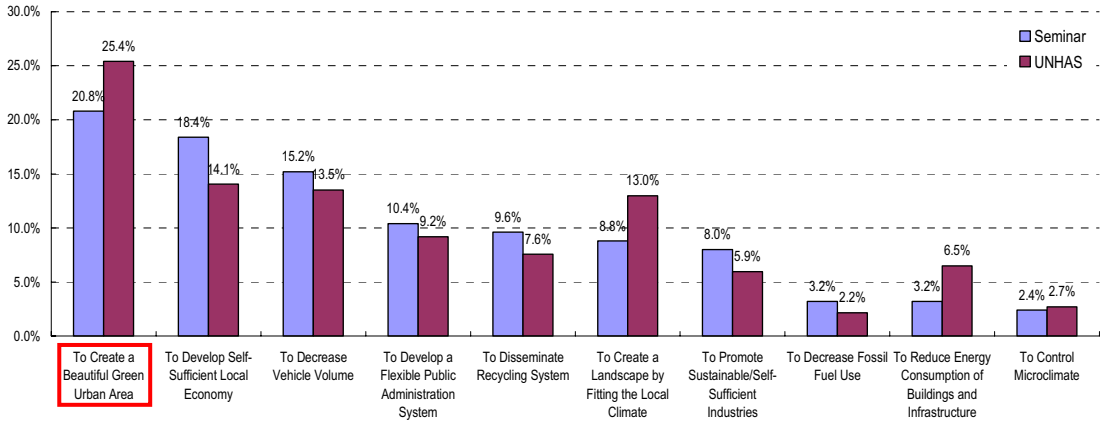
Regency	1993 Price (Mill. Rp.)	2004 Price (Mill. Rp.)	2004 Price (Mill. US$)
GRDP Total	13,906,478	54,416,048	5,376
Total PIP (2005-2020)	5,100,000	20,000,000	1,976
Annual PIP	340,000	1,330,000	131

Source: JICA Study Team

The public investment framework will be further examined when more information on the action programs to be proposed under the spatial development plan becomes available. A preliminary assessment indicates that such a framework would not be an unattainable target in the event that the private finance initiatives and public-private-partnership are applied to several large investments projects to be envisaged in Mamminasata.[4]

4.6 Green Area Framework

As discussed in the foregoing Chapter, the Mamminasata spatial plan will be elaborated to protect the environment and promote the amenities in Mamminasata. For reference, a questionnaire survey given to the university students participating in the Seminar held by the JICA Study Team has revealed that they have a keen interest in expanding green spaces in Mamminasata as shown in the following.



Source: Results of Questionnaire Survey at Seminars (JICA Study Team)

Figure 4.4: Best Attraction in Spatial Planning

Although the land use zoning is to be discussed later, it is proposed that targeting the establishment and maintenance of green areas in Mamminasata is set as one of the frameworks to follow. Through discussions at the workshops and working group meetings, it has been proposed that the Mamminasata area would have green

[4] Refer to Sector Study Report (15) for detail.

areas (parks and forest coverage) as targeted below.

Table 4.7: Green Area Framework for Mamminasata

		MKS	Maros	Gowa	Takalar	Total
Current *	(%)	2.4	44.5	19.8	19.0	28.7
	(ha)	440	46,620	14,300	10,450	71,810
Future Target	(%)	5.0	57.0	33.0	22.0	38.0
	(ha)	880	59,440	23,900	12,590	96,810
Additional Area Required	**(ha)**	**+440**	**+12,820**	**+9,600**	**+2,140**	**+25,000**

Note: *Current green area includes forest, bushes and grass land identified by the land use map prepared by BPN
Source: JICA Study Team

For reference, more than 200 km^2 (20,000 ha) of land exists that is appropriate for afforestation area. This will be discussed further under the land use zoning. It is also noted that a sizable afforestation program would be viable if a CDM scheme is made applicable to such a program.[5]

The current green area in Makassar is around $3m^2$/person. A target to double the green area in 15 years is relatively conservative, but it is a target to be realized by any means. (For reference, Curitiba city in Brazil expanded the green areas from $1m^2$/person in 1970 to $55m^2$/person in 2002.)

Image Photograph of Green Metropolitan (An Urbanscape of Curitiba City, Brazil)

4.7 Spatial Structure Framework

Currently, the expansion of the urban center in Makassar is in the process of creating urban sprawl under uncontrolled land use, causing deterioration of the urban environment and inefficient infrastructure. The amenities in urban areas have also been deteriorating. A basic structure for spatial planning is proposed as illustrated below for the formation of a spatial plan in Mamminasata. The proposed structure is basically a "fan structure."

[5] Refer to Chapter 6.2 and Sector Study Report (3) for detail.

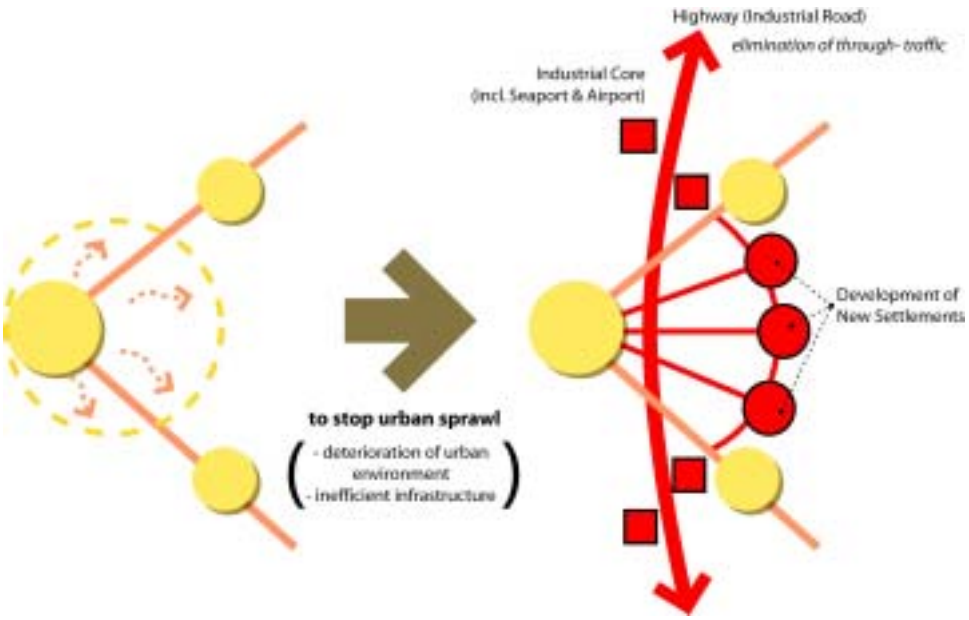


Figure 4.5: Image of Shift to New Spatial Structure in Mamminasata

More specifically, the spatial structure in Mamminasata would be formed as illustrated in the following figure:

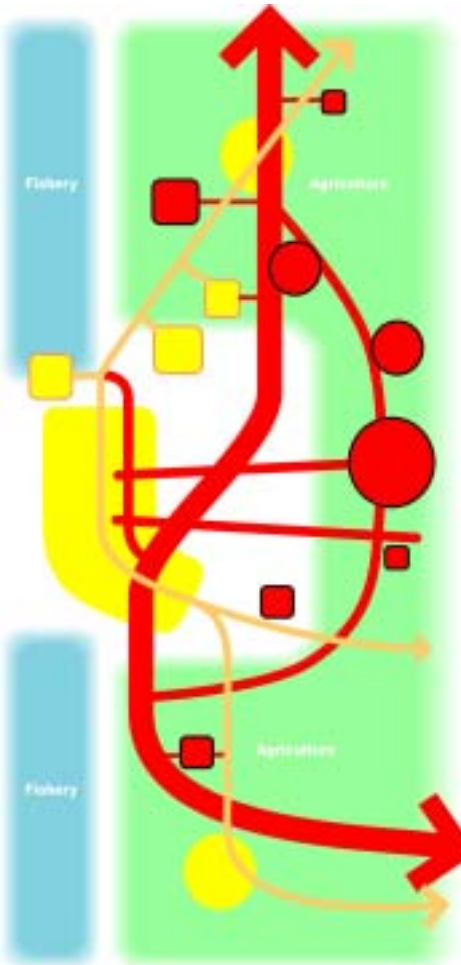


Figure 4.6: Spatial Structure in Mamminasata

A junior high school student from Makassar, named Yeni Masni, presents an image that, while modern and traditional buildings are developed, a large green space is kept in the metropolitan area.

5. SPATIAL DEVELOPMENT STRATEGY

With the development frameworks set as discussed in the foregoing Chapter, regional development strategies for Mamminasata are presented herein.

5.1 Mamminasata as a Logistical and Trade Hub in Eastern Indonesia

The existing spatial plan envisages that the Mamminasata area would function as a hub in Eastern Indonesia. It is also expected that Mamminasata would be internationally linked to ASEAN and other countries in East Asia. Particular attention is to be paid to the East ASEAN Growth Area formed by Brunei, Indonesia, Malaysia and the Philippines (BIMP-EAGA). An image of this function is illustrated below.

source: JICA Study Team

Figure 5.1: Image of Hub Function by Mamminasata

The hub function should not be limited to transportation in Eastern Indonesia. Based on the cluster development theory, the function of Mamminasata is proposed to be a **"Logistical and Trade Hub"**. It is therefore suggested that the spatial plan be strategically implemented so that Mamminasata would function as a logistical and trade hub in Eastern Indonesia and East Asia.

To function as an effective hub, Mamminasata should develop its trade sector and manufacturing sector in parallel and in a coordinated manner. Once the manufacturing sector is developed in Mamminasata to a certain extent, materials from Kalimantan, Papua and other islands in Eastern Indonesia could be processed and assembled in Mamminasata. Through such a value-adding process, a higher economic value will be produced in Mamminasata.

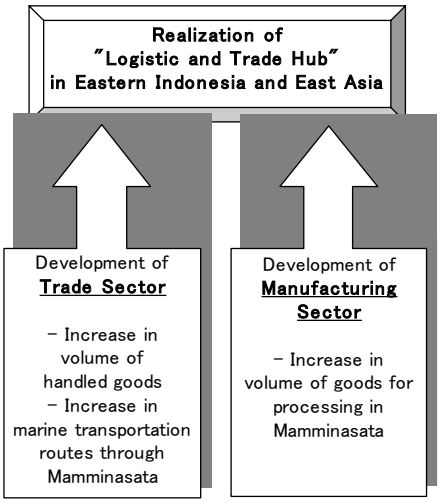


Figure 5.2:
Formulation of Logistical and Trade Hub

Desirably, the processing function now concentrated on Java Island, particularly in Surabaya for non-processed products from Mamminasata, would be strategically transferred to Mamminasata as early as possible and, in the longer-term, it would be further shifted to other centers in Eastern Indonesia.

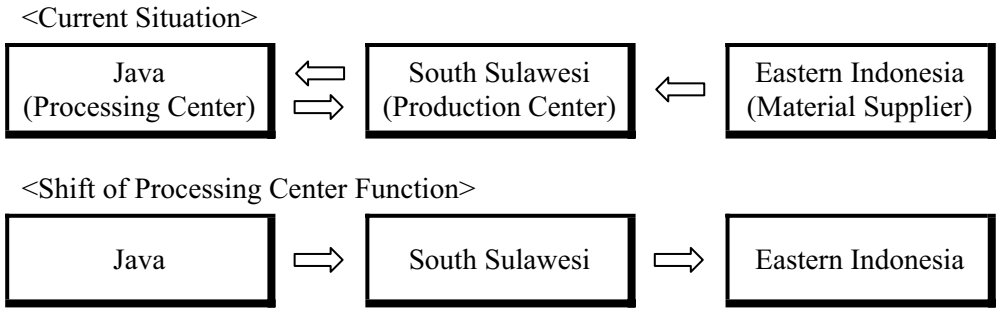


Figure 5.3 Transfer to Processing Centers in Short and Long Terms

For instance, processing of cacao beans shipped to Surabaya could be shifted to locate in Makassar through improvements in transportation and other infrastructure, as well as by means of some fiscal incentives to be granted in Mamminasata. Likewise, recyclable garbage shipped to Surabaya and returned to Makassar after processing could be processed in Mamminasata if it is well classified and stably supplied in the region. Any hindrance should be removed so that resource-based products could be processed locally and localization could be promoted over the country.[1]

[1] Refer to Sector Study Reports (5) and (6) for detail.

5.2 Mamminasata to Spearhead Overall Development of Sulawesi

As discussed in Section 2.1, the Mamminasata area is contributing for 36% of GDP in South Sulawesi, with a higher growth rate in GRDP and higher labor productivity than any other regency. Most resources in South Sulawesi are processed in and/or traded through Makassar and the Mamminasata area. Economically and financially, the Mamminasata area should lead development of South Sulawesi province in the short and long run, networking the economic activities in other regencies of the province.

Networking in South Sulawesi, with Mamminasata as a regional center and other cities as sub-regional centers, is of vital importance for balanced regional development, as well as for mitigating various risks. Unless such a network is developed, regional inequity would be advanced, economically and socially, aggravating the environment here and there.

Figure 5.4 Future Spatial Structure of South Sulawesi

Strategically speaking, Mamminasata will form a **Mamminasata Cluster** promoting linkages among economic activities within Mamminasata, while Mamminasata would invite other regencies in South Sulawesi to form a **South Sulawesi Cluster.** Such clusters should not necessarily be limited to Mamminasata and South Sulawesi. They could be expanded more widely to Sulawesi Island to form a **Sulawesi Island Cluster**. Promotion of linkages within these clusters should be further elaborated, but it could be facilitated through development of transportation network by land, sea and air. In this context, development of Trans-Sulawesi Road or Corridor, as well as seaport and airport expansion in Mamminasata would play a vital role. If the proposed shift of processing center functions from Surabaya to Mamminasata is realized, gradually but steadily, such a shift would in turn be transferred to South Sulawesi and Sulawesi Island in medium and long terms. Thus, Mamminasata should lead overall development of Sulawesi and Eastern Indonesia.

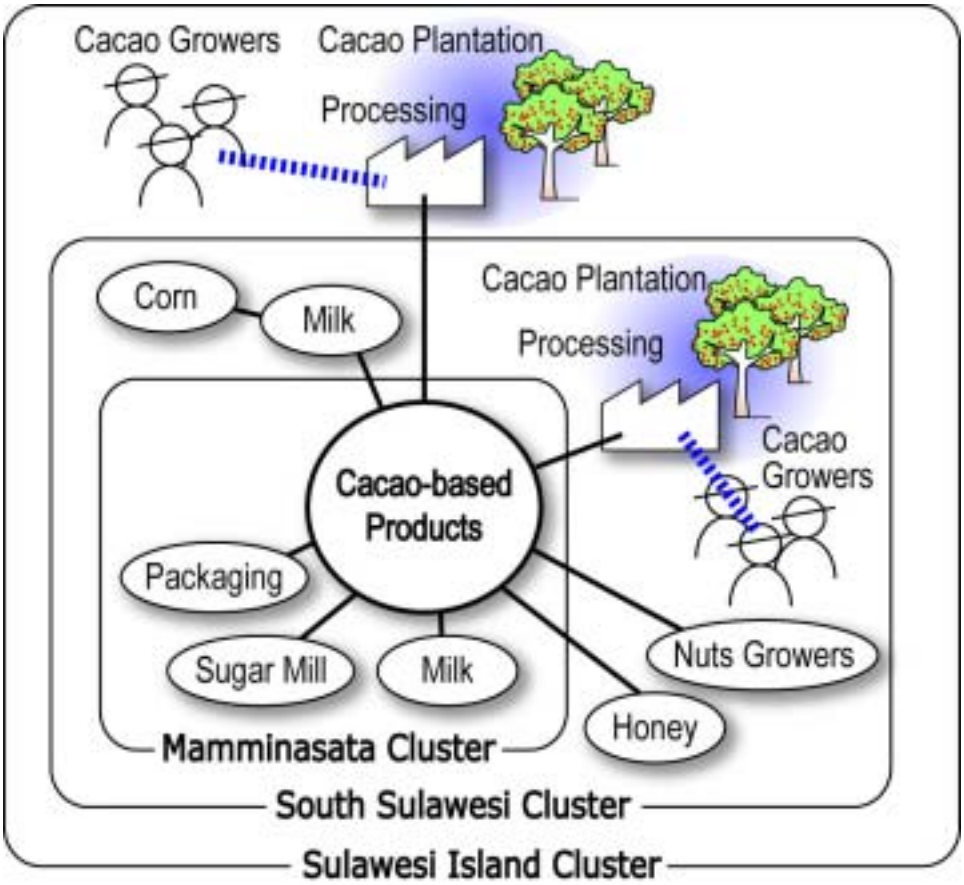


Figure 5.5 An Image of Cacao-based Cluster in South Sulawesi

5.3 Reduction in Pollutants and Environmental Loads

"**Environmental Friendly and Clean Metropolitan Mamminasata"** cannot be realized without protection of the environment and reduction in pollutants. The environmental conditions in Mamminasata have been aggravating in recent years, particularly in Makassar, mainly due to the increased population and traffic, as well as expanding economic activities. People's awareness on protection of the environment and reduction in pollutant remains weak. For instance, the seashore along the Losari beach, Makassar's most famous sunset view terrace, is full of solid waste every morning and untreated effluent is flowing into the bay areas.

Losari beach where solid wastes are floating

Stuck drainage where solid waste is dumped

To make Mamminasata a harmonized and eco-friendly Metropolis, the current conditions causing pollution need to be improved. Strategies and countermeasures are to be worked out for the following environmental constraints:

(i) water pollution in rivers and canals;
(ii) water pollution in coastal and small island areas;
(iii) groundwater pollution;
(iv) air pollution;
(v) soil contamination;
(vi) noise and vibration; and
(vii) offensive odors.

The following diagram shows the procedures to work out such countermeasures:

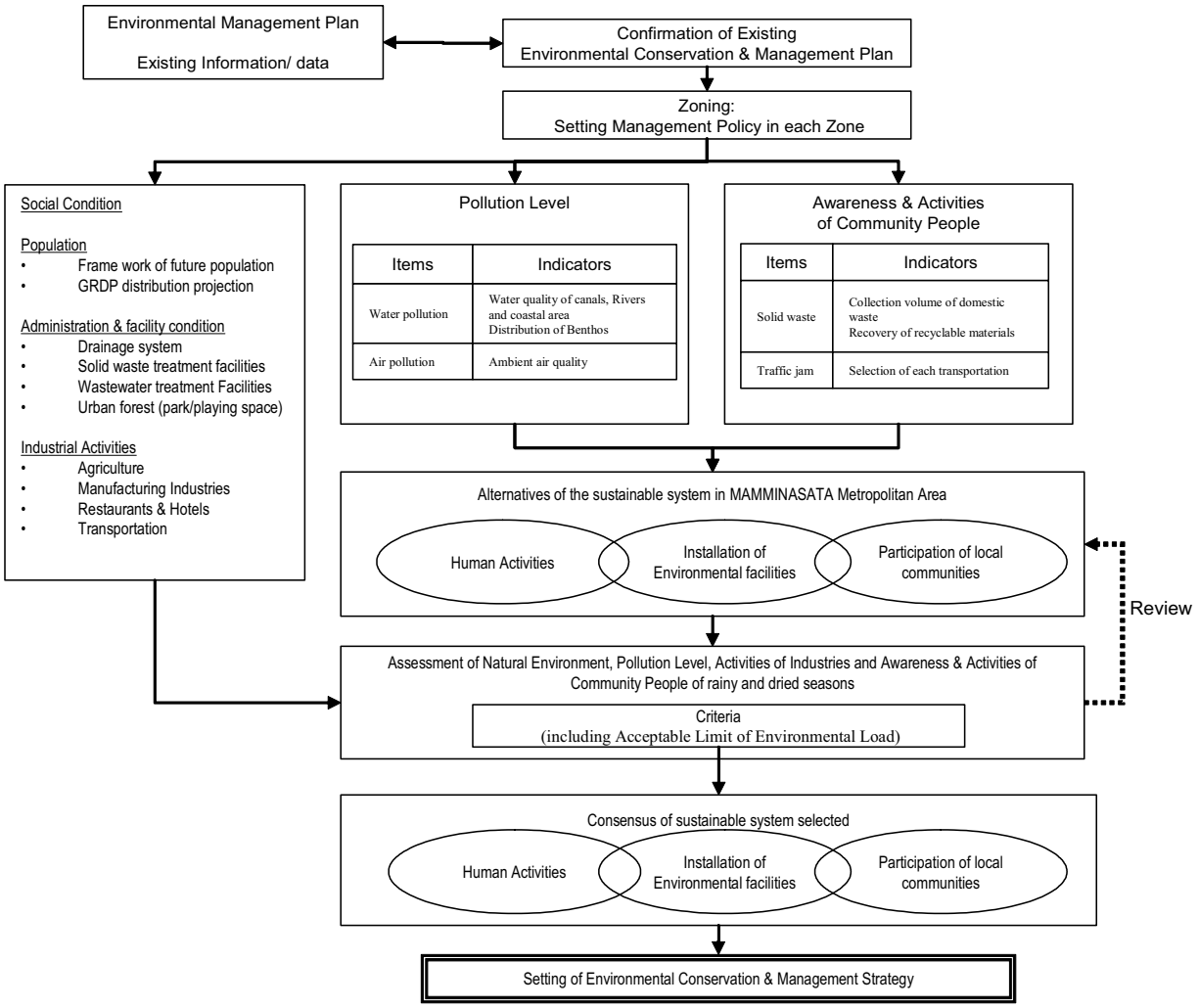


Figure 5.6: Framework of Environmental Conservation and Management Strategy

Preventive measures are to be taken to **r**educe the quantity of effluent, **r**euse the durable materials, and **r**ecycle the resources (**RRR or 3R**). Reduction of the effluent will be programmed for the spatial plan in Mamminasata, including:

(i) Orderly and collective industrial location;
(ii) Reduction in traffic by such means as closer location of working and residential areas, traffic demand management, and improvement in telecommunications;
(iii) Clear demarcation of land use and its restrictions; and
(iv) Reduction in water and energy consumption and losses, together with demand-side management;

Combined with the demarcation of land use, green areas and belts are to be planned and implemented in Mamminasata. Reforestation will also be planned as discussed in the definition of frameworks for the spatial plan.

Reuse and recycling will be programmed mainly for solid waste management, including the possibility to introduce separate solid waste collection and to promote the production of compost. The solid waste management practices in Curitiba, Brazil will be referred to in programming the waste management.

At the same time, public awareness for the environment should be raised by all means. In this context, environmental education will be initiated and promulgated in Mamminasata. Additionally, introduction of the Clean Development Mechanism (CDM) will be studied and implemented in order to reduce the financial burden in reforestation, clean energy development and in other applicable fields.[2]

5.4 Creation of a Recycle-oriented Society

To mitigate the environmental loads, it is proposed that the Mamminasata society be directed towards the creation of a recycle-oriented society. Separation in collection of solid wastes and promotion of recycling of materials are to be planned and promoted by the Mamminasata people.

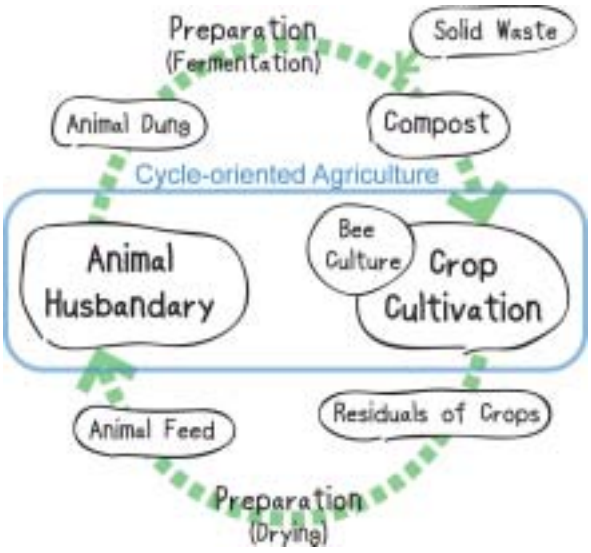


Figure 5.7: Conceptual Diagram of Cycle-oriented Agriculture

The recycle-oriented society is not limited to the urban life, but it is planned to be expanded to the rural life. For instance, agriculturalists are encouraged to use compost fertilizer made of solid waste and to introduce integrated farming and organic farming. The integrated farming is planned, for example, in expanding the cultivation of fruit trees in orchards where livestock breeding is expanded and bee culture is introduced. Such a recycle-oriented farming practice would increase productivity and profitability in agriculture.

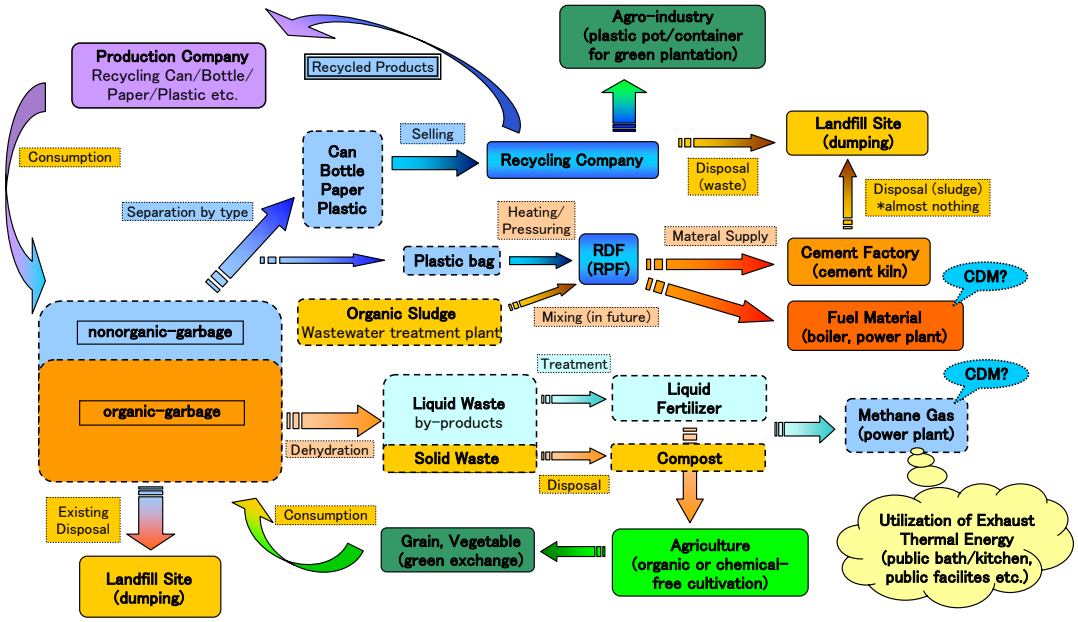
Expansion of the green belts/areas will also contribute to the creation of a recycle-oriented society in Mamminasata. The quantity of CO_2 will be reduced and

[2] Refer to Sector Study Report (3) for detail.

oxygen will be increased by greens in urban and rural areas. When fruit trees are planted, they will increase income.

In the longer term, though as yet it is uncertain whether it can occur before or after 2020, production of plastics made from corn and other starches would be envisaged in the Mamminasata area.

In the implementation of the Mamminasata spatial plan, therefore, it is suggested that the public and private sectors use their wisdom to create and promote a recycle-oriented society by themselves. The environmental education will also be oriented towards this direction.[3]



Source: JICA Study Team

Figure 5.8: A Garbage and Waste Recycling Model

5.5 Enhancement of Locally Added Value

As pointed out in Section 2.3, the value added in the current economic activities in Mamminasata is relatively low. Local resources and raw materials are exported to Surabaya or abroad and products are imported for consumption. For instance, Mamminasata/South Sulawesi is a leading cacao producer in the world, but it is mostly exported as cacao beans with less value added locally. The spatial plan of Mamminasata should be implemented with a view to increase value added in the region.

[3] Refer to Sector Study Report (3) for detail.

Table 5.1: Average Export Value of Cacao Beans (1999-2003)

No.	Country	Export Value (US$1,000)
1	Côte d'Ivoire	1,327,150.6
2	Ghana	481,428.8
3	**Indonesia**	**346,570.8**
4	Nigeria	281,014.8
5	Cameroon	142,610.6
6	Netherlands	135,938.8
7	Estonia	88,831.6
8	Belgium	76,498.4
9	Ecuador	71,616.0
10	Papua New Guinea	44,971.0
	Total (Aggregation)	3,209,979.0

Source: FAO Statistics Database

Table 5.2: Position of Indonesia in Export of Cacao Related Products

Product	Export Value (US$1,000)	World Rank
Cocoa Butter	78,715.0	5
Cocoa Husks & Shells	1581.6	4
Cacao Paste	6,258.0	15
Cocoa Powder and Cake	31,676.8	11

Source: FAO Statistics Database

Another example is transshipment and warehousing via Makassar port. Although a number of warehouses are currently located in the area and more are planned, value added in such a logistical industry appears to be quite low. More value will be added if packaging, labeling and other logistical industries are integrated. As noted in Section 5.1) above, the Mamminasata spatial plan should be implemented to function as a logistical and trade hub, instead of a transportation hub.

This will lead to the conclusion that Mamminasata should be integrated into a **"cluster"** and that the development of business and industrial linkages both vertically and horizontally should be promoted. The land use plan and industrial locations under the Mamminasata spatial plan should be elaborated so that such strategic linkages and integration as a cluster would be promoted in order to enhance the value added in the Mamminasata area.

5.6 Demand-oriented Service Delivery

As pointed out in Section 2.3, the existing Mamminasata spatial plan, the Makassar City Plan and other district spatial plans have incorporated as many projects as the respective authorities are willing to realize. Some of these projects have been planned from a supply-oriented approach. For instance, a plan for railway construction appears to be in this category, as it has not been justified from the demand side. Since the financial resources are limited for public investments and the private sector is encouraged to join the improvement of infrastructure in Mamminasata, the demand for such facilities is a decisive factor for implementation. The Mamminasata spatial plan should be implemented under the

principle that the public services are delivered on the basis of the demands of the people in Mamminasata.

An exceptional case is the reduction of risks in the human and economic activities in Mamminasata. This is because such risks are unpredictable and the demand is often unjustifiable. Risks of environmental deterioration are not easily recognizable but they are quite damaging if left unaddressed until after they become apparent. The public investment under the Mamminasata spatial plan should be more oriented to the reduction of natural hazards and various risks, inclusive of the environmental risks.

It should also be taken into account that the improvement in infrastructure should not always be implemented simply following the increase in demand. There are instances when demand should be controlled by demand side management. For instance, traffic demand management will be indispensable in the urban center in Makassar. Demand-side management is also required for the power supply in Mamminasata.

In the event that the demand-oriented service delivery is pursued, it must be kept in mind that demands are always changing and **flexibility** is required in the implementation. As lessons are learned though the inspection of spatial development in Curitiba, Brazil, the Mamminasata spatial plan should be implemented with flexibility in response to the actual changes in demands.

5.7 Participatory Approach in Spatial Planning and Implementation

A wide range of stakeholders is involved in the implementation of the Mamminasata spatial plan and it is desirable that the stakeholders are involved from the planning stage to the implementation stage. It is a fact that the existing spatial plans are not open to the public yet but rather are kept to a limited interest group.

The supply-oriented service delivery might be planned and implemented by a top-down approach, but, in general, the demand-oriented service delivery should be implemented by a bottom-up approach. Sustainability is maintained if and when the stakeholders are motivated by ownership and they join the operation and maintenance of facilities created for them. In the event that the existing Mamminasata spatial plan and the district spatial plans are implemented as drafted, it is suggested that the plans be open to public review at the earliest possible time and that they would be amended to incorporate the demands of stakeholders for the

best interest of the people in Mamminasata.

It is noted that, through the operation of pilot projects in the course of this study, the people in Mamminasata are willing to join the communities and collaborate together for the betterment of their environment. Though the pilot operation is quite limited in scale, it is understood that the people, once motivated, will actively participate in their programs oriented to create a Creative, Clean and Coordinated Metropolitan Area of Mamminasata.

It is understandable that the open information system applied under the participatory approach would result in an increase in land prices and make land acquisition more difficult for the actual construction of the planned facilities. Such a negative impact should be prevented by applying regulations that any land acquired on or after the date of application of the open information system be valued as on that application date.

5.8 Implementability of Spatial Plans

The land use plan formulated through the spatial planning should be legally authorized and respected by all stakeholders in principle. The legal settings, however, are better defined leaving room for flexibility to allow proper response to any changes in circumstances. On the other hand, the environmental regulations should be thoroughly followed without exception.

As reviewed in Chapter 4, Paragraph 5), the financial situation is a decisive factor for the implementation of the Mamminasata spatial plan. The public investment is relatively limited, and there is a financial gap in implementation. Such a financial gap should be clarified under the spatial plan. Although the central/provincial governments are encouraging the private sector to join in the implementation of various infrastructure improvement activities, the private finance initiative will not always result in success from the viewpoint of the stakeholders.

One of the possible solutions to overcome the financial gap in the implementation of the Mamminasata spatial plan is an introduction of joint private-public finance or partnership (private-public-partnership: PPP). Under PPP, the private and public sectors will cooperate for the best benefits of the people so that the private, public and beneficiaries are in a win-win-win position.

The PPP will not force joint finance, but it will open some opportunities for public and private entities to share in financing a portion of the development projects in

parallel. For instance, a hydropower station may be constructed and operated by private initiative while the transmission line and distribution system is operated by public initiative. For better implementation of the Mamminasata spatial plan, such partnerships should be pursued for the best interests of the people in the region.

Another possibility is to apply a Clean Development Mechanism (CDM) to reduce the costs in environment-friendly investments. For instance, application of CDM would be studied for the promotion of reforestation in Mamminasata and for the implementation of the renewable energy resource development, including hydropower stations.

It would be preferable that the development/improvement projects be implemented in a package or in an integrated form so that the development objectives would be attained more effectively with some synergy effects. For instance, a water supply expansion project could be combined with a sewerage improvement project in a package in order to create a Clean Metropolitan Mamminasata.

In such a manner, the Mamminasata spatial plan should be implemented by mobilizing all possible financial resources as well as consolidating all the wisdom of the stakeholders in Mamminasata.

6. SPATIAL PLANNING

A spatial plan for Mamminasata will be formulated to realize a Creative, Clean and Coordinated Metropolitan Mamminasata. Toward this end, land use zoning will be delineated and environmental policies defined. Additionally, the roles of stakeholders are discussed for better implementation of the spatial plan.

6.1 Land Use Zoning [1]

1) Major Issues

The current land use in Mamminasata (based on IKONOS satellite images in 2003 and updated information) is characterized by a relatively large agricultural area (106,320 ha or about 42.5% of the total land area), decreasing green and forest areas (71,790 ha or 28.7%) and an increasing urban area (14,930 ha or 6.0%). The urban area consists of residential areas (13,140 ha), commercial/business areas (1,290 ha) and industrial areas (500 ha).

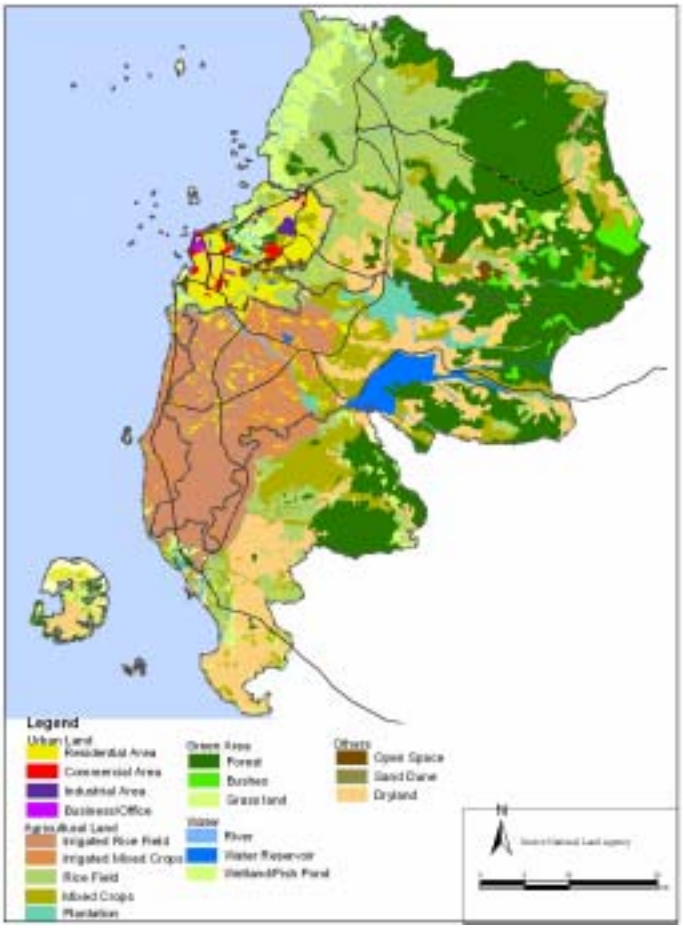


Figure 6.1: Current Land Use in Mamminasata

[1] Refer to Sector Study Report (2) for detail.

The land use plan prepared under the Mamminasata metropolitan spatial plan in 2004, as illustrated below, envisages a larger area of urban settlements (63,500 ha), commercial areas (68,800 ha) and industrial areas (37,200 ha). It does not appear that the land use has been proposed on the basis of estimated land requirements for these purposes. This makes it difficult to understand how to lead the future growth in an efficient and effective manner in the light of future development frameworks.

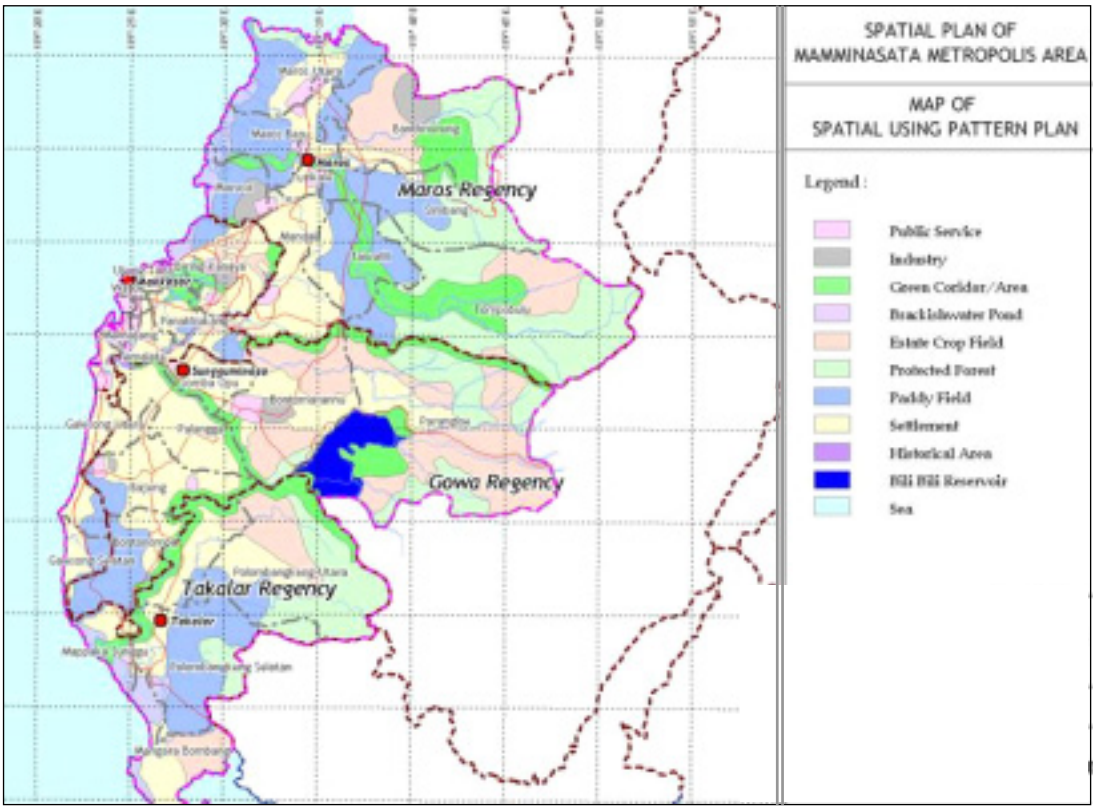


Figure 6.2: Land Use Envisaged under Existing Mamminasata Spatial Plan

The Makassar City Plan, as introduced in Section 2.2, is a relatively ambitious plan designating a sizable land area for industrial and warehousing use. Attention is drawn to the land use in the Tallo river estuary and the reclamation of its flood plain. Ecological impacts of this reclamation are significant, and the flood protection works would require large investments, as it is difficult to control river discharge in the upstream reservoir scheme.

The existing land use plans should be reviewed from the viewpoint of environmental protection, as well as on the basis of the existing conditions and a reasonable estimate of demand for land use requirements.

2) Area of Limited Use for Development

Land use zoning started with the demarcation of the limited use areas in land use planning. These areas will include (i) protected and restricted areas, (ii) areas vulnerable to natural disaster or risks, and (iii) reserve areas for specific use.

The protected area in Mamminasata extends over a forest conservation area to the east of about 26,000 ha (10.4%) (refer to the Presidential Decree NO41/1999). For protection of waterfront, the coast line (100 m from the high tide level) and river banks (100 m on both banks for major rivers and 50 m for small rivers) are restricted lands (refer to the Presidential Decree NO.32/1990 and Government Regulation NO.47/1997). In this context, special attention should be drawn to the land use in the Tallo river estuary and its downstream basin.

Figure 6.3: Protected Forestry Area regulated by Presidential Decree

Figure 6.4: Demarcation Area for Coast Line and Major Rivers Regulated by PD

The flood prone areas and wetlands in Mamminasata should be clearly demarcated and their use should be carefully discussed from the viewpoint of prevention of risks and protection of the environment. The lands subject to floods extend over 15,500 ha along the Tallo and Maros rivers, as shown on the map.

Figure 6.5: Existing Flood Area and Wetland Area (as of 2005)

Figure 6.6: Existing and Proposed Technical Irrigation Areas

The reserved land will cover the land irrigated by the Bili Bili irrigation project (23,600ha). Marginal land within the irrigated area (up to a maximum of 5%) may be converted to residential and other uses if it is approved by the authorities concerned. Even if this is done, the total benefits to accrue from the Bili Bili project would not decrease.

If the areas demarcated for restricted use, hazardous areas and reserved lands are mapped in a combined form, the limited use areas for development are demarcated as shown in the figures.

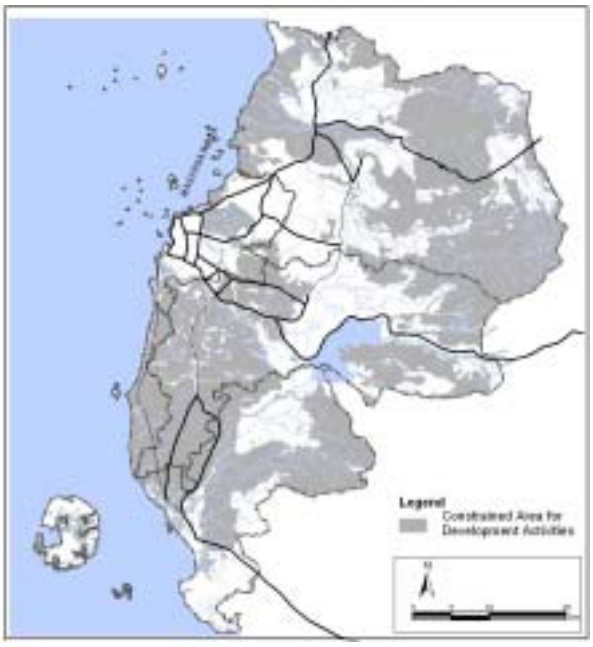


Figure 6.7: Constrain Area for Development

3) Land Use Demand

As noted in Section 4.1, the population in Mamminasata will increase by about 630,000 (from 2.25 million in 2005 to 2.88 million in 2020). The lands for expansion of the residential area in Makassar are limited, and the people will reside more in suburbs, mostly in Maros and Gowa in the near future. The population in Takalar will increase more or less at the average rate of population increase in Mamminasata (about 1.6% per annum).

The Mamminasata Metropolitan Spatial Plan envisages a relatively large area for residential land use, totaling around 63,500 ha. This appears excessive. By guiding people to reside in high density multi-family apartment houses, less land will be required. The JICA Study Team estimates that the land requirements for residential use will increase by 7,000 ha during the plan period (from 13,000 ha in 2005 to around 20,000 ha in 2020). This estimate is based on the following calculation:

600,000 pop (2005-2020) ÷ 70 pop/ha (average of Makassar city in 2003) ≒ 8,500 ha
8,500 ha ÷ 120% (improvement in landuse efficiency) ≒ 7,000 ha

The Mamminasata Spatial Plan envisages that the residential zones will be developed to the east of Makassar, i.e., in the regency of Makassar, Gowa and Maros. This direction is reasonable in view of the land availability. However, the residential areas should be duly planned in combination with the transportation network. Without this combined approach traffic congestion will become a major problem due to developing the new residential areas.

Based on the population projection and the current land use, it is planned that the newly developed residential areas would be distributed as shown in the following diagram.

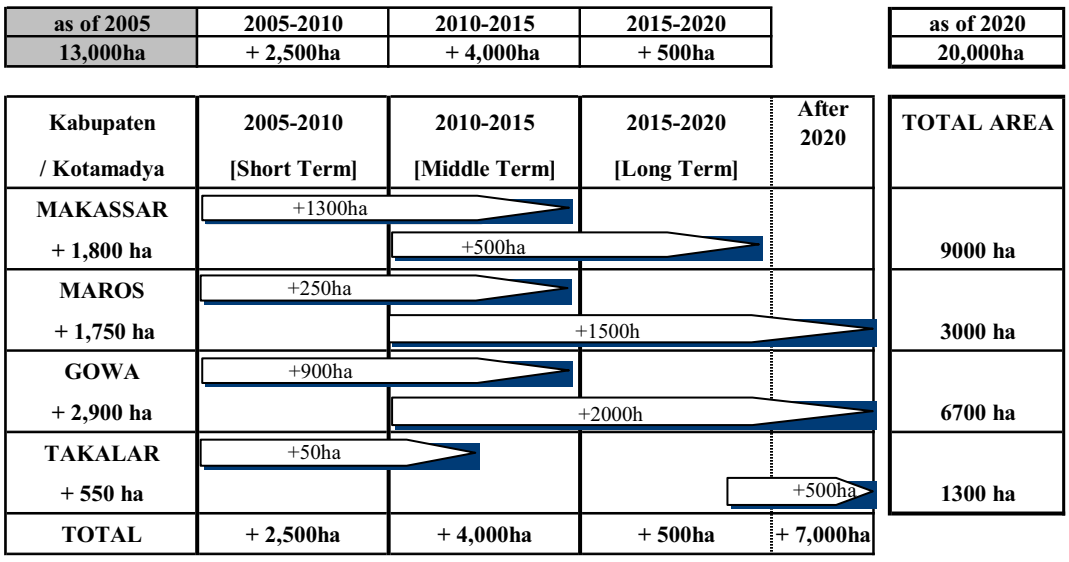


Figure 6.8: Distribution and Phases of Residential Land Development

Through the distribution of residential land development, it is expected that future population in each regency in 2020 will increase as shown in the following figure. It is expected that a trend of population concentration to Makassar city would be alleviated by guiding residential development to other regencies than Makassar.

Figure 6.9: Allocation of Future Population in each Regency

In the meantime, the land required for industrial development is estimated to be around 700 ha in net (as discussed in Section 7.2) or 1,500 ha in gross for land use zoning. In view of the potential industries and industrial locations, it is planned that the industrial lands would be located in the following manner.

as of 2005	2005-2010	2010-2015	2015-2020
500 ha	+ 200 ha	+ 300 ha	+ 200 ha

as of 2020	
1,200 ha (Net)	2,000~3,000 ha (Gross)

Kabupaten / Kotamadya	2005-2010 [Short Term]	2010-2015 [Middle Term]	2015-2020 [Long Term]	Total Area (Net)	Total Area (Gross)
MAKASSAR	200ha	*Low Availability of Developable Land*		700 ha	1,000~1,500 ha
MAROS	*Improvement of Infrastructure*	300ha	50 ha	350 ha	700~1,000 ha
GOWA	*Improvement of Infrastructure, Generation of local resource based industry*		100ha	100 ha	200~300 ha
TAKALAR	*Improvement of Infrastructure, Generation of local resource based industry*		50ha	50 ha	100~200 ha
TOTAL	200ha	300ha	200ha	1,200 ha	2,000~3,000 ha

Figure 6.10: Distribution and Phases of Industrial Land Development

It is noted that the existing district spatial plans have envisaged a larger area of land for industrial use as a result of the supply-oriented industrial planning while the above proposed industrial land use plan is based on a demand-oriented land use plan.

It is suggested that each regency formulate an industrial development strategy on how to attract investors and identify what categories of industries are potentially to be promoted.

4) Land Use Zones

The Law of Spatial Planning (Law No.24/1992), which is under revision by the Ministry of Public Works, classifies land use into "Protected Zones" and "Cultivation Zones".

Basically, it is planned that the Mamminasata area will be zoned into (i) Urban Planning Zone, (ii) Semi-Urban Planning Zone, (iii) Production Forest Zone and (iv) Protection Zone. The first three zones are "Cultivation Zones", while the last zone is a "Protected Zone" corresponding to the definition under the national law. In Mamminasata, Makassar municipality and the surrounding area will be classified as urban planning zones, while the forest land to the east of Mamminasata is classified as a production forest zone or conservation zone. The land area situated between them will be a semi-urban planning zone.

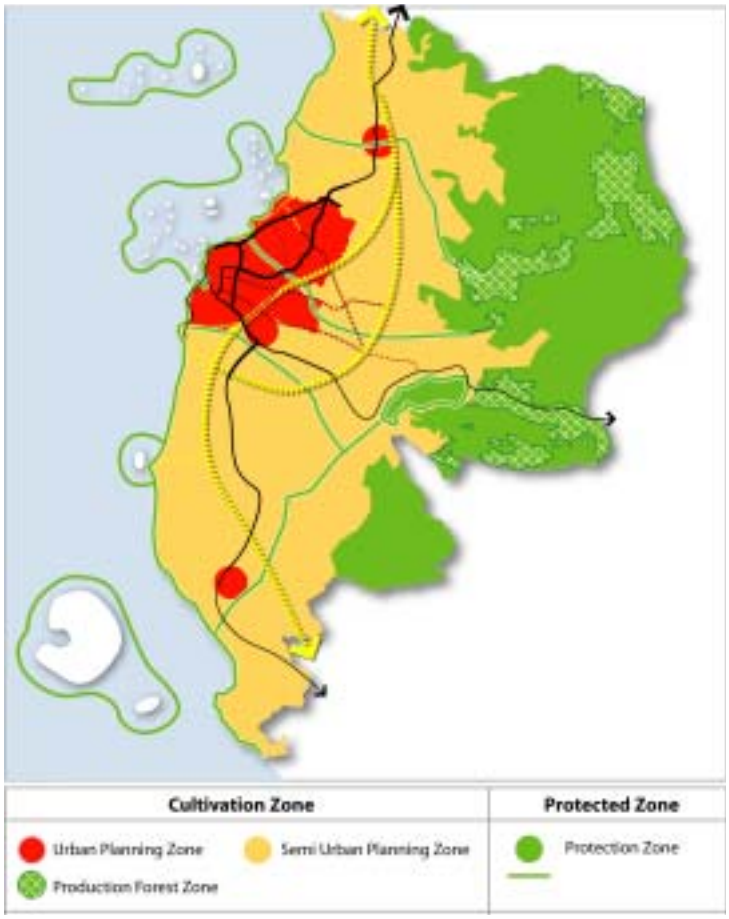


Figure 6.11: Land Use Zones

The four land use zones are further categorized in the following manner.

Law No.24/1992	*4-zones for Mamminasata*		*9-areas for Mamminasata*
Cultivation Zone	Urban Planning Zone	--	Promotion Area [Category 1]
		--	Promotion Area [Category 2]
		--	Control Area
	Semi-Urban Planning Zone	--	Agricultural Priority Area
		--	Agricultural and Settlement Area
		--	Control Area
	Production Forest Zone	--	Afforestation Area
Protected Zone	Protection Zone	--	Protection Area
		--	Water-front Reserves

Figure 6.12: 4 Land Use Zones and 9 Land Use Areas

The distribution of land use zones in Mamminasata is proposed as illustrated below.

Figure 6.13: Land Use Areas

The protection zone will cover nearly 90,000 ha, including the protected area of about 25,000 ha (Law No.41/1999) and existing forest land of about 65,000 ha. The area appropriate for afforestation, as production forest, is around 22,000 ha, which is around 90% of the goal set for the additional green area (around 25,000 ha).

As seen on the zoning map, the flood plain in the estuary of the Tallo River is designated as a "control area" in the urban planning zone. Although the drafted Makassar City Plan envisages reclaiming a majority of this land for warehousing and other uses, it is not recommended to reclaim the estuary because it will have negative impacts on the surrounding environment. It is also because the hydrological simulation indicates that the reclamation will result in serious drainage problems in the existing urban center in Makassar.

On the other hand, a land use concept in Mamminasata has been formulated in line with the framework set for the spatial structure. The general concept has been discussed with stakeholders as shown in the following figure.

Figure 6.14: Land Use Concept for Mamminasata

5) Land Use Guideline

A land use guideline should be established to appropriately regulate development activities in the respective zones and areas designated in the land use zoning. A general preliminary outline of the guideline has been prepared, as shown in the following table, while further discussion and technical examination is necessary in combination with spatial designation in land use zoning.

Table 6.1: Land Use Guideline

Zone	Area	Permissible Land Use			
		Industry	Housing	Commercial	Education/Social
Urban Planning Zone	**Promotion Area [Cat. 1]** approx. 200 km^2	**Yes/No** - Industry Type - Development Scale - Infra. Conditions	**Yes**	**Yes**	**Yes**
	Promotion Area [Cat. 2] approx. 20 km^2	**Yes/No** - Industry Type - Development Scale - Infra. Conditions	**Yes**	**Yes**	**Yes**
approx. 250 km^2	**Control Area** approx. 30 km^2	**No**	**No**	**No**	**Yes/No** - Development Scale
Semi-urban Planning Zone	**Agricultural Priority Area** approx. 350 km^2	**No**	**No**	**No**	**Yes/No** - Development Scale
	Agricultural & Settlement Area approx. 940 km^2	**Yes/No** - Industry Type - Development Scale - Infra. Conditions	**Yes/No** - Planned Population - Development Scale - Infra. Conditions	**Yes/No** - Development Scale - Infra. Conditions	**Yes/No** - Development Scale
approx. 1,450 km^2	**Control Area** approx. 60 km^2	**No**	**No**	**No**	**Yes/No** - Development Scale
Production Forest Zone approx. 220 km^2	**Afforestation Area** approx. 220 km^2	**No**	**No**	**No**	**Yes/No** - Ecological-wise
Protection Zone	**Protection Area (Existing Forest)** approx. 900 km^2	**No**	**No**	**No**	**Yes/No** - Ecological-wise
approx. 930 km^2	**Water-front Reserves** approx. 30 km^2	**No**	**No**	**No**	**Yes/No** - Ecological-wise

Classification of the Index: [Yes] Promoted, [Yes/No] Conditional, [No] Prohibited
Note: Even in case of [No], existing building right is protected.

In line with the guideline, the areas for new residential areas, industrial sites, educational sites, green parks, and fishery centers have been planned as shown in the following figure.

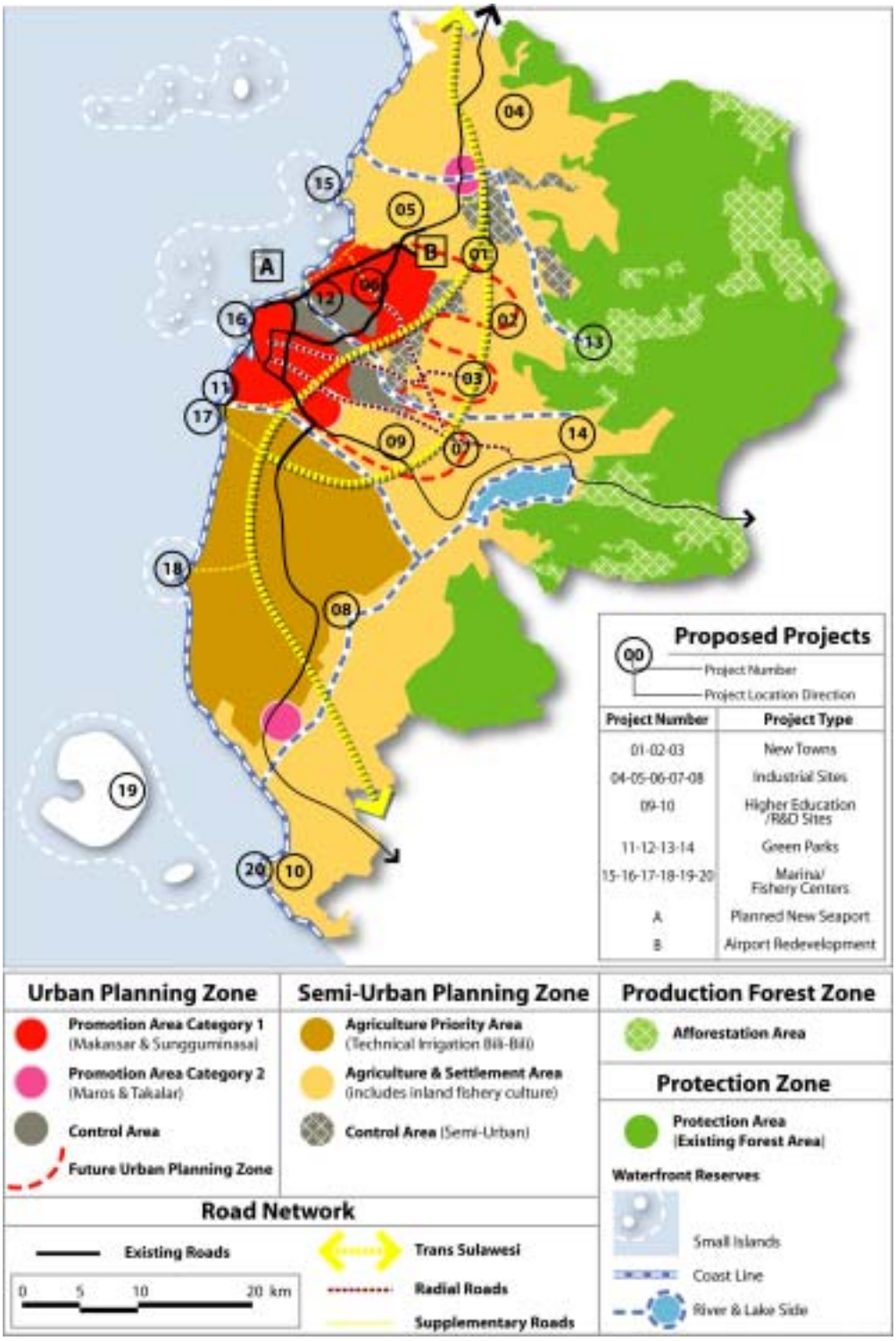


Figure 6.15: Proposed Projects in Land Use Zoning

From the viewpoint of spatial planning, the Mamminasata metropolitan area is evaluated to be appropriate for designation as a "special area" under the National Spatial Plan.

To make Mamminasata a clean metropolitan area, more is needed than to simply

designate it a special area under the Law. For instance, a lack of regulation on building space has been causing congestion and lack of green space or amenities in the urban area. In order to strategically develop residential areas and to ensure the living environment and amenities, it is desirable that the existing building regulations be reviewed and new ones enacted, in addition to the land use guideline, for Mamminasata [2].

6) Development Promotion Model Area

Through working group discussions, development promotion model areas are selected from the proposed projects under the following criteria.

(i) To be situated in an Urban or Semi-Urban Planning Zone but not in a Production Forest Zone nor Conservation Zone;

(ii) To be a model in terms of urban planning technology, of which the approach can be referred/applied to future similar development cases, and

(iii) To be a flagship/strategic development which can represent the concept of CCC Mamminasata.

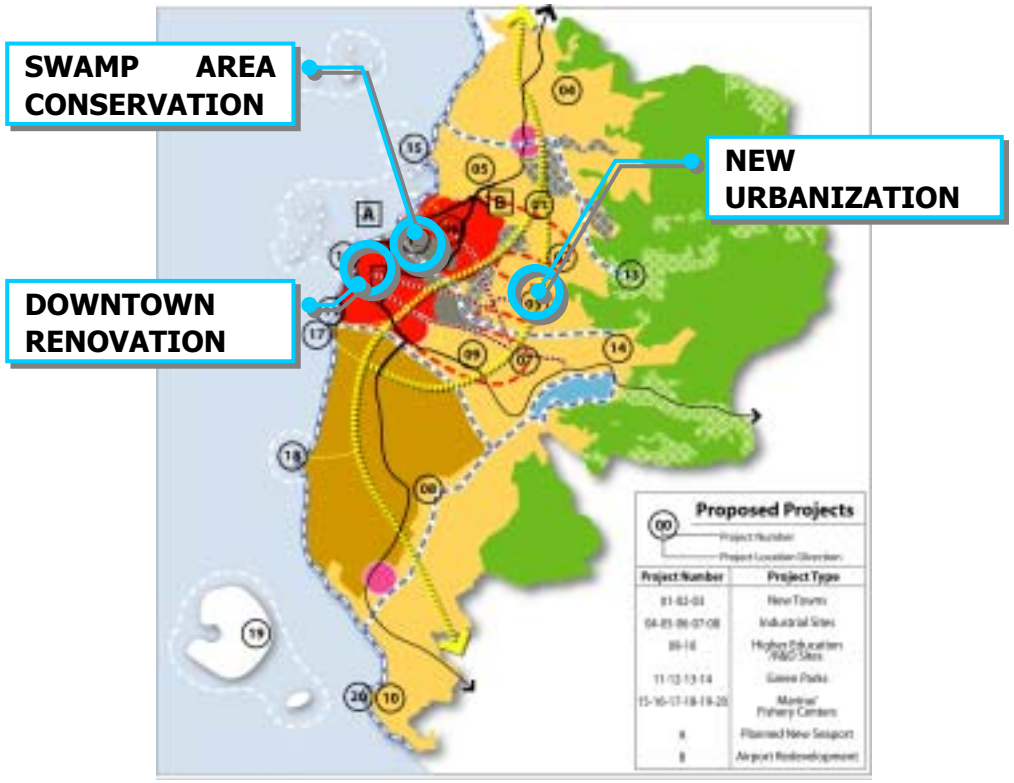


Figure 6.16: Development Promotion Model Area

There are three development promotion model areas have been identified as shown in the above figure. Development images in each area are prepared as follows:

[2] Refer to Chapter 11.

(1) Swamp Area Conservation

Being situated in a *control area* in an *urban planning zone*, where most development activities are regulated except for educational or social purposes up to a certain development scale, in accordance with the land use guideline (preliminary).

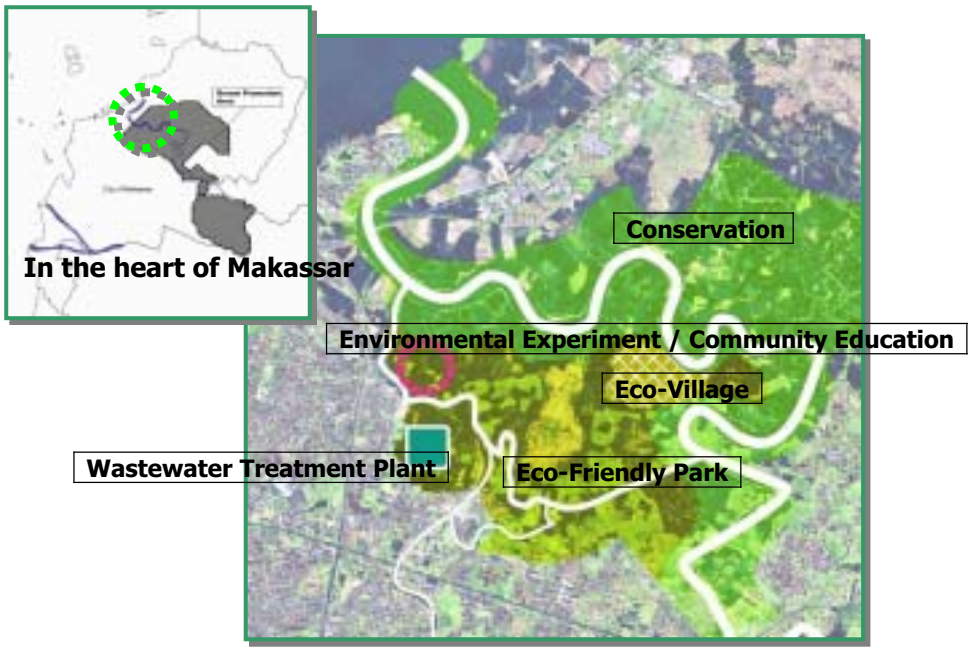


Figure 6.17: Development Image of Swamp Area Conservation

(2) Downtown Renovation

Being situated in a *promotion area category 1* in an *urban planning zone*, where most development activities are allowed but type, scale and infrastructure conditions are regulated in industrial developments, according to the land use guideline.

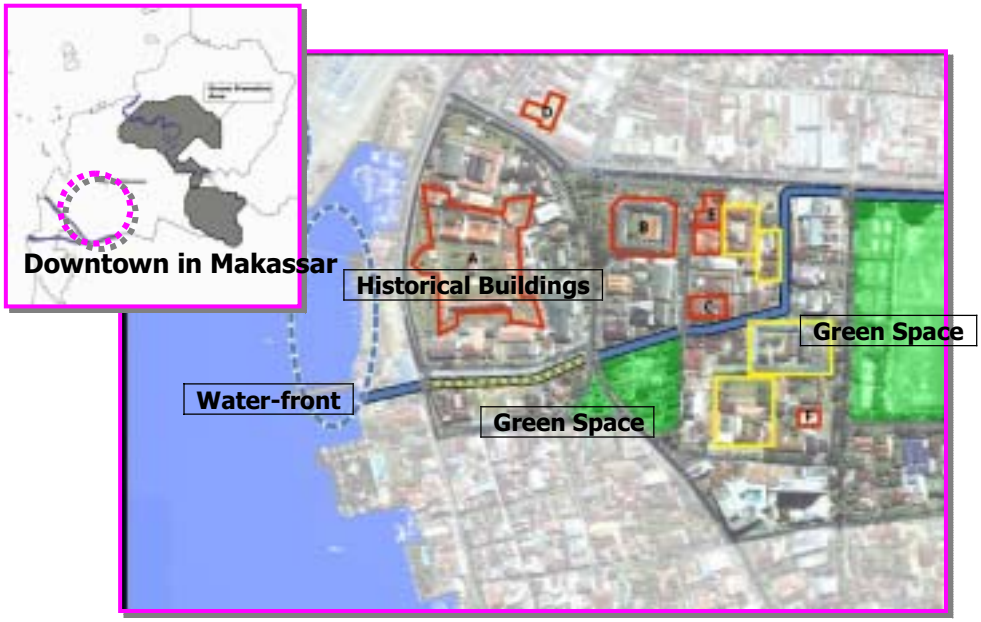


Figure 6.18: Development Image of Downtown Renovation

Since downtown area has many historical heritages constructed in old days, it is appropriate to develop the area for the purpose of urban tourism enhancement. This area is, in principle, to be developed under a rather strict land use regulation, with lower building coverage and floor ratio, to retain the urbanscape in good conditions, even though it is not so effective from economical view in land use.

A model plan of combination of downtown renovation (Figure 6.18) and high utilization of land in the suburbs (Figure 6.19) are presented, as sample image, where conservation of downtown area and higher utilization along a major road is drawn.

Downtown area of Makassar, where many historical heritages remains, will be conserved under regulated development volume to contribute to urban tourism enhancement, while suburban area of Makassar, especially along the major roads such as Jl. Pettarani and Jl.Sultan Alauddin should be more highly utilized in land use together with reallocation of government office which is now scattering around the roads.

Figure 6.19: Development Image of Higher Utilization in Land Use along a Major Road

(3) New Urbanization

being situated in an *agriculture and settlement area* in a *semi-urban planning zone*, where most development activities are allowed but to a limited extent in accordance with the land use guideline (preliminary). Development scale should be regulated to be large enough to avoid small and scattered developments to promote development efficiency.

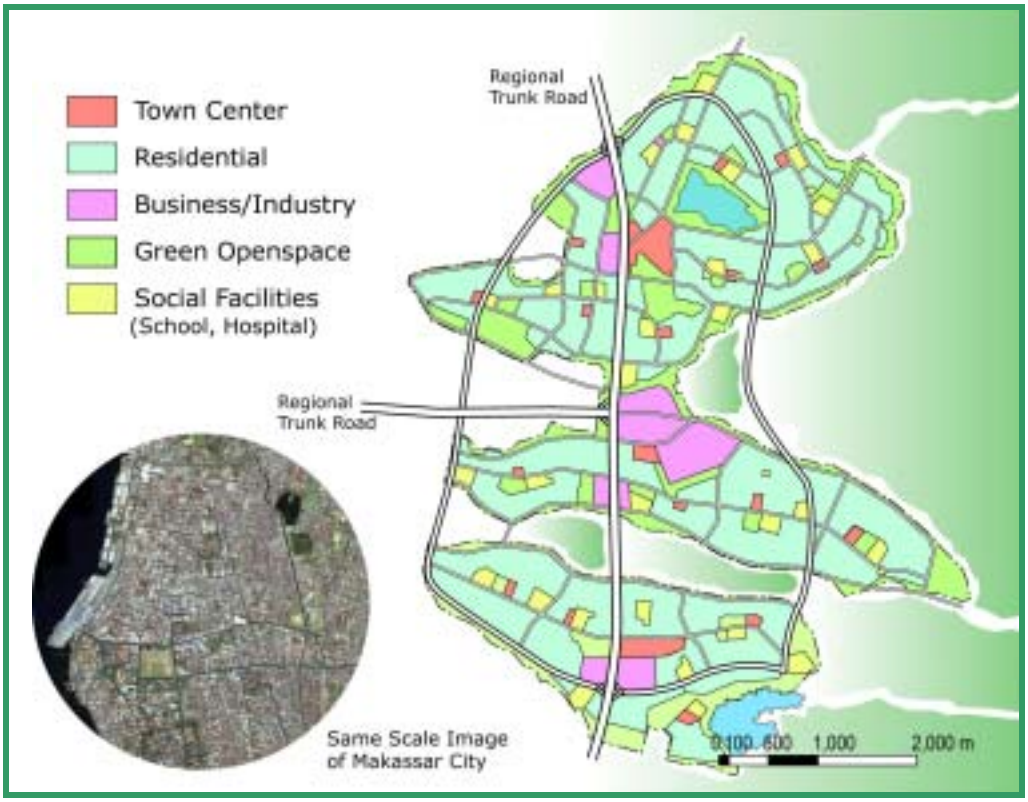


Figure 6.20: Development Image of New Urbanization

6.2 Environmental Improvement and Enhancement [3]

1) Major Issues

Despite the naturally endowed beauty along the coast to the west and in the mountainous forests to the east, the environment of Mamminasata has been deteriorating mainly due to the increasing population and economic activities in recent years. People's awareness of the environment is at the relatively low level. Unless proper measures are taken, Mamminasata will turn out to be an uncomfortable area in which to live, particularly in urban areas.

Photo: Dark water in drainage canal where solid waste are floating and emitting offensive odors

[3] Refer to Sector Study Report (3) for detail.

Monitoring of water quality, particularly the organic matter content, along major rivers and canals has revealed that the standards and regulations are not always followed as shown below.

Table 6.2: Representative Values of Water Quality Analysis

Parameters	Unit	Tallo River		Jeneberang River		Canal		Marine Life	Marine Tourism
		2004/12/10		2004/12/8		2004/		2004/7/6	
		Tello Bridge (ST.4)	Tallo Toll Bridge (ST.6)	Sungguminasa Bridge (SJ.5)	Benteng Somba Opu (SJ.6)	Pannampu street	Urip Sumoharjo street	Estuary of Tallo River	Around Losari Beach
Physical :									
Total Dissolved Solids (TDS)	mg/l	605	-	123	214	1,640	13,400	43,801	846,347
Total Suspended Solid (TSS)	mg/l	163	601	454	111	-	-	333	370
Chemical									
pH	-	6.96	8.58	7.45	7.48	7.129	7.382	8.16	8.27
Iron (Fe)	mg/l	0.58	0.26	2.04	1.87	0.728	0.099	1.033	0.744
Mangan (Mn)	mg/l	0.27	0.10	0.105	0.096	1.2171	0.2399	tt	tt
Cupper (Cu)	mg/l	tt	tt	tt	tt	-	-	0.191	0.183
Zinc (Zn)	mg/l	0.061	0.095	0.054	0.087	tt	tt	0.184	tt
Total Chromium (Cr)	mg/l	tt	tt	tt	tt	-	-	tt	tt
Cadmium (Cd)	mg/l	0.004	0.194	tt	0.001	tt	0.0622	0.006	tt
Lead (Pb)	mg/l	tt	0.260	0.258	0.139	0.0174	0.0099	-	-
Calcium Carbonate ($CaCO_3$)	mg/l	-	-	-	-	600.48	3,823.05	-	-
Nickel (Ni)	mg/l	0.410	0.482	0.463	0.365	-	-	0.174	0.719
Organic matter ($KMnO_4$)	mg/l	8.22	19.28	3.16	5.37	158	50.56	-	-
Hydrogen Sulphine (H_2S^-)	mg/l	0.004	0.006	0.044	0.027	-	-	-	-
Disolved Oxigen (DO)	mg/l	3.88	2.8	7.14	7.14	0	1.5	6.2	6.6
Chlouride (Cl^-)	mg/l	225.08	7,022.2	3.88	50.44	1,616.52	9,146.10	-	-
Flourine (F^-)	mg/l	-	-	-	-	1.0112	tt	-	-
Sulphate (SO_4)	mg/l	43	1,000	17	20	71.3	236	-	-
Amonium (NH_3-N)	mg/l	0.88	2.36	0.11	0.13	-	-	-	-
Nitrate (NO_3-N)	mg/l	0.416	0.245	1.007	0.715	3.4	2.5	0.4	0.3
Nitrite (NO_2-N)	mg/l	0.152	0.038	0.144	0.065	0.026	0.059	0.004	0.003
BOD_5	mg/l	3.056	5.33	1.44	3.06	620.0	43.7	23.0	29.9
COD	mg/l	9.50	20.0	4.0	6.30	1,702	126	52.0	59.0
Detergent	mg/l	-	-	-	-	1.02	1.95	-	-
Metil blue active compounds	mg/l	0.244	0.494	0.03	tt	-	-	-	-
Mineral oil	mg/l	tt	tt	tt	tt	-	-	-	-
Bacteriology :									
Fecal Coliform	MPN/100ml	20	1,100	1,100	50	-	-	-	-
Total Coliforms	MPN/100ml	700	2,200	1,700	1,100	-	-	-	-

Notes : Exceeding the standard
Remaks :
1) River/Canal Water Quality : Governmental Regulations No.82-2001
2) Sea Water Quality : Ministry of Environment Decree No.51-2004
Source :
1) River/Canal Water Data : Hasil Pengujian Kuakitas Air, Laut Tanah dan Udara di Provinsi Sulawesi Selatan Tahun 2004 (Testing Result of Water, Sea Water, Land and Air Quality of South Sulawesi Year 2004) BAPEDALDA South Sulawesi
2) Sea Water Data : Kajian kualitas limbah cair pada beberapa titik kanal/sungai di Kota Makassar (Quality study of waste water at some canal/river in Makassar city), BTKL Makassar 2004

Air pollution along the main streets in Makassar has been deteriorating. The ambient air quality analysis shows that the values of PM_{10} for 24 hours are exceeding the national and provincial standards, as tabulated below.

Table 6.3: Representative Value of Ambient Air Quality

	NO.	SO_2 μ g/Nm3	CO μ g/Nm3	NO_2 μ g/Nm3	O_3 μ g/Nm3	PM_{10} μ g/Nm3	TSP μ g/Nm3	Pb μ g/Nm3	Nox μ g/m3	Remarks
analysis result *1)	1 Karebosi	116.27	-	17.55	109.68	204.20	188.19	1.78	10.34	15-Jul-04
	2 Stadion Matoangin	125.73	-	1.41	83.47	191.06	219.08	1.37	6.22	16-Jul-04
	3 Hertasning (Lapangan)	120.84	-	7.60	148.07	174.28	196.40	1.11	3.94	21-Jul-04
	4 Depan Kantor Keuangan	107.65	-	7.36	63.09	178.90	179.17	2.15	3.64	12-Jun-04
	5 Pasar Sentral Depan NV Haji Kalla	129.52	-	24.30	105.60	394.34	380.05	2.21	26.38	11-Jun-04
	6 PT. Berdikari (Pelabuhan)	112.43	-	39.15	55.13	276.40	205.87	1.05	25.90	13-Jun-04
	7 KIMA	98.76	-	62.12	68.33	308.63	291.18	1.62	29.96	27-May-04
National standard for ambient air quality *2)										
measured duration	1 hour	900	30,000	400	235	-	-	-	-	
	24 hours	365	10,000	150	-	150	230	2	92.5*4)	
	1 year	60	-	100	50	-	90	1	-	
Local standard for ambient air quality *3)										
measured duration	1 hour	900	30,000	400	230	-	-	-	-	
	24 hours	360	10,000	150	-	150	230	2	92.5*5)	
	1 year	60	-	100	50	-	90	1	-	

Notes: Exceeding the standard
Source:
*1) "*Hasil pemeriksaan kualitas udara KOTA MAKASSAR tahun 2004* (Examination Result of Makassar city Year 2004)" : → 24 hours survey
*2) Government Regulation regarding Control of Air Pollution No.41-1999
*3) Governor's Regulation of South Sulawesi Province No. 14-2003
*4) Governor's Dgree of the Minister for Environment concerning Guidekines for Establishment of Environmental Quality Standards No.2-1988
*5) Governor's Dgree of South Sulawesi Province No.465-1995

Major issues to be addressed in Mamminasata, therefore, are summarized as (i) water pollution on land and in the ocean and coastal areas, (ii) solid waste management, (iii) air pollution, which is mainly caused by increased traffic, and (iv) expansion of green spaces.

2) Environmental Strategy

Despite the fact that the water and air quality is deteriorating in Mamminasata, there are some encouraging movements towards the creation of a better environment. For instance, a block of environment-friendly streets called "Kasi Kasi" has been developed and a private "green school" is teaching environmental education. Lakang village is attractive for creation of an environment-friendly village even in the urban zone of Makassar.

Photo: Kasi-Kasi Street

Public awareness is the most important factor to make Mamminasata a clean metropolitan area. BAPEDALDA has established a strategic plan for environmental management for Makassar City for 2001-2005 to promote (i) environmental awareness enhancement for all stakeholders, (ii) motivation enhancement employing the communities' initiative and creativity, and (iii) partnership and cooperation among all stakeholders and at all levels of communities. The strategy appears to be excellent, but no concrete action has been taken by the stakeholders. For the implementation of the Mamminasata spatial plan, it would be better to choose some realizable action programs, even if they are small, and disseminate them gradually in a wider area. This is one of the lessons learned from the experience of Curitiba, Brazil.

In the course of this Study, pilot projects have been operated for solid waste management and afforestation with the following sub-projects:[4]

(i) Healthy exchange project (clean canal activity);
(ii) Garbage management at households (garbage separation);
(iii) Practical environmental education at schools (garbage and tree planting); and
(iv) Integrated environmental improvement in the controlled land zone in Makassar (at the Lakang area) involving school children and the community.

The "healthy exchange project" is an exchange of garbage for food in the low income area along the drainage canal in Makassar, twice a week, and it is executed under the cooperation of NGOs. It aims at the attainment of healthy living conditions by creating the awareness of slum residents that the canal is NOT a garbage dumping site. Garbage collected by children and house wives is transported by "becak" drivers to a city office arranged truck loading site for exchange for foodstuffs.

Photo before garbage collection

Photo after garbage collection

Photos showing before and after Green Exchange Program (Pilot)

[4] Refer to Annex to Sector Study Reports (3) and (10).

The garbage separation at households, on the other hand, was put into trials in 6 residential blocks of high and middle income levels for separation of recyclable and non-recyclable solid wastes. Environmental education and practice at primary schools is aiming at collection of recyclable wastes and tree planting (100~1,000 trees per school every year) in collaboration with headmasters, PTA, teachers and NGOs. The integrated environmental improvement at Lakkang will introduce the value of recyclable materials by planting 500 trees in the village.

Photo: Community-based Tree Plantation in Lakkang

Photo: Tree Planting Promotion in Takalar

Based on the current situation and the needs for protection of the environment, several strategies will be applied in creating a clean Mamminasata metropolitan area. They would include:

(1) Green Campaign

To attain the target set under the framework (refer to Section 4.6), green areas in Mamminasata will be expanded by the efforts of all stakeholders. A green week will be designated sometime in October, and the Governor of South Sulawesi will take the initiative to promote planting of trees in private and public spaces. A clear target will be set annually for the planting area and/or the number of plants. This will lead to the formation of green belts/spaces in and around the urban area as well as along the river courses. Some spaces are also proposed for the reforestation program (refer to the Land Use Concept in Section 6.1). At the same time, trees for protection in the urban area will be demarcated for prohibition of cutting.

(2) Conservation of Waterfront Areas

While a number of new city plans call for creating artificial lakes and waterfront areas for the comfort of the residents, Mamminasata is blessed with the natural oceanic and river front. There is no reason to diminish such a natural endowment. The waterfront areas will be strategically conserved as public assets and used for parks, green belts, recreation areas and so forth.

(3) Conservation of Tallo River Estuary

The estuary of the Tallo River is currently a flood plain and a variety of natural conditions are preserved. The Makassar City Plan envisages reclaiming this estuary for industrial and warehousing development. The Middle Ring Road is planned to be constructed across the estuary. The JICA Study Team is of the opinion that the Tallo river estuary should not be developed for such purposes but rather preserved for waterfront and green areas. For implementation of the Makassar Plan, further discussion should be held among the stakeholders in Mamminasata.

(4) Maintenance of Drainage Canals

Flood drainage canals have been constructed in Makassar and floods of the Jeneberang River up to the magnitude of a 50 year event have been controlled by the Bili Bili dam and reservoir. During the dry season, however, drainage canals have no flow and stagnated water becomes a cause of pollution. Management of the drainage canals should be improved in due consideration of the designed water budget downstream of the Jeneberang river.

(5) Control of Wastewater Discharge

Direct discharge of industrial wastewater as well as effluents from restaurants, hotels and households should be controlled in the urban area. Septic tanks should be installed to serve the residents of the rural areas. Installation of a sewerage treatment plant will be discussed in a later Section.

(6) Improvement in Air Quality

As pointed out previously, air pollution along the congested roads is exceeding the government standards. The road traffic volume should be controlled by shifting to public transport systems, and vehicle inspections should be strengthened, particularly for the control of lead (Pb). A study will be made on the balance of gas emissions and increasing the absorptive capacity by means of tree planting in the urban areas.

(7) Application of a Clean Development Mechanism (CDM)

For tree planting in the sizable green areas in Maros, Gowa and Takalar, a reforestation program will be formulated, and the possibility of funding application for CDM will be sought. The reforestation program would incorporate a planting program of fruit trees so that it would contribute at the same time for diversification and enhancement of agricultural products. Possible application of CDM will be discussed for development of renewable energy for the Mamminasata area.

(8) The national regulations on the environmental standards are in force, inclusive of Regulation No.82/2001 on water pollution control. At the provincial level, the Governor Decree No.14/2003 is promulgated for control of (i) water quality, (ii) discharged wastewater quality, (iii) ambient air quality, (iv) industrial emission gas quality, (v) noise level, and (vi) vibration. However, monitoring of water quality along major rivers and canals has revealed that the standards are not always followed, particularly the organic matter content.

Additionally, solid waste management should be implemented as discussed later in Chapter 8.3

3) Plan Formulation and Implementation

With a target of green area set under the framework as discussed in Section 4.6, the existing green open space of about 71,900 ha. (28.7% of total land) will be expanded in each planning zone. Potential areas for green area expansion will be planned in each zone and district as shown in the following diagram.

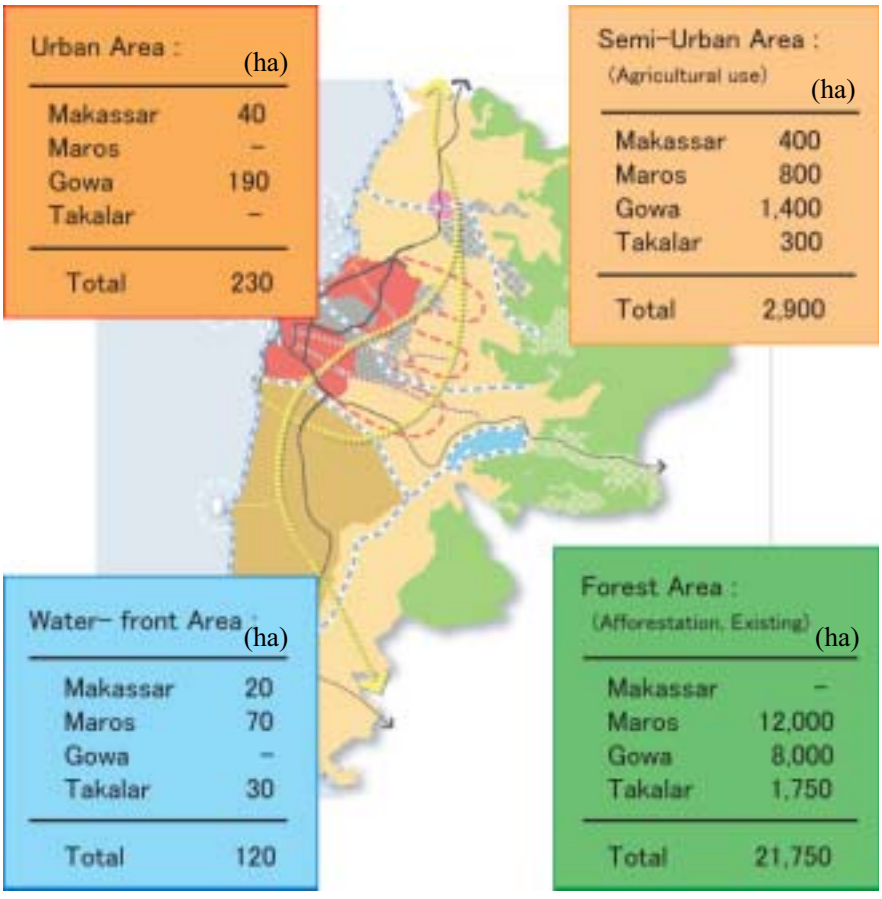


Figure 6.21: Green Area Expansion Plan

In the urban zone in Makassar and Gowa, about 5% of the existing built-up areas would be planned for green areas (e.g., parks). In the semi-urbanized zone, more green areas would be secured, totaling about 2,900 ha or equivalent to around 20% of the zone. The wetland along the coastal line in Makassar, Maros and Takalar, totaling around 120 ha, would also be targeted for green area to make eco-friendly coastal zone. River banks and road sides will also be planned for green area. In the conservation zone, the deforested land and bush area would be planned for afforestation, totaling around 20,000 ha. In addition, some undulated lands of about 1,800 ha in Takalar will be targeted for green area. Consequently, a total of 25,000 ha will be newly planted and the Mamminasata green area will become 96,800 ha or 38 % of the total land area.

In addition to the green area expansion plan, a number of programs are proposed for the betterment of the environment and amenity in Mamminasata, as enumerated in the following. It is noted that some additional programs are to be proposed under the improvement of drainage systems, sewerage improvement systems and solid waste management systems in the latter part of this report.

(1) Promotion of Environmental Awareness

Green campaigns will be organized by the public authorities as well as by NGOs. A green campaign will be led by the Governor at the provincial and regency levels. Each municipality and regency will designate an annual target for tree planting in line with the framework set under this study. NGOs and communities will collaborate in promoting this campaign. At the same time, environmental education will be disseminated, learning lessons from the pilot program executed in the course of this study, as well as lessons from the existing informal education at green schools and the “Kasi Kasi” street full of trees and flowers. Likewise, the environmental awareness campaign will be gradually expanded, learning lessons from the pilot green exchange program. It is also planned that a “Bupati Award” (an award from the regency governor) would be granted annually to the most beautiful block in urban and rural/village areas in each municipality and regency.

(2) Dissemination of School/Community-based Green Promotion

With the lessons to be learned from the pilot project, it is planned that the school/community-based green promotion program would be disseminated widely in each regency, as well as in Makassar. Collaboration among the public sector, schools, communities and NGOs is indispensable to promote the program and make it sustainable in Mamminasata.

(3) Planning and Execution of Sizable Reforestation under the CDM scheme

Under the land use zoning for the spatial plan for Mamminasata, around 20,000 ha in the mountainous areas and flood plains along the major rivers are to be reforested in the short and long term. To this end, it is planned that a CDM-based reforestation plan would be formulated and a sponsoring enterprise would be searched for internationally.

(4) Formation of Waterfront Management Program

A study should be made on the requirements for environmental management of the coastal and river front zones in Mamminasata, including the coastal and oceanic zone, flood plains, possible conservation areas for retarding basins and flood protection forests along the major rivers. Part of this program may be executed in combination with the improvement in solid waste landfill sites, sewerage treatment sites, and watershed management areas.

(5) Protection of Biodiversity and Natural Resources

Butterflies in Bantimurung National Park

The Bantimurung National Park is famous as a butterfly valley, and it should be preserved through local initiative. It is said that 143 varieties of butterflies are currently living in the park though more than 270 varieties have been recorded by UNHAS. The local initiative may start with the environmental education at schools where butterfly breeding could be revived under the guidance of the academic circle. River estuaries as in the case of the Tallo River, on the other hand, are blessed with aquatic biodiversity, estuary eco-system and birds, and they should be preserved as far as possible. The coastal eco-system (e.g., mangrove and coral reef) should also be reserved properly.

The following figure shows representative programs for the betterment of the environment by land use zoning.

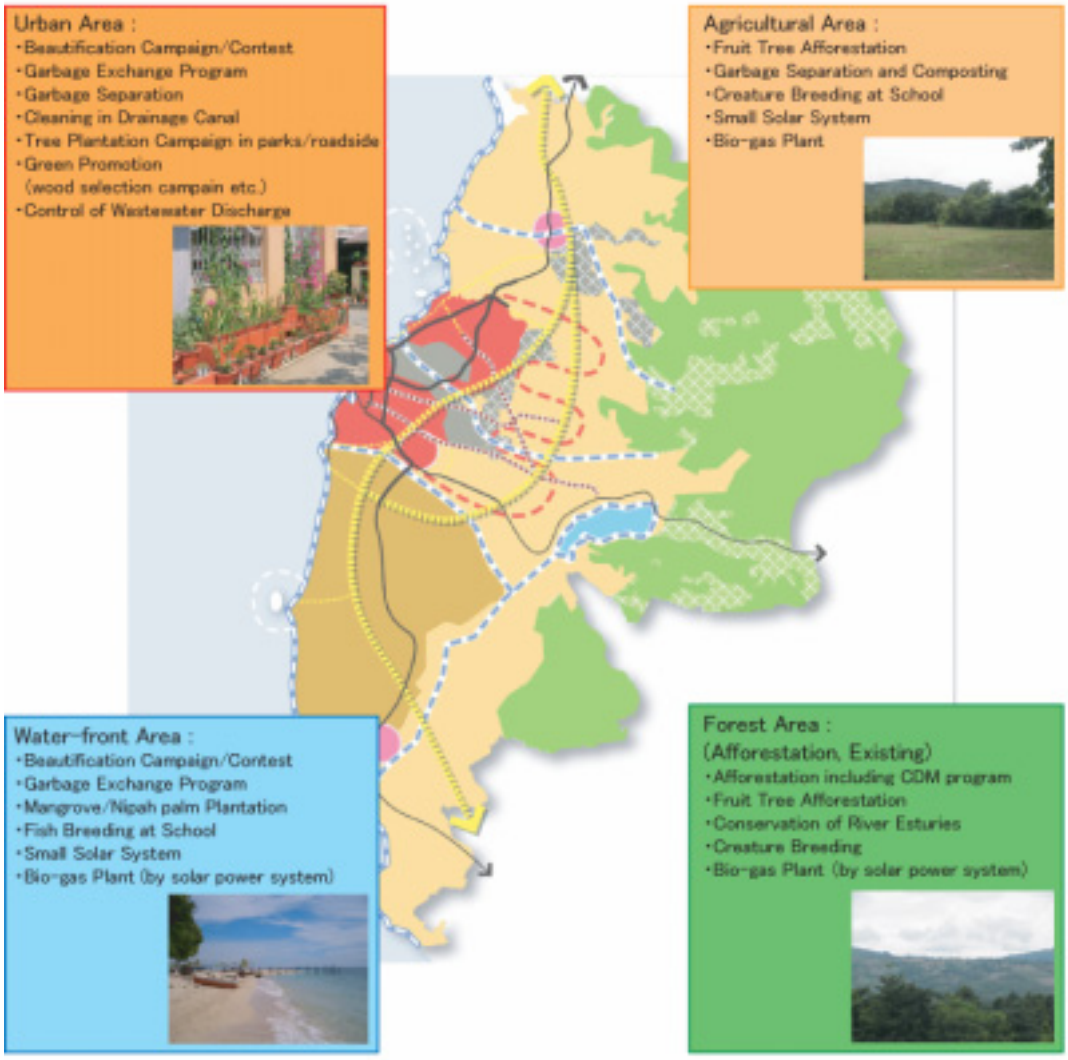


Figure 6.22: Environmental Betterment Programs

Understandably, the environmental protection programs are laborious tasks for all the people in Mamminasata. However, steps should be gradually and steadily taken to create a **"clean"** Mamminasata metropolitan area.

It should also be emphasized that environmental betterment and management is not attainable unless proper policies are established and the rules and regulations are legistalted and strictly observed by the Mamminasata people. Strong initiative, therefore, should be taken by leaders in respective societies.[5]

[5] Refer also to Chapter 11.

6.3 Roles of Stakeholders

1) Major Issues

In Mamminasata, as well as in South Sulawesi and Indonesia as a whole, various plans and regulations have been put into practice, but they are not always implemented or followed by the stakeholders. A number of rules are disregarded or overlooked, causing deterioration in the environment and uncoordinated urban development. The social costs are getting higher and higher. The deterioration of the urban environment clearly indicates the phenomena, and there will be no need to demonstrate other samples of deterioration or lack of coordination.

One of the reasons for disorderly and uncoordinated development is a lack of commitment by the stakeholders, each of whom has different interests than the others. A weak monitoring and evaluation system and weak leadership taken in respective groups of stakeholders are also causing such phenomena. Without rectifying such vicious phenomena, the proposed Mamminasata spatial plan would repeat the errors of the past. It is for this reason that the roles of respective stakeholders are re-confirmed and all stakeholders are directed towards a common goal to create a creative, clean and coordinated Mamminasata metropolitan area.

It is also noted that the planning and implementation of regional development has been executed by the public or private sectors rather independently, and the people to be benefited from the development projects/programs have not been involved in the planning stage. Although some public hearings are held by the authorities concerned, most decisions have been made in a top-down approach with substantial modifications under the political and administrative influence. The people in the region have not been involved in the spatial development. For the formulation and implementation of the spatial plan, a participatory approach should be introduced to make the plan more sustainable and manageable.

2) Roles of Stakeholders

Major stakeholders related to implementation of the spatial plan in Mamminasata are (i) the public sector, (ii) private sector, (iii) academic sector, (iv) NGOs, and (v) Mamminasata citizens.

The public sector is responsible for defining the policy, rules and plans, demarcating the role of each stakeholder, earmarking the budget for public investments, monitoring and supervising the implementation, and evaluating the results of

implemented projects/programs. Unfortunately, it is observed that the public offices are outsourcing such duties to outside entities without proper monitoring and supervision. Officers should pursue the interests of the people with high motivation as civil servants. Once the land use zone and plan are defined, the public sector should define the guideline and regulations and implement them with proper monitoring and supervision. A policy to promote equity development over the country should be well established.

The private sector is pursuing profits to accrue from its businesses, as a matter of course. However, it is not fair that it is trying to get profits by disregarding the ethics, rules and regulations. They should observe the rules and regulations in force. The private sector should sometimes be a partner with the public sector and the people in the region, pursuing a win-win relationship or better, a win-win-win relationship.

The academic sector is responsible, in general, for human resource development and research. The educational level, however, remains relatively low if it is evaluated from the viewpoint of the implementation of the spatial plan and socio-economic development in Mamminasata. The academic sector should also be involved more actively in the implementation of the proposed spatial plan. It is understood that universities are also obliged to contribute partly to the society. Involvement of university students will also contribute to the better and more specific understanding of the spatial plan, and will give positive influence to the community. Practical implementation is also expected to be achieved through campus initiative. The university campus itself must be a model for the implementation of the spatial plan.

A number of the NGOs in Mamminasata are expected to contribute to the social enhancement of the people in the region. Most NGOs in Sulawesi were formed in the era where criticizing government and advocating for society were the main task for NGOs. However, at present, service-oriented NGOs need to become a bridge connecting the government and community for better livelihood development. Preferably, NGOs, as a part of the community have more concern for community needs and environmental issues and therefore will take the initiative to become actively involved and assist in the realization of a “creative, clean and coordinated” Mamminasata metropolitan area. NGOs, as reliable partners representing the community’s demands, are expected to facilitate discussions and initiate a participatory approach for socialization.

The citizens of Mamminasata are concerned about the deteriorating natural and social environment but are not active in taking the initiative by themselves. Rules and

regulations should be observed at any cost. The citizens are found, in general, not active in cooperating or collaborating in the community, blaming the poor performance of the public sector.

Now that a common target is set for the realization of a "creative, clean and coordinated" metropolitan area in Mamminasata, each stakeholder should commit him/herself to fulfill the respective role for the implementation of the Mamminasata spatial plan.

3) Participatory Approach

The existing plan for Mamminasata, as well as the spatial plans for Makassar City and other regencies, have been and are being planned by the public authorities concerned. In fact, the existing BKSPMM was formed by public officers and there is no involvement of the private sector or the people in the region. In general, most government officers understand that the participatory approach means public consultation meetings and involvement of the community in the physical work. There are only limited efforts to examine the needs and identify the ideas, opinions and thought of the communities.

Therefore, for this study on implementation of the integrated spatial plan more stakeholders have been involved including the financial and other members of the private sector, the academic sector and NGOs. Some pilot programs have been executed, as introduced above, with the participation of the people and communities in the villages/districts, university students, teachers, NGOs and other stakeholders. To enhance the public awareness of the environment in particular, the participatory approach is deemed indispensable for sustainable implementation of the programs.

For the modification and finalization of the municipality/district spatial plans, it is recommended that more participation of the people in the region, the private sector and NGOs be realized. Unless the people are involved in planning and preparatory works, the implementation of projects/programs for spatial development will turn out to be less sustainable and more costly. Since the Mamminasata spatial plan envisages creating a "creative, clean and coordinated metropolitan area", the participation of stakeholders is of vital importance.

7. ECONOMIC DEVELOPMENT PLAN

The spatial development plan should be formulated and implemented in harmony with the regional economic development plans. Based on a review of the current situation and prospects in the region, agricultural, industrial, trade, investment and tourism development in Mamminasata are discussed and planned here.

7.1 Agricultural Development [1]

1) Major Issues

The agricultural land in Mamminasata extends over 106,050 ha or 42% of the total land area. Agriculture in the region contributes 32% of GRDP (2.2% in Makassar, and about 45% in the other three regencies) and offers employment for 57% of the economically active population. Eighty nine percent of the agricultural land is under irrigation. The Bili Bili irrigation project is the most notable scheme with a total irrigation service area of 23,600 ha.

Paddy is the principal crop, contributing around 15% of paddy production in South Sulawesi. The cropping pattern which prevails in the irrigated land is mainly "paddy, paddy, and palawija (soybeans, mungbeans, groundnuts and maize)". Productivity of paddy is relatively high at 5.17 tons/ha as compared with the provincial average (4.72 tons/ha), though productivity of other crops is relatively low. While paddy production is stable and maize production is increasing in Mamminasata, production of soybeans and mungbeans have decreased in recent years. Other cash crops cultivated in Mamminasata are cacao, coffee, coconuts, cashews and sugarcane. A sugar mill has operated in Takalar since 1984.

Table 7.1: Area and Production of Paddy

	Harvested Area (ha)		Production (thousand ton)		Yield (ton/ha)	
	1999	2003	1999	2003	1999	2003
South Sulawesi	902,286	847,305	3,870.0	4,003.1	4.29	4.72
Makassar	4,139	2,269	19.5	11.5	4.71	5.07
Maros	39,757	38,590	218.6	213.2	5.50	5.52
Gowa	45,953	49,060	205.9	232.5	4.48	4.74
Takalar	23,857	21,374	124.0	118.7	5.20	5.55
4 Region Total	113,706	111,293	568	575.9	5.00	5.17
Percentage of the Province total	12.6%	13.1%	14.7%	14.4%	-	-

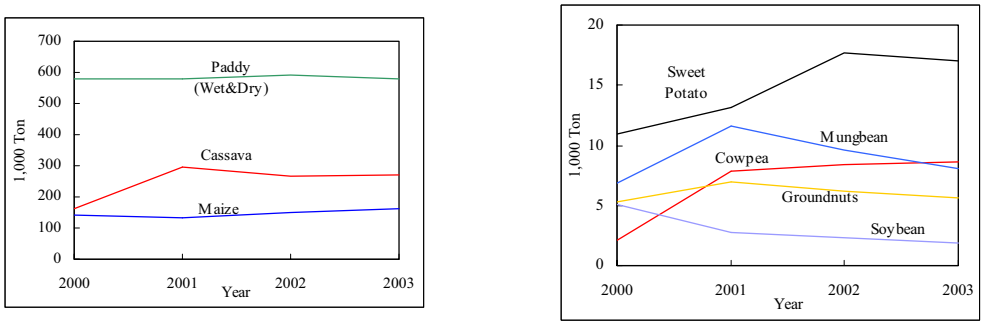
Source : BPS, South Sulawesi, Makassar, Gowa, Takalar and Maros in Figure, 2003

[1] Refer to Sector Study Report (4) for detail.

Table 7.2: Production of Other Food Crops (2003)

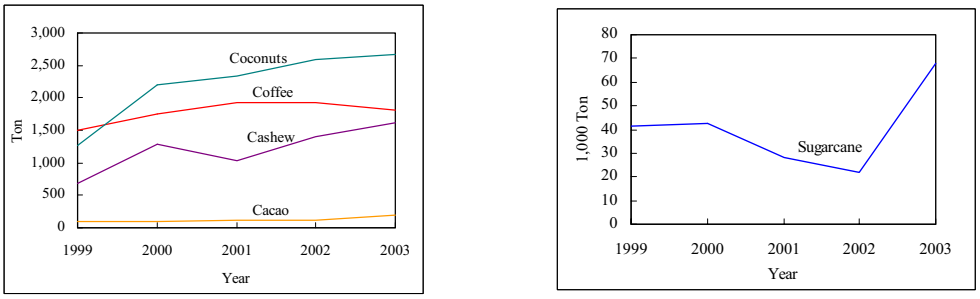
	Harvested Area (ha)			Production (ton)		
Crop	Province	Mamminasata (%)		Province	Mamminasata (%)	
Maize	213,818	34,818	(16%)	650,832	161,578	(25%)
Cassava	40,808	14,927	(37%)	590,717	271,319	(46%)
Sweet Potato	5,748	768	(13%)	61,789	16,967	(27%)
Groundnuts	43,385	3,867	(9%)	52,763	5,650	(11%)
Soybeans	16,992	1,327	(8%)	24,140	1,890	(8%)
Mungbeans	33,180	11,180	(34%)	38,608	8,055	(21%)

Source : BPS, South Sulawesi, Makassar, Gowa, Takalar and Maros in Figure, 2003



Source: BPS, South Sulawesi, Makassar, Gowa, Takalar and Maros in Figure, 2001, 2002, 2003

Figure 7.1: Production Trend of Food Crops in Mamminasata



Source: BPS, South Sulawesi, Makassar, Gowa, Takalar and Maros in Figure, 2001, 2002, 2003

Figure 7.2: Production Trend of Major Estate Crops in Mamminasata

Issues to be addressed in the agricultural sector on the production side are (i) inferior seed/seedling varieties, (ii) unconcerned attitude of farmers for product quality other than paddy, (iii) lack of marketing and other post-harvest services, (iv) inadequate management of brackish water fish culture, and (v) lack of large vessels for offshore fishing. On the processing side, major constraints are (i) unstable supply and non-homogeneous quality of raw materials, (ii) lack of advanced processing technology, (iii) low level of by-product utilization, and (iv) inferior quality and design of packaging.

Fishery is another important activity in South Sulawesi, with its production ranked third in Indonesia. In 2003, the production of marine fishery and brackish water

pond fishery reached 468,000 tons, an increase of 8% from 2000. The production along the Mamminasata coastal line accounts for 18% of the provincial production, or around 90,000 tons per year (72,200 tons in marine fishery and 17,800 tons in brackish water fishery in 2003). Cultured fish are mainly tilapia, milkfish, mullet, and giant sea perch, as well as mixed culture with prawns/shrimp. The shrimp production is mainly for export, but its production has been substantially decreased due to outbreaks of diseases. Around 50% of fishery products are marketed in Makassar, of which 60% are locally consumed and 40% are exported.

Table 7.3: Fishery Production in Mamminasata (2003)

Administrative Unit	Marine Fishery	Inland Fishery						Total (ton)
		Brackish Water Pond	Fresh Water Pond	Paddy Field	Lake	River	Swamp	
South Sulawesi	354,425	122,571	2,301	3,925	14,252	2,102	6,057	505,633
Makassar	17,958	373	0	0	0	0	0	18,331
Maros	14,743	9,219	9	16	0	0	0	23,986
Gowa	0	60	88	119	0	101	77	444
Takalar	39,544	7,540	0	0	0	0	0	47,083
Mamminasata Total	72,244	17,192	96	135	0	101	77	89,844
Percentage of the Province output	20.4%	14.0%	4.2%	3.4%	0.0%	4.8%	1.3%	17.8%

Source: Statistical Report of Fishery, South Sulawesi, 2003.

Livestock breeding in Mamminasata is not very active, except for poultry. Cattle are raised for meat and as draft animals and a few milk cows are bred in the area.

Table 7.4: Livestock Population (2003)

(Unit: head)

	Milk Cows	Beef Cattle	Buffalo	Horses	Goats	Sheep	Pigs	Ducks	Broiler Chickens	Domestic Chickens
Makassar	29	1,322	665	126	4,152	0	3,247	36,669	9,058	300,567
Maros	0	40,488	10,465	4,403	17,490	0	60	311,511	318,709	773,304
Gowa	0	70,572	22,568	8,380	17,822	0	5,159	215,913	709,680	831,217
Takalar	0	17,392	5,137	1,079	20,237	7	0	101,867	236,900	359,952
Total	29	129,774	38,835	13,988	59,701	7	8,466	665,960	1,274,347	2,265,040

Source: BPS, South Sulawesi, Makassar, Gowa, Takalar and Maros in Figure, 2001, 2002, 2003

2) Agricultural Development Strategy

Agricultural development in Mamminasata should be planned and promoted from the demand side. According to a recent socio-economic survey, the daily per capita calorie intake from rice is decreasing, while average total calorie intake is increasing. Food consumption in Mamminasata is being diversified, shifting to less rice consumption and more consumption of meats, fruits, oils and ready-made processed foods. Agriculture in Mamminasata should be developed to meet the changing demand for products, particularly in the urban area in Makassar.

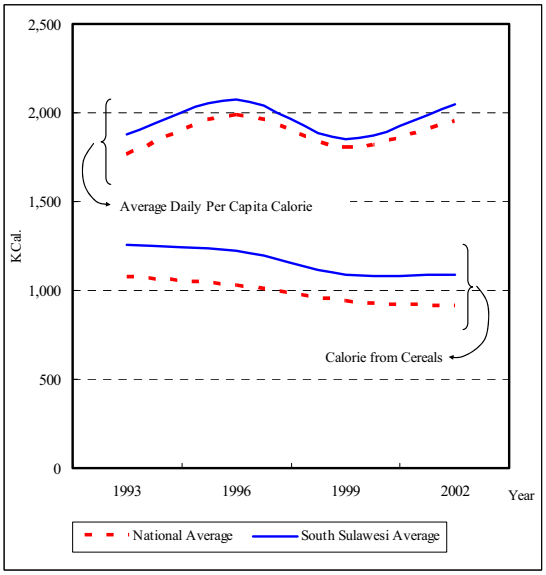


Figure 7.3: Daily Per Capita Calorie Intake from Cereals (Urban Area) in Indonesia and South Sulawesi

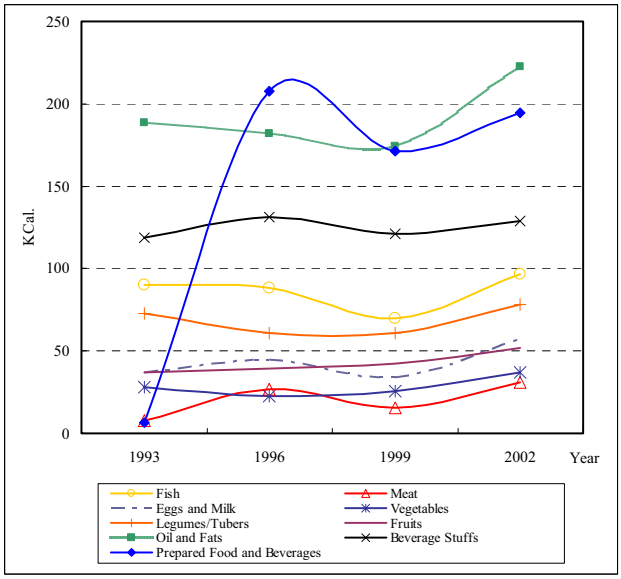
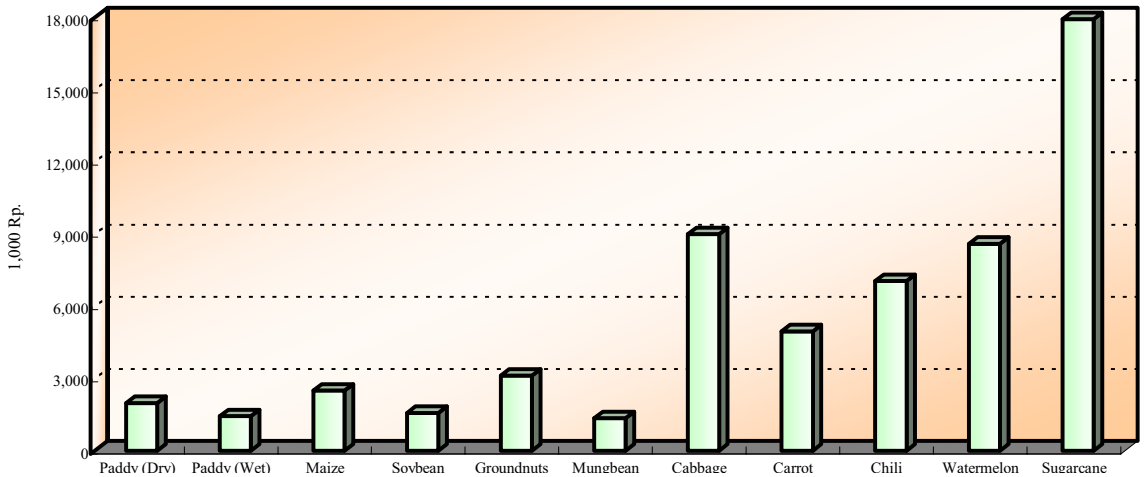


Figure 7.4: Daily Per Capita Calorie Intake from Other Sources of Food (Urban Area) in South Sulawesi

Source: Consumption of Calorie and Protein of Indonesia and the Province (National Socio-Economic Survey), 1999 and 2002, BPS.

Since the arable land area in Mamminasata is limited, productivity has to be increased to enhance and protect the farmers' income levels. Improvement of yield in crops other than paddy, application of improved varieties, and introduction of mixed and integrated farming are to be promoted to enhance the productivity. Likewise, organic farming will be introduced to produce niche products for niche market. A gradual shift from the "paddy, paddy, and palawija" cultivation to a cropping pattern with higher productivity will be envisaged in the surroundings of the urban center in the light of increased urban population in and around Makassar.



Note: Sugarcane is per harvest with cultivation period of more than 18 months.
Source: Dinas Pertanian, Perkebunan and DISIMP Office

Figure 7.5: Net Returns per Hectare per Harvest for the Selected Irrigated Crops

One of the points to be discussed in the Mamminasata spatial plan is the expansion of urban area and the existing Bili Bili irrigation system. Under the land use plan for Mamminasata, it is provisionally envisaged that the irrigated lands of about 960 ha in the surroundings of Sungguminasa (850 ha where urban sprawl has advanced) and at the estuary on the left bank of the Jeneberang river (100 ha where a concession has been extended to Tanjung Bunga for urban development) are to be shifted to residential and other uses. In addition, some rice fields (840 ha) in Maros and Takalar, as well as mixed crop lands (450 ha) in Gowa and Maros will be converted to land use for other purposes, as shown in the figure below.

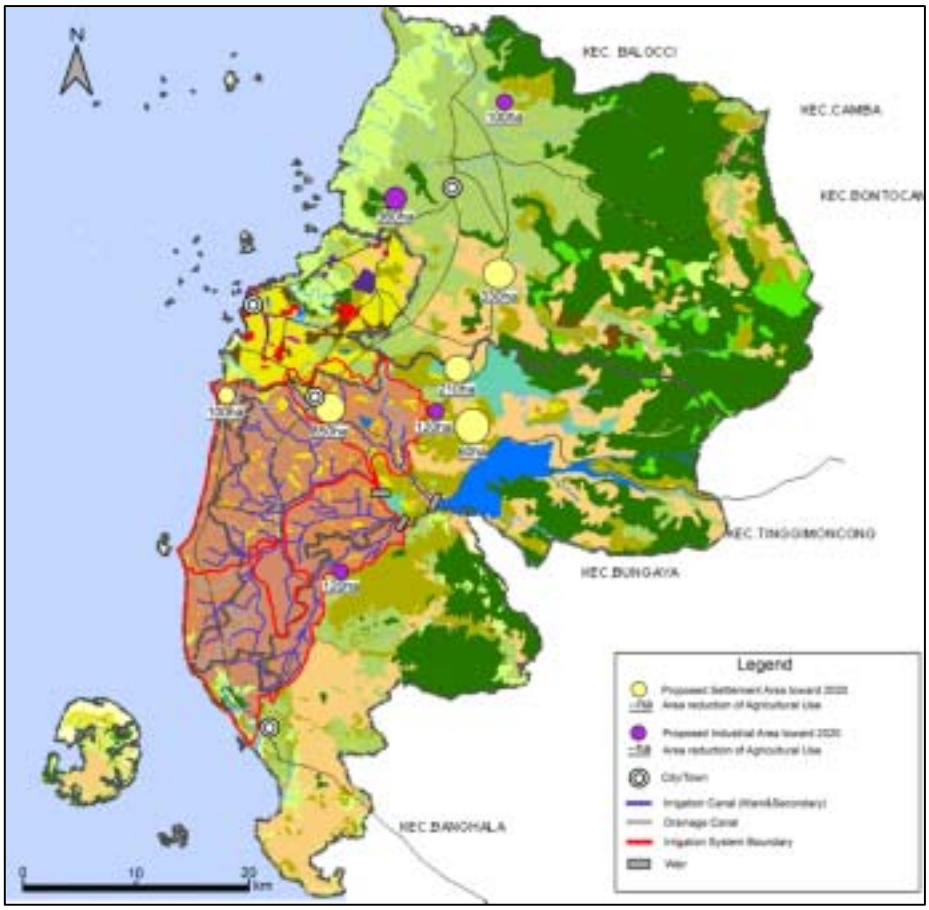


Figure 7.6: Area Reduction of Agricultural Land by Year 2020

Such a shift appears to be inevitable. However, the economic benefits planned for the Bili Bili irrigation project should not be decreased by such a shift. A reduction of production value with the decrease in irrigation area of 960 ha is estimated to be around Rp.4 billion or 4% of the project benefits. This reduction will be recovered by some changes in cropping patterns (introduction of high-value crops, e.g., fruits and vegetables) to meet the diversified demand in the urban centers. (Estimate of the return from the Bili Bili project is presented in the Sector Study Report (4).)

Another important issue to be addressed is the operation of the state-owned sugar mill in Takalar, which was established in 1984 with a milling capacity of 3,000 tons/day. Currently, nearly 5,000 workers are employed in sugarcane cultivation and milling. Although it was previously grown on a total of nearly 7,000 ha of land (maximum in 1993), sugarcane is currently cultivated on about 4,000 ha and its yield is as low as 35 tons/ha. Irrigated sugarcane land is limited to around 400 ha. The sugar mill is only operated for some 70 days/year with the reduced cane production. Such a situation is crucial, and the Takalar sugar mill can not survive unless proper measures are taken immediately.

Possible strategies to be taken for revitalization of the Takalar sugar mill include, but are not limited to the following:

(i) allocate more irrigation water to the sugarcane fields from the Bili Bili system utilizing the supply that will be freed up by the shift from irrigated land to urban use as noted above;

(ii) introduce new varieties appropriate for irrigated cultivation and appropriate application of fertilizer and other inputs, with a target to get a sugarcane yield of around 80 tons/ha.;

(iii) renovate the management system including the privatization or outsourcing of management.

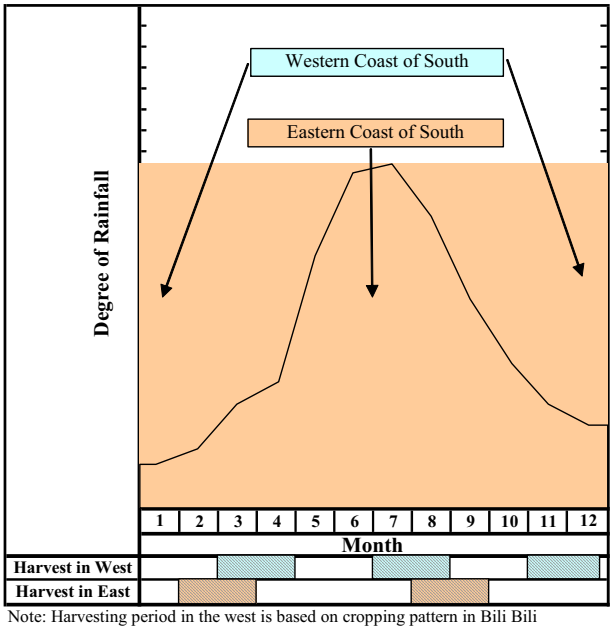
Another issue to be discussed at the moment is the viability of the proposed Pamukulu dam and irrigation project proposed in the southeastern part of Takalar. The project aims at the expansion of irrigated area from 3,000 ha to 6,400 ha for cultivation of "paddy, paddy, and palawija". The construction cost of the system is preliminarily estimated to be around US$11,000 per ha, or five times higher than the rehabilitation cost of the Bili Bili irrigation project. In view of the large investment required and the shifting demand in agricultural products, as discussed previously, financial viability of the proposed project appears to be rather doubtful. An alternative program is to be

Figure 7.7: Existing Plan of Pamukulu Irrigation Project

developed to serve this area for mixed cultivation of upland crops and livestock breeding to meet the increasing demand.

In the highland areas, cultivation of highland vegetables and high value crops (e.g., cacao, vanilla, markisa and other fruits, kapok, and bee culture) will be encouraged to expand further. Such products would provide a stable supply of raw materials for processing.

South Sulawesi province, with Mamminasata located to the west, has an advantage in agricultural production and processing. It is the difference in agro-climate, particularly the rainfall pattern, in the east and west part of the province. Such a seasonal difference in the east and west will make it possible to supply seasonal products over a longer period as raw material for processing. This advantage should be utilized to the utmost extent for constant supply of materials to be processed.



Note: Harvesting period in the west is based on cropping pattern in Bili Bili Irrigation Project, while in the east on cropping pattern in Salomekko Irrigation
Source: Feasibility Study Report on Bili Bili Irrigation Project, and Data from DISIMP (Decentralized Irrigation System Improvement Project) Office.

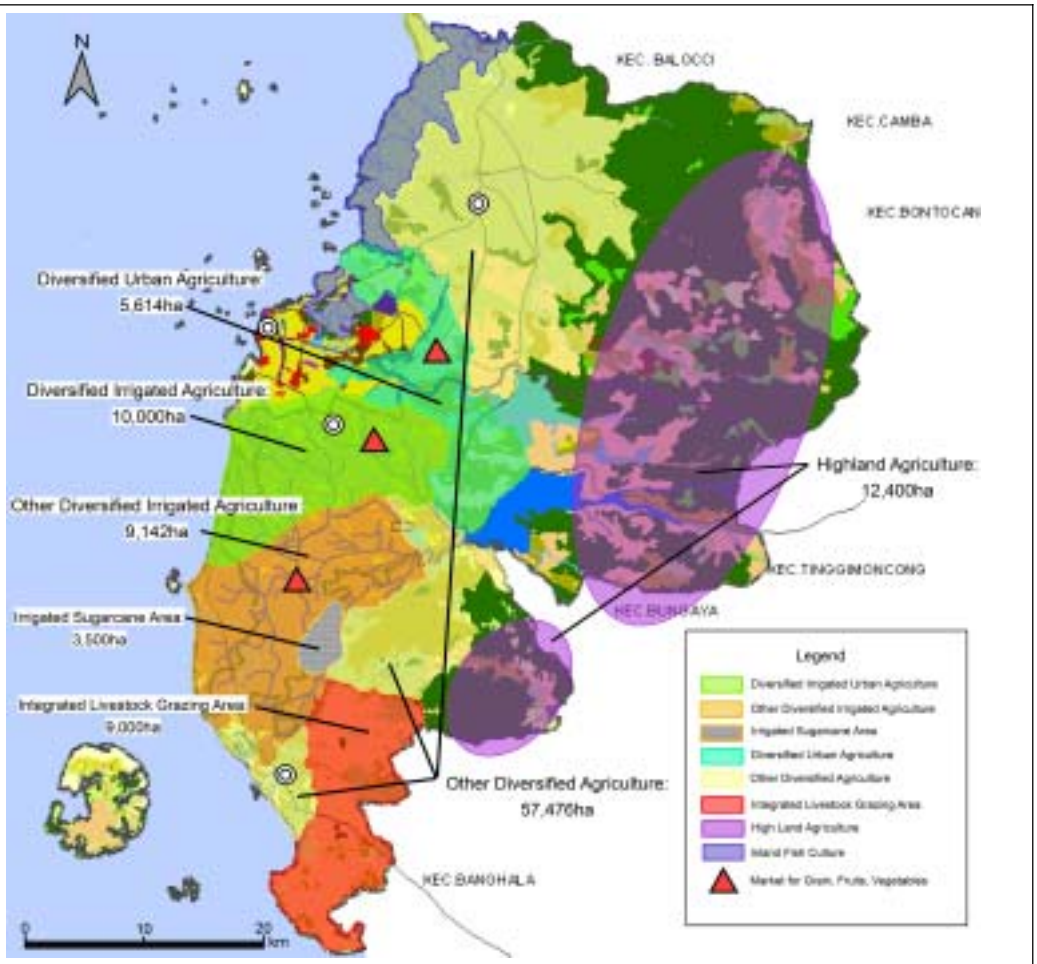
Figure 7.8: Rainfall Patterns and Harvest Period of Annual Crops (Irrigated) in South Sulawesi

3) Plan Formulation and Implementation

The agricultural development plan for Mamminasata should be formulated and implemented in line with the following:

(1) Agricultural Land Use Zoning

Based on the current situation of agriculture in the region and the strategies discussed in the foregoing paragraph, it is provisionally proposed that the agricultural land use in Mamminasata would be planned and implemented as shown in the following figure.



Type of Irrigation	Zoning	Cropping Intensity	Area (ha)	Net Production Value (Mil. Rp.)**
Technical Irrigation*	Diversified Irrigated Urban Agriculture	239%	10,000	50,735
	Other Diversified Irrigated Agriculture	239%	9,142	44,117
	Irrigated Sugarcane Area	100%	3,500	62,767
		Sub-Total	22,642	157,619
Semi/Non-Technical Irrigation and Rainfed Area	Diversified Urban Agriculture	140%	5,614	18,185
	Other Diversified Agriculture	130%	57,476	164,537
	Dry Land Agriculture	70%	3,000	4,593
	High Land Agriculture	130-160%	12,400	--
	Integrated Livestock Grazing Area	--	9,000	--
		Sub-Total	87,490	187,315
		Total	110,132	344,934

Note: *The area for technical irrigation is net area, while the remaining area is gross area.
**The net production values from high land agriculture and integrated livestock grazing are not accounted.

Figure 7.9: Agricultural Land Use Zoning in 2020

The cropping intensity proposed in the Figure on the foregoing page is based on the cropping patterns proposed to enhance the productivity in the respective types of agricultural practices, as shown in the following table:

Table 7.5: Cropping Intensity Proposed for Mamminasata (2020)

Type of Crop	Zoning (Bili-Bili Irrigation)		Zoning (Other Agricultural Land)		
	Diversified Irrigated Urban Agriculture	Other Diversified Irrigated Agriculture	Diversified Urban Agriculture	Other Diversified Agriculture	Dry land Agriculture
Wet Paddy	94%	94%	89%	70%	0%
Dry Paddy	94%	94%	0%	0%	0%
Palawija	40%	45%	40%	55%	37%
Vegetables	10%	0%	10%	0%	3%
Annual Fruit Crops	0%	5%	0%	5%	10%
Perennial Tree Crops	1%	1%	1%	0%	20%
Total	239%	239%	140%	130%	70%
Net Return per ha	5.1 Mil. Rp./ha	4.8 Mil. Rp./ha	3.2 Mil. Rp./ha	2.9 Mil. Rp./ha	1.5 Mil. Rp./ha

(2) Fishery Development

Fishery production will increase to meet the increasing demand of the urban population. Total marine fishery products are targeted to increase from 76,200 tons in 2005 to 119,400 tons in 2020 through a controlled expansion of modern vessels for offshore fishery. Brackish water pond fishery will also increase from 18,100 tons in 2005 to 28,400 in 2020 with increased productivity, particularly by improving inland fishery in Takalar. In order to increase productivity and ensure stable production, hatcheries are to be developed along the coastal areas, as illustrated in figure 7.10.

Figure 7.10: Future Hatchery Development Area

Fishery production increase to meet the demand of the increasing urban population with production targets as proposed in the following.

Table 7.6: Fishery Production Plan in Mamminasata

(Unit: ton)

Type of Fishery		2005	2020
Marine Fishery		76,203	119,410
Inland Fishery	Brackish Water Ponds	18,134	28,416
	Fresh Water Ponds	102	159
	Paddy Fields	142	222
	Lakes	0	0
	Rivers	106	166
	Swamps	81	126
Total		94,767	148,501

Source: Estimated from the data in Sulawesi Selatan in Figure 2003, BPS, and Laporan Statistik Perikanan Sul-Sel, 2003

(3) Livestock Development

A sizable area of dry land (about 35,000 ha) exists in Mamminasata, and livestock grazing should be promoted on this dry land in combination with upland crop cultivation, including fodder crops. It is planned that the livestock production will grow in Mamminasata as projected in the following table.

Table 7.7: Livestock Production Plan in Mamminasata

(Unit: head)

Type of Livestock	2005	2010	2015	2020
Cows	136,885	156,414	194,279	214,500
Buffalo	40,963	46,807	58,138	64,189
Horses	14,754	16,859	20,941	23,120
Goats	62,972	71,956	89,376	98,678
Pigs	8,930	10,204	12,674	13,993
Ducks	702,451	802,667	996,981	1,100,746
Broiler Chickens	1,344,174	1,535,942	1,907,771	2,106,332
Domestic Chickens	2,389,151	2,730,003	3,390,896	3,743,821

Source: Based on Makassar, Maros, Gowa, and Takalar in Figure, 2002, 2003. BPS

(4) Agro-based Cluster Development

To increase the local value added, it is envisaged to promote clustering of agro-processing in Mamminasata. A conceptual image of an agro-based cluster is shown in the diagram in the following figure (also refer to Figure 7.22 for Takalar agro-based cluster image) :

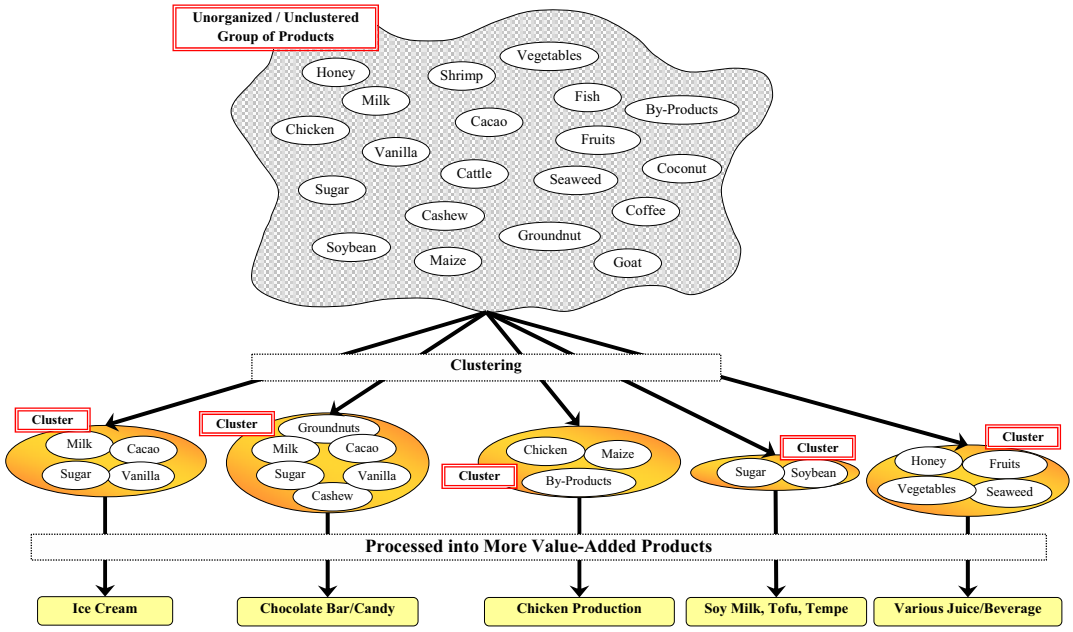


Figure 7.11: Concept of Agro-Industrial Clustering

(5) Marketing Improvement

In parallel to the agro-based cluster development, the marketing system of the Mamminasata products should be modernized. The following diagram shows a conceptual image of marketing improvement in agro-based products in Mamminasata.

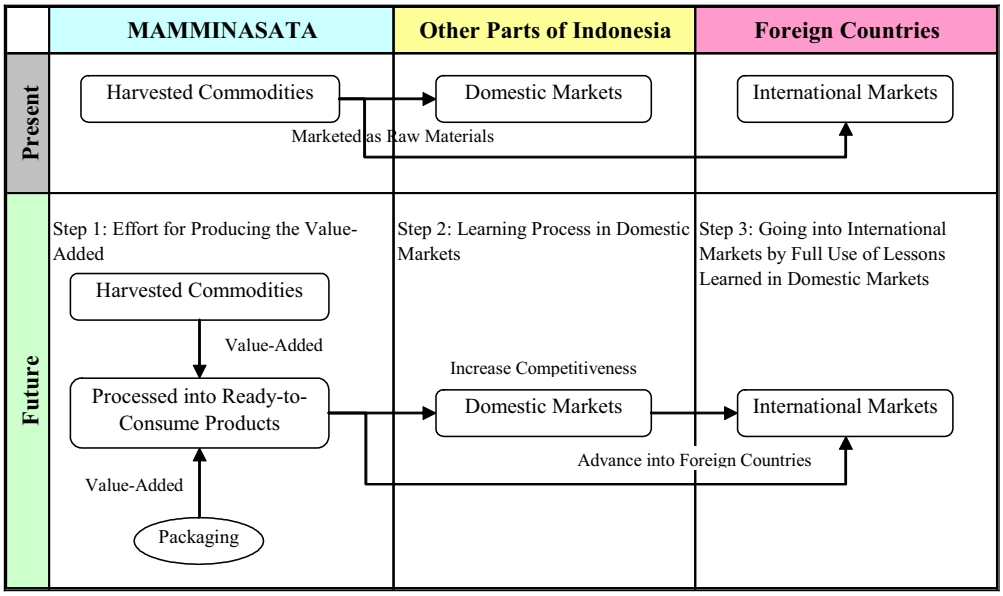


Figure 7.12: Concept of Marketing Strategy for New Clusters

For instance, passion fruit (Markisa) in Mamminasata is reputed for its deliciousness, and its processing into Markisa juice is promising for more domestic consumption and exports. Its processing, quality testing, bottling, labeling, and packaging should be modernized for marketing in other parts of Indonesia and foreign markets. Since its harvest season is relatively short, the processing facilities should also be utilized for other fruits and products.

As a program of marketing improvement, it is planned that a wholesale agricultural market would be set up in Gowa or Takalar so that daily wholesale trade in agricultural products is introduced as a part of the improvement in the marketing system. The wholesale markets should be equipped with an auction place, an information center, storage facilities and packaging facilities.

(6) Agricultural GRDP

A high growth scenario in the macro-economic framework of the Mamminasata spatial plan envisages an annual average growth rate of over 5% in the agricultural sector. This implies that the agricultural production should double in the 15 years up to 2020. It appears that this will be difficult to attain even though the strategies and directions discussed in the foregoing paragraph are applied. It should be pointed out that the arable land can not be expanded and the primary crop (paddy) is already at a high level of yield.

Under the moderate growth scenario, an annual average growth rate of 3% is expected, which is equal to a level of an increase of 150% from 2005 to 2020. This target is attainable by applying the strategies and plans as proposed in the foregoing paragraphs. GRDP in the agricultural sector is estimated for the Mamminasata spatial plan as tabulated below.

Table 7.8: Estimated Agricultural GRDP by Sub-sector

(1993 Constant Price, Unit: Million Rp.)

By Sub-Sectors	2005	2010	2015	2020
Food / Non Food Crops	473,716	541,299	672,339	742,316
Livestock	29,922	34,191	42,468	46,889
Forestry	501	573	711	785
Fishery	161,469	184,505	229,171	253,023
Total	**665,608**	**760,568**	**944,690**	**1,043,014**

*Note: Sub-sectors' shares are based on the data from three regencies other than Makassar, where the sub-sector breakdown is not available.

4) Action Program

Based on the development strategies and plans as discussed in the preceding section, the short-term action programs are proposed for implementation in 2006~2010, including the program as tabulated below.

Table 7.9: Short-term Action Programs in the Agricultural Sector

No.	Program	Description	Main Actor	Supportive Actor
(S1)	Commodity-Wise Post Harvest Training	Producers should become fully aware of product quality and market signals. For quality control at the production level, commodity-wise training programs on post harvest treatment should be formulated and implemented for producers.	Producers (farmers)	Government
(S2)	Study Program for the Producers Group	In order to have better understanding of the agro-processing industry for selected crop producers, periodic study tours should be arranged. Participants are expected to learn how their harvest products are processed into commercial goods. It will take great effort to raise producers' awareness of product quality.	Producers (farmers)	Government / Manufacturers
(S3)	Inter-Departmental Collaboration Program for Local Government	In order to strengthen the linkage between the production and processing factors, cooperative activities between the department of agriculture, plantation, fishery and industry, or programs such as Gerbang Emas should be carried out consistently. The aim of these programs is to enhance the initiative of each department as the Governor's Office does for Gerbang Emas. For implementation, it is recommended that key staff from each relevant department should form new departments with strong leadership to focus on such inter-departmental linkage strengthening activities. The staff of the new departments are expected to perform efficiently and logically,	Government	Government
(S4)	Strengthening of R&D Capability	Research and development (R&D) capability for region-specific seed / seedling varieties for agriculture and forestry should be enhanced to accelerate potential unit yields and qualities.	Government	Academic Institutions
(S5)	Stock Assessment of Marine Fishery	Marine fish stock assessment should be conducted in order to create clear guidelines and regulations, which stipulate a marine preserve area and closed seasons by species, with guidance from the National Fishery Stock Committee. This assessment should be carried out in scientific manner presumably by an academic institute in collaboration with a state research institute so that assessment results could be given a strong scientific grounding.	Government	Academic Institutions
(S6)	Strengthening Fishery Marketing	Cold storage should be provided adjacent to major fishery markets, most likely in Makassar and Takalar, in order to minimize losses and enable fishermen to increase their marketing opportunities. New storage facilities are expected to absorb the increased fishery production as well.	Fishermen / Government	--

Likewise, the medium and long-term action programs are proposed as summarized in the following:

<Medium-term Action Programs>

M-1: Integrated livestock development program in combination with upland crop cultivation (mixed-culture) in the dry areas

M-2: Linkage strengthening program to promote linkage between producers and manufacturers for agro-based industrialization

M-3: Development and promotion of by-products industries, with particular attention to cacao, coconuts, cashews and other tree crops, as well as oil crops like maize, soybeans, groundnuts, and coconuts.

M-4: Advanced technological development for agro-processing industries, including processing of ready-to-consume products and semi-processed products for domestic markets.

M-5: Development and promotion of the packaging industry, including vacuum-packing, package design, re-labeling, and others.

M-6: Hatchery development program in the coastal area for tiger prawns, milk fish, grouper, mackerel, flying fish, sea horse and so on.

M-7: Fishery port development study, assessing the optimal scale and location for long-term development of offshore fishery.

<Long-term Action Programs>

L-1: Agri-business education promotion for younger generations, particularly in the areas related to marketing of agricultural products and industrialization.

L-2: Agricultural enterprises formulation program in order to promote the establishment of agricultural enterprises for better management and enhancement of competitiveness in agriculture.

L-3: Offshore fishery development, inclusive of capacity building in oceanic law, sustainable marine yields, fishing and sailing techniques in the open sea, and so on.

In the implementation of the Mamminasata spatial plan, as well as the plans to be formulated on the regency basis, it is recommended that the following points be duly taken into account.

(a) Removal of existing irrigation canals should be avoided or minimized in the future land use in Mamminasata;

(b) Reduced production values from the reduction of agricultural land should be compensated for by increased unit productivity in the remaining lands adopting higher value-added crops;

(c) Technical irrigation development on the newly irrigable lands should be re-examined from the economic and financial viewpoints;

(d) Alternative land utilization for livestock grazing and tree crop planting should also be promoted in the areas where fallow irrigation is uneconomical;

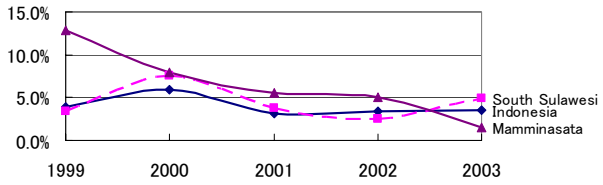
(e) In relation to agro-industrial development, Takalar sugar factory should draw special attention. Unless proper actions are taken for a change in management, it will not be able to survive; and

(f) More private investments should be attracted in the agro-/fishery-processing and marketing, with due attention to the protection of the environment in Mamminasata.

7.2 Industrial and Trade Development [2]

1) Major Issues

GRDP contribution of the manufacturing sector is relatively low in Mamminasata (21%) if compared with the national average (31%); yet it is higher than the average of South Sulawesi (12%). It is mostly concentrated to Makassar City, and other three regencies in Mamminasata contribute only 16% of that from Makassar. Food/beverages and wood products are dominant, accounting for 83% of the manufacturing GDP. About 71% of workers are employed in micro and small enterprises. There are only 180 medium and large enterprises in Mamminasata.



Source: Statistics of Indonesia, Statistics of South Sulawesi, Produk Domestic Regional Bruto (Makassar, Maros, Gowa, and Takalar respectively)

Figure 7.13: Growth Rate in Manufacturing

[2] Refer to Sector Study Reports (5) and (6) for detail.

The average growth rate in the manufacturing sector was less than 5% in 2000-2003 (a high growth rate of 13% in 1999 was attributable to the establishment of a large-scale cement factory in Maros.) Productivity in the manufacturing sector is much lower than the national average.

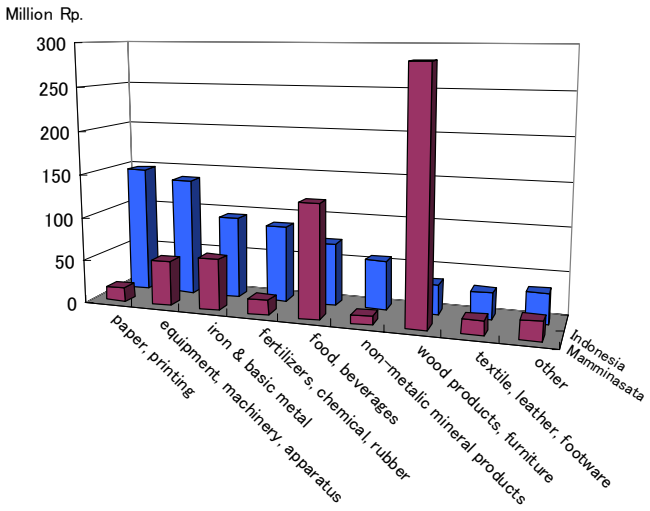


Figure 7.14: Value Added per Employee in the Large and Medium Scale Enterprises (2003)

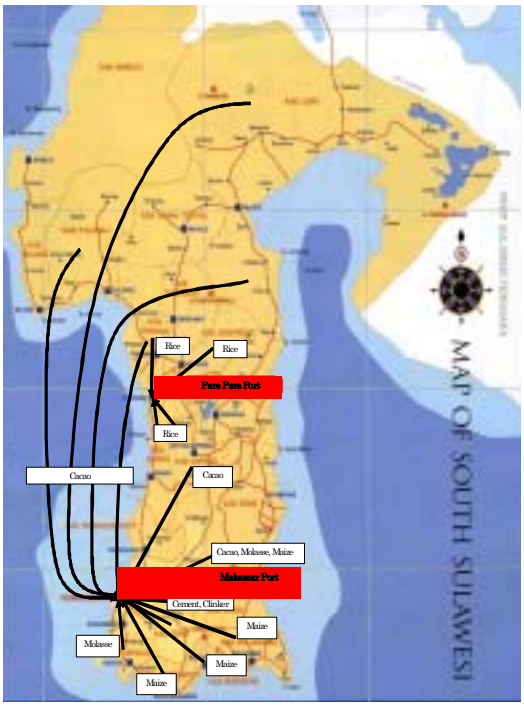
It is noted that the recycling industry has been growing by 7% per year in South Sulawesi for the last 5 years (10% in all of Indonesia), though its contribution to the Mamminasata GRDP still remains at only 0.1%.

Issues to be addressed in the manufacturing sector are multi-fold, and they have been analyzed by referring to Michael Porter's Diamond Model. From the "demand conditions", the markets in South Sulawesi and Mamminasata generally value the products not by quality but by price. This keeps the enterprises in a weak condition by targeting production of only higher value products. From the "factor conditions", the major constraints are the relatively low level of human resources and the lack of adequate infrastructure and supporting industries, as well as BDS providers and facilitators. From the viewpoint of "firm strategy, structure and rivalry", enterprises in Mamminasata do not deal with outbound logistics, marketing/sales and service activities to reach the final markets. They should challenge themselves to move into both upstream and downstream markets to strengthen the value chain. A SWOT analysis for the food industry in Mamminasata is presented for reference.

Table 7.10: SWOT Analysis of the Food Industry in Mamminasata

	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry
Strength	Abundant raw material		Supporting activities by Gerbang Emas, RTEPC, etc.	
Weakness	• Insufficient infrastructure • Only limited plain fields are available for new investors	The best quality is only for export.	Lack of supporting industries	Not going into higher value added products
Opportunity	Mamminasata Development Plan	Upgrade of living standards		
Threat				Market competition from imported goods

On the other hand, major exports of South Sulawesi are nickel (36%), cocoa (35%), fish and shellfish (17%), amounting to a total export value of $526 million in 2003. Most of the export products are local resource based products. Major imports are wheat (44%), sugar (18%), mineral raw materials and ceramic products, amounting to a total import value of $92 million (2003). About 60% of exports and 90% of imports are via Makassar port. Cacao and other export products of South Sulawesi are transported to and shipped from Makassar, as shown on the map. It is noted however, that there is little direct shipment from Makassar port to markets overseas, and most containers are transshipped at Surabaya.



Note: All the routes for commodity transportation indicated in the map use land transportation.

Figure 7.15: Accumulation of Export Goods to Makassar Port

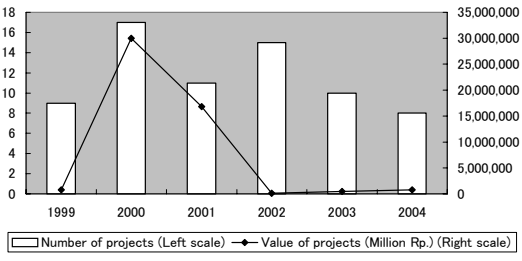
An argument has been raised as to whether Mamminasata should rely more on warehousing to become a trade hub in Eastern Indonesia. In fact, there are 112 listed warehouses in and around Makassar and further investments are said to be likely. The reality is that these warehouses are for storing agricultural products (about 40%), fishery products and construction materials without processing or

value-adding activities. Economic growth will hardly be attainable if activities are limited to the least value added practices as encountered in the current warehousing industry.

Issues to be addressed in the promotion of investments are also multi-fold. For instance, investors have to go through a minimum of eight steps to launch a business taking an average of 51 days (the national average is worse, requiring 12 steps and 151 days). The "one-roof service system" has been proposed but the regional investment coordinating boards are reluctant to give up their vested rights under the decentralization policy. Labor related issues are more serious for foreign investors. The World Bank study revealed that an employee to be fired should be paid an amount equal to 157 weeks' salary while it is 53 weeks on an average throughout East Asia. The cost of enforcing contracts as counted from court and attorney fees is more than twice as expensive as the East Asian average.

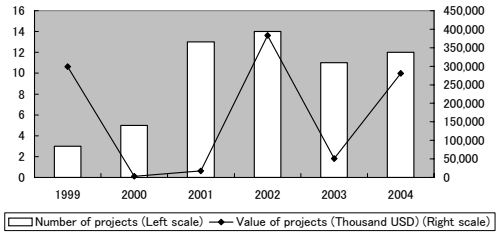
Foreign investors in Mamminasata express their concern over prevailing illegal products in the markets, jeopardizing fair competition. Local taxes are imposed without pre-notification and tax inspections are excessive for foreign investors. Likewise, it is reported that additional charges are imposed on export and/or shipment other than the normal charges/tariffs. Such unaccountability is really an impediment factor condition that makes foreign investors less attractive in investments in South Sulawesi. Some investors are withdrawing from manufacturing due to such disincentive factors. Improvement in accountability and transparency is pre-requisite for the promotion of investments in Mamminasata.

Investors coming into Eastern Indonesia are entitled to tax incentives in addition to the incentives granted at the national level. They include (i) reduction of land and building tax by 50% for up to 8 years and (ii) compensation for losses for 8 years. The actual amount of investment coming into South Sulawesi, however, has stagnated in recent years, as shown in the following figures.



Source: BPPMD
Note: Figures are realization-base.

Figure 7.16: Trend of Domestic Investment in South Sulawesi



Source: BPPMD
Note: Figures are realization-base.

Figure 7.17: Trend of Foreign Investment in South Sulawesi

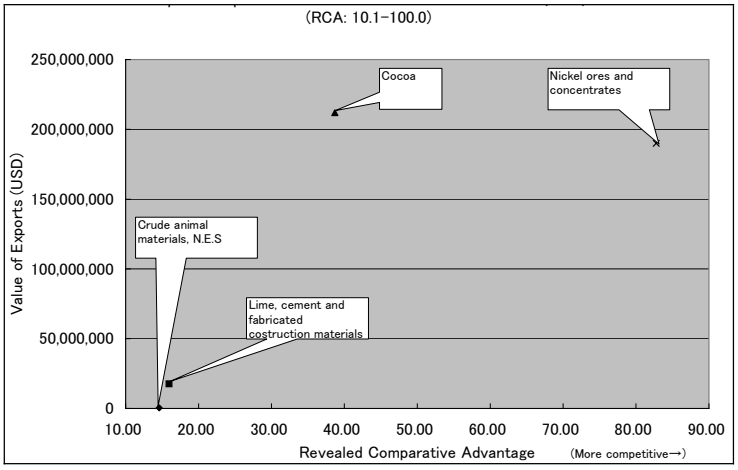
Lack of adequate infrastructure is another constraint in industrial and trade promotion. For instance, some factories in the KIMA industrial estate have been

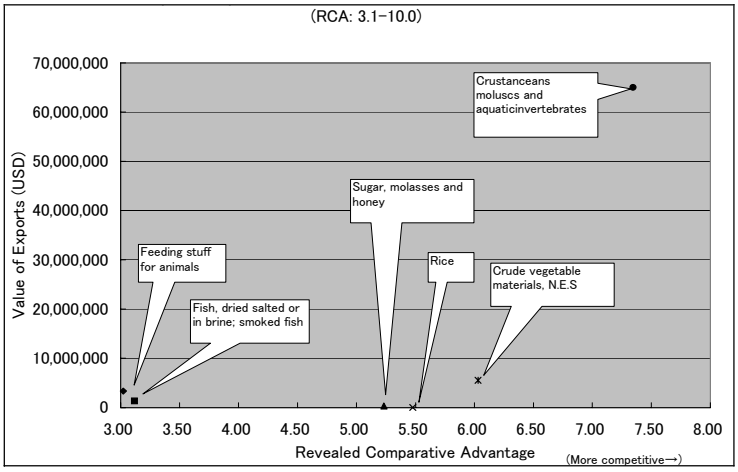
obliged to stop manufacturing due to frequent blackouts due to insufficient transformer capacity at the nearby substation.

Specific attention is drawn to the fact that Indonesia has not been so active in the regional investment promotion in the East ASEAN Growth Area (EAGA) that has been promoted by Indonesia, Brunei, Malaysia and the Philippines since 11994. It is reported that Indonesia is in low profile in promoting intra- and extra-EAGA trade investments. Indonesia is a lead country of the Working Group for a natural resource development cluster where agro-industry, fisheries, forestry industries are to be collectively promoted along with the industries related to the environment. In this context, it is proposed that Mamminasata, for its geographical position, would assume a leading role in regional trade promotion in the East ASEAN.

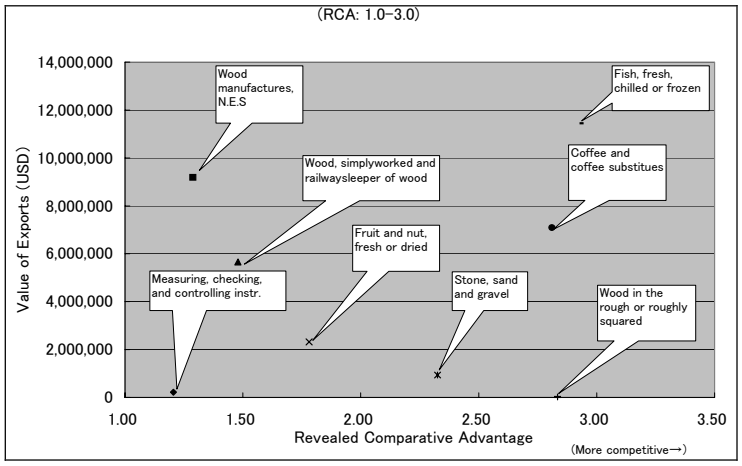
2) Industrial and Trade Development Strategy

Since industries in Mamminasata are principally based on local resources, resource-based industries and exports will be promoted. Competitiveness of various resources available in Mamminasata and South Sulawesi is evaluated by the Revealed Comparative Advantage (RCA), as shown below.





Note: $RCA_i=(X_{i,\ South\ Sulawesi}/\Sigma X_{South\ Sulawesi})/(X_{i,\ Indonesia}/\Sigma X_{Indonesia})$ where RCA_i is the revealed comparative advantage of commodity i, $X_{i,\ South\ Sulawesi}$ is the export value of commodity i from South Sulawesi, $\Sigma X_{South\ Sulawesi}$ is the total export value from South Sulawesi, $X_{i,\ Indonesia}$ is the export value of commodity i from South Sulawesi, and $\Sigma X_{Indonesia}$ is the total export value from Indonesia.



Source: BPS (2004) Statistik Perdagangan Luar Negri Indonesia Expor 2003

Figure 7.18: Export Competitiveness of South Sulawesi (2003)

The RCA analysis indicates that "cocoa" is highly competitive in South Sulawesi, next to nickel, and that the production, processing and export of cocoa products could be accelerated. Sulawesi could be the **World's No.1 Producer of Cacao Products**. Mamminasata could play the role of processing and export center of cocoa products.

Cement and fabricated construction materials are also competitive with a high value of RCA. Expansion of cement production could be achieved in Mamminasata, both for exports and for promotion within the domestic construction industry. It is envisaged that a cement-based construction and housing industrial complex could be developed in Maros.

For industrial development, more strategies are to be adopted. They would include (i) emphasis on human resource development through universities and UTP, (ii) promotion of public-private partnerships, (iii) promotion of supporting and related industries, (iv) improvement of the system to induce higher payment for better quality products, and (v) promotion of industrial clusters. Industrial clustering will be of particular importance for SMEs and lessons are to be learned from the previous and on-going business development services (BDS). Development of industrial estates/parks should also promote clustering and linkage promotion among enterprises within and outside the parks.

Additionally, trade promotion strategies are proposed to include (i) change in the trade flows or patterns, (ii) effective promotional activities and information dissemination, and attractive incentives to be granted for investors and exporters. The proposed change in trade flows implies that more processing should be introduced in Mamminasata with raw materials brought from Kalimantan, Papua and other Eastern Indonesian areas, as shown in the following diagram.

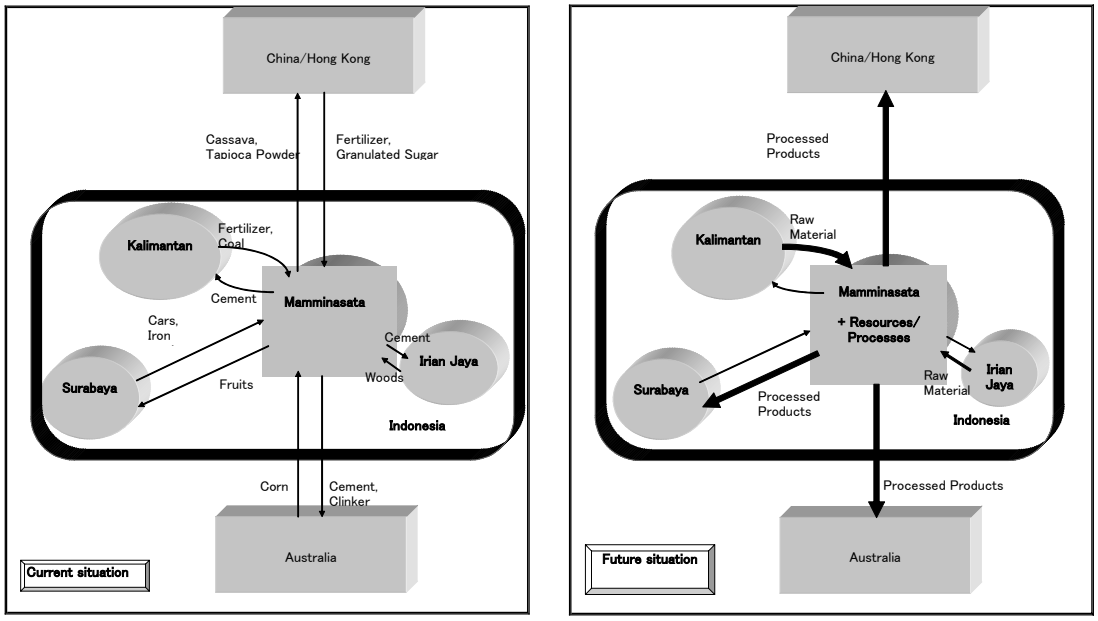


Figure 7.19: Change in Trade Flows via Mamminasata

3) Plan Formulation and Implementation

Development of the industrial sector in Mamminasata will be programmed to step up gradually with the enhancement of value added in processing the local resources. Provisionally, it is planned that the industrial sector would develop under the following scenario:

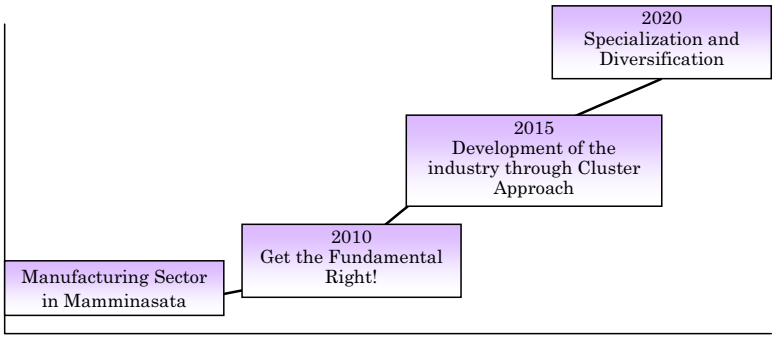


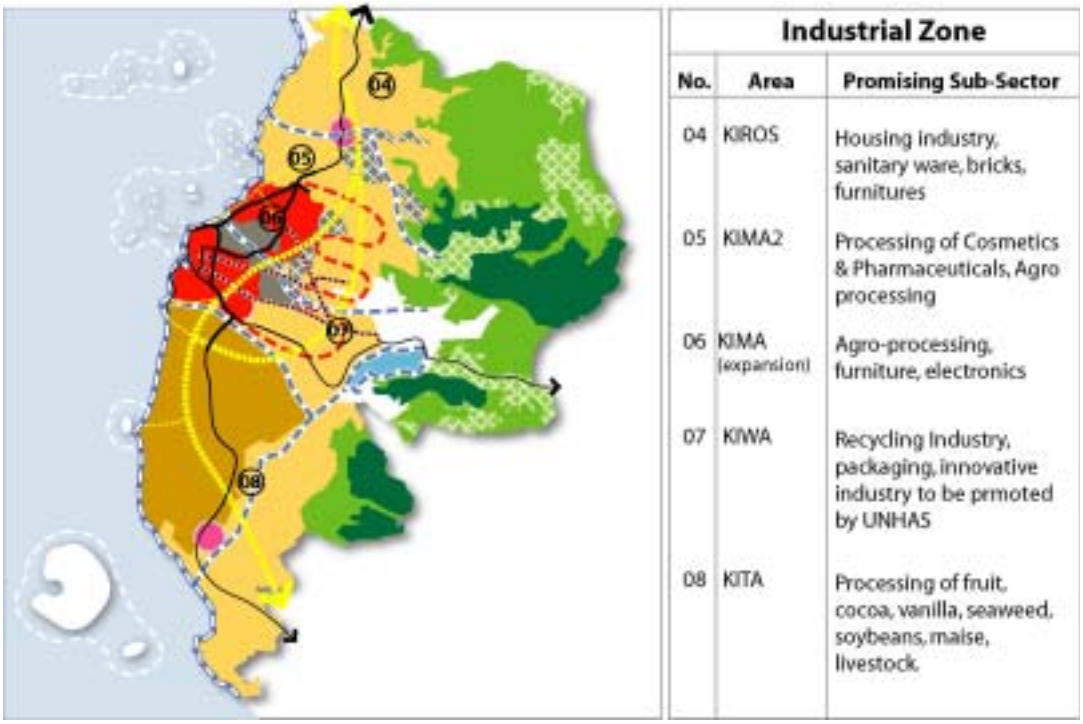
Figure 7.20: Image of Industrial Development Scenario in Mamminasata

Table 7.11: Industrial Development Scenario (Agenda)

	Term Agenda	Actions	Goal
2005-2010	Get the Fundamentals Right!	• Infrastructure development • Enforcing market friendly policies	To create a business environment to bring in more investment
2011-2015	Development of Industry through the Cluster Approach	• While targeting agro-and marine- related manufacturers, the cluster approach is taken.	To strengthen linkages among the different sectors of industry
2016-2020	Specialization and Diversification	• To guide each enterprise to focus on technological development, in which it has core competence.	To create industries, which manufacture high quality value added products

To facilitate and promote investments in the industrial sector, each regency in Mamminasata has been planning to set up industrial estates. The land use zoning will be prepared on the basis of land requirements for industrial use, as discussed in Section 6.1, but detailed location and plans should be elaborated through further studies on potential industrial categories for location in each industrial zone.

The following figure shows a preliminary industrial location. For instance, Makassar city may expand the KIMA industrial estate and promote further investment in cacao and other processing industries in line with the expansion of the Makassar port facilities. Maros may study to develop an industrial park with particular attention to locate housing industries, making use of cement, marbles, woods and other raw materials available in the regency. Industrial location in Gowa may be somewhat hindered with the accessibility to the port and other transportation facilities, and the industrial park should start with the selection of target industries and promotion of investments in such an industrial park. Promotion of recycling industries is one of the strategies to be elaborated by Gowa.



Industrial Zone

No.	Area	Promising Sub-Sector
04	KIROS	Housing industry, sanitary ware, bricks, furnitures
05	KIMA2	Processing of Cosmetics & Pharmaceuticals, Agro processing
06	KIMA (expansion)	Agro-processing, furniture, electronics
07	KIWA	Recycling Industry, packaging, innovative industry to be prmoted by UNHAS
08	KITA	Processing of fruit, cocoa, vanilla, seaweed, soybeans, maise, livestock.

Figure 7.21 Industrial Zoning in Mamminasata

Takalar, on the other hand, has a potential to develop an agro-processing industrial complex in combination with the rehabilitation of the existing sugar mill. Processing of fruit for juice and other beverages, cacao produced in the eastern peninsula for various cacao-based products, and vanilla for ice cream and other natural products would be linked with the sugar production nearby. Processing of sea weeds, soybeans and maize may also be promoted in the agro-processing industrial complex.

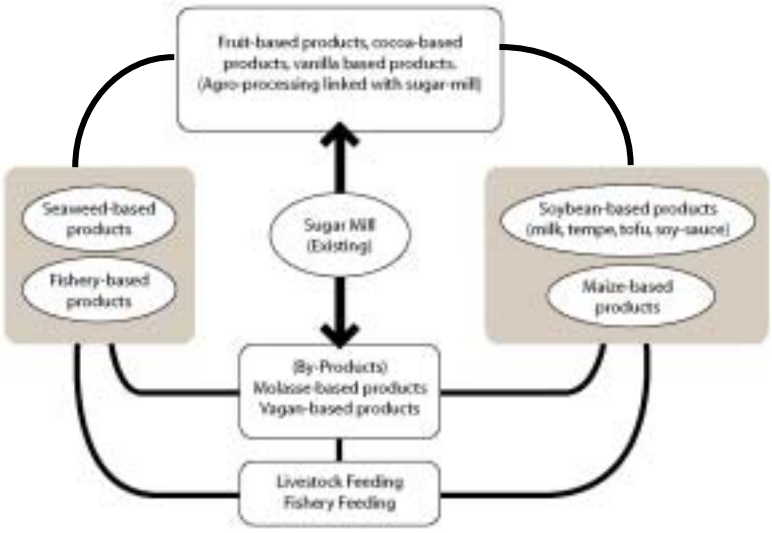


Figure 7.22 Takalar Agro-based Cluster

Unlike the KIMA industrial estate, the new industrial estates and parks should be developed by the private initiative. The public sector would support the private sector in improving infrastructure outside the industrial estates (e.g., power and water supply, sewerage treatment, and transportation networks). Foreign and domestic investors are approached not only for promotion of industries but also for promotion of investments in such industrial estates.

In formulating a detailed plan for industrial estate development, it is suggested that the recycling industries be strategically promoted with a view to attain an eco-friendly region in Mamminasata. There is no reason why most solid wastes in Mamminasata are shipped to Surabaya and the recycled products imported back into Mamminasata.

BAPPEDA South Sulawesi has projected that the annual average growth rate in the manufacturing sector will be over 9% up to 2020. This appears to be a little too ambitious in the light of the previous performance (5% growth in 2000-2003), as well as in view of the preconditions, locally available resources, infrastructure development and national/regional policy measures applied and to be applied in the near future. More realistically, it is provisionally planned that the manufacturing sector in Mamminasata would grow at an annual average rate of 6.3%, as tabulated below.

Table 7.12: Estimated Manufacturing GRDP by Sub-Sector

(1993 Constant Price, Unit: Mill. Rp.)

By Sub-Sectors	2005	2010	2015	2020	CAGR
Food, beverages (L&M)	449,108	653,659	970,533	1,266,055	7.2%
Textile, leather, footwear (L&M)	1,339	2,202	3,698	5,280	9.6%
Wood products, furniture (L&M)	420,661	469,496	533,370	572,560	2.1%
Paper, printing (L&M)	3,432	9,071	24,573	50,154	19.6%
Fertilizers, chemical, rubber (L&M)	6,148	13,458	30,152	53,353	15.5%
Non-metallic mineral products (L&M)	5,893	10,790	20,192	31,243	11.8%
Iron & base metals (L&M)	3,692	5,481	8,302	10,989	7.5%
Equipment, machinery, apparatus (L&M)	26,424	52,855	108,134	178,781	13.6%
Other (L&M)	1,189	1,733	2,577	3,365	7.2%
Small and micro enterprises	128,438	201,401	322,371	444,401	8.6%
Total	**1,046,325**	**1,420,147**	**2,023,902**	**2,616,181**	**6.3%**

Note: L&M: Large and medium enterprises

The trade sector is expected to grow at an annual average growth rate of around 7% towards 2020. This is slightly lower than the BAPPEDA projection (7.5%) but higher than the average in the past (5.6% in 2000-2003).

In order to promote domestic and foreign investments, the business climate in Mamminasata and Indonesia as a whole needs to improve by eliminating business obstacles. At the regional level, some incentives to investors and some measures for export promotion are to be planned and implemented together with improvements in the infrastructure and human resources. The existing tax preferential treatments are to be maintained and the training services for exporters are to be strengthened, including the Regional Export Training and Promotion Center in Makassar.

4) Action Program

For accelerated industrial development in Mamminasata, the following action programs are proposed. (Details are presented in the Sector Study report.)

(i) Cluster promotion for cacao-related industries;

(ii) Cluster promotion networking the individually operated Gerbang Emas industries in Mamminasata and South Sulawesi;

(iii) Strengthening the capacity of BDS providers and facilitators; including the capacity and function of the LPM at universities;

(iv) Strengthening the capacity of UPT to strengthen supporting and related industries;

(v) Strengthening the capacity of BDI and BLKI, particularly for training in production management and quality control;

(vi) Strengthen the capacity of RETPC to develop packaging, clustering and to promote exports;

(vii) Strengthening the capacity of technical universities, particularly for promotion of entrepreneurship, production and quality control, and other practical technologies;

(viii) Compilation of the industrial and related statistics; and

(ix) Development of industrial estates/parks in due consideration of the industrial location, environmental protection, clustering and other impacts.

The above actions are mainly for the public sector. The private sector should be encouraged to create new industries and expand the capacity to manufacture competitive products, including the expansion of the cement factories and related housing industries.

For trade and investment development in Mamminasata, it is also suggested to implement the following actions:

(i) Study and improvement of investment incentives to be granted for Mamminasata industries;

(ii) Designation of bonded zones for trade promotion;

(iii) Execution of more effective exhibitions of Mamminasata products;

(iv) Introduction of "Awards" for excellent Mamminasata exports; and

(v) Intensive marketing promotion with China as a targeted market.

7.3 Tourism Development [3]

1) Major Issues

Tourism areas in South Sulawesi are the (i) Tana Toraja area, (ii) Makassar area, and (iii) Bulkumba-Selayar Island area. While the Tana Toraja area is known as a cultural and natural tourism destination for foreign tourists and the Bulkumba-Selayar Island area is known as an excellent diving spot, the Makassar tourism area in Mamminasata is a gateway to various tourism spots in South Sulawesi.

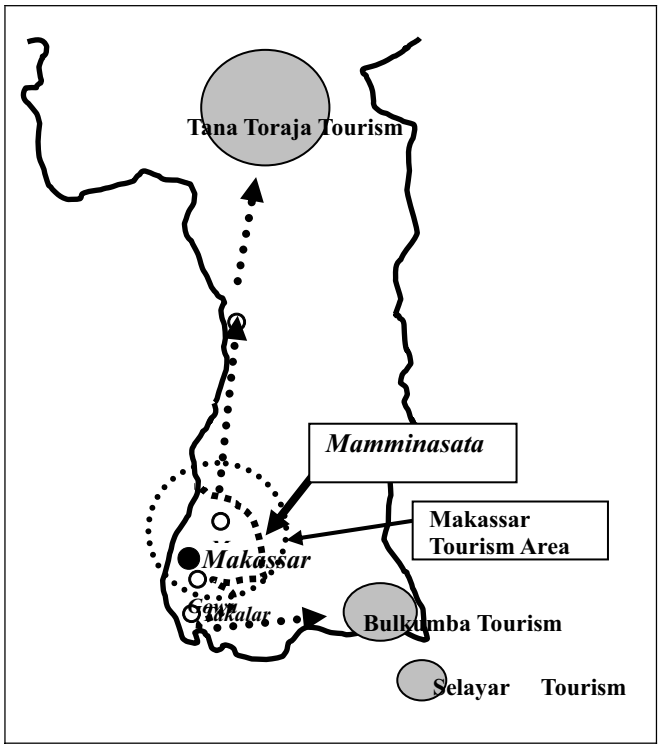
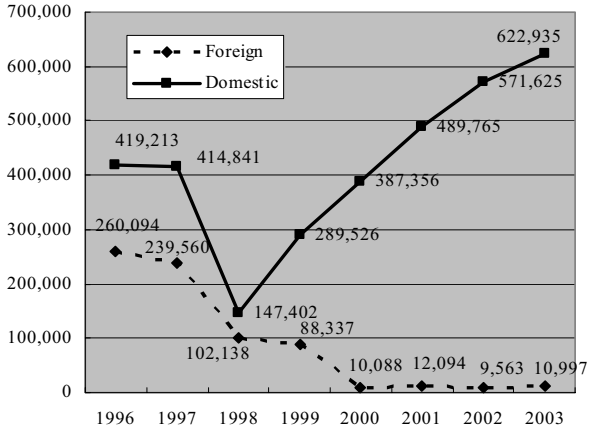


Figure 7.23: Tourism Areas in South Sulawesi

Domestic tourists and visitors to South Sulawesi are increasing steadily after the drop in 1998, while foreign tourists decreased drastically in 1998 and again in 2000, they are remaining at the level of around 10,000, as shown on the following figure. Such a sharp drop in foreign tourists is due to the preoccupation with security conditions in Indonesia, with the implication that excellent security is prerequisite to promote tourism in any part of the world.



Source: Tourism Marketing & Promotion, Culture and Tourism Office, South Sulawesi Province

Figure 7.24: Foreign and Domestic Visitors to South Sulawesi

[3] Refer to Sector Study Report (7) for detail.

Makassar is famous for its spectacular sunsets, and it is said to be one of the most beautiful spots in the world to see the sunset. Tourists and the local people enjoy the scenery along the Losari beach and other coasts. This tourist asset has not been well utilized, partly because it has not been well combined with other tourism attractions. Although tourism areas and resources in Mamminasata are identified as shown in the following figure, they are not yet attracting foreign tourists to enjoy Makassar/Mamminasata as a final destination.

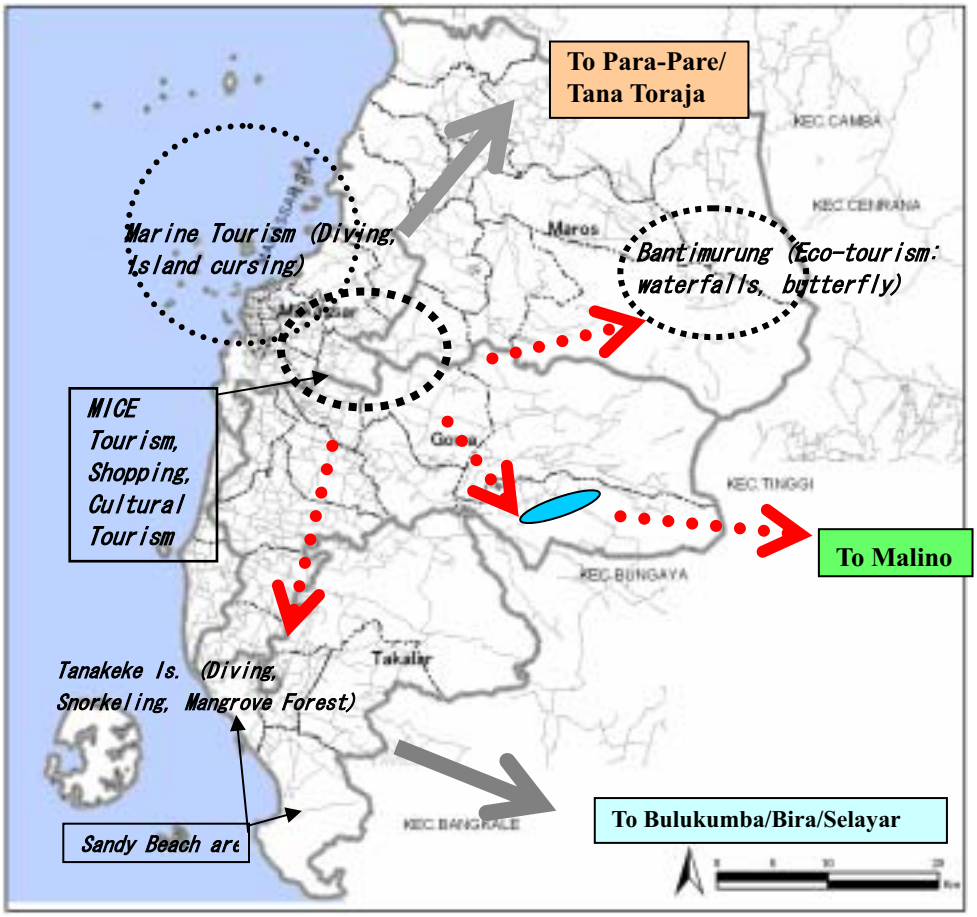


Figure 7.25: Tourism Areas within Mamminasata

Major tourism resources and attractions in Mamminasata are shown in the following figure, including cultural and historical tourism, religious spots, marine and nature tourism, agro-tourism, convention tourism, and sport/recreational tourism.

Photo of Fort Rotterdam

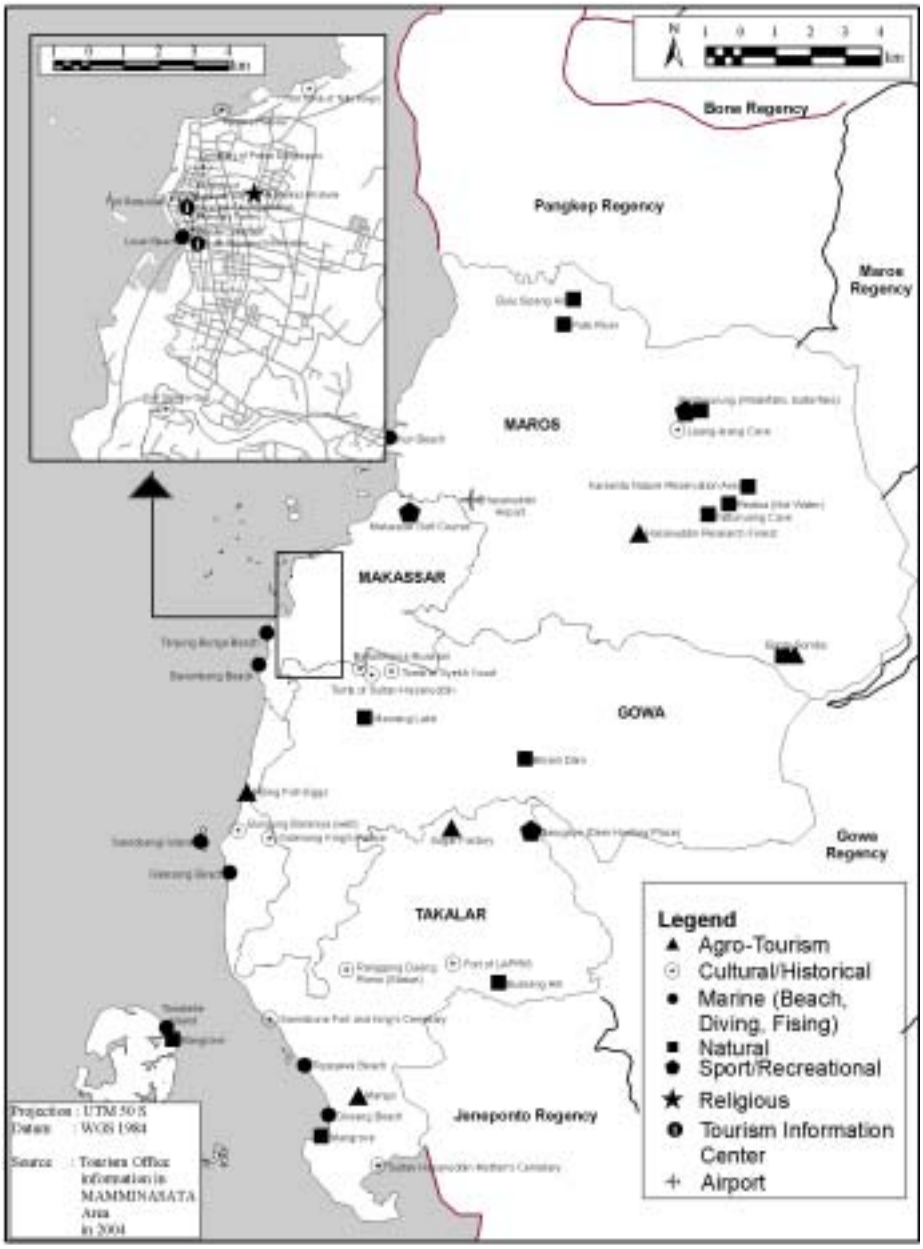


Figure 7.26: Tourism Resources and Attractions in Mamminasata

Another notable attraction is the plethora of marine diving spots around a number of islands offshore of Makassar. A diving center offers various diving tours to nine diving spots near offshore islands, including a tour to Kapoposang Island located within a 1.5 hour ride by speedboat for 2-3 day stays at bungalows on the island. One-day or half day diving tours are offered to Samalona, Lanjukang, Lumu Lumu and Kodingareng Kebe islands. Diving seasons are from April to November. Tour participants numbered 200-300 each year from 2001 to 2004.

The average length of a foreign tourists' stay in Mamminasata was around 1.5 days with an average expenditure of around $80/day. No data is available on expenditure by domestic tourists.

On the other hand, the annual income from the hotel and restaurant sub-sector in Mamminasata increased from $48,560 to $73,300, or at an annual average rate of 6.2%, and it contributed around 2% of GRDP. The contribution of the tourism sector to the regional economy remains relatively small.

2) Tourism Development Strategy

Tourism development in Mamminasata would be rather limited for foreigners, unless it is developed in combination with other tourism area developments (e.g., Tana Toraja) or it is combined with the promotion of conventions and other activities in Makassar.

Several strategies are contemplated for tourism promotion in Mamminasata. They are:

(i) Promotion of MICE tourism in Makassar combined with the public and business sectors, like seminars, conferences, conventions, wedding and religious ceremonies, as this has the most potential. MICE tourism would induce more spending per visitor, longer stays and more employment opportunities for the locals.

(ii) Enhancement of cultural and historical value of the heritages, e.g., Fort Rotterdam, Paotere Harbor, the Old tombs of King Tallo, the Cemetery of Prince Diponegore, the Mandala monument, For Somba Opu and the grave of Syech Yusuf.

(iii) Improvement of tourism information services, facilities and infrastructure, as the existing tourism information centers (TICs) are ineffective and inconvenient for tourists to access. Museums should also be improved, along with the improvement of tourism signage and explanation boards.

(iv) Promotion of marine tourism as beaches and islands around Mamminasata offer favorable natural conditions for marine tourism development. It will include Losari beach, Kayangan and Lae-Lae kel. islands, Kadingareng Keke and Lanjukang islands, Kuri beach, Galesong and Topejawa beaches, Cikoang beach and Tanakeke islands, and Sanrobengi islands. Marine tourism will be developed along with fishery development for local residents.

(v) Creation of attractive local tourism-related products, including handicrafts, woven silk products, agro-products, etc.

(vi) Promotion of linkage and networks for inter-regional and regional tourism, including linkage/networking with Tana Toraja, Bulukumba and Bira.

(vii) Further improvement in tourism administration and capacity development of tourism-related staff, both in the public and private sectors.

(viii) Promotion of the public-private-partnership for tourism development in the field of facility improvement, promotion and marketing, and capacity building. One idea to set up a "Mamminasata Tourism Marketing Promotion Board" will be worth studying.

It should be noted that foreign tourists, while enjoying the spectacular Makassar's sunsets, would find it uncomfortable to be in a town with so much garbage scattered along the streets, coasts and rivers/canals and with unpleasant noise in public spaces. The environmental protection and promotion of amenities should be prioritized for the promotion of tourism in Mamminasata.

3) Plan Formulation and Implementation

The overall goal of tourism sector development in Mamminasata should be set in the following manner.

> ***To develop and promote Mamminasata as a main gateway tourism destination in South Sulawesi to attract more domestic and foreign tourists and tourism businesses by improving and developing tourism resources and facilities, as well as by strengthening regional and inter-regional tourism linkages for supporting the regional economy***

Various projections have been made on the tourist arrivals in South Sulawesi, including a study by the Provincial Culture and Tourism Office. Although the national and provincial projection predicted, in 2002, a slight decrease in foreign tourist arrivals in South Sulawesi during the period from 2003 to 2008, the actual record shows an increase in 2004. Foreign visitors are projected referring to the local and international tourist destination forecasts. For domestic visitors, the projection is made on the basis of classified and non-classified hotel guests as estimated by the local authority, as well as GRDP projections in Mamminasata. The tourist arrivals in Mamminasata are thus estimated as summarized in the following table.

Table 7.13: Estimated Tourist Arrivals in Mamminasata (Provisional, Unit: Thousand)

	Domestic	Annual Growth Rate	Foreign	Annual Growth Rate	Total	Annual Growth Rate
2004	734	22.0%	18	12.0%	752	-
2005	780	15.0%	21	15.0%	801	6.52%
2010	1,189	10.0%	40	10.0%	1,229	10.00%
2015	1,747	8.0%	63	6.5%	1,810	7.95%
2020	2,338	6.0%	86	6.5%	2,424	6.02%

Source: Tourist statistic (Foreign and domestic tourists) in 2004, Association of the Indonesian Tours & Travel Agencies, BPS statistic, Tourism Marketing Report, 2002 (CETAK BIRU PEMASARAN PARIWISATA INDONESIA, KEMENTERIAN KEBUDAYAAN DAN PARIWISATA, INDONESIA, 2002), Tourist Destination Forecast in East Asia and the Pacific Region by World Tourism Organization (WTO)

Remark: Projected domestic and foreign tourists include business visitors. Projected numbers of tourists in the table are visitors to Makassar City.

Currently, there are a few hotel development plans in Makassar (e.g., Clarion with 340 rooms, Tanjung Bunga with 250 rooms, and Horizon with 115 rooms) and the existing and planned hotel rooms would meet the requirements (both classified and non-classified) up to around 2010.

With the estimated foreign tourists/visitors to Mamminasata, tourism receipts would amount to around $7 million in 2010 (with 2 days stay and expenditures of $95/day) and over $20 million in 2020 (with 2.5 days stay and expenditures of $105/day).

The foreign tourist market is to be further developed, particularly the Asian and European markets, including excursion tours to Mamminasata and Tana Toraja for Bali visitors. Marine tourism and eco-tourism, if properly developed in and around Mamminasata, could attract tourists for longer stays. Three Indonesian tourism information centers are re-opening in Japan, China and Australia. It is expected that Chinese tourists would substantially increase if and when direct air flights are opened to Makassar. For domestic tourists markets could be further developed for MICE tourism, convention tourism and other attractions. Annual events, like a fireworks festival along Losari beach, should also be promoted to attract domestic tourists.

For foreign and domestic tourists, conservation of the cultural and historical heritages in Mamminasata should draw special attention. Such conservation programs will not be implementable in a short period and efforts should be steadily increased in combination with the programs for environmental conservation. For instance, Fort Rotterdam in Makassar together with the surrounding areas should be conserved as an historical complex. A proposal to create a Fort Rotterdam park and enhance the amenities around the old city is worth further study. It is also

desirable that the eastern part of Tanjung Bunga, where traditional buildings are exhibited, be turned into a cultural heritage park to attract foreign and domestic tourists, not to mention the Mamminasata people.

4) Action Program

For tourism development in Mamminasata, short- and long-term programs are recommended for implementation. They would include;

<Short-term Programs>

(i) Improvement of Fort Rotterdam and its surrounding area to create the "Fort Rotterdam Historical Area", by upgrading the museum, signage, presentation of the Fort and re-developing the surrounding area;

(ii) Improvement of the beach area in front of Fort Rotterdam and Rosali beach, including beautification of the beaches and improvement of the jetty for cruising boats (A sunset cruising will attract more tourists and visitors);

(iii) Improvement of the Somba Opu Traditional Culture Park, including the improvement of existing traditional houses and the museum, handcraft center;

(iv) Improvement of tourism information services so that updated and user-friendly information services are provided; and

(v) Promotion of MICE tourism for the domestic market, as well as promotion of convention tourism with the planned convention center in Makassar.

Image Drawing of Celebes Convention Center

<Mid- and Long-term Programs>

(i) Promotion of marine tourism in Makassar and other coastal areas, for promotion of island cruising, sunset cruising, diving, snorkeling and fishing;

(ii) Development of nature- and community-based tourism, in and around Bantumurung, Tallo estuary, Bili-Bili reservoir, etc.

(iii) Promotion of agro-tourism in combination with expansion of fruit orchards in the forest and reforestation areas, particularly in Gowa and Maros;

(iv) Development and promotion of a series of tour circuits by connecting several selected tourist sites in Mamminasata, as “Mamminasata Tour Circuits