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

SECTOR STUDY REPORT

JULY 2006

KRI INTERNATIONAL CORP.
NIPPON KOEI CO., LTD.

FOREWORD

The Sector Study Reports presented in this volume of the Final Report will supplement the Study on the Integrated Spatial Plan for the Mamminasata Metropolitan Area with detailed analysis and plan formulation by sector. This volume is composed of 16 sector study reports as follows.

Sector Study Reports

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

While the readers of the Main Report will understand the Integrated Spatial Plan for the Mamminasata Area as a whole, those who are interested in further details of the sector analysis and plan formulation will get additional information in these Sector Study Reports how the spatial plan has been formulated on the basis of sector-wise studies.

SECTOR STUDY

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

Study on Implementation of
Integrated Spatial Plan for
The Mamminasata Metropolitan Area

SECTOR STUDY (1)

SOCIO-ECONOMIC STUDY

KRI International Corp.
Nippon Koei Co., Ltd

Table of Contents

1. DEMOGRAPHY

1.1 Demographic Trend

1) Total Population

The national population of Indonesia is **215.28 million** (2003), 7.1% of which resides in Sulawesi region. More than a half of the Sulawesi population belongs to South Sulawesi province (see Table 1-1).

Table 1-1: Population Comparison (2003)

	South Sulawesi	Sulawesi Region	Indonesia
Population (2003) ('000)	8,253	15,382	215,276
Population Share (of Sulawesi)	53.7%	-	-
Population Share (of Indonesia)	3.8%	7.1%	-

Source: BPS

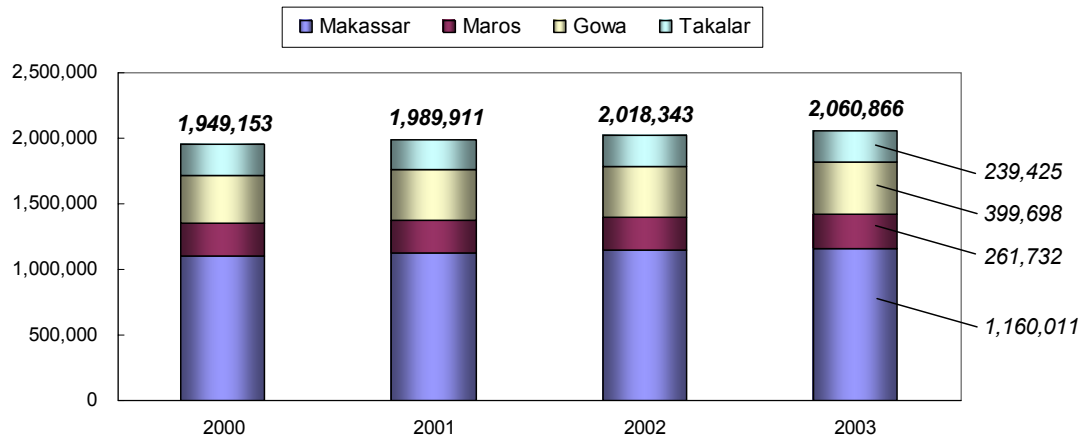
The Mamminasata metropolitan area has a total population of **2.06 million** (2003) in its area of **246,230 ha**, covering Makassar city, twelve sub-districts of Maros regency, ten sub-districts of Gowa regency, and Takalar regency. More than half of its population resides in Makassar, while 19.4% in Gowa, 12.7% in Maros, and 11.6% in Takalar, respectively (see Table. 1-2).

Table 1-2: Size and Population of Mamminasata Metropolitan Area (2003)

District		Size (ha)*	(%)	Population**	(%)
Makassar	(All 14 Sub-district)	18,057	7.3	1,160,011	56.3
Maros	(12 of 14 Sub-districts)	103,902	42.2	261,732	12.7
Gowa	(10 of 16 Sub-districts)	72,325	29.4	399,698	19.4
Takalar	(All 7 Sub-districts)	51,947	21.1	239,425	11.6
Total		246,230	100.0	2,060,866	100.0

Source: JICA Study Team*; BPS**

The population in Mamminasata has been growing steadily with an average annual growth rate of **1.9%** between 2000 and 2003 (see Fig. 1-1). Gowa has the highest growth rate of 2.5% among the four districts, while the others remain below 2% (i.e. Makassar 1.8%; Maros 1.8%; Takalar 1.4%).

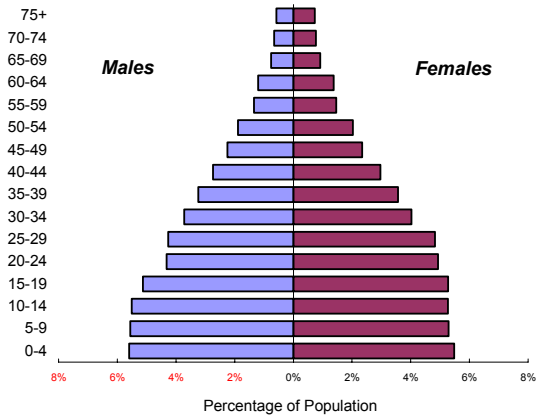


Source: BPS

Figure 1-1: Population Trend of Mamminasata Metropolitan Area (2000-2003)

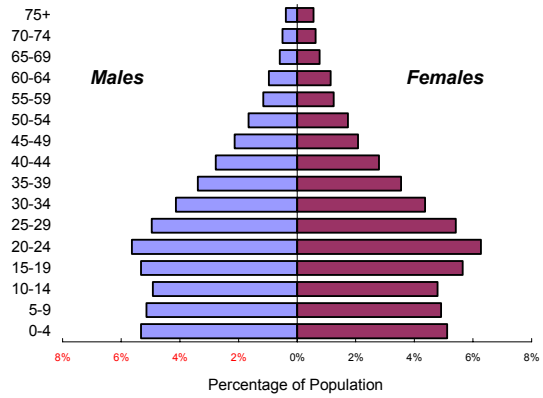
2) Population Structure

The population structure of Mamminasata is rather distinct from that of South Sulawesi province. The population pyramids below indicate that Mamminasata area has a more even age distribution than South Sulawesi, which has an unbalanced distribution among age groups with a larger proportion of population less than 20 years old (see Fig. 1-2ab).



Source: BPS

Figure 1-2a: Population Pyramid: South Sulawesi (2000)



Source: BPS

Figure 1-2b: Population Pyramid: Mamminasata (2000)

3) Population by Sub-district

(1) Population Size and Density

Population size significantly varies among the 43 sub-districts, which constitute Mamminasata. Most of the populous sub-districts with more than 50,000 residents are in Makassar and Gowa, while the sub-districts in Maros and Takalar typically have residents 20,000 to 40,000 within their areas.

Population density has a clearer comparison between the sub-districts in Makassar and those in the other districts (see Fig. 1-3 and Annex 1). Highest density sub-districts (more than 40 persons per ha) are mostly seen in the sub-districts of inner old city of Makassar, such as Makassar, Bontoala, Mamajang, Mariso, Ujung Tanah, Rappocini, Wajo, Tallo, Ujung Pandang, and Panakkukang. On the other hand, medium density sub-districts (20-40 persons per ha) are seen in sub-urban sub-districts as such as Tamalanrea, Manggala, Biringkanaya, Somba Opu, and Galesong Utara. Low density sub-districts (less than 20 persons per ha) covers the other sub-districts.

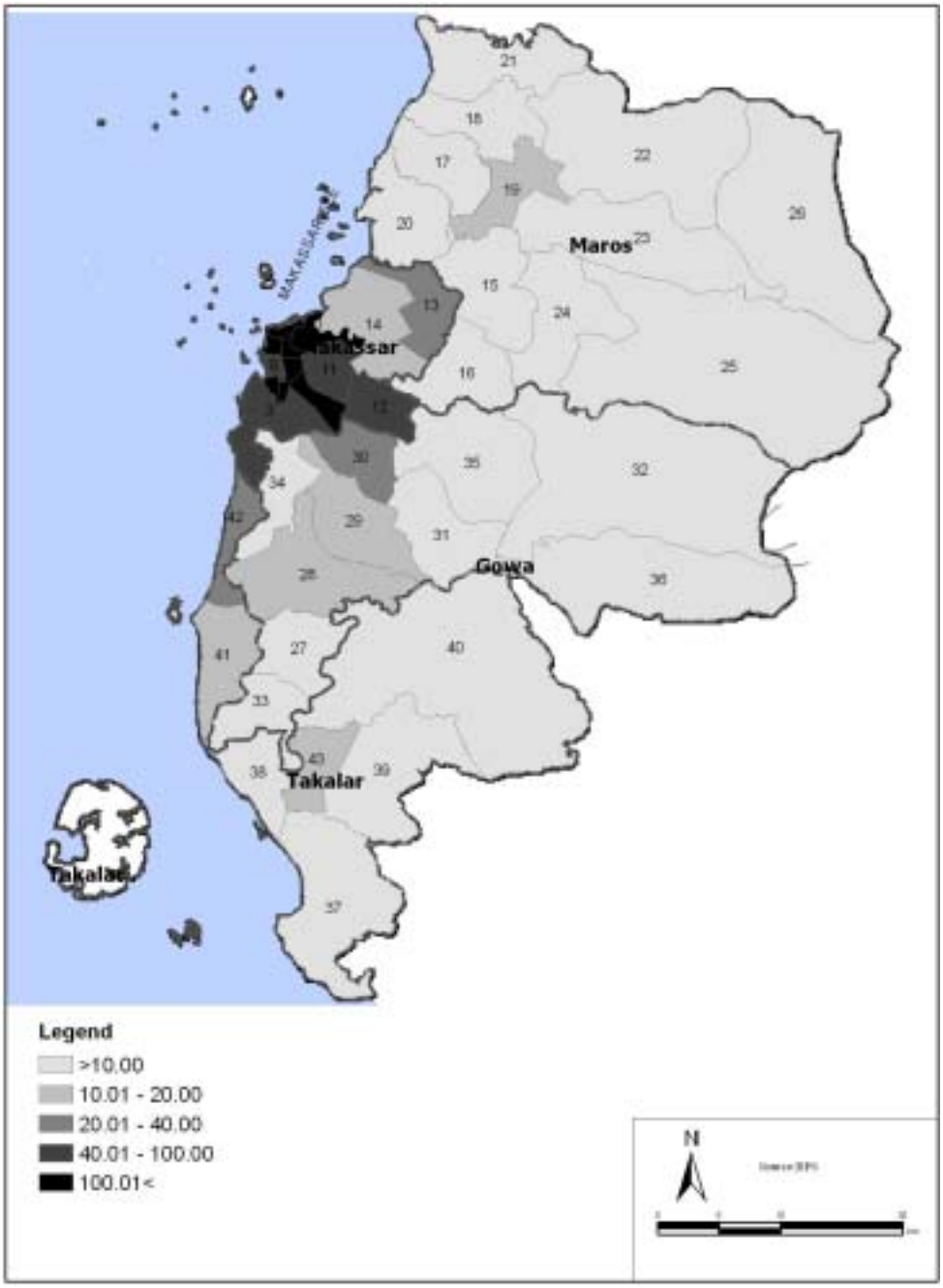


Figure 1-3 Population Density by Sub-District (2003)

(2) Growth Rate

Growth rate also varies significantly among sub-districts, though it is only 1.9% in Mamminasata area as a whole (see Fig.1-4 and Annex 1). Many populous inner sub-districts of Makassar such as Wajo, Bontoala, Mamajang, Ujung Pandang, and Makassar, undergo population decline while a few others retain only minor escalation. In contrast, sub-urban districts, including Biringkanaya, Manggala, Mandai, Moncongloe, and Tamalanrea, have more than 3 % in a growth rate. The majority of rural areas have neither significant population escalation nor decline.

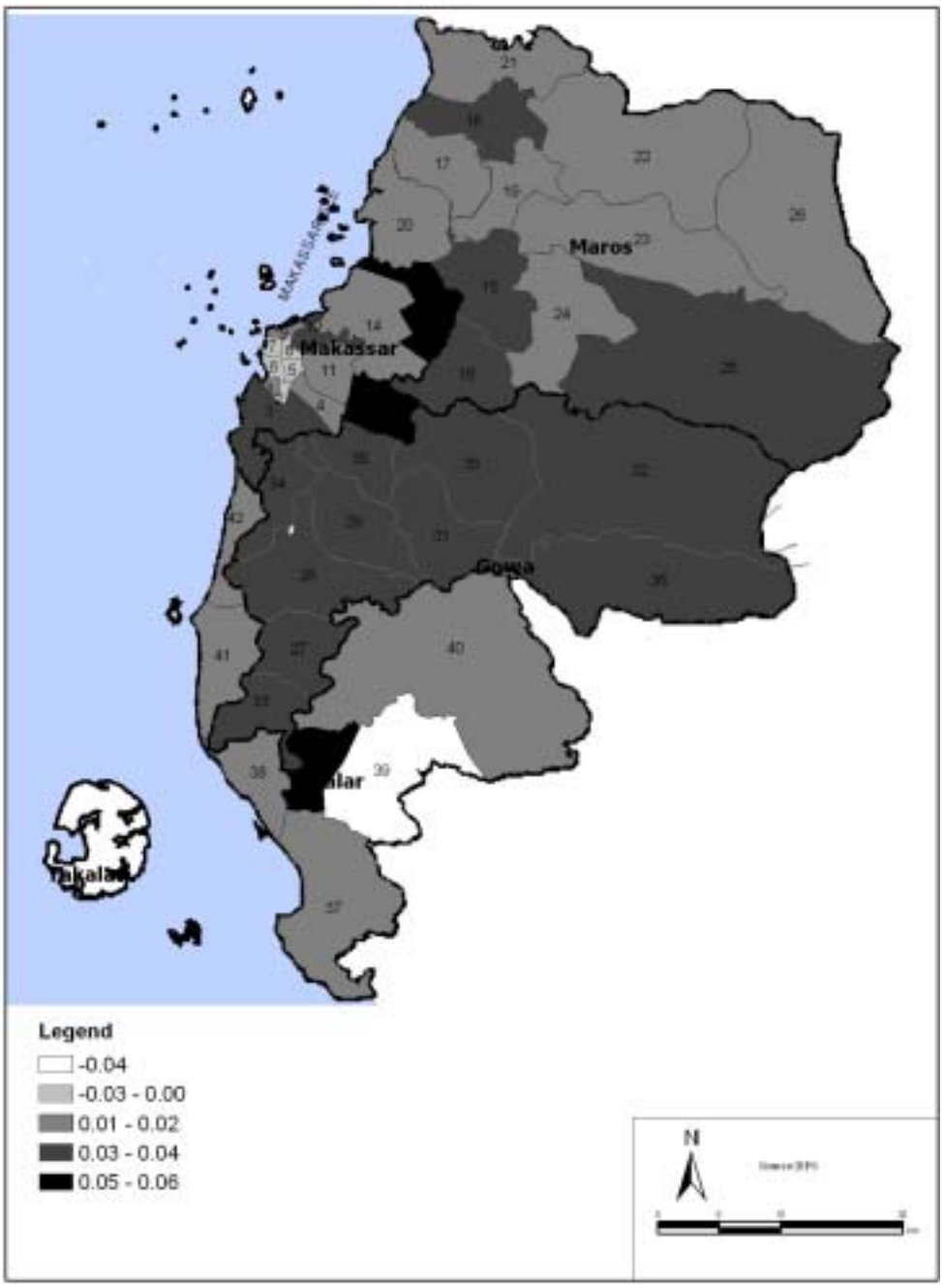


Figure 1-4 Population Growth Rate by Sub-District (2000-2003)

1.2 Demographic Framework

1) Projection Method

In formulating a macro framework for socio-economic development of Mamminasata, JICA Study Team has made a population projection between 2000 and 2020, applying the cohort component method with consideration of the population trend between 2000 and 2003.[1] The cohort component method has been employed for its advantages to forecast the whole population structure (age and sex) over a target period in order to have an accurate understanding of residence population as well as working population in Mamminasata. Setting the targeting year 2020, JICA Study Team has prepared the population projection by sub-district. In addition to the base year population, the cohort component method requires fertility and mortality data for natural increase and migration data for social increase.

(1) Base Year Population

The base year population of each sub-district is taken from the 2000 population census conducted by Badan Pusat Statistik (BPS), as it is considered the most reliable demographic data with the full account of age and sex distribution.

(2) Fertility

The assumptions of fertility begins with an estimation of the present age specific fertility rates in each district based on the 1990 and 2000 population censuses by using MORTPAK, a UN developed software for demographic measurement. The future trend is estimated by taking the UN national forecast into consideration. The estimated total fertility rates (TFRs) are as follows (see Table 1-3). The estimated figures show that the TFRs decline throughout the projected period, and they will go down even below 2.0 in Makassar and Gowa.

Table 1-3: Estimated Total Fertility Rates (2000-2020)

District	2000-2005	2005-2010	2010-2015	2015-2020
Makassar	2.3400	2.1722	2.0043	1.8661
Maros	2.8695	2.6637	2.4578	2.2883
Gowa	2.1235	1.9712	1.8189	1.6934
Takalar	2.5400	2.3578	2.1756	2.0256
Indonesia	2.3700	2.2000	2.0300	1.8900

Note: The national trend is taken from the medium variant case of the UN forecast (2004).
Source: JICA Study Team

(3) Mortality

Mortality for the projected period is estimated on the basis of the 2000 population census, as well as UN national forecast. The future trend is assumed with the age specific mortality rates calculated from the result of the 2000 population census as well as the UN national forecast of infant mortality rate and crude mortality rate. The

[1] The cohort component method is the most widely used method for population projection, including the official projection of Japan undertaken by National Institute of Population and Social Security Research.

estimated infant mortality rates are as follows (see Table 1-4). The estimated figures indicate that the infant mortality rates decline up to 2020, though the levels are still considerably higher than the national average. The crude mortality rates are estimated to be a few percent lower than the national average.

Table 1-4: Estimated Infant Mortality Rates (per 1,000 Live Births)

District	2000-2005		2005-2010		2010-2015		2015-2020	
	Male	Female	Male	Female	Male	Female	Male	Female
Makassar	39.18	29.42	30.92	23.22	26.42	19.85	23.03	17.30
Maros	63.82	50.78	50.37	40.08	43.05	34.25	37.52	29.85
Gowa	52.85	41.15	41.71	32.47	35.65	27.75	31.07	24.19
Takalar	77.29	62.71	61.00	49.49	52.13	42.29	45.43	36.86
Indonesia	42.70		33.70		28.80		25.10	

Note: The national trend is taken from the medium variant case of the UN forecast (2004).
Source: JICA Study Team

(4) Migration

The assumptions of migration are also based on the 2000 population census. The age specific net migration rates calculated from the census data are assumed to continue at the same level throughout the projected period. Makassar has the highest net migration rate (8.54 per 1,000) followed by Gowa (1.80), though there are more outflow migration in Maros (-0.64) and Takalar (-7.17) (see Table 1-5).

Table 1-5: Estimated Migration Flows and Rates (2000)

District	In-migration	Out-migration (In Province)	Out-migration (Out Province)	Net migration	Net migration Rate (per 1,000)
Makassar	22,917	8,733	4,790	9,394	8.54
Maros	2,642	1,633	1,183	- 175	-0.64
Gowa	5,283	2,128	2,232	924	1.80
Takalar	1,384	2,034	997	- 1,646	-7.17
South Sulawesi	15,951	--	33,933	- 17,981	-2.30

Source: JICA Study Team

2) Total Population

Based on the above assumptions, JICA Study Team has estimated the total population of the study area to reach as much as **2.8 million** in 2020. The projected annual average growth rate between 2000 and 2020 is **1.9%**, which is at the same level as the past rate of 2000-2003.

Dinas Spatial Planning of South Sulawesi province also prepared the population projection up to 2013 in its basic infrastructure plan for Mamminasata (see Table 1-6). The total population would be estimated 2.7 million if the present annual growth rate of 1.6 % will continue to be at the same level for the consequent years. JICA Study Team, however, will employ its own population projection instead of the case made by South Sulawesi province, since the South Sulawesi projection is limited to be evidenced merely on the past trend of 1997-2001 and does not consider other important demographic determinants such as population structure, fertility, mortality, and migration.

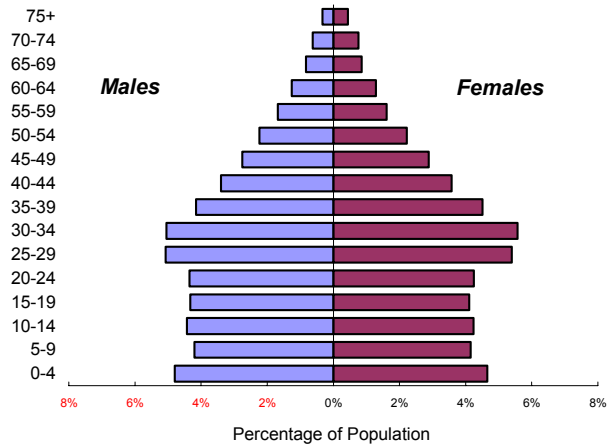
Table 1-6: Population Projection by the Dinas of Spatial Planning and Settlement, South Sulawesi province

District	2001	2004	2005	2006	2007	2008	2013	CAGR
Makassar	1,130,384	1,156,006	1,163,751	1,171,548	1,179,397	1,187,299	1,227,610	0.69%
Maros	251,740	274,809	286,626	298,951	311,806	325,213	401,412	3.96%
Gowa	377,876	404,672	414,020	423,584	433,369	443,380	497,011	2.31%
Takalar	232,396	245,896	250,568	255,329	260,180	265,123	291,285	1.90%
Mamminasata	**1,992,396**	**2,081,383**	**2,114,965**	**2,149,412**	**2,184,752**	**2,221,015**	**2,417,318**	1.62%

Source: Dinas Spatial Planning, South Sulawesi province

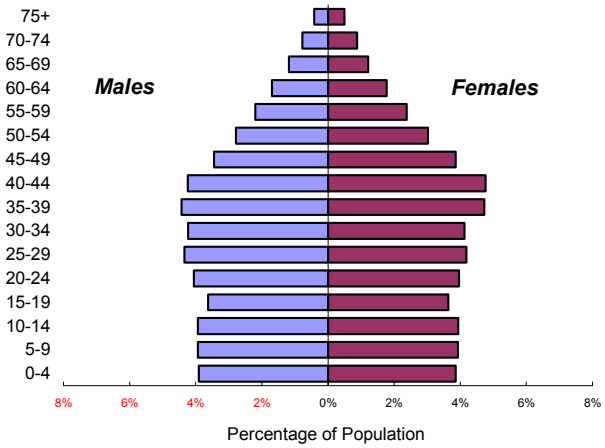
3) Population Structure

The population structure of Mamminasata will become much closer to a typical urbanized pattern. The population pyramid of 2020 will be "rectangular" shape, as Mamminasata will have 71.5 % of working age population (15-64 years old) while only 23.5 % will belong to child population (less than 14 years old) (see Fig. 1-5ab).



Source: JICA Study Team

Figure 1-5a: Population Pyramid: Mamminasata (2010)



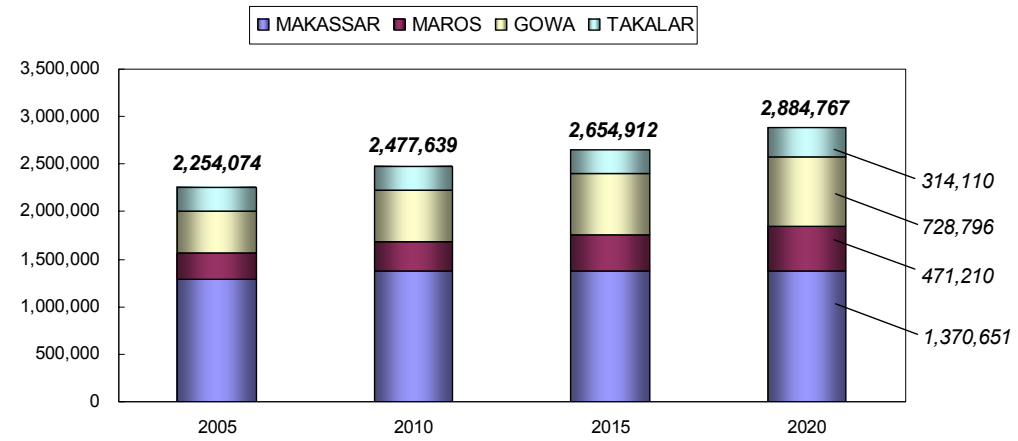
Source: JICA Study Team

Figure 1-5b: Population Pyramid: Mamminasata (2020)

4) Population by Sub-district

Thus, population in Mamminasata up to 2020 has been demographically estimated based on the past trends and assumptions of fertility, mortality, and migration. Reflecting future development interventions in industry and housing, JICA Study Team further estimates that the total residential population in Mamminasata is estimated to be **2.48 million in 2010** (2.67 million in total population of four districts) and **2.88 million in 2020** (3.08 million in total districts). The Mamminasata population from 2005 to 2020 is predicted to grow at the average annual rate of **1.7%**.

The majority of the Mamminasata population will continue to live in Makassar in 2020 (51.7%). However, because of the industrial and housing development in Maros and Gowa, their proportion will rise up to 14.8% and 23.8%, respectively. The proportion of Takalar will decrease down to 9.7% (see Fig. 1-6 and Annex 2.).



Source: JICA Study Team

Figure 1-6: Population Projection of Mamminasata by Regency (2005-2020)

5) Population Density

Population density by sub-district in 2010 and 2020 is estimated as shown in Figures 1-7 and 1-8. A population density change/trend compared between 2005 and 2020 is also shown in Figure 1-9.

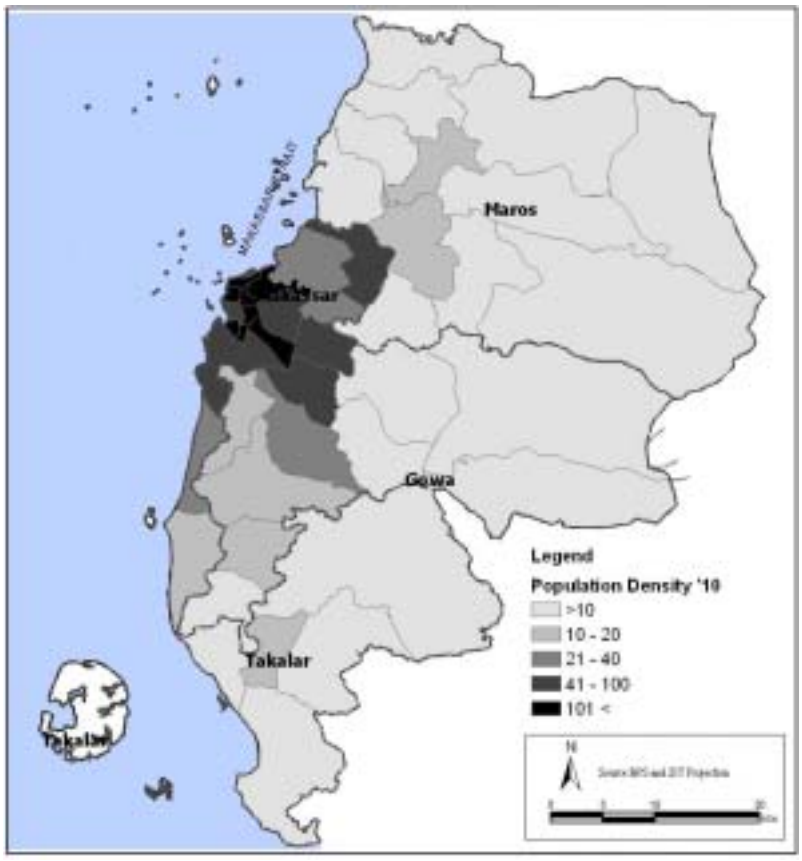


Figure 1-7: Population Density by Sub-District (2010)

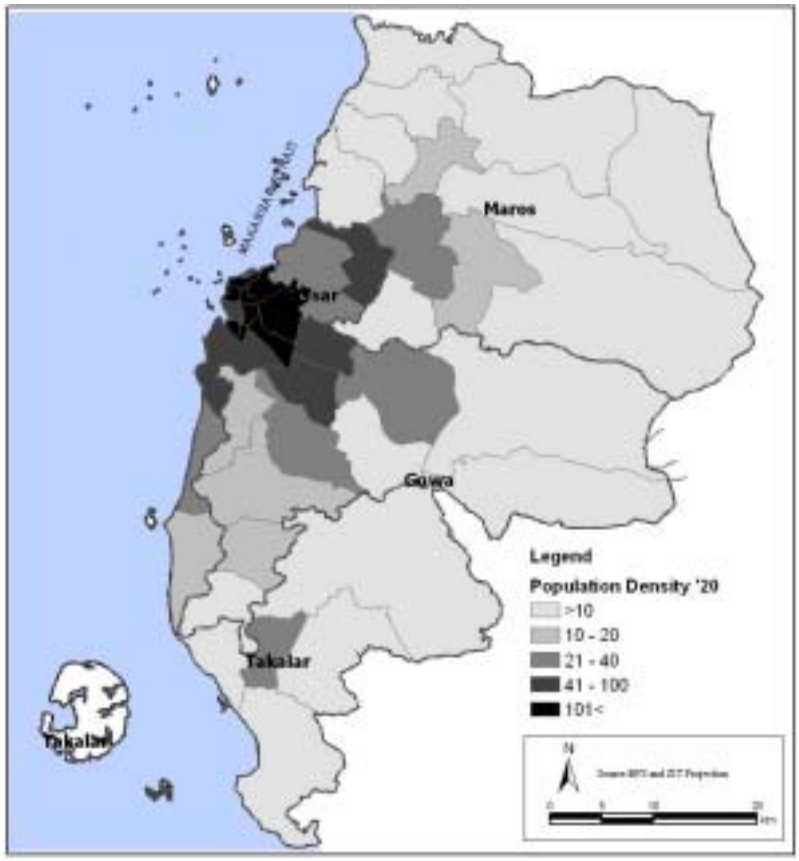


Figure 1-8: Population Density by Sub-district (2020)

Figure 1-9: Trend/Change in Population Density (2005-2020)

1.3 Working Population

Based on the above population projection and the economic trends, the working population in Mamminasata area is estimated to increase to **0.98 million** in 2010 and **1.24 million** in 2020. The unemployment ratio is generally high in urban center in Makassar and relatively low in rural agricultural areas. For the whole Mamminasata, it is estimated that the unemployment ration will be lowered to around **6.9%** in 2010 and **5.1%** in 2020 (see Table 1-7 and Annex 3).

Table 1-7: Working Population: 2005 – 2020

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. ECONOMY

2.1 Economic Performance of Mamminasata Metropolitan Area

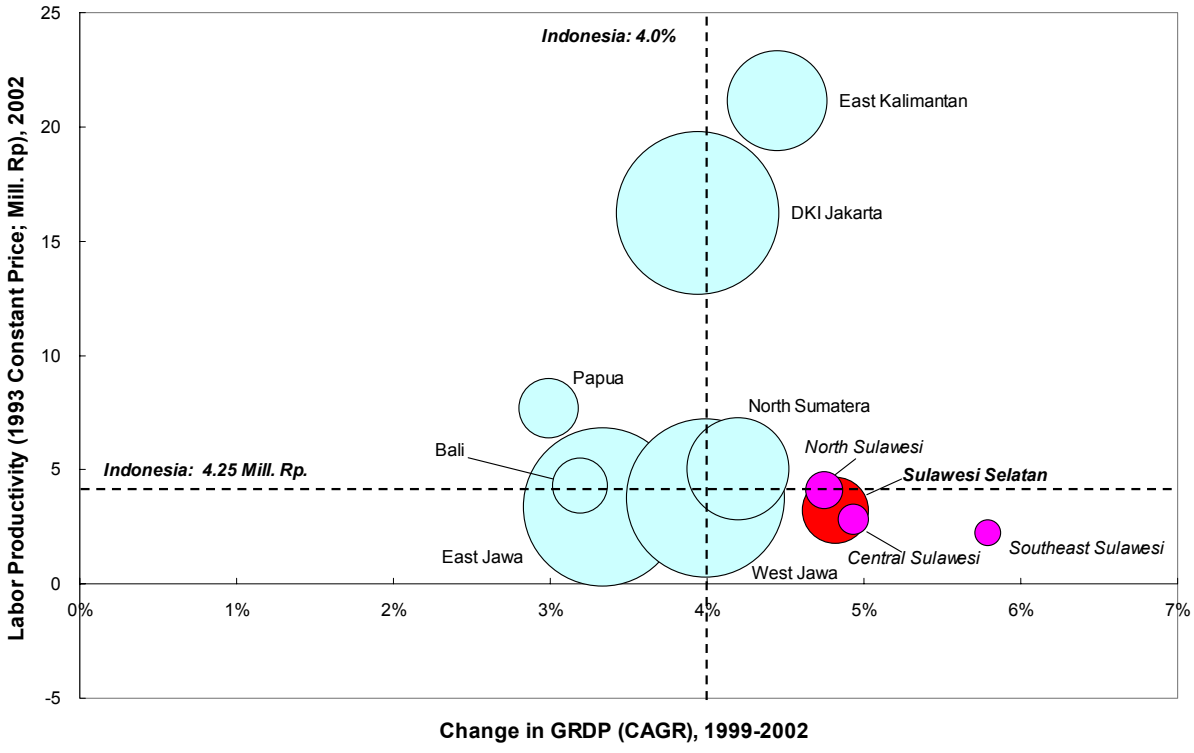
The GRDP of South Sulawesi province is Rp. 11,690,525 million, contributing to 2.6% of the national GDP. Of the whole Sulawesi region, South Sulawesi shares more than its half. GRDP per capita of South Sulawesi remains at a low level or around 61% of the national average (see Table 2-1).

Table 2-1: Economic Comparison (2002) (1993 Constant Price)

	South Sulawesi	Sulawesi Region	Indonesia
GRDP (2002) (Rp. Million)	11,690,525	21,288,139	444,453,474
GRDP Share (of Sulawesi)	54.9%	-	-
GRDP Share (of Indonesia)	2.6%	4.8%	-
GRDP per Capita	1,391,383	1,356,661	2,130,591

Source: BPS (2003)

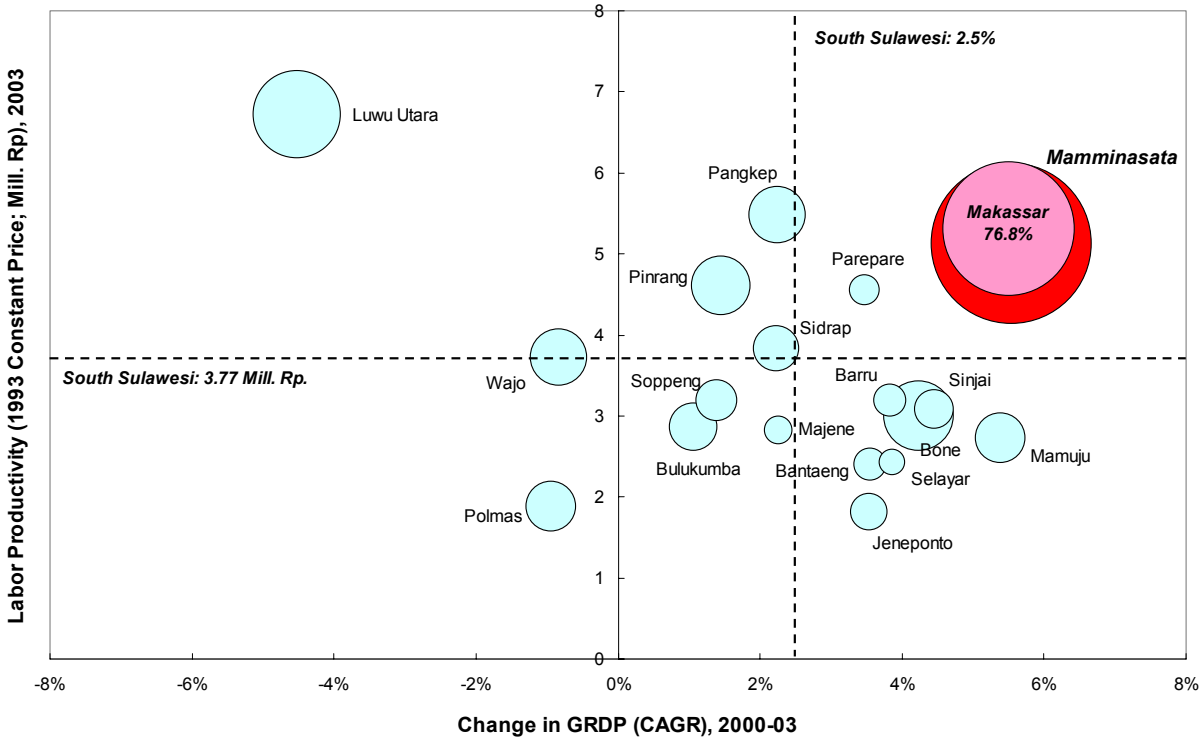
The economic performance of the South Sulawesi province from 1999 to 2002 shows a slightly different pattern from that of the whole county in terms of change of GRDP (i.e. annual average GRDP growth rate) and labor productivity (i.e. value added productivity). The labor productivity of South Sulawesi is Rp 3.21 million, which is more than Rp one million lower than the national performance. On the other hand, the change of GRDP of South Sulawesi is 4.8%, about 1% higher than the national average (see Fig. 2-1).



Source: JICA Study Team

Figure 2-1: Economic Performance of South Sulawesi province (1999-2002)

By applying the same analytical framework to the South Sulawesi economy, it becomes clear that the Mamminasata economy plays an extremely important role in South Sulawesi (see Fig. 2-2). The economic performance of Mamminasata is superior to that of South Sulawesi both in change of GRDP and in labor productivity. This indicates that, with the large size of the Mamminasata economy, the economic development of Mamminasata can greatly enhance that of Sulawesi Island as a whole.



Source: JICA Study Team

Figure 2-2: Economic Performance of Mamminasata (2000-2003)

2.2 Economic Policy and Plan

1) National Mid-Term Plan

The new mid-term national development plan (2005-2009), formulated by BAPPENAS, defines the targets at the national level as summarized below:

(i) GDP growth rate will go up from 5.5% in 2005 to 7.6% in 2009;

(ii) Investment will keep two digit-growth, strongly supporting the economic growth;

(iii) Unemployment and poverty ratios will be reduced to nearly half by 2009;

(iv) Inflation rate will go down to 3% by 2009, stabilizing foreign exchange rate; and,

(v) Budget balance will turn out to be positive in 2008 by increasing tax revenues.

Table 2-2: Targets under the National Mid-Term Plan (2005-2009)

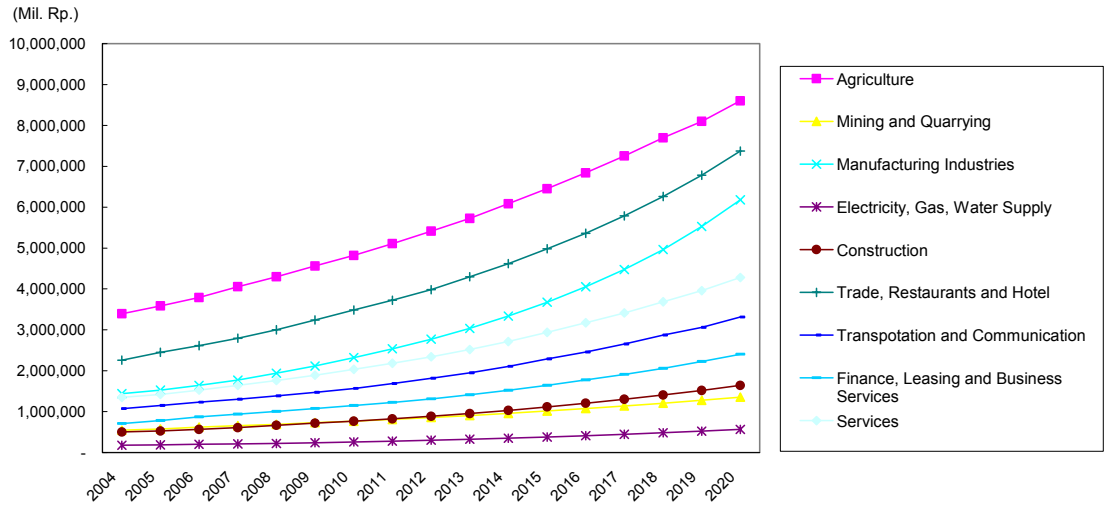
Economic indices	2005	2006	2007	2008	2009
GDP growth Rate (%) (2000 Constant Price)	5.5	6.1	6.7	7.2	7.6
Investment Growth Rate (%)	14.6	17.8	16.3	14.3	12.8
Unemployment Ratio (%)	9.5	8.9	7.9	6.6	5.1
Poverty Ratio (%)	---	---	---	---	8.2
Inflation Rate (%)	7.0	5.5	5.0	4.0	3.0
Foreign Exchange Rate (Rp./US$)	8,900	8,800	8,800	8,700	8,700
Budget Balance (GDP Ratio (%))	-0.7	-0.6	-0.3	0.0	0.3

Source: BAPPENAS

2) BAPPEDA South Sulawesi Plan

BAPPEDA South Sulawesi province formulated a long-term provincial development plan for 2004-2026, based on such policies as i) strengthening of manufacturing industry; ii) scaling down of the agriculture sector; and iii) achievement of a minimum 7% annual GRDP growth.

The provincial development plan envisages an average annual GRDP growth rate of **7.4%** (2004-2020), and sets high targets in the manufacturing industry (9.5% in the annual growth rate) as well as finance, leasing and business service (8%), as illustrated in Figure 2-3.



Source: BAPPEDA South Sulawesi

Figure 2-3: GRDP Projection of South Sulawesi (2004-2020)

2.3 Economic Framework

1) BAPPEDA Scenario

Based on the BAPPEDA projection above, JICA Study Team has estimated GRDP of Mamminasata (inclusive of non-Mamminasata sub-districts of Maros and Gowa). This "BAPPEDA scenario" envisages an average annual growth of **8.2%** on the assumption that a high growth would be realizable in the manufacturing industry (**9.8%**) and finance, leasing and business service sectors (**10.6%**) (see Table 2-3).

Table 2-3: GRDP Projection – BAPPEDA Scenario (1993 Constant Price, Million Rp.)

Industry	2005		2010		2020		CAGR
	GRDP	(%)	GRDP	(%)	GRDP	(%)	(%)
Agriculture	590,358	11.8	794,006	11.0	1,416,535	8.7	6.0%
Mining & Quarrying	54,173	1.1	72,479	1.0	127,919	0.8	5.9%
Manufacturing Industry	1,016,878	20.3	1,545,623	21.4	4,116,321	25.4	9.8%
Electricity, Gas & Water Supply	141,282	2.8	194,608	2.7	424,504	2.6	7.6%
Construction	296,496	5.9	428,800	5.9	922,285	5.7	7.9%
Trade, Restaurants & Hotel	1,302,199	26.1	1,854,153	25.6	3,920,682	24.2	7.6%
Transportation & Communication	604,875	12.1	822,605	11.4	1,740,759	10.7	7.3%
Finance, Leasing & Business Services	347,951	7.0	594,418	8.2	1,584,673	9.8	10.6%
Services	644,182	12.9	922,002	12.8	1,941,300	12.0	7.6%
Total	4,998,395	100.0	7,228,693	100.0	16,194,978	100.0	8.2%

Source: BAPPEDA South Sulawesi

2) Alternative Scenarios

Compared with the recent trends of economic activities of the South Sulawesi province and Mamminasata, the above BAPPEDA scenario targets a higher growth rate. Therefore, JICA Study Team has formulated two alternative scenarios in defining the macro-economic framework for the Mamminasata spatial plan. These alternatives are "moderate growth scenario" (projection by JICA Study Team) and "low growth scenario" (projection based on the past trends). Table 2-4 summarizes the envisaged growth rates by industrial sector of three scenarios.

Table 2-4: Macro-economic Framework for Mamminasata: 3 Scenarios (2005-2020)

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

Source: JICA Study Team

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

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

(ii) Manufacturing growth at the average annual rate of 9-10% would be less attainable in the light of the facts that potential industries in Mamminasata would

mostly be local resources based, and capital-intensive industry would be less expectable to attain such a high growth rate; and,

(iii) It is expected that more investments are directed to protect the environment and enhance the amenity 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 in Mamminasata. It is, therefore, proposed that the macro economic framework is set to follow the moderate growth scenario.

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

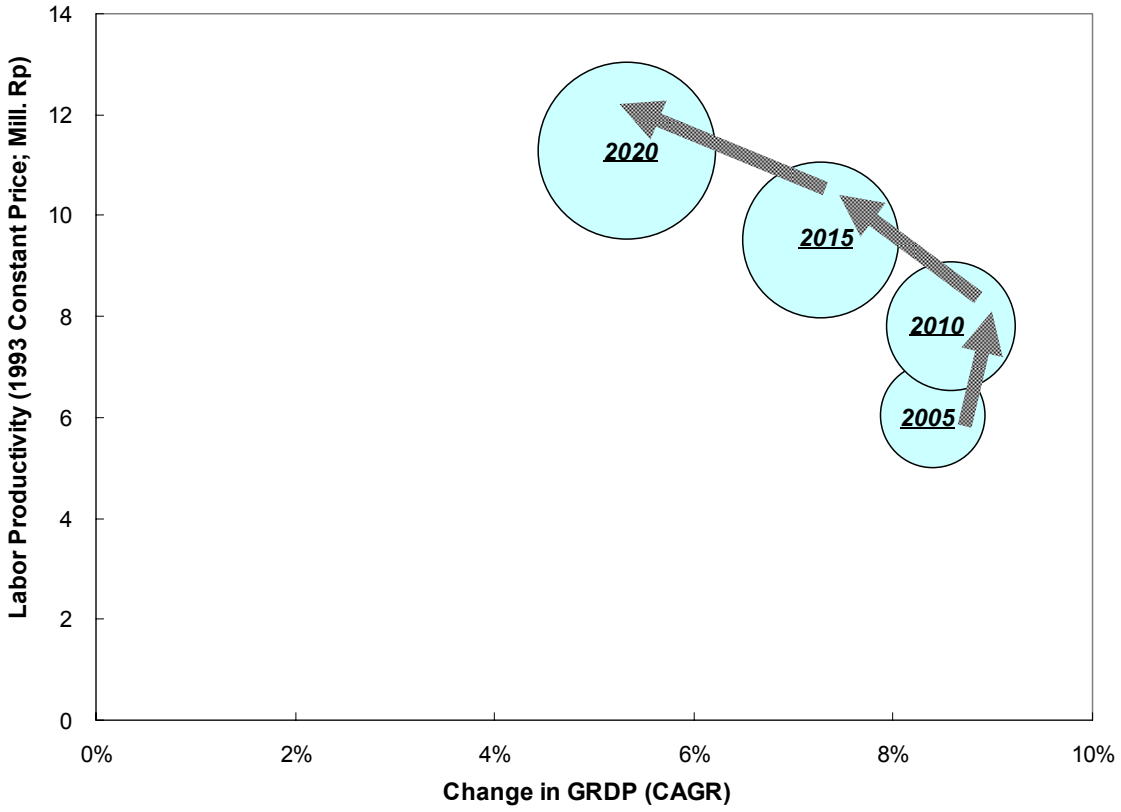


Figure 2-4: Moderate Growth of the Mamminasata Economy

3) Moderate Growth Scenario

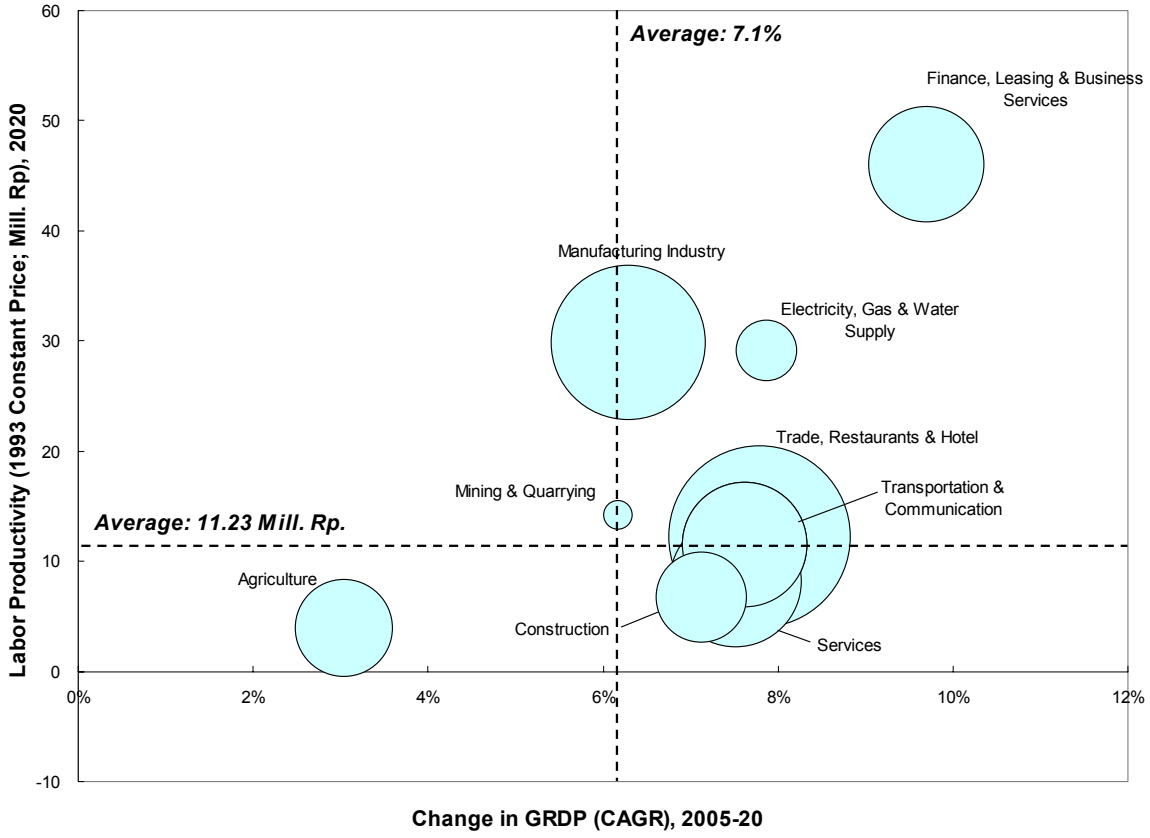
Even in the moderate scenario, the average annual GRDP growth rate is set to be **7.1%**, which is still a challenging target for the Mamminasata economy. The moderate scenario envisages an average annual growth of **3.0%** in the agriculture sector, **6.3%** in the manufacturing industry, and **9.7%** in the finance, lending and business services (see Table 2-5 and Annex 4).

Table 2-5: 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

With the working population projection as discussed in section 1.3, JICA Study Team estimates the working population for each industrial sector and consequently its labor productivity (see Annex 5). Figure 2-5 schematically presents the projected economic framework under the moderate economic growth scenario. It indicates that because of relatively high labor productivity and growth rate, manufacturing and finance, leasing and business services sectors are to play a vital role in leading the Mamminasata economy to attain the target economic growth.



Source: JICA Study Team

Figure 2-5: Projected Economic Performance of Mamminasata (2005-2020)

Population Trend by Sub-District (2000-2003)

Sub-District	Area (ha)	2000	Density 2000	2001	Density 2001	2002	Density 2002	2003	Density 2003	Growth Rate
Maniso	257,13	51.003	198,35	52.411	203,83	53.262	207,21	51.980	202,15	0,63%
Mamajang	256,55	58.850	229,39	60.475	235,73	61.286	238,89	56.988	222,13	-1,07%
Tamalanrea	3.175,30	128.329	40,41	131.871	41,53	133.119	41,92	140.306	44,19	3,02%
Rappocini	821,17	125.498	152,83	128.962	157,05	128.855	156,92	133.660	162,77	2,12%
Makassar	249,57	80.127	321,06	82.341	329,93	84.104	337,08	79.362	318,00	-0,32%
Ujung Pandang	301,47	27.765	92,10	28.523	94,61	29.889	99,15	27.279	90,49	-0,59%
Wajo	212,43	34.114	160,59	35.055	165,02	35.402	166,65	32.519	153,08	-1,58%
Bontoala	204,19	56.875	278,54	58.445	286,23	59.549	291,63	54.671	267,74	-1,31%
Ujung Tanah	268,11	44.055	164,32	45.272	168,86	46.129	172,05	45.156	168,43	0,83%
Tallo	864,25	115.527	133,67	118.716	137,36	120.786	139,76	124.755	144,35	2,59%
Panakkukang	1.585,18	123.820	78,11	127.238	80,27	129.651	81,79	127.632	80,52	1,02%
Manggala	2.132,32	77.122	36,17	79.251	37,17	81.102	38,03	89.088	41,78	4,93%
Biringkanaya	2.910,32	95.320	32,75	97.951	33,66	100.018	34,37	113.650	39,05	6,04%
Tamalate	4.818,65	81.614	16,94	83.873	17,41	85.140	17,67	82.965	17,22	0,55%
MAKASSAR	**18.056,63**	**1.100.019**	**60,92**	**1.130.384**	**62,60**	**1.148.312**	**63,60**	**1.160.011**	**64,24**	**1,79%**
Mandai	5.497,99	25.659	4,67	25.845	4,70	26.054	4,74	26.774	5,23	3,89%
Moncongloe	4.475,67	9.335	2,09	9.378	2,10	9.483	2,12	10.425	2,33	3,75%
Maros Baru	3.821,88	20.750	5,43	21.420	5,60	21.629	5,66	21.753	5,69	1,59%
Lau	4.332,67	20.755	4,79	20.961	4,84	21.104	4,87	22.637	5,22	2,94%
Turikale	3.297,29	34.146	10,36	35.009	10,62	35.210	10,68	34.764	10,54	0,60%
Marusu	4.764,44	21.050	4,42	20.529	4,31	21.718	4,56	21.597	4,53	0,86%
Bontoa	5.708,37	23.999	4,20	24.057	4,21	22.877	4,01	24.665	4,32	0,92%
Bantimurung	14.408,72	26.513	1,84	26.764	1,86	27.028	1,88	27.187	1,89	0,84%
Simbang	10.084,95	19.701	1,95	19.789	1,96	20.013	1,98	20.417	2,02	1,20%
Tanralili	6.379,31	21.419	3,36	21.356	3,35	21.462	3,36	22.343	3,50	1,42%
Tompobulu	25.910,53	11.965	0,46	11.975	0,46	12.120	0,47	13.363	0,52	3,93%
Camba	14.536,00	13.337	0,92	13.509	0,93	13.550	0,93	13.691	0,94	0,89%
Cenrana	15.220,67	12.988	0,85	13.185	0,87	13.242	0,87	13.807	0,91	2,06%
Mallawa	23.592,00	10.359	0,43	10.617	0,45	10.703	0,45	11.331	0,48	2,38%
MAROS	**142.030,29**	**272.116**	**1,92**	**274.394**	**1,93**	**276.193**	**1,94**	**286.760**	**2,02**	**1,76%**
Bontonompo	3.639,06	31.765	8,73	31.782	8,73	32.702	8,99	34.186	9,39	2,48%
Bontonompo Selatan	3.329,33	26.554	7,98	26.567	7,98	27.337	8,21	28.577	8,58	2,48%
Bajeng	7.132,89	68.693	9,63	69.930	9,80	70.763	9,92	73.975	10,37	2,50%
Pallangga	5.020,54	66.491	13,24	67.686	13,48	68.493	13,64	71.602	14,26	2,50%
Barombong	3.029,84	26.003	8,58	26.472	8,74	26.788	8,84	28.003	9,24	2,50%
Somba Opu	2.850,71	84.566	29,66	86.090	30,20	87.115	30,56	91.069	31,95	2,50%
Bontomarannu	5.197,19	22.247	4,28	22.649	4,36	22.919	4,41	23.969	4,61	2,50%
Pattallassang	7.886,00	19.726	2,50	20.082	2,55	20.322	2,58	21.244	2,69	2,50%
Parangloe	21.948,91	12.933	0,59	13.166	0,60	13.322	0,61	13.927	0,63	2,50%
Manuju	12.290,04	12.218	0,99	12.437	1,01	12.585	1,02	13.156	1,07	2,50%
Tinggimoncong	27.563,00	31.414	1,14	31.981	1,16	32.364	1,17	33.833	1,23	2,50%
Tombolo Pao	25.911,00	22.106	0,85	22.514	0,87	22.792	0,88	23.826	0,92	2,53%
Bungaya	17.553,00	13.462	0,77	13.709	0,78	13.869	0,79	14.520	0,83	2,50%
Bontolempangan	14.246,00	15.128	1,06	15.401	1,08	15.589	1,09	16.293	1,14	2,50%
Tompobulu	13.299,00	27.890	2,10	28.387	2,13	28.721	2,16	30.025	2,26	2,49%
Biringbulu	21.839,00	31.660	1,45	32.232	1,48	32.618	1,49	34.098	1,56	2,50%
GOWA	**192.735,51**	**512.876**	**2,66**	**521.104**	**2,70**	**528.316**	**2,74**	**552.293**	**2,87**	**2,50%**
Mangarabombang	9.504,83	32.314	3,40	32.951	3,47	33.563	3,53	33.784	3,55	1,49%
Mappakasunggu	3.036,59	24.983	8,23	25.266	8,32	25.610	8,43	26.033	8,57	1,38%
Polombangkeng Selatan	7.968,33	27.088	3,40	23.414	2,94	23.471	2,95	23.891	3,00	-4,10%
Polombangkeng Utara	22.702,65	39.026	1,72	39.262	1,73	40.338	1,78	40.843	1,80	1,53%
Galesong Selatan	3.997,97	43.124	10,79	43.951	10,99	44.479	11,13	44.563	11,15	1,10%
Galesong Utara	2.050,89	38.562	18,80	38.997	19,01	39.317	19,17	41.107	20,04	2,15%
Pattalassang	2.685,37	24.622	9,17	28.555	10,63	28.967	10,79	29.204	10,88	5,85%
TAKALAR	**51.946,83**	**229.718**	**4,42**	**232.396**	**4,47**	**235.745**	**4,54**	**239.425**	**4,61**	**1,39%**
4 DISTRICTS	**404.769,27**	**2.114.729**	**5,22**	**2.158.278**	**5,33**	**2.188.566**	**5,41**	**2.238.489**	**5,53**	**1,91%**
MAMMINASATA	**246.230,27**	**1.949.153**	**7,92**	**1.989.911**	**8,08**	**2.018.343**	**8,20**	**2.060.866**	**8,37**	**1,88%**

Estimated figures
Non Mammanasata Area
Source: BPS

Population Projection by Sub-District (2005-2020): Moderate Case

Sub-District	2005	2010	2015	2020	CAGR
Mariso	57.215	54.355	51.494	48.633	-1,08%
Mamajang	62.615	59.484	56.353	53.223	-1,08%
Tamalanrea	155.476	156.253	156.720	157.031	0,07%
Rappocini	147.798	140.409	133.019	125.629	-1,08%
Makassar	87.319	82.953	78.587	74.221	-1,08%
Ujung Pandang	29.505	29.652	29.741	29.800	0,07%
Wajo	35.216	33.455	31.695	29.934	-1,08%
Bontoala	60.126	57.120	54.114	51.107	-1,08%
Ujung Tanah	49.910	47.415	44.919	42.424	-1,08%
Tallo	138.412	131.492	124.571	117.650	-1,08%
Panakkukang	141.788	150.000	156.000	162.000	0,89%
Manggala	99.235	111.000	117.000	123.000	1,44%
Biringkanaya	127.508	167.000	176.000	185.000	2,51%
Tamalate	93.319	153.000	162.000	171.000	4,12%
MAKASSAR	**1.285.443**	**1.373.588**	**1.372.212**	**1.370.651**	**0,43%**
Mandai	31.925	55.000	85.000	115.000	8,92%
Moncongloe	11.440	11.555	11.612	11.669	0,13%
Maros Baru	23.842	24.081	24.200	24.319	0,13%
Lau	24.682	24.929	25.052	25.175	0,13%
Turikale	38.207	38.589	38.780	38.971	0,13%
Marusu	23.669	24.379	24.853	24.853	0,33%
Bontoa	27.050	27.320	27.455	27.591	0,13%
Bantimurung	29.204	30.080	30.664	30.664	0,33%
Simbang	22.169	22.390	22.501	22.612	0,13%
Tanralili	24.727	24.000	72.000	120.000	11,11%
Tompobulu	14.722	14.869	14.943	15.016	0,13%
Camba	14.617	14.763	14.836	14.909	0,13%
Cenrana	15.039	15.190	15.265	15.340	0,13%
Mallawa	12.110	12.231	12.292	12.353	0,13%
MAROS	**313.402**	**339.375**	**419.452**	**498.472**	**3,14%**
Bontonompo	36.561	36.744	36.853	36.927	0,07%
Bontonompo Selatan	30.562	30.715	30.806	30.867	0,07%
Bajeng	79.656	80.054	80.293	80.453	0,07%
Pallangga	78.115	149.000	149.000	149.000	4,40%
Barombong	30.551	31.000	31.000	31.000	0,10%
Somba Opu	100.441	130.000	130.000	130.000	1,73%
Bontomarannu	25.941	26.000	26.000	26.000	0,02%
Pattallassang	23.002	23.000	119.000	215.000	16,07%
Parangloe	15.045	15.120	15.165	15.195	0,07%
Manuju	14.211	14.283	14.325	14.354	0,07%
Tinggimoncong	36.334	36.516	36.625	36.698	0,07%
Tombolo Pao	25.670	25.798	25.875	25.926	0,07%
Bungaya	15.938	16.018	16.066	16.098	0,07%
Bontolempangan	17.884	17.974	18.027	18.063	0,07%
Tompobulu	32.269	32.430	32.527	32.592	0,07%
Biringbulu	37.143	37.329	37.440	37.515	0,07%
GOWA	**599.323**	**701.980**	**799.004**	**895.687**	**2,71%**
Mangarabombang	35.113	35.464	35.815	36.166	0,20%
Mappakasunggu	26.967	27.236	27.506	27.776	0,20%
Polombangkeng Selata	24.524	24.769	25.014	25.260	0,20%
Polombangkeng Utara	42.028	43.289	43.709	44.129	0,33%
Galesong Selatan	46.048	46.508	46.969	47.429	0,20%
Galesong Utara	43.058	43.489	43.919	44.350	0,20%
Pattalassang	30.134	35.000	35.000	89.000	7,49%
TAKALAR	**247.871**	**255.755**	**257.932**	**314.110**	**1,59%**
4 DISTRICTS	**2.446.039**	**2.670.698**	**2.848.601**	**3.078.919**	**1,55%**
MAMMINASATA	**2.254.074**	**2.477.639**	**2.654.912**	**2.884.767**	**1,66%**

N.B. Non-Mamminasata Area

Population Framework (2005-2020): Moderate Case

District	2005	2010	CAGR	2015	CAGR	2020	CAGR	CAGR 2005-2020
MAKASSAR								
Population	1.285.443	1.373.588	1,3%	1.372.212	0,0%	1.370.651	0,0%	0,4%
Working Age Population	899.810	961.511	1,3%	974.271	0,3%	973.162	0,0%	0,5%
Labor Force Population	461.513	493.159	1,3%	519.189	1,0%	518.598	0,0%	0,8%
Working Population	415.361	443.843	1,3%	477.654	1,5%	477.110	0,0%	0,9%
(Unemployment Rate)	11,1%	11,1%		8,7%		8,7%		
MAROS								
Population	313.402	339.375	1,6%	419.452	4,3%	498.472	3,5%	3,1%
Working Age Population	203.711	227.382	2,2%	289.422	4,9%	343.945	3,5%	3,6%
Labor Force Population	113.447	126.629	2,2%	166.968	5,7%	198.422	3,5%	3,8%
Working Population	107.774	120.297	2,2%	161.959	6,1%	192.469	3,5%	3,9%
(Unemployment Rate)	5,3%	5,3%		3,1%		3,1%		
GOWA								
Population	599.323	701.980	3,2%	799.004	2,6%	895.687	2,3%	2,7%
Working Age Population	347.607	491.386	7,2%	583.273	3,5%	662.808	2,6%	4,4%
Labor Force Population	226.188	319.745	7,2%	391.201	4,1%	444.545	2,6%	4,6%
Working Population	219.402	310.153	7,2%	379.465	4,1%	431.209	2,6%	4,6%
(Unemployment Rate)	3,1%	3,1%		3,1%		3,1%		
TAKALAR								
Population	247.871	255.755	0,6%	257.932	0,2%	314.110	4,0%	1,6%
Working Age Population	161.116	173.913	1,5%	180.553	0,8%	223.018	4,3%	2,2%
Labor Force Population	98.249	106.052	1,5%	113.712	1,4%	140.457	4,3%	2,4%
Working Population	96.284	103.931	1,5%	111.438	1,4%	137.647	4,3%	2,4%
(Unemployment Rate)	2,0%	2,0%		2,0%		2,0%		
TOTAL*								
Population	2.446.039	2.670.698	1,8%	2.848.601	1,3%	3.078.919	1,6%	1,5%
Working Age Population	1.612.245	1.854.192	2,8%	2.027.518	1,8%	2.202.934	1,7%	2,1%
Labor Force Population	899.396	1.045.585	3,1%	1.191.070	2,6%	1.302.022	1,8%	2,5%
Working Population	838.822	978.225	3,1%	1.130.515	2,9%	1.238.436	1,8%	2,6%
(Unemployment Rate)	7,2%	6,9%		5,4%		5,1%		

* Total of four districts, inclusive of non-Mamminasata sub-districts.

GRDP Projection (Moderate Scenario) (2005-2020) (Million Rp.)

1) Mamminasata (4 Districts) by Industrial Sector

Industry	2005	(%)	2010	(%)	CAGR	2015	(%)	CAGR	2020	(%)	CAGR	CAGR 2005-
Agriculture	665.608	13,3%	760.568	10,1%	2,7%	944.690	8,8%	4,4%	1.043.014	7,5%	2,0%	3,0%
Mining & Quarrying	43.315	0,9%	60.255	0,8%	6,8%	84.937	0,8%	7,1%	106.426	0,8%	4,6%	6,2%
Manufacturing Industry	1.046.325	20,9%	1.420.147	18,8%	6,3%	2.023.902	18,9%	7,3%	2.616.181	18,8%	5,3%	6,3%
Electricity, Gas & Water Supply	139.965	2,8%	214.245	2,8%	8,9%	321.009	3,0%	8,4%	436.259	3,1%	6,3%	7,9%
Construction	331.526	6,6%	748.859	9,9%	17,7%	872.298	8,1%	3,1%	931.910	6,7%	1,3%	7,1%
Trade, Restaurants & Hotel	1.188.170	23,8%	1.862.851	24,7%	9,4%	2.743.380	25,6%	8,0%	3.664.500	26,4%	6,0%	7,8%
Transportation & Communication	572.739	11,5%	876.742	11,6%	8,9%	1.291.154	12,0%	8,0%	1.724.664	12,4%	6,0%	7,6%
Finance, Leasing & Business Services	366.918	7,3%	622.097	8,2%	11,1%	1.005.032	9,4%	10,1%	1.472.730	10,6%	7,9%	9,7%
Services	643.829	12,9%	979.567	13,0%	8,8%	1.436.527	13,4%	8,0%	1.910.794	13,7%	5,9%	7,5%
Total	**4.998.395**	**100,0%**	**7.545.331**	**100,0%**	**8,6%**	**10.722.929**	**100,0%**	**7,3%**	**13.906.478**	**100,0%**	**5,3%**	**7,1%**

2) District by Industrial Sector

Industry	2005	(%)	2010	(%)	CAGR	2015	(%)	CAGR	2020	(%)	CAGR	CAGR 2005-
Primary	73.882	2,0%	74.534	1,5%	0,2%	75.284	1,3%	0,2%	76.040	1,2%	0,2%	0,2%
Secondary	1.311.300	35,3%	1.726.768	35,2%	5,7%	1.875.777	33,2%	1,7%	1.684.790	27,1%	-2,1%	1,7%
Tertiary	2.324.569	62,7%	3.102.088	63,3%	5,9%	3.697.080	65,5%	3,6%	4.461.284	71,7%	3,8%	4,4%
MAKASSAR	**3.709.751**	**100,0%**	**4.903.390**	**100,0%**	**5,7%**	**5.648.141**	**100,0%**	**2,9%**	**6.222.114**	**100,0%**	**2,0%**	**3,5%**
Primary	197.686	46,4%	228.932	37,7%	3,0%	290.020	14,5%	4,8%	318.119	10,9%	1,9%	3,2%
Secondary	104.579	24,5%	152.986	25,2%	7,9%	556.372	27,9%	29,5%	1.007.606	34,6%	12,6%	16,3%
Tertiary	123.743	29,0%	225.469	37,1%	12,7%	1.151.339	57,6%	38,6%	1.585.272	54,5%	6,6%	18,5%
MAROS	**426.008**	**100,0%**	**607.387**	**100,0%**	**7,4%**	**1.997.731**	**100,0%**	**26,9%**	**2.910.997**	**100,0%**	**7,8%**	**13,7%**
Primary	273.565	45,9%	315.636	19,2%	2,9%	397.714	15,7%	4,7%	446.410	12,1%	2,3%	3,3%
Secondary	100.886	16,9%	469.230	28,5%	36,0%	722.966	28,6%	9,0%	1.109.596	30,2%	8,9%	17,3%
Tertiary	222.098	37,2%	862.157	52,3%	31,2%	1.409.717	55,7%	10,3%	2.123.339	57,7%	8,5%	16,2%
GOWA	**596.549**	**100,0%**	**1.647.023**	**100,0%**	**22,5%**	**2.530.397**	**100,0%**	**9,0%**	**3.679.345**	**100,0%**	**7,8%**	**12,9%**
Primary	120.475	45,3%	141.466	36,5%	3,3%	181.672	33,2%	5,1%	202.445	18,5%	2,2%	3,5%
Secondary	44.366	16,7%	94.522	24,4%	16,3%	147.031	26,9%	9,2%	288.784	26,4%	14,5%	13,3%
Tertiary	101.246	38,0%	151.543	39,1%	8,4%	217.957	39,9%	7,5%	602.793	55,1%	22,6%	12,6%
TAKALAR	**266.087**	**100,0%**	**387.531**	**100,0%**	**7,8%**	**546.660**	**100,0%**	**7,1%**	**1.094.022**	**100,0%**	**14,9%**	**9,9%**
Primary	665.608	13,3%	760.568	10,1%	2,7%	944.690	8,8%	4,4%	1.043.014	7,5%	2,0%	3,0%
Secondary	1.561.131	31,2%	2.443.506	32,4%	9,4%	3.302.146	30,8%	6,2%	4.090.776	29,4%	4,4%	6,6%
Tertiary	2.771.656	55,5%	4.341.257	57,5%	9,4%	6.476.093	60,4%	8,3%	8.772.688	63,1%	6,3%	8,0%
TOTAL	**4.998.395**	**100,0%**	**7.545.331**	**100,0%**	**8,6%**	**10.722.929**	**100,0%**	**7,3%**	**13.906.478**	**100,0%**	**5,3%**	**7,1%**

Economic Framework (2005-2020): Moderate Case (Million Rp.)

Industry	GRDP (Mill. Rp.)	(%)	Working Pop.	(%)	Productivity (Mill. Rp.)	GRDP (CAGR)	Working Pop. (CAGR)	Productivity (CAGR)
2005								
Agriculture	665.608	13,3%	267.170	32,2%	2,49			
Mining & Quarrying	43.315	0,9%	6.137	0,7%	7,06			
Manufacturing Industry	1.046.325	20,9%	59.525	7,2%	17,58			
Electricity, Gas & Water Supply	139.965	2,8%	5.889	0,7%	23,77			
Construction	331.526	6,6%	50.841	6,1%	6,52			
Trade, Restaurants & Hotel	1.188.170	23,8%	210.664	25,4%	5,64			
Transportation & Communication	572.739	11,5%	74.147	8,9%	7,72			
Finance, Leasing & Business Services	366.918	7,3%	18.164	2,2%	20,20			
Services	643.829	12,9%	136.849	16,5%	4,70			
Total	**4.998.395**	**100,0%**	**829.386**	**100,0%**	**6,03**			
2010								
Agriculture	760.568	10,1%	267.170	27,6%	2,85			
Mining & Quarrying	60.255	0,8%	6.500	0,7%	9,27			
Manufacturing Industry	1.420.147	18,8%	66.631	6,9%	21,31			
Electricity, Gas & Water Supply	214.245	2,8%	10.000	1,0%	21,42			
Construction	748.859	9,9%	100.000	10,3%	7,49			
Trade, Restaurants & Hotel	1.862.851	24,7%	236.225	24,4%	7,89			
Transportation & Communication	876.742	11,6%	100.000	10,3%	8,77			
Finance, Leasing & Business Services	622.097	8,2%	23.000	2,4%	27,05			
Services	979.567	13,0%	157.000	16,2%	6,24			
Total	**7.545.331**	**100,0%**	**966.526**	**100,0%**	**7,81**			
2015								
Agriculture	944.690	8,8%	267.170	23,7%	3,54			
Mining & Quarrying	84.937	0,8%	7.000	0,6%	12,13			
Manufacturing Industry	2.023.902	18,9%	77.078	6,8%	26,26			
Electricity, Gas & Water Supply	321.009	3,0%	12.500	1,1%	25,68			
Construction	872.298	8,1%	120.000	10,6%	7,27			
Trade, Restaurants & Hotel	2.743.380	25,6%	283.356	25,1%	9,68			
Transportation & Communication	1.291.154	12,0%	125.000	11,1%	10,33			
Finance, Leasing & Business Services	1.005.032	9,4%	28.000	2,5%	35,89			
Services	1.436.527	13,4%	207.000	18,4%	6,94			
Total	**10.722.929**	**100,0%**	**1.127.104**	**100,0%**	**9,51**			
2020								
Agriculture	1.043.014	7,5%	267.170	21,6%	3,90	3,0%	0,0%	3,0%
Mining & Quarrying	106.426	0,8%	7.500	0,6%	14,19	6,2%	1,3%	4,8%
Manufacturing Industry	2.616.181	18,8%	87.600	7,1%	29,87	6,3%	2,6%	3,6%
Electricity, Gas & Water Supply	436.259	3,1%	15.000	1,2%	29,08	7,9%	6,4%	1,4%
Construction	931.910	6,7%	140.000	11,3%	6,66	7,1%	7,0%	0,1%
Trade, Restaurants & Hotel	3.664.500	26,4%	300.000	24,3%	12,22	7,8%	2,4%	5,3%
Transportation & Communication	1.724.664	12,4%	150.000	12,2%	11,50	7,6%	4,8%	2,7%
Finance, Leasing & Business Services	1.472.730	10,6%	32.000	2,6%	46,02	9,7%	3,8%	5,6%
Services	1.910.794	13,7%	234.952	19,0%	8,13	7,5%	3,7%	3,7%
Total	**13.906.478**	**100,0%**	**1.234.222**	**100,0%**	**11,27**	**7,1%**	**2,7%**	**4,3%**

Study on Implementation of
Integrated Spatial Plan for
The Mamminasata Metropolitan Area

SECTOR STUDY (2)

LAND USE STUDY

KRI International Corp.
Nippon Koei Co., Ltd

Table of Contents

1. OVERVIEW OF LAND USE

1.1 Current Land Use

The Mamminasata area is approximately 2,700 km^2 in size, consisting of four regions, i.e., Makassar Municipality, Gowa regency, Maros regency, and Takalar regency. The current land use in Mamminasata has been reviewed on the basis of the existing land use map prepared by the National Land Agency from the satellite images of IKONOS 2003, as well as updated information by JICA Study Team.

The major land use of in Mamminasata is agriculture (40%) and green area (30%). Half of agricultural land is irrigated, extending along the coastal line and the Jeneberang river. The green area concentrates mainly on the east side of Mamminasata in Gowa and Maros regencies. Another major land use is a dry land (13%) located to the north of Bili Bili dam and to the eastern part of Takalar regency.

Urban area for residential, commercial, business/office, and industrial use accounts only for 6 % of total land. The urban area extends mainly in Makassar municipality. The current use is classified into five major types as described in the following.

(1) Urban Area

The urban area (6% of the total area) consists of residential, commercial, business/office, and industrial uses. Most urban areas extend in Makassar municipality. Other residential areas are developed along the existing roads/streets without formulating a large residential zone.

(2) Agricultural Area

The agriculture land mostly locates to the west of Mamminasata. The irrigated land is about 300 km^2 in size, mainly covered by the Bili-Bili irrigation project. Other rice field extends to the northern part of Maros regency. Agricultural area account for 40%, of the total land.

(3) Green Area

Forest area accounts for 26% of total land, or 650 km^2. It extends to the east, mainly in Maros and Gowa regencies. The western part of Mamminasata has quite a limited green area.

(4) Water

There is Bili-Bili dam as water reservoir. Two major rivers (Tallo river and Jeneberang river) are running across the area. Along the coastline in northwest, the wetland with many small fish ponds is predominant.

(5) Others

The dry land (16% of total land) extends in middle and south eastern part of Mamminasata. The dry land in Takalar has limitation in land use with sandstone on slopes. As discussed in the agricultural development plan, the dry land would be used for mix-culture of dry crops and livestock breeding.

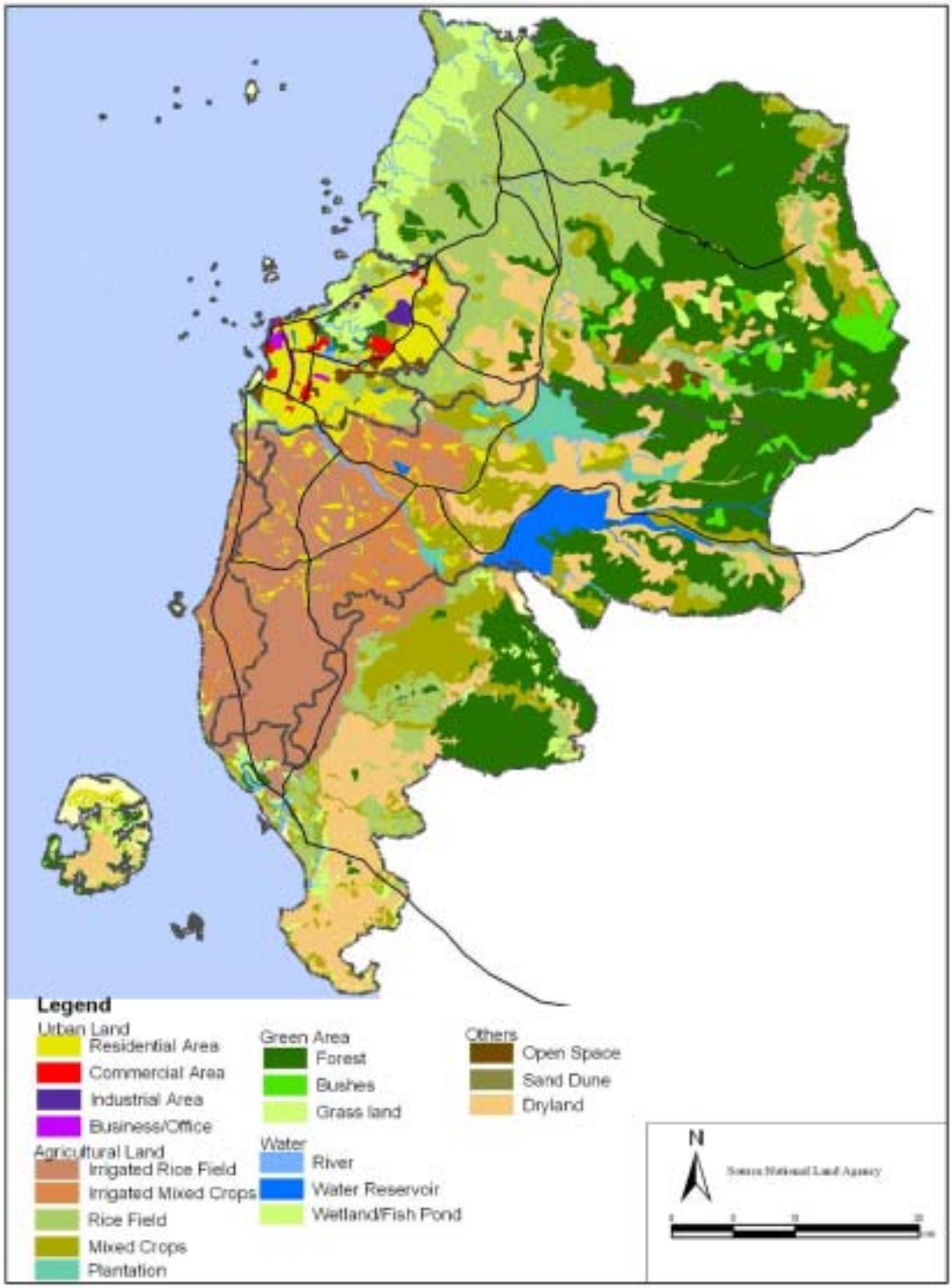


Figure 1.1: Current Land Use (2003)

Table 1.1: Current Land Use in Mamminasata

Categories	Area(sq.km)	Share(%)
Urban Area		
Residential Area	131.4	5.3%
Commercial	8.2	0.3%
Business/Office	4.7	0.2%
Industrial Area	5.0	0.2%
Agricultural Area		
Irrigated Mixed Crops	105.0	4.2%
Irrigated Rice Field	284.1	11.4%
Mixed Crops	249.9	10.0%
Rice Field	393.9	15.8%
Plantation	30.3	1.2%
Green Area		
Grass Land	21.8	0.9%
Bushes	43.0	1.7%
Forest	653.1	26.1%
Water		
River	50.2	2.0%
Wetland/Fish Pond	112.8	4.5%
Water Reservoir	42.5	1.7%
Others		
Dryland	347.3	13.9%
Sand Dune	0.7	0.0%
Open Space	16.4	0.7%
Total	**2,500.2**	**100%**

Source: Basic data from the National Land Agency

The current land use by regency is summarized as follows.

(1) Makassar Municipality

Makassar is already built out, with approximately 50% of its land used for residential, commercial, business, and industrial purposes. The built-out area extends to the south of the municipality and to the eastern area adjacent to Maros. A new development area under going in Tanjung Bunga in the estuary of the Jeneberang river. About 20% of the municipality is covered with rice fields, irrigated and non-irrigated. The green area is limited to 2.4% of the total land.

(2) Gowa Regency

Half of Gowa district is covered with agricultural fields, 65 % of which is irrigated. Residential area, accounting for 5% of total land, is scattered among the irrigated land and the existing roads. The eastern part of Gowa is used for tea and fruit plantations, highland horticulture and forestry area.

(3) Maros Regency

Maros is mainly covered with rice field (35%) and forest (44%). Dry land (10%) is not utilized actively. Residential area accounts only for 1.2% of the total land and dispersed along the road and rivers.

(4) Takalar Regency

Major land use in Takalar is agriculture (50% of total land) followed by dry land (25%). The coastal area is covered with irrigated land of the Bili-Bili, Bissua and Kampili areas. The dry land in southern part is not utilized due to geological and topological condition. Residential area accounts for 1.4 % of total area.

Table 1.2: Current Land Use by Regency (unit: km2)

Categories	Gowa	Makassar	Maros	Takalar	Total
Urban Area	**37.8**	**90.9**	**12.8**	**7.8**	**149.3**
Residential Area	37.8	73.1	12.8	7.7	131.4
Commercial	0.0	8.1	0.0	0.1	8.2
Business/Office	0.0	4.7	0.0	0.0	4.7
Industrial Area	0.0	5.0	0.0	0.0	5.0
Agricultural Area	**386.7**	**39.8**	**369.0**	**264.9**	**1060.5**
Irrigated Mixed Crops	70.7	1.0	0.0	33.2	105.0
Irrigated Rice Field	188.7	8.3	0.0	84.5	281.4
Mixed Crops	80.4	8.3	75.8	85.4	249.9
Rice Field	16.9	22.2	292.9	61.9	393.9
Plantation	30.0	0.0	0.3	0.0	30.3
Green Area	**143.0**	**4.3**	**466.1**	**104.4**	**717.8**
Grass Land	0.0	0.0	11.8	10.0	21.8
Bushes	4.7	0.0	38.3	0.0	43.0
Forest	138.3	4.3	416.0	94.4	653.1
Water	**54.8**	**26.9**	**87.6**	**36.2**	**205.5**
River	14.3	7.5	19.9	8.5	50.2
Wetland/Fish Pond	0.0	18.4	67.7	26.7	112.8
Water Reservoir	40.5	0.9	0.0	1.1	42.5
Others	**99.8**	**17.9**	**110.3**	**136.4**	**364.4**
Dryland	99.7	8.5	103.0	136.1	347.3
Sand Dune	0.0	0.7	0.0	0.0	0.7
Open Space	0.1	8.7	7.3	0.3	16.4
Total	**722.1**	**179.8**	**1,048.6**	**549.8**	**2,500.3**

Source: Basic data from thje National Land Agency

1.2 Proposed Land Use under Existing Spatial Plan

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 area (68,800 ha) and industrial area (37,200 ha). It does not appear that the land use has been proposed on the basis of the estimated land requirements for these purposes. It is difficult to understand how to lead the future growth in an efficient and effective manner in the light of future development frameworks.

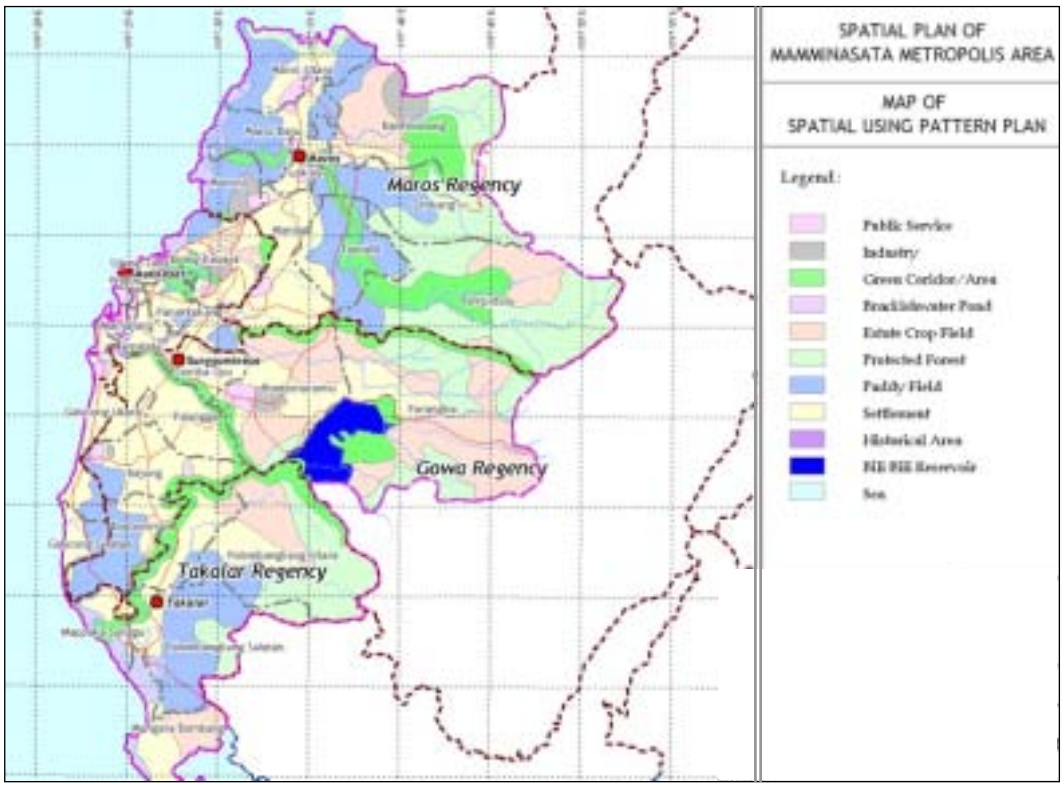


Figure 1.2: Land Use Envisaged under Existing Mamminasata Spatial Plan

Through discussions at the working group meetings, some specific issues have been brought up, among the stakeholder regencies, as introduced in the following.

Table 1.3: Development Policy/Direction under Provincial Spatial Plan

Sectors	Development Policy/Direction
Urban Development/Housing	・The primary service centers shall be Makassar city, Capitals of Maros, Gowa, and Takalar ・The secondary service centers shall be Lau District(Maros), Bonto Marannu District(Gowa), and Mangarabombang District(Takalar) ・The future development core shall be Fort Somba Opu area(Makassar), Samata education area(Gowa), and Sudiang sport center(Makssar)
Agriculture/Fishery	・Agriculture is directed to Maros, Gowa, and Takalar
Environment	・Makassar City shall be developed as environmentally friendly city harmonizing with green belt ・Preserved Forest area shall be protected from any development activities ・Wetland areas shall be protected ・Coastline area shall be preserved not to damage the beach ecosystem ・Riverside area shall be preserved not to damage the river ecosystem
Industries	・Proposed Improvement in Agro-business/Industry, Agro-business information center ・Agro-Industrial Development shall be extended to Maros, Gowa, and Takalar based upon each commodity potential as follows - Agro industry in Maros - Horticulture industry in Gowa - Fish industry in Takalar
Education	・Higher education facilities related to agro-industry and agro-business shall be developed in Maros, Gowa, and Takalar

Sectors	Development Policy/Direction
Tourism	・Makassar City shall be "Shopping Tourism Center" connected to seaport, airport, and bus terminal ・Coastal area, islands, and riverside shall be developed for marine and river tourism ・Area where is rich in nature resource shall be used for natural tourism ・Historical heritages shall be integrated for historical tourism sites
Transportation	・To improve outer ring road that connects Mamminasata internal areas and railway network from or to Mamminasata areas ・To improve river transportation system along with the facility and infrastructure establishment ・To improve Makassar seaport facilities as the ocean/international seaport ・To establish an international airport that is able to facilitate the trading and tourism activities

While discussing about the existing spatial plan for Mamminasata, spatial plans of the regencies have been reviewed. A spatial plan of Takalar regency was prepared in 2001, and Gowa regency in 2003. Maros regency will get it within this year, while Makassar city is in the final process to compile the plan.

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 disclosed totally, a spatial plan has been worked out as shown on the following figure:

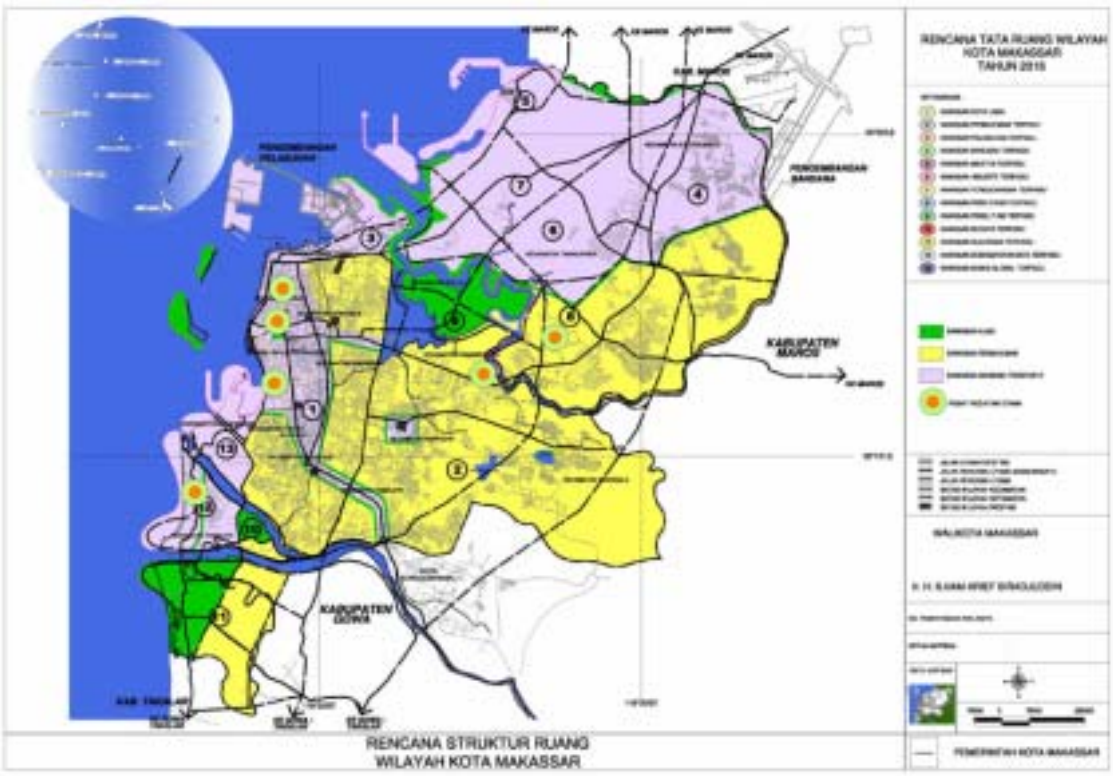


Figure 1.3: Regional Spatial Plan of Makassar City

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

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

(ii) The Plan envisages reclamation on the right side of the Tallo river estuary for industrial and residential use, together with the ambitious expansion plan of the 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 determined for the benefit of the people in Makassar and the whole Mamminasata as well.

(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 area, while it has been found that Makassar people expect better amenity for living and hope to transfer it to the future generations. It is suggested that the green space is 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, 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 better be further examined.

The district spatial plans in Maros, Gowa and Takalar also enlist 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 from the respective point of view. For instance, Maros and Takalar are willing to have their own port facilities. A huge amount of investments are required if the projects enlisted by 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, less coordination has been

pursued among them for the formulation of the integrated spatial plan, as well as the respective district spatial plan.

1.3 Issues to be Addressed on Current Land Use and Future Land Use Plan

a) Need to develop an implementable plan

The existing spatial plan proposed future development directions for Mamminasata, but it is important to indicate how to realize the proposed projects/programs under the future framework. The existing plan is paying less attention to its implementability, i.e., demand-basis estimate, stage-wise programming, and financial arrangement, etc.

b) More attention to the conservation/protection

It is necessary to preserve the forestry area and to further increase the green area in Mamminasata. The green area in the built-up area of Makassar and its surroundings should also draw special attention as it has been decreased to 2.4% of the urban zone.

c) Protection of hazardous area

The hazardous area like the potential flooding in Makassar municipality and the surrounding area should draw special attention in land use planning. Basically these areas are not suitable for development in terms of the eco-system and cost efficiency.

d) Balance between the current land use and future development

At the planning stage, it is necessary to consider existing conditions such as land use, environmental condition and regulated area in order to formulate a more efficient and realistic plan. It is, however, observed that the current conditions and land use are not fully taken into account under the existing spatial plan.

e) Lack of coordination among institutions

It is observed that there is a lack of coordination among government agencies and institutions, particularly information sharing for planning. Each regency is trying to formulate its own development plan without coordination with plans developed by other organizations, even though an agreement of cooperation for Mamminasata area development has been concluded among the regencies under the coordination of the province.

2. LAND USE PLANNING

2.1 General Directions

The land use plan aims at showing a desired but achievable shape of land use in Mamminasata to be realized in a 15-year time frame, as well as in view of the longer term perspectives. The principles of planning are:

1) Firstly, the land areas not suitable for use are identified, demarcating the areas with high risk of natural disaster and the areas for environmental protection or conservation.
2) Future requirements for land use under the socio-economic framework are to be reflected in the plan, inclusive of the requirement for industrial development and housing development.
3) The plan will pay due attention to the existing future plans formulated by each government. However, as it was observed that there exists intra-regency disconnection and insufficient consideration on the protection of the environment, such inappropriate planning would be suggested for rectification.

2.2 Identification of Unsuitable Land for Development

The land not suitable for use of development will be identified from the viewpoints of natural disaster and legal regulations.

Flood Risk Areas

As shown in the following map, areas along the major rivers in Mamminasata (e.g., Maros and Tallo rivers) are subject to flooding. Such a flood risk area extends for 155 km^2 in total. The area along the coastal line in Maros is also wetland and fishponds subject to flooding. Future land use in the flooding areas should be restricted to protect residents from flood hazards.

Figure 2.1: Flood Area and Wetland Area (2005)

Protected Area for forestry conservation

By the Presidential Decree No.41/1999, certain types of the forestry areas are prohibited for any development activity for protection of the environment. Such a protected area extends to the east boundary of Mamminasata, with a total land of approximately 260 km^2 (10.4 % of total land).

Figure 2.2: Protected Forestry Area

Demarcation area for coastal line and riverside

For the waterfront conservation, there are two regulations at the national level; i.e., the presidential decree No.32/1990 and government regulation No.47/1997. These regulations define in the following manner.

- Coastal demarcation criteria are the land along the river bank with the minimum of 100 meters from the highest tide level to the land.
- Protection is addressed to preserve the river from any human that could cause damages to the river water quality, river bank/base condition, and river flow.

Figure 2.3: Coastal and Riverside Land Regulated

- River demarcation area is 100 meters on both banks of major rivers and 50 meters from small rivers.
- For river in the settlement areas, the demarcation is 10-15 meters (This width is enough to build inspection road).

2.3 Reserved Land

Reserved land for Agricultural Use

Technical irrigation area of 24,000 ha in Gowa and Takalar regencies shall be reserved for agriculture, except for some areas identified under the Agriculture Study. The proposed irrigation area in the southern part of Takalar (6,400 ha) will be decided by the Agriculture Study if it should be reserved or not.

Figure 2.4: Technical Irrigation/Irrigable Areas

Reserved land for Green Area

The area protected for forestry conservation under the presidential decree is approximately 10% of total land, and other existing forestry areas, though not regulated, extend for 40,000 ha or 16% of total land. The existing forestry areas shall be reserved for green area in addition to the regulated area for protection. With the conservation, 26 % of total land shall be kept as green space. Further, it is planned that more green spaces, as well as connecting conserved green area or green network, would be reserved in Mamminasata.

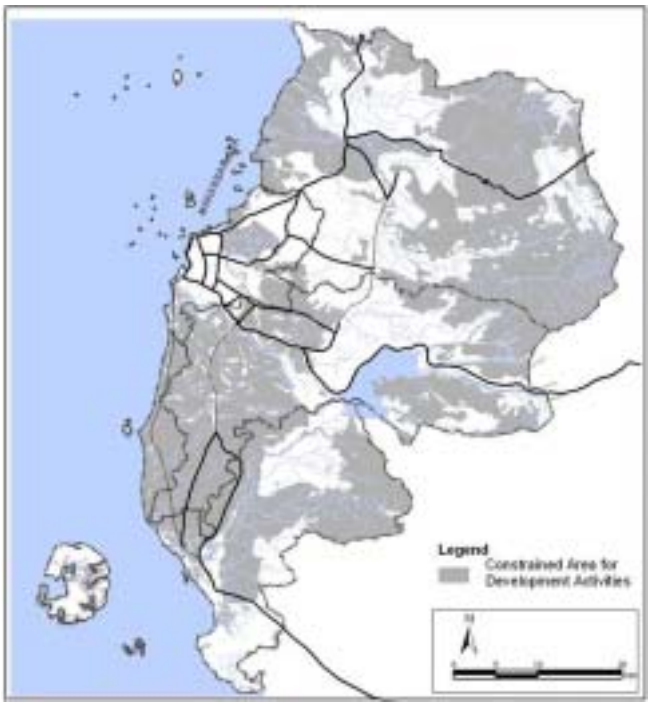


Figure 2.5: Constrain Area for Development

Figure 2.5 combines the land not suitable for use and reserved land for technical irrigation and green area. The total constrain area is approximately 1,580 km^2 (158,000 ha) or 63 % of total land in Mamminasata.

2.4 Land Use Requirement

The major generators to induce the future land use will be large-scale developments such as housing and industry. In the following section, basic policy and required land for housing and industrial development are presented in a summarized form.

(1) Direction and Required Land for Housing Development

The current condition and issues to be addressed in future development in residential area are summarized as follows.

- Currently, the Mamminasata population concentrates heavily in Makassar City with a high density and insufficient open spaces (CBD area: ±300 person/ha)
- Existing housing development projects tend to shift to the outskirt of Makassar such as in Gowa and Maros regencies
- Gowa and Maros regencies have potentially developable lands for future housing development with a better environment

In the light of the current condition, a direction of housing development to cope with the projected population growth will be delineated as follows.

Direction of Housing Development

- To decentralize population from Makassar to other regencies
- To locate large scale residential areas with efficient infrastructure
- To set up development timeframe considering the progress of infrastructure establishment

Required Land and timeframe of Housing Development

The future population is estimated to increase by nearly 600,000 by 2020, from 2.3 million in 2005 to 2.9 million in 2020. The ongoing or planned housing developments by the private sector in Mamminasata by 2010 is approximately 4,700 ha in total as shown in the following table.

Kabupaten	Kecamatan	Area (ha)
Makassar	Biringkanaya	877
	Manggala	374
	Mariso	2
	Panakkukang	170
	Tamalate	1,027
	Sub Total	2,450
Maros	Mandai, Tanral	450
	Moncongloe	6
	Lau	1
	Turikale	17
	Marusu	3
	Sub Total	478
Gowa	Pallangga	1,427
	Somba Opu	319
	Bontomarannu	3
	Barombong	8
	Sub Total	1,756
Takalar	Pattallassang	62
	Sub Total	62
Grand Total		4,683

Figure 2.6: Planned Housing Development by 2010

If 50% of the planned housing developments are assumed to be implemented by the targeted year, such new residential areas could accommodate about 200,000 people. It indicates that housing development for additional 400,000 people should be prepared within 10 years from 2010 to 2020. The area required for 400,000 people is estimated to be approximately 4,500 ha, as calculated below.

400,000 pop ÷ 70 pop/ha (population density of Makassar city in 2003)≒ 5,700 ha

5,700 ha ÷ 120~130 % (improvement in land use efficiency)≒ about 4,500 ha

By guiding people to reside in high density multi-family apartment houses, from the present conventional type of small independent houses, land use efficiency could improve to a considerable extent (see the BOX below). In other words, smaller land areas than that estimated in the original Mamminasata Metropolitan Spatial Plan in 2004 can accommodate more people under better spatial conditions, with open/green space, by introducing a concept of more efficiency in land use.

[BOX]

A MODEL CALCULATION ON IMPROVEMENT OF LAND USE EFFICIENCY

i) Re-capture of Existing Residential Area

In case of Makassar city, 4,000 m2 of residential area is assumed to exist in 1.0 ha of the gross city area (see Table 1.2). This residential area can accommodate about 70 people or 14 houses in the actual situation. Assuming that 30% of the residential area is the net housing area by taking account of common spaces for road, path, park, etc., and the average housing scale is 60 m2 per house with one-story independent building, the BCR (Building Coverage Ratio) is calculated to be 70%, which is equal to FAR (Floor Area Ratio).

ii) Improvement in Land Use

Assuming that a three-story multi-family apartment house is to be built in the same net housing area of 1,200 m2 (in 4,000 m2 of residential area), with the BCR of 50% and the FAR of 150%, the building scale would be approximately 1,800 m2 (600 m2/floor x 3 floors). This building can accommodate 18 households or 90 persons in total (128% of the existing condition) with the average floor area of 100 m2 per house, of which 80 m2 can be secured as net housing area (30% larger that the existing condition). In this way, multi-family type housing is effective not only for improving land use efficiency but also for making the living environment more spacious.

The Mamminasata Spatial Plan envisages that the residential zones will be developed to the east of Mamminasata, 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.

as of 2005	2005-2010	2010-2015	2015-2020	as of 2020
13,000ha	+ 2,500ha	+ 4,000ha	+ 500ha	20,000ha

Kabupaten / Kotamadya	2005-2010 [Short Term]	2010-2015 [Middle Term]	2015-2020 [Long Term]	After 2020	TOTAL AREA
MAKASSAR + 1,800 ha	+1300ha	+500ha			9000 ha
MAROS + 1,750 ha	+250ha	+1500h			3000 ha
GOWA + 2,900 ha	+900ha	+2000h			6700 ha
TAKALAR + 550 ha	+50ha			+500ha	1300 ha
TOTAL	+ 2,500ha	+ 4,000ha	+ 500ha	+ 7,000ha	

Figure 2.7: Required Land and Timeframe for Housing 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 2.8: Allocation of Future Population in each Regency

(2) Direction and Required Land for Industrial Development

The development direction for industrial development in Mamminasata is delineated in view of the available local resource and development potential, as summarized in the following.

Direction of Industrial Development

- To expand industrial development in Makassar as an industrial center in Eastern Indonesia.
- To induce industrial development into Maros, Gowa and Takalar regencies and promote processing industries making use of local resources.

- To introduce research and development (R&D) center and higher education complex, aiming at high value-added local industries; (Gowa: Agro-industry related R&D, Takalar: Fishery related R&D)
- To plan industrial development in accordance with infrastructure development

Required Land and Timeframe of Industrial Development

It is estimated that 1,200 ha of land will be required in net for industrial development in Mamminasata to attain a moderate growth scenario. The development timeframe and distribution of land by regency is planned in view of the regional potential and existing projects for development.

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 2.9: Required Land and Timeframe for Industrial Development

2.5 Development Direction by Regency

Based upon the regional development frameworks contemplated by regencies, as well as the existing condition and potential for development as assessed by sector, the development direction of each regency is predicted as follows.

Makassar City

Current Conditions / Potential

- Highly built out for settlements with small room for future dev.
- Infrastructure need more enhancement for high quality of urban life
- Insufficient open space and green area especially in CBD
- Established commercial/trade center with seaport development and airport located
- Potential for MICE tourism

Development Direction

- To develop as a Business/Commercial Center as a hub in Eastern Indonesia

- To introduce middle/high-rise residential buildings with surrounding open space and amenity
- To make the city more attractive to visitors with beautification of the urban environment

Maros Regency

Current Conditions / Potential

- High potential for future development in land availability but needs careful consideration in flood area and airport safety
- International airport closely located and major local industry in the north
- Needs to strengthen the north-south axis (connection to Makassar) to afford future development

Development Direction

- To develop as the secondary city of Makassar with expansion of local industry and airport related industry
- To accommodate population growth as a satellite city with sufficient open space, while necessary to improve road networks which make commuters more accessible to Makassar city
- To conserve wetland along coastal line as open space or recreation areas

Gowa Regency

Current Conditions / Potential

- Rich in natural resources, such as river and forestry
- Comparatively high potential for future development in land availability, while needing careful consideration in flooding areas
- New Large-scale system irrigation area in the western part

Development Direction

- To introduce satellite cities to accommodate future population growth with sufficient open space and good accessibility of infrastructure
- To create eco-city with green belt and green space by embracing nature resources in the hinterland
- To induce R&D center and higher education facility which supports local-resource-based industry

Takalar Regency

Current Conditions / Potential

- Locate along coastal area with marine resources (i.e. Fish, Mangrove, Coral leaf)
- Insufficient infrastructure and needs long timeframe for land use conversion.
- Potential system irrigation area (planned by Prop. Gov.)

Development Direction

- To improve productivity of agriculture and fishery, while taking into account the accessibility to the market
- To induce R&D center and higher education facility which supports local-resource-based industry
- To enhance infrastructure in a view of long-term development, so that future development potential is expanded.

2.6 Future Land Use Zoning

The Law of Spatial Planning (Law No.24/1992), which is under revision by the Ministry of Public Works, classifies the land use into the "Protected Zone" and "Cultivation Zone". Basically, it is planned that the Mamminasata area will be zoned to (i) Urban Planning Zone, (ii) Semi-Urban Planning Zone, (iii) Production Forest Zone, and (iv) Protection Zone. The first three zones are "Cultivation Zone", 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 into the urban planning zone, while the forest land to the east of Mamminasata is classified as a production forest zone or protection zone. The land area situated between them will be a semi-urban planning zone.

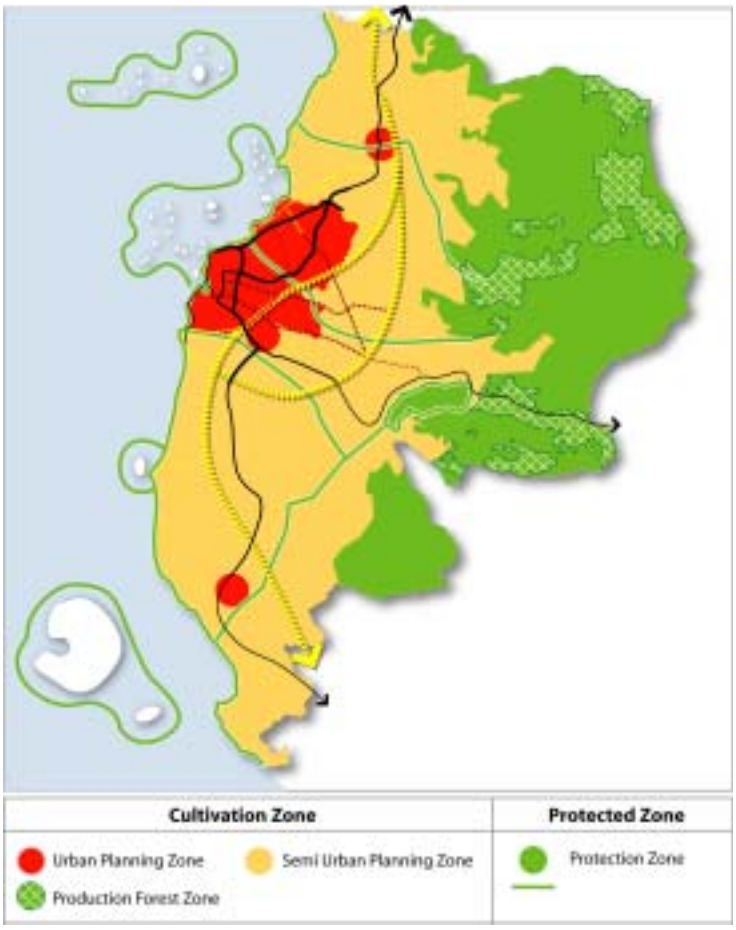


Figure 2.10: Land Use Zones

Four land use zones are further categorized in the following manner.

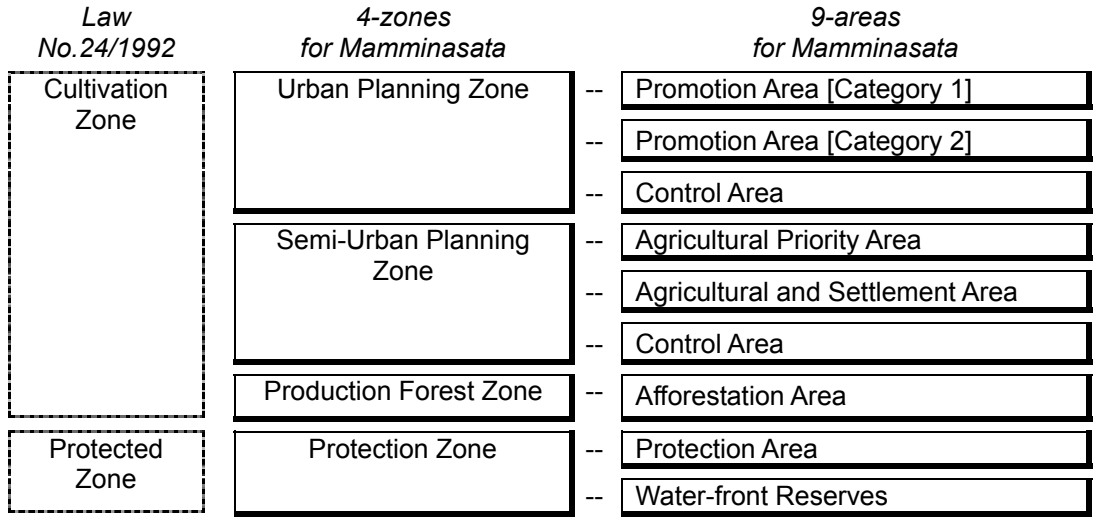


Figure 2.11: 4 Land Use Zones and 9 Land Use Areas

Urban Planning Zone is designated to cover established and on-growing urban area where more efficient and effective utilization of land is required. Urban Planning Zone is further consisting of three areas as follows;

Promotion Area Category 1 in which level of urbanization is high enough.

Promotion Area Category 2 in which urbanization has begun recently. And,

Control Area is designated in areas of low utilization such as swamp, inundation/flood prone area, green open space, etc. so as to ensure quality of urban environment.

Semi-Urban Planning Zone consists of agricultural and settlement area where development potential in the long-time future. Semi-urban Planning Zone is further split into three areas as follows;

Agricultural Priority Area where development activities area strictly regulated for the purpose to protect agricultural production.

Agriculture and Settlement Area in which development activities are allowed if the type, scale, and infrastructure conditions of development activities are permitted by a Development Guideline.

Control Area is designated in areas such as swamp, inundation/flood prone area, green open space, etc.

Production Forest Zone is the hilly area surrounded by forest area and grass lands, in which Afforestaion Area is designated, where production forest is to be promoted with incentives.

Protection Zone is further classified into Protection Area and Water-front Reserves in accordance with strictness in development and priority in conservation.

Distribution of the land use areas in Mamminasata is now proposed as illustrated in the following.

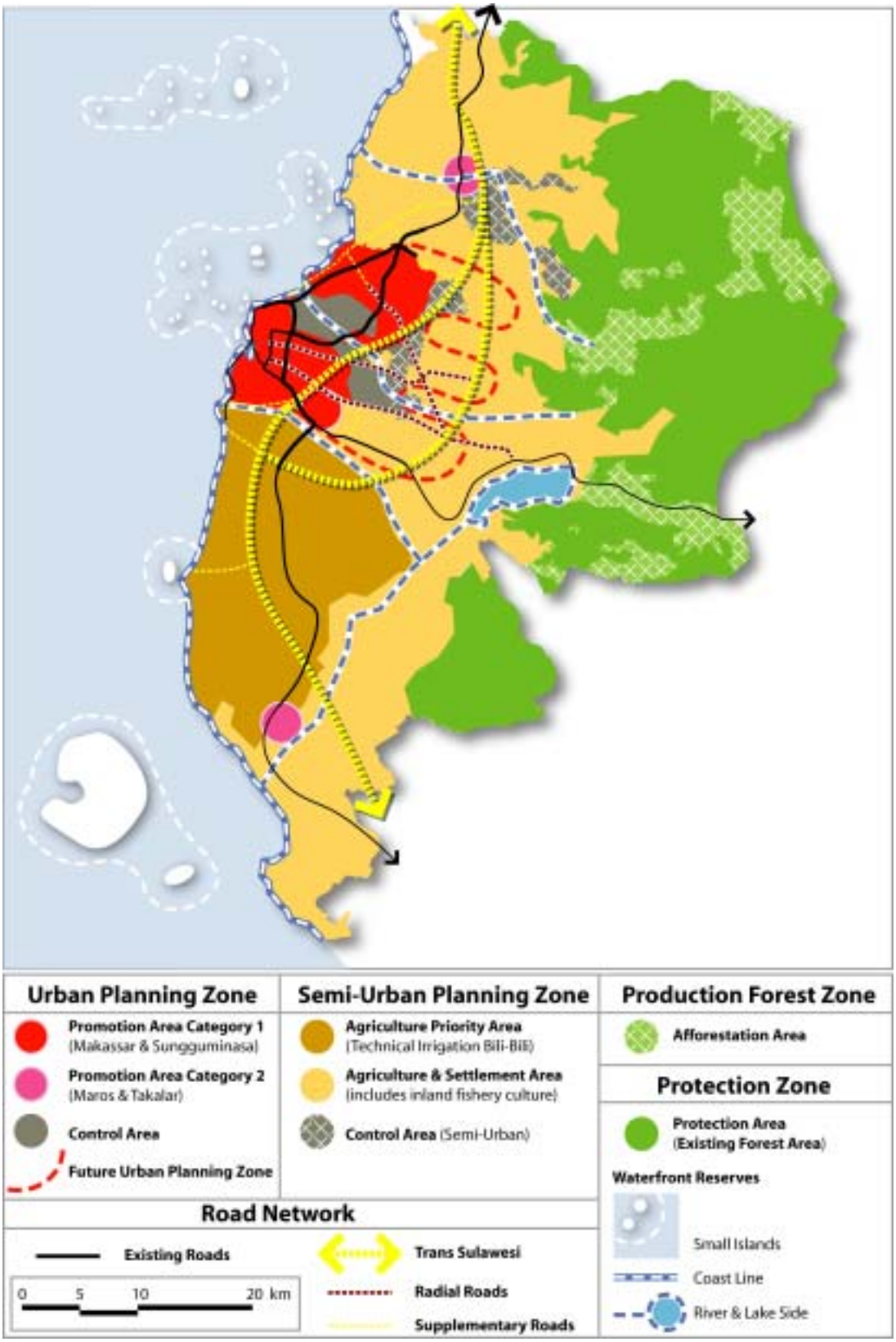


Figure 2.12: Land Use Areas

The protection zone will extend for 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 is around 22,000 ha, which is around 90% of the goal set for the additional green area (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. A general concept has been discussed with stakeholders as shown in the following.

Figure 2.13: Land Use Concept for Mamminasata

The concept was formulated, taking into account the constrain area for development as well as future land use direction of each regency, while putting emphasis on the following basic strategies in land use.

1) Under the principle of well-balanced development among the regencies, housing area and industrial area should be distributed to the regencies other than Makassar, as being directed as an objective in the existing spatial plan for Mamminasata, i.e., "multi core development". At the same time, from the viewpoint of efficient urban development, revealed potential of urbanization (i.e., attractiveness of current Makassar city) should be utilized under a clear structural direction by which disordered urban sprawl could be controlled.

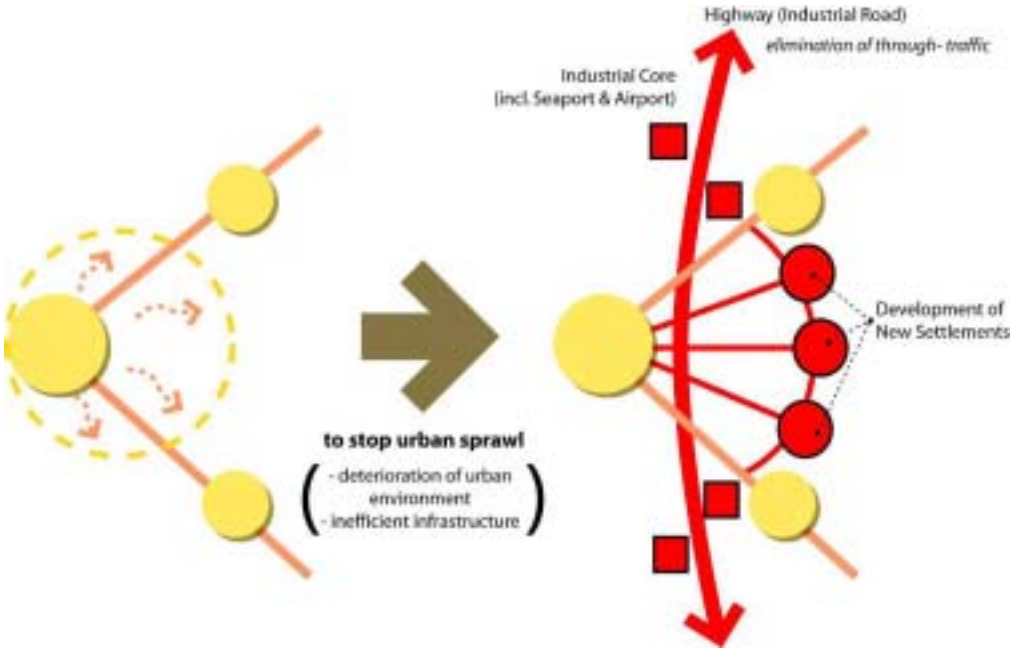
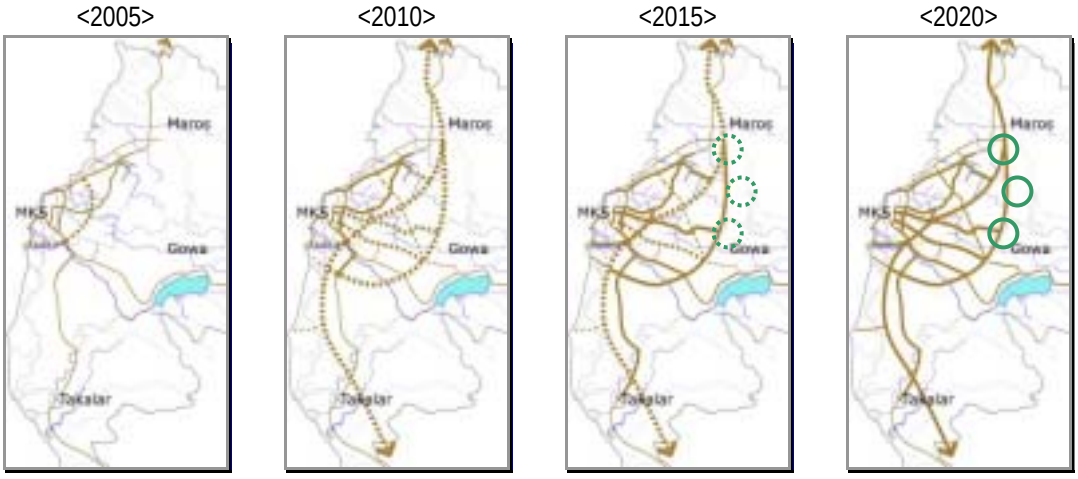


Figure 2.14: Spatial Development Structure for Mamminasata

The above figure illustrates a spatial development structure applied to make the Mamminasata development efficient and effective, being combined with inland transportation enhancement (see the following basic strategy and Figure 2.15). To stop disorderly urban sprawl and to control the development direction, east-west axis and connecting by-pass should be introduced, which would become trunk roads to connect new settlements (shown in red circle) and the existing city centers (shown in yellow circle). At the same time, a new inter-regional highway should be envisaged in order for Mamminasata to widely connect to the outside in shorter travel time, that could support one of the main economic activities of Mamminasata, i.e., a trade and logistic hub.

2) To support the well-balanced development, as discussed above, transportation function should be enhanced to expand the economic activities from Makassar to the other regencies in Mamminasata, and to further spread to the whole Mamminasata. Inland transportation, road network in particular, should be prioritized in the light of land use, while expecting future expansions of seaport

and airport as long-distance transportation functions.



Existing Condition | *Improvement of Inner-City Road in Makassar* | *Completion of N-S and E-W Road for New Township* | *Completion of Inter-regional Trunk Road*

Figure 2.15: Stage-wise Inland Transportation Development

3) To become a eco-friendly and human-centered metropolitan area, green open space such as regional forest, water-front reserves and regional recreational park should be enhanced, while paying attention to the coastal area conservation. Such land as flood plain or marginal forest zone is suitable for recreational park.

Figure 2.16 a: An Image of River-front Conservation

Figure 2.16 b: An Image of Coastal Area Conservation

2.7 Land Use Management

To make the Mamminasata land use zoning effective in urban development administration, it is necessary to introduce an integrated land use management system. The management system is composed of the following three elements, i.e., (i) Guideline and Regulations for optimal utilization of limited land resources through regulating/controlling development activities, (ii) Incentives for promotion of development activities in line with the guideline/regulations, and (iii) Inter-regional Coordination for smooth, harmonized and unified operation of the common rules among the concerned regencies/agencies.

(i) Establishment of Land Use Guideline and Related regulations

A land use guideline should be established to appropriately regulate development activities in the respective zones and areas designated in the land use zoning. General idea of the guideline has been preliminarily prepared, as shown in the following table, while further technical examination is necessary in combination with spatial designation in land use zoning[1].

Table 2.1: 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.

[1] Sector Study Report (16) Institutional Study is discussing more on this issue.

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

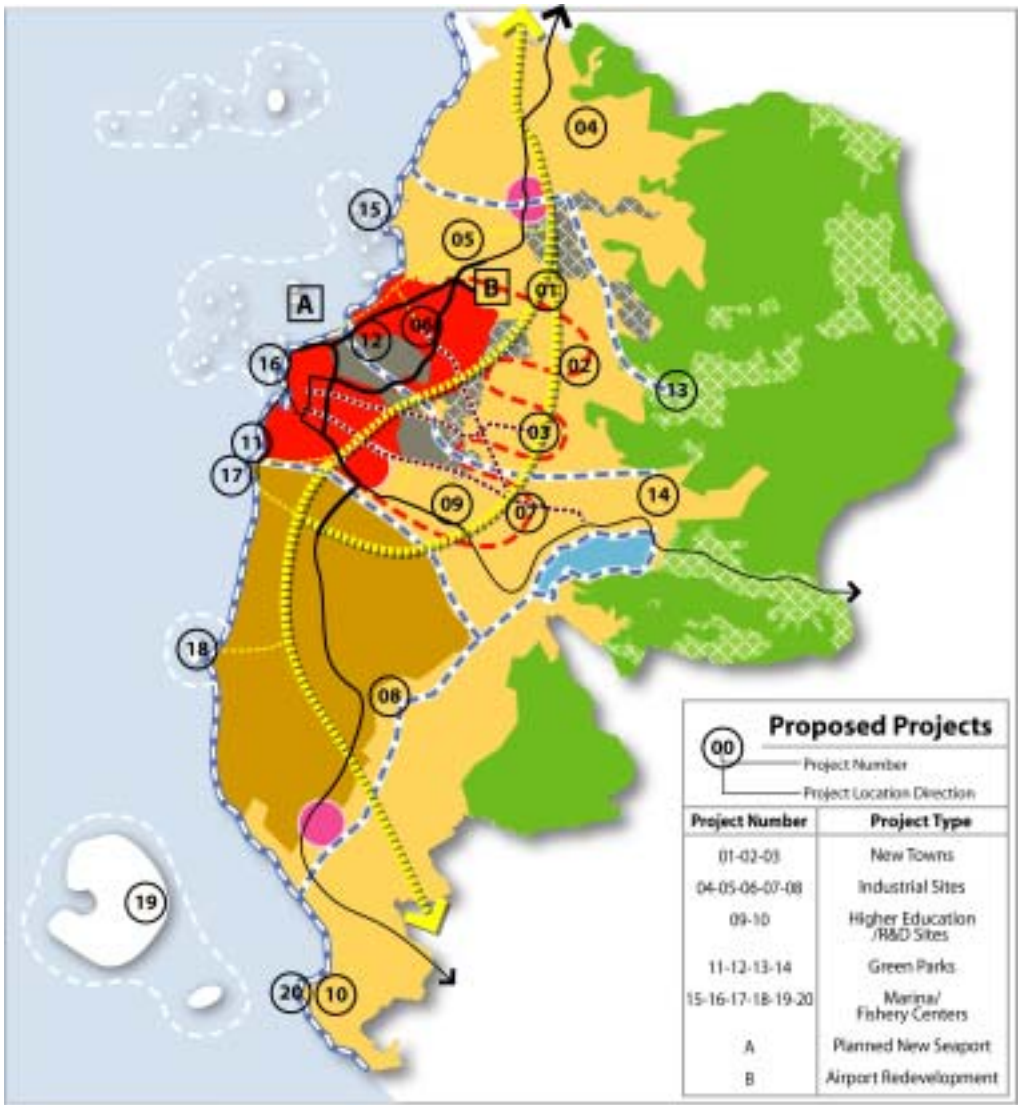


Figure 2.17: Proposed Projects in Land Use Zoning

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

Once the regulations are established, it is required for developers to get official permission from the authority. Development activity which is assessed unsafe or unsatisfied with the regulations should not be allowed to implement. Volume, height and usage of buildings are to be appropriate controlled. Necessity of regulations for land use, landscape, urban amenity, and transportation are discussed separately in the Sector Report on Institutional Study.

(ii) Introduction of Incentive Measures

It is concerned that strict control or establishment of regulations might slow down development activities. For having development in appropriate conditions, it is desirable not only to control/regulate but also to introduce incentive measures. The following incentive measures are to be considered.

Easing Standard of Volume Control

Building control shall regulate volume, height and usage of building in the designated zone and area. Incentive measure of easing standard aims at giving a certain level of easement on building volume and/or height, for instance, to those who want to develop/build instead several regulations are set on a set-back from site boundary and greening in the site. TDR (Transfer of Development Right) is also to be contemplated for natural and historical conservation.

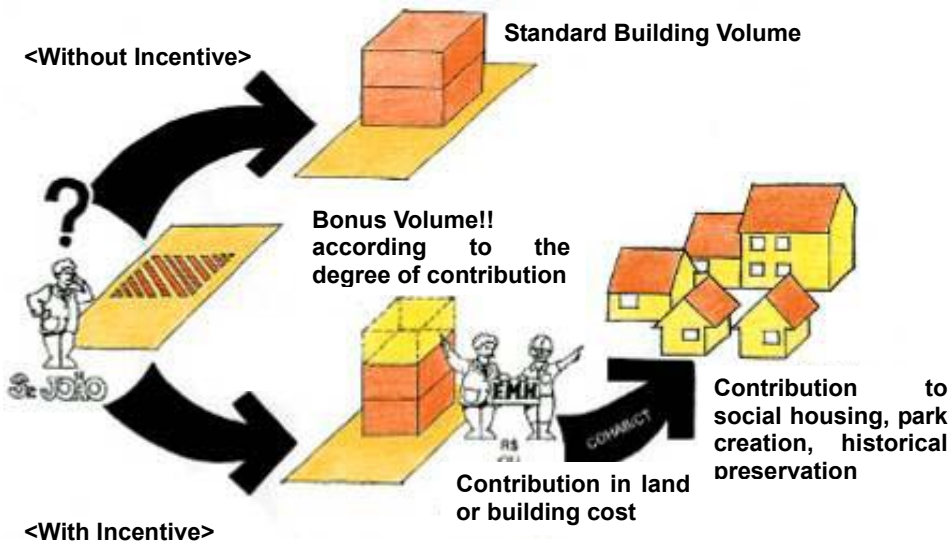


Figure 2.18: Application of TDR Scheme

Introduction of CDM system for Conservation

On conservation zone as well as greening in the urban area concerning construction of new trunk road and trash disposal facility, CDM (Clean Development Mechanism) system is to be contemplated for getting financial and technical assistance from foreign countries. Both private and public sector in developed countries are now so much interested in getting credit, aiming at the goals of the Kyoto Protocol in 1997, by contributing to prevention from global warming. Such development and conservation projects as green area promotion or waste water treatment are possible to draw financial and technical assistance. The details of benefit of CDM system are

separately discussed in the Environmental Study.

(iii) Establishment of Inter-regional Coordination

As the current inter-regional coordination among the regencies is assessed not enough to efficiently implement the Mamminasata Spatial Plan, it is necessary to consider establishing an implementation body, together with developing a regulatory framework. The authorized implementation body should be responsible for preparing an integrated spatial plan and with a certain power of implementation to independently enforce the guideline/regulations over the concerned regencies, while retaining administrative independence in urban management of the regencies. Details are discussed separately in the Sector Report on Institutional Study.

2.8 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 Urban or Semi-Urban Planning Zone but not in Production Forest Zone or Protection Zone.

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

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

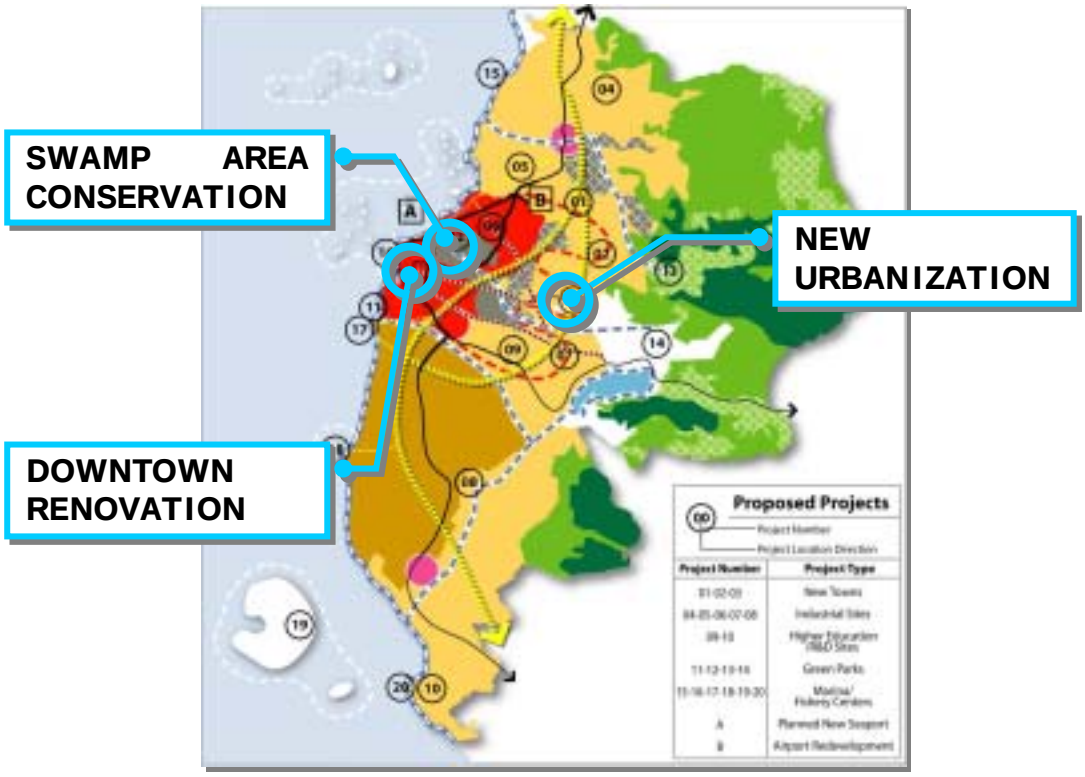


Figure 2.19: Development Promotion Model Area

As shown in the above figure, three Development Promotion Areas have been selected. Development images in each area are prepared as follows.

(i) 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.

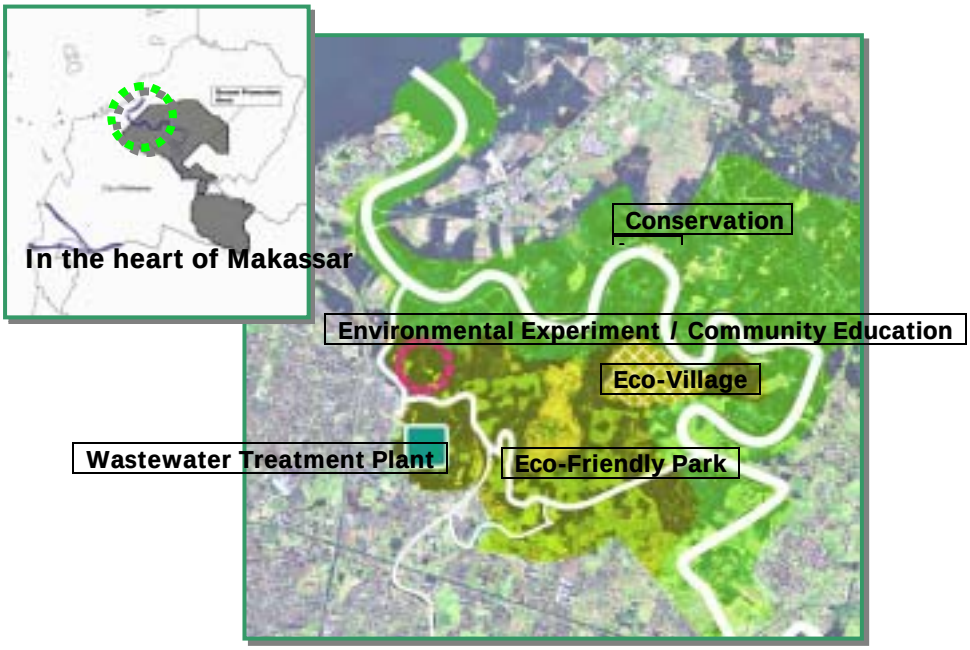


Figure 2.20: Development Image of Swamp Area Conservation

Conservation of the urban environment is one of the highest priority in Mamminasata Spatial Planning. To realize this concept, swampy area in the lower reach of the Tallo River is proposed to be protected.

This swampy area conservation will contribute to the expansion of green spaces in Makassar and turning it into the center of water front green land for the Makassar and Mamminasata people.

Figure 2.21: An Image of Swampy Area Conservation (Moere-numa Park in Sapporo city, Japan)

(ii) 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.

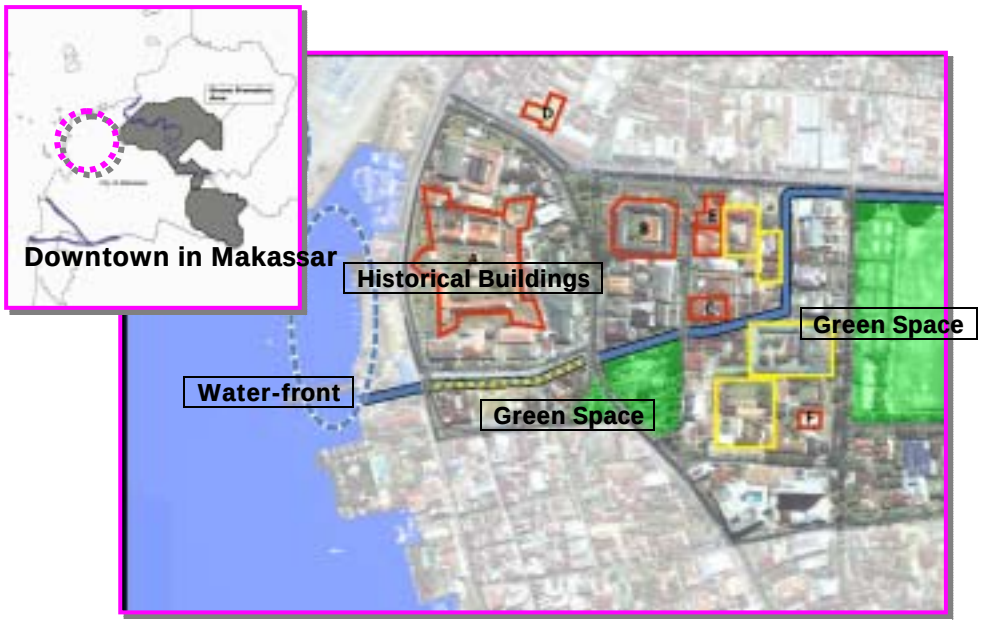


Figure 2.22: Development Image of Downtown Renovation

Figure 2.23: Fort Rotterdam

Mamminasata has many cultural and historical heritages constructed in old days. It is appropriate to develop such areas for the purpose of urban tourism enhancement. This area is, in principle, to be developed under strict land use regulations, with lower building coverage and floor ratio, to retain the urbanscape in good conditions, even though it is not so effective from the economical view in land use. An example is the re-development of the Fort Rotterdam and its surrounding blocks in Makassar as shown in Figure 2.22.

While conserving the cultural and historical heritages in the downtown, 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 offices now scattering along the roads.

A model plan of combination of downtown renovation (Figure 2.22) and high utilization of land in the suburbs (Figure 2.24) are presented, as sample images, 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 2.24: Development Image of Higher Utilization in Land Use along a Major Road

(iii) 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. Development scale should be regulated to be large enough to avoid small and scattered developments to promote development efficiency.

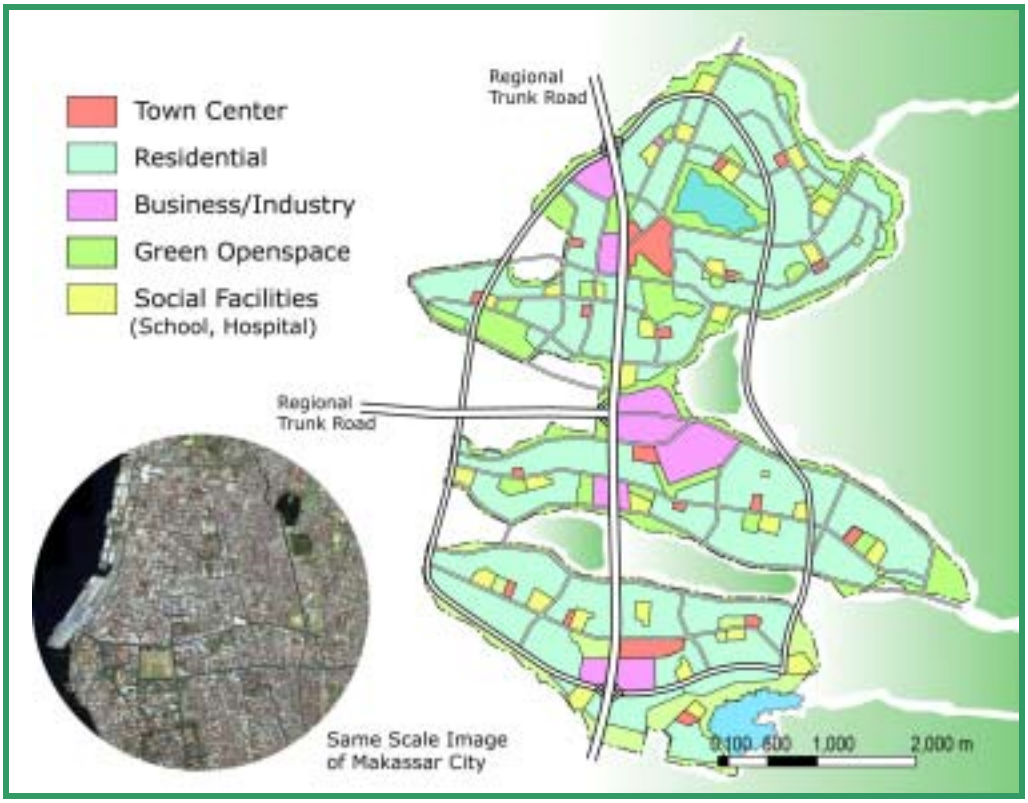
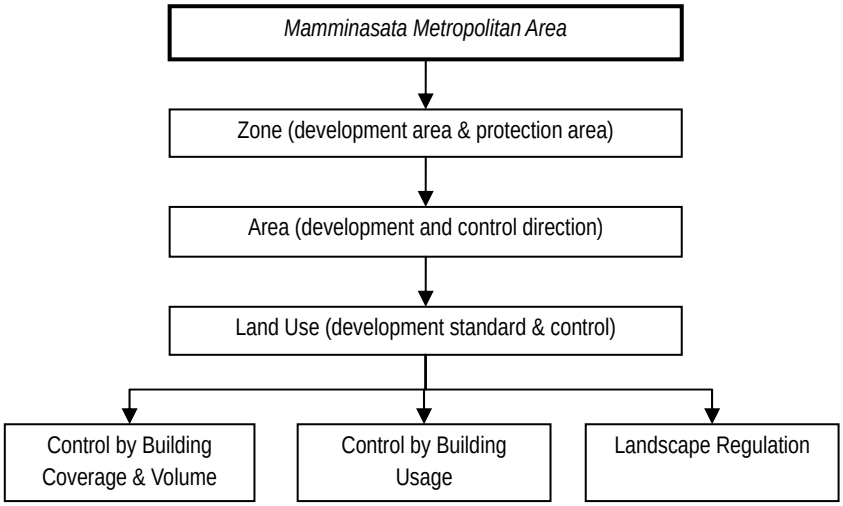


Figure 2.25: Development Image of New Urbanization

Urban population will increase by nearly 200,000 respectively in Makassar, Gowa and Maros towards 2020 and new urban centers are required to be developed. To the east of Makassar, a few urban centers will be developed and they will be linked with Makassar and other regencies by roads and other networks. While, better utilization of land will be planned not only for residential but also for commercial and industrial uses. Figure 2.25 shows a development image of new urbanization.

Guideline proposed for Land Use Control
in Mamminasata Metropolitan Area

The Spatial Plan for the Mamminasata Metropolitan Area has worked out a land use plan showing the development direction of the metropolitan area. In order to follow the proposed land use plan, control standards have to be clearly provided. Control measures are proposed for (i) zoning and land use classification, (ii) building coverage ratio and building volume, and (iii) building usage. A land use hierarchy and control measures are illustrated in the following figure.



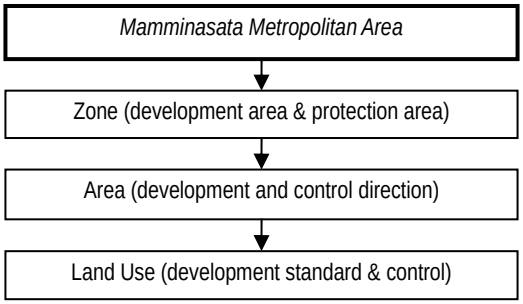
The spatial plan shows the land use from the viewpoint of the development direction and image of the future metropolitan area. This guideline, on the other hand, is prepared to provide the definition of land use and the control measures including the following.

(i) Land use hierarchy (zone, area, land use),
(ii) Building coverage and volume control,
(iii) Building usage control by land use, and
(iv) Landscape regulation to cover specific area of specific interest.

1 Land Use (Zoning) Control

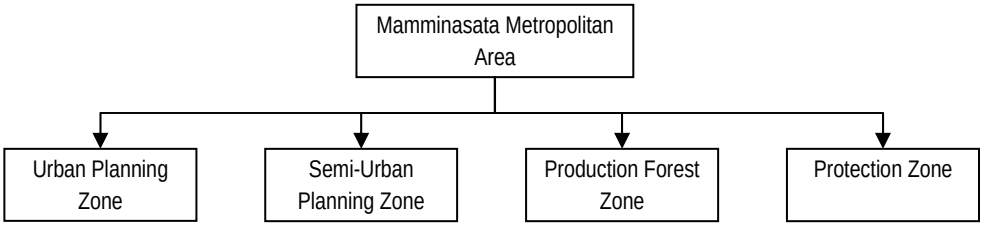
1.1 Land use hierarchy

Since urbanization has already been in progress, it is difficult to control urban development by designating zoning simply by land utilization, such as residential use, commercial use, industrial use and so forth. In order to control urbanization, it is important to show the development direction and specify control measures. Urban development is managed through three urban classification, namely (i) zone, (ii) area, and (iii) land use.



(1) Zone

Development (cultivation) area and protected area are designated in the Mamminasata Metropolitan Area. The development area is classified into three categories, i.e., (i) urban planning zone, (ii) semi urban planning zone, and (iii) production forest zone belongs to cultivation area. The protection zone is the conservation zone designated under the National Spatial Planning Law (Law No. 24/1992).



A general zoning guideline is prepared summarized in the following table.

(i). Urban Planning Zone (cultivation area)	City or urban area with population concentration and providing working place where needs integrated development and to be conserved. The area needs urban development such as residential area, industrial area and other urban function.
(ii). Semi Urban Planning Zone (cultivation area)	The area outside Urban Planning Zone where some building construction has already started or expected to start in the near future. The area has risk of negative impact on environment and urban development if the area is left alone without proper land use plan
(iii). Production Forest Zone	The existing forest area that can be utilized as economic activities.

(cultivation area)	
(iv). Protection Zone (conservation area)	Environmentally important area (forest, water) and designated for protection purpose. Development activities are strictly limited

(2) Area

"Area" is designed to show the development direction as well as the control direction. Types of area shall depend on characteristics of the zoning and development direction. A general guideline is proposed as shown in the following table.

(i). Promotion Area [Cat 1]	Already urbanized area with high population concentration and urban development has to be well controlled to avoid further deterioration of urban environment. Improvement of urban amenity and efficient land utilization is the priority concern for the land use control
(ii). Promotion Area [Cat 2]	Area where urbanization has begun recently. Since urbanization level is still low, proper control shall be applied for urbanization.
(iii). Control Area	Area of low utilization such as swamp, inundation/flood prone area, green open space. Development activities area strictly regulated.
(iv). Agricultural Priority Area	Irrigation area which is used for agricultural activities. Development activities are strictly regulated for the purpose to protect agricultural production.
(v). Agricultural and Settlement Area	The area where urbanization has not begun and utilized either as agriculture or no utilization. Urbanization with control measures are directed in this area. New town, industrial zone, education/R&D development are planned in this area.
(vi). Afforestation Area	The hilly area surrounded by forest area and presently grass land and create production forest with intensive afforestation
(vii). Protected Forest Area	Existing forest area where should be protected. Development activities area strictly regulated.
(viii). Water Front Reserves	River, lakes, ocean area. Development activities area strictly regulated

(3) Land use

Land use is set for residential, commercial, industrial, open and green area, development control. Since the area is already urbanized and used for a variety of purposes, it is important to promote efficient land use for creation of a comfortable urban environment. For the purpose of controlling the urban land use, the line of land use should be drawn by block or area with small cluster.

Residential Use

Residential area is for use as a residential area and a place to support life.It also covers a place to conduct community activity within a limited environment.

Therefore, residential area and shelter area shall fulfill the environmental norms which are healthy, secured, and well harmonized. Besides, the settlement area should be free from noise, dirt, air, smell, and other pollution.

Residential area does not mean that only housing development is allowed. Any activity needed for creation of attractive living condition, such as commercial activities and pubic facilities is made available. This area also should be able to support the viability of socialization process from the existing cultural value in a particular community, and be secured as well as easy access to service center and offices. Within the residential area, other facilities are also required, such as the education, health, shopping, recreational facilities. Types of housing shall be specified depending on the type of residential area to be provided.

Objective	▪ Provide land for developing settlement area with various density in all urban area; ▪ Accommodate various type of settlement in order to encourage settlement provision for all levels of society; ▪ Reflect patterns of development required by society at the settlement area today and in the future. ▪ Residential area can be divided in to (i) Exclusive residential area and (ii) Residential dominant area. The former aims to provide fine residential area and the condition is more strict.

Typical Types of Houses

Detached housing area	Individual unit housing with spacious placement to develop individual house unit by accommodating various mapping size and types of housing construction as well as attempt to increase the quality of its environment, character and life situation. (building coverage ratio: 20~50%)
Row housing Area	Individual unit housing with row type in small mapping constructed along with environment access road; this zone is a transitional opportunity between individual unit housing and high-density (building coverage ratio: 75% or higher)
Apartment housing area	Multiple individual unit housing with various density

Commercial Use

Commercial and service area is an area which will expectedly attract businesses and contribute additional value added to one particular urban area. This area should have a good access to housing location and easy marketing.

For the comfort of visitors, commercial and service area should fulfill the environmental norms which are healthy, secured, harmonized, and "attractive" as well as business-oriented. Therefore, the regulation on this area should meet the terms of dimension, intensity and design which will expectedly be able to attract as many visitors as possible. Sufficient facility and infrastructure should be provided for water, waste disposal, road network are other conditions. The land use in the commercial

area can be classified as shown in the following table.

Objective	▪ Provide land to accommodate workers of shop, service, recreation and community service; ▪ Provide clear regulation for commercial and service area which covers dimension, intensity and design in reflecting various patterns of development required by society

Types of Usage in Commercial Area

Government use	Provide area which accommodates workers in a limited number, mainly giving service for citizens and also for national and international interest
Office use	Office provides area to accommodate workers in a limited number, retail activity is only back-up and house development with medium to high intensity is allowed; this zone is applied to center for big events or special area where commercial activities are rejected.
Shopping use	Shopping serves trade, shopping and services activities; this zone may contain settlement development whose orientation is commercial activity and apartment; industrial/manufacturing use is restricted to medium intensity within small to medium scale.
Central area (tourism related area)	Local and tertiary center, which are provided for shopping and local service activities, consists of retail shops and private service companies with extensive choice, which fulfill recurrent need. This kind of activity requires comfortable location close to all housing area, relatively prevents unwanted effects for nearby housing. Therefore, this zone is scattered around city; centers for primary and secondary urban shopping provide shopping places which are occasionally visited by member of family and services needed by businessmen who are spread largely, and possess a large number of shops which basically generate traffic.

Types of building that can be established in this area are:

- Commercial business building (retail and wholesaler): shop, small shop, wholesale place, etc;
- Office building: private/government office, trade, etc;
- Lodging building: hotel, guest house, motel, hostel, inn, etc;
- Storehouse building: parking lot, show room, warehouse;
- Conference building: hall, conference;
- Tourism building (closed room): cinema, playground.

Industrial Use

Industrial area is an urban productive area. This area is expected to give value-added to a certain urban area. At the same time, it is necessary to control the impact of industrial activity on the urban environment, differentiating the industrial activities from other urban activities.

Attention is to be paid to the accessibility of labor and raw materials, as well as marketing of finished-goods. Therefore, location close to road network and ports is an important factor. It is also important to pay attention to the impact of industrial activities on the environment.

Objective	▪ Provide space for industrial and manufacturing activities, maintaining a balance among economically-utilized lands and enhance the growth of job opportunity; ▪ Promote flexibility for new industries and re-develop industrial projects; ▪ Ensure high-quality industrial development, and protect industrial use as well as non-industrial use

Types of Industrial Area

Industry exclusive area	Provides space for industrial activities with extensive land use by prioritizing basic sector of manufacture; this zone aims to increase the use of industrial land efficiently on minimal development standard, provide safety for nearby property and society in general; this zone also restricts the existing non-industrial use in order to be able to provide sufficient land for big-scale industrial use
Semi - industrial area	The area where any types of activities are allowed except for the activities that are hazardous to environment.

Open Area and Green Area

Open space area has its norms according to respective functions, which is to maintain/protect the environment covering natural and artificial resources. As an open space area, it can also be utilized as recreational spots.

Objective	▪ Zone which aims to maintain/protect land for recreation other than education building, and to enjoy its visual beauty. ▪ Preserve and protect endangered and sensitive land; ▪ It is applied to land whose main function is park or open space or individual land of which its development should be limited to apply open-space policy as well as protect health, safety and welfare of public

Types of Open/Green Area

Protected green open space area	It aims to protect natural resources and as well as sensitive land; this zone only allows the use which may help preserve natural character of land The condition of the area is summarized below (*). • Land slope above 40%; • In case of land sensitive to erosion, that is Regosol, Litosol, Orgosol and Renzina, the land slope is above 15%; • Water infiltration area with altitude of 1000 meters above sea level; • Can be river demarcation/lake demarcation/water spring demarcation with specification as follows: ➢ River demarcation in urban area is an area along river which is presumably sufficient for constructing inspection road or minimum 15 meters; ➢ Lake demarcation is a land along the lake whose width is proportional with physical shape and condition between 50 – 100 m from the highest point to land. This area has important benefit to maintain life of the lake.

Artificial green open space area	It is applied to park and public facilities which aims to extend city lung, reduce city's lack of fresh air and provide various kind of recreation needed by society. The condition of the area is summarized below (*). ・ It mainly functions as park, playground, and sport field, as well as give fresh to city (light and fresh air), and neutralize air pollution as city lung; ・ The location and need are adjusted with environmental unit of housing/activity being served; ・ The location is made in such a way so that it is able to become bound factor.
Water management open space area	It aims to control development in flood area to protect health, safety and public welfare as well as reduce the danger of flood at area identified as flood control area which is pointed by local government; this zone aims to preserve the natural character in flood area with the intention of reducing public fund expenditure for the cost of flood control project and protect function and value of flood control area in relation to preservation or refill of ground water, water quality, flood flow counter measure, attempt of wild animals and habitat protection. The condition of the area is summarized below (*). ・ It has high capability to absorb rain water, therefore it plays as an aquifer that is used for water source; ・ It has rain fall > 2000 mm/year and land permeability is > 27.7 mm/hour.

Note: * Manual in Arranging Zoning Regulation in Urban Area prepared by Directorate General of Spatial Planning, Ministry of Regional Infrastructure and Settlement

Following table shows a proposed size of parks by the number of residents.

Regulations on Parks

Land Use	Facility/Items	Development Target
Open area	Urban park: General park	Size: 10 ha / Population: 100,000 persons
	Urban park: Athletic park	Size: 15 ha / Population: 100,000 persons
	Residential park: medium scale	Size: 4 ha / Population: 40,000 persons
	Residential park: small scale	Size: 1 ha / Population: 10,000 persons
	Water front (river, lakes)	Utilization of exiting water area as a park or increase access.
Green area	Road, Parks, Open space	More than 20% of the new development area (including parks, street trees)

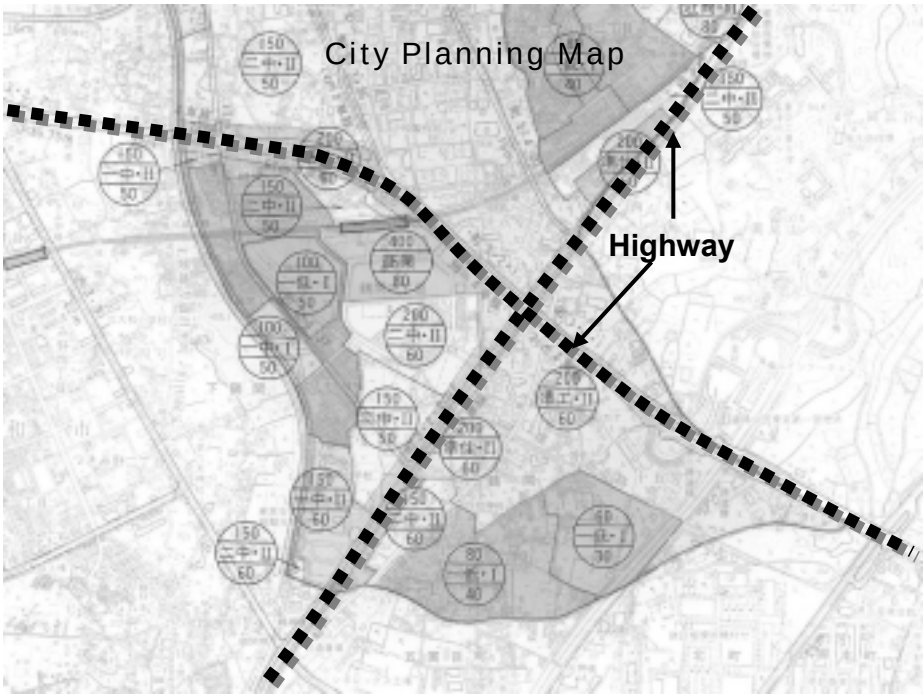
1.2 Building Coverage/Volume Control by Land Use

Building coverage and volume control is important to keep the volume of buildings balanced in urban area. Building coverage ratio (a ratio of building floor at ground level against land area) is important to secure the living environment such as ventilation, sunshine, and lightening. In addition, the building coverage ratio is important to prevent fire from spreading. A space between buildings will minimize the risk of fire spreading.

Building volume is also important to control height of buildings. The larger the volume, the higher the building will be. Commercial area can allow high building volume to enhance land use efficiency. Residential area or beach area, on the other hand, shall keep a building volume low to maintain the environment.

Guidance on Building Coverage and Volume (sample)

Land Use Area	Building Coverage Ratio (%)	Building Volume (%)
Residential Area (low height)	30, 40, 50, 60	50, 60, 80, 100, 150, 200
Residential Area (high height)	30, 40, 50, 60	100, 150, 200, 300, 400, 500
Commercial Area	60, 80	200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300
Industry Area	50, 60,80	80, 100, 150, 200



Note: upper number: volume, lower number: building coverage ratio, middle sign: land use

Sample of Building Coverage and Volume Control

1.3 Types of Building Allowed

Types of building use shall also be defined by the land use. Residential area is the most controlled area. Semi-industrial area, on the other hand, is less controlled area so that almost all types of buildings are allowed. A general guideline of building use is proposed as summarized in the following table.

Building Use by Land Use (Provisional)

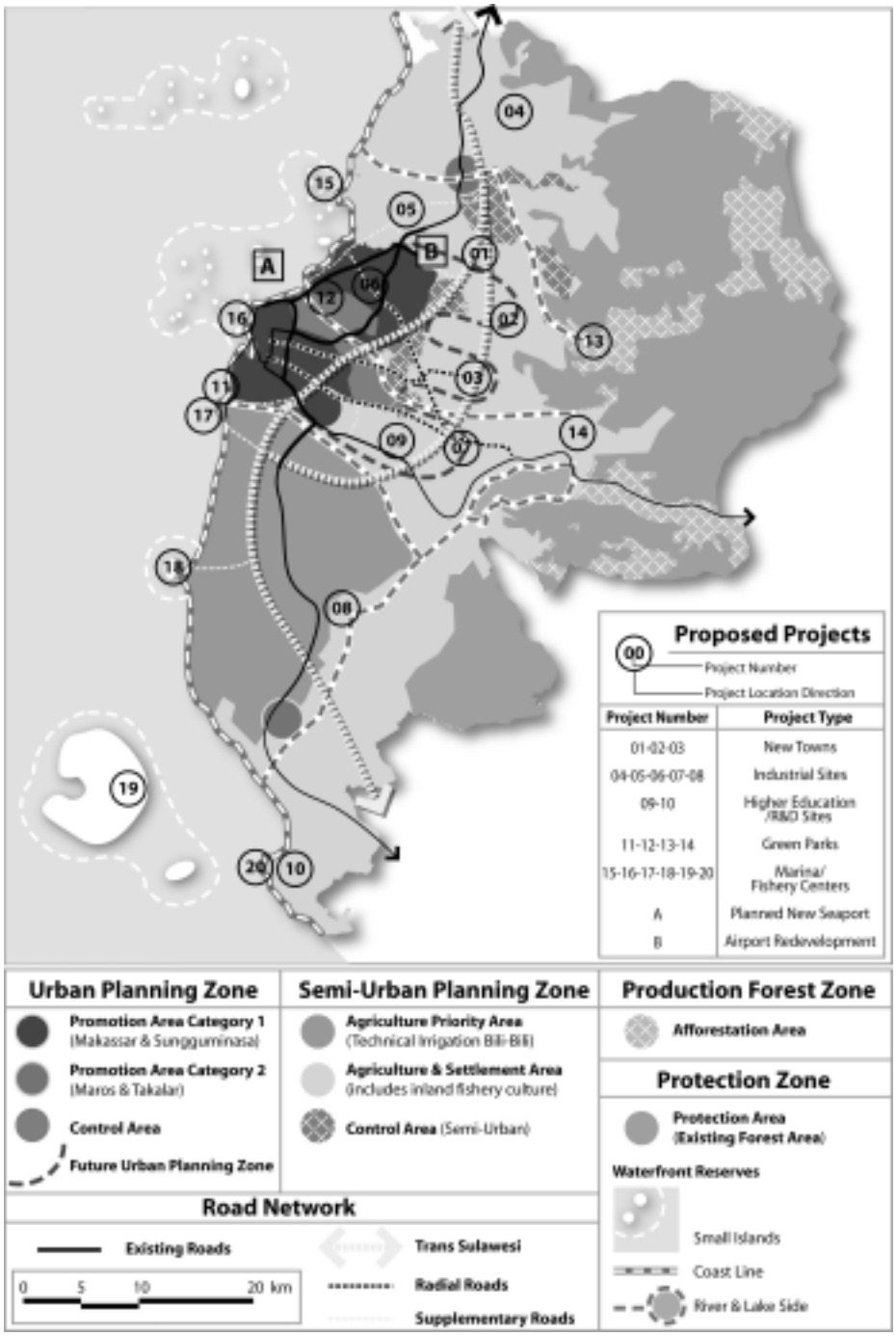
Building Use \ Land Use		Residential Area (exclusive)	Residential Area	Commercial Area (exclusive)	Commercial Area	Industrial Area (exclusive)	Semi-Industrial Area
Residential facility	Detached housing, Row housing, Apartment housing	○	○	○	○	X	○
Education	Kindergarten, primary school, junior high school, high school	○	○	○	○	×	○
	University, vocational school	×	○	○	○	×	○
Religious	Mosque, church, temple	○	○	○	○	○	○
Welfare	Clinic	○	○	○	○	○	○
	Hospital	○	○	○	○	×	○
Commercial	Theater	×	×	○	○	×	○
	Hotels	×	×	○	○	×	○
	Shops (small scale, rumah took)	○	○	○	○	○	○
	Shops (large scale, independent building)	×	×	○	○	×	○
	Amusement (karaoke, night club)	×	×	○	○	×	○
	Amusement (indoor facility)	×	×	○	○	×	○
	Warehouse	×	×	○	○	×	○
Sports	Golf, bowling	×	×	○	○		○
Public	Government building	×	×	○	○	×	○
Industry	Factory (attached to house)	○	○	○	○	×	○
	Factory (small scale)	×	×	○	○	○	○
	Factory (not harm to environment)	×	×	○	○	○	○
	Factory (harm to environment)	×	×	×	×	○	×
Hazard warehouse	Chemical, oil, gas	×	×	×	×	○	×

Note: ○: allowed, ×: not allowed

1.4 Control in the Mamminasata Metropolitan Area

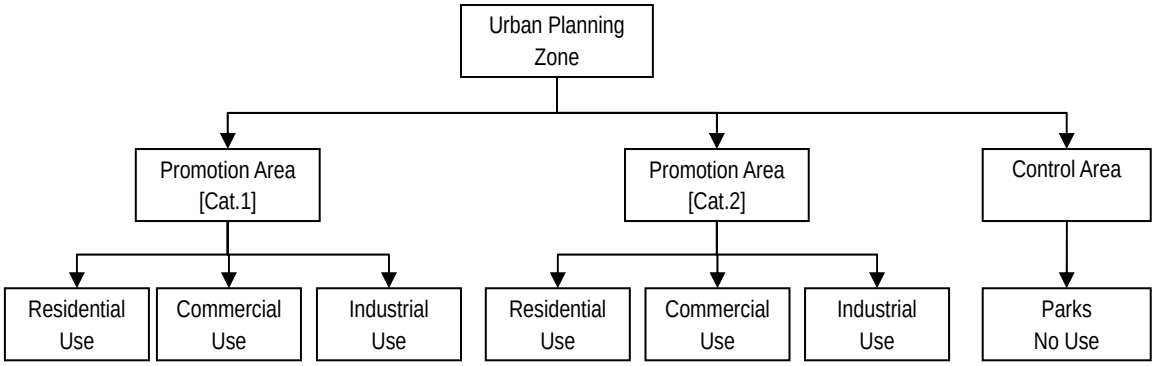
(1) Land Use Plan and Control structure

Based on the hierarchy of urban control and its definition, the land use plan in the Mamminasata Metropolitan area is proposed as shown in the following figure.

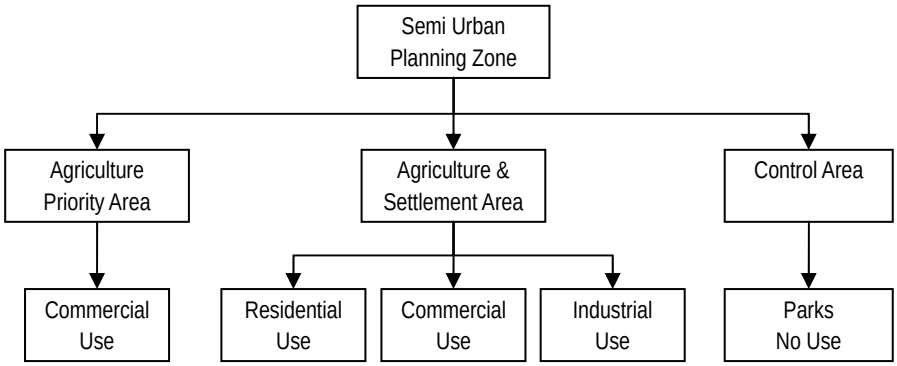


Proposed Land Use Zoning

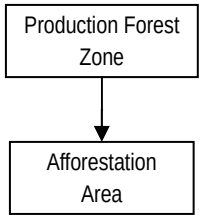
A control structure of the Spatial Plan for Mamminasata Metropolitan area is shown in the following diagrams.



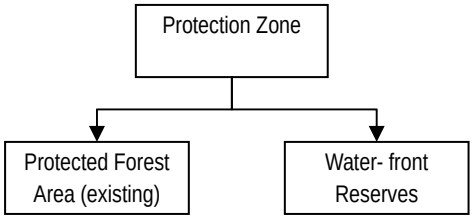
Control Structure in Urban Planning Zone



Control Structure in Semi-Urban Planning Zone



Control Structure in Production Forest Zone



Control Structure in Protection Zone

The overall development direction and control measure is summarized in the Annex.

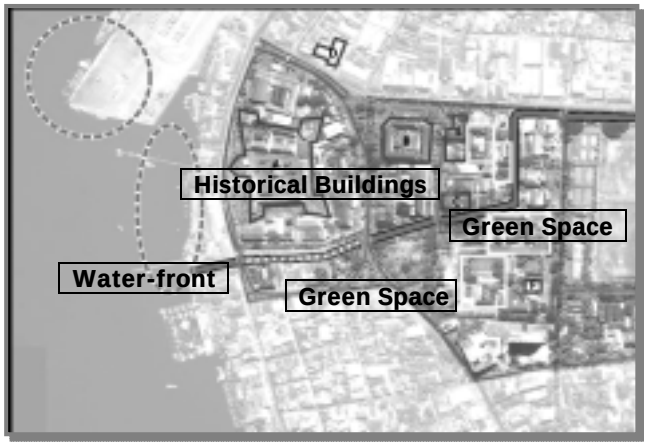
(2) Regulations for Urban Planning Zone

Makassar is designated as the Urban Planning zone Promotion Area (Cat. 1) and the Control Area. In principle, any development is prohibited in the Control Area. Promotion Area (Cat. 1) is designated to promote efficient and effective land use. Urban Planning Zone, Promotion Area (Cat. 2) is applied to the existing urban center in each district, except for Makassar, to establish urban area with the excellent urban amenity.

Promotion Area (Cat. 1)

In a *promotion area category 1* in the *urban planning zone*, most development activities are allowed but type, scale and infrastructure conditions are regulated for industrial development.

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



Development Image of Downtown Renovation (Promotion Area [Cat.1])

Promotion Area (Cat. 1): Commercial area

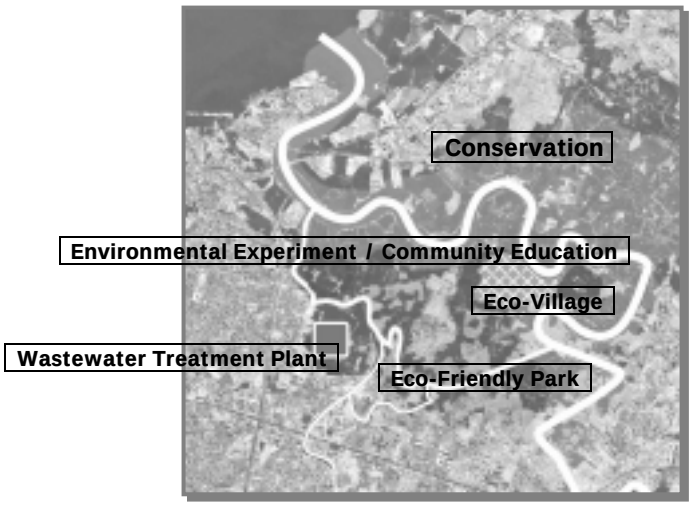
A model plan of combination of downtown renovation and high utilization of land in the suburbs are presented, as sample image, where conservation of downtown area and higher utilization along a major road is drawn.

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

Control area (open space, green area)

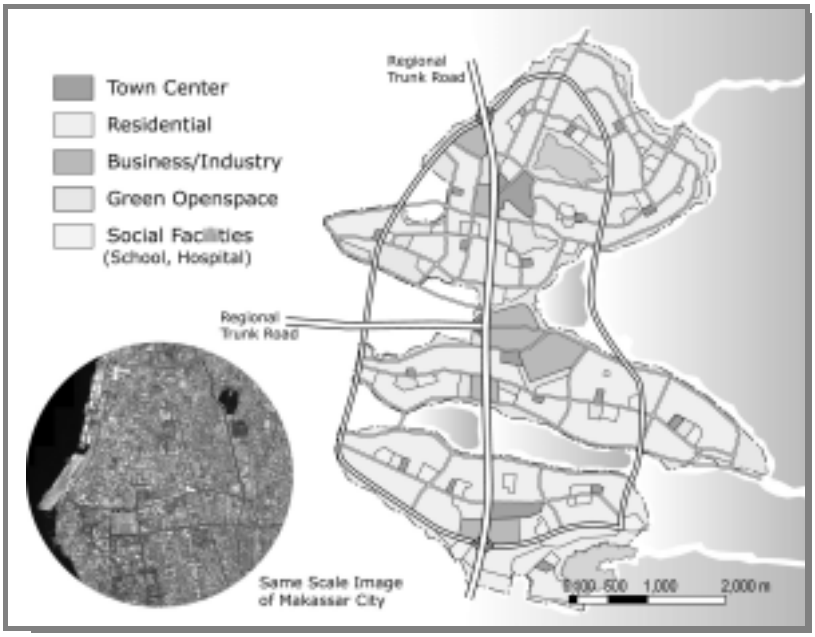
In a *control area* in the *urban planning zone*, most development activities are regulated except for educational or social purposes up to a certain development scale.



Development Image of Swamp Area Conservation (Control Area)

(3) Regulations for Semi-urban Planning Zone (Agricultural and Settlement Area)

In the agricultural and settlement area, urban development can be allowed only with development permits. In order to avoid uncontrolled urban development, only large-scale planned development will be allowed in the area. The minimum development area will be 20 ha. New township will be developed under this control.



Development Image of New Urbanization Area

(4) Transportation Management

Transportation management is indispensable for urban development. Legislation for transportation management should also be strengthened as part of urban management.

Legislation for Transportation Management

Items	Description
Road Structure	・ Promote user friendly road structure. ・ Efficient road structure for automobiles and pedestrians. ・ Landscape (trees, design) has to be defined.
Traffic management	・ Promote efficient road management by vehicle control and road utilization (separate lane for types of vehicle). ・ Control route of pete-pete, becak, motor cycle, private vehicle, large vehicle. Some roads shall be prohibited from enter for a certain type of vehicle. Control by the function of the roads and the zoning in the urban area. ・ Establishment of pedestrian only period (e.g. weekend) in designated area ・ Control of street vendors. ・ Proper management of traffic lights.
Parking	・ Control the parking along the streets which disturb traffic flow.
Road signs	・ Clear road sign not only for the local people, but also for tourists. Design and location have to be appealing.
Barrier free	・ Structure of road and traffic management that concerns socially handicapped people.
Exhaust control	・ Control exhaust from vehicle.

It is also important to adopt a new method of road construction, particularly the regulation on land usage, because once the road plan is announced, the people would buy land, making the land acquisition and road construction difficult.

2 Institutional Arrangement

Even though general direction and control measures for urban development are specified in the land use and building usage, some area specific rules need to be applied for the improvement of the living condition for specific interests. Hence, additional institutional arrangements are required.

(1) Town Development Guideline

A Town Development Guideline is designed to prevent unwanted development and to create an ideal town environment by applying tougher restriction on the development activities. The guideline also aims at preventing dispute between developer and residents prior to construction. The guideline is prepared by provincial government at the city and town levels. It will cover the following.

・ Landscape design (color, design, height of building)
・ Environmental concern (natural, cultural, historical environment).
・ Public announcement prior to development application (particularly for large

scale development)

- Public consultation from developer to residents

(2) Building Agreement

A Building Agreement aims at supplementing the minimum standard set by the Building Code which can not cover specific areas and specific needs. The Building Agreement is applied to a specific area to satisfy specific needs of the residents. The agreement is based on the Civil Law, and need to go through legal procedure (approval from the government and public announcement) so that after the agreement is reached, not only the signer but also any party that possess the land later on has to follow the agreement. In the process of formulation of the agreement, community, developer and the government have to coordinate together under the government initiative.

Building Agreement on Foreface (Sample Image)

(3) Special land use

Land use and building utilization standard is not sufficient to control and follow the spatial plan, particularly in the metropolitan area. Special area needs to be designated to realize special interest such as landscape, greenery and culture. Some special areas are proposed as summarized in the following table.

Sample of Special Land Use

Type of Special Land Use	Objectives	Items to be Controlled
Vertical development promotion area	Facilitating efficient land utilization by promoting vertical development and maintaining public open space	Utilization, volume
Landscape conservation area	Conserving the artificial landscape in the urban area which contains the architecture that has beauty	Control architecture (land, structure) that disturb/ruin the landscape
Natural landscape conservation area	Conserving the natural landscape in the urban area	Architecture, land structure, color of architecture, advertisement board
Urban greenery conservation area)	Conserving the green area in the urban area	Architecture, land structure, color of architecture, advertisement board
Cultural and historical architecture conservation area	Maintain and conserve the cultural and historical landscape which is composed of traditional architecture and possessing traditional architecture value	Architecture, land structure, color of architecture, renovation and structural change of architecture, advertisement board