GOVERNMENT OF THE REPUBLIC OF MALAWI
MINISTRY OF LOCAL GOVERNMENT AND RURAL DEVELOPMENT
LILONGWE CITY COUNCIL

THE STUDY ON URBAN DEVELOPMENT MASTER PLAN FOR LILONGWE IN THE REPUBLIC OF MALAWI

FINAL REPORT *Summary*

SEPTEMBER 2010

JAPAN INTERNATIONAL COOPERATION AGENCY
KRI INTERNATIONAL CORP.
NIPPON KOEI CO., LTD.

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EXCHANGE RATE

USD 1 = MWK 143.31 = JPY 90.14

JICA rate, as of February 2010

PREFACE

In response to the request from the Government of the Republic of Malawi, the Government of Japan decided to conduct the “Study on Urban Development Master Plan for Lilongwe in the Republic of Malawi”, which was entrusted to the Japan International Cooperation Agency (JICA).

JICA selected a study team consisting of the joint venture (JV) between KRI International Corp., and Nippon Koei Co., Ltd. The team, headed by Mr. Isamu Asakura of KRI International Corp., was dispatched to Malawi during the period from June 2009 to September 2010.

The team conducted field surveys and formulated the comprehensive urban master plan of Lilongwe based on the consensus built in a series of discussions with concerned officials of the Government of the Republic of Malawi, donor community members, citizens, and other stakeholders, through workshops, seminars, and exhibitions. This final report was prepared based on the result of the intensive analyses of all the data and information obtained during the study, and offers a set of recommendations for the comprehensive improvement of the City of Lilongwe.

I hope that this report will contribute to the prosperity of the City of Lilongwe as the capital city of the Republic of Malawi and towards becoming the gateway to its neighboring countries. I also hope that the cordial relationship between our two countries has been strengthened by this collaborative study.

Finally, I wish to express my sincere appreciation to the concerned officials of the Government of the Republic of Malawi for the close cooperation they extended to the study team.

September 2010

Kiyofumi KONISHI
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

September 2010

Mr. Kiyofumi Konishi
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

Letter of Transmittal

Dear Sir,

We are pleased to submit herewith the Final Report on the "Study on Urban Development Master Plan for Lilongwe in the Republic of Malawi".

The study was jointly carried out by the JV between KRI International Corp. and Nippon Koei Co., Ltd., under a contract with your Agency for a fourteen-month period from June 2009 to September 2010.

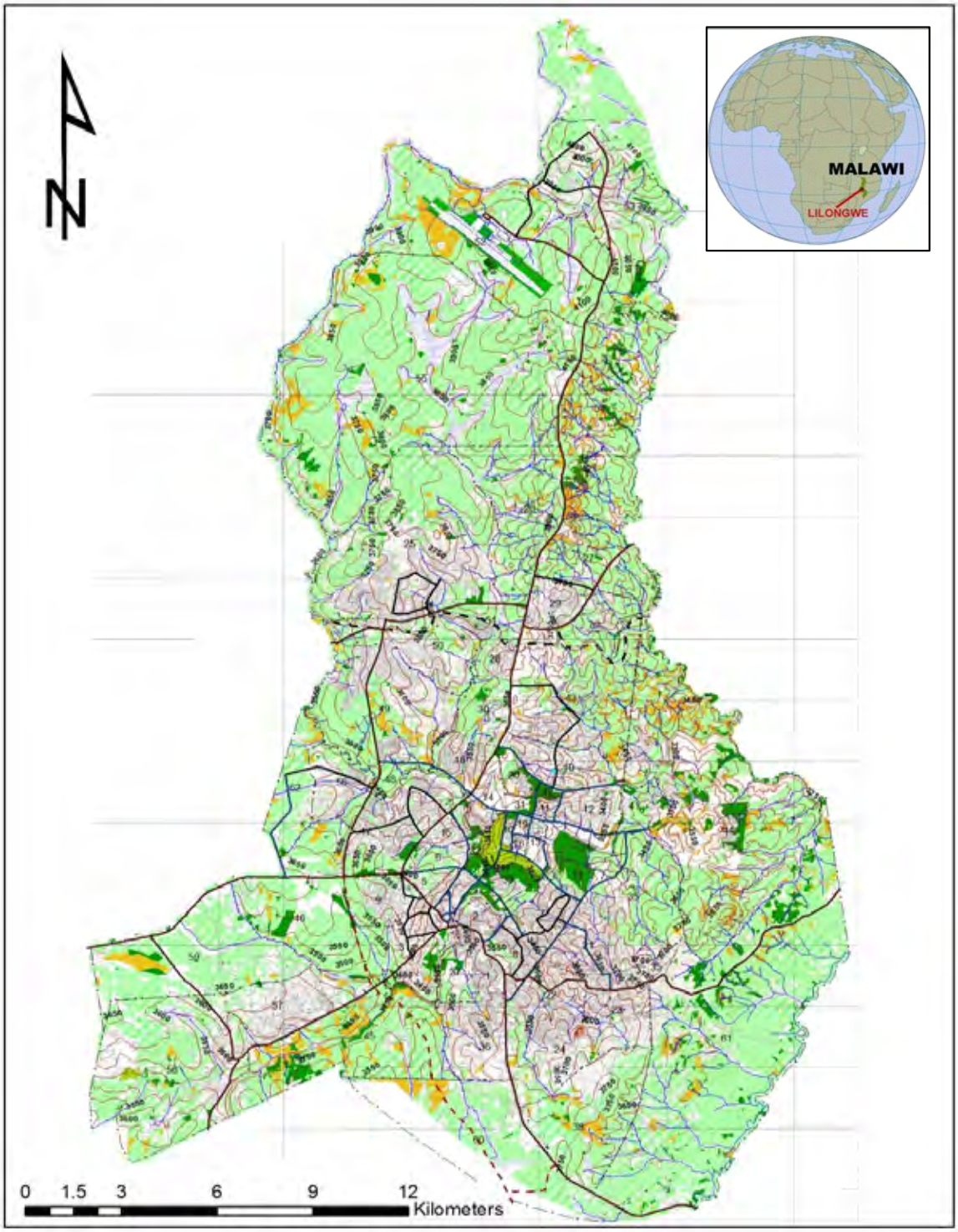
The study aimed at the formulation of a comprehensive urban development master plan of Lilongwe and the development programs for urban transport development, water supply and sewerage development, enhancement of living environment, and environmental management. The study carefully endeavored on information dissemination and consensus building by participatory method with regards to the contents of the master plan, results of the pre-feasibility study, social and environmental considerations, etc. through a series of seminars and workshops. Representatives from government agencies, donors, and NGOs, leaders of community development committees, members of the Parliament and traditional chiefs participated in the seminars. It was recommended during the seminars that the master plan should be implemented as soon as possible through an undertaking of the Government of Malawi in cooperation with stakeholders.

This final report is the fruit of the continuous effort of all stakeholders for this study. We wish to take this opportunity to express our sincere gratitude to your Agency, the Embassy of Japan in Malawi, the JICA Malawi office, the MoLGRD, Lilongwe City Council (LCC), and the others concerned in the Republic of Malawi, for their valuable support provided to the study.

Finally, we genuinely wish that the master plan will be realized towards the development of Lilongwe, and that the friendly relationship between Malawi and Japan will continue.

Yours very sincerely,

Isamu Asakura
Team Leader
The Study on Urban Development Master Plan
for Lilongwe in the Republic of Malawi



Location Map

Photos of Present and Future

Nature Reserve in the Heart of the City

Steering Committee at LCC

Urban Arterial Road with Heavy Congestion

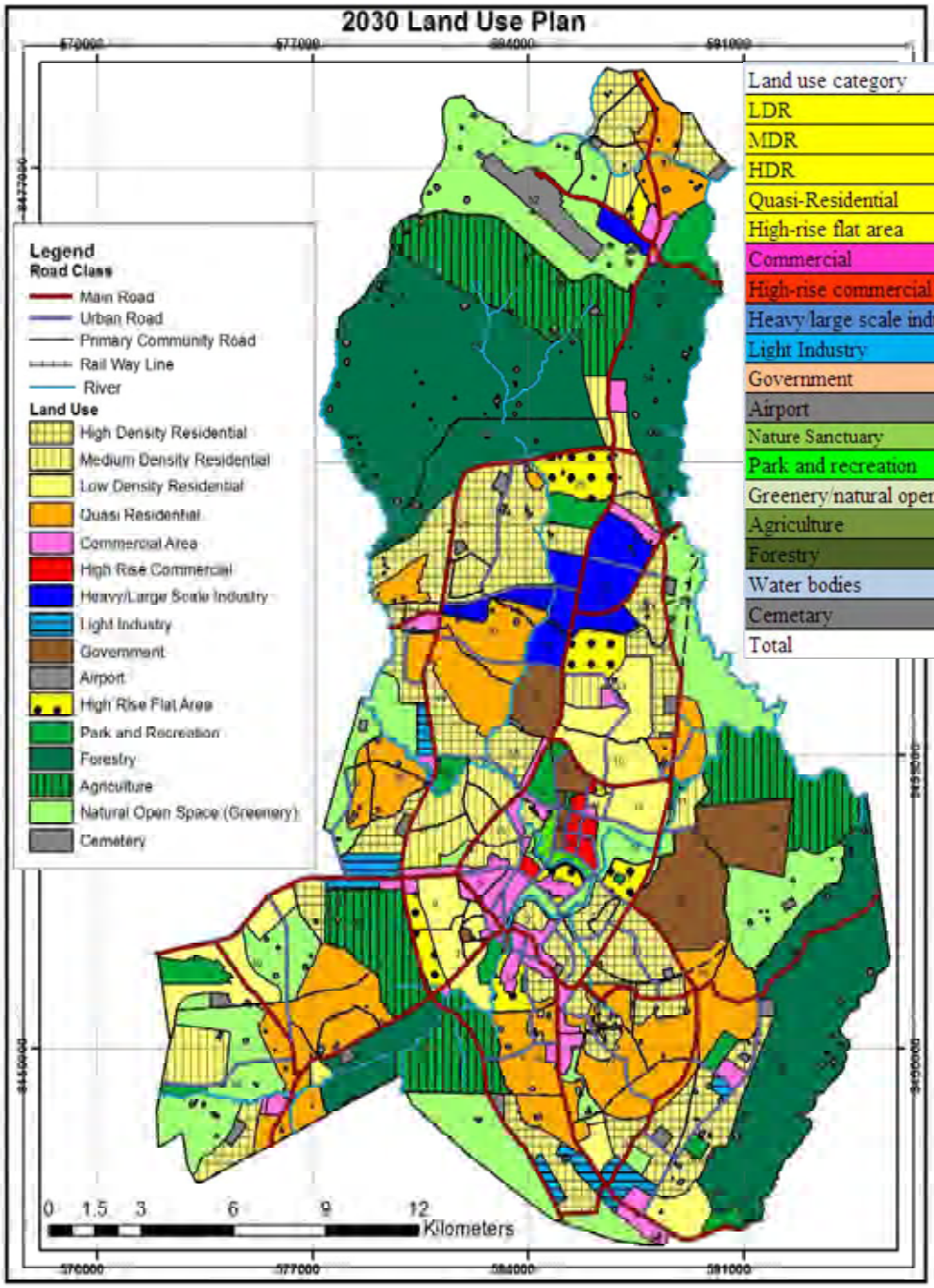
Current Business/Commercial area

Seminars for Stakeholders

Future Image of Lilongwe
(Industrial Park for Small/Medium Scale Industries and Logistics Centre)

Green Preservation for Environmentally-Friendly Urban Development

Future Image of Lilongwe
(High-rise Business/Commercial Area)



Land use category	Land area	(%)	
LDR	2,670	6%	40%
MDR	1,987	4%	
HDR	6,795	14%	
Quasi-Residential	6,171	13%	
High-rise flat area	1,155	2%	
Commercial	1,611	3%	4%
High-rise commercial	219	0%	
Heavy/large scale industries	1,280	3%	4%
Light Industry	616	1%	
Government	1,836	4%	4%
Airport	358	1%	1%
Nature Sanctuary	137	0%	17%
Park and recreation	1,149	2%	
Greenery/natural open space	6,840	14%	
Agriculture	4,309	9%	9%
Forestry	9,566	20%	20%
Water bodies	0	0%	0%
Cemetary	701	1%	1%
Total	47,400	100%	100%

Source: JICA Study Team

Lilongwe City Land Use Plan for 2030

THE STUDY ON URBAN DEVELOPMENT MASTER PLAN FOR LILONGWE CITY IN THE REPUBLIC OF MALAWI

FINAL REPORT SUMMARY

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Abbreviations

BCR	Building Coverage Ratio
BRT	Bus Rapid Transit
CDS	City Development Strategy
EIA	Environmental Impact Assessment
EIB	European Investment Bank
FAR	Floor Area Ratio
GDP	Gross Domestic Product
GoJ	Government of Japan
GoM	Government of Malawi
IDA	International Development Association
IEE	Initial Environmental Examination
JICA	Japan International Cooperation Agency
LCC	Lilongwe City Council
LIDS	Lilongwe Integrated Development Strategy
LRT	Light Railway Transit
LWB	Lilongwe Water Board
MEGS	Malawi Economic Growth Strategy
MGDS	Malawi Growth and Development Strategy
MMDGs	Malawi Millennium Development Goals
MoIWD	Ministry of Irrigation and Water Development
MPUWSP	Malawi Peri-Urban Water and Sanitation Project
MWK	Malawian Kwacha
NWDP	National Water Development Program
RA	Road Authority
SADC	South African Development Community
SEA	Strategic Environmental Assessment
TCPA	Town and Country Planning Act
THA	Traditional Housing Area
WB	World Bank

1. Introduction

1.1 Background

- The Government of Malawi (GoM) decided to relocate its capital from the city of Zomba to Lilongwe in 1965. Consequently, the capital was officially transferred to Lilongwe in 1975. The Lilongwe Master Plan developed in 1968 shows the basic principles of the urban planning for Lilongwe City (hereafter referred to as "the City" or "Lilongwe"). The Lilongwe Outline Zoning Scheme meanwhile, which followed in 1969, indicated the outlines on land use for this new capital. The said zoning scheme was reviewed in 1986, and the City's jurisdiction was expanded by including Area 56 and Area 57. Then, Area 58 was added to the jurisdiction of the City according to the 2008 Population and Housing Census, although its inclusion is not yet legitimized. The 1986 Outline Zoning Scheme was intended to promote regulated urban development and appropriate land use for transport and other purposes. The scheme was effective until 2000, but has not been updated thereafter due to financial, technical and human resources constraints.

- The jurisdiction area of Lilongwe City, including Area 58, is 393 km² and has a population of approximately 674,000 according to the 2008 Population and Housing Census. Despite the fact that the existing outline zoning scheme was planned to develop the four sectors: (1) Old Town Sector, (2) Capital Hill Sector, (3) Kanengo Sector, and (4) Lumbadzi Sector, the urban area has been expanding to the southern, southwestern and western areas of the old town section of the City. Unplanned settlements occupied by illegal settlers expanded in almost all areas. Some areas have problems on illegal settlers occupying the lands designated for industrial development and public use. It is therefore necessary to urgently identify and secure a sizeable land area for planned residential development.

- In the meantime, the rapid increase in the number of vehicles causes traffic congestions along National Road No. 1, particularly in the Old Town area, which also serves as an international arterial road passing through the centre of the urban area. Hence, this causes merging of international and intra-city transportation, creating a traffic problem that needs to be addressed. Other traffic-related issues that need to be dealt with include improvement of public transport facilities, improvement of access to unpaved areas, and widening of the main trunk roads. The growing population of the City would trigger off the necessity for urban facilities such as urban water supply, sewerage/on-sanitation and solid waste management. Improvement of urban facilities' services will be essential for the enhancement of urban environment in the City.

- In this context, it is urgently necessary to establish an integrated urban development master plan in order to promote planned land use and regulate urban facility development. In response to the official request of the GoM, the Government of Japan (GoJ) decided to conduct "the Study on Urban Development Master Plan for Lilongwe" in the Republic of Malawi ("the Study") in accordance with the Agreement on Technical Cooperation between GoM and GoJ signed on 15th November 2008. Accordingly, Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of GoJ, undertook the Study in close cooperation with the Ministry of Local Government and Rural Development (MoLGRD) and other authorities concerned under the GoM.

1.2 Objectives

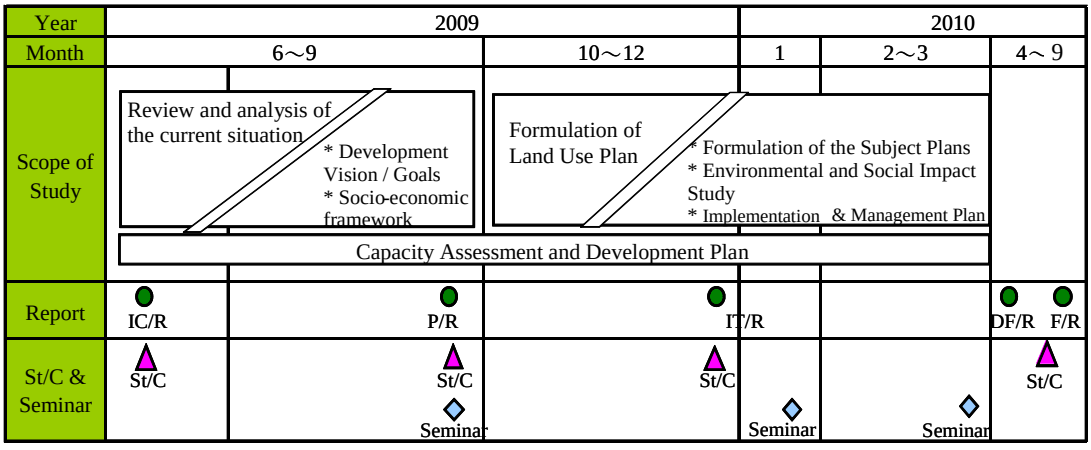
- The Study developed the urban plan, land use plan, infrastructure/utility plan (urban transportation, urban environment utilities) in cooperation with LCC. The objectives of the Study are as follows:

(1) To formulate the long-term (2030) land use plan of Lilongwe City,
(2) To formulate the sectoral plans on transport and urban facilities (i.e. water supply, sewerage and solid waste management),
(3) To formulate a capacity development plan for LCC to ensure implementation of the outputs of the Study,
(4) To formulate an implementation and management plan, and
(5) To carry out technical transfer to Malawian counterparts through the Study.

1.3 Framework of the Study

- The Study was implemented from June 2009 to September 2010. Figure 1 shows the implementation schedule.

Figure 1 Implementation Schedule for the Study



Note: IC/R: Inception Report P/R: Progress Report IT/R: Interim Report DF/R: Draft Final Report F/R Final Report

- The Study is largely divided into three parts. The first part encompasses i) review and analysis of the current situation, ii) development of vision/goals, and iii) review of the socioeconomic framework. The first part was done from June 2009 to October 2009. The second steering committee meeting held on 8 October 2009 approved the vision and goals of Lilongwe, and indicators on population and economy (GDP). The first seminar held on 20 October 2009 informed the participants (central government officials, donors, private sectors, or traditional chiefs) of the current issues on urban development and land use/urban transportation, including public transportation system/water supply, sewerage and solid waste management. The participants also actively discussed the future direction.

- The second core part encompasses the i) land use plan for each stage, ii) formulation of sector plans in the areas of urban transportation and utilities, ii) environmental and social impact study, iii) capacity assessment and development plan, and iv) implementation and management plan. The third steering committee meeting was then held in December 2009 to discuss the interim results of the Study. The core part of the Study was elaborated through further coordination, and its results were presented during the second seminar held in January 2010. At the beginning of March 2010, the Study entered into the second part and held a third seminar where all components of the core part were presented.

- The Study focused on the development of the development programs/projects for the implementation of the master plan. The fourth steering committee meeting held on 15 June 2010 confirmed priority projects, the implementation plan (indicative cost, responsible organization), and that the steering committee would take the responsibility for the implementation of the master plan.

1.4 Structure of the Report

The final report consists of the following separate volumes:

- Main Report (English)
- Summary (English)
- Drawings (English)
- Summary (Japanese)

2. Socioeconomic Conditions and Development Framework

2.1 Socio-economy and Development Policy

2.1.1 Social Conditions

- In landlocked countries with small population in Africa, the urbanization ratio is not very high. According to a UN report (World Urbanization Prospect, 2001), the urbanization ratio ranged from 14.2% to 15.5% in Uganda, Malawi and Ethiopia in 2000. This report expected further concentration of the population in large cities in the future. The ratio is expected to exceed the ratio of GDP or job creation. The report expected that the urbanization ratio of these three countries would reach to about 30% in 2030 (Table 1).

Table 1 Urbanization Ratio in Africa (3 Countries)

	1950 (%)	2000 (%)	2030 (%)
Uganda	3.1	14.2	29.5
Malawi	3.5	14.7	30.1
Ethiopia	4.6	15.5	31.0

Source：World Urbanization Prospect, 2001

- The City is one of the most urbanized and rapidly growing cities in Malawi. According to the 2008 Population and Housing Census, Lilongwe has a population of 674,448, which exceeds that of Blantyre City (661,256). As the population of the City was only 19,425 in 1966, this indicates that it has grown by more than 34 times in the last 40 years. Together with the population growth, the population density has also increased from 43 persons/km² in 1966 to 1,702 persons/km² in 2008. Table 2 shows the population densities and growth rates of the four major cities in Malawi on a historical basis. Although population growth in the City is continuing, it is noted that its population growth rate is declining. Between 1998 and 2008, the growth rate was 4.3 percent per annum while it was as high as 6.4 percent per annum in the preceding decade.

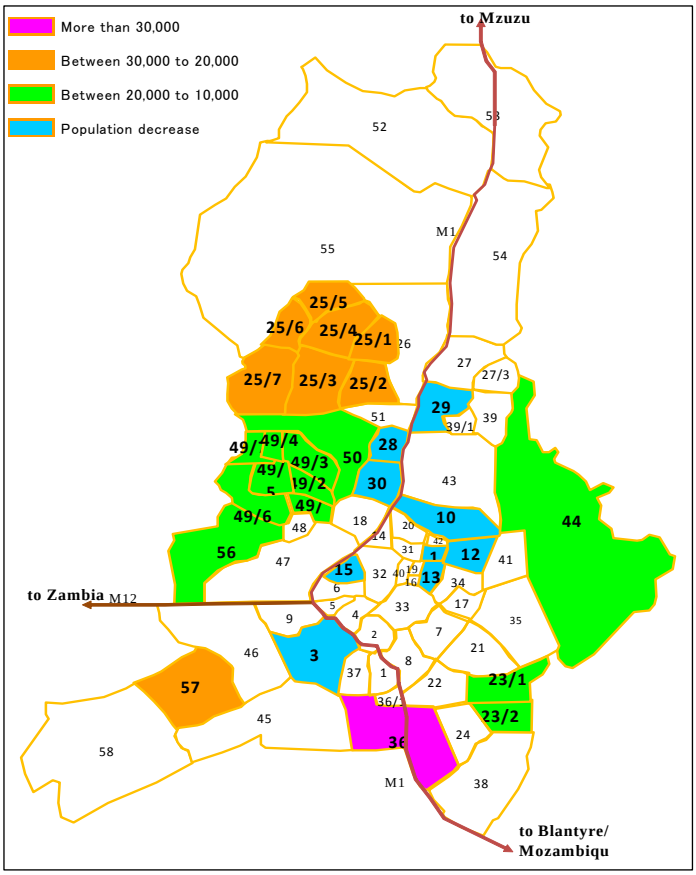
Table 2 Population, Land Area and Population Density of Major Cities in Malawi (1966-2008)

Land Area										
Lilongwe			Blantyre		Zomba		Mzuzu		Malawi Total	
393㎢			220㎢		39㎢		48㎢		94,276㎢	
Population & Population Density										
	Lilongwe		Blantyre		Zomba		Mzuzu		Malawi Total	
	(person)	(per/㎢)	(person)	(per/㎢)	(person)	(per/㎢)	(person)	(per/㎢)	(person)	(per/㎢)
1966	**19,425**	**49**	109,461	498	19,666	504	8,940	177	4,039,583	43
1977	**98,718**	**251**	219,011	996	24,234	621	16,108	336	5,547,460	59
1987	**223,318**	**568**	333,120	1,514	43,250	1,109	44,217	921	7,988,507	85
1998	**440,471**	**1,121**	502,053	2,282	65,915	1,690	86,980	1,812	9,933,868	105
2008	**674,448**	**1,702**	661,444	3,007	87,366	2,240	128,432	2,676	13,066,320	139

Source: Lilongwe City Development Strategy Phase I, Statistical Yearbook 2008

- 52% of the population in Lilongwe is aged 18 and over, and this rate is slightly higher than the national average (48%). In the meantime, the sex ratio of population aged 18 and over in Lilongwe (111.85) is significantly higher than that of the national average (91.62). It implies that there is a flow of working age male population into the urban cities.

- Figure 2 shows the areas where the City's population decreased and increased by more than 10,000 during the ten years from 1998 to 2008. Urban sprawl is exceptional in the southern area (Area 36) where population increased by more than 30,000, followed by the southwest (Area 57) and the west (Area 25) with more than 20,000, and then, the southeast (Area 44). On the other hand, areas shaded blue in the figure indicate low density housing areas where population has decreased, resulting in sparse population density.



Source：JICA Study Team

Figure 2 Population Increase/Decrease during 1998-2008 by Area

- According to national documents in Malawi (Integrated Household Survey 2004-2005), average annual household income is very high in Lilongwe compared to the average in other 3 major cities in Malawi. For instance, household expenditure in 2005 shows that mean and median annual household expenditure is MWK 233,000 in Lilongwe (USD

1,970, USD 1 = MWK 118 in 2005), MWK 160,000 in Blantyre, MWK 154,000 in Zomba, and MWK 152,000 in Mzuzu. The survey also reports poverty conditions. The percentage below poverty line (MWK 16,165 per year) is 33.4 % in Lilongwe, 28.4 % in Blantyre, 40.3 % in Zomba, and 44.6 % in Mzuzu. The highest share of household expenditure in Lilongwe is for food (42.9 %) followed by housing, utilities and furnishing (24.3%), and transport, communication and recreation (18.2%). Compared to other urbanized areas, Lilongwe is characterized by its high expenditure on transport, communication and recreation.

2.1.2 Economic Conditions

- Regarding employment in Lilongwe, the tertiary sector is the largest industry (78%) in Lilongwe, followed by the primary sector (13%) and secondary sector (9%). A high percentage of employment in the tertiary sector is attributed to many employed workers in the retail/wholesale areas. In the secondary sector, firms in Lilongwe produce relatively low-technology and domestic market-oriented goods, such as food/beverage, rubber/plastic products for home consumption, and furniture. They fall into the category of light industry. In contrast, firms in Blantyre specialize in relatively high value-added industry such as textiles, chemicals/chemical products, rubber/plastic products, metal products, and machinery equipment.

- The tertiary sector (services) in Lilongwe is characterized by a big supermarket and a commercial mall supported by the growing demand for imported goods, the development of the banking sector, tourism-related industries (i.e. hotels and transportation), public transportation services (mini buses) and trucking industries. Among them, international delivery (trucking) services would be highlighted since Lilongwe is surrounded by potential agronomic areas where tobacco and cash crops (coffee, cotton and groundnuts) are produced, and is strategically located as a depot centre to redistribute products to the South African Development Community (SADC) regional markets.

2.1.3 Policies and Plans related to the Study

- Four policies and plans are related to this Study. These are the 1) Malawi Growth and Development Strategy (MGDS), 2) Lilongwe Outline Zoning Scheme, 3) Lilongwe Integrated Development Strategy, and 4) City Development Strategy.

1) MGDS 2006/2007-2010/2011 is a policy framework for national development. It was promulgated in 2005 and based on the Malawi Economic Growth Strategy (MEGS) of 2004. It aims at achieving the Malawi Millennium Development Goals and Malawi Vision 2020, which was promulgated in 1998.

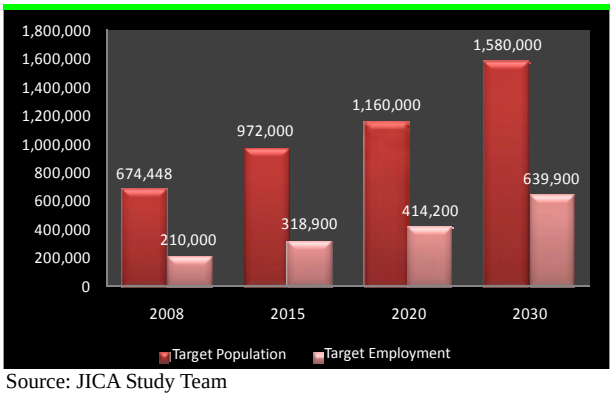
2) The Lilongwe Outline Zoning Scheme is a land use plan that was put into effect in 1986. However, the scheme expired in 2000 and has not been revised since then.

3) The Lilongwe Integrated Development Strategy (LIDS) was formulated in 1990. It promoted urban development plans and development strategy plans in the master plan of the City. LIDS was implemented with the assistance of the United Kingdom. However, after its revision in 1998, LIDS was abolished in 2000. Subsequently, there is no urban development plan for Lilongwe.

4) The City Development Strategy (CDS） aims to deal with development strategies and policies for Lilongwe as the capital city. With the assistance of the Cities Alliance, the final report was submitted to the City in March 2010. It includes five themes namely, governance, housing/land, community development, public service and environment, and economic development. Along with these themes, it lists programs to be implemented from 2010/11 to 2014/15.

2.2 Development Framework

- The population of Lilongwe was 674,000 in the census year of 2008 and estimated to increase to 1.58 million in 2030 as shown in Figure 3. This figure is more than double that of the current population.



Source: JICA Study Team

Figure 3 Development Framework of Lilongwe City

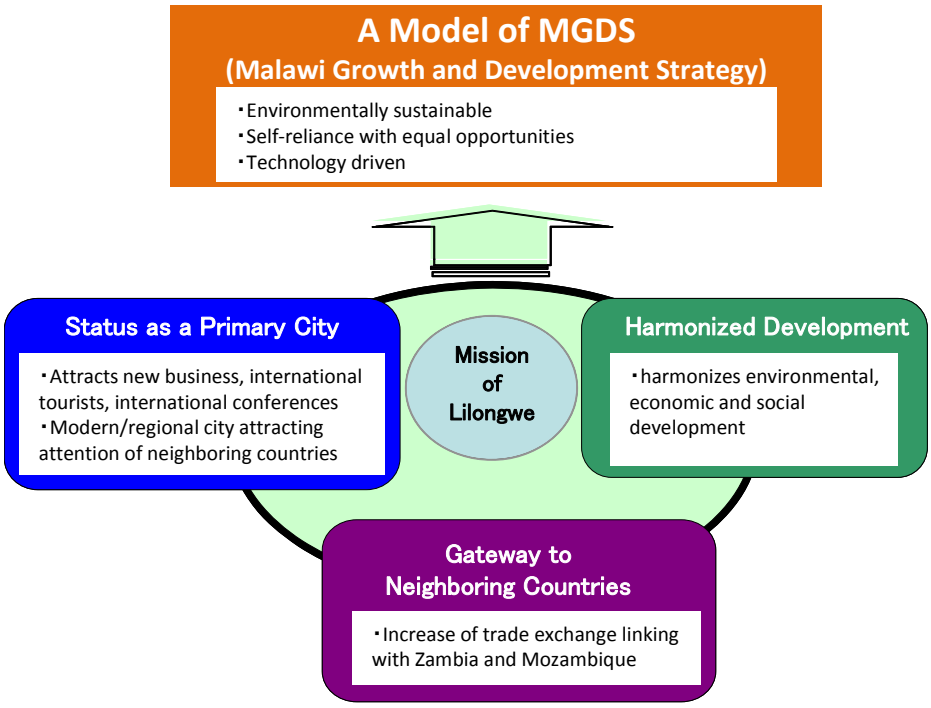
- As of 2008, the number of economically active population was expected to be as many as 260,000, and projected to increase to 710,000 in 2030. In order to ensure employment for this increase in population, it is necessary to create job opportunities for the adequately employed in the formal sector by attracting industries. About 100,000 people are estimated to work in the formal sector. The number is expected to increase up to 330,000 in 2030.

- The Lilongwe GDP in 2005 is roughly estimated to be MWK 65,250 million (US$456 million) in real terms, which is approximately 20% of the national GDP in 2005. Lilongwe GDP is expected to reach MWK 307,000 million (US$2,150 million) with growth rates at 6.0% annually between the present and 2015, at 7.0% between 2016 and 2020, and at 6.5% between 2021 and 2030.

3. Development Vision

3.1 Development Vision

- Lilongwe, located in the central region of Malawi, was established as a trading centre in 1906 and became the capital city with a purpose-built town in 1975. As of 2008, Lilongwe has a population of about 674,000 which is larger than that of Blantyre. The development vision of the capital city appears to be urgently required. In view of its development trend, Lilongwe is expected to have the following three missions in the national context as shown in Figure 4. The missions of Lilongwe are to i) have the status of the primacy city, ii) be the capital city harmonizing environment, economic and social development embodied in the Malawi Vision 2020 and the Malawi Growth Development Strategy (MGDS) as the concept and iii) be the international gateway of Malawi to its neighbouring countries.



Source：JICA Study Team

Figure 4 Missions of Lilongwe City

3.2 Development Strategy

3.2.1 Development Issues

As a result of the Study, the following are the identified urban development issues of Lilongwe City:

- The growing demand for residential lands accompanied by the increase in urban population in the City;
- Inefficiency in residential land use featured by large plot size per residence and one storey-houses in low density residential areas;
- Lack of government policy for industrialization and employment creation in connection with the increase in urban population;
- Risk of environmental degradation caused by the lack of policy for preservation of natural environment in the centre of the City;
- Poor living environment in traditional housing areas (THA) and unplanned settlements;
- Expansion of unplanned settlements;
- Traffic congestion in the M1 road sections in the City Centre and Old Town, and insufficient services of public transportation,
- Insufficient level of urban utilities (water supply, wastewater treatment and solid waste management),
- Insufficient level of urban planning and development management administered by the relevant authorities, particularly the Lilongwe City Council (LCC).

3.2.2 Urban Development Strategy

The urban development strategy comprised of the following items based on the development issues discussed in Section 3.2.1.

1. Facilitation of the one-concentration development scheme in the Old Town and City Centre in compliance with the concept of “efficient land use”;
2. Establishment of industrial bases in the Kanengo industrial area and along the Western Bypass under construction,
3. Promotion of business activities in the centre of the City and establishment of a commercial centre including shopping malls adjacent to the Kamuzu International Airport;
4. Improvement of living conditions in THA and unplanned settlements;
5. Improvement of urban environment;
6. Strengthening of public administration against illegal urban development; and
7. Development of transportation infrastructure and urban facilities necessary for economic growth.

1. **Facilitation of efficient land use** : Presently, Lilongwe City takes the form of a one-concentration development in the Old Town and City Centre. Urban concentration in the two areas shall continue in the future because their land use densities are currently low. In view of the 2030 population forecast (1.6 million) in Lilongwe, urban concentration will render positive benefits to the City in terms of efficient use of urban infrastructure and

utilities with low development cost, compared to the self-contained development of four sectors (Old Town, Capital Hill, Kanengo and Lumbadzi) proposed in the 1978 Lilongwe Structure Plan. Urban concentration in the Old Town and City Centre is thus the more desirable spatial development in the City.

2. **Expansion of land use for industrial/logistics functions for economic growth** : The City needs industrialization for its economic growth. In order to secure job opportunities in the formal sector employment against labour force increase in the future, the urban economic structure should be strengthened in the areas of commerce/business, manufacturing industry and logistics. For instance, the existing Kanengo industrial zone shall be expanded to accommodate domestic industries manufacturing consumer goods, while the logistics/distribution industries shall be promoted along the Western Bypass which is under construction.

3. **Establishment of a central business district (CBD) with more diversified and high ordered business/commerce activities**: The Old Town and City Centre, being the central areas of the City, should establish the CBD where business offices offering highly demanded services are to be located. There exist idle lands in the City Centre and small manufacturing factories in the Old Town. To establish a business zone such as the CBD, both idle land and areas where small factories are located, shall be converted to a new commercial zone. For this purpose, the existing factories shall be relocated into a suburban area.

4. **Preservation and utilization of abundant greenery to create green network and buffer green**: In order to realize eco-friendly urban development, a land use plan balancing preservation of natural environment and urban development is significant. Such land use plan adheres to the preservation of the existing greenery resources such as nature reserves and water front greens in the central area of the City.

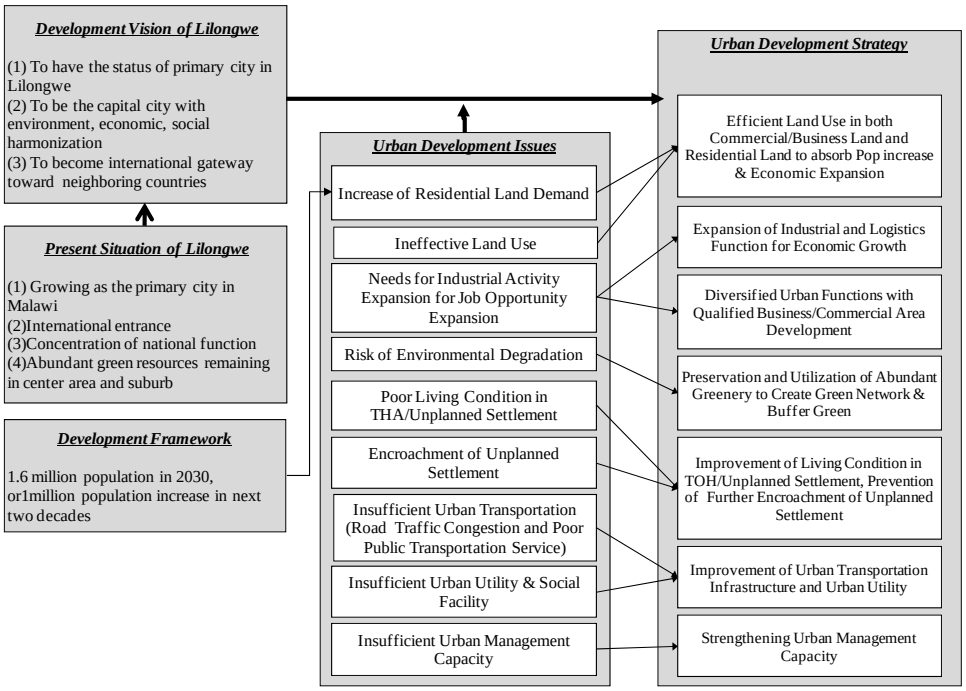
5. **Improvement of living condition in THA and unplanned settlements** : Both THA and unplanned settlements shall no longer be recommendable for the City in the future since it is expected to be the gateway of the middle income country proposed in the Malawi Vision 2020. Nevertheless, there would be constant inflow of social migration into the City, resulting in the expansion of unplanned settlements occupied by new illegal residents. Further encroachment by unplanned settlements should be controlled by strict land use control and building construction permit. Living conditions of the existing unplanned settlements should be improved through land adjustment measures. Funds for new houses and community infrastructure in unplanned settlements to be improved shall be generated through the sale of adjusted plots to the private sector.

6. **Upgrading of urban transportation and utilities services**: Urban transportation services aim at the improvement of road network where traffic volume is expected to increase (particularly in the M1 section in the central area of the City to alleviate traffic congestion) and improvement of the existing minibus depot/construction of new bus terminal to promote public transportation. Upgrading of urban facility services comprised of water supply system (construction of new dam/water treatment plan, and rehabilitation of the existing dam/water treatment plant), sanitation system (piped sewer and septic tank) and solid waste disposal system (improvement of solid waste collection and landfill management of final disposal).

7. **Strengthening of urban development management's capacity** : Good governance of urban development management requires capacity development of the stakeholders in charge of development/building control. Such capacity development encompasses i) planning coordination among the relevant stakeholders (MoLHUD, LCC and line agencies responsible for infrastructure development) with respect to plot/sub-division application, ii) planning standard/guidelines for plot/building application, and iii) implementation system of development/building control. LCC is specifically required to improve its capability to carry out operation and maintenance of infrastructure/utilities which is part of its responsibility. Hence, it further needs capacity development in operation and maintenance.

3.2.3 Development Vision

Figure 5 shows the schematic flow from the development vision of Lilongwe to the urban development strategy, including urban development issues. The matrix shown in Table 3 presents how the urban development strategy contributes to the development vision.



Source: JICA Study Team

Figure 5 Strategy to Contribute to Vision Realization

Table 3 Matrix Showing the Relationship between Urban Development Strategy and Development Vision

Development vision / Development strategy	To have the status of primary city in Lilongwe	To be the capital city with environment, economic, social harmonization	To become international gateway toward neighboring countries
Efficient land use in both commercial/business land use and residential land use to absorb increasing population and economic activity	◎	○	○
Appropriate expansion of Industrial Area	○	◎	○
Diversified urban functions	◎	◎	○
Preservation and utilization of abundant greenery to create green network & buffer green	○	◎	○
Improvement of living condition in TOH/ unplanned settlement prevention of further encroachment of unplanned settlement	○	◎	○
Improvement of transportation infrastructure and urban utility	○	○	◎
Strengthening urban management capacity	○	○	○

Note ◎: Direct contribution, ○: Indirect contribution

Source: JICA Study Team

4. Urban Development Plan

4.1 Issues on Urban Development

4.1.1 Status Quo

- **Land use** : As shown in Table 4, the total area of the City is 39,345 ha, out of which, agricultural land use shares 21, 646 ha or 55% of the total area. Agricultural land use is virtually an open space comprising of agriculture, woodlands and grasslands. Most of the open space is land used for seasonal agriculture such as planting maize. The land area for agriculture planned under the 1986 zoning scheme was 7,900 ha, which implies that most of the open space for seasonal agriculture has been illegally used. The built-up area, comprising of residential, industrial, commercial, and institutional, shares 11,924 ha or 30% of the total area. Out of the total built-up area, the residential area occupies 9,317 ha which corresponds to 23.7%. Unplanned settlements where illegal residents without land registration live occupies a substantial share (40%) of the residential area. The THA is the second largest residential area occupying 1,757 ha or 19 %. THA is not a statutory housing zone where residents are given certificates of title without a cadastral map. Residential area comprising of low/medium/high density is the statutory housing area where residents are given a leasehold title.

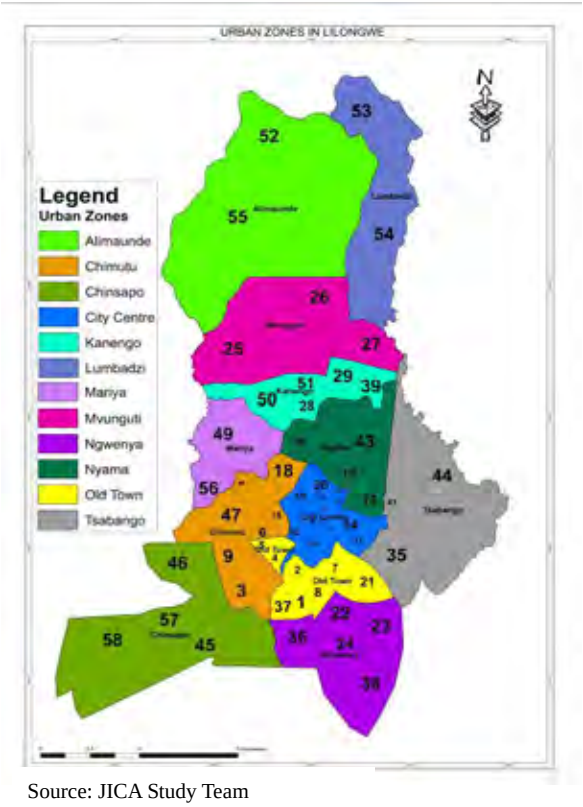
Table 4 Present Land Use of Lilongwe City (2009)

Land Use Category		Size (ha)		%	
Housing	Low density housing	1,338.42	9,316.64	3.4	23.7
	Medium density housing	846.48		2.2	
	High density housing	346.26		0.9	
	THA	1,757.27		4.5	
	Unplanned settlement area	3,700.47		9.4	
	Others	1,327.74		3.4	
Industry			457.16		1.2
Commercial			339.42		0.9
Government			934.53		2.4
Institutional			876.53		2.2
Agriculture			21,646.19		54.9
Others			5,774.74		14.7
Total			39,345.21		100.0

Source: JICA Study Team

- **Urban expansion towards the southern area of the City** : The City's area consists of 12 zones as shown in Figure 6. The population densities of the Old Town and Ngwenya, in the southern area of the City, are 75 persons/ha and 50 persons/ ha, respectively, which is far higher than the average population density (17 persons/ha) of the entire City. Ngwenya is strategically located in terms of accessibility to the Old Town, where plenty of job opportunities are available. Hence, urban population has increased in the southern

area of the City. The northern area (Alimaunde/Lumbadzi) without commercial zones is, on the other hand, sparsely populated with around 10 persons/ha. The plan about the self-independent four sectors was traced back to the 1986 Outline Zoning Scheme. The four sectors are comprised of the Old Town, Capital Hill (government institutions), Kanengo industrial zone and Lumbadzi commercial zone. Nevertheless, actual urbanization turned out to be not the self-contained type of urban development planned under the 1986 zoning scheme, but has expanded towards the southern area of the City.



Source: JICA Study Team

Figure 6 Spatial Macro Zoning (12) of Lilongwe City

- **Growing population in unplanned settlements and decreasing population in statutory housing area** : The growing population in unplanned settlements is attributed to the expansion of non-statutory housing area (unplanned settlements) that are outstanding in Chinsapo, Ngwenya and Kanengo. The expansion of unplanned settlements is also observed in the northern area around Alimaunde, Lumbadzi and Mvunguti. This implies that the formal residential areas are not large enough to accommodate the increase of urban population. The statutory housing area is, on the other hand, featured by the decrease of population. This is true for Chimutu (Areas 3 and 9) and Nyama (Areas 10 and 12), for instance. These areas belong to the low density residential zone where plot size per house is extensive.

- **One-storey houses/buildings:** Most of the houses and buildings in residential and commercial areas are those of one-storey structures. Two-storey houses also exist but very rarely. The highest buildings in the Old Town consist of three storeys, but are also mostly one-storey structures. The City Centre is the only area where buildings of more than three storeys are observed. The City's population is now approximately 670,000 and is expected to continue to grow in the future. Under such circumstances, high-rise buildings contributing to efficient land use shall be increasingly highlighted.

- **Urbanization of one-concentration** : Socio-economic activities comprising of commercial, financial and cultural businesses, are concentrated in the central area of the City, the Old Town and City Centre. Urban spatial development takes a one-concentration form in the two areas. Urbanization of the City shall progress in this pattern of one-concentration in the future.

- **Manufacturing/service industries that are not suitable for the zoning category of the Old Town** : According to the 1986 zoning scheme, Kanengo was planned as an industrial zone. There currently exist capital intensive industries such as tobacco processing and a grain refinery in Kanengo, while small and medium services/industries located in the Old Town were planned as the commercial zone under the previous zoning scheme. These consist of light industries manufacturing furniture and agricultural machines/tools. Since the Old Town is expected to become part of the CBD in the future, small/medium industries that are not suitable for the zoning category of the Old Town should be relocated to other areas. To this end, the industrial zone shall be divided into heavy and light industries in the future land use plan.

4.1.2 Urban Development Issues

- The main issues relating to the land use plan of Lilongwe City are summarized as follows:

  - The 1986 zoning scheme proposed four self-contained zones comprising of the Old Town (commercial zone), the Capital Hill (government institutions), Kanengo (industrial zone) and Lumbadzi (commercial zone). Nevertheless, the spatial development that actually progressed is the one-concentration pattern in the Old Town and City Centre. As a result, the four independent zones would not be suitable for the spatial development plan for a city like Lilongwe, having a relatively small population in a landlocked country.

  - The current population (approximately 670,000) would be the appropriate scale to focus commercial/business activities on a selected area since one-concentration

gives rise to efficient land use. Further infrastructure development would need less cost in one-concentration than in a scheme proposing development in plural areas. How urban infrastructure and utilities are to be developed depends on the one-concentration scheme, which is the basic approach to urban development in Lilongwe.

- Lilongwe shall have to provide plenty of job opportunities for the growing labour force. In particular, employment creation in the formal sector shall be the significant issue since Lilongwe is given a mission to achieve a relatively high economic growth as discussed in Chapter 2. To this end, this could require development of the secondary and tertiary sectors in the capital city.

- Lilongwe as the capital city shall have to play the significant role in taking the lead in the national economic development. For this purpose, business activities in the Old Town and City Centre should be diversified and upgraded. For instance, the central area of the City could best suit as CBD where financial/businesses of a high-order are to be located. A new zoning category for CBD should be taken into account for the future land use plan.

- The improvement of poor living environment in THA and unplanned settlements shall be an important issue to be tackled in order to enhance urban environment in terms of sanitation and a cityscape. To accomplish this, two measures are needed. One is the upgrading of the existing unplanned settlements. This could be achieved by an institutional measure transforming them to a statutory housing area. The other measure involves an administrative control to prevent further encroachment of the planned area by illegal residents.

- Preservation of the existing greenery resources such as nature reserves and waterfronts adjacent to the commercial/business zone (the Old Town and City Centre) is important from the viewpoint of urban environment. New greenery buffer zones shall be created between areas for urban land use.

4.2 Land Use Plan

4.2.1 Urban Structure Concept

- The basic approach to the urban structure of Lilongwe is the one-concentration in the Old Town and City Centre. The two advantages of one-concentration are identified. One is the efficient land use while the other is the lesser cost of urban development than that in the 1986 zoning scheme proposing development in different areas.

- With regard to the future urban structure of Lilongwe, the following three alternatives are evaluated as shown in Figure 7. The three alternatives adopt a common approach wherein the Old Town and City Centre shall remain the pole of urban economy.
    - Alternative 1: Linear Shape Development

      As the City has a linear shape in the north-south direction, one of the alternatives for the future urban structure will be a linear shape development As shown in Figure 7, this pattern shows urban development along a few arterial roads planned in the north-south direction. In this connection, construction of a long-distance mass transit mode axis (railway line/major roads) shall be essential to the feasibility of this urban development structure. Nevertheless, it seems too difficult to construct and operate mass transit facilities in sparsely populated areas. Further, many commuters do not take mini-buses and prefer to walk to their workplace to save money. Thus, for the time being, it will not be feasible to construct such mode of transport for commuters in the City.

    - Alternative 2: Radial Shape Development

      The radial urban structure is observed in many big cities in the world. This alternative structure can be applied on the condition that Lilongwe is to be developed in pursuit of large-scale urban economic development. As shown in Figure 7, this pattern takes the form of the City's expansion extending in any direction from the inner ring road circling the Old Town and City Centre. The merit of this alternative is its less development cost compared to the other alternatives. The demerits meanwhile are that it causes decrease of the City's greenery and nature, and that urban conurbation will spread throughout the area indiscriminately.

    - Alternative 3: Cluster Shape Development

      As shown in Figure 7, this alternative takes the form of cluster shape development between the inner and outer ring roads, and outside the outer ring road. The cluster shape development can mitigate the disadvantage of greenery and natural environment damage in the radial shape pattern. Land spaces colored as white in Figure 7 can mitigate damage of greenery and nature. In recent years, the cluster shape development is popular among urban planners in the world because it is a suitable pattern for delineation of area on the selective development purpose, and prevention of endless and indiscriminate extension of urban conurbation.

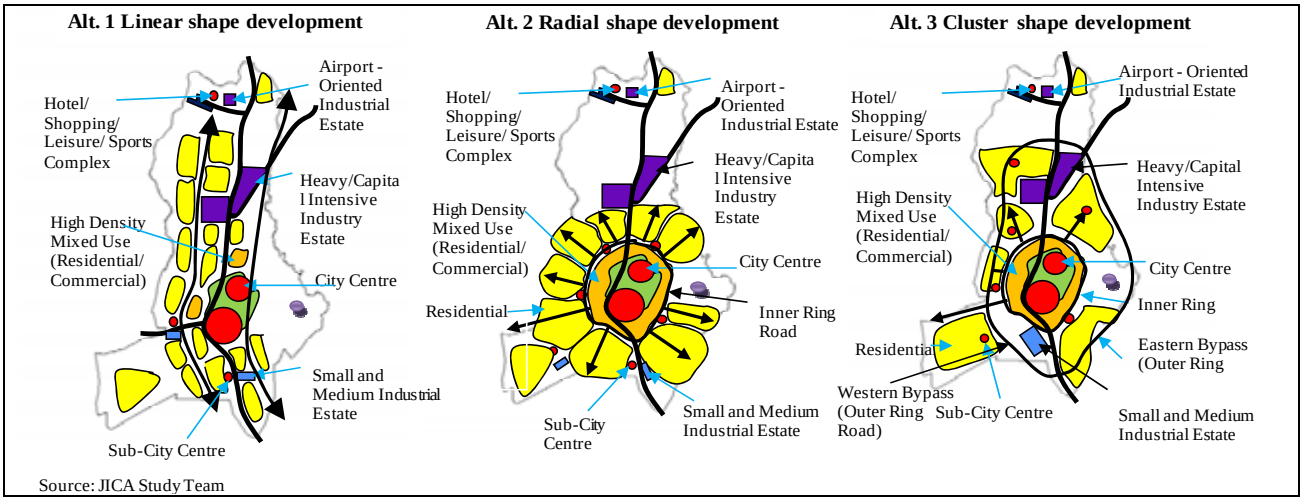
- Table 5 shows an assessment presenting the comparison among the future urban structure pattern alternatives. Alternative 4 is added as a zero option (a status quo option)

from the viewpoint of Strategic Environmental Assessment (SEA). Based on the comparison among the alternatives including the zero option, it is concluded that Alternative 3 will be the most appropriate development for the future urban structure of Lilongwe City.

Table 5 Comparison of the Future Urban Structure Pattern Alternatives (Summary)

Item	Alternative 1 : Linear Shape Development	Alternative 2 : Radial Shape Development	Alternative 3 : Cluster Shape Development	Alternative 4 : Zero Option
Evaluation	In less developed countries, constructing a linear transport axis will be difficult in terms of attaining financial viability	It will result to indiscriminate urban developments in all directions, causing damages to nature and greenery.	It will possibly achieve not only the necessary urban development but also greenery preservation in consideration of nature endowments.	This option will result in adverse impacts on social and nature environments.
Necessary Countermeasures	A short distance transit mode can be introduced.	Some modifications to this type can be considered by resembling Alternative 3 as a possible option, keeping the merits of Alternative 2.	Demerits will not come out by elaborating physical planning design.	Urban development and land use shall be managed properly.
Recommendation	It is recommended to adopt Alternative 3 as the main solution. In view of economic efficiency and urban size, it would be efficient and reasonable to concentrate on commercial developments, mostly in the central area.			

Source: JICA Study Team



Source：JICA Study Team

Figure 7　Urban Structure Alternatives

4.2.2 Basic Principles for Land Use Plan

- Figure 8 shows a schematic flow comprising of urban development strategy, land use planning principles and land use planning measures. The 2030 land use plan is prepared based on this conceptual flow

- **Urban concentration in the central area (the Old Town and City Centre):** One-concentration in the central area (the Old Town and City Centre) could be the best pattern in terms of efficient land use and the less development cost of urban infrastructure in order to expand commercial/business activities in the future. To this end, the future land use plan needs i) new zoning categories such as high-rise commercial and high-rise residential, ii) decrease of the minimum plot size per residence, and iii) introduction of density control measures on building coverage ratio/floor area/building line. Mixed-use of land i.e., high-rise residences in high-rise commercial area, is also a new zoning category to be introduced for the attainment of efficient land use. This zoning will bring about increase in night-time population in the central area.

- **Introduction of new planning standards and guidelines for urban plan and building control :** The existing planning standards and guidelines is to be improved in the areas with i) height regulation and design criteria for common and individual spaces for high rise flat/commercial areas, ii) subdivision regulations for low cost housing in high density residential areas, iii) subdivision standards for public facility requirements, road standards, block length, water supply system, sewerage disposal and drainage system and others.

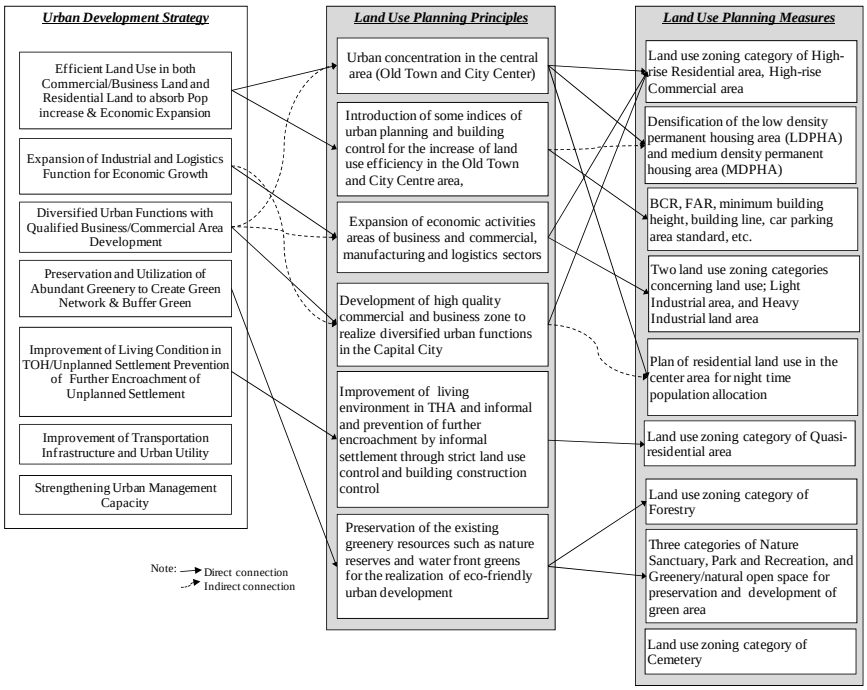
- **Expansion of economic activities' areas in commercial, manufacturing and logistics industries :** Further economic development in Lilongwe needs i) promotion of foreign direct investment (FDI), ii) strengthening of linkage between FDI and domestic firms, and iii) development of depot and/or a long distance trucking industry towards SADC countries. Consequently, industrial policies such as i) what industries to be promoted in Kanengo area, ii) creation of a new zoning for small/medium industries, and iii) depot/delivery industries along the Western Bypass, shall be made clear. It is also worthwhile considering the industrial and commercial facilities adjacent to the Kamuzu International Airport.

- **Development of CBD with commerce/business activities of high quality/order:** Development of CBD with commercial and business activities of high quality and order in the Old Town and City Centre are necessary for the achievement of the mission of Lilongwe, which is to be the "Gateway to Neighbouring Countries".

- **Improvement of living environment in THA and unplanned settlements and prevention of further encroachment by unplanned settlements** : Improvement of living environment in THA and unplanned settlements is one of the urban development strategies. Therefore, the existing THA shall be converted into high density residential area while further encroachment by the expansion of unplanned settlements should be restricted through development and building control. The future land use plan introduces

the new zoning category, quasi-residential, in place of the existing unplanned settlements. A quasi-residential is not a statutory housing area but a housing area where residents are given a certificate of title without leasehold title. The existing THA is a true quasi-residential area. The future land use plan aims to carry out the step-wise upgrading of unplanned and quasi-residential areas to planned residential area (residents with leasehold titles of 33 or 66 or 99 years). Living environment in THA and quasi-residential shall be improved through a land adjustment method. This method enables target residents to hold land titles (certificate of title) and also to generate funds for new houses and community infrastructure improvement (road, drainage, sewerage and water supply) through the sale of adjusted plots. The plots for sale should be sizeable enough for private developers to purchase for redevelopment purposes. Such fund might be pooled and administered by LCC for the improvement of living environments in THA and quasi-residential areas.

- **Preservation of the existing greenery resources:** The new zoning categories such as nature reserves, park/recreation area, natural open space (greenery) shall be introduced into the future land use plan according to the strategy for environmentally friendly urban development.



Source: JICA Study Team

Figure 8 Urban Development Strategy and Land Use Planning Principles and Measures

4.2.3 Land Use Planning Measures

The following are land use planning measures based on land use planning principles:

- Introduction of the new zoning categories such as high rise flat area and high rise commercial area in the Old Town and City Centre for the purpose of urban concentration on the two areas and efficient land use.
- Decrease of the existing minimum plot size regulation in low and medium density residential areas for the purpose of efficient land use.
- Introduction of BCR, FAR, building height/line, and car parking space regulations such as: i) Building control by zoning category, ii) Regulation on maximum floor area ratio (FAR) by zoning category (the current regulation has a single FAR only), iii) Regulation on maximum building coverage ratio (BCR) by zoning category, iv) New regulation on minimum and maximum plot sizes, and v) Building height/line and standard regulations for minimum car parking spaces.
- Separation of the current industrial area category into large scale industry (Kanengo), and small and light industries. The latter shall be newly planned for small and light manufacturing/services industries that should be relocated from the Old Town.
- Promotion of mixed use comprising of high-rise flats and high-rise commercial areas. It could result in the influx of night-time population into the central area of the City.
- Unplanned settlements should not be proposed in the future land use plan because this settlement is not a statutory housing area. The plan proposes the so-called quasi-residential area where residents will be given certificate of titles without leasehold titles.
- The environmentally friendly zoning categories shall be introduced. These are i) forestry, ii) nature reserves, iii) parks/recreation areas, iv) nature sanctuary and v) natural open spaces (greenery).

4.2.4 Land Use Plan for 2030

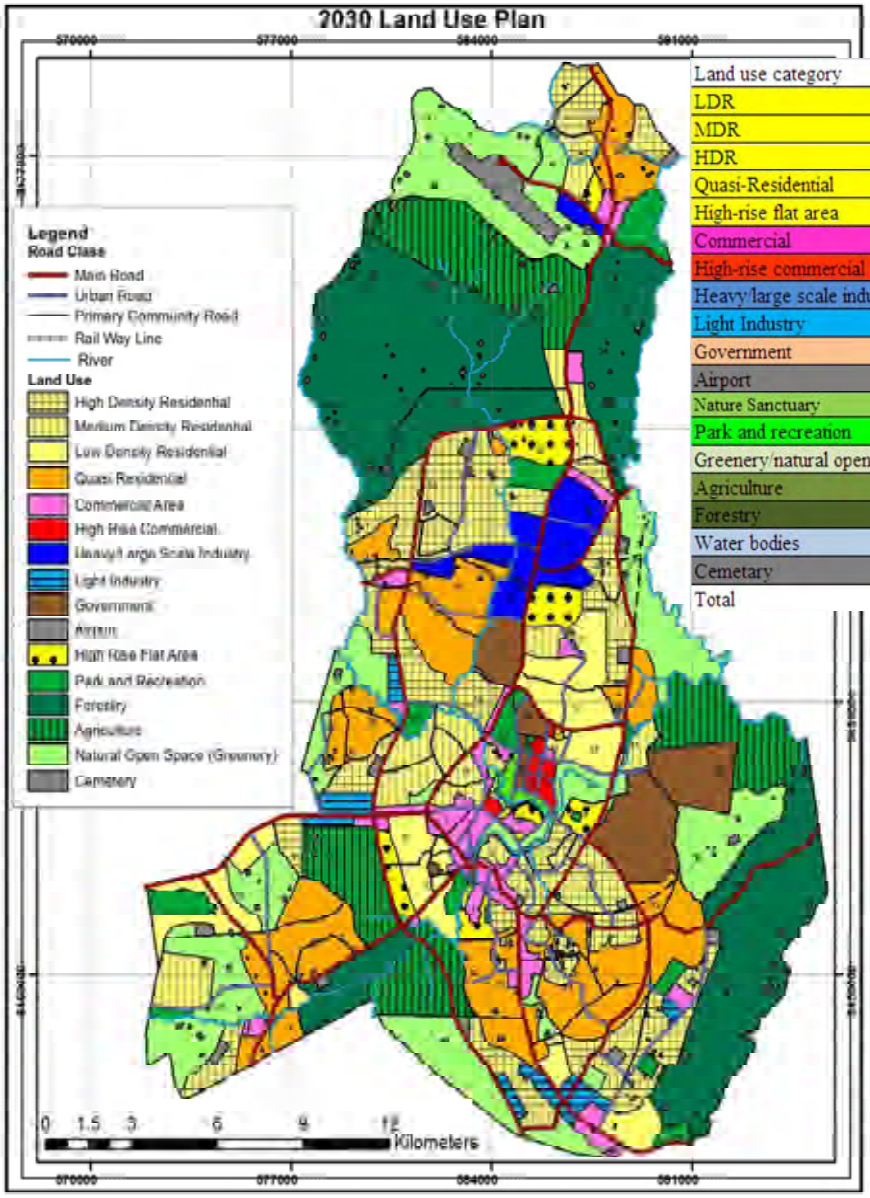
- The future urban structure comprising of the built-up area and greenery/open space based on Alternative 3 is shown in Figure 9. This alternative is called the cluster shape development and has the advantage of the urban development being planned by cluster. Further, the cluster shape development is expected to encourage community-based social activities.

Source：JICA Study Team

Figure 9 Spatial Composition of Future Built-up Area and Greenery /Open Spaces

- The built-up area in Lilongwe forms an oval shape with the Old Town and City Centre at its centre. Nature sanctuary is located as the buffer greenery zone between the Old Town and City Centre, and brings about the favourable amenity to the urban environment in the City. As exemplified by the nature sanctuary, the cluster shape development makes it possible for the City to be planned with built-up areas surrounded by nature open spaces and buffer greenery zones.

- The 2030 land use plan and land area composition is shown in Figure 10.



Land use category	Land area	(%)	
LDR	2,670	6%	40%
MDR	1,987	4%	
HDR	6,795	14%	
Quasi-Residential	6,171	13%	
High-rise flat area	1,155	2%	
Commercial	1,611	3%	4%
High-rise commercial	219	0%	
Heavy/large scale industries	1,280	3%	4%
Light Industry	616	1%	
Government	1,836	4%	4%
Airport	358	1%	1%
Nature Sanctuary	137	0%	17%
Park and recreation	1,149	2%	
Greenery/natural open space	6,840	14%	
Agriculture	4,309	9%	9%
Forestry	9,566	20%	20%
Water bodies	0	0%	0%
Cemetary	701	1%	1%
Total	47,400	100%	100%

Source: JICA Study Team

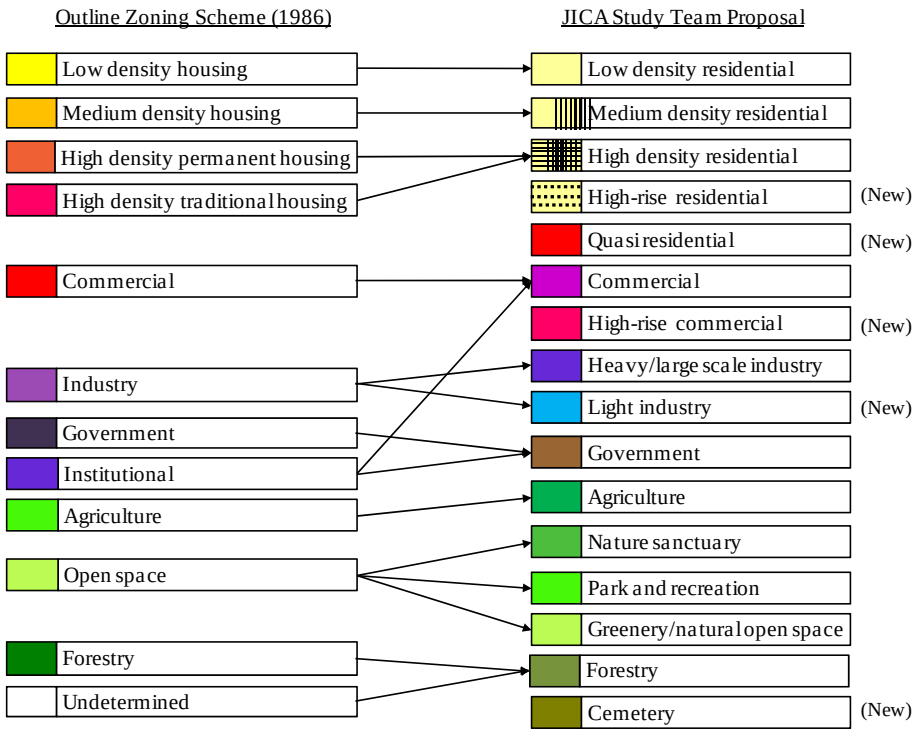
Source：JICA Study Team

Figure 10　Land Use and Land Area Composition in 2030

4.2.5 Institutional Measures to Implement Land Use Control

The following four institutional measures are introduced for land use control:

1. **Amendment of zoning categories** : The single zoning category for commercial and industrial areas planned under the 1986 Outline Zoning Scheme is further split into two categories. The 2030 land use plan proposes a quasi-residential area in place of unplanned settlements. Introduction of quasi-residential area is attributed to the step-wise transformation of the existing unplanned settlements to planned (statutory) housing area. Further, the existing category of THA shall be abolished and converted into a high density residential area. The category of open space shall be divided into nature sanctuary, park/recreation area and greenery/natural open space. Figure 11 shows the contrast between the 1986 zoning scheme and the 2030 land use plan.



Source: JICA Study Team

Figure 11 Contrast in Land Use Categories between the 1986 Scheme and 2030 Land Use Plan

2. **Clarification of building usage/activity by land use category**: The current Standards and Guidelines (SG) stipulates technical aspects on how to build in each zone. Nevertheless, the same SG does not provide explicit and concrete descriptions on what types of buildings can be built or prohibited in each land use zone. In this connection, the matrix table shall be provided for building control in each land use category. The matrix table is exhibited in Chapter 5 of the main report while its capacity development is described in Chapter 10.

3. **Density control measures** : Irrespective of developed or developing countries, the building BCR and FAR are very common as density control measures. BCR is already

adopted in Malawi, but the current usage situation is very simple. About 33% is universally adopted for all the residential areas while 66% is adopted for both industrial and commercial areas. FAR has not been introduced yet as a means of density control. Taking into account the future population increase, LCC should introduce FAR and elaborate on the BCR regulations. For instance, the FAR would be in the range of 40% for low density residential areas to 200% for high rise commercial areas. The minimum plot size is decreased from 2,000 square meters to 1,000 square meters.

4. **Regulation on lot design control**：Measures of building height, building line setback, and car parking space in accordance with new land use category are proposed as upgrading of spatial development control measures. For instance, eight- to twelve-storey structures should be built for low density residential areas.

5. The minimum lot size shall be reduced and the maximum lot size regulation shall be established to achieve densification and land use efficiency.

5. Transportation Development

5.1 Issues in Urban Transportation

- The road network in Lilongwe City comprised of main, secondary, urban and community roads. There is a total road length of 585 km in the city, excluding community roads whose length is about 137 km. The road density in the city is 0.29 km/km² excluding community roads. Road pavement ratio in the city is 45% and 96%, including and excluding community roads, respectively. All main roads and almost all secondary roads are paved, although most of them are in poor condition due to poor maintenance, unpaved shoulders and improper construction of roadside drainages. The pavement ratio of community roads is only 29% and some unpaved sections are almost impassable during rainy season.

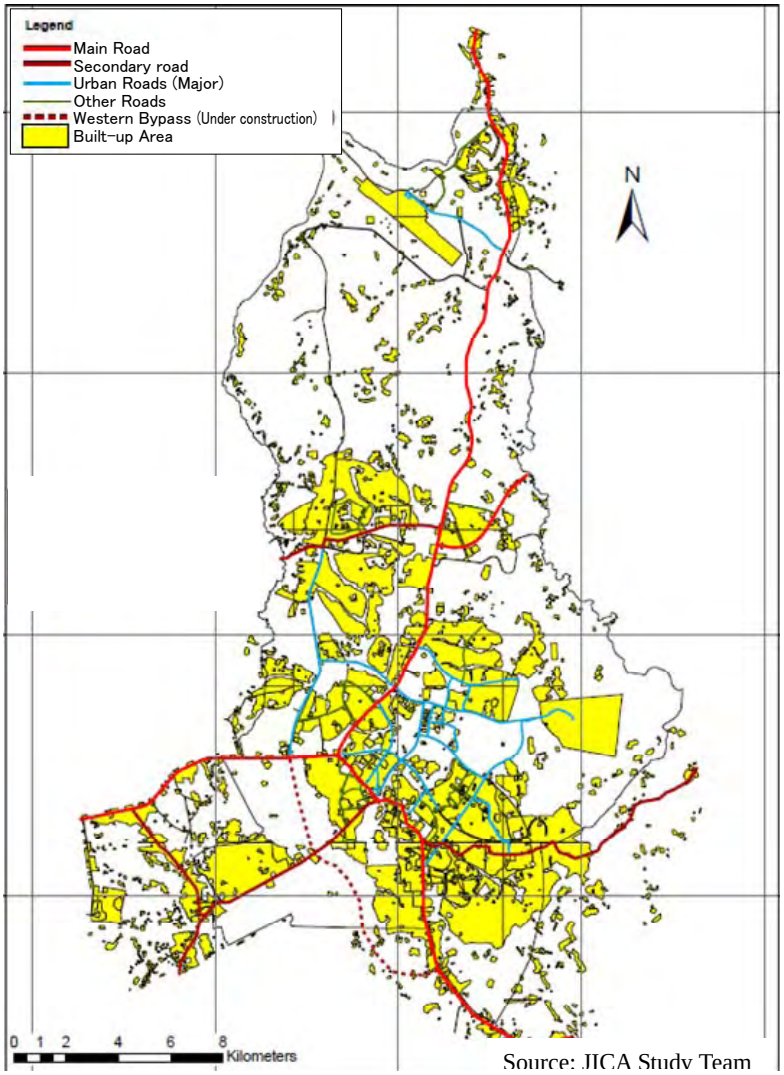


Figure 12 Current Road Network

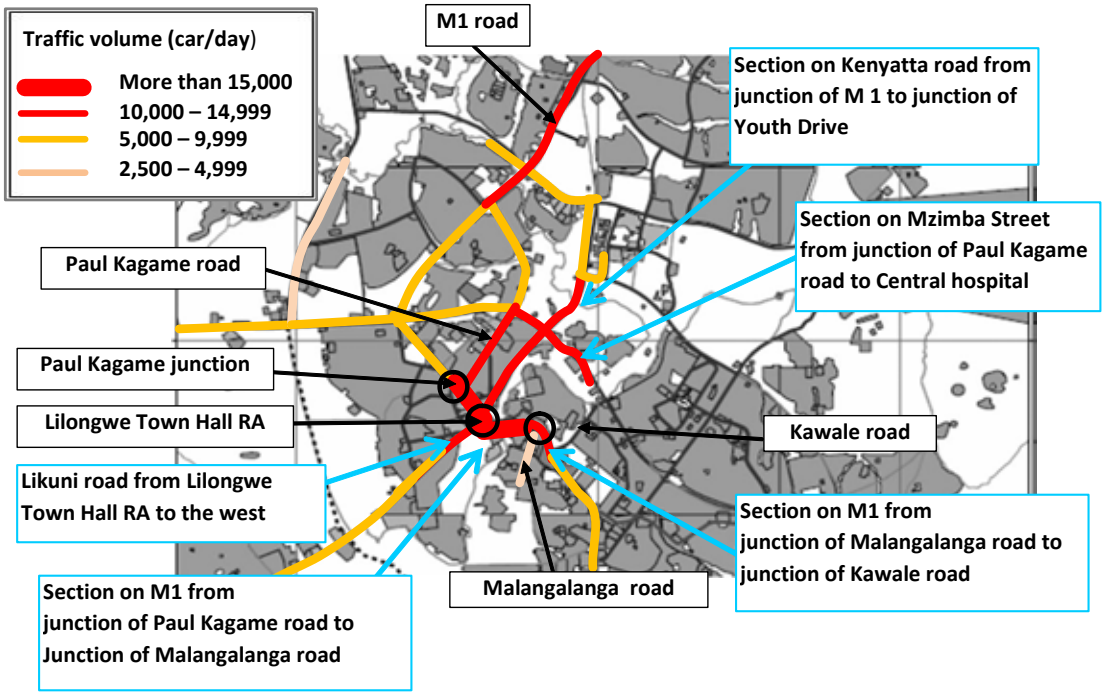
- The Roads Authority is responsible for the management of main, secondary and district

roads, while the Lilongwe City Council (LCC) is responsible for the management of urban and community roads. LCC has the following management problems:

- Lack of coordination with other national bodies, e.g. the Roads Authority, National Road Safety Council and the road traffic police
- Limited human resources in terms of the number of staff members and their skills
- Lack of vehicles and equipment for operation and maintenance
- Lack of budget for road improvement and maintenance
- Insufficient information system, including traffic and information signs for traffic safety
- Lack of guardrails and street lights to reduce risks of traffic accidents
- Insufficient facility for pedestrian safety (pedestrian road, zebra crossing, pedestrian signal, etc.)

5.1.1 Issues in Road Transport

- As shown in Figure 13, the daily traffic volume on M1 road, in the section from the junction of Paul Kagame to that of Malangalanga Road, is more than 15,000 vehicles. This traffic exceeds the two-lane road capacity of 12,000 vehicles per day. Traffic congestion is serious especially at the Lilongwe Town Hall Roundabout, where 27,000 cars per day traffic are observed.



Source: JICA Study Team, Traffic Survey Result

Figure 13 Current Traffic Volume in Centre Area (2009)

- Major issues in road transport are summarized as follows:
    - Inadequate traffic capacity of some sections of two-lane roads.
    - Insufficient handling traffic capacity at intersections of roundabouts compared with that at intersections with traffic signals.

5.1.2 Issues in Public Transport

- The main development issues on public transport are summarized as follows:
    - Congestion in the current minibus depot in the Old Town
    - Limited space to accommodate passengers and absence of surface markings for moving passengers in the minibus depot
    - Expensive mini bus fares for low-income families

- With the Old Town as a hub, there are eleven routes of mini-bus services connecting the Old Town to other areas, both within and in the suburbs of the City. The number of daily passengers commuting on these eleven routes is approximately 228,000 during weekdays and 203,000 during weekends. As a result, the current minibus depot is always congested during commuting period.

- The features of the existing minibus depot are its limited space to accommodate passengers, absence of surface markings for moving passengers and absence of destination display boards. These situations worsen congestion further.

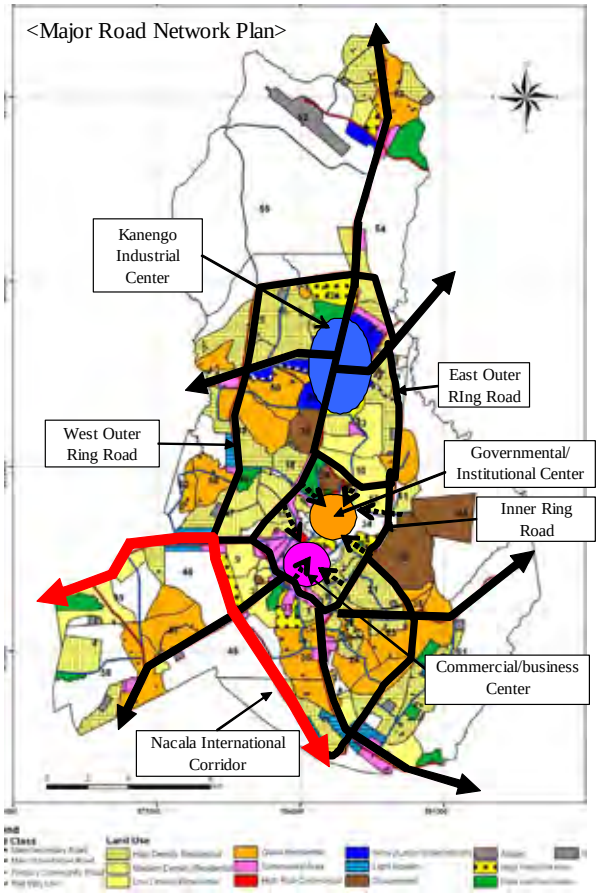
- Mini bus fares are rather expensive (about MWK 100) compared to the income level of low-income families. Results of a mini-bus passenger survey revealed that the main mini-bus users are market vendors and white-collar workers such as government officials and employees of private companies. Many people in the lower-middle to low-income bracket, including students, travel long distances by walking. Approximately 14% of the trips are made on foot. About ten thousand pedestrians travel by walking everyday on the M1 section, from Lilongwe Bridge to the junction with Malangalanga Road in the Old Town. There is no sidewalk for pedestrians along the M1 section.

5.1.3 Issues in Traffic Control and Management

- Traffic control and management shall also be taken into account for smooth road transport and traffic safety. Introduction of a central control system (central signal control system) and safety facilities (guardrails, street lights and traffic signs) shall be necessary in the future.

5.2 Transportation Development Plan

- The transportation development plan is formulated in conjunction with the cluster shape development (urban structure). The road network plan is presented in Figure 14, considering the road network components shown in the figure;
  - A road network including the missing links for smooth road transport in the city by means of improvement and construction of roads and related facilities
  - Improvement of M1 Road traversing from south to north in the City
  - Construction of an inner ring road around the central area of the two poles of the Old Town and the City Centre
  - Construction of an outer ring road bypassing cargo traffic from the Kanengo industrial zone to the south area
  - Construction of seven radial roads connecting the inner/outer ring roads to the suburban area (five main roads and two arterial roads)
  - Construction of the Western Bypass as part of the Nacala Corridor

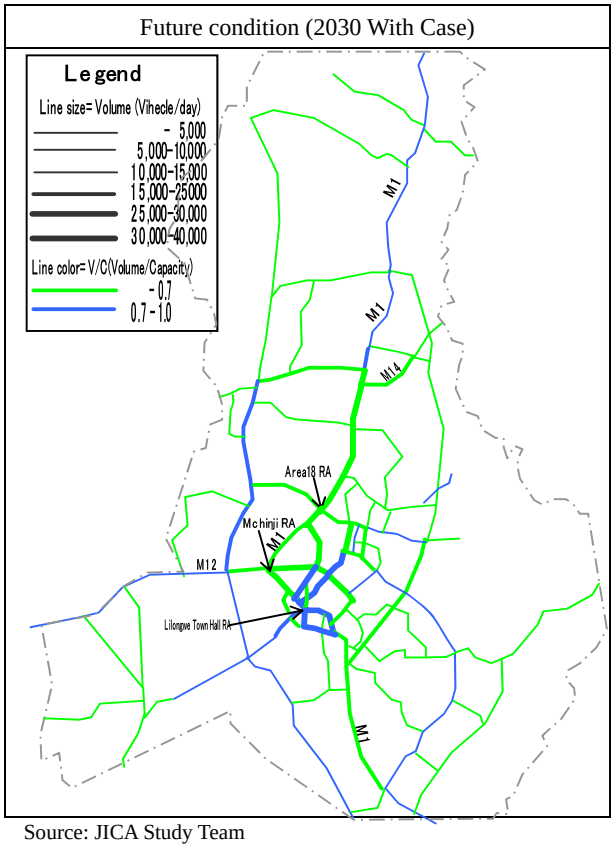


Source: JICA Study Team

Figure 14 Road Function and Road Network Plan

5.2.1 Traffic Demand Projection

- The future trip generation/attraction volume estimated based on the future socio-economic framework will be 3.8 million trips, which is double the present generated trips of 1.9 million. Moreover, the future modal share of



Source: JICA Study Team

Figure 15 Projection of Road Traffic Volume in 2030

vehicles will increase in line with the improvement of income levels and vehicle ownerships. Accordingly, vehicle trips will rapidly increase due to the multiple effects of the increase in trip generation and modal split. Future road traffic volume is estimated based on the above trip generation/attraction volume and modal share.

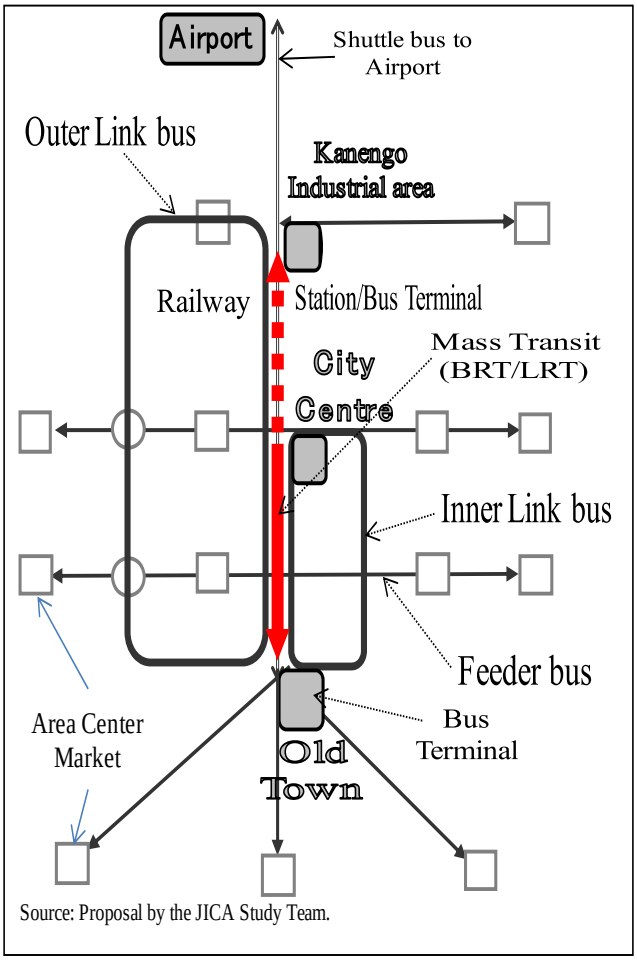
- Figure 15 shows the traffic demand projection with road development. The maximum daily traffic volume is currently more than 15,000 vehicles and is expected to increase to 30,000-40,000 vehicles in 2030. In particular, traffic volume on M1 Road in the central area will be in the range of the maximum traffic volume.

5.2.2 Public Transport Development Plan

- The number of person trips using public transport in 2030 is estimated at approximately 830,000, of which those between the City Centre and Old Town areas will be approximately 100,000 per day. Public transportation demand from the western residential area to the centre area is also expected to increase.

- Public transportation services by Bus Rapid Transit (BRT) or Light Rail Transit (LRT) between the City Centre and Old Town areas, and ring route services by large bus services linking the Old Town - City Centre - Kanengo industrial area-western residential area are recommendable as proposed in Figure 16.

- Bus terminal construction at both ends of the BRT/LRT will be necessary at the City Centre and Old Town areas.

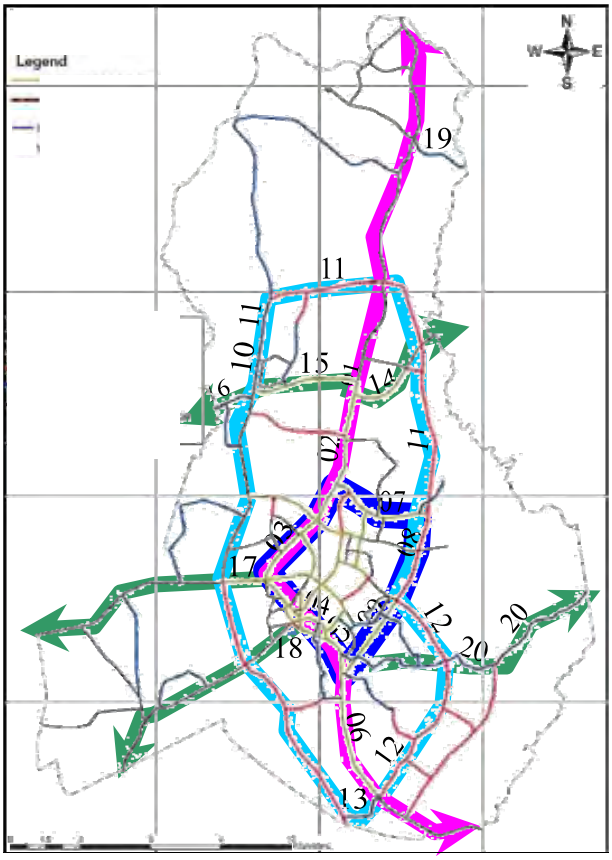


Source: JICA Study Team

Figure 16 Concept of Public Transportation Network in 2030

5.2.3 Projects for Transportation Development

- Figure 17 shows the development of the road network while Table 6 presents a list of urban transportation projects.



Source: JICA Study Team

Figure 17 Road Network Development Plan in 203(

- **M1 Road:** M1 Road (project numbers 1-6) penetrating through the city area from north to south, shaded pink in Figure 17, will be expanded from two to four lanes. Because of severe traffic congestion observed in the central area, priority is given to the M1 Road in the central area (project numbers 3-5).
- **Inner and Outer Ring Roads:** Both outer and inner ring roads are important trunk networks forming the urban structure as shown in Figure 9. The ring roads (the inner indicated by blue line and outer by light-blue) reduce the through-traffic to the city centre area. Priority is given to the missing link of the outer ring road (project number 10).
- **Radial Road:** Radial roads (indicated by green lines shown in Figure 17) connecting the central area to the ring roads/suburban area are planned based on the proposed urban structure shown in Figure 9. The priority is given to the missing link with the outer ring road and M1 Road. (project numbers 16 and 18)
- **Maintenance and Rehabilitation:** Strengthening the capacity of LCC will be urgently required in the areas of road maintenance and rehabilitation. The capacities of LCC's staff members are to be strengthened in the fields of planning, project management and maintenance. It is also important to enhance their ownership through projects such as the preparation of a road inventory database. LCC is then able to make a road maintenance and rehabilitation plan based on this road inventory database. Since rehabilitation and maintenance is part of their daily works, such a database will contribute to the capacity development of staff members.
- **Public Transport Development:** Public transport development comprised of comprehensive projects including review of minibus operation routes, institutional reform of bus operation, expansion of the existing minibus depot, construction and improvement of a bus stop, and construction of a new bus terminal. The priority is given to the extension

of the existing minibus depot and review of minibus operation routes.

- **Traffic management:** Traffic management consists of projects such as improvement of intersections from roundabout to traffic signal to increase handling traffic capacity, installation of central signal control system and parking management system.
- **Traffic safety:** Traffic safety consists of projects such as a road safety master plan, and construction of safe pedestrian and bicycle network.
- **Air transport development:** Air transport development comprised of the modernization of navigation system, and improvement of baggage-handling system. Since the existing facilities are very old, their urgent rehabilitation will be required.

Table 6 Transportation Development Projects

Category	No.	Project	Implementation Schedule			Priority Project
			Short	Mid	Long	
North - South Axis (M1)	1	Widening of M1 Kanengo			■	
	2	Widening of M1 Area18 RA North		■		
	3	Widening of M1 Area 18 Roundabout - Mchinji Roundabout	■			?
	4	Widening of M1 Old Town Area Muchinji RA- Community Center	■			?
	5	Widening of M1 Community Center - Chidzanja Road	■			?
	6	Widening of M1 South			■	
Inner and Outer Ring Road	7	Widening & Extension of Chayamba Road for Inner & Outer Ring Roads		■		
	8	Extension of Chidzanjya Road for Inner Ring Road		■	■	
	9	Widening of Chidzanjya Road for Inner Ring road		■		
	10	Improvement of Northern Outer Ring Road I	■			?
		Improvement of Northern Outer Ring Road II			■	
	11	Construction of North Western Arch of Outer Ring Road			■	
	12	Construction of South Western Arch of Outer Ring Road		■		
	13	Improvement of Western Bypass Access Road for Outer Ring Road		■		
Radial Road	14	Widening of Salima Road (M14)			■	
	15	Widening of S123 in Area 50 & 51			■	
	16	Improvement of S123 in Area 50	■			?
	17	Widening of Mchinji Road (M12)			■	
	18	Widening of Likuni Road (S124) in Area 3	■			?
	19	Improvement of T361in Area 53 & 54		■		
	20	Improvement of T363 in Area 61			■	
Maintenance/ Rehabilitation		Capacity Development for LCA's Road Related Services	■			?
		Road Maintenance Program, Road Rehabilitation Program	■	■	■	?
		Development of Road Inventory Database	■			?
Public Transport Development		Construction of New Bus Terminals		■	■	
		Expansion of Minibus Depot in Old Town	■			?
		Construction & Improvement of Bus Stops	■	■		
		Review of Minibus Operation and Routes	■			?
		Institutional Reform of Bus Operation	■			
		Bus Rapid Transit (BRT) Introduction Program			■	
		Establishment of New Bus Company (Third sector company)		■		
Traffic Management		Improvement of Intersections	■	■	■	?
		Introduction of Central Control System			■	
		Improvement of Car Parking System	■	■		?
Traffic Safety		Development of Safety Traffic Environment (Road Safety Master Plan)	■	■		?
		Development of Safe Pedestrian Network	■	■		?
		Development of Cycle Road Network	■	■	■	?
Air Transport Development		Modernization of Navigation System	■			?
		Improvement of Baggage Handling system and Area expansion	■			?

Note: /1On-going Nacala corridor project under construction is not included in this table.
/2 Urban road/community road projects are not shown in this summarized table. Source: JICA Study Team

6. Urban Environmental Utility Development Plan

6.1 Issues of Urban Environmental Utility Development

- Within the city of Lilongwe, water supply service is provided by the Lilongwe Water Board (LWB) while sewerage, sanitation and solid waste management services are under the jurisdiction of different departments of the Lilongwe City Council (LCC). General information on the water supply, sewerage, sanitation and solid waste management services in Lilongwe is summarised in Table 7-9.

- **Water supply**: All ongoing/planned projects are essentially part of the National Water Development Program (NWDP), a five-year, US$300 million multi-donor country-wide effort administrated by the Ministry of Irrigation and Water Development (MIWD). Lilongwe is included in two of the projects of NWDP-II of World Bank (WB)/International Development Association (IDA) and the Malawi Peri-Urban Water and Sanitation (MPUWSP) of the European Union (EU)/European Investment Bank (EIB). According to estimates by LWB, the water demand of Lilongwe will increase to 95,650 m^3/day in 2013 from 73,250 m^3/day in 2008. Considering the capacity of the existing Kamuzu Dam 1 and 2 of 86,000 m^3/day and existing water treatment plants, the shortfall will soon happen and development of new water sources, construction of treatment plants, and rehabilitation of existing facilities are urgent. The present 44% water loss is higher than the target rate of 20%, hence, decreasing water losses with the reduction of Non-Revenue Water (NRW) is also an urgent issue for the Lilongwe water supply system. Considering that the number of kiosk (common tap) is only 475, while the total water connection is 31,500 in 2008, an increase of the kiosk services is necessary for water service improvement in THA and unplanned urban settlements.

- **Sewerage and sanitation:** The treatment capacity of 6,100 m^3/day of the Kauma Sewage Treatment Plant is still sufficient for the present treatment demand of 5,280 m^3/day. However, the capacity of LCC, in terms of management of data collection and analysis, tariff collection, and equipment maintenance, is still weak to appropriately run Kauma Sewage Treatment Plant. Although the National Statistics Office reported that 80% of households are equipped with house toilets, majority of the toilet systems is pit latrine which is not recommendable due to unsanitary conditions and its adverse impact to the environment. The septic tank system is the preferable toilet system in terms of sanitary conditions. However, removal and treatment of septage in the tanks is inadequately managed by LCC. Following the example of Blantyre City transferring its sewerage task to Blantyre Water Company successfully, it is recommended that Lilongwe City to promptly hand over its sewerage task to LWB.

- **Sold waste disposal**: The current waste collection rate of the city is 30% on average. Presently, the LCC collects wastes from households in the low- and medium-density housing areas, while no regular service for waste collection is done by LCC in the THA/informal settlement areas. The number of compactors and skip carriers for garbage collection is limited and most of them are out of order. Lack of capacity of LCC is one of reasons for inadequate management of solid waste collection works.

Table 7 Basic Features and Major Current Constraints for Water Supply Services

Total population of Lilongwe City	674,000
Population served (LWB estimate 2009/10)	75%
Safe yield of dams	86,000 m^3 per day
Installed capacity of treatment plants	95,000 m^3/day
Average sales volume	44,000 m^3/day (2009 Q2)
Systems loss	44% (2009 Q2)
Actual average consumption (JST estimates based on LWB claim)	88 lpcd
Constraints of Water Supply Services	Remarks
• Urgent rehabilitation is required for dam, WTP, reservoir, booster pump, pumping mains • Loss reduction/leak detection • Extension of service area	Addressed in the National Water Development Program (NWDP)
• Tariff Adjustment • Asset Management • Staff Vacancy	Not included in the NWDP, but LWB can implement by itself
• Replacement of distribution pipe • New construction for dam, WTP, and reservoir	New projects needed, but with longer time frame.

Source: JICA Study Team

Table 8 Basic Features and Major Current Constraints for Sewerage Treatment Services

・ Total population of Lilongwe City	674,000	・ LCC-operated treatment plants	4
・ Household served by sewer system	9%	・ Industrial waste STP	2
・ Household served by septic tank	20%	・ Estimated domestic generation	5,280 m^3/d
・ NSO claim as 'safe sanitation'	83%	・ Capacity of Kauma Plant	6,100 m^3/d
Constraints of Sewerage Treatment Services		Remarks	
• Poor legal & institutional authority		Needs specific plan and time frame for handing over the operation from LCC to LWB	
• No overall plan		Development of sanitation strategy is included in NWDP II	
• Weak institutional capacity • Sewerage usage tariff discontinued		Needs institutional capacity development	
• Inadequate removal and treatment of septage of septic tanks		Needs collector vehicles and treatment plants, but after management study	
• Unsanitary pit latrine		Included in MPUWSP for five years	
• Frequent sewer blockage • Need to cover high density area • Poor operation of Kauma STP		Needs flow meter, laboratory equipment, and operation equipment of existing facilities, after capacity improvement	
• One treatment plant (Lumbadzi) is not working		Included in LCC's current budget in 2009/2010	

Source: JICA Study Team

Table 9 Basic Features and Major Current Constraints for Solid Waste Management Services

・ Total population of Lilongwe City	674,000	・ Collection (2007-08)	86 tons/d
・ Unit generation (2009 LCC estimate)	0.5 kg/c/d	・ Collection percentage	30%
・ Total City waste generation	335 tons/d	・ Disposal method	Open dump
		・ Disposal site location	Area 38/2

Constraints of Solid Waste Management	Remarks
• Weak institutional capacity • Lack of public awareness campaign • Most of the compactors and skip carriers are out of order • No tariff for residential customers • Inadequate industrial and medical waste collection	Needs institutional capacity development
• Collection rate is only 30% in average throughout the city. • No service to THA and informal housing • Unsanitary open dump lacking equipment, office, wears	Needs landfill equipment, collection vehicles, weigh-bridge and litter bins

Source: JICA Study Team

6.2 Urban Environmental Utility Development Plan

6.2.1 Water Supply System Development

6.2.1.1 Planning Concept

- LWB planned to serve 100% of the city area by 2030 (current water supply coverage is about 75%) by expanding individual connections and common taps instalment. However, the improvement of water loss is not identified in the LWB plan

- The future water demand is estimated on the basis of the socio-economic indicators projection in this Study. Total water demand is estimated comprising domestic/residential demand, public sector (office) demand, institutional demand, commercial demand, industrial demand and water system loss. The daily and hourly maximum water consumption ratio is set to be at 1.25 and 1.5, respectively.

6.2.1.2 Demand Projection

- There is no Malawi standard for unit consumption, either for residential or non residential areas. The current and proposed unit residential consumptions and main service type by area are given in Table 10.

Table 10 Unit Water Consumption Rate and Service Type by Area

Area Type	Current unit consumption	Proposed unit consumption (2030)	Current Main Water Supply Service	2030 Main Water Supply Service
Low density	150 lpcd	200 lpcd	House connection	House connection
Medium density	80 lpcd	150 lpcd	House connection	House connection
High rise flat	N/A	150 lpcd	New area type proposed	House connection
High density (HD)	25 lpcd	100 lpcd	- Current HD permanent mostly have house connections - Current THAs have yard connections and kiosks	- House connection - Yard connection / house connection
Quasi-residential	25 lpcd	50 lpcd	Current informal areas are mostly not served, few kiosks are available	Kiosks
Mixed use	N/A	150 lpcd	N/A	House connection

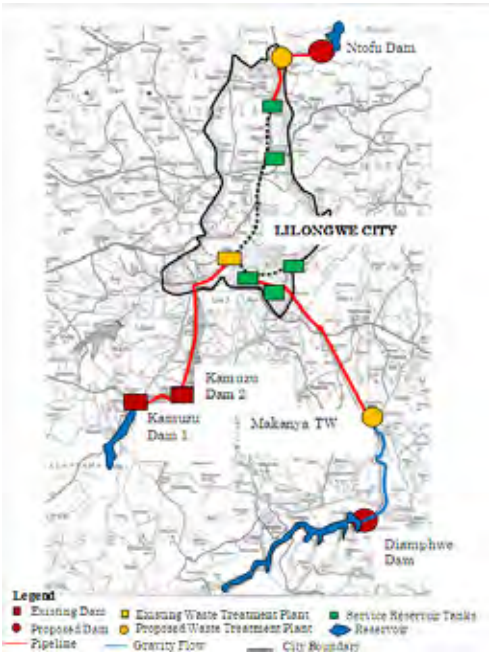
Note: lpcd (liter per man/day) Source: JICA Study Team

- Water demand in 2030 is estimated to be 210,000 m^3/day, out of which, the domestic water demand is about 145,000 m^3/day.

6.2.1.3 Development Concept for the Water Supply System

- **Development of dam/purification plant:** The maximum planned water supply volume from the two existing dams is 85,000 m^3/day. Thus, the shortfall in 2030 will be 125,000 m^3/day, for which new sources need to be secured. Similarly, the combined installed capacity of the two existing water treatment plants is 95,000 m^3/day, making the shortfall in 2030 to be 115,000 m^3/day, for which a new WTP needs to be constructed.

- **Facility development for improvement of service coverage**: To achieve the target of 100% coverage ratio, facilities such as 201,000 new service connections and 2,550 new kiosks must be provided. Adequate distribution plan is also required to sustain these new connections, including new service reservoirs and booster pumps.



Source: Based on TLWSP, 2002

Figure 18 Location of Water Supply Facility

- Necessary projects for the development of water supply system are shown in Table 11,

and the dam and purification plants with relevant facilities are presented in Figure 18.

- A feasibility study is now on-going for new source developments and a treatment plant under the WB-funded NWDP II. In addition, the service extension and development component and NRW reduction program are included in the ongoing EU-funded MPUWSP project.

Table 11 List of Water Supply System Development Projects

ID No	Project	Implementation Period			Remarks	Priority Project
		Short	Mid	Long		
WS1	Development of Diamphwe Dam as New Source				FS is on-going under NWDP-II (WB)	✔
WS2	Study on Development of Ntofu Dam					
WS3	Study on Comprehensive Groundwater Management					
WS4	Development of Water Treatment Plant			2nd Phase	FS is on-going under NWDP-II	✔
WS5	Extension and Development of Distribution System			2nd Phase		
WS6	ServiceExtension and Development				On-going under NWDP-II/MPUWSP(EU) for 5 years	✔
WS7	NRW Reduction Program				On-going under MPUWSP (EU) for 5 years	✔

Source: JICA Study Team

6.2.2 Sewerage and Sanitation System

6.2.2.1 Planning Concept

- Although the National Statistic Office reported that 80% of the population of Lilongwe City is receiving sanitary wastewater treatment services, the actual rate is 30% on the basis of the WHO standard. Therefore, the foremost target is to bring the entire population under a safe sanitation net, either by piped sewer, septic tank or sanitary latrine.

- Population density is the key parameter in determining the appropriate level of a sewage disposal system. Low population density areas should be excluded from the sewerage service area, which is predominantly applied to the high population density area. Development of sewerage system in the populated area is technically viable because of the effective collection of much wastewater and expansion of service coverage area. Wastewater generated in a low density area can be managed through on-site systems (septic tanks) at a much lower investment with equivalent health benefits. For populated areas where water supply is not available as house connection or where the present sanitation system is unsafe latrine, an intermediate system of sanitary latrine is proposed. Based on the above discussion, the proposed sewerage system applied by area is shown in Table 12.

Table 12 Proposed Sanitation Service Type by Area

Area Type	Current	Up to 2015	Up to 2020	Up to 2030	Beyond 2030
Low density	Septic tank	Continue	Continue	Continue	Review
Medium density	Septic tank/ Sewer	Sewer	Continue	Continue	Continue
High rise flat	N/A	Sewer	Continue	Continue	Continue
High density -Current permanent -New development -Current THA	 Septic tank/ Sewer N/A Unsafe latrine/ Sanitary Latrine	 Sewer Sewer Sanitary latrine	 Continue Continue Continue	 Continue Continue Sewer	 Continue Continue Continue
Quasi-residential	Unsafe latrine	Sanitary latrine	Continue	Continue	Sewer
Mixed use (except industrial area)	N/A	Sewer	Continue	Continue	Continue
Mixed use (industrial area)	N/A	Septic tank	Continue	Continue	Continue

Source: JICA Study Team

- The sewerage system is planned based on a mix of the new sewerage system and existing facilities. Current facilities shall be rehabilitated for maximum utilization of current assets. In the absence of a Malawi standard for influent and effluent quality, the design values used for the Kauma STP are adopted.

6.2.2.2 Demand Projection

- In 2030, 98% of the population will have access to safe sanitation by sewer, septic tank and sanitary latrine. Wastewater generation in 2030 is estimated at 121,000 m^3/day for the sewerage treatment plant. In 2030, about 54% of the population will depend on the sewerage system and on-site technologies like septic tanks (6%) and sanitary latrines (38%).

- **Sewerage/Sanitation demand:** The requirement for sewerage and sanitation development by 2030 is given in Table 13. It may be noted that the improvement of the existing sewage treatment plant and construction of new plant area are necessary due to the limited current operating capacity of the sewage treatment plant with 6,100 m^3/day. Other required infrastructures include sewer collectors, lift pumps, and collection and treatment facilities of septage from septic tanks and sanitary latrines. A strong institutional capacity backed by adequate skills base and strong legal authority is essential to deliver the service.

Table 13 Sewerage/Sanitation Demand in 2030

Category	Demand
Sewage treatment capacity	121,000 m^3/d
Number of Septic tanks	23,800
Number of sanitary latrines	150,000

Source: JICA Study Team

6.2.2.3 Development Concept of the Sewerage/Sanitation System

- **Priority projects:** The necessary projects related to the sewerage/sanitation sector plan are summarized in Table 14. Seven projects out of 12 projects in Table 14 are selected as the priority projects. On-going priority projects include i) preparation of the sewerage and sanitation master plan, ii) sanitation promotion campaign, iii) provision of safe latrine, iv) rehabilitation of the Lumbazi Sewage Treatment Plant. Priority projects i) – iii) are being conducted by NWSDP-II of WB and priority project iv) is scheduled to be implemented through LCC budget in 2010. In addition, the i) capacity development of LCC's sewerage service, ii) study on sewerage service tariff, and iii) study on on-site sanitation management are selected as the rest of the priority projects. Capacity development of LCC's sewerage service should be undertaken on the assumption that transfer of the task from LCC to LWB has been achieved and LCC's task will be limited to septic tank management. Figure 19 shows the location of the operating Kauma, and out of operation Lumbazi, sewage treatment plants.

Table 14 List of Sewerage/ Sanitation System Development Projects

ID No	Project	Implementation Period			Remarks	Priority Project
		Short	Mid	Long		
SS1	Preparation of sewerage and sanitation Master Plan	■			On-going under NWSDP-II(WB)	✔
SS2	Capacity building of LCA's sewerage service	■				✔
SS3	Tariff study and implementation	■				✔
SS4	Sanitation promotion campaign	■	■	■	On-going under NWSDP-II(WB) for 1st phase only	✔
SS5	Provision of safe latrine	■	■	■	On-going under MPUWSP(EU) for 1st phase only	✔
SS6	Study on on-site sanitation (OSS) management	■				✔
SS7	Implementation of OSS management		■			
SS8	Rehabilitation of Lumbadzi STP	■			On-going under LCA budget	✔
SS9	Extension of Kauma STP		■			
SS10	Up-gradation of existing STP			■		
SS11	Construction of additional STPs		■	2nd Phase		
SS12	Sewerage service extension		■	2nd Phase		

Source: JICA Study Team

Source: JICA Study Team

Figure 19 Location of Sewage Treatment Plant, Solid Waste Dumping Station

6.2.3 Solid Waste Management

6.2.3.1 Planning Concept

- This study targeted that waste collection services should be provided for all household governmental, educational, and private business activities by 2030.

- The current collection rate of waste (as of 2009) is 30% in terms of city average. LCC collects wastes from households in the low and medium density housing area, meanwhile the LCC periodically collects wastes through communal waste bin in the high density permanent housing areas. In the THA/informal settlement areas, no regular service for waste collection is done by LCC and illegal dumping is observed. These low collection rate of wastes should be urgently improved.

6.2.3.2 Demand Projection

- The basis of estimation for solid waste generation is shown in Table 15.

Table 15 Estimation Basis for Solid Waste Generation

No.	Category	Waste Type	Basis of Estimate for Demand Growth
1.	Domestic waste	Domestic waste	Population basis
2.	Other municipal wastes (OMW)	Commercial, industrial (non-hazardous) and institutional waste, street wastes, garden waste	Increase proportional to economic growth

Source: JICA Study Team

- It is assumed that the collection rate will be improved to 100% in 2030 for both the low/medium/high density residential areas and THA/informal residential settlements. Based on the estimated waste generation rate, targeted waste collection coverage, and planned population and economic growth, the future amounts of solid waste to be collected were projected as shown in Table 16.

Table 16 Future Amount of Solid Waste (to be collected)

(Unit: ton/ year)

Category	Current	2015	2020	2030
Domestic waste	16,700	32,700	111,000	340,000
OMW	14,700	35,200	66,000	150,000
Total	31,400	67,900	177,000	490,000

Source: JICA Study Team

- A new landfill site (final dumping site) will be necessary after 2025 when the present disposal area (25 ha) in Area 38 is fully used up. The location of the present landfill site is shown in Figure 19.

6.2.3.4 Solid Waste Management System Development

- **Solid waste disposal management project:** It is necessary at first to improve regular waste collection services to all households in its jurisdiction in order to conduct proper solid waste management. To attain a sanitary living environment, 15 projects concerning institutional enhancement, collection and transportation improvement, final disposal improvement, and waste reduction promotion, etc. are proposed as shown in Table 17.

- **Priority Projects:** The selected priority projects include i) capacity development of the institutional organization, ii) procurement of equipment for waste collection and transportation, iii) procurement of equipment for landfill management, iv) pilot project for composting at a community, and v) program for community activity for cleaning. Among these five priority projects, i) capacity development of the institutional organization is proposed as the most priority project, which involves the capacity improvement program for LCC on waste collection, final disposal, and waste reduction tasks. Procurement of waste

collection equipment is planned for skip carrier for THA and unplanned settlements, which are currently not benefitted by the waste management service of LCC. Procurement of heavy machines such as bulldozer is necessary in the final dumping site to carry out semi-sanitary landfilling by covering dumped garbage with earth. Moreover, the composting pilot project at a community and the program for community activity for cleaning are important to educate the residents.

Table 17 List of Solid Waste Management System Development Projects

Category	ID No	Project	Implementation Period			Remarks	Priority Project
			Short	Mid	Long		
Institutional enhancement	SW1	Capacity Development of institutional organization					✔
	SW2	Comprehensive master plan for solid waste management					
Collection and transportation improvement	SW3	Procurement of equipment for waste collection and transportation	1st phase	2nd phase	3rd phase		✔
	SW4	New maintenance workshop for SWM equipment					
	SW5	Privatization of waste collection service of residential waste					
	SW6	Privatization of waste collection service for THA, quasi-residential area					
Final disposal improvement	SW7	Procurement of equipment for landfill management					✔
	SW8	Construction of the engineered landfill site at the designated land					
	SW9	Construction of the engineered landfill at the new site					
Waste reduction promotion	SW10	Pilot project for composting at a community				On-going under UNDP	✔
	SW11	Promotion of composting at community level					
	SW12	Program for community activity for cleaning					✔
	SW13	Public enhancement for 3R (reduction, reuse and recycling)					
	SW14	Local Government Act to promote Sound Material Cycle Society					
Hazardous waste	SW15	Procurement and installation of treatment facility for infectious waste					

Source: JICA Study Team

7. Environmental Preservation and Development Plan

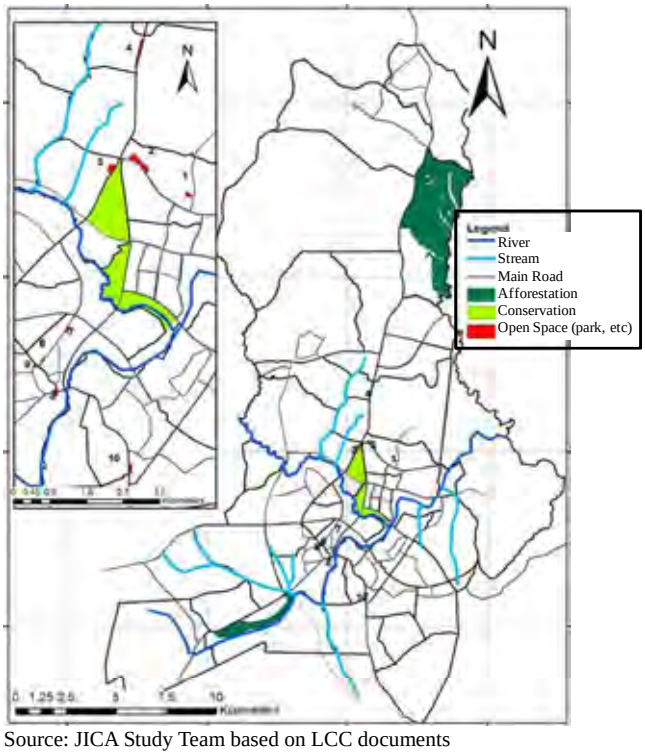
7.1 Planning Concept

- The concepts of environmental development are as follows:
  - Green space shall be positively reserved because it is an important recreation and relaxation facility in the city and it also contributes to the reduction of CO_2 and global warming.
  - Current reserved areas shall be reserved continuously in the future in compliance with the laws.
  - Afforestation shall be carried out especially in the designated afforestation areas. Said areas will be reserved and will not be subject to any development.
  - Parks shall be designated in the land use plan and will be developed in accordance with this master plan.

7.2 Environmental Development Plan

- **Afforestation:** Afforestation is a pressing issue in Lilongwe City where rapid deforestation occurs. Afforestation brings not only environmental benefit but also other positive impacts such as water resource preservation and landscape conservation. An afforestation project is planned in Area 45 and 54, as shown in Figure 20. The forested area will be about 1,500 ha.

- **Park:** Park development is also important to create attractive urban environment. This report proposes that park areas, neighbourhood parks and parks for children (ten in total) will be developed in the short term, in addition to afforestation and park development. It includes development and conservation of green areas along with rivers. These areas contribute to the conservation of natural environment and creation of a good city view. Figure 20 shows the afforestation, park development and natural green conservation areas.



Source: JICA Study Team based on LCC documents

Figure 20 Plans for Environmental Preservation and Park Development

Table 18 Projects for Environment Preservation

Sub-Programs	ID No	Projects	Implementation Schedule		
			-2015	-2020	-2030
Park and Green Development	EP 1	Park Construction (1 Area Park, 6 Neighborhood Park, 1 Children Park)			
Natural Greenery Preservation	EP 2	Afforestation of 1,520 ha Barren Land in Area 45 and 54 (Lumbazi)			
	EP 3	River Side Trees Rehabilitation			

Source: JICA Study Team

8. Capacity Development Plan

8.1 Governance of Urban Development

- **Absence of the City Councilors**: The Lilongwe City Council (LCC) consists of elected councilors of councilors and an administrative body providing public services. A country election has not been conducted for almost five years due to the lack of financial resources of LCC. This gives rise to the suspension of its decision-making authority because all legislations relating to its activities have not been enacted. The absence of the City Councilors brings about the unfavourable effects to the City's administration.

- **Capacity of the administration body**: The administration body comprising of nine departments has been constrained by a number of issues. The most serious one is the high vacancy rate situation in all departments, estimated at around 30% of the mid-professions. For instance, the three posts of chief engineers responsible for road, sewerage and construction have been vacant in the Civil Engineering Division under the Department of Engineering. The vacancy is also observed in the post of chief engineer responsible for solid waste management in the Department of Health and Social Welfare. The organizational structure of LCC has changed over time. It appears to create consistency in its problems in view of certain activities that call for comprehensive functional review in line with the strategic development plan of LCC. For instance, solid waste management should not always be under the Department of Health and Social Welfare. A supervisory post responsible for the operation of solid waste management is placed lower than a manager. Community development currently administered under the Department of Planning and Development should also be functionally reviewed. In September 2005, LCC has adopted an approved organizational chart, job descriptions and specifications that have been developed by the Ministry of Local Government and Rural Development. (MoLGRD) However, its implementation has not yet been carried out.

- **Urban plan and development management**: Urban plan and development in Lilongwe has been practiced without an effective land use plan since the previous 1986 land use plan lost effect in 2000. As a result, some plot/subdivision applications that do not accord to the 1986 zoning scheme have been approved at the discretion of persons in charge of approval. The more serious matter is the multiplicity of landlords (five stakeholders) administering the jurisdiction area of the City. For instance, plot/subdivision applications under the jurisdiction of Ministry of Land, Housing and Urban Development (MoLHUD) are submitted to the Plot Allocation Committee of the Department of Lands but scarcely coordinated with the Town Planning Committee of LCC which is primarily responsible for approval of all development applications. Furthermore, the existing Planning Standards and Guideline is utterly obsolete, thus, its amendment should be regarded as an urgent matter.

As a matter of fact, Blantyre City was engaged in the amendment of planning standards and guideline shortly after its master plan was completed in 2000. Lilongwe should follow the action taken by Blantyre. The Department of Planning and Development of LCC is responsible for development/building control suffers from the chronic shortage of manpower for survey and monitoring of development/building applications. At present, two staff members handle 70-80 applications per month. The multiplicity of landlords makes it more difficult for LCC to handle urban plan and development management.

- **Infrastructure development including operation and maintenance** : Infrastructure development in the City is a fragmented responsibility of several stakeholders. The central government is responsible for the main/arterial roads and water supply while LCC is for urban/community roads, sewerage and solid waste management. The decentralization policy appears to make local councils become implementers of infrastructure development. Nevertheless, the real situation is not the case. LCC is still dependent on the design and construction of urban roads, for instance. Although the major constraints are the lack of technical staff members and budget, LCC also appears to lack the will to empower its implementation capability. To date, neither the Civil Engineering Division nor the Solid Waste Management Division submits any proposal for improvement of public services. What can be done under technical and financial constraints would be, for instance, to prepare inventory data on urban/community roads and sewers/equipment for solid waste collection. Nevertheless LCC does not have such inventory data. This could be attributed to the lack of ownership or incentive (salary). LCC could require a comprehensive approach to solve this problem. A demarcation of job responsibilities among the relevant stakeholders, particularly with the Roads Authority and Lilongwe Water Board (LWB), shall be carefully taken into account.

- **Land management** : The Land Act (2000) empowers the state to control and own all types of lands in Malawi. In this sense, the Department of Lands as the central government should be in a position of administering land registration in public land. Actual situation is, however, the difference in land registration system accompanied by the multiplicity of landlords (MolHUD, LCC, Malawi Housing Corporation, Airport Development Limited and private sector). LCC has been granted a long term lease (199 years) on nominal charge (public freehold) since 1975. Then, it subdivides the traditional housing area (THA) plots for individual allocation under ownership certificates with monthly tenancy agreement. Public land comprising of low/medium density residential, commercial, industrial and institutional administered by the Department of Lands, has been subdivided for the development under leasehold titles that are usually 99 years or of shorter period. Leasehold titles subject to survey specification and cadastral mapping showing land title management are interpreted as the statutory land registration while the ownership certificates without leasehold titles are not. This is attributed to the failure of the enactment of 1998 Housing

Bill in which land tenure in THA and unplanned settlements were clearly spelled out. THA needs to be the statutory housing area in the future. A governance issue (who will be responsible for the management of unplanned settlements) on unplanned settlements shall be made clear in the future. Furthermore, urban plan needs improvement of living conditions in THA and unplanned settlements. New houses and community infrastructure improvement will be achieved through the use of fund generated from land adjustment measures in which adjusted plots are sold to private developers.

8.2 Capacity Development Plan

8.2.1 Capacity Development Plan

- Capacities are defined as institutional arrangements, organizational or functional capabilities, and individual capabilities for the attainment of good governance. Table 19 shows the capacity development plan in the following areas: i) institutionalization of urban development master plan, ii) capacity development for effective urban management, and iii) improvement of living environment in THA and unplanned settlements. The capacity development plan based on governance of urban development (8.1) is summarized below.

Table 19 Capacity Development Plan

Sub-Programs	ID No	Projects	Implementation Schedule		
			-2015	-2020	-2030
Institutionalization of urban development MP	CD 1	Legalization of the 2030 land use plan	■		
	CD 2	Review of the master plan		■	■
Capacity development for effective urban management	CD 3	Urban plan and development management	■		
	CD 4	Improvement of land registration	■	■	
	CD 5	Enhancement of LCC administration	■	■	
	CD 6	Institutional strengthening of priority projects	■		
Improvement of living environment in THA and unplanned settlements	CD 7	Strengthening of land registration system; property records, land survey	■	■	■
	CD 8	Fund creation for community development	■		
	CD 9	Improvement of public services by strengthening community-based organization (CBO)	■		

Source: JICA Study Team

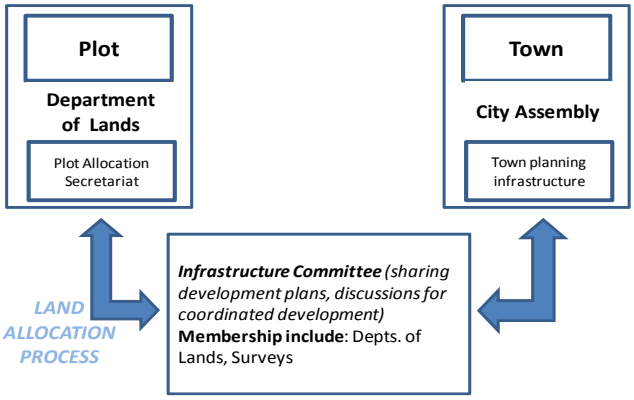
- **Legalization of the 2030 land use plan (CD 1)** : Since the 1986 zoning scheme terminated its effect in 2000, urban development management has been practiced without proper development control. It is therefore urgently required to legalize the 2030 land use plan. The procedures for legalization of the 2030 land use plan comprised of i) preparation of documents such as explanation of a new zoning scheme and mapping of

the 2030 land use plan, ii) approval of documents by the Town Planning Committee, and iii) final approval of the 2030 land use plan by the Minister responsible for town and country planning. Shortly after the completion of this master plan, the Planning and Development Department of LCC should start preparing all necessary documents.

- **Review of the master plan (CD 2)** : Compared to the Malawi Growth and Development Strategy (MGDS) planned on the mid-term basis, the LCC virtually operates urban development activities which are programmed into the City's budget on a per fiscal year basis. Urban plan and development management should also be conducted under a mid-term frame. There is currently no legal enforcement to review the city's plan on a mid-term basis in Malawi. To this end, a clause on the review of the plan shall be added to the existing Town Country and Planning Act. The alternative enforcement to review the master plan would be the executive order issued by the Chief Executive Officer (LCC). The latter binds LCC to secure budget for review of the master plan on a mid-term (five years) basis.

- **Urban plan and development management (CD 3)** : In order to solve the issues on urban plan and development management discussed in Section 8.1, this plan needs i) planning coordination over development applications among the relevant stakeholders, ii) improvement of the existing Planning Standards and Guideline in line with the 2030 land use plan, and iii) an enforcement system of development/building control and its implementation structure. Item i) means institutional arrangements for the relevant stakeholders such as multiple landlords administering jurisdiction area of the City, and central government responsible for infrastructural development. For instance, the Department of Lands (MoLHUD) is in a position of receiving development applications on low/medium density residential, commercial, industrial and institutional areas the department administers. Such applications are surveyed and approved by the Plot Allocation Committee under the department. Figure 21 shows the planning coordination process among the Plot Allocation Committee and the Infrastructure Committee, and the Town Planning Committee of the LCC. Institutional arrangement for the City's planning coordination was already spelled out in the existing Town Country Planning Act. Nevertheless, such a planning coordination has never been practiced in Lilongwe. This is mainly caused by the difficulty in sustaining multi-coordination system. Item ii) includes not only the new zoning categories but also new regulations for plot allocation and subdivision plan. For instance, the new regulations include a) low cost housing introduced in high density residential area, b) subdivision standards for public facility requirements such as road, minimum and maximum lot size, block length, water supply system and sewerage/drainage system. The existing Building By-Law is so old (1961) that it should be urgently improved in the light of the recent building standards and technology. It took only two years for Blantyre City to prepare the new building

regulations. Lilongwe is also requested to follow Blantyre's case. Item iii) puts an emphasis on the enforcement system of development control (site inspection→ approval→ monitoring). Planning coordination depends on how such an enforcement system works efficiently. The issue would be its implementation structure considering its limited number of staff members for development control. One idea would be designating staff members to monitor 12 zones (see Section 4.1.1) while site inspection is carried out by experienced staff members belonging to the headquarter of LCC.



Source：JICA Study Team

Figure 21 Planning Coordination between Relevant Stakeholders

- **Improvement of land registration (CD 4)** : This plan (CD 4) encompasses formulation of i) a land tenure system in THA to be converted into high density residential area, ii) the definition of quasi-residential area and its land tenure system together with who manages such a system, iii) the customary tenure system for traditional tribes preserved by the 2000 Land Policy, and iv) condominium regulations to be introduced in high rise flat/high rise commercial/mixed use of residential and commercial areas. A new housing bill should be enacted by the parliament to facilitate the above issues and the focal points could be THA and quasi-residential areas. A land tenure system in THA shall be converted from the current "certificate of title" to "leasehold title of 66 or 99 years" when THA is converted into high density residential area. Then, a land registration in THA shall be synthesized into the land tenure system administered by the Department of Lands. Quasi-residential areas shall be administered by LCC, with a land tenure system similar to the certificate of title which is currently prevailing in THA.

- **Enhancement of LCC administration (CD 5)** : The issues of LCC's administration are i) high vacancy rate in mid-professions, ii) the comparatively low qualification of supervisors responsible for actual operation of public services, resulting in low incentive, iii) inappropriate placement of some divisions in LCC's administration structure, iv) the standard of salary is lower than that of public servants of the national government, and v) few university graduates with qualifications in urban plan and engineering.

In view of these issues, LCC needs a comprehensive reform of its organizational structure. The following are the practical measures in the short-term frame:

1) The present position of deputy directors should be abolished. Instead, a division head responsible for the actual operation shall be equivalent to the position given to a deputy director. This could enhance motivation of staff members responsible for actual operation of public services.

2) LCC prioritizes recruitment of university graduates with qualifications in urban planning and engineering. If necessary, their initial standard salary should be raised as an incentive.

3) LCC should create a unit for unplanned settlements. LCC is currently ready for establishment of a unit for unplanned settlements in compliance with the "Improvement of Living Environment in Unplanned Settlements" to be financed (USD 2.5 million) by the Gates Foundation (its headquarters is located in Seattle in the USA).

The year 2010 could be the turning point in the urban plan of Lilongwe. It is desirable that LCC takes the step-by-step actions towards reforming its organizational structure. A more detailed reform plan of LCC's administration is presented in Chapter 10 of the main report.

- **Institutional strengthening of priority projects (CD 6)** : The priority projects are i) improvement of community roads, water supply and solid waste collection in THA and unplanned settlements, ii) improvement of urban roads, water supply and solid waste collection in low/medium/high density residential area, iii) infrastructure development (main roads and urban utilities such as sewerage treatment plants and water resource development), and iv) urban environment enhancement projects (parks, buffer zones of greenery). The capacities necessary for the operation/maintenance of infrastructure form part of planning, project management and maintenance/rehabilitation works. It is recommended that LCC strengthens the capacities of staff members in these areas of works. As a good example, the Blantyre City carries out a training program to upgrade the skills of their staff members in managing project funds and work progress. A data management could be one of the daily works that can be managed by LCC. For instance, an inventory data on urban/community roads under the jurisdiction of LCC could certainly facilitate preparation of their maintenance plan for urban/community roads. LCC also needs coordination with the Roads Authority and LWB in order to carry out maintenance works for sewerage and arterial roads.

- **Strengthening of land registration system; property records, land survey in THA and unplanned settlements (CD 7)** : CD 4 aims at the institutional design of land tenure systems in THA and unplanned settlements in the future. This plan (CD 7) meanwhile is intended to establish the data on individual plot in THA and unplanned settlements. Such data include cadastral mapping proving individual land title, topographic conditions/roads/utilities by block, and property records of leasehold/certificate of title holders. The implementation of CD 7 needs equipment and vehicles for land survey and computers for data management. LCC is requested to provide the budget for CD 7 which will be under the responsibility of the Planning and Development Department of LCC.

- **Fund creation for community development (CD 8)** : Community development in Malawi depends mostly on donors' funds. As a result, community development is not sustainable subject to the aid policies of donors. In order to solve such a constraint, a land adjustment measures for urban renewal in both THA and unplanned settlements could be the best approach to create another source of fund for community development. To this end, LCC should make a subdivision plan of priority blocks, subdividing them into candidate plots to be improved and plots for sale. Plots for sale should be sizeable enough for private developers to purchase for redevelopment. Fund generated through a land adjustment method can be pooled in a special account administered by LCC. Then LCC uses the fund to carry out improvement of living conditions in THA and unplanned settlements. Improvement of living conditions in THA and unplanned settlements includes priority projects discussed in the CD 6. Some of the residents in THA and unplanned settlements might sell their land titles for speculative investment, and hence, LCC must ban such actions.

- **Improvement of public services by strengthening CBO (CD 9)** : Many residents in THA and unplanned settlements are underemployed or informally employed, and thus, their living standards are extremely low. Improvement of living environment also needs increase of their income. The undertaking of public services by CBOs has been experimentally practiced in developing countries, e.g., in Kenya. This could contribute in increasing the community's income. Public services undertaken by communities are fee collection and construction works of water kiosks, and transportation of waste collection bins or drums to intermediate points where skips are placed. The undertaking of public services is alternatively interpreted as one method of privatization or subcontracting services to private organizations. This method could contribute to savings in LCC's budget that otherwise would be offered to plenty of unskilled staff members as a fixed cost. In this sense, CBO shall actively participate in priority projects such as those involving improvement of living conditions and operation/maintenance of

buffer greenery zones.

8.2.2 Implementation Schedule

- The capacity development plan shall be preferably implemented in a short-time frame (present-2015). The existing Steering Committee, headed by the CEO of LCC, is requested to continue working diligently in order to plan and manage implementation of the capacity development. The indicative implementation schedule is shown in Table 20.

Table 20 Implementation Schedule of Capacity Development Plan

Projects	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Legal/institutional arrangement					
CD 1 Legalization of land use	———				
CD 3 Planning system		———			
CD 3 Planning standards		———			
CD 3 Land use control			———		
CD 4 Land registration system					
a) Housing Bill		———			
b) Unplanned settlements		———	———		
c) High density residential				———	———
d) Customary tenure		———	———		
e) Condominium Bill				———	———
Implementation					
CD 7 Land record, mapping,etc			- - -	- - -	- - -
CD 8 Fund creation			———	———	
CD 9 CBO			———	———	
CD 5 Public administration					
a) New administration	———	———			
b) Streamlining of LCC		———	———		
c) Human resource development			- - -	- - -	- - -
CD 6 Implementation of projects					
a) Land use control			- - -	- - -	- - -
b) Road development	———				
c) Solid waste management and sewerage		———			

Source: JICA Study Team

- Since legalization of the 2030 land use plan is a prerequisite to the development/building control and plot allocation, this CD 1 project should be firstly be implemented immediately after completion of this master plan.
- Enhancement of LCC's administration will become the precondition for other projects so that the early implementation of CD 5 is desirable. It would need several years to carry out streamlining of LCC as well as human resource development.
- As to institutional strengthening of priority projects (CD 6), it is recommended that LCC should firstly focus on road section under the Engineering Department, then sewerage section under the Engineering Department and the cleaning section under the Health/Social Welfare Department. Strengthening of implementation structure of development control shall be implemented after its enforcement system is established

(CD 3).

- Implementation of urban plan and development management (CD 3) shall be divided into i) institutional design of planning coordination, ii) improvement of the existing Planning Standards and Guideline, and iii) enforcement system of development control.
- Project (CD 4) is the precondition for the project CD 7. LCC shall need coordination work with the MoLHUD for drafting of the new Housing Bill. It would need the mid-term period to implement the CD 7 project, and hence, its implementation shall be after 2015.
- Both fund creation for community development (CD 8) and improvement of public services by strengthening CBO (CD 9) are interpreted as the supporting projects for improvement of living conditions in THA and unplanned settlements. The need for both projects shall be taken into account within the short-term frame.

8.2.3 Implementation Method

- The implementation method of the capacity development plan for LCC is shown in Table 21. Urban plan and development management will be implemented through the technical assistance of a donor while improvement of living environment in THA and unplanned settlements shall be financed by the Gates Foundation. Implementation of priority projects shall be assisted by RA for road improvement and in-house consultant for solid waste management and sewerage management. Others will be implemented by LCC itself.

Table 21 Implementation Method for Capacity Development Plan

Project	Implementation Method
Legalization of the 2030 land use plan	LCC
Urban plan and development management	TA from a donor
a) Planning system	
b) Planning standards	
c) Land use/building control	
Land management (land tenure system and land registration system)	LCC
Improvement of living conditions in THA and unplanned settlements	Gates Foundation
a) Fund creation	LCC
b) Strengthening of CBO	LCC
Enhancement of LCC administration	
a) New administration	LCC
b) Streamlining of staff members	LCC
c) Human resource development	LCC
Implementation of priority projects	
a) Practice of development control	TA from a donor
b) Strengthening of road maintenance	RA
c) Institutional strengthening of the LCC for solid waste management and sewerage management	In-house consultant

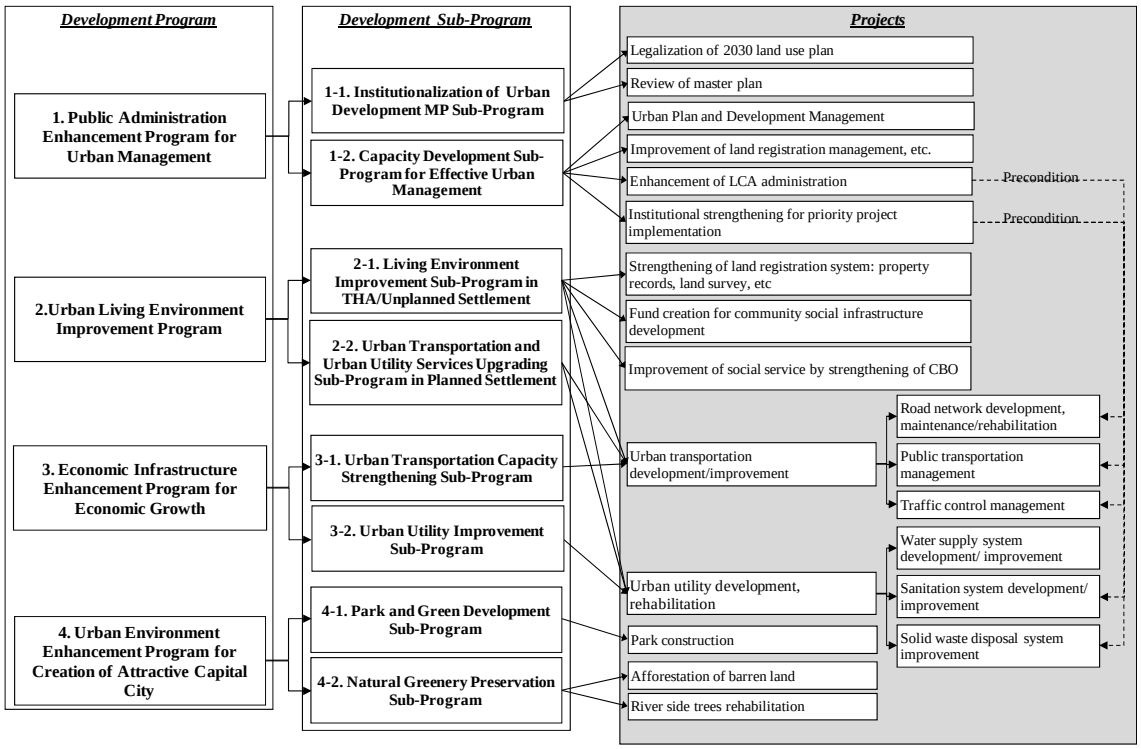
Source: JICA Study Team

9. Urban Development Program

9.1 Urban Development Program

9.1.1 Development Program

- Based on City Development Strategy, development programs and sub-programs of Lilongwe City to 2030 are set as shown in Figure 22.



Source: JICA Study Team

Figure 22 Necessary Development Programs for Lilongwe City

- The contents of each development program are as follows:

- Public Administration Enhancement Program for Urban Management

In order to achieve good governance in urban management, the program aims at capacity development on urban planning and its development management, mainly for LCC.

- Urban Living Environment Improvement Program

The program aims to improve the living environment in THA and unplanned settlement areas. It is also intended to improve public service and development of infrastructure in planned settlement areas.

- Economic Infrastructure Enhancement Program for Economic Growth

The program involves development of urban transportation and utilities infrastructure which are necessary for economic growth.

- Urban Environment Enhancement Program for Creation of Attractive Capital City

The program is intended for the development of rich natural environment and green zone preservation for improving the City's environment and landscape.

9.1.2 Sub-Programs

- The development programs consist of eight sub-programs. The contents of the sub-programs are as follows:

[Public Administration Enhancement Program for Urban Management]

- Sub-program for institutionalization of the Urban Development Master Plan

This sub-program consists of the following two projects:

i) Legalization of the 2030 land use plan: the long-term (2030) land use plan is a prerequisite of the other programs and sub-programs. After finalizing the master plan, LCC and the MoLGRD should legalize the 2030 land use plan.

ii) Review of master plan: For realizing review of master plan (in every five years), it is necessary to state in TCPA to have a legal binding force, and to make it compulsory through instruction from the mayor. LCC and the MoLGRD cooperate and review the master plan.

- Sub-program for Capacity Development for Effective Urban Management

This sub-program consists of the following four projects.

i) Urban planning and management: Planning coordination, planning standards and development regulation, which are based on new zoning, are important tasks for LCC (especially the leader on urban development management). For this capacity development, leadership by LCC and its institutionalization which supports the leadership are important.

ii) Improvement of land registration management: After legalization of the 2030 land use plan, it is necessary to officially clarify the land property and registration system on new residential land use, such as definition of 'quasi residential,' land property system and management body, property rights on apartments which are to be built in 'high rise flat area' and 'commercial and residential mixed area,' land property system when THA is included in high density residential areas, and conversion of rights from traditional land property to leasehold. Drafts on the new residential land use are under the responsibility of the MoLGRD, except the 'quasi residential area.' LCC is responsible for the 'quasi residential area.'

iii) Enhancement of LCC administration: Based on this master plan, it is important to first implement feasible measures. Assumingly, it takes ten years to implement fundamental reorganization of LCC; therefore, it is preferable to enhance the administration gradually.

iv) Institutional strengthening for priority projects' implementation: This project primarily aims at the empowerment of the Engineering Department for road development and sewerage treatment, and the Health and Community Services for solid waste collection, in the areas of planning, construction and maintenance.

[Urban Living Environment Improvement Program]

- Sub-program for Living Environment Improvement in THA and Unplanned Settlement

This sub-program consists of the following five projects;

i) Strengthening of land registration system and land use survey in THA and unplanned settlement areas: Based on the above mentioned 'Improvement of land registration management' project, this project streamlines data on THA and unplanned settlement areas. The data includes topography, roads, and utilities in each plot, house plot, and land property.

ii) Fund creation for community social infrastructure development: The source of fund is from profits from the sales of land to private sectors by land plot adjustment. The fund is used for developing infrastructure and utilities in THA and unplanned settlement areas.

iii) Enhancement of community organizations: Local community organization implements some of the infrastructure and utilities in THA and unplanned settlement areas.

iv) Urban transportation development/improvement: This project aims at developing and improving community roads

v) Urban utility development and rehabilitation: This project aims at developing water kiosks; providing safe latrine and promoting community activity for clean facilities in THA and unplanned settlements.

- Sub program for improving urban transportation and urban utilities in planned settlement

This sub-program consists of the following six projects.

i) Urban road construction, maintenance/rehabilitation

ii) Public transportation improvement (expansion of minibus depot, and improvement of minibus operations system)

iii) Traffic control management (formulation of traffic master plan, and networking pedestrian and cycle roads)

iv) Water supply system development and improvement

v) Sanitation system improvement
vi) Solid waste disposal system improvement

Finance, human resource and organizations of the city are the main constraints for implementing this sub-program. Therefore, cooperation with central government organizations (Road Authority, LWB, Ministry of Irrigation and Water Development) is indispensable. The problem is to secure a budget from cooperating organizations, which makes this sub-program available. For instance, the Road Department and the City implement development of the city roads, in accordance with the development of main roads (whose management is responsibility of the Road Authority). The Road Authority will provide financial assistance. Regarding public service done by the city only (e.g. solid waste management), it could be assumed that public private partnership (PPP) scheme will be adopted. It is necessary to achieve an approach which does not rely on city finance as much as possible. As an option, employing private companies could be considered for collecting service fees from beneficiaries.

[Economic Infrastructure Enhancement Program for Economic Growth]

- Sub-program for Urban Transportation Capacity Strengthening

This sub-program consists of the following projects:

i) Major road development (M1, ring roads and radial roads)
ii) Traffic control management (improvement of intersections and improvement of parking system)
iii) Improvement of Kamuzu International Airport (navigation system and baggage handling system)

Mitigation for congestion of roads in the center of the city (M1) is an urgent issue to be tackled. For the medium and long term, it is necessary to develop ring roads, improve intersections and introduce traffic sign boards, on a step by step basis. Furthermore, improving navigation system at Kamuzu International Airport is indispensable, being the gateway to Malawi.

- Sub-program for Urban Utility Improvement

This sub-program consists of the following projects:

i) Water supply system (dams, water treatment plants and water pipes)
ii) Sanitation system (existing sewage plants)

In response to the population increase in Lilongwe City (about 160 million in 2030), ensuring water resource and water treatment plants, and rehabilitation of existing sewage plants should be included in the national development plan, as these are vital in sustaining urban life functions. This sub-program is implemented basically under Lilongwe Water Board.

[Urban Environment Enhancement Program for Creation of Attractive Capital City]

-Sub-program for Park and Green Development

i) In order to improve the functions of the recreation and landscape facilities of the city, parks and green areas are developed.

-Sub-program for Natural Greenery Preservation

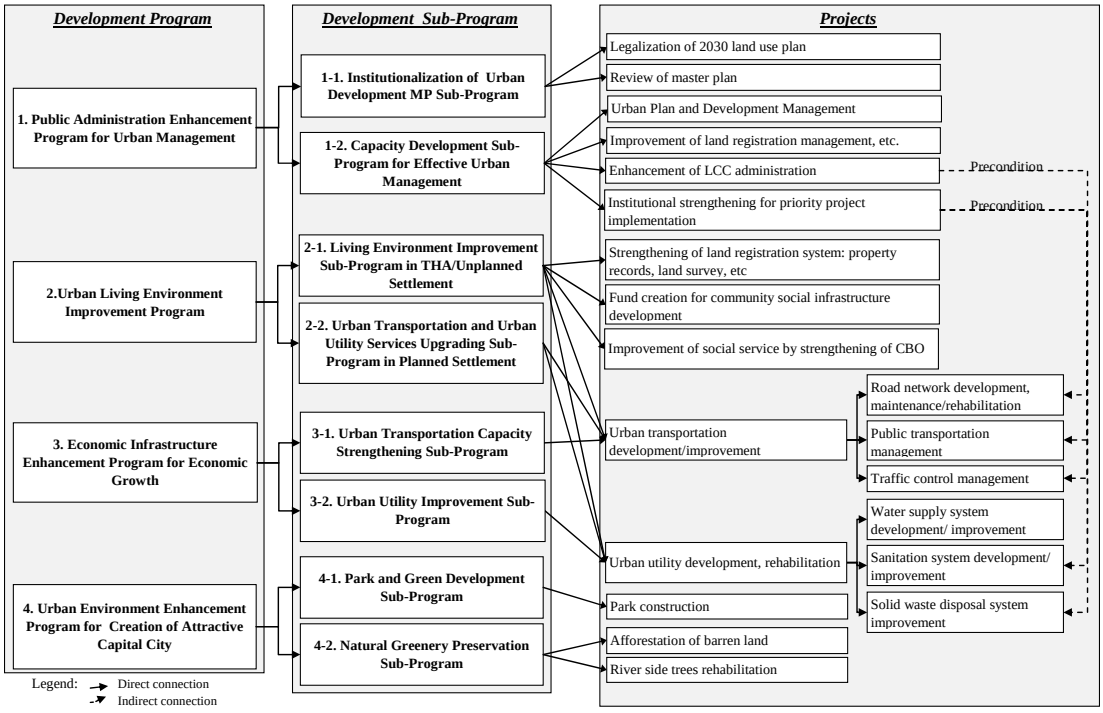
On the basis of the concept 'urban development with rich greenery,'this sub-program aims at enlarging the green space.

i) Forestation activities
ii) Tree planting and its operation along river sides

9.2 Project Plan

- This section is based on the development program and priority projects which are proposed in the respective sector plans (transportation, urban utilities, environment and capacity development). The priority projects are evaluated and selected considering five criteria namely, i) urgency, ii) feasibility, iii) cost-effectiveness, iv) consistency with land use plan, and v) environmental considerations.

- Figure 23 shows the correlation between the sub-programs and projects.



Source：JICA Study Team

Figure 23 Development Programs and Project Formulation

- The list of priority projects includes the implementation schedule, responsible organizations and implementation cost for each project, which is sorted according to development sub-programs, as shown in Table 21-24.

- The total project cost of the priority projects by 2030 is estimated to be about MWK 60 billion or USD 420 million. In particular, two programs on Urban Living Environment (MWK 36 billion) and Economic Infrastructure Enhancement (MWK 23 billion) share 98% of the total project cost. It is necessary to include some projects in the Malawi Growth and Development Strategy (MGDS).

Table 22 Priority Projects for Public Administration Enhancement Program

Sub-Program	Project	Implementation Schedule			Resp. Organization		Dev. Cost	
		-2015	-2020	-2030	Implem-entation	Ope./ mainte.	MKW billion	US$ million
1-1. Institutionalization of Urban Development MP Sub-Program	1-1 (1) Legalization of 2030 land use plan				LCA/ MoLHUD	-	0.004	0.03
	1-1 (2) Review of master plan		review	review	LCA	-	0.029	0.20
1-2. Capacity Development Sub-Program for Effective Urban Management	1-2 (1) Urban Plan and Development Management				MoLGRD/ LCA	-	0.401	2.80
	1-2 (2) Improvement of land registration management				LCA/ MoLHUD	-	0.009	0.06
	1-2 (3) Enhancement of LCA administration (New public administration, streamlining of LCA staff and HRD)				LCA	-	0.009	0.06
	1-2 (4) Institutional strengthening for priority project implementation				LCA	-	0.014	0.10
						Total	0.47	3.3

Table 23 Priority Projects for Urban Living Environment Improvement Program

Sub-Program	Project	Implementation Schedule			Resp. Organization		Dev. Cost	
		-2015	-2020	-2030	Implem-entation	Ope./ mainte.	MKW billion	US$ million
2-1. Living Environment Improvement Sub-Program in THA/Unplanned Settlement	2-1 (1) Strengthening of land registration system: property records, land survey, etc				LCA	-	0.014	0.10
	2-1 (2) Fund creation for community social infrastructure development				LCA	NGO	0.007	0.05
	2-1 (3) Improvement of social service by strengthening of CBO				LCA	CBO	0.007	0.05
	2-1 (4) Transportation development/improvement; Community road improvement in THA/unplanned settlement				MoLHUD/ LCA	MoLHUD/ LCA	3.468	24.20
	2-1 (5) Urban utility development, rehabilitation, expansion; water kiosk development, provision of safe latrine, composting & cleaning education in THA/unplanned settlement				MoIWD/ LWB/LCA	NGO	6.492	45.30
2-2. Urban Transportation and Urban Utility Services Upgrading Sub-Program in Planned Settlement	Urban transportation development/improvement							
	2-2 (1) Urban road development & maintenance and inventory database				LCA/RA	LCA/RA	12.210	85.20
	2-2 (2) Public transportation improvement (Expansion of Minibus Depot in Old Town, Review of Minibus Operation and Routes)				LCA	LCA/MOAM	0.115	0.80
	2-2 (3) Traffic control management establishment (Development of Safety Traffic Master Plan, Development of Safe Pedestrian Network, Development of Cycle Road Network)				LCA/ NRSCM	LCA	2.293	16.00
	Urban utility development, rehabilitation, expansion							
	2-2 (4) Water supply system development/ improvement (Service extension and development, NRW reduction program)				LWB/CBO	LWB/CBO	4.342	30.30
	2-2 (5) Sanitation system improvement (Preparation of sewerage and sanitation master plan, Sanitation promotion campaign, Study on on-site sanitation (OSS) management)				MoIWD/LCA	-	2.185	15.25
	2-2 (6) Solid waste disposal system improvement (Procurement of equipment for waste collection, transportation, dumping, pilot project for composting and community activity for cleaning)				LCA	LCA	5.059	35.30
						Total	36.19	252.6

Note: MoLHUD(Ministry of Land, Housing and Urban Development, MoIWD (Ministry of Irrigation and Water Development), NRSCM(National Road Safety Council of Malawi), CBO(Community based Organization),MOAM(Minibus Owners Association of Malawi)

Table 24 Priority Projects for Economic Infrastructure Enhancement Program for Economic Growth

Sub-Program	Project	Implementation Schedule			Resp. Organization		Dev. Cost	
		-2015	-2020	-2030	Implem-entation	Ope./ mainte.	MKW billion	US$ million
3-1. Urban Transportation Capacity Strengthening Sub-Program	Urban transportation development/improvement							
	3-1 (1) Major road development & maintenance (M1, Ring, Radial)	■	■	■	RA	RA	18.258	127.40
	3-1 (2) Traffic control management establishment (Improvement of Intersections, Improvement of Car Parking System)	■	■	■	RA/LCA	RA/LCA	0.688	4.80
	3-1 (3) Other transportation improvement (Modernization of Airport Navigation System, Improvement of Airport Baggage Handling System)	■			MoTPI	ADL	1.003	7.00
3-2. Urban Utility Improvement Sub-Program	Urban utility development, rehabilitation, and expansion							
	3-2 (1) Water supply system development/ improvement (Development of Diamphwe Dam as new source, Development of new water treatment plant)	■	■		MoIWD/LWB	LWB	3.153	22.00
	3-2 (2) Sanitation system improvement(Rehabilitation of Lumbadzi STP)	■	■		LCA		0.036	0.25
						Total	23.14	161.5

Note: MoTPI (Ministry of Transportation, Public Infrastructure), MoIWD (Ministry of Irrigation and Water Development), ADL(The Airport Development Limited), NRSCM(National Road Safety Council of Malawi)

Table 25 Priority Projects for Urban Environment Enhancement Program for the Creation of Attractive Capital City

Sub-Program	Project	Implementation Schedule			Resp. Organization		Dev. Cost	
		-2015	-2020	-2030	Implem-entation	Ope./ mainte.	MKW billion	US$ million
4-1. Park and Green Development Sub-Program	4-1 (1) Park construction (1 area park, 6 neighborhood park, 1children park)	■			LCA	LCA	0.006	0.04
4-2. Natural Greenery Preservation Sub-Program	4-2 (1) Afforestation of 1,520ha barren land in area 45 and 54 (Lumbazi)	■	■		LCA	LCA	0.100	0.70
	4-2 (2) River side trees rehabilitation	■	■		LCA	LCA	0.004	0.03
						Total	0.11	0.77
						Grand Total	59.9	418

Note：Exchange rates: USD 1.00 = MWK 143.31

Ministry of Land, Housing and Urban Development (MoLHUD), Ministry of Transportation, Public Infrastructure (MoTPI), Ministry of Irrigation and Water Development (MoIWD), National Road Safety Council of Malawi (NRSCM), The Airport Development Limited (ADL), Community based Organization (CBO), Minibus Owners Association of Malawi (MOAM)

Source：JICA Study Team

9.3 Efforts towards Realizing Programs

- During the fourth steering committee meeting on 15 June 2010, the JICA Study Team, MoLGRD, and LCC confirmed that the following projects are to be implemented within a short term development plan period:

  a) 1-1(1): Legalization of 2030 land use plan (by December 2010)

  b) 1-2(3): Enhancement of LCC administration (August 2010 – March 2011)

  c) 1-2(4): Institutional strengthening for priority project implementation, especially strengthening the engineering department of the city for the M1 road project in the center of the city. (August 2010 – March 2011)

  d) 1-2(1): Urban plan and development management (August 2011 – July 2013)

  e) 1-2(2) and 2-1(1): Land registration management, and formulation of cadastre in THA and unplanned settlement

  f) 2-1(4): Improvement of community roads in THA and unplanned settlement

  g) 2-1(5): Water kiosk, sewage tanks and education on water kiosk, sewerage tanks and solid waste disposal system

  h) 3-1(1): Project for M1 Road's urgent improvement

- In order to implement other programs and sub-programs, it is necessary to collaborate with other related organizations such as Road Authority, LWB and MoIWD. The steering committee needs to collaborate with central governments and inform them about the recommended inclusion of the other programs and sub-programs in the next MGDS (2012-2016).

10. Environmental and Social Consideration

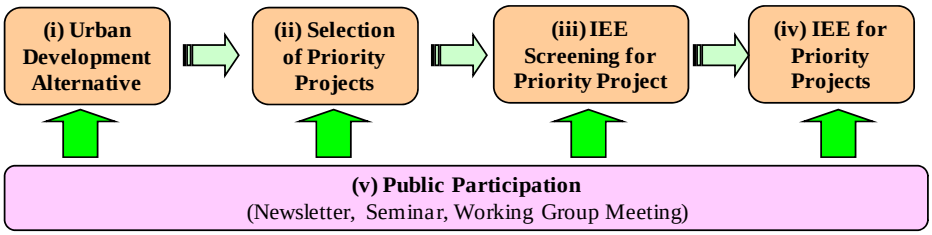
10.1 Environmental Consideration

- In this master plan study, the initial environmental examination (IEE) was made for the priority projects for urban transportation and utilities. Additionally, the strategic environmental study (SEA) was applied in the formulation of the master plan and its IEE-level study.

10.1.1 Strategic Environmental Assessment（SEA）

- According to the JICA Guidelines for Environmental and Social Consideration of 2004, SEA is defined as an assessment being made at the policy, planning and program levels rather than an EIA at the project level.

- In this master plan study, SEA was applied to the i) selection of the future urban structure, ii) selection of priority projects and iii) IEE for priority projects as shown in Figure 24.



Source：JICA Study Team

Figure 24 Structure of SEA

10.1.2 Priority project screening for IEE

- In compliance with the Guideline for EIA in Malawi, a total of 23 priority projects requiring project briefing documents are selected except the capacity development projects. Nineteen priority projects identified in the urban transportation sector fall into three categories: new road, expansion and improvement. Scoping matrix for IEE is prepared for each category while the remaining projects are outside the scoping because they are already on-going.

10.1.3 Results of IEE scoping

- There is no serious impact anticipated for all road projects according to the result of IEE. Nevertheless, full attention should be paid to the impact on resettlement/land acquisition, local economy and cutting street trees at the time of project design and implementation.

- Resettlement and land acquisition : Some resettlements and/or land acquisition shall be anticipated in the cases of new road construction and road expansion. According to an interview with one environmental planner in the Roads Authority, resettlement did not bring about serious problems in past projects. However, it is recommended to hold public consultation with project-affected persons including local residents, and make them understand the project benefits and impacts.

- Local economy : Impact on local economy caused by road construction would be the resettlement of illegal vendors located inside the right of way in the Old Town, and provision of car parking space for shops/companies. Public consultation with affected shops/business entities shall also be necessary.

- Cutting of street trees : Cutting of street trees may have some impacts on the natural environment and landscape. It was reported that there were complaints from local residents about cutting of trees in the course of road construction in Blantyre City. It is recommended that road design should consider preservation of existing street trees by adjusting road sections. In case cutting of street tress is unavoidable, new trees are to be planted.

10.1.4 Public Participation

Public participation was undertaken in the course of the master plan study, through the following means:

- Issuance of newsletters : Newsletters were issued two times in July and October, 2009 in order to disseminate information and updates on the progress of the study.
- Seminars : Seminars were held with participants from government agencies, donors, NGO, local representatives, members of the Parliament and traditional chiefs. The seminars were reported through mass media such as TV, radio, and newspapers as shown in Table 26.

Table 26 Outline of Seminars for SEA

Seminar	Date	Main Topics	Place	No. of Participants
1st Seminar	2nd October,2009 9:00-12:00	- Current situation and issues - Development framework - Development strategy	Pacific Hotel	60
2nd Seminar	26th January, 2010 9:00 – 13:00	- Draft land use plan 2030 - Sector development plan	Crossroad Hotel	70
3rd Seminar	10th March, 2010 9:00 – 13:00	- Priority projects - 2030 land use plan	Pacific Hotel	80

Source：JICA Study Team

- Working Group Meetings : Working groups were established in i) land use planning, ii) urban transportation, iii) urban utilities and iv) environment in order to invite a wide range of public stakeholders. Working group meetings have been held many times as shown in Table 27, to discuss necessary topics.

Table 27 Frequency of Working Group Meetings

Sector	Number of Meetings
Land use planning	14 times
Urban transportation	6 times
Urban utilities	8 times
Environment	2 times

Source: JICA Study Team

11. Recommendations

11.1 Background of the Study

Thirty five years after relocation of the capital from Zomba, the population of Lilongwe (about 670,000) exceeds that of Blantyre, a major city in the south part of Malawi. Lilongwe has now become the largest city in Malawi (according to the census in 2008). Lilongwe is expected to expand its economy and society as national economy performs steadily, based on strong economic growth and mineral resources development in the South African region.

In the meantime, the Lilongwe Outline Zoning Scheme, an urban plan for Lilongwe City, needs to be reviewed. Although the scheme was reviewed once in 1986, periodical reviews (expected every 5 years) were not implemented. Its target year, 2000, has already passed. Although it is planned in the scheme, urban development in the north part of the city did not materialize. Instead, the City has expanded to the south, southwest and west. Unplanned settlement areas also occupied by the poor have unexpectedly sprawled. It weakens urban transportation functions and thus, review of the existing urban plan becomes a pressing issue.

In this context, JICA undertook this study in close cooperation with MoLGRD, LCC and other authorities concerned, in order to realize appropriate land use plans and planned infrastructure development, and formulate a master plan for urban development targeted in 2030.

11.2 Development Issues

Urban development issues which Lilongwe City faces are as follows:

- The growing demand for residential lands accompanied by the increase in urban population in the City;
- Inefficiency in residential land use featured by large plot size per residence and one storey-houses in low density residential areas;
- Lack of government policy for industrialization and employment creation in connection with the increase in urban population;
- Risk of environmental degradation caused by the lack of policy for preservation of natural environment in the centre of the City;
- Poor living environment in THA and unplanned settlements;
- Expansion of unplanned settlements;

- Traffic congestion in the M1 road sections in the City Centre and Old Town, and insufficient services of public transportation,
- Insufficient level of urban utilities (water supply, wastewater treatment and solid waste management),
- Insufficient level of urban planning and development management administered by the relevant authorities, particularly the LCC.

11.3 Development Target

The development targets of Lilongwe City toward 2030 are set as below:

- Status as a major city of Malawi in South African Development Community (SADC)
- Capital city with social and economic development and environment conservation based on Malawi Vision 2020 and MGDS
- International gateway of Malawi to SADC

11.4 Development Framework

The population of Lilongwe City was about 674,000 as per the census year of 2008 and is estimated to increase to approximately to 1.6 million in 2030. The economically active population in the year 2030 would accordingly increase to 640,000 or about three times of the 2008 which is 210,000.

11.5 Urban Development Strategy

1) **Promoting effective land use:** Due to the present low density land use in the central areas of the Old Town and City Centre, urban concentration in these areas is expected to continue. This will positively benefit the efficient usage of urban infrastructure and the realization of a low-cost and effective urban development. However, in case the city's population increases to more than two to three million after 2030, adverse effects of traffic congestion, for instance, will be serious, causing irreversible damage to urban activities. The planned dispersion of the new city centre in a satellite development should be discussed as the city's development strategy sometime after 2030.

2) **Expansion of the existing industrial and logistics land use for economy promotion:** In order to secure job opportunities to accommodate increase in labour force, the business and commercial, manufacturing and logistics sectors should be enhanced. Expansion of the existing industrial land uses in the Kanengo area and new developments in the logistics/distribution industry along Nacala Corridor (under

development to serve as the South African Spinal Road) will contribute to the expansion of the formal sector employment in the City.

3) **Diversification of urban functions by developing commercial and business zones:** To diversify the urban functions of Lilongwe City as national capital, commercial and business zone of a high order, it should be developed through the utilization of vacant lands in the central area and reuse of urban factories' plots after their relocation. Development of an international tourism base near the international airport will be an opportunity to promote this diversified urban function.

4) **Improvement of living environment in THAs and unplanned settlements:** Poor living conditions in THAs and unplanned settlements should be upgraded to improve the urban environment in respect of urban amenity. Encroachment by unplanned settlements should be controlled through strict land use and building construction management to constrain further expansion of the poor residential environment.

5) **Conservation and utilization of existing green areas for formulating green area network and green buffer zone:** For the realization of eco-friendly urban development which balances natural environment preservation and urban development, the existing greenery resources, such as the nature reserves and waterfront greens in the central area, should be strictly protected. Regeneration of forests and development of parks should be actively implemented.

6) **Improvement of traffic transportation infrastructure and utility services:** To support the improvement of living environment and achieve economic growth in the City, infrastructure and utilities development should be accelerated.

7) **Improvement of urban management capacity:** To implement the development strategy above, capacity development of LCC concerning city planning, management, control of land use and building construction should be done.

11.6 Land Use Plan

11.6.1 Urban Structure

The urban development in Lilongwe has been concentrated in the Old Town area with the adjoining City Centre. On this basis, efficient usage of land and urban infrastructure in the central area should be challenged. An effective, albeit low-cost, urban development in the central area should be realized in the subsequent 20 years, until 2030.

Land use efficiency should be improved by introducing high-density commercial and

business land use in the central area. Meanwhile, residential areas will absorb the increasing population not only in the central area but also in the adjacent vicinities. In between the different land uses, reserved and agricultural greens should be utilized as buffer areas, forming the cluster shape land use to achieve a balanced development with environmental preservation and economic/social development.

11.6.2 Land Use Plan

The principles hereunder were applied in the land use plan formulation:

- Acceleration of densification in the Old Town and the City Centre areas
- Introduction of some indices on urban planning and building control to increase land use efficiency in the Old Town and City Centre areas
- Expansion of business and commercial, manufacturing and logistics sectors for the enhancement of urban economic development
- Development of commercial and business zones in order to realize diversified urban functions in the capital city
- Improvement of living environment in THA and unplanned settlement, and prevention of further encroachment by unplanned settlement through new land use zoning category and strict control on land use and building construction, and
- Preservation of the existing greenery resources and development of parks for realization of eco-friendly urban development

Institutional improvement for land use and building construction control is necessary as proposed hereunder for the implementation of the land use plan:

- Introduction of new zoning categories such as high-rise residential area and high-rise commercial area, where multi-storey buildings are to be built
- Lessen minimum housing lot size to densify low and medium density residential areas.
- Introduction of regulations such as building coverage ratio (BCR), floor area ratio (FAR), building height, building line setback, and mandatory provision for car parking.
- Current industrial zoning category will be divided into two categories, namely, heavy/large scale industry and light industry areas
- Promotion of mixed land use which enables construction of residential houses in high rise commercial and commercial area. This will ensure existence of night-time population (living population) in the City Centre areas, which is currently utilized

specifically for business and administrative land use

- In order to gradually legalize unplanned residential areas, 'quasi-residential' area should be introduced
- Introduction of various zoning categories such as forests, green preservation, park and recreation area, and natural open space

11.7 Urban Development Program for Lilongwe City

Four development programs with eight sub-programs are proposed hereunder to realize the urban development strategy and land use plan.

- Public administration enhancement program for urban management
  - Sub-program for institutionalization of urban development master plan
  - Capacity development sub-program for effective urban management
- Urban living environment improvement program
  - Living environment improvement sub-program in THA and unplanned settlements
  - Urban transportation and urban utility services upgrading sub-program in planned settlements
- Economic infrastructure enhancement program for economic growth
  - Urban transportation capacity strengthening sub-program
  - Urban utility improvement sub-program
- Urban environment enhancement program for the creation of an attractive capital city
  - Park and green development sub-program
  - Natural greenery preservation sub-program

The total cost for the implementation of the urban development program is estimated to be MWK 60 billion (equivalent to USD 4.2 billion or JPY 38 billion). Of this, MWK 36 billion is allotted for urban living environment improvement program, and MWK 23 billion for economic infrastructure enhancement program for economic growth.

Table 28 Estimated Costs for Development Programs

(Unit: MWK billion)

Program	Short	Medium	Long	Total
1. Public Administration Enhancement Program for	0.42	0.02	0.01	0.46
2. Urban Living Environment Improvement	9.71	9.99	16.48	36.19
3. Economic Infrastrucuture Enhancement Program	13.49	2.36	7.28	23.14
4. Urban Environment Enhancement Program for Creation of Attractive Capital City	0.06	0.05	-	0.11
Total (MWK billion)	23.69	12.43	23.78	59.90
Equivalent to USD million	165	87	166	418
Equivalent to JPY billion	149	78	150	377

Note: Exchange rate: USD 1 =JPY 90.14= Euro1.40 = MWK 143.31 (as of Feb. 2010)

Source: JICA Study Team

The following projects are selected and proposed as priority projects for the implementation of urban development programs.

i) **Public administration enhancement program:** legalization of this master plan, capacity development for LCC concerning urban planning and development management, and institutional strengthening for project implementation and management for LCC

ii) **Urban living environment improvement program:** institutional strengthening for LCC on land registration system, and fund creation for developing social infrastructure; Improvement of transportation and utilities in unplanned and planned settlements.

iii) **Economic infrastructure enhancement program for economic growth:** Improvement and development of urban transportation and utilities.

iv) **Urban environment enhancement program for creation of attractive capital city:** Development of parks and green areas, afforestation of barren land, and rehabilitation of river side trees.

The major implementing organization in-charge of the project will be LCC, the Roads Authority and LWB. LCC will play a significant role in the implementation of all programs, while the Roads Authority and LWB will implement major road network development and water supply system improvement, respectively.

11.8 Sector Development Plan

11.8.1 Capacity Development Plan

LCC is the major stakeholder to attain good governance of urban development in Lilongwe City. The capacity development required for LCC will be

- Legal and institutional arrangement for the new zoning scheme and infrastructural development, proposed by this study
- Improvement of LCC's administrative capacity in planning land use guideline and ensuring its effectiveness; land registration system in high-density areas (THA) and quasi-residential area; development of roads and utilities
- Development and enhancement of management capacity of LCC on improving living environment in THA and unplanned settlement.

As mentioned above, it is indispensable to improve, develop and enhance LCC's administrative capacity on legalization, infrastructure development and troubleshooting in THA and unplanned settlement.

11.8.2 Urban Transport Development Plan

Improvement in urban transport development is necessary for improving THA, unplanned settlement and other residential areas, and developing economic infrastructure for vitalizing industries. Formulated plans are as follows:

- To manage increasing traffic, it is necessary to improve public transportation and develop road network.
- In the central area of the City, current traffic volume has already exceeded the existing road capacity. It is necessary to improve the road network, especially to urgently increase M1 Road traffic width to four lanes, and to improve associated intersections.
- Inner and outer ring roads will be developed as detours for through-traffic. Entrance to the central area by cargo trailers coming from the Kanengo industrial area heading to the south direction, should be strictly controlled,
- Public transportation should be improved by means of reorganization of mini-bus routes, introduction of large bus services in the City, and expansion of the mini bus terminal. Construction of an integrated bus terminal should also be carried out.

11.8.3 Urban Utility Development Plan

Water demand of Lilongwe City in 2030 will increase to 210,000 m^3/day from the present 80,000m^3/day, in line with population increase and economic expansion. Formulated plans are as follows:

- The maximum water supply volume from the existing two dams located at the Lilongwe River is 85,000 m^3/day. Since the treatment capacity of their two plants is 95,000 m^3/day, a shortfall will soon happen. New water sources and new water treatment plants must be developed without delay.

- A feasibility study is now on-going for the new source development and water purification plant under the World Bank funded National Water Development Program (NWDP) II. In addition, the service extension and development component and non-revenue water reduction programs are included in the ongoing European Union funded MPUWSP project.

- Solid waste disposal work by LCC covers mainly low/medium density residential and commercial/business areas. Garbage collection rate in the City is around 30% on average, although there is minimal collection executed in high density residential areas and almost no collection from the unplanned residential areas. As the final dumping site has enough capacity, the problem to tackle within the short-term period is the improvement of collection rate. LCC has full responsibility for the solid waste disposal management; however, its capacity is insufficient. A strong institutional capacity supported with adequate skills base and vigorous institutional enhancement is essential to deliver better services.

11.8.4 Environment Development Program

For sustainable environment and its protection and management, formulated plans are as follows:

- Green areas shall be actively conserved because they are important for the recreation and relaxation facilities in the City, and for the reduction of CO_2 and global warming.
- Current natural sanctuaries shall be legally conserved in the future.
- Planting trees shall be actively implemented, and conserved from urban development.
- Parks which are planned in this master plan will be developed at an early stage.

11.9 Recommendations

1) Realization of the land use plan, development programs, and projects proposed in this study will be done on the basis of the empowerment of urban planning/management and project development/management capacity of LCC. Therefore, the capacity development program concerning legalization of the urban development master plan, urban planning and land development control and project management are issues to be tackled urgently and with highest priority.

2) Considering that urban development demand will increase drastically due to the rapid population increase and economic expansion in the near future, realization of urban development master plan and land use plan proposed in this study will be essential for the construction of attractive and functional urban environment. Thus, to assure the realization of this master plan, it should be legalized and formalized as a principal blueprint for the development of Lilongwe City.

3) Living environment and urban landscape of Lilongwe City will be degraded if the unplanned settlements occupying 40% of the residential area of the City is uncontrolled against continuous sprawl. By the empowerment of the management capacity of LCC concerning urban planning, land development control and building construction control, prevention of sprawl and upgrading of living environment of unplanned settlements are expected.

4) Regarding infrastructure and utility development, widening of major road networks in the central area of the City should be urgently conducted to decongest worsening road traffic situation. Institutional improvement of solid waste management and sanitary management by LCC will be the preconditions or at least should be simultaneously achieved as physical inputs.

5) Lilongwe City is a rare and precious case as the natural sanctuary is preserved in its central area. By preserving the natural environment continuously in conjunction with active afforestation and park/green development, creation of attractive urban environment will be effectively achieved.