Ministry of Environment, Science, Technology and Innovation (MESTI)

Town and Country Planning Department (TCPD)

THE STUDY

ON

THE COMPREHENSIVE URBAN

DEVELOPMENT PLAN

FOR

GREATER KUMASI

IN

THE REPUBLIC OF GHANA

FINAL REPORT

VOLUME 1

September 2013

Japan International Cooperation Agency (JICA)

ORIENTAL CONSULTANTS CO., LTD.

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ALMEC CORPORATION

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The Study on the Comprehensive Urban Development Plan for Greater Kumasi in the Republic of Ghana

Final Report

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List of Abbreviations

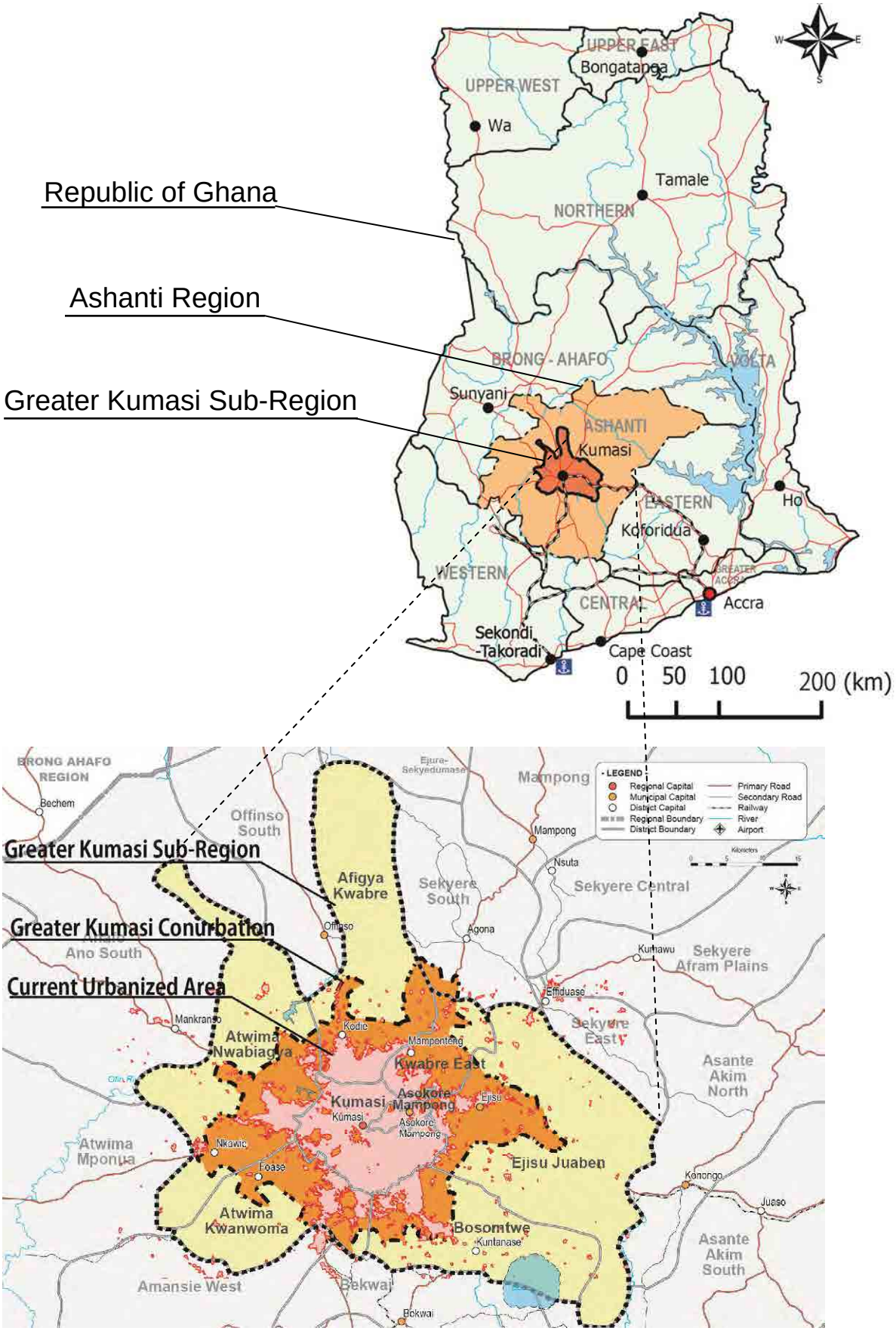
AFD	Agence Française de Développement French Agency for Development
AGI	Association of Ghana Industries
BOST	Bulk Oil Storage and Transportation
BPO	Business Processing Outsourcing
BRRI	Building and Road Research Institute
BRT	Bus Rapid Transit
BSP	Bulk Supply Point
CAP 84	Town and Country Planning Ordinance, 1945
CAPEX	Capital Expenditure
CBD	Central Business District
CHPS	Community-based Health Planning and Services
CSIR	Council for Scientific and Industrial Research
CWSA	Community Water and Sanitation Agency
DFR	Department of Feeder Roads
DMU	Drain Maintenance Unit
DPCU	District Planning Co-ordinating Unit
DUR	Department of Urban Roads
DVLA	Driver Vehicle License Authority
EAP	Economically Active Population
EC	Energy Commission
ECG	Electricity Company of Ghana
EHD	Environmental Health Department
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EPA	Environmental Protection Agency
EPO	Economic Planning Officer
FIRR	Financial Internal Rate of Return
FRHP	Focus Region Health Project
GCNet	Ghana Community Network Services Limited
GDP	Gross Domestic Product
GHA	Ghana Highway Authority
GHC	Ghana Cedi
GHS	Ghana Health Service
GIS	Geographical Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit German International Cooperation

GNFS	Ghana National Fire Service
GoG	Government of Ghana
GPRTU	Ghana Private Road Transport Union
GRDP	Gross Regional Domestic Product
GRIDCo	Ghana Grid Company Limited
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit German Technical Cooperation Agency
GUMPP	Ghana Urban Management Pilot Project
GWCL	Ghana Water Company Limited
HOV	High Occupancy Vehicles
HSD	Hydrological Service Department
IBRD	International Bank for Reconstruction and Development
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
IMF	International Monetary Fund
IPP	Independent Power Producers
IRI	International Roughness Index
ISPs	Informal Service Providers
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
KATH	Komfo Anokye Teaching Hospital
KBTH	Korle Bu Teaching Hospital
KCRP	Kumasi Composting & Recycling Plant
KMA	Kumasi Metropolitan Assembly
KMA-WMD	Kumasi Metropolitan Assembly Waste Management Department
KNUST	Kwame Nkrumah University of Science and Technology
KVIP	Kumasi Ventilated-Improvement Pit
LAP	Land Administration Project
LP	Local Plan
LUSPA	Land Use and Spatial Planning Authority (Proposed)
MCI	Millennium Cities Initiative
MDA	Ministry, Department and Agency
MDGs	Millennium Development Goals
MESTI	Ministry of Environment, Science, Technology & Innovation
MLGRD	Ministry of Local Government and Rural Development
MMDA	Metropolitan, Municipality, District Assembly
MMT	Metro Mass Transit

MoFEP	Ministry of Finance and Economic Planning
MOH	Ministry of Health
MOU	Memorandum of Understanding
MRF	Materials Recovery Facility
MSL	Mean Sea Level
MTDP	Medium Term Development Plan
MTHS	Medium Term Health Strategy
MTTU	Motor Transport Transit Unit
MVA	Mega Volt Ampere
MWRWH	Ministry of Water Resources, Works and Housing
NDPC	National Development Planning Commission
NGO	Non-Governmental Organization
NPV	Net Present Value
NRW	Non-Revenue Water
O&M	Operation and Maintenance
OASL	Office of the Administration of Stool Lands
OMC	Oil Marketing Companies
OPEX	Operating Expense
PAPs	Project Affected Persons
PCU	Passenger Car Unit
POW	Program of Work
PPMED	Policy, Planning, Monitoring and Evaluation Division
PSS	Primary Substation
PURC	Public Utility Regulator Company
RCC	Regional Co-ordinating Council
RED	Roads Economic Decision Model
ROW	Right of Way
RPCU	Regional Planning Co-ordinating Unit
S/W	Scope of Work
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SIP	Strategic Investment Programme
SP	Structure Plan
SRTM	Shuttle Radar Topography Mission
SSP	Strategic Sanitation Plan
SWM	Solid Waste Management
TCPD	Town and Country Planning Department
TDM	Transportation Demand Management

UESP	Urban Environmental Sanitation Programme
UGB	Urban Growth Boundary
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UPTUs	Urban Passenger Transport Units
VIP	Ventilated Improved Pit
VOC	Vehicle Operating Cost
VRA	Volta River Authority
WC	Water Closet
WD	Works Department
WEDC	Water, Engineering and Development Centre
WHO	World Health Organization
WPA	Wildlife Protected Area
WRC	Water Resources Commission
WRS	Water Resources Science
WTP	Water Treatment Plant

Study Area: Greater Kumasi Sub-Region



Photos of Greater Kumasi Sub-Region

Concentrated traffic around the central market in Kumasi: Kumasi City has been the centre of inter-regional and international logistics and trade

Kejetia Trotro Terminal in Kumasi City: Many routes of trotro (small bus) are available from this Terminal toward areas in Kumasi City and its surrounding areas.

Poorly developed road in a suburban area: In suburban areas of Greater Kumasi Sub-Region, rapid population increase has been taking place.

Deteriorated & unused railway line in Kumasi: Railway lines were constructed in the early 20th century connecting Kumasi with Accra, Tema and Takoradi.

Garbage illegally dumped in rivers and houses illegally constructed in their buffer zones along the rivers

Vehicle traffic on a national road (so-called Accra Road) entering into Kumasi City from the eastern side

The first stakeholder meeting for the spatial planning process for Greater Kumasi Sub-Region

The second stakeholder meeting for the spatial planning process for Greater Kumasi Sub-Region

Brief on the Study Project

Country: The Republic of Ghana

Study Project Name: Project on the Comprehensive Urban Development Plan for Greater Kumasi in the Republic of Ghana

Study Project Period: January 2012 to September 2013

Executive Agency: Ministry of Environment, Science, Technology and Innovation (MESTI)

Implementation Agency: Town and Country Planning Department (TCPD)

Study Area: The Study covers the Kumasi metropolitan area and its surrounding seven districts, namely Afigya-Kwabre District, Kwabre East District, Ejisu-Juaben Municipality, Asokore-Mampong Municipality, Bosomtwe District, Atwima-Kwanwoma District and Atwima-Nwabiagya District. Kumasi City and these adjoining districts are defined as the Greater Kumasi Sub-Region.

Objectives of the Project:

- To formulate a Sub-Regional Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region.
- To formulate a Sub-Regional Structure Plan (SP) to guide the development and/or redevelopment of the urbanizing portion of the Greater Kumasi Sub-Region, which is defined as the Greater Kumasi Conurbation.
- To formulate an implementation plan for the Greater Kumasi Sub-Regional SDF and SP.
- To carry out relevant technology transfer to Ghanaian counterparts through the Study.

Scope of the Project:

The Scope of the Study Project includes the following items:

- Present situation analysis
- Formulation of a future vision for the Greater Kumasi Sub-Region
- Identification of overall development objectives
- Formulation of development strategies for the Greater Kumasi Sub-Region
- Formulation of the Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region
- Formulation of the Structure Plan (SP) for the Greater Kumasi Conurbation
- Formulation of Sub-Regional Infrastructure Sector Plans and Programmes
- Implementation Plan of the SDF, SP and Sub-Regional Infrastructure Plans
- Capacity Development Programme for Spatial Development Planning and Implementation
- Strategic Environmental Assessment for the SDF, SP and Sub-Regional Infrastructure Plans

Executive Summary

1. Background

Kumasi is the capital city of Ashanti Region. Kumasi City (Kumasi metropolitan area, KMA) had a population of approximately two million in 2010. The Greater Kumasi Conurbation, which covers Kumasi City and its surrounding urbanizing portion of adjoining districts, had a population of 2.46 million in 2010. Kumasi is an important commercial centre for the regional economy. Kumasi also has the role of the transport and logistics centre for international distribution networks covering the surrounding landlocked countries, such as Burkina Faso, Mali and Niger.

In recent years, the urban environment has deteriorated due to lack of public services and extreme congestion in the city centre, as well as in suburban areas. These problems have arisen due to the rapid population increase in Kumasi City and urban sprawl in suburban areas beyond the border of Kumasi City.

In Ghana, the Town and Country Planning Department (TCPD) has worked on establishment of a new Land Use & Spatial Planning Law, under which spatial plans and socio-economic development plans are to be formulated in an integrated manner. Under the new spatial planning system, spatial plans (spatial development frameworks and structure plans) should be formulated at the national, regional, sub-regional and district levels so that planning and coordination between different levels and a holistic approach to urban development and environmental issues become possible.

2. Present Situation and Issues

Population Increase in Kumasi City and Urban Sprawl beyond the Border of Kumasi City: Unbalanced Provision of Basic Infrastructure and Weak Enforcement of Land Use Regulations

From 1984 until 2010, Kumasi City showed a very high population increase with an average annual rate of over 5.6%. The population of Kumasi City increased from 490,000 in 1984 to 1,170,000 in 2000 (increase of 680,000). From 2000 to 2010, Kumasi's population increased by a further 860,000 to reach 2 million.

Spatially urbanized areas have expanded beyond the boundary of Kumasi City into adjoining areas. The population of the Greater Kumasi Conurbation covering Kumasi City and surrounding urbanized areas was 2.46 million in 2010.

From 1984 to 2000, an extremely rapid increase in population took place in both Kumasi City (5.63% per annum) and its surrounding districts (4.24% per annum). On the other hand, from 2000 to 2010, while the rate of population increase continued to be very high within Kumasi City (as high as 5.69% per annum), that of the surrounding districts slowed down to an annual average rate of 2.16% per annum. As a result, a loose and low-density urban sprawl extends along a 30 km radius from the

centre of Kumasi.

This excessive concentration and continued high increase in the rate of population in Kumasi City can be explained by both the underdeveloped basic infrastructure in suburban areas outside Kumasi City and the high concentration of urban functions and public infrastructure/services in Kumasi City. Moreover, the existing system of layout plans and land use regulations has not been able to effectively control the urban sprawl.

Uncertain Ability of Economic Growth of Informal Sector

Kumasi appears to be economically prosperous supported by highly active commerce, logistics and car repair and other small manufacturing sectors, while it is the centre of regional government and finance in the Ashanti Region. However, the majority of these economic sectors are informal. They have relatively low productivity and weak potential for growth. Moreover, in the last ten years, the growth of the manufacturing sector in the Ashanti Region has been stagnant, while other regions, such as Brong Ahafo, Volta, Central and Eastern Regions, have largely increased their economically active population in the manufacturing sector.

Considering the rapidly increasing urban population and the necessity for receiving the continued influx of migrants from the northern areas, it is necessary for the Greater Kumasi Sub-Region to keep providing job opportunities for these people. For this purpose, it is essential for the Greater Kumasi Sub-Region to revitalize formal economic sectors including manufacturing and knowledge sectors and to create an effective link between informal and formal sectors.

Inefficient Utilization of Space: Underdeveloped Urban Function in City Centre and Suburban Areas

While the population increase continues in Kumasi City, many old compound houses remain in Kumasi's central areas, occupying prime lands in the city centre. These lands should be used to expand the Central Business District (CBD) and upgrade the urban function of Kumasi City Centre. These lands are also suitable for accommodating mid-rise housing. These are some examples of the inefficient utilization of urban space.

The transportation modes connecting Kumasi City Centre and suburban areas are only vehicles on roads and tro-tros (small-sized vans). There are no modern high-capacity public transportation modes to integrate the central area with suburban areas. Moreover, there are not enough modern commercial facilities in suburban areas. As a result, sparse residential development has taken place alongside the radial roads. This is another example of inefficient spatial utilization.

By 2033, a population of 5.5 million will reside and work in the Greater Kumasi Conurbation. In order to accommodate this large urban population, the provision of efficient transportation and functional urban centres is essential to induce and support residential areas and economic activities in suburban areas.

Underdevelopment of Economic Infrastructure and Underutilization of Human Resources to Support Economic Development

The revitalization of the economic sector including manufacturing requires infrastructure, such as roads, electricity and water. Therefore, at the first stage of revitalization of industries, it is useful for Greater Kumasi to take advantage of the unused lots available in the existing Kaase Industrial Area, which already has this infrastructure. At the second stage, it is necessary to make a solid effort to establish the Inland Container Depot (ICD) and Technological Park (export processing zone) planned in Boankra, as soon as possible, to instigate private investment promotion.

For revitalization of the economic sector, it is essential to utilize available human resources, such as researchers and students of KNUST and other advanced research institutes. It is important to make an effective link between the economic sector and these universities and research institutes.

Heavy Traffic Congestion in Kumasi: Serious Weak Point for Transport and Logistics Centre

An important transport corridor connecting the southern area and northern area goes through Greater Kumasi. Since Kumasi is located in the central area of Ghana, it plays the role of transport and logistics centre not only for the Ashanti Region, but also as a gateway to the northern area of Ghana.

However, Kumasi City has suffered from traffic congestion in its central area, similar to cases in most large urban areas. Heavy traffic congestion has been observed on the Inner Ring Road, which was constructed as a bypass.

To sustain the roles as a gateway and transport/logistics corridor, it is necessary for the Greater Kumasi Sub-Region to construct another ring road (Outer Ring Road) to prevent trucks from travelling through the city centre. Furthermore, it is important to utilize the Outer Ring Road not only to strengthen the bypass transport function, but also to promote the development of urban centres and residential areas in suburban areas.

3. Comprehensive Urban Development Plan for Greater Kumasi

The Comprehensive Urban Development Plan for Greater Kumasi is composed of the following plans and programmes:

- Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region
- Structure Plan (SP) for the Greater Kumasi Conurbation
- Infrastructure Sector Plans and Programmes
- Implementation Plan for the Greater Kumasi Sub-Regional SDF and Conurbation SP, as well as Sub-Regional Infrastructure Plans
- Capacity Development Programme for Spatial Development Planning and Implementation

The Greater Kumasi Sub-Region administratively covers Kumasi City and its

adjoining seven districts. The Greater Kumasi Sub-Region covers both urban and rural areas. The areas of the urbanized and urbanizing portion radiating out from Kumasi City within the Greater Kumasi Sub-Region are defined as the Greater Kumasi Conurbation.

The SDF for the Greater Kumasi Sub-Region is shown by diagrams to show the spatial structure of the sub-region, as well as by statements of development strategies. On the other hand, the SP for the Greater Kumasi Conurbation is shown by general land use plans to designate land uses to guide district-level SDFs and SPs, and by statements of actions to implement development strategies, including programmes and projects.

4. Vision

In the consultation with stakeholders, the following future vision for the Greater Kumasi Sub-Region has been identified:

"The Greater Kumasi Sub-Region will become a pioneer to transform the current economy to a vibrant, modernized and diversified economy including commerce, logistics, manufacturing and knowledge-based industries, by creating a liveable, sustainable and efficient urban space, while maintaining the historical and cultural aspirations of the Ashanti Region."

5. Goals

Considering current issues and expected roles for the Greater Kumasi Sub-Region, the following goals are clarified to pursue the vision above:

- To revitalize economic sectors by promoting the development of formal economic sectors, as well as modernization of informal sectors.
- To efficiently and effectively utilize the space available within the Greater Kumasi Sub-Region both by developing suburban areas and by enhancing urban functions of the central area of Kumasi.
- To develop infrastructure and services to support and promote socio-economic development and spatial development.

6. Socio-Economic Framework

In 2010, the population of the Greater Kumasi Sub-Region was 2.46 million. In 2033, its population is expected to reach 5.5 million. On the other hand, the number of jobs in the Greater Kumasi Sub-Region was 1.14 million in 2010, and is expected to reach 2.74 million in 2033.

7. Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region

Socio-Economic Development Policies for the Greater Kumasi Sub-Region

The overall strategies for medium and long-term socio-economic development are to focus on the following sectors:

- Investment in the manufacturing and knowledge sectors
- Modernization of small-scale commerce, logistics, car repairing services and small-scale machine manufacturing
- Creating an effective link between these sectors

Spatial Development Strategies for the Greater Kumasi Sub-Region

Considering the expansion of urbanization beyond the border of Kumasi City and the continuing rapid population increase in the Greater Kumasi Sub-Region, it is necessary to widely distribute urban functions outside Kumasi City within its adjoining urbanizing areas. At the same time, it is essential to enhance the advanced urban function of the central part of Kumasi City by expanding the CBD and improving infrastructure.

For this purpose, it was proposed to transform the existing mono-centric spatial structure centring on Kumasi City into a multi-nucleus spatial pattern with suburban centres. In actuality, in the stakeholder consultation, a multi-nucleus spatial pattern was preferred.

However, considering the practical difficulty to create such a decentralized spatial pattern, a combination of the spatial multi-nucleus structure and urban corridors are proposed as the spatial development strategies for the Greater Kumasi Sub-Region. In order to achieve this proposed spatial pattern, infrastructure development, BRT establishment and land use plans and regulations should be implemented in an effectively integrated manner.

Development Strategies for the Greater Kumasi Sub-Region

A diagram showing the future spatial structure was prepared for the Greater Kumasi Sub-Region considering the socio-economic development policies and spatial development strategies.

In order to transform the existing mono-centric spatial structure to a decentralized one, and to encourage revitalization of industries, it is necessary to promote the following development strategies for the Greater Kumasi Sub-Region:

1) To distribute industrial areas in suburban areas by developing industrial parks to accommodate formal economic sectors and provide employment opportunities in response to the future large population increase.

2) To distribute/decentralize commercial/business/service functions to suburban areas by developing urban centres in suburban areas to increase residential

populations in suburban areas.

3) To restructure and expand the central area of Kumasi City to upgrade the urban functions of Kumasi City Centre.

4) To widen major radial roads not only to induce decentralization of urban functions to suburban areas from Kumasi City Centre, but also to achieve stronger integration between the central and suburban areas.

5) To establish Bus Rapid Transit (BRT) routes on major radial roads and to develop an Outer Ring Road to promote the development of residential areas and urban centres in suburban areas.(Although railway does not play an important role in urban public transportation by 2033 or so, the BRT dedicated lanes could be a good base for future development of rail-based public transportation in the very long term beyond 2033.)

6) To promote development of multi-storey housing in the central area of Kumasi City Centre by urban renewal measures for restructuring and enhancement of the urban functions of the Kumasi City Centre, and near urban centres in suburban areas to support the development of urban functions in suburban areas.

7) To designate and utilize urban growth boundaries and control the official approval of layout plans (or local plans) to guide suburban housing development towards desirable areas.

8) To designate and develop open spaces, river buffer zones and conservation areas to promote recreational activities and healthy lifestyles, as well as to improve the urban environment and amenities.

9) To implement other strategies for aspects of tourism, mining, health, education and rural development

8. Structure Plan for the Greater Kumasi Conurbation

General Land Use Plan for the Greater Kumasi Conurbation

Following the spatial structure and spatial development strategies proposed by the SDF for the Greater Kumasi Sub-Region, a general land use plan for the Greater Kumasi Conurbation has been created. This general land use plan is important and useful to guide the formulation of not only district-level SDFs and SPs, but also sub-regional-level infrastructure sector plans.

The major characteristics of the general land use plan are as follows:

- Expanded CBD in Kumasi City Centre (within the Inner Ring Road)
- Sub-centres at major junctions along the Inner Ring Road
- Mixed development areas allowing multi-storey buildings to accommodate commercial/business and residential areas
- Higher-density residential areas (both low-rise and mid-rise housing) outside the

Inner Ring Road and within the proposed Middle Ring Road
- Low-density residential areas outside the proposed Middle Ring Road
- Mixed development areas consisting of commercial/business and residential land uses) in suburban centres and district centres, allowing multi-storey buildings
- Industrial areas outside the proposed Outer Ring Road and along the major radial roads to accommodate formal industrial sectors
- Conservation areas covering immediate catchment areas of existing and proposed dams for conservation and future development of water resources

Urban Growth Management

An urban growth boundary is proposed for urban growth management in suburban areas. The proposed urban growth boundary extends up to 25 km from Kumasi City Centre along major radial roads, and is set partly along the proposed Outer Ring Road (at about a radius of 15~18 km from the city centre). Inside the urban growth boundary, urban development is promoted by providing basic infrastructure with priority. On the other hand, outside the urban growth boundary, layout plans (or local plans) for new area development (new subdivisions) should not be approved in principle.

9. Priority Programs and Projects

Priority Strategic Programmes for Urban and Industrial Development

To implement the socio-economic development policies and spatial development strategies, the following priority strategic programmes for promoting integrated urban and industrial development have been formulated:

- Programme for Investment Promotion for Greater Kumasi
- Programme for Revitalization of Kaase Industrial Area
- Programme for Development of Boankra Industrial-Logistics Centre
- Programme for Development of Kumasi-Ejisu Urban Corridor
- Programme for Redevelopment of Kumasi City Centre
- Programme for Development of New Towns
- Programme for Modernization of Informal Sectors

Programmes and Projects for Infrastructure Sectors

Sector plans and programmes for the following seven infrastructure/services sectors have been formulated for the Greater Kumasi Sub-Region:

- Transportation
- Water Resources
- Water Supply
- Liquid Waste Treatment
- Drainage
- Solid Waste Management
- Electricity Supply

Priority Projects for Infrastructure Development

The provision of infrastructure/services is essential for urban and economic development. The following infrastructure/services projects have been selected out of the formulated sector programmes:

- Outer Ring Road Project
- Middle Ring Road Project
- Project for Introduction of Type B Bus and Establishment of BRT System
- Feasibility Study on Water Resources Development for Greater Kumasi Sub-Region
- Project for Expansion of Water Supply Capacity of Barekese Water Treatment Plant
- Project for Effective Use of Existing Distribution Pipes Project
- Project for Development of Septage Treatment Ponds in Adjoining Districts/Municipalities within Greater Kumasi Sub-Region
- Expansion of Asafo Simplified Sewerage System for CBD Area
- Project for Solid Waste Management Improvement in MDAs Adjoining KMA within the Greater Kumasi Sub-Region
- Project for Replacement of Small-Sized Wires and Deteriorated Equipment, and Realignment of Distribution Lines

10. Implementation Plan

In Ghana, the capacity of the regional government for implementing development plans is limited due to a lack of adequate planning systems and development budget. To promote the implementation of the formulated spatial development plans for the Greater Kumasi Sub-Region, it is necessary to make the following special institutional arrangements.

- To establish a “regional platform” consisting of various actors under the Regional Planning and Coordinating Unit (RPCU) to promote the implementation of the Spatial Development Plan for Greater Kumasi.
- The National Development Planning Commission (NDPC) and the Town and Country Planning Department (TCPD), which will be restructured into a Land Use and Spatial Planning Authority (tentative name) after the Law of Land Use and Spatial Planning passes, should plan a key coordinating role at the national level.
- The national-level infrastructure agencies in charge of the proposed Outer Ring Road and water resources development should play a key role in utilizing and maintaining the Comprehensive Urban Development Plan for Greater Kumasi because these two projects are very important for the Greater Kumasi Sub-Region. The Department of Urban Roads is in charge of the Outer Ring Road and Ghana Water Company Limited (GWCM) is responsible for water resources development for the water supply.

11. Capacity Development Programme

A capacity development programme for those who are engaged in spatial development planning and implementation has been prepared. The major objective of the capacity development programme is to enable planning officers and others to utilize the Comprehensive Urban Development Plan (including SDF, SP and sub-regional infrastructure sector programmes) to make an effective and sustainable impact from the plan. The programme is composed of sub-programmes targeted at the following five major groups:

- Planning officer and others who work for national-level planning institutions
- Planning officers and others who work for regional-level physical (or spatial) planning institutions
- Planning officers and others who work for district-level physical (or spatial) planning institutions
- Citizens including traditional chiefs (who are traditional owners of lands)
- Teachers and researchers at universities and polytechnic institutes

12. Recommendation

Based on this JICA Study on the Comprehensive Urban Development Plan for Greater Kumasi, the following are recommended for implementation of the Plan:

- The Ashanti Region Regional Co-ordinating Council (RCC) should proceed with the process for official approval of the Master Plan as an official spatial plan document, together with other related agencies.
- After receiving official approval by the RCC of Ashanti Region, the Master Plan should be sent to the National Development Planning Commission (NDPC) so that necessary coordination can be done including incorporation of various important proposals of the Master Plan into the national-level mid-term development policy and mid-term sector development plans, as well as the district-level mid-term development plans.
- At the regional level, the RCC should establish a regional platform under the Regional Planning Coordinating Unit (RPCU) to promote implementation of the Master Plan and conduct the following activities:
  - Activities to appeal to national-level infrastructure sector agencies for implementation of priority projects
  - Activities for attracting private investment in accordance with the Master Plan
  - Formulation of district-level SDFs and SPs, and enforcement and implementation of land use regulations following the district-level SDFs and SPs

The major parts of the Master Plan for Greater Kumasi are the sub-regional level SDF and SP. The sub-regional level SDF is mentioned in the draft Law on Land Use and Spatial Planning. However, the role and contents of the sub-regional level SP

have not been clarified in the draft Law. Under these circumstances, it is strongly recommended to clarify the official and legal position of the sub-regional SP so that the sub-regional SP could be used to guide the formation of district-level SDFs and SPs.

Conclusion

The Comprehensive Urban Development Plan for Greater Kumasi, formulated by the JICA Study Project, is composed of the following plans and programmes. This set of plans and programmes is called the Master Plan for Greater Kumasi or the Master Plan.

- Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region
- Structure Plan (SP) for the Greater Kumasi Conurbation
- Infrastructure Sector Plans and Programmes
- Implementation Plan for the Greater Kumasi Sub-Regional SDF and Conurbation SP, as well as Sub-Regional Infrastructure Plans
- Capacity Development Programme for Spatial Development Planning and Implementation

The Master Plan has been completed through technical examination by the national-level TCPD and the Ashanti regional-level TCPD under the direction of the Regional Co-ordinating Council (RCC), the Ministry of Environment, Science, Technology & Innovation (MESTI), the Ministry of Local Government and Rural Development (MLGRD), and the National Development Planning Commission (NDPC). The study project has been monitored, guided and supported by organizing meetings of the technical and steering committees, whose members are representatives of national ministries, regional departments and local governments.

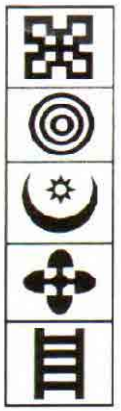
The study for formulating the Master Plan was initiated in January 2012 based on the agreement on the collective formulation of the Master Plan among Kumasi City and its adjoining six districts, namely Afigya-Kwabre District, Kwabre East District, Ejisu-Juaben Municipality, Bosomtwe District, Atwima-Kwanwoma District and Atwima-Nwabiagya District. Later, in early 2013, Asokore-Mampong Municipality was created out of the Kumasi Metropolitan area. Therefore, a total of seven MMDAs have been involved in the planning process and are covered by the Master Plan. These seven MMDAs compose the Greater Kumasi Sub-Region.

In the planning process for the Master Plan, six rounds of stakeholder consultative meetings (covering both regional and district levels) were conducted not only to collect various local information/knowledge and opinions, but also to present and discuss the concepts, proposals, spatial plans and projects being prepared in the course of formulating the Master Plan.

The Master Plan is comprehensive and integrated with respect to contents and characteristics. The items and sectors covered by the Master Plan are numerous and complicated. However, it is considered that the effective and timely implementation of the selected seven priority strategic programmes for urban and industrial development, as well as the ten priority infrastructure projects will initiate self-sustaining growth of the economic sectors and the transformation of the spatial structure of the Greater Kumasi Sub-Region in the medium and long terms.

Many of the proposed priority programmes and projects in the Master Plan are not new and have been discussed and planned for long time. The new aspect of the Master Plan is the emphasis on the linkage between revitalization of industries, transformation of the spatial structure and infrastructure development.

The social-economic and spatial development for the Greater Kumasi Sub-Region including the Greater Kumasi Conurbation is very important because of the large population and the potential for contribution to national economic development. It is worthwhile to mobilize public and private investment to revitalize the economic sector, develop infrastructure and transform the spatial structure. This revitalization will become possible through making a concerted effort towards spatial and socio-economic development in accordance with the Master Plan for Greater Kumasi.



PART I

Introduction

Chapter 1 Introduction

1.1 Background

Kumasi is the capital city of Ashanti Region. Kumasi City (Kumasi Metropolitan Assembly, KMA) has a population of approximately 2.0 million. Kumasi has been a commercial centre of the regional economy. Kumasi also has been playing the role of the transport and logistics centre for international distribution networks covering the surrounding landlocked countries, such as Burkina Faso, Mali and Niger.

In recent years, the city environment has deteriorated resulting in extensive urban sprawl, lack of public services and extreme congestion in the city centre. These problems have arisen due to rapid population increase in Kumasi City and its suburban areas. Therefore, the improvement of urban infrastructure, such as road networks, water supply and sewage systems and solid waste management, has become a pressing issue, which requires concerted actions of not only Kumasi but also its surrounding districts.

Despite this serious situation, no comprehensive and systematic efforts have been made at coping with those problems partly due to the absence of a sub-regional development plan for Greater Kumasi as a whole. Limited governmental capacity at the district level, including insufficient budgets, is also a hindrance to actions for problem solving.

For sustainable development of a key centre of the economy, transport and logistics not only for Ashanti Region, but also for economic development of the nation, mid-term and long-term comprehensive development plans are required for Greater Kumasi Sub-Region. Furthermore, the formulation of land use plans and sector development plans in line with the sub-regional strategic plan are also necessary.

In Ghana, the Town and Country Planning Department (TCPD) has been working on establishment of a new Land Use & Planning Law, under which spatial plans and socio-economic development plans are to be formulated in an integrated manner. The new law and new spatial planning system is to replace the “Town & Country Planning Act”.

Under the new spatial planning system, spatial plans (spatial development frameworks and structure plans) should be formulated at the national, regional, sub-regional and district levels so that planning and coordination between different levels and a holistic approach to urban development and environmental issues

becomes possible.

Based on the background mentioned above, the Government of Ghana has submitted a request to Japan International Cooperation Agency (JICA) for provision of a technical assistance project for formulating a Comprehensive Urban Development Plan for Greater Kumasi, in accordance with the New Spatial Planning System, as well as TCPD's capacity development concerning spatial planning.

1.2 Goals of the Study Project

The goal of the Project, which is to be attained during and after the Project, is to formulate a Comprehensive Urban Development Master Plan for Greater Kumasi Sub-Region.

The goal of the Project, which is to be attained by utilizing the proposed plan, is to contribute to the promotion of efficient and effective development of the Greater Kumasi Sub-Region.

1.3 Objectives of the Study Project

As stipulated in the Scope of Work (S/W) for this Study, which was signed between GOG and JICA on the 9th August 2011, the objectives of the Project are as follows:

- To formulate a Spatial Development Framework for the Greater Kumasi Metropolitan Area,
- To formulate a Structure Plan to guide the development and/or redevelopment of the Greater Kumasi Metropolitan Area,
- To formulate implementation and management plans for the Structure Plan, and
- To carry out relevant technology transfer to Ghanaian counterparts through the Study.

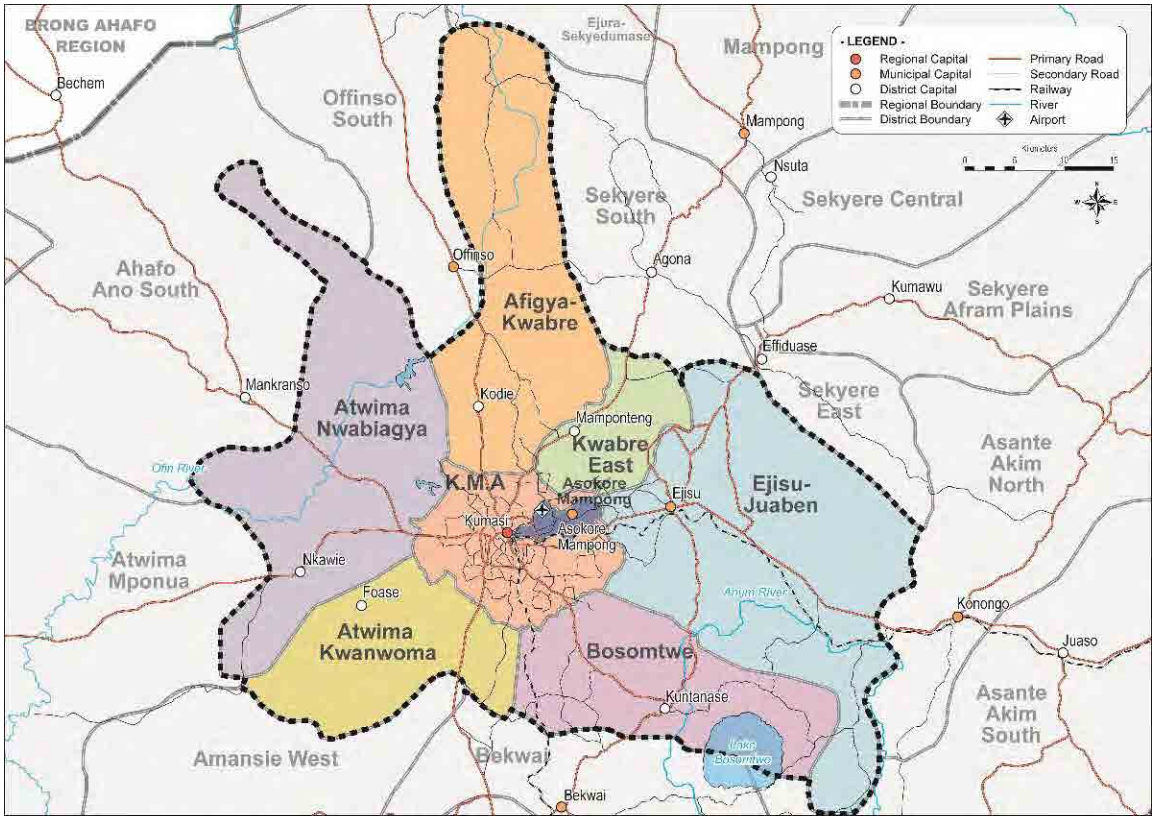
By reviewing the discussions held for determining the Scope of Work for this Study, the JICA Study Team defined the objectives of the Project as follows:

- To formulate a Sub-Regional Spatial Development Framework for the Greater Kumasi Sub-Region,
- To formulate a Sub-Regional Structure Plan to guide the development and/or redevelopment of the part of the Greater Kumasi Sub-Region[1], which is subject to urbanization from Kumasi City,
- To formulate implementation plan for the Sub-Regional Structure Plan, and
- To carry out relevant technology transfer to Ghanaian counterparts through the Study.

[1] According to the Technical Note signed between the TCPD and the JICA Study Team on August 16th, 2012, the planning area for the Structure Plan for KMA and its adjoining urbanizing areas within the Greater Kumasi Sub-Region is called "Greater Kumasi Conurbation."

1.4 Study Area

The Study covers Kumasi Metropolitan Assembly and its surrounding 7 districts, namely Afigya-Kwabre District, Kwabre East District, Ejisu-Juaben Municipality, Asokore-Mampong Municipality, Bosomtwe District, Atwima-Kwanwoma District and Atwima-Nwabiagya District. These districts are defined as the Greater Kumasi Sub-Region. The total area is approximately 2,850 km^2. See Figure 1.4.1.



Source: JICA Study Team

Figure 1.4.1 Study Area: Greater Kumasi Sub-Region

1.5 Executive Agency, Implementing Agency and Other Counterpart Agencies

The Executive Agency for this Project is the Ministry of Environment, Science, Technology & Innovation (MESTI).

The Implementing Agency for this Project is the Town and Country Planning Department (TCPD) of the Ministry of Environment, Science, Technology & Innovation (MESTI).

In addition to the TCPD, this Project is conducted with Ashanti Regional Co-ordinating Council (RCC) under direction of Ministry of Local Government and Rural Development (MLGRD), National Development Planning Commission (NDPC), Ministry of Finance and Economic Planning (MoFEP).

Other counterpart agencies for this Project are those agencies whose representatives are members of Steering Committee and Technical Committee for this Project.

1.6 Phases of the Project

The planning process of this Project is composed of the following four phases.

Phase 1: Analysis of Present Situation, Setting of Vision, Formulation of Basic Development Policies and Spatial Development Strategies

Phase 2: Formulation of a Spatial Development Framework for the Greater Kumasi Sub-Region, Formulation of a Structure Plan for the Greater Kumasi Conurbation and Formulation of Infrastructure and Services Sector Plans for the Greater Kumasi Sub-Region

Phase 3: Formulation of a Comprehensive Urban Development Master Plan for the Greater Kumasi Sub-Region, including Implementation Plan and Capacity Development Programme.

Phase 4: Preparation of the Final Report

The study results of each phase is compiled in the following study reports:

- Progress Report: Study results of Phase 1
- Interim Report: Study results of Phase 2
- Draft Final Report: Study results of Phases 1, 2 and 3
- Final Report: All study results of all phases

1.7 Organization of Final Report

The objectives for preparing the Final Report are two-fold:

- To record the study activities in Phases 1, 2, 3 and 4.
- To present a Spatial Development Framework for the Greater Kumasi Sub-Region, a Structure Plan for the Greater Kumasi Conurbation and Infrastructure and Services Sector Programme for the Greater Kumasi Sub-Region, Implementation Plan, Capacity Development Programme and Strategic Environmental Assessment.

The Final Report is organized into the following seven parts:

Part I: Introduction

Part II: Present Situation of Ghana, Ashanti Region and Greater Kumasi Sub-Region

Part III: Spatial Development Framework (SDF) for Ashanti Region

Part IV: Spatial Development Framework (SDF) for Greater Kumasi Sub-Region

Part V: Structure Plan (SP) for Greater Kumasi Conurbation

Part VI:	Infrastructure Sector Plans and Programmes for Greater Kumasi Sub-Region
Part VII:	Implementation Plan
Part VIII:	Capacity Development Programme for Spatial Development Planning and Implementation
Part IX:	Strategic Environmental Assessment on Spatial Development Framework (SDF) and Structure Plan for Greater Kumasi Conurbation

Chapter 2 Planning Approach and New Spatial Planning System for Ghana

2.1 Planning Approach

The spatial planning study was conducted based on the following approaches:

- Formulation of a Sub-Regional Development Master Plan seeking Economic Development, Social Development and Environmental Conservation
- Formulation of Sub-Regional Spatial Development Framework (SDF) and Structure Plan (SP) based on the New Spatial Planning System of Ghana
- Planning Process based on Stakeholder Consultation

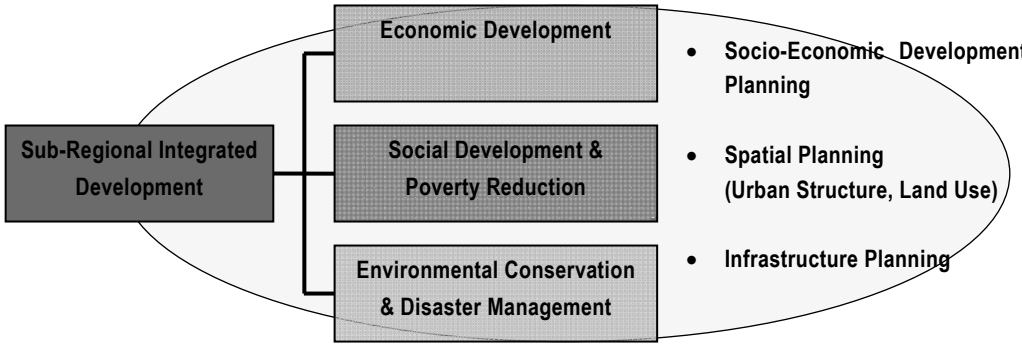
2.1.1 Formulation of a Sub-Regional Development Master Plan seeking Economic Development, Social Development and Environmental Conservation

A master plan for development of Greater Kumasi Sub-Region was formulated seeking the following three aspects:

1) Economic Development,
2) Social Development & Poverty Reduction, and
3) Environmental Conservation & Disaster Management.

"The Comprehensive Urban Development Master Plan" is a spatial development plan combined with infrastructure and services development plans, with clear orientation to socio-economic development[1] and paying attention to environmental conservation & disaster management. In this sense, the master plan would be a tool for making an effort at integrated development for Greater Kumasi Sub-Region covering these three aspects.

[1] Under the current planning system in Ghana, socio-economic development plans and spatial development plans have been prepared independently of each other or without relation to each other.



Source: JICA Study Team

Figure 2.1.1 Major Aspects in Master Planning for Sub-Regional Development

National visions/goals and sector objectives are identified by reviewing existing policy and plan documents in order to understand major directions and policies of regional-level socio-economic and spatial development.

In the existing development planning system, socio-economic development plans are to be formulated only at the national level and district level. Neither regional nor sub-regional level plans for socio-economic development are to be formulated. Therefore, there is a relatively large gap in terms of scale and scope between national development plans and district development plans.

Not only for Kumasi, but also for Accra and Sekondi-Takoradi, urban agglomerations are physically expanding beyond their central cities (metropolises). These urban agglomerations occupy not only central cities but also adjoining municipalities and districts, which constitute a sub-region.

As a result, sub-regional levels are significant for consolidating socio-economic development plans and infrastructure sector development plans for Greater Kumasi, as well as for environmental conservation planning.

The sub-regional level urban agglomerations, such as Accra, Kumasi and Sekondi-Takoradi, are also important for national economic development. Major infrastructure for promoting economic development for these sub-regional urban agglomerations requires allocation from central government's sector budgets, as well as donors' financial assistance.

In these points, the formulation of a sub-regional master plan for Greater Kumasi is very significant and meaningful.

2.1.2 Formulation of Sub-Regional Spatial Development Framework (SDF) and Structure Plan (SP) based on the New Spatial Planning System of Ghana

(1) Two Types of Spatial Plans

The following two spatial plans for Greater Kumasi Sub-Region were formulated in accordance with the new spatial planning system prepared Ghana[2].

- Spatial Development Framework (SDF) for Greater Kumasi Sub-Region
- Structure Plan (SP) for Greater Kumasi Conurbation

The Sub-Regional SDF is situated under the Regional SDF and the National SDF. The Greater Kumasi Sub-Regional SDF is to guide not only the SP for Greater Kumasi Conurbation, but also district SDFs within Greater Kumasi Sub-Region. The SP for Greater Kumasi Conurbation is to guide the district-level SDFs and SPs.

The SDF is the spatial strategy for achieving defined social, economic and environmental objectives and policies. The SDF is an indicative plan showing expected development in the next fifteen or twenty years. The SDF is to guide the formulation of structure plans and local plans by providing the parameters for structure plans and local plans.

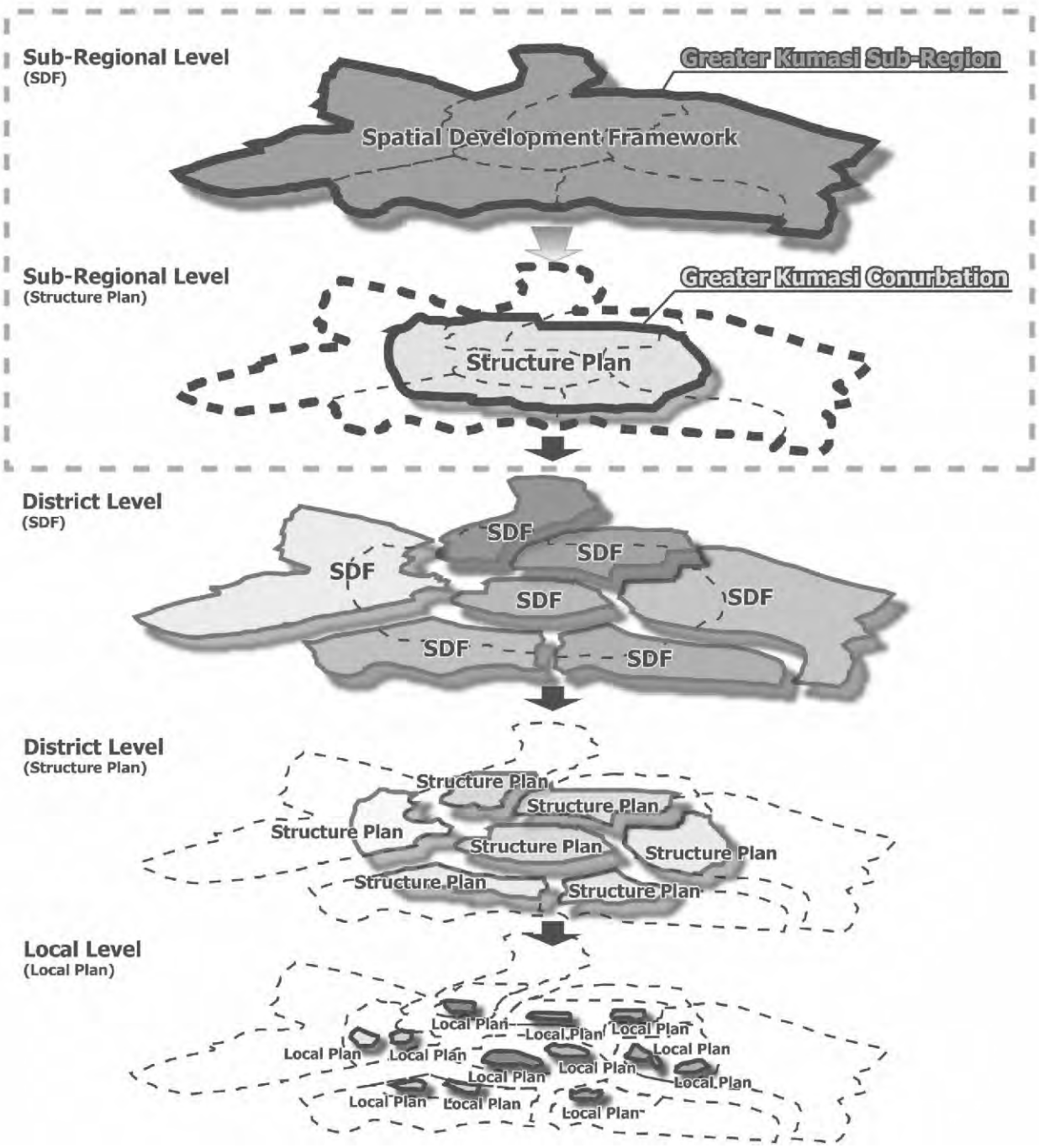
The Structure Plan (SP) for Greater Kumasi Conurbation is a kind of land use plans which is combined with infrastructure sector plans. The Structure Plan (SP) for a conurbation is an official document for prescribing land uses at the level of sub-region and an official long-term framework for guiding future development of a sub-region. It also demarcates the alignment/corridors or locations of all major transportation, water, sewerage and power networks and other key features of development.

(2) Planning Areas for SDF and Structure Plan

According to the Technical Note signed between TCPD and the JICA Study Team on August 16th, 2012, the planning areas for the Sub-Regional SDF and the Structure Plan at the Sub-Regional Level have been determined as follows:

- The Sub-Regional SDF to be formulated in the Project shall cover the whole area of the Greater Kumasi Sub-Region.
- The Structure Plan at the Sub-Regional Level to be formulated in the Project shall cover “the area to be contiguously urbanized by the target year” as stated in the M/M signed on 16th December 2010. This area shall be defined by the Sub-Regional SDF. This “area to be contiguously urbanized by the target year” is called the “Greater Kumasi Conurbation”.

[2] The following four materials are referenced for the new spatial planning system:
- Draft Land Use and Spatial Planning Bill (October 2011)
- Manual for the preparation of spatial plans (Ministry of Environment Science and Technology, Town and Country Planning Department, November 2011)
- Land use and Planning Management Information System (LUPMIS) Manual
- New Planning Model Guidelines Vol. 1-4



Source: JICA Study Team

Figure 2.1.2 Planning Areas: Relation among Sub-Regional Level SDF, Sub-Regional Level SPs, District Level SDFs and District Level SPs

(3) Target Years for SDF and SP

In the same way, the target years for SDF and Structure Plan to be formulated in this Project have been extended as follows:

The target year for the SDF and Structure Plan to be formulated in this Project is 2025 (13 years from 2012) in the Minutes of Meeting signed on 16th December 2010.

However, in accordance with the draft law for the New Spatial Planning System, the planning periods for the SDF and Structure Plan are 20 years and 15 years respectively. Therefore the target year for the SDF and Structure Plan in the Greater Kumasi Sub-Region should be 2033 (20 years from 2013) and 2028 (15years from 2013) respectively in this Project. In addition, the phases for spatial development planning are set for 1) 2013-2018, 2) 2018-2023, 3) 2023-2028, and 4) 2028-2033.

2.1.3 Planning Process based on Stakeholder Consultation

Stakeholder coordination and participation is required in the process of spatial development planning, involving a variety of stakeholders, consisting not only of government agencies but also of representatives of civil society and private sectors, including Community-Based Organizations and NGOs and business associations. Otherwise conflicts of different interest groups would emerge so that viability of formulated spatial development plans would become low.

Under the Draft Land Use and Spatial Planning Bill, all plans should be prepared with the participation of the general public and key stakeholders (Section 48 of the Draft Land Use and Spatial Planning Bill). This indicates unquestionably that the new spatial planning system of Ghana considers having adequate stakeholder consultation to be mandatory.

It is necessary for a variety of people who represent different sectors of people, as well as government agencies, to participate, express their views and contribute in the process of spatial planning by organizing more open stakeholder meetings. For this purpose, the JICA Study Team held six stakeholder meetings in the course of the Planning Study. See Table 2.1.1 for the matters to be discussed for the six stakeholder meetings.

Table 2.1.1 Stakeholder Consultative Meetings held for Greater Kumasi SDF and SP

	Matters Discussed
The First Meeting	Discussion on SDF for Greater Kumasi Sub-Region 1. New Spatial Planning System 2. Process and Method of a Series of Stakeholder Meetings 3. Issues and Constraints for Development
The Second Meetings	Presentation and Discussion on SDF for Greater Kumasi Sub-Region 1. Options on Socio-Economic Development Policies for Ashanti Region and Greater Kumasi Sub-Region 2. Options on Spatial Structure of Greater Kumasi Sub-Region including Roles, Functions, Future Visions and Basic Development Policies for Greater Kumasi
The Third Meeting	Discussion on SDF for Greater Kumasi Sub-Region 1. Socio-Economic Frameworks 2. Development Strategies for Greater Kumasi Sub-Region 3. Urban Structure and Spatial Distribution of Urban Functions
The Fourth Meetings	Discussion on SDF for Greater Kumasi Sub-Region 1. Revised Spatial Development Framework Discussion on SP for Greater Kumasi Conurbation 1. Land Use Plan 2. Major Infrastructure Plans

The Fifth Meeting	Discussion on Comprehensive Urban Development Master Plan consisting of SDF, SP and Sector Programmes 1. Revised SDF for Greater Kumasi Sub-Region 2. Revised SP for Greater Kumasi Conurbation 3. Sector Programmes 4. Implementation Plan
The Sixth Meeting	Discussion on Comprehensive Urban Development Master Plan consisting of SDF, SP and Sector Programmes 1. Revised SDF for Greater Kumasi Sub-Region 2. Revised SP for Greater Kumasi Conurbation 3. Revised Sector Programmes 4. Implementation Plan 5. Priority Projects 6. Capacity Development Programme

2.2 New Spatial Planning System for Ghana

2.2.1 National Development Planning System

The National Development Planning System of Ghana is based on a public administration that seeks to integrate the local government and central government at the regional and district levels. It seeks to decentralise but also to integrate the development planning process and its supporting budgetary system. It aims to provide adequate transfers of financial, human and other resources from central government to local authorities.

The major objectives of the decentralised Development Planning System are:

- To create an institutional framework for public and community participation in national development in order to ensure optimal resource mobilisation, allocation and utilisation for development;
- To provide opportunities for greater participation of local people in development planning and efficient management of local resources; and
- To establish effective channels of communication between the national government and local communities and increase administrative effectiveness at both levels.

This Planning System seeks to vest authority for implementation of national development with decentralised institutions. The focal points of these institutional arrangements are the Metropolitan, Municipal and District Assemblies (MMDAs).

Four main laws provide the legal core of Ghana's planning system:

- The Civil Service Law, 1993 (sections 11 to 14);
- The Local Government Act, 1993 (Part II);
- The National Development Planning Commission Act, 1994; (sections 1, 2 and 9 to 15); and
- The National Development Planning (Systems) Act, 1994.

The decentralised planning system comprises:

- The National Development Planning Commission (NDPC)
- Regional Co-ordinating Councils (RCCs)
- Metropolitan, Municipal and District Assembles (MMDAs)
- Sectoral Ministries, Departments and Agencies (MDAs)

(1) National Development Planning Commission (NDPC)

Functionally, NDPC is at the apex of the structure. Act 479 of 1994 gives the NDPC responsibility for co-ordinating all National Development Plans. It is mandated to provide the framework and direction for National Development Planning and implementation. It provides guidelines for the preparation of the District Development Plans which it then harmonises with sectoral plans to produce a broad overall National Development Plan. It also advises the President on development planning policy and strategy. National Development Plans, policies and strategies which are proposed by the Commission are approved by the President.

(2) Metropolitan, Municipal and District Assemblies (MMDAs)

Under the Local Government Act 462 of 1993, MMDAs are designated as Planning Authorities and have executive, deliberative and legislative powers. The planning functions of the District Planning Authority include initiation and preparation of District Development Plans and settlement Structure Plans in the manner prescribed by the National Development Planning Commission (NDPC). The Act ensures that the plans are prepared with full participation of the local communities.

Legislative Instrument 1589 also established Area Councils, Town Councils and Unit Committees as elements in the structure of local authorities. These sub-structures may prepare a Sub-district or Local Action Plan in accordance with the approved District Development Plan.

Within the MMDAs, planning functions are coordinated by the District Planning Co-ordinating Units (DPCUs) which provide a secretariat for the District Planning Authority and coordinate planning activities of sectoral departments (e.g. Education, Agriculture etc.) in the District.

There is also provision for Joint Planning Areas and Joint Planning Boards between MMDAs for areas with special physical or social-economic characteristics which require that they be considered as a single unit for the purpose of development planning.

(3) Regional Co-ordinating Councils (RCCs)

The RCCs are positioned between the NDPC and the MMDAs. They have the task of co-ordinating the Development Plans and programmes of the District Planning Authorities, and harmonising these with National Development Plans, policies and priorities for approval by NDPC. They are also expected to provide the District Planning Authorities the information and data that are necessary for the preparation of the District Development Plans. The planning functions of the RCCs are coordinated by the Regional Planning Co-ordinating Units (RPCUs).

(4) Sectoral Ministries, Departments and Agencies (MDAs)

At the national level, Ministries prepare sector plans following guidelines which are also provided by NDPC. The Ministry of Finance and Economic Planning (MoFEP) has a special relationship with NDPC with regard to the preparation of budget, and fiscal and financial strategies with guidelines provided by NDPC. At the MDA level, the planning functions are performed by the Policy Planning, Monitoring and Evaluation Division (PPMED).

2.2.2 Current Spatial Planning System in Ghana

(1) Existing Legislation for Spatial Planning

The requirement for Spatial Planning is provided for in the National Development Planning System and supported by the following legislation:

- The Local Government Act, 1993;
- The National Development Planning Commission Act, 1994;
- The National Development Planning (Systems) Act, 1994;
- The Town and Country Planning Ordinance, 1945 (CAP 84)

The Spatial Planning functions are currently performed at the national, regional and district levels.

(2) Organization for Spatial Planning

The Town and Country Planning Department (TCPD) is a technical department of the Ministry of Environment, Science and Technology (MEST). It is responsible for spatial and human settlement policy[3]. At the regional level, it is a part of the RPCUs of the RCCs and is responsible for coordination, harmonization and monitoring the operations of the District Physical Planning Departments.

The National Development Planning System is an integrated planning approach involving the social, economic and spatial elements of the system. District Planning Authorities are therefore required to prepare Development Plans that include human settlement Structure Plans. Act 462, requires MMDAs to be responsible for the development, improvement and management of human settlements and the environment.

Under the decentralised planning structure, MMDAs have TCPDs that provide technical support to the District Planning Coordinating Units, which plan and manage changes in the physical environment, direct the growth, development, and improvement of human settlements.

[3] "Ghana 10-Year Development Plan 2006-2015: Spatial and Human Settlements Development Strategy in a Changing Economy", NDPC, Accra, December 2006. See also "Human Settlements and Land use Policy in Ghana: a Policy Study", Land Use Planning and Management Project, Town and Country planning Department, Accra, Ghana June 2009

(3) Current Situation of Spatial Planning

Although the NDPC is supposed to provide guidelines for planning, those for spatial planning are not yet available. As a consequence, the system of planning remains primarily based on the Town and Country Planning Ordinance of 1945 (CAP 84), which focuses on the preparation of 'Planning Schemes' or (which include detailed neighbourhood layouts, or 'Sector Plans'). The Spatial Planning system is therefore active at district level with the preparation, approval and control of Planning Schemes and Sector Plans. Structure Plans exist for a few cities. However, these are decades old. The only spatial development plan which has ever been prepared at national level was that of 1963-70.

Until very recently, therefore, Spatial Planning has not been taking place at the Regional and National levels. The Spatial Planning System was also not practiced in a participatory manner, as expected, and the exclusion of citizens' involvement has hampered control of development. Besides, the institutions responsible for spatial planning have been poorly resourced and unable to manage the physical environment at the intended level.

2.2.3 New Spatial Planning System being Established

The Town and Country Planning Department is revitalising the Spatial Planning System, and has prepared a Land Use and Spatial Planning Bill, which will shortly go before Parliament, to address the existing limitations. When passed, the Bill will replace the current obsolete law on spatial planning, CAP 84, and help to establish a system that is more integrated, decentralised and participatory. This new system seeks to ensure comprehensive spatial development planning with conformity at the national, regional and district levels.

(1) The Three-Tier System

The proposed Spatial Planning System is a three-tier system, involving the preparation of Spatial Development Frameworks (SDFs), Structure Plans (SPs) and Local Plans (LPs) as outlined in the following section 1) – 3).

1) Spatial Development Framework (SDP)

The SDF provides a strategic vision (desired future) for the spatial development of the Nation, a Sub-National entity, Region, Sub-Region or District. It is an indicative plan, showing expected development over a fifteen to twenty-year period. It will include the location of key components of a strategy which is aimed at achieving the desired development. It addresses the spatial development implications of settlement, housing, education, health care, economic development, employment, infrastructure services (waste, water, energy, etc.), tourism and leisure, transportation, communications, culture and the environment. It provides a perspective on, and proposals for, what kinds of development should take place, how much should occur, and where and how they should happen in order to take advantage of presented opportunities.

2) Structure Plan (SP)

The Structure Plan is a legal document which prescribes both private and public use of land. A Structure Plan is a more detailed and accurate spatial plan which is used to guide the future development or redevelopment of all or part of a district, city or town for ten or more years. It defines all land uses, including residential, commercial, industrial and mixed use areas, major open space, agricultural areas and those requiring special treatment, such as areas of outstanding natural beauty, conservation areas and areas of historic or cultural importance, as well as areas for upgrading, regeneration and security.

It also indicates the alignment and corridors of trunk and major transportation routes, trunk and major water, sewerage and power networks and other key features for managing the effects of development. It further defines areas where no particular use is designated and which is expected not to change during the period for which the plan is valid. Local Plans within a city or town should be in compliance with any Structure Plan.

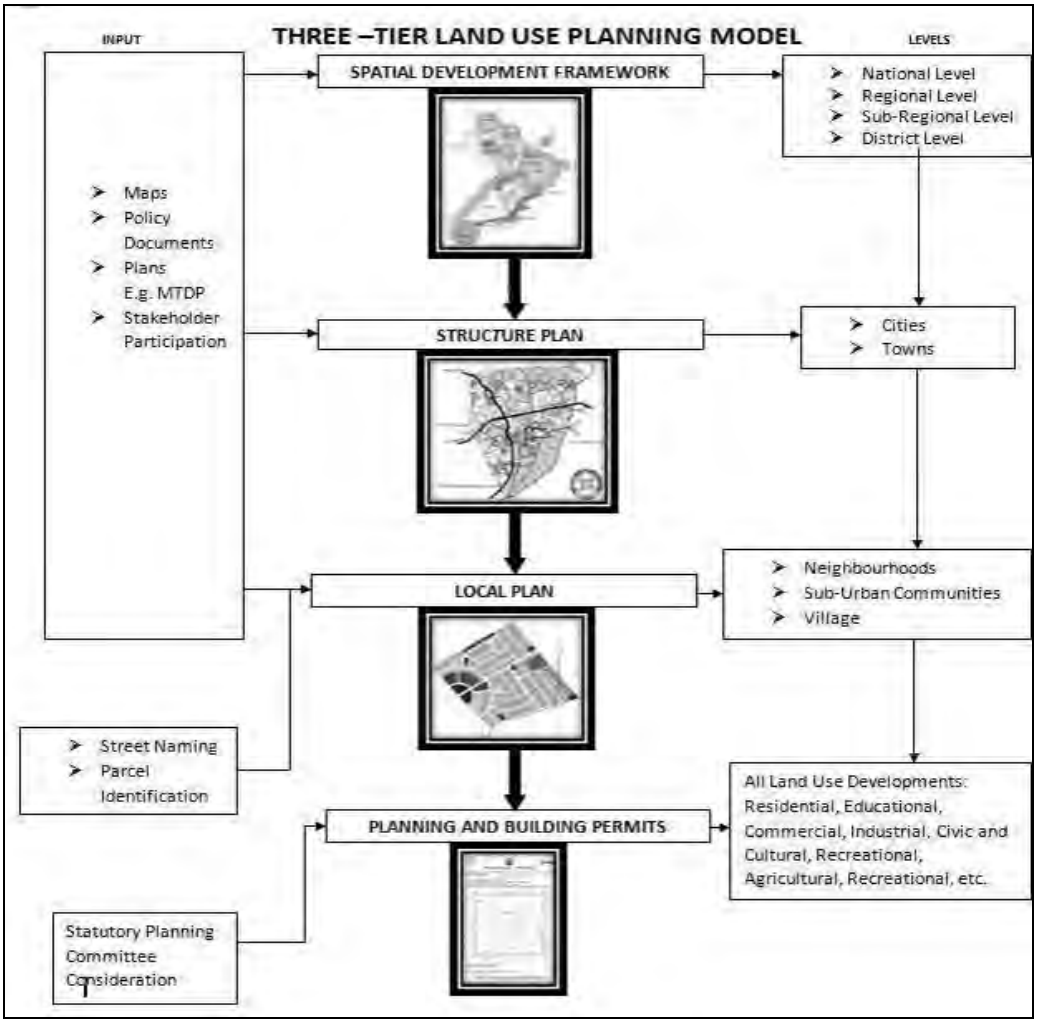
3) Local Plan (LP)

A Local Plan is an even more detailed plan in which individual plots can be identified. It proposes the disposition of land by function and purpose, or to be preserved in its present state, to meet the present and future identified community needs for ten or more years. Local Plans are prepared when needed and the uses of land must be in conformity with permitted uses of the land in the designated zoning classification identified in the Structure Plan.

Local Plans contain:

a. The dimensions of any parcel for various land uses
b. Road and footpath rights of way
c. Type of buildings that can be built on each of the designated plots
d. The setbacks for buildings on the plot if different from those given in the National Planning Standards
e. The maximum height of buildings on the plot
f. The permitted maximum ratio of built area to plot area if different from the National Planning Standards
g. Detailed plans for water reticulation, drainage, sewerage, electricity distribution, telecom network including the connections made to the main distribution networks.

The three-tier Planning System (Figure 2.2.1) provides a direct connection between national and local development strategies and their spatial realisation through a ‘chain of conformity’. Each level of plan must conform with the next levels. For instance, an SDF prepared for the Region must be in compliance with the National Spatial Development Framework, and a Local Plan with its Structure Plan.



Source: LUPMP, 2010, TCPD

Figure 2.2.1 Three-Tier Land Use Planning System

(2) Institutional Arrangements

The Land Use and Spatial Planning Bill proposes the creation of a Town and Country Planning Authority to replace the Town and Country Planning Department. The Authority shall have a multi-sectoral Board and be responsible for preparation of the National Spatial Development Framework in collaboration with the National Development Planning Commission. This Plan shall form the basis for all other Spatial Plans in Ghana. The Authority shall also be responsible for spatial planning policy, setting standards, and monitoring and evaluation at the national level.

The Bill also envisages the preparation of a Regional Spatial Development Framework and Sub-Regional Spatial Development Frameworks by Regional Spatial Planning Committees. The Regional and Sub-Regional Spatial Development Frameworks shall provide guidance for the preparation of District Spatial Development Frameworks by the District Assemblies.

The District Assemblies shall be responsible for the preparation of District Spatial Development Frameworks from which Structure Plans will be prepared for all major towns and cities. Local Plans shall also be prepared for neighbourhoods in

conformity with the Structure Plan. District Spatial Planning Committees have also been proposed, to provide technical input to the existing District Planning and Coordinating Units which are responsible for coordination of plan preparation at the district level.

The new planning model also proposes greater involvement of stakeholders from plan initiation through to implementation. The new model of planning, therefore, puts great emphasis on stakeholder participation in the planning process.

2.2.4 Sub-Regional Level Spatial Plans within the New Spatial Planning System

(1) Significance of Sub-Regional Spatial Plans

Not only in Kumasi, but also in Accra and Sekondi-Takoradi, the urban agglomerations are expanding beyond their cities' boundaries and occupying important parts of the regions. Administratively, those parts of the regions are called sub-regions, which are composed of several districts. In Ghana, those sub-regions have been very important places not only for urban development, but also places for national economic development. Therefore, major infrastructure for promoting economic development for these sub-regional urban agglomerations requires substantial allocation from central government's sector budgets, as well as donors' financial assistance. In this sense, the formulation of a sub-regional master plan for Greater Kumasi is very significant and meaningful.

In the Memorandum of Understanding (MOU) between the Kumasi Metropolitan Assembly and its neighbouring districts for the Comprehensive Urban Spatial Planning Project, the issue of Greater Kumasi is mentioned as follows:

"The boundaries of Kumasi Metropolitan Assembly and its surrounding districts have virtually merged due to rapid urban development. Aside from this, many infrastructural development programmes are taking place without regard to spatial linkages between the Kumasi Metropolitan Assembly (KMA) and its neighbouring districts, e.g. Wood Village, landfill sites, channelization of drains and major arterial roads etc. There is also uncontrolled meltdown of boundaries due to lack of a comprehensive spatial plan for the Greater Metropolitan Area."

Kumasi Metropolitan Assembly needs to rely on the surrounding suburban districts for the following reasons:

- To get food supply from suburban agriculture,
- To get access to suburban green space for fresh air, water, open space and recreation space,
- To solve traffic congestion by relocating urban functions from the central city to suburban areas,
- To provide traffic through Kumasi City with detour paths by constructing outer ring roads in suburban areas,
- To get access to waste disposal sites in surrounding districts because there is no space for waste disposal sites in Kumasi City,
- To get access to water resources available in surrounding districts,

- To construct retarding basins/reservoirs in surrounding districts to prevent flooding, and
- To supplement the insufficient urban function of Kumasi City by allowing access to urban functions in surrounding districts.

On the other hand, the surrounding districts are also able to get the following benefits from the economic / social / industrial development of Kumasi City (KMA):

- Access to employment opportunities and social services available in Kumasi City, and
- Industrial and economic development of the surrounding districts by taking advantage of accumulated urban economies and markets in Kumasi City.

It is necessary for Kumasi City government and its surrounding district governments to understand the interdependent and reciprocal relationships between the central city and its surrounding districts. On that basis, it is very important to formulate spatial plans which enable the strengthening of the cooperation among the MMDAs within Greater Kumasi Sub-Region, and address urban problems at the sub-regional level.

(2) Rationale for Sub-Regional Spatial Plans

Sub-Regional Spatial Development Frameworks are categorized as a type of SDF, and must be in compliance with the parameters established in the National Development Plan and its spatial realisation, the National Spatial Development Framework in the proposed Spatial Planning System. Sub-Regional SDFs, which are prepared by the Regional Spatial Planning Committee in coordination with District Physical Planning Departments and District EPOs, are approved by the RCC and affected Assemblies, and are duly signed by the Regional Minister.

Compared to these, Sub-Regional Structure Plans are not definitively provided in the proposed Spatial Planning System, while structure plans are supposed to be formulated for each district, part of a district or multiple districts.

(3) Contents of Sub-Regional Spatial Plans

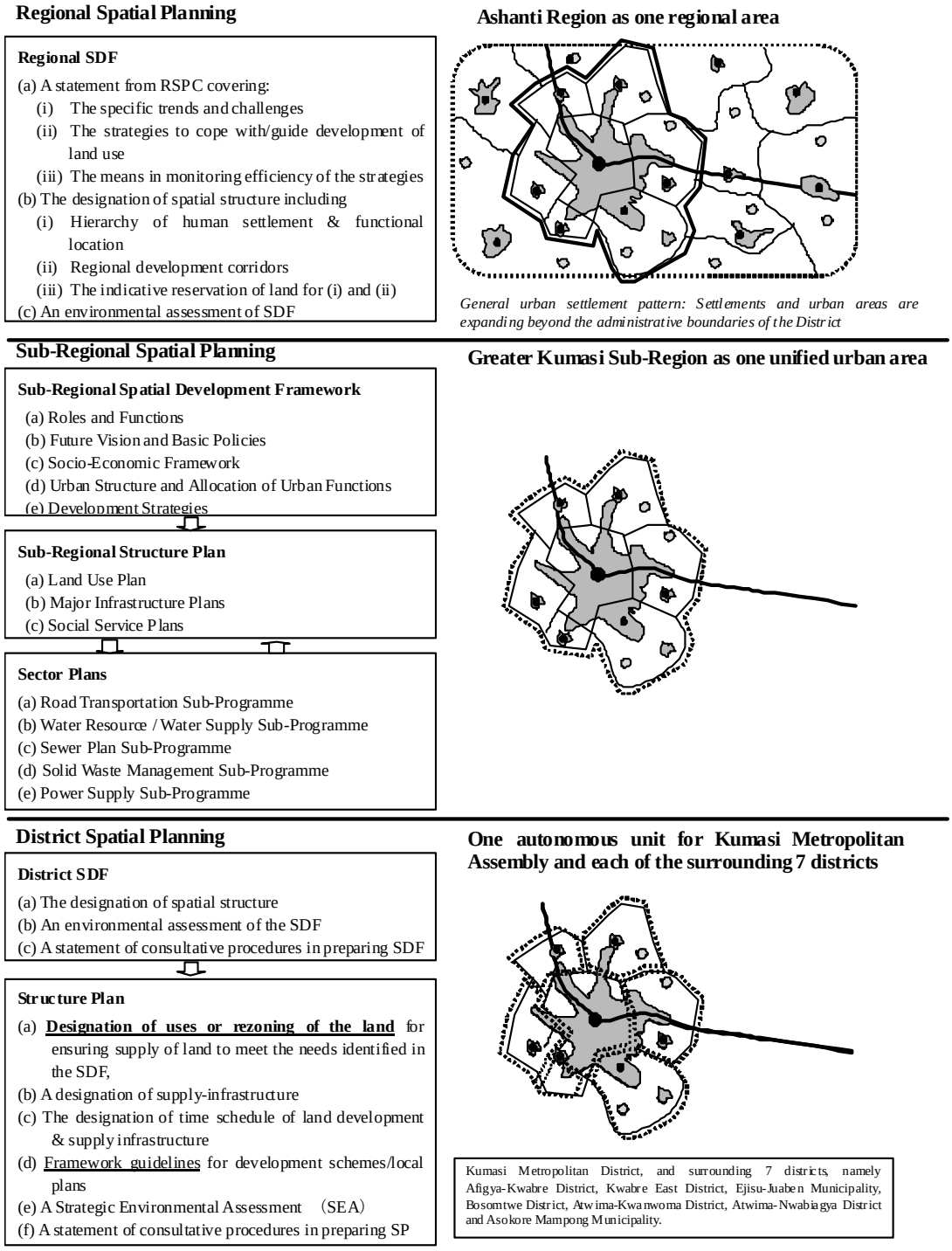
The importance of Sub-Regional level spatial plans is clear, as discussed in Section 2.2.4(1), when it comes to large urban agglomerations which expand beyond the central city's administrative boundaries into surrounding districts. However, in the context of Ghana's decentralization policy, metropolises, municipalities and districts are decentralized and autonomous local governments, which have their own power to decide their own spatial plans, in compliance with upper-level spatial plans (Regional-level SDFs and National-level SDF).

Then what are the roles of Sub-Regional SDFs and Sub-Regional Structure Plans? The following roles are expected for Sub-Regional SDFs and Structure Plans.

- Major urban functions are spatially arranged at the Sub-Regional level.
- Sub-Regional level infrastructures (relatively large-scale infrastructures) are planned.

- Important urban facilities at the Sub-Regional level are spatially arranged.
- Sub-Regional level land use plans are indicative to guide District level land use plans.

However, detailed land use plans should be determined at the district level, while taking guidance from the sub-regional spatial plans (SDFs and Structure Plans).



Source: JICA Study Team

Figure 2.2.2 Sub-Regional Spatial Plans in Relation to Regional and District Levels

2.2.5 Proposed Official Position of Sub-Regional Level Structure Plans in relation with the New Spatial Planning System

(1) Prospective Legal Position of Sub-Regional Level Structure Plans

Although Sub-Regional Spatial Development Frameworks (SDFs) are somehow situated within the New Spatial Planning System delineated by the Draft Law on Land Use and Spatial Planning, Sub-Regional Level Structure Plans (SPs) are not legally positioned in the prospective New Spatial Planning System.

In the New Spatial Planning System, Structure Plans (SPs) are prepared and approved only by district assemblies. District-Level Structure Plans have statutory documents and plan maps, with which development and building permits are issued in compliance. Under the current decentralization policy and the prospective Land Use and Spatial Planning Law, district assemblies have decentralized planning and law enforcement authorities.

While the importance of Sub-Regional Spatial Plans such as SDFs and SPs is clearly understood in the previous section, Such the meaning of formulating Sub-Regional SPs is not compatible with the district responsibility and power given by the decentralization policy and the decentralized planning system (both socio-economic and spatial), if district-level SDFs and SPs must comply the contents specified by Sub-Regional SPs.

If the function and authority of Sub-Regional SPs and District-Level SPs are rigorously considered and performed, these two-levels of SPs could have potential conflicts.

Even under the strong policy for decentralization toward the district level, however, it is desirable to formulate a Sub-Regional Structure Plan for a large conurbation consisting of more than two districts, for the purpose of guiding the formulation of District-Level SDFs and SPs, so that it could achieve efficiency and effectiveness of land use and infrastructures.

In this sense, it is essential to establish the clear administrative or legal position of Sub-Regional Structure Plans (SPs) for large conurbations consisting of more than two districts.

(2) Alternative Methods to Officially or Legally Situate Sub-Regional Structure Plans (SPs) in relation to the New Spatial Planning System

In order to avoid such conflicts between the Sub-Regional SPs and District-Level SPs, it is necessary to prepare administrative or legal instruments. In this section, four alternatives are proposed and analysed in their utility.

- Method 1: For the TCPD, to revised the draft law for Land Use and Spatial Planning before official approval
- Method 2: For the TCPD, to prepare a separate law to oblige the government to formulate Sub-Regional SPs for large conurbations consisting of more than two districts, as a technical reference for the formulation of District-Level SDFs and

SPs

- Method 3: For the TCPD, to issue a Legal Instrument for the prospective Land Use and Spatial Planning Law, on Sub-Regional Structure Plans for large conurbations consisting of more than two districts
- Method 4: For Ashanti RCC and concerned district assemblies, to officially approve the Sub-Regional SDF-SP for Greater Kumasi without any legal background

1) Method 1: For the TCPD, to revised the draft law for Land Use and Spatial Planning before official approval

In this method, the draft law on Land Use and Spatial Planning, which is under review for approval, should be revised in that district-level SDFs and SPs should comply with sub-regional level structure plans (SPs). The sub-regional SPs are composed of general land use plans and sub-regional level infrastructure plans.

In this method, there are two cases in which roles for sub-regional level structure plans should play. One is the case in which district assemblies should give up certain authorities of spatial planning by complying with the sub-regional level structure plans. The other one is the case in which the sub-regional structure plan is a technical reference which district assemblies would use for formulating district SDFs and SPs.

It is necessary to re-submit the revised draft law to the parliament prior to the final approval by the parliament and the president.

2) Method 2: For the TCPD, to prepare a separate law to oblige the government to formulate Sub-Regional SPs for large conurbations consisting of more than two districts, as a technical reference for the formulation of District-Level SDFs and SPs

Instead of incorporating the sub-regional level structure plans into the draft law of Land Use and Spatial Planning (Method 1), in Method 2 it is proposed to prepare a separate but related law to the draft Land Use and Spatial Planning Law. The separate law delineates that related district assemblies within the Sub-Region and RCC should collectively prepare and approve a SDF and a SP to cover the urbanizing portion of concerned districts.

In this separate law, sub-regional structure plans are technical reference to the formulation of district-level SDFs and SPs.

3) Method 3: For the TCPD, to issue a Legal Instrument for the prospective Land Use and Spatial Planning Law, on Sub-Regional Structure Plans for large conurbations consisting of more than two districts

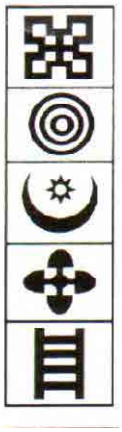
In this method, a legal instrument for the Land Use and Spatial Planning Law should be prepared specially for sub-regional structure plans. In this method, the legal instrument is complementary with the draft Land Use and Spatial Planning Law for clarifying the roles of sub-regional structure plans. Therefore, there are two cases

depending on the approved law. As written in the section for Method 1, one is the case in which district assemblies should give up certain authorities of spatial planning by complying with the sub-regional level structure plans. The other one is the case in which the sub-regional structure plan is a technical reference which district assemblies would use for formulating district SDFs and SPs.

4) **Method 4:** For Ashanti RCC and concerned district assemblies, to officially approve the Sub-Regional SDF-SP for Greater Kumasi without any legal background

This is not legal but administrative method to secure the position and roles of the sub-regional SPs. In Method 4, Ashanti RCC and concerned district assemblies should approve formulated sub-regional SPs in an administrative manner.

Based on the administrative approval, it is necessary for RCC and concerned district assemblies to agree to utilization of the sub-regional SPs as important guidelines for formulating spatial plans.



PART II

Present Situation of Ghana, Ashanti Region and Greater Kumasi Sub-Region

Chapter 3 Present Situation of Ghana, Ashanti Region and Greater Kumasi Sub-Region

3.1 Past Development Trend and Current Development Policies of Ghana

3.1.1 Past Development Trend of Ghana

(1) Past Economic Development of Ghana

After the external debt crisis in the late 1990s, Ghanaian economy has recovered steadily. after 2005 Ghana's GDP grew at over 6 % due to the favourable prices of cacao and gold. The share of the service sector (including commercial activities) in GDP has been in an increasing trend, while that of agriculture (including forestry and fishing) in a decreasing trend. The share of the industrial sector (including mining, manufacturing, electricity & water, and construction) fluctuated in the past but it has been in a decreasing trend in recent years.

(2) Poor Performance of Manufacturing Sectors

In general the manufacturing industries of Ghana have been weak. The recent rapid contraction in the manufacturing sectors was mainly due to the energy crisis Ghana suffered. Other factors for declining performance of the manufacturing sectors is attributed partly to the massive influx of cheap imported goods, unstable supply and low quality of raw materials and high costs of credit.

(3) Agricultural Sector of Ghana

Agriculture is an important economic sector for Ghana, contributing 28 percent of Ghana's GDP and employing 51 percent of the country's labour force including forestry in 2008. Since the late 1990s, the Ghanaian Government has taken a policy to diversify the agricultural sector to reduce dependency on the exports of traditional commodities such as cocoa and timber. Although the country is still heavily dependent on import for rice and wheat, the Government's efforts to increase cereal production and develop non-traditional exports have resulted in diversified cropping systems, leading to achievement of high growth rates in both food crops (cassava, yam, plantain, maize, and rice) and cash crops (cocoa beans, oranges, groundnuts, tomatoes, chillies and peppers, bananas and cashew nuts).

Table 3.1.1 GDP at 2006 Price by Economic Activity of Ghana

	2007		2008		2009		2010		2011 estimates	
	million GHC	%	million GHC	%	million GHC	%	million GHC	%	million GHC	%
Agriculture	5,322	28.6	5,716	28.1	6,129	28.5	6,453	27.8	6,507	24.7
Crops	3,743	20.1	4,064	20.0	4,479	20.8	4,703	20.3	4,878	18.5
o.w. Cocoa	493	2.6	509	2.5	535	2.5	677	2.9	771	2.9
Livestock	458	2.5	481	2.4	502	2.3	526	2.3	552	2.1
Forestry & logging	706	3.8	682	3.4	687	3.2	757	3.3	651	2.5
Fishing	416	2.2	488	2.4	460	2.1	467	2.0	427	1.6
Industry	3,930	21.1	4,522	22.2	4,725	22.0	5,053	21.8	7,132	27.1
Mining & quarring	532	2.9	544	2.7	581	2.7	690	3.0	2,116	8.0
o.w. Crude oil	0	0.0	0	0.0	0	0.0	65	0.3	1,372	5.2
Manufacturing	1,801	9.7	1,868	9.2	1,844	8.6	1,984	8.5	2,242	8.5
Electricity	118	0.6	141	0.7	152	0.7	170	0.7	169	0.6
Water & sewerage	227	1.2	229	1.1	246	1.1	259	1.1	267	1.0
Construction	1,252	6.7	1,739	8.5	1,902	8.8	1,949	8.4	2,339	8.9
Services	9,358	50.3	10,106	49.7	10,667	49.6	11,714	50.4	12,689	48.2
Trade, repair of vehicles, household goods	1,203	6.5	1,317	6.5	1,388	6.4	1,573	6.8	1,854	7.0
Hotels & restaurants	917	4.9	1,000	4.9	962	4.5	988	4.3	1,023	3.9
Transport & storage	2,573	13.8	2,672	13.1	2,790	13.0	3,014	13.0	3,114	11.8
Information & communication	503	2.7	601	3.0	624	2.9	777	3.3	909	3.5
Financial intermediation	560	3.0	620	3.0	678	3.2	791	3.4	799	3.0
Business, real estates & other services	944	5.1	943	4.6	945	4.4	1,076	4.6	1,227	4.7
Public administration & defence; social security	960	5.2	1,082	5.3	1,208	5.6	1,249	5.4	1,341	5.1
Education	720	3.9	814	4.0	915	4.3	963	4.1	1,000	3.8
Health & social work	259	1.4	271	1.3	312	1.4	347	1.5	364	1.4
Other community, social & personal services	720	3.9	786	3.9	845	3.9	936	4.0	1,057	4.0
GDP at basic prices	18,610	100.0	20,344	100.0	21,521	100.0	23,220	100.0	26,328	100.0
Net indirect taxes	1,303		1,248		934		1,032		1,414	
GDP in purchasers' value	19,913		21,592		22,454		24,252		27,742	

Source: Ghana Statistical Service 2012

Agricultural production in Ghana is dominated by small-scale farming, with 90 percent of total cultivated land being held by landholders of less than two hectares. The country's fragmented production and processing systems are a major constraint

to cash crops in achieving price competitiveness on international markets. The small-holding agricultural system in Ghana needs to overcome its disadvantages in technologies and economies of scale in order to compete with large-scale plantations in foreign countries.

Ghanaian cocoa has successfully developed and maintained an advantageous position on the international market due to its well-established cultivation and post-harvest technologies. On the other hand, exporting product such as pineapple, cashew nut and orange are struggling with the great change in the export amount.

(4) Oil and Gas in Ghana

In Ghana, oil and gas was discovered recently. Now the reserves, supply and consumption of oil of Ghana rank 41st (not including US), 55th, and 93rd respectively in the world. The crude oil proved reserves jumped to 0.66 billion barrels in 2011 as they are being explored. Taking advantage of the expected increase of revenues from oil and gas development, the government of Ghana is interested in embarking on downstream industries related to oil and gas, and utilizing revenues and increased borrowing capacity for investing in infrastructure development for supporting industrial development and modernizing agricultural sectors.

Table 3.1.2 Oil and Gas in Ghana

	2007	2008	2009	2010	2011	2011 Ranking
Crude Oil Proved Reserves (Billion Barrels)	0.02	0.02	0.02	0.02	0.66	41 not including US
Total Oil Supply (Thousand Barrels per Day)	7.69	7.69	7.69	8.88	74.27	55
Total Petroleum Consumption (Thousand Barrels per Day)	47.66	44.37	47.00	60.00	64.00	93
Proved Reserves of Natural Gas (Trillion Cubic Feet)	0.80	0.80	0.80	0.80	0.80	71 not including US
Dry Natural Gas Production (Billion Cubic Feet)	0.00	0.00	0.00	0.00	0.00	
Dry Natural Gas Consumption (Billion Cubic Feet)	0.00	0.00	0.00	0.00	4.24	

Source: U S Energy Information Administration (EIA) International Energy Statistics

3.1.2 Current Development Policies of Ghana

(1) Long-Term National Vision 2020

In 1995, long-term national development policies for 2020 were presented in Ghana – Vision 2020. The long-term vision for Ghana is to become a middle-income country by the year 2020. In the production side, the share of industry in GDP was expected to increase from 16% to 37% with an average annual growth rate in output of over 12%.

(2) Ghana Shared Growth and Development Agenda (GSGDA): National Policy Framework

The latest policy paper formulated with accordance with Ghana – Vision 2020, Ghana Shared Growth and Development Agenda (GSGDA) (2010-2013) was presented by the President to the parliament in December 2010. The paper presents a per capita GDP target of US$3,000. The paper also emphasizes that special efforts should be made to ensure a shift from the current economy dependent on the export of mineral resources and agricultural commodities to a more modernized, diversified and efficiency-based economy – industry-based economy.

(3) Spatial Development Policies of Ghana

For many years, Ghana has suffered geographical disparities of development between the northern part and the southern part of the country. However, no substantial geographically-oriented or spatially-oriented policies or programmes had been formulated or implemented. In contrast to the past government the current government's national development policies and programmes are different in their focus on spatial orientation in development. In addition to the National Urban Policy (NUP) and Savannah Accelerated Development Programme, the following four area-based development initiatives/programmes, were announced.

- Western Corridor Development Initiative
- Eastern Corridor Development Initiative
- Capital City Development Initiative
- Forest Belt Development Initiative

Out of the four Development Initiatives, Western Corridor Development Initiative is in the spotlight with the oil and gas development. The projects are to be financed by the China Development Bank Corporation (CDB) in agreement with the Ghana government.

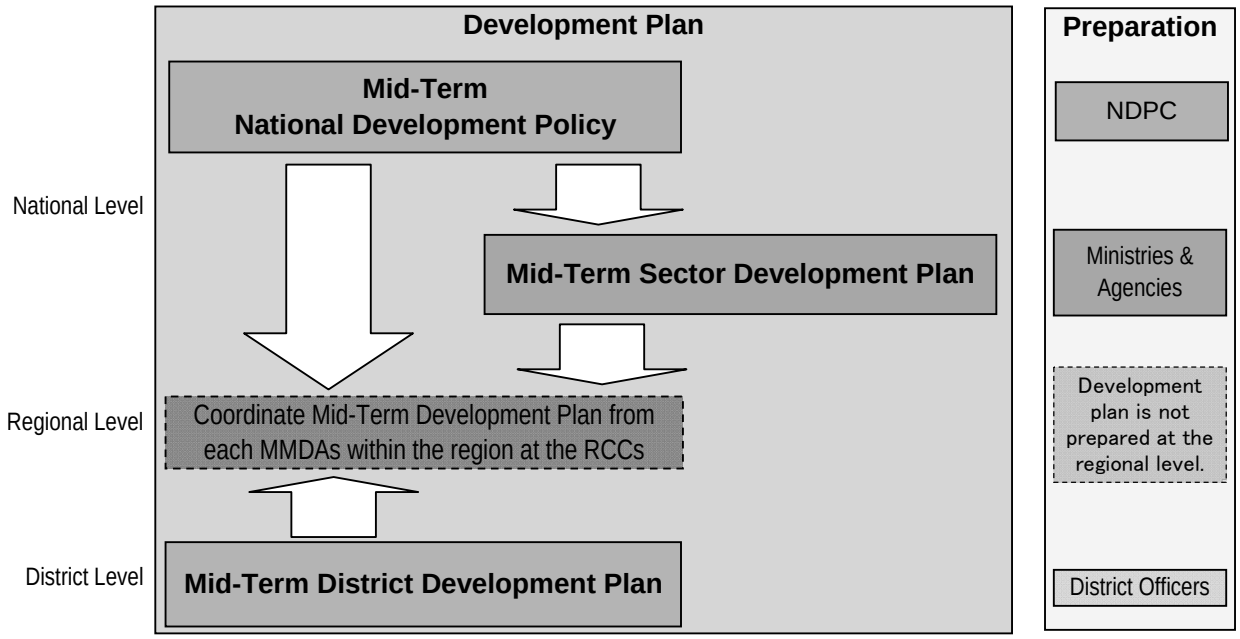
The NUR discusses about several issues in the urban area from various perspectives and outlines objection policies. It especially focuses on urban growth management for controlling the excessive growth of Greater Accra Metropolitan Area and Greater Kumasi Sub-Region, while promoting urban growth of small-medium scale cities.

(4) Institutional Aspects of Development of Ghana

The administration system of government of Ghana consists of four level structures: national, regional, district and sub-district levels. Ministries at the national level undertake policy planning, monitoring and evaluation of policies and programmes. There are 10 regions in Ghana and each region has Regional Coordinating Councils (RCC). RCCs coordinate policy implementation among districts, but they do not implement any development projects.

At the district level, there are three types of districts according to population size: districts, municipalities and metropolises. Each of them has an assembly and they are *preliminarily* responsible for policy implementation in Ghana. Minimum populations of districts, municipalities, and metropolises are 75,000, 95,000, and 250,000 respectively.

The national budget for the fiscal year 2012 marked a significant development in the introduction of the composite budget, for the purpose of strengthening of the fiscal decentralization process. The budgets of certain departments are being placed in the budgets of the district (composite budget) and accordingly the affiliation of officials in over 12 departments, including Town and Country Planning Department (TCPD) is being transferred to local governments.



Source: JICA Study Team

Figure 3.1.1 Hierarchy of Development Plan in Ghana

3.2 Present Characteristics of Ashanti Region

3.2.1 Key Characteristics of Ashanti Region

Between 1975 and 2000, agricultural lands expanded largely in terms of land area. However, after 2000, it is said that many rural people left their agricultural lands and migrated to urban areas. The regional agricultural has been stagnant, many agricultural lands has been deteriorated, created a lot of out-migrants, in Ashanti Region's rural areas in general and especially in the north-eastern Savannah area of Ashanti Region. In fact, between 2000 and 2010, the population increase rates decreased to less than 1 % per annum in rural areas of Ashanti Region (outside Greater Kumasi Sub-Region within Ashanti Region). This suggests that net outmigration from rural areas to urban areas largely took place in Ashanti Region.

On the other hand, the production of citrus and other fruits increased in response to expanding urban markets. Part of the produced citrus is processed into juice and exported.

The forest depletion due to farm land expansion could cause the decrease of volume of timber production. As a result, the production of timber processing industries in and around Kumasi City has been decreased and faced with a collapse of the timber processing industries.

As a result, although Kumasi, the second largest city of Ghana is located in Ashanti Region, the ratio of economically active population (EAP) who are working in the formal private sector is limited compared with Greater Accra Region which has Greater Accra, the capital city of Ghana. The figures are rather similar with that of Ghana, which demonstrates that Ashanti Region is a region with a huge population working in the informal sector.

Table 3.2.1 Ratio of EAP by Employment Sector (15 years old and above)

Region	Public Sector	Private Sector (Formal)	Private Sector (Informal)	Others	Total
Ashanti	6.6%	7.1%	85.6%	0.7%	100.0%
Greater Accra	8.0%	17.4%	73.2%	1.4%	100.0%
Ghana	6.3%	7.0%	86.1%	0.7%	100.0%

Source: GSS, 2010 Population and Housing Census

In Ashanti Region, there are several urban centres, such as Obuasi, Konongo, Offinso Municipalities, where public service facilities (health and education) are relatively well equipped. As a result, these urban centres could play important roles of regional centres serving to surrounding rural areas.

In the rural areas of Ashanti Region, a substantial number of workers are engaged in the industrial sector, including textiles, wood carving, black smith.

3.2.2 SWOT Analysis for Ashanti Region

Major concerns and issues are analyzed by looking at strength (S) and weakness (W)

of Ashanti Region from internal factors and at opportunities (O) and threats (T) from external factors (Method of SWOT analysis).

(1) Internal Factors of Strength (S)

Internal factors of strength are found in the following aspects:

- Ashanti Region's mainstay is agriculture based on its good soils and rainfall. Ashanti Region is also endowed with a good number of working populations in rural areas.
- Ashanti Region is centrally located in the territory of Ghana. It occupies an advantageous and central location for logistics bases serving not only inland regions of Ghana, but also inland neighboring countries.
- There are many urban centres (metropolitan, municipality and district capitals, and small towns) in Ashanti Region. These centres are functional as distribution centres of agricultural products and chemical inputs, as well as providers of public services including health and education.
- Ashanti Region's capital, Kumasi is the central city of the region, with the second largest population of over 2 million in 2010. Kumasi and its surrounding districts form a sub-region, namely the Greater Kumasi Sub-Region. The rapidly urbanizing Greater Kumasi Sub-Region reached a population of 2.8 million in 2010. This is a huge accumulation of urban consumption capacity.
- Kumasi City and its surrounding suburban areas have certain manufacturing bases including timber processing and agro-processing, as well as auto-repairing services and semi-manufacturing. Such manufacturing tradition and human resources could be a potential base for further development.

(2) Internal Factors of Weakness (W)

Internal factors of weakness are found in the following aspects:

- Trunk roads have been relatively well developed in Ashanti Region. However, the improvement of local roads and access roads to farm lands has been far behind the needs, in respect of supporting agricultural production and marketing.
- In part of Kumasi and its surrounding areas, electricity supply is not stable. In rural areas and some district capitals of Ashanti Region, the situation of electricity and telecommunication is not good.
- The majority of farmers are small farmers with 1.2 ha of land under cultivation. Mostly, they depend on rainfall for their agricultural production. They usually do not use chemical inputs. Even under strong government initiatives, it might be difficult to modernize existing small agriculture to be more productive.
- The arable land of Ashanti Region is only 60 %, and 80% of that is already cultivated. This suggests that most of the existing lands are utilized somehow for agriculture. Therefore, it might be difficult to attract foreign and domestic capital to modernization and scale-up agriculture. It is necessary to create and implement special measures for agricultural investors to allow easier access to large-scale lands.

(3) External Factors of Opportunities (O)

External factors of opportunities are found in the following aspects:

- The current Ghanaian government has adopted a set of development policies for economic transformation including industrial development in integration with agriculture and natural resources exploitation. Within Ashanti Region, it is possible to pursue both agricultural modernization and agro-based industrial development in a closely integrated manner.
- Currently, the Ghanaian government has promoted enhancement of capacity for cacao processing within the country. Ashanti Region is one of the leading cacao producing regions. Moreover, Kumasi has a cacao processing capacity. It is highly possible for Ashanti Region and Kumasi City to promote both cacao production modernization and cacao processing in an integrated fashion.
- The possibility of utilizing government revenues from oil and gas production in the areas off-shore of the Western Region is becoming high, leading to higher possibility to re-invest those revenues in necessary infrastructures for supporting development in various regions. One of such regional development initiatives is the Forest Belt Development.

(4) External Factors of Threat (T)

External factors of threat are found in the following aspects:

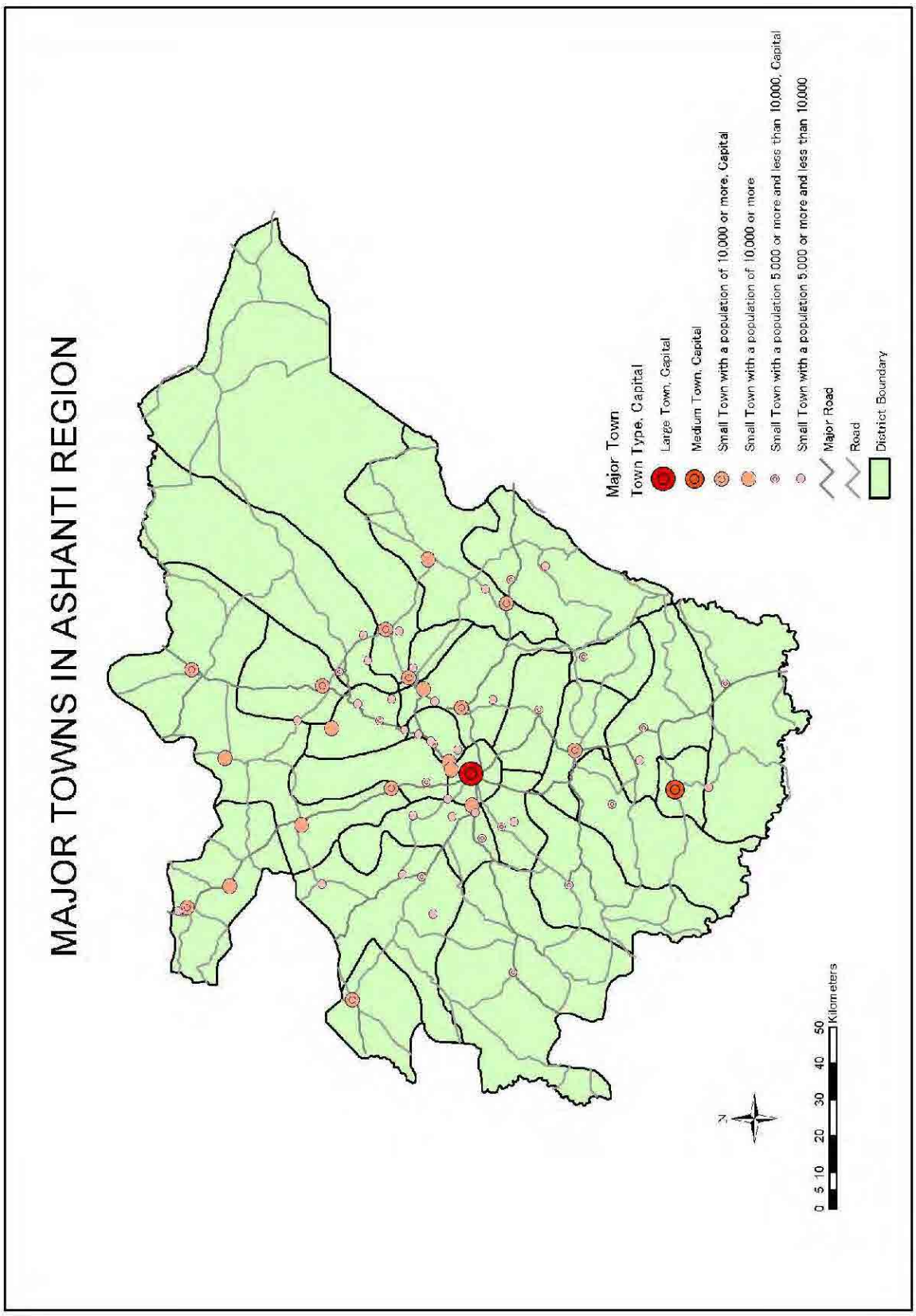
- For many years under the past national policies, agricultural modernization had not been widely achieved. Although the current government has given a higher priority to agricultural modernization, it might be difficult to actually implement those measures and to realize the intended objectives.
- For many years under the past national policies, industrial development had not been widely promoted or achieved. Although the current government has given a higher priority to industrial development in integration with agricultural modernization, it might be difficult to realize the intended results.
- Based on the oil and gas exploitation and their down-stream industries, the Western Region might be able to develop its economic infrastructures and manufacturing bases, so as to further develop the Sekond-Trakoradi Sub-Region. This situation might exacerbate risks of Greater Kumasi's decline in economic power for attracting public and private investments compared to Sekondi-Takoradi.

Table 3.2.2 SWOT Cross Analysis for Ashanti Region

	Opportunity	Threat
	• A set of development policies for economic transformation including industrial development in integration with agriculture and natural resources exploitation has been adopted by the current Ghanaian government. • The possibility of utilizing government revenues from oil	• Agricultural modernization and industrial development had not been widely achieved under the past national policies. • Based on the oil and gas exploitation and their down-stream industries, Western Region might develop its economic

		and gas production in the areas off-shore of the Western Region is becoming high, leading to higher possibility to re-invest those revenues in necessary infrastructures for supporting development in various regions.	infrastructures and manufacturing bases to develop Sekondi-Takoradi Sub-Region. This situation can exacerbate risks of Greater Kumasi's decline in economic power for attracting public and private investments.
Strength	• Ashanti Region has good soils and rainfall for agriculture and is also endowed with a good number of working populations in rural areas. • Location of Ashanti Region occupies an advantageous and central location for logistics bases serving not only inland regions of Ghana, but also inland neighbouring countries. • Many urban centres functional as distribution centres of agricultural products and chemical inputs, as well as providers of public services including health and education exists. • Greater Kumasi Sub-Region reached a population of 2.8 million in 2010 which is a huge accumulation of urban consumption capacity. • Kumasi City and its surrounding suburban areas have certain manufacturing bases including timber processing and agro-processing, as well as auto-repairing services and semi-manufacturing.	• By taking advantage of this strength and external threats, it is possible to promote modern agricultural development including that of cocoa production and integrated development of agriculture and industry (agro-processing).	• For utilizing this strength under the identified external threat, it is necessary to upgrade urban functions and to implement measures for attracting investments to agro-processing industry.
Weakness	• The improvement of local roads and access roads to farm lands has been far behind the needs, in respect of supporting agricultural production and marketing. • In part of Kumasi and its surrounding areas, electricity supply is not stable. In rural areas and some district capitals, the situation of electricity and telecommunication is not good. • The majority of farmers are small farmers with 1.2 ha of land under cultivation. Even under strong government initiatives, it might be difficult to modernize existing small agriculture to be more productive. • The arable land of Ashanti Region is only 60 %, and 80% of that is already cultivated. Therefore, it might be difficult to attract foreign and domestic capital to modernization and scale-up agriculture.	• For utilizing identified external opportunities and preparing against the identified weakness, it is necessary to develop infrastructures in rural areas, such as roads between urban centres and rural areas and electricity in district centres and rural areas. • It is necessary to implement special measures to ensure accessibility to agricultural lands by investors for attracting investments to commercial agriculture and for increasing production for agro-processing industry.	• For preparing against this weakness under the identified external threat, it is necessary to implement measures to develop small-scale agriculture to supply agricultural produce to outside Ashanti Region.

Source: JICA Study Team



Source: JICA Study Team based on data of 2000 Population and Housing Census

Figure 3.2.1 Urban Centres in Ashanti Region

3.3 Present Characteristics of Greater Kumasi Sub-Region

3.3.1 Natural Environment of Greater Kumasi Sub-Region

Ashanti Region, in which Greater Kumasi Sub-Region is located, is endowed with fertile soils and annual rainfall of 1,600-1,700mm. There are two rainy seasons. One is the months of May-July and the other is those of September-November. These natural conditions are suitable for agriculture. On the other hand, Ashanti Region is rich in sands and rocks, which can be used for construction material.

Greater Kumasi Sub-Region is located in upper stream of the basin of the Pra River. Moreover, the Offin River, Oda River and Anunu River run in the Greater Kumasi Sub-Region. Bosomtwe Lake, natural lake, is also located in Greater Kumasi Sub-Region.

The environment of Greater Kumasi Sub-Region has suffered from threats due to rapidly increased population and economic activities. Especially the concentrated car repairing workshops in Suame Magazine, spreading sand mining outside Kumasi City and illegal garbage dumping in rivers are increased threats to the environment in Greater Kumasi Sub-Region.

3.3.2 Socio- Economy of Greater Kumasi Sub-Region

Major economic sectors of Kumasi City are service sectors including car repairing in Suame Magazine and commerce in the Central Market. On the other hand, in surrounding districts of Kumasi City, a shift has been taking place from the primary industry (mostly agriculture) to the tertiary industry (mostly commerce and services).

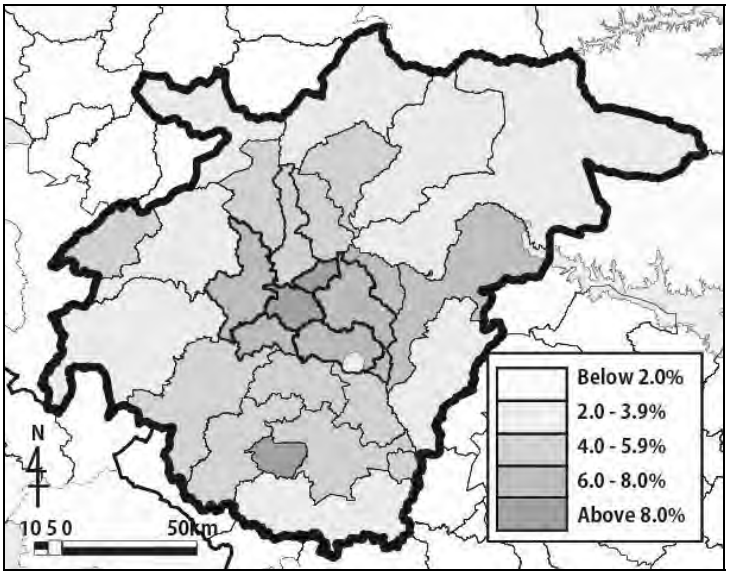
The unemployment rates of Kumasi City and Kwabre-East District are over 8%, which are higher than other districts of Ashanti Region. The percentages of EAP working in informal sectors in Greater Kumasi Sub-Region are relatively lower than those districts outside Greater Kumasi Sub-Region. On the other hand, the unemployment rates of Greater Kumasi Sub-Region are relatively higher than those districts outside Greater Kumasi Sub-Region.

Table 3.3.1 Percentage of Economic Active Population out of the Total Population

	Public Sector	Formal Private Sector	Informal Private Sector	Others	Total
KMA	8.9%	24.6%	63.3%	3.2%	100.0%
Urban Areas outside KMA within Greater Kumasi Sub-Region*	7.4%	17.2%	73.2%	2.2%	100.0%
Rural Areas outside KMA within Greater Kumasi Sub-Region*	4.0%	13.6%	80.8%	1.7%	100.0%
Total outside KMA within Greater Kumasi Sub-Region	4.8%	14.5%	78.9%	1.8%	100.0%
Greater Kumasi Sub-Region*	7.2%	20.5%	69.6%	2.6%	100.0%
Outside Greater Kumasi Sub-Region*	5.2%	11.7%	79.8%	3.4%	100.0%
Ashanti Region	6.3%	16.5%	74.2%	3.0%	100.0%

Source: 2000 Population and Housing Census

* Atwima District、Bosomtwe-Kwanwoma District、Ejisu-Juaben District、Kwabre District、Afigya-Sekyere District in accordance with the administrative units in 2000



Source: 2010 Population and Housing Census and Census Atlas

Figure 3.3.1 Unemployment Rates by District in Ashanti Region (over 15 years old)

3.3.3 Existing Development Projects for Greater Kumasi Sub-Region

(1) Existing Development Projects for the Transport Sector

A transport planning study for Greater Kumasi Sub-Region is being conducted by the assistance of the WB. The 2005 Urban Transport Planning and Management Study for Kumasi which was assisted by AFD was reviewed and the following was recommended:

- Construction/Widening of 19 roads
- Optimization of Signals of 5 Junctions
- Upgrading of Small Paratransit Vehicles into Large Bus Vehicles (Type B Transit Routes)
- Development of 5 BRT routes

The construction/widening of 19 roads include the construction of new Outer Ring Road by 2021. The development of five BRT routes are to be implemented in the following five roads: Mampong Road; Offinso Road; Sunyani Road; Bekwai Road; Accra Road.

(2) Existing Development Projects for the Water Resources and Water Supply Sector

Ghana Water Limited Company (GWLC) is conducting the Kumasi Water Supply Project funded by the ORET Program (Development Relevant Export Transactions Program), which is a program of the Dutch Government to support Dutch Export. The project consists of the rehabilitation of the water treatment plant and technical assistant. Once the rehabilitation of the existing facilities is completed the capacity of the WTP will be 232,000 m^3/d, thus the total capacity of WTPs is now 123,500 m3/d (110,000 m^3/d + 13,500 m^3/d). The technical assistance includes (i) network modeling and asset management, (ii) strategic master planning, (iii) reduction of

unaccounted for water, and (iv) training. It is currently assumed that the percentage of Non Revenue Water (NRW) is to be approximately 40%, which is very high.

(3) Existing Development Project for the Liquid Waste Sector

The Strategic Sanitation Plan for Kumasi (SSP-Kumasi, 1999) recommended that area of 300 – 600 person/ha should implement simplified sewerage system, area of 20 – 50 person/ha should have household latrines and in other areas household latrines or septic tanks.

According to the UNICEF / WHO Joint Monitoring Programme on sanitation, public shared toilets (and home toilet facilities shared by more than one household) are not considered as improved sanitation. This means increasing the number of public toilets does not contribute to the MDG7 Target1. However although MMDAs shall ensure the availability of facilities for the liquid waste, it seems that districts and municipality have been facing difficulty in the implementation process.

(4) Existing Development Project for the Solid Waste Management Sector

The KMA-WMD has an engineered sanitary landfill facility at Oti commissioned in 2004 under the Urban Environment Sanitation Project financed by the WB. Oti Sanitary Landfill Site has future development plan under the Ghana Urban Management Pilot Project (GUMPP) financed by AFD. It is projected that the total capacity of Oti Sanitary Landfill Site will last until 2028 after all development is complete.

(5) Existing Development Project for the Drainage Sector

As a part of the responsibility of KMA for planning and implementing drain maintenance, KMA is planning to establish a Drain Maintenance Unit (DMU) in its WMD.

(6) Existing Development Project for the Electricity Supply Sector

Bui Dam is under construction to increase the installed generation capacity in Ghana by 22%. Once the project is complete in 2013, it is assumed that Ghana will contribute to alleviate power shortages common in the whole of Ghana.

(7) Existing Development Project for Health Sector

Current health sector development projects are mostly formulated to achieve the Millennium Development Goals (MDGs).

(8) Existing Development Project for Education Sector

The Basic Education Sector Improvement Program was designed to support the

[1] The United Nations (UN) Millennium Development Goals (MDGs) launched in 2000, presents a minimum set of targets for achieving poverty reduction and sustainable development. The Government of Ghana is committed to the principles of the MDGs and with respect to MDG 7, which seeks to ensure environmental sustainability, will work towards improving access to safe water supply and sanitation to reduce the proportion of population without access to basic water supply and sanitation by 50% by 2015 and 75% by 2025.

government's policy of "Free Compulsory Universal Basic Education" financed as a loan project by the WB. As for the secondary and tertiary education project has been formulated in response to the determination of the Government of Ghana to provide relevant education to all Ghanaians at all levels, thus facilitating poverty reduction and promoting socio-economic growth and national development.

3.3.4 Key Characteristics of Greater Kumasi Sub-Region

National Roads and Inter-Regional Roads are coming through Kumasi City (KMA), connecting Kumasi with major cities and regions in Ghana. Because of the geographical central location, Kumasi City plays a significant role of the gateway between Northern Part and Southern Part in Ghana.

Population and economic activities are concentrated in KMA. Over 50% of Ashanti Region's population is found in KMA.

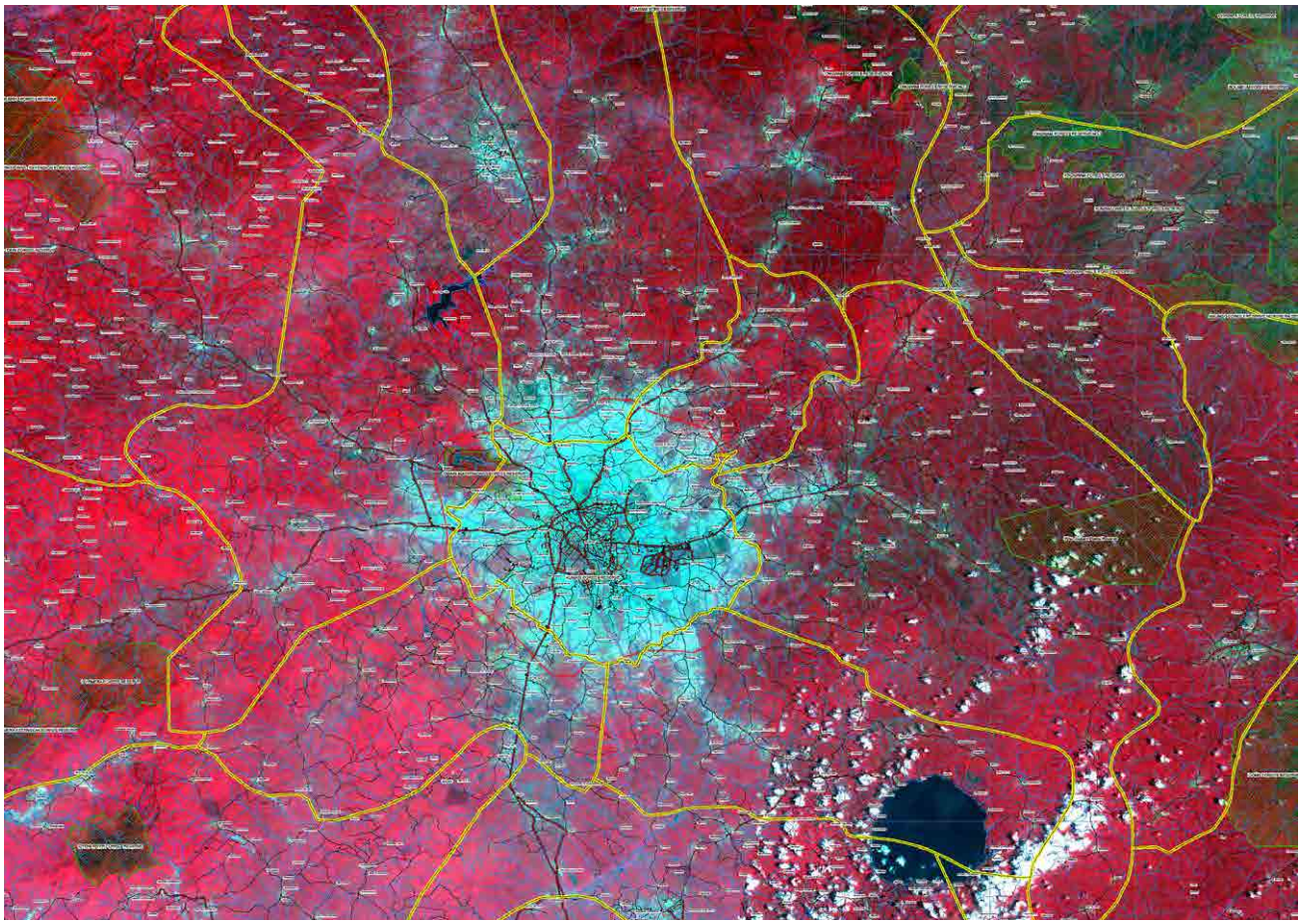
KMA showed very high population growth rates over 5.6% per annum continuously from 1984 via 2000 and further to 2010. In adjoining districts to KMA, from 1984 to 2000, suburbanization took place widely, causing annual population increase as a rate of 4.1%. However, their speed of population increase dropped to 2.1% per annum between 2000-2010.

Poverty pockets or slum communities have been formed in KMA. In those areas, their population densities are very high.

Table 3.3.2 Population of Greater Kumasi Sub-Region and Ashanti Region, 1984, 2000 and 2010

	Population			Annual Population Growth Rate (%)		Area (km^2)	Population Density (persons/km^2)		Population Increase (persons)		% of Population Increase of Ghana
	1984	2000	2010	1984-2000	2000-2010		2000	2010	1984-2000	2000-2010	2000-2010
KMA	487,504 *1	1,170,270 *3	2,035,064 *5	5.63%	5.69%	254	4,607	8,012	682,766	864,794	15.0%
Afigya-Kwabre	39,971 *2	89,358 *4	136,140 *5	5.16%	4.30%	517 *6	173	263	49,387	46,782	
Kwabre East	42,044 *2	101,100 *4	115,556 *5	5.64%	1.35%	135 *6	750	857	59,056	14,456	
Ejisu-Juaben	78,783 *1	124,176 *3	143,762 *5	2.88%	1.48%	723 *6	172	199	45,393	19,586	
Bosomtwe	41,283 *2	66,788 *4	93,910 *5	3.05%	3.47%	353 *6	189	266	25,505	27,122	
Atwima Kwanwoma	44,437 *2	79,240 *4	90,634 *5	3.68%	1.35%	291 *6	273	312	34,803	11,394	
Atwima-Nwabiagya	56,352 *2	127,809 *4	149,025 *5	5.25%	1.55%	597 *6	214	250	71,457	21,216	
Outside KMA	302,870	588,471	729,027	4.24%	2.16%	2,616	225	279	285,601	140,556	
Greater Kumasi Sub-Region	790,374	1,758,741	2,764,091	5.13%	4.62%	2,870	613	963	968,367	1,005,350	17.5%
Outside Greater Kumasi Sub-Region	1,299,726	1,854,209	2,016,289	2.25%	0.84%	21,519	86	94	554,483	162,080	
Ashanti Region	2,090,100 *1	3,612,950 *3	4,780,380 *5	3.48%	2.84%	24,389	148	196	1,522,850	1,167,430	20.3%
Ghana	12,296,081 *1	18,912,079 *3	24,658,823 *5	2.73%	2.69%	238,533	79	103	6,615,998	5,746,744	100.0%

Source: *1: 1984 Population and Housing Census
*2: Estimate based on 2010 District Boundaries and 1984 Community Populations
*3: 2000 Population and Housing Census
*4: Estimate based on 2010 District Boundaries and 2000 Community Populations
*5: 2010 Population and Housing Census
*6: Area measured using the District Boundary Maps by TCPD Regional Office



Source: JICA Study Team, based on ALOS AVNIR-2, JAXA 2008/2011

Figure 3.3.2 Urbanization of Greater Kumasi Sub-Region

Table 3.3.3 Urbanized Areas of Each MMDAs within Greater Kumasi Sub-Region

	Total Land Area (km^2)	Forest Reserve Area (km^2)	%	Urbanized Area (km^2)	%
Kumasi Metropolitan	234.15	5.28	2.3%	214.18	91.5%
Afigya Kwabre	517.28	22.97	4.4%	32.67	6.3%
Atwima Kwanwoma	290.72	0.00	0.0%	35.37	12.2%
Atwima Nwabiagya	596.98	8.44	1.4%	30.90	5.2%
Bosomtwe	352.58	0.00	0.0%	39.22	11.1%
Ejisu-Juaben	723.40	56.82	7.9%	25.57	3.5%
Kwabre East	134.82	0.00	0.0%	25.29	18.8%
Sub-Total of Outside KMA	2,615.78	88.23	3.4%	189.02	7.2%
Total Land Area	2,849.93	93.51	3.3%	403.20	14.1%

Source: JICA Study Team, based on the ALOS Satellite Imagery taken in 2008 and 2011

3.3.5 SWOT Analysis for Greater Kumasi Sub-Region

The major concerns and issues are analyzed (SWOT analysis) by looking at the strengths (S) and weaknesses (W) of Greater Kumasi Sub-Region from internal factors and at opportunities (O) and threats (T) from external factors.

(1) Internal Factors of Strength (S)

Internal factors of strength are found in the following aspects:

- Kumasi City (KMA) and its surrounding districts have formed a large urban conurbation and a large agglomeration of urban economies. Their populations are massive, nearly 3 million, who are economically active workers and a huge number of urban consumers.
- KMA is endowed with rich resources of higher educational and research institutions, including KNUST and other national research institutes. These institutions have attracted a large number of excellent young people to Kumasi, but they also produce a large number of excellent graduates for Kumasi and Ghana every year. There is high collaboration/linkage potential between higher education/research institutions and local industries.
- KMA and its surrounding districts have developed machine repairing services and manufacturing industries. One of the famous examples is car repairing services/manufacturing in Suame Magazine, which attracts customers widely, not only from Ashanti Region but also from the Northern Part of Ghana and further from neighbouring inland countries.
- KMA and its surrounding districts have developed a wide range of manufacturing industries (machinery, agro-processing, wood processing, beverage, etc.). Such manufacturing tradition and human resources could be a potential base for further development.
- KMA has developed an active commercial tradition. KMA has the Central Market, which attracts shoppers widely not only from Greater Kumasi but also from Ashanti Region and further northern parts of the country, even from neighbouring inland countries. Such tradition of commerce could be the foundation for further development by modernizing the commercial sector.
- Ashanti Region's mainstay is agriculture, based on relatively rich soils and rainfall favourable to agriculture, as well as a large population of farmers. Ashanti's agriculture could provide more raw material for agro-processing industries in the Greater Kumasi Sub-Region.
- Kumasi is geographically located almost at the centre of Ghana. Major transport routes go through Kumasi. Kumasi and Greater Kumasi could continue to be a logistics centre connecting to northern inland neighbouring countries and northern regions of Ghana.
- Ashanti Region's trunk roads (national and inter-regional roads) have been well developed and they are connected to Kumasi. The surrounding districts also could take advantage of those well developed trunk roads.

(2) Internal Factors of Weakness (W)

Internal factors of weakness are found in the following aspects:

- Kumasi is located 300 km inland from the coastal area and major ports. In comparison with the coastal region and port cities, Kumasi's locational handicap is large when it comes to export and import of commodities/goods.

- Although car repairing sectors in Suame Magazine and commercial sectors in Central Market create a huge number of employment opportunities, those sectors are called informal sectors, which only produce a relatively small amount of added value per worker. Therefore, in the future it will be difficult for these informal economic sectors to support the increasing number of urban population and to sustain the growth of urban economies in Greater Kumasi Sub-Region.
- Current strong sectors, like Suame Magazine, Central Market and truck transport of Kumasi are causing serious urban problems in respect of traffic congestion and the urban environment. These sectors could increasingly cause malfunctions of transportation and inefficiency of socio-economic activities to Kumasi and Greater Kumasi Sub-Region.
- KNUST and other national research institutes have tried, but have not succeeded in producing entrepreneurs. They have not been so collaborative with local economic sectors including local informal sectors. They have not contributed to economic development, industrial development or the regional economy.
- Not only in Greater Kumasi Sub-Region, but also in Ghana as a whole, foreign investments have not been actively made for developing the manufacturing sectors. There might be structural problems for this past situation.
- Because of the existing two dams and water reservoirs constructed for water supply in the colonial era, Kumasi has water supply not only to its citizens but also industries, such as beverage factories. However, the water quality of the two reservoirs is increasingly adversely affected by suburbanization. Moreover, the rapidly increasing populations require water resources development. However, such situation poses uncertainty of water availability for rapid and large urban growth of Greater Kumasi Sub-Region.
- Many people still depend on farming in the districts surrounding Greater Kumasi Sub-Region. However, rapid expansion of urban areas and increase of land prices cause difficulties in access to farm lands in surrounding districts.

(3) External Factors of Opportunities (O)

External factors of opportunities are found in the following aspects:

- Kumasi is expected to continue to be one of the important transport routes in Ghana in the national transport policies. Therefore, the national and inter-regional roads connecting with Kumasi will be well maintained or further upgraded in the future.
- Since the Greater Kumasi Sub-Region is the second largest urban area in Ghana in terms of population and its economic size, in terms of social development, as well as economic development, social infrastructures and economic infrastructures of the Greater Kumasi Sub-Region will be improved as needs arise.
- The current government's policies emphasize the importance of modernization of agriculture and integrated development of industry and agriculture. Within Ashanti Region, agricultural development and industrial development could be promoted in an integrated manner.

- The current government policies emphasize the increasing of cocoa processing within the country. Ashanti Region is the second largest cocoa producing region in Ghana. Moreover, Kumasi has factories for cocoa processing. While Ashanti Region promotes enhancement of productivity of cocoa farming, the Greater Kumasi Sub-Region could have the potential for developing more cocoa processing capacities.

(4) External Factors of Threat (T)

External factors of threat are found in the following aspects:

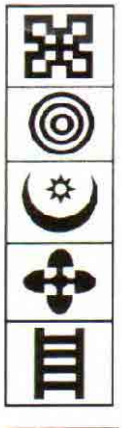
- Although the current government policies give high priority to industrial development in integration with agricultural modernization, it is uncertain how substantial the efforts that the government makes are and how effective they are.
- It is uncertain how much the informal economic sectors, such as Suame Magazine and commerce, can continue to contribute to the economic growth of the Greater Kumasi Sub-Region.
- Since the government promotes the development of the Western Corridor and Eastern Corridor as road transport routes connecting ports with inland regions/inland countries, the relative importance of the Central Corridor through Kumasi might be reduced.

Table 3.3.4 SWOT Cross Analysis for Greater Kumasi Sub-Region

	Opportunity	Threat
	• The national and inter-regional roads connecting with Kumasi will be well maintained or further upgraded in the future as the need arise. • The current government's policies emphasize the importance of modernization of agriculture and integrated development of industry and agriculture. They also emphasize the increasing of cocoa processing within the country.	• It is uncertain how substantial and effective the efforts that the government makes for industrial development in integration with agricultural modernization will be. • The government is promoting the development of the Western and Eastern Corridor as road transport routes connecting ports with inland regions and countries.

Strength	• KMA and its surrounding districts have huge number of EAP and urban consumers. • KMA is endowed with rich resources of higher educational and research institutions, producing a large number of excellent graduates. • KMA have developed machine repairing services and manufacturing industries such as Suame Magazine, attracting customers not only from whole of Ghana but also from neighbouring inland countries. • KMA and its surrounding districts have developed a wide range of manufacturing industries (machinery, agro-processing, wood processing, beverage, etc.). • Central Market in KMA attracts shoppers not only from whole of the country, but further from neighbouring inland countries. • Ashanti's agriculture can provide raw material for agro-processing industries. • Kumasi is geographically located almost at the centre of Ghana. Major transport routes go through Kumasi.	• By taking advantage of this strength, it is possible to activate the manufacturing in the formal sector (including agro-processing) due to the geographical location of Kumasi.	• By utilizing this strength and for preparing against the identified external threats, it is necessary to modernize Suame Magazine and develop the expertise of Central Market. • It is necessary for higher educational institutions and manufacturing sector such as factories and Suame Magazine to co-develop.
Weakness	• Kumasi's locational handicap is large for export and import of commodities/goods. • Difficulty for informal economic sectors to support the increasing number of urban population and to sustain the growth of urban economies in Greater Kumasi Sub-Region in the future. • Current strong sectors, like Suame Magazine, Central Market and truck transport of Kumasi could increasingly cause malfunctions of transportation and inefficiency of socio-economic activities. • KNUST and other research institutes have not succeeded in producing entrepreneurs and contributing to economic development, industrial development or the regional economy. • Foreign investments have not been actively made for developing the manufacturing sectors. • Uncertainty of water availability for rapid and large urban growth of Greater Kumasi Sub-Region. • People still depend on farming in the rural area of Greater Kumasi Sub-Region but rapid expansion of urban areas and increase of land prices cause difficulties in access to farm lands in surrounding districts.	• For utilizing the external opportunities and preparing against the identified weakness, it is necessary to enforce measures for knowledge-based sector based on ICT by utilizing the graduates of higher educational institutions.	• For preparing against this weakness under the identified external threat, it is necessary to promote the development of small-scale agriculture in the rural area of Greater Kumasi Sub-Region since Greater Kumasi Conurbation will become a city with population of over 5 million which has a huge market.

Source: JICA Study Team



PART III

Spatial Development Framework (SDF) for Ashanti Region

Chapter 4 Visions, Socio-Economic Development Policies, and Spatial Structure for Ashanti Region

4.1 Introduction

(1) Spatial Development Framework and Socio-Economic Development Policies for Ashanti Region

In the New Spatial Planning System of Ghana, National, Regional, Sub-Regional and District Level Spatial Development Strategies (SDFs) should be prepared. In this multi-layered spatial planning system, lower-level SDFs should be prepared in compliance with their upper-level SDFs. Therefore, a SDF for Greater Kumasi Sub-Region should be consistent with the Regional Level SDF for Ashanti Region, which should be compliant with the National Level SDF for Ghana. Since the new system is still being introduced in Ghana, the National Level SDF for Ghana and the Ashanti Region's SDF are not yet existent.

Although the levels must conform, this does not mean that the process has to start at the top, national level. Local, District or Regional levels plans are also necessary to inform each other and the national level. In setting the system up, plans are initially having to be prepared at all levels. It is necessary in this context to make assumptions about the levels above or below any one that is being prepared, until those other levels are available. When they are, some adjustments will be necessary to align the plans.

Although the SDF looks at and guides physical aspects of development and the environment, it is also necessary to bring in social and economic factors. In this sense, the SDFs are to be prepared in alignment with the Medium Term Development Plans (MTDPs) at the national and district levels. But in the current National Development Planning System for socio-economic development, such MTDPs have not been formulated at the regional and sub-regional levels. Hence a further problem arises in that in the Regional Level SDF for Ashanti Region, there is no relevant socio-economic development plans for Ashanti Region to refer to.

Under this circumstance, the Study Project on spatial development planning for Greater Kumasi Sub-Region needs to make assumptions where necessary about relevant visions and socio-economic development policies for Ashanti Region, and review and interpret socio-economic development policies at the national level and any plans and programmes of different sectors at the regional level, as well as by trying to gain some understanding of the context of existing and prospective problems on development and the environment in Ashanti Region.

(2) Socio-Economic Development Policies and Spatial Development Strategies for Ashanti Region

Spatial development strategies are the main elements of the SDF. Such spatial development strategies for Ashanti Region are intended not only to support the implementation of selected socio-economic development policies for the Ashanti Region and but also to guide the formulation and implementation of Greater Kumasi Sub-Region's spatial development strategies. In this chapter, both socio-economic development policies and spatial development strategies are discussed for Ashanti Region.

4.2 Visions for Ashanti Region: Vision Statement for Stakeholder Consultation

(1) A Vision Proposed for Ashanti Region

A Vision for the Future of Ashanti Region can be considered by looking at the following two aspects of development:

- National directions of development in the long term, and
- Physical, natural, social and economical characteristics of the region.

Based on the analysis of these two sets of aspects, the following vision for Ashanti Region for stakeholder consultation was proposed. This proposed vision statement was generally accepted at the stakeholder consultative meeting.

> *"The Ashanti Region will maintain the historical and cultural aspirations of the region, create a vibrant, modernized and diversified economy based on endowed natural resources and people, which will bring sufficient employment and social services to its people, while pioneering and contributing to propelling Ghana into middle-income status of the world."*

(2) National Directions of Development in the Long Term

In 1995, Ghana aimed to become a middle-income country in the long term (1996-2020) by following a co-ordinated programme of economic and social development policies. The bold vision was supported by setting long-term objectives concerning the following matters:

- Human development to reduce poverty, increase incomes and reduce disparities in incomes and opportunities
- Economic growth to establish an open and liberal market economy
- Rural development to provide adequate economic and social infrastructure and to protect and improve the rural environment
- Urban development to enable urban settlements to play a pivotal role in national development
- An Enabling Environment to deepen reforms of public administration and legal framework

In 2010, Ghana still maintained the vision and objectives to achieve a middle-income status of the country. Very challenging policies have now been instated for economic

transformation, especially through investment in the agricultural and manufacturing sectors. In addition, some of the funds gained from oil and gas exploitation are being reserved for infrastructure development.

Strong messages of the Better Ghana Agenda (GSGDA) include the following:

- It is necessary to transform the economy from the current factor-driven economy (heavily commodity dependent economy and import tax dependent revenues) to an efficiency driven economy
- It is necessary to anchor industrial development on the conversion of Ghana's natural resources into value-added products with emphasis on agro-based manufacturing, down-stream oil & gas and mineral processing and manufacturing, tourism and creative arts.
- It is necessary to create strong linkages between industrialization and agriculture/other natural resources endowments.

(3) Physical, Natural, Social and Economic Characteristics of Ashanti Region

In summary of the present situational analysis given in Chapter 5, Ashanti Region has the following potential resources and features on which it can pursue the Vision for the future:

- Ashanti Region has a proud long historical and cultural tradition, being at the centre of the Ashanti Kingdom.
- Ashanti Region is an agricultural region with good soils and climate.
- Ashanti Region has Kumasi as its capital city for traditional and government administration.
- Ashanti Region has Kumasi as its commercial centre of West African significance.
- Ashanti Region has Kumasi is an academic centre of excellence, again on a West African scale.
- Ashanti Region has clusters of manufacturing sectors in Kumasi and its surrounding areas.
- Ashanti Region is strategically located in the centre of the country.
- Ashanti Region is a hub of transportation connecting the southern and northern parts of Ghana, as well as toward neighboring inland countries.

4.3 Socio-Economic Development Policies for Ashanti Region

Options for socio-economic development polices for the Ashanti Region were proposed for the purpose of examining them in stakeholder consultative meetings. Potentials and options for economic development in the Ashanti Region are examined from two geographically different perspectives. One set of options are for Greater Kumasi Sub-Region and the other set of options is for outside the Greater Kumasi Sub-Region. For the purpose of consideration and discussion, very different types of options are put forward. However, by considering each as alternatives, all eventualities can be considered in dimensioning of plans.

<u>Greater Kumasi Options</u>

- Greater Kumasi Option A: Focus on Commerce, Logistics and Car Repairing

Services/Manufacturing
- Greater Kumasi Option B: Focus on the Manufacturing Sector
- Greater Kumasi Option C: Focus on both Manufacturing and Knowledge-Based Sectors

Outside Greater Kumasi Options

- Outside Greater Kumasi Option 1: Modernization of Small-Scale Agriculture
- Outside Greater Kumasi Option 2: Promotion of Foreign and Domestic Direct Investment in the Agricultural Sector in Integration with the Agro-Processing Industry
- Outside Greater Kumasi Option 3: Promotion of Development of the Mining Sector

(1) Greater Kumasi Options

1) Option A: Greater Kumasi's Focus on Commerce, Logistics and Car Repairing Services/Manufacturing

This option proposes a continuing focus on the existing major economic sectors in Kumasi, namely the commerce sector (wholesale and retail), logistics sector (goods transport and warehouses) and car repairing services/manufacturing. Currently, these sectors employ a large number of informal sector workers. However, the value added created by these sectors is not large. Moreover, it is uncertain if these sectors can continue to flourish or even survive in the medium and long term future.

This focus needs substantial investment in heavy-loaded roads and railways, including truck terminals and dry ports.

2) Option B: Focus on Manufacturing Sector

In response to the national development policy framework (GSGDA)'s objectives to become a middle-income country by 2020, this option proposes a focus on pursuing economic transformation by linkages between the manufacturing and agriculture sectors. Ashanti Region's advantages in this focus are 1) the industrial bases of Greater Kumasi, and 2) high agricultural potential in Ashanti Region, both small scale and large scale. This combination enables better integration between agricultural development and industrial development within a region.

This focus needs not only enhancement of the quality of infrastructure services for the manufacturing sector, but also better access roads to and within agricultural areas.

3) Option C: Focus on Both Manufacturing and Knowledge-Based Sectors

In addition to agro-processing industrial potential, this option pays attention to the presence of KNUST and other higher education/research institutions in Kumasi. The nurturing of knowledge-based economic sectors can be promoted by collaboration between universities and private sectors and by Foreign Direct Investment (FDI), because spin-out of technology is expected from FDI companies. ICT and Business Processing Outsourcing sectors are also one of the target areas for attracting foreign companies.

This focus needs not only enhancement of the quality of infrastructure services for the manufacturing sector, but also better access roads to and within agricultural areas. This

focus also needs office buildings in urban settings, which are equipped with a better quality of electricity and ICT infrastructure.

(2) Outside Greater Kumasi Options

1) Outside Greater Kumasi Option 1: Modernization of Small-Scale Agriculture

Firstly, there is a potential for a focus on the improvement of conventional small-scale agriculture (both cash and food crops) in terms of seeds and inputs. In integration with Kumasi's commercial centres, local service centres covering Ashanti Region should play key roles for distributing improved seeds and inputs to small-scale agriculture in the region.

2) Outside Greater Kumasi Option 2: Promotion of Foreign and Domestic Direct Investment in the Agricultural Sector in Integration with the Agro-Processing Industry

In contrast to the option focusing on small-scale agriculture, development can also take the form of foreign and domestic direct investment in large-scale agricultural businesses, which will require a large amount of arable lands. Foreign and/or domestic companies investing in agriculture are encouraged to invest simultaneously in agro-processing industries.

3) Outside Greater Kumasi Option 3: Promotion of Development of the Mining Sector

Ashanti Region still has unexploited mineral resources, such as Bauxite and Gold. Nynahin area has a huge reserve of Bauxite, to which an extension of the railway is planned from Awaso (an exiting Bauxite mine). Such mineral resource development could generate local employment and transform small towns into regional service centres, like Obasi and Konongo. With Bauxite mining development, Nynahin town (district capital) could grow to be a regional service centre.

4.4 Scenarios of Socio-Economic Development for Ashanti Region

In Section 4.3, two sets of options for Socio-Economic Development Policies are proposed and discussed for the Ashanti Region. The one set was for the Greater Kumasi Sub-Region and the other set was for the area inside of the Ashanti Region but Outside the Greater Kumasi Sub-Region. In this section, three different combinations of these two sets of socio-economic development policies are proposed and discussed for the purpose of considering different options of the Spatial Structure for Ashanti Region.

Although there are nine combinations of the two sets of options, here we set the following three most likely combinations:

Scenario 1: Combination of the following two options:
- Greater Kumasi Option: Focus on Manufacturing Sector
- Outside Greater Kumasi Option: Modernization of Small-Scale Agriculture

Scenario 2: Combination of the following two options:
- Greater Kumasi Option: Focus on Commerce, Logistics and Car Repairing

Services/Industry

- Outside Greater Kumasi Option: Promotion of Foreign and Domestic Investments in Agriculture Sector in Integration with Agro-processing Industry

Scenario 3: Combination of the following two options:

- Greater Kumasi Option: Focus on Both Manufacturing and Knowledge-Based Sectors
- Outside Greater Kumasi Option: Promotion of Development of Mining Sector

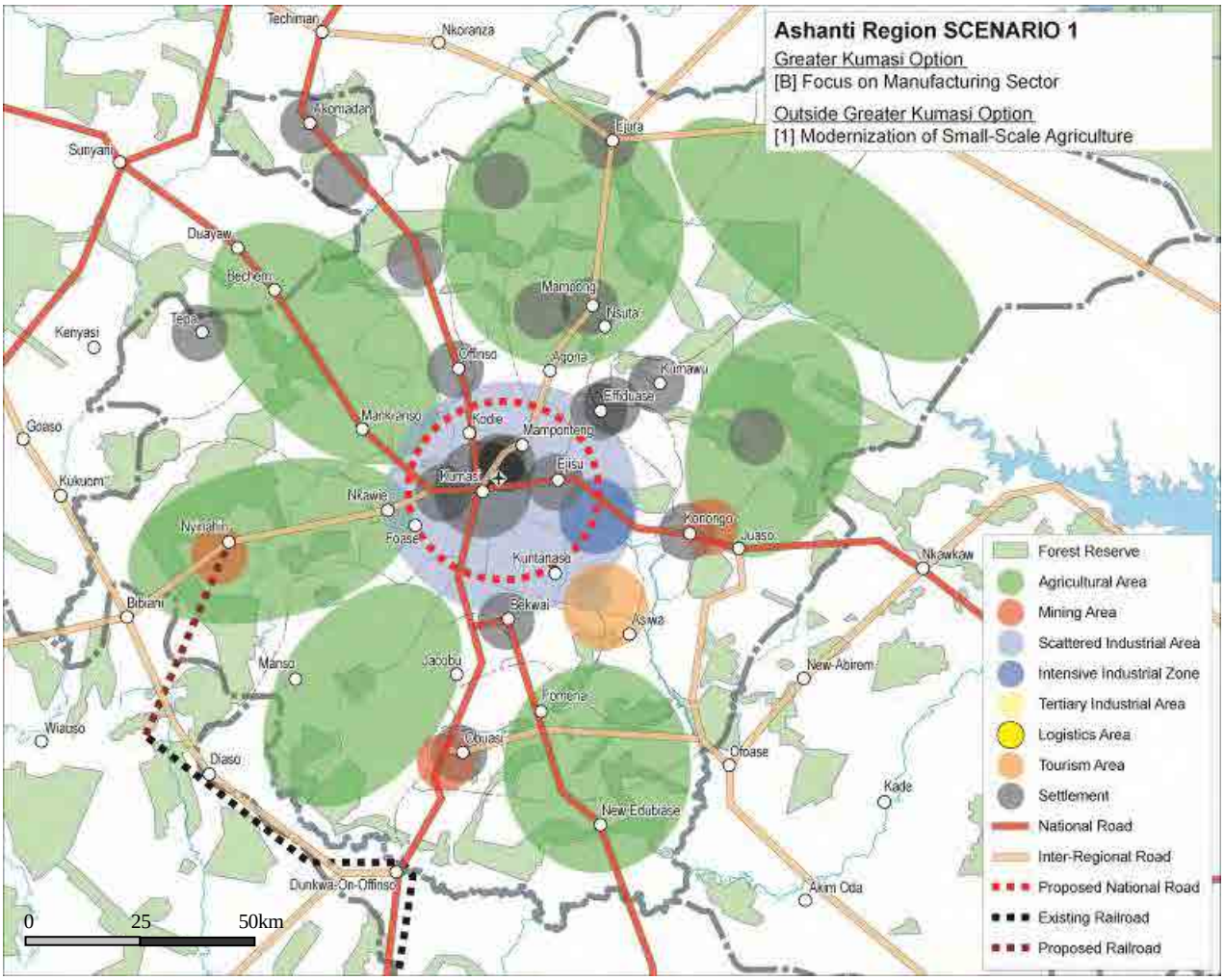
4.5 Options of Spatial Structure for Ashanti Region

Based on the analysis of these three scenarios for socio-economic development for Ashanti Region, three options of the spatial structure for Ashanti Region were formulated. Each of the three scenarios requires a different option of the spatial structure for Ashanti Region.

Interestingly, three different socio-economic development policies and scenarios demand different types of spatial structure within the Ashanti Region, as described below and as shown in through Figure 4.5.1 to Figure 4.5.3.

Option 1: Regional Spatial Structure for Scenario 1 [Manufacturing+Small-Scale Agriculture Modernization]

- The transport for Greater Kumasi Sub-Region is based on roads in the long term (15-20 years), but not on railways.
- Road connection between agricultural areas and Greater Kumasi Sub-Region is essential for supporting the integration between small-scale agricultural modernization and agro-processing in Greater Kumasi Sub-Region.
- The construction of an Outer Ring Road is important both for enabling through traffic to bypass Kumasi and for providing access to an ample number of land plots in order to attract manufacturing industries along the Outer Ring Road.
- Railway improvement is expected for transporting bauxite from Awaso and also from Nyinahin.
- District capitals are important service centres for modernization of agriculture and rural life.

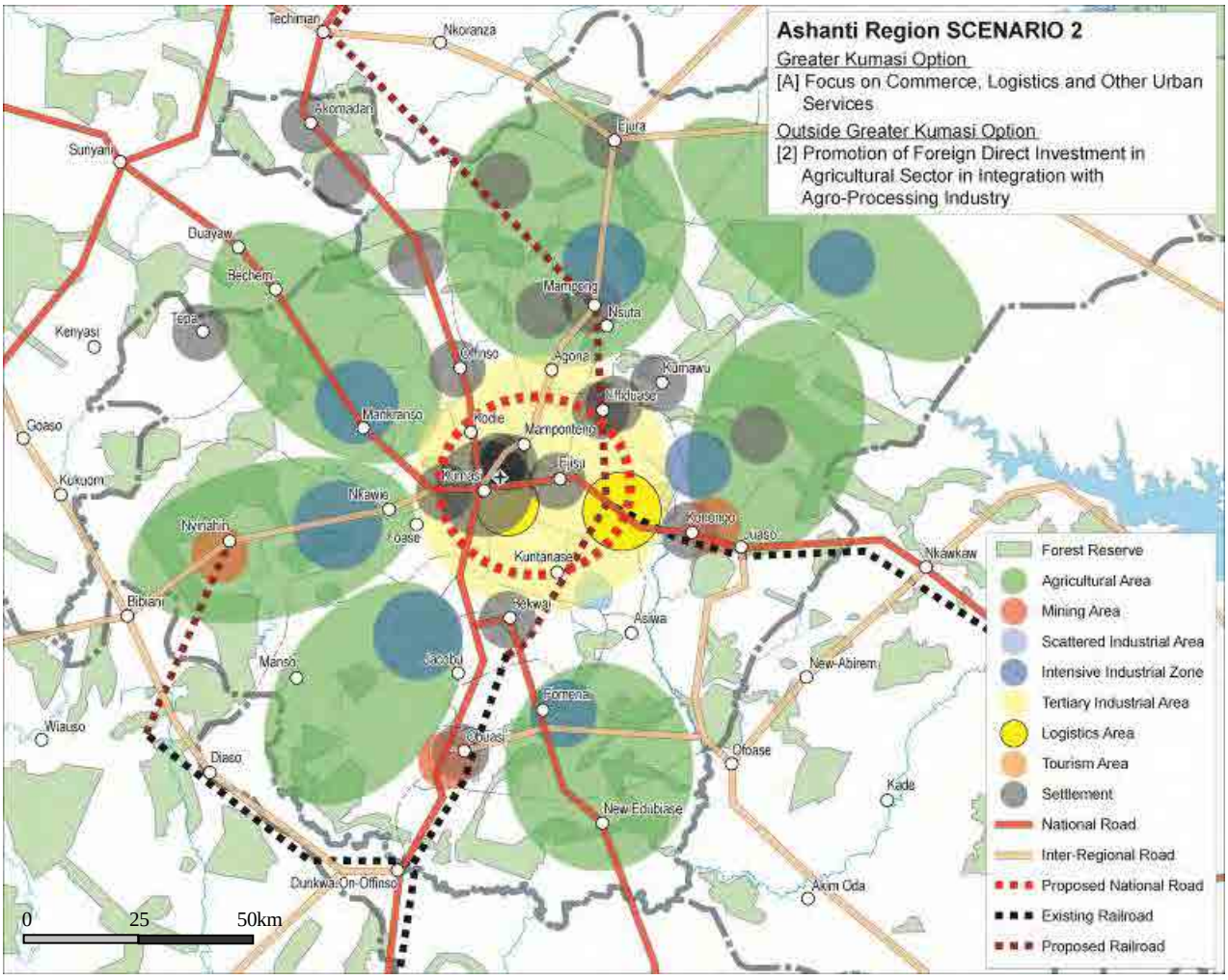


Source: JICA Study Team

Figure 4.5.1 Option 1: Regional Spatial Structure for Scenario 1

Option 2: Regional Spatial Structure for Scenario 2 [Commerce/Logistics/Car Repairing+Agriculture Investment+Agro-Processing Industries]

- Development of both railways and roads should be emphasized.
- A wider-width (over 6 lanes) and heavy-load road should be constructed for the Outer Ring Road in order to modernize and strengthen the logistics functions and logistics industries in the Greater Kumasi Sub-Region.
- The Western Railway Line and Eastern Railway Line should be connected by constructing a new section between Boankra and Bekwai for enabling Greater Kumasi Sub-Region to have good access to both Tema Port and Takoradi Port.
- A new railway line should be constructed for extending the existing railway network to the northern part of the country.
- For integration of agriculture and agro-processing industries within agricultural areas, some district capital towns should be upgraded to become service centres for agriculture and bases for agro-processing industries.

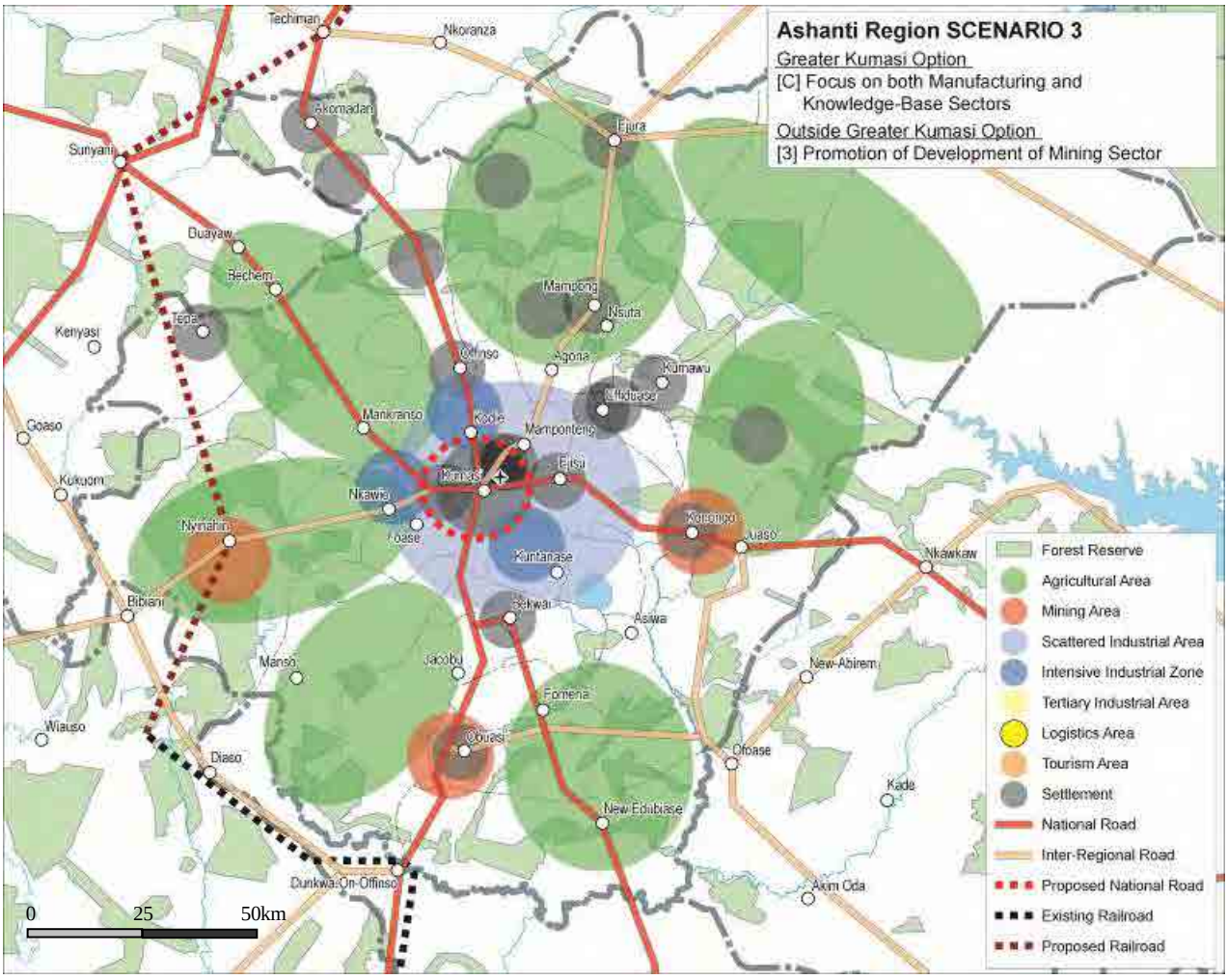


Source: JICA Study Team

Figure 4.5.2 Option 2: Regional Spatial Structure for Scenario 2

Option 3: Regional Spatial Structure for Scenario 3 [Both Manufacturing and Knowledge-Base Sectors + Mining Sector]

- A smaller Outer Ring Road than that currently planned is needed for providing better mobility within the urban areas of the Greater Kumasi Sub-Region.
- Such a smaller Outer Ring Road could provide land and good access for knowledge-based industries, which prefer to be closer to the city centre and the airport.
- Railway development should be upgraded for the mining sectors (including railway extension to Nynahin), but not for the Greater Kumasi Sub-Region in this option.



Source: JICA Study Team

Figure 4.5.3 Option 3: Regional Spatial Structure for Scenario 3

4.6 Selected Options of Spatial Structure for Ashanti Region

The options for socio-economic development policies and these kinds of scenarios were discussed at the second series of stakeholder meetings (organized between 8th June and 21st June, 2012) at the district level including KMA and at the regional level.

The stakeholders at the district level showed preference to Option A for Greater Kumasi and Option 2 for Outside Greater Kumasi. On the other hand, the stakeholders at the regional level showed clear preference to Option C. For reducing the migration from outside Greater Kumasi to Greater Kumasi, it is necessary to promote development of both mining sector and agricultural sector within Ashanti Region.

Therefore, it is necessary to consider Scenario 2 and Scenario 3 as the basis for spatial structure of Ashanti Regional SDF.

Considering both the preference of the stakeholders and the technical analysis done through the Study, the following socio-economic scenarios are proposed:

For the Greater Kumasi Sub-Region: in the short term, [A] Focus on Commerce is selected and in the medium and long terms, [C] Focus on Manufacturing and Knowledge Sectors.

Outside the Greater Kumasi Sub-Region: both [2] Focus on Agricultural Investment and [3] Focus on Mining Sector.

By combining these policies, outside the Greater Kumasi Sub-Region, economic sector development can be promoted further to slow down migration to the Greater Kumasi Sub-Region. Moreover, inside the Greater Kumasi Sub-Region, the dependency on informal sectors can be gradually reduced.

This combined set of socio-economic policies would require a regional spatial structure, which combines the spatial options shown in Figure 4.2 and Figure 4.3. This regional spatial structure should have the following characteristics:

- Long-distance cargo railway transport is important. The Eastern Line should be extended from Ejisu or Boankra to the north. The connection of the Western Line with Kumasi's central area should be maintained. The branch line to Awaso should be extended to Nynahi from Awaso.
- The proposed Outer Ring Road should be constructed close to the central area of Kumasi in order to induce urban development.
- Urban centres for supporting both agricultural development and mining development are important, and roads to connect these urban centres to the Greater Kumasi Conurbation should be improved.

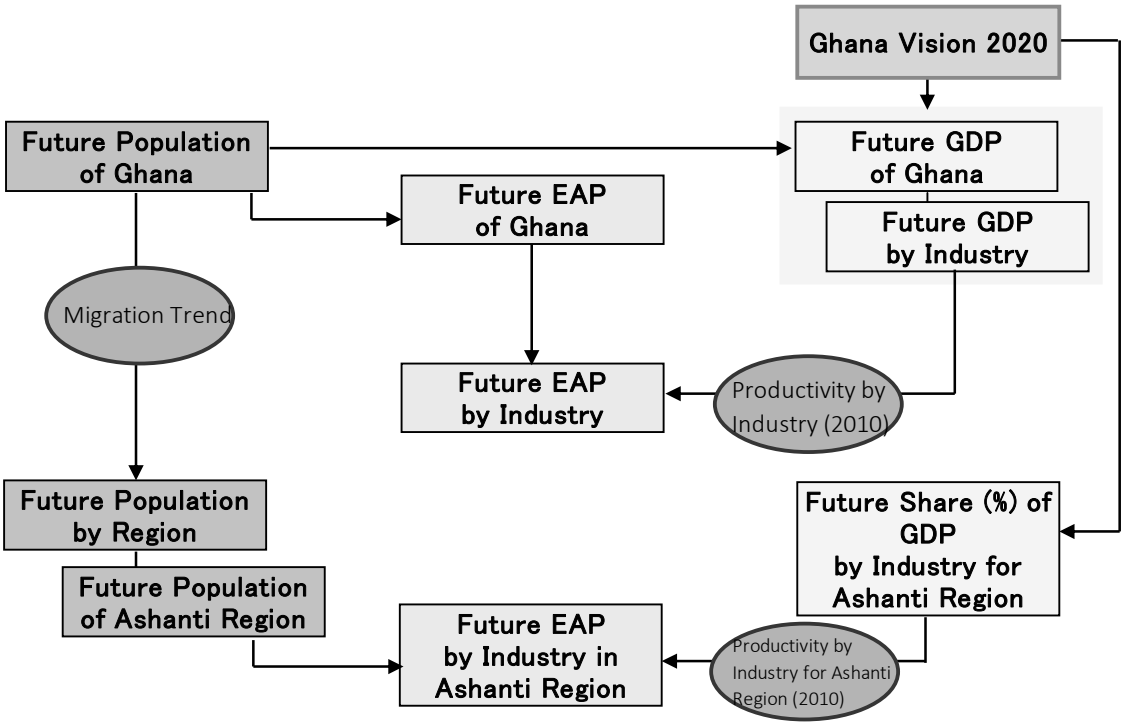
Chapter 5 Socio-Economic Frameworks for Ashanti Region

5.1 Introduction

In this spatial development planning project, socio-economic frameworks consisting of population and economic active population (EAP) by industry are prepared for Ghana as a whole, Ashanti Region and Greater Kumasi Sub-Region. Furthermore, for the Greater Kumasi Sub-Region, sub-frameworks are prepared for KMA and Greater Kumasi Conurbation.

In Chapter 5, future populations and EAPs by industry of Ghana as a whole and Ashanti Region are predicted for the future socio-economic frameworks. The socio-economic frameworks are prepared for years 2018, 2023, 2028 and 2033.

The socio-economic framework for Ashanti Region was prepared as the flowchart below.



Source: JICA Study Team

Figure 5.1.1 Flowchart for Ashanti Region's Socio-Economic Framework

5.2 Population and GDP Trends in Ghana

(1) Past Population and Estimated Future Population of Ghana

In Ghana, the population has rapidly increased in the recent decades with 24.7 million as of 2010 which is twice the size of the population in 1984, 12.3 million, as described in Table 5.1.1.

Table 5.2.1 Past Population Trend

	1970	1984	2000	2010
Population	8,559,313	12,296,081	18,912,079	24,658,823
Growth Rate (Annual %)	-	(2.62%)	(2.73%)	(2.69%)

Source: GSS, 1970, 1984, 2000 and 2010 Population and Housing Census

Although the annual growth rate decreased slightly from 2.73% to 2.69%, the annual growth rate of Ghana has been high in the past forty years with over 2.6%. Based on the past population trend in Ghana, the assumption that the annual population growth rate will continuously decrease to as low as 2% per annum by year 2033 is employed in order to estimate the future population of Ghana for the socio-economic framework for this Project.

The United Nations (UN) and Ghana Statistical Service (GSS) have also predicted that the future population growth rate of Ghana will continuously decrease to even lower rates than 2% per annum in the next decades.

The forecast by the UN shows three variants: high; medium and low. In the UN's population projection for 2033 for Ghana, the average annual population growth rates for the three variants in the period 2028-2033 was 2.03%, 1.74% and 1.42% respectively (see Table 5.1.2). This prediction was first done in year 2000 and was revised in 2010.

Table 5.2.2 Future Population Prediction by UN (Year 2010-2033)

Variant		2010	2013	2018	2023	2028	2033
High	Population (,000)	24,392	26,244	29,575	33,148	36,890	40,791
	Growth Rate (Annual %)	-	2.47%	2.42%	2.31%	2.16%	2.03%
Medium	Population (,000)	24 392	26 131	29 113	32 162	35 274	38 450
	Growth Rate (Annual %)	-	2.32%	2.18%	2.01%	1.86%	1.74%
Low	Population (,000)	24,392	26,018	28,651	31,175	33,659	36,121
	Growth Rate (Annual %)	-	2.18%	1.95%	1.70%	1.55%	1.42%

Source: Population Division of the Department of Economic and Social Affairs, 2011, World Population Prospects: The 2010 Revision, UN

The future population by GSS was forecast in 2005 for the period 2000-2025 based on the 2000 Population and Housing Census. In this forecast, the average annual

population growth rate for the period 2020-2025 was estimated to be 1.78% (Table 5.1.3).

Table 5.2.3 Future Population Prediction by GSS (Year 2000-2025)

Year	2000	2005	2010	2015	2020	2025
Population	18,912,080	21,026,106	23,316,880	25,669,386	28,207,720	30,806,994
Growth Rate (Annual %)	-	2.14%	2.09%	1.94%	1.90%	1.78%

Source: GSS, 2005, Population Data Analysis Report

However, since both of the predictions (UN and GSS) were conducted before 2010, they were not able to reflect the most current figures of 2010 Population and Housing Census in their predictions.

Ghana's total population in the future for the socio-economic framework for this Project is based on the consideration of the on-going following trends:

- Large increase in share of urban population, which causes a higher cost of raising a child, and
- Women's social participation and advancement, as well as getting access to higher education in the urban areas.

Considering both the still high population growth rates and these strong trends, the annual population growth rate is estimated to be approximately 2.1% for the period 2028-2033, which is slightly higher than that of UN's high variant prediction. Based on the annual population growth rate estimated for 2033 the population of Ghana is projected to be 30.2 million in the year 2018, 33.9 million in 2023, 37.8 million in the year 2028, and 41.9 million in the year 2033 which is approximately 170% of the population compared with year 2010 (Table 5.1.4).

Table 5.2.4 Future Population of Ghana

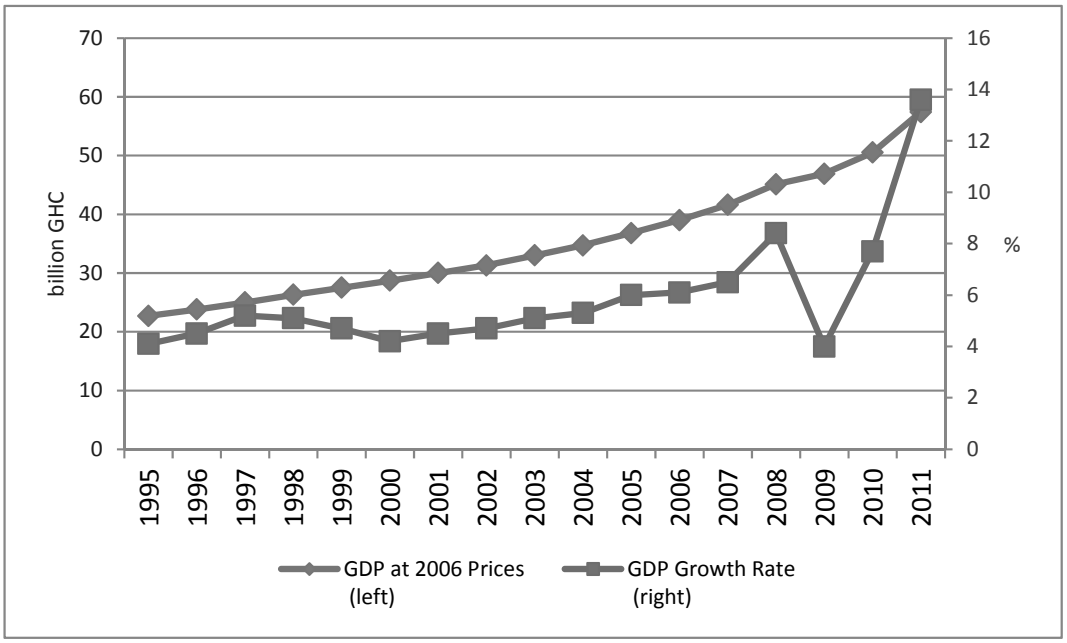
Year	2000*	2010*	2013	2018	2023	2028	2033
Population	18,912,079	24,658,823	26,655,204	30,171,371	33,902,644	37,817,508	41,876,311
Growth Rate (Annual %)	2.73%	2.69%	2.63%	2.51%	2.36%	2.21%	2.06%

Source: JICA Study Team
Note*: GSS, 2000 and 2010 Population and Housing Census

(2) Past GDP and Future GDP of Ghana

Since the 1990s, Ghana's economic development has been steady but slow. The real GDP growth rate has been around 5% per annum (Figure 5.2.1) and the real per capita GDP growth rate has been around 3% with an annual population growth rate of around 2.2%.

When it comes to the years after 2005, Ghana's GDP grew at over 6% per annum, due to the favourable prices of cacao and gold.



Source: IMF, World Economic Outlook Database 2012

Figure 5.2.1 Past GDP at 2006 Prices and GDP Growth Rate

Future GDP of Ghana from 2012 until the year 2017 has been predicted by the International Monetary Fund (IMF). Using this prediction, the following three possibilities for future GDP between 2018 and 2033 are considered in the framework. (Figure 5.2.2)

a) Accelerating high economic growth

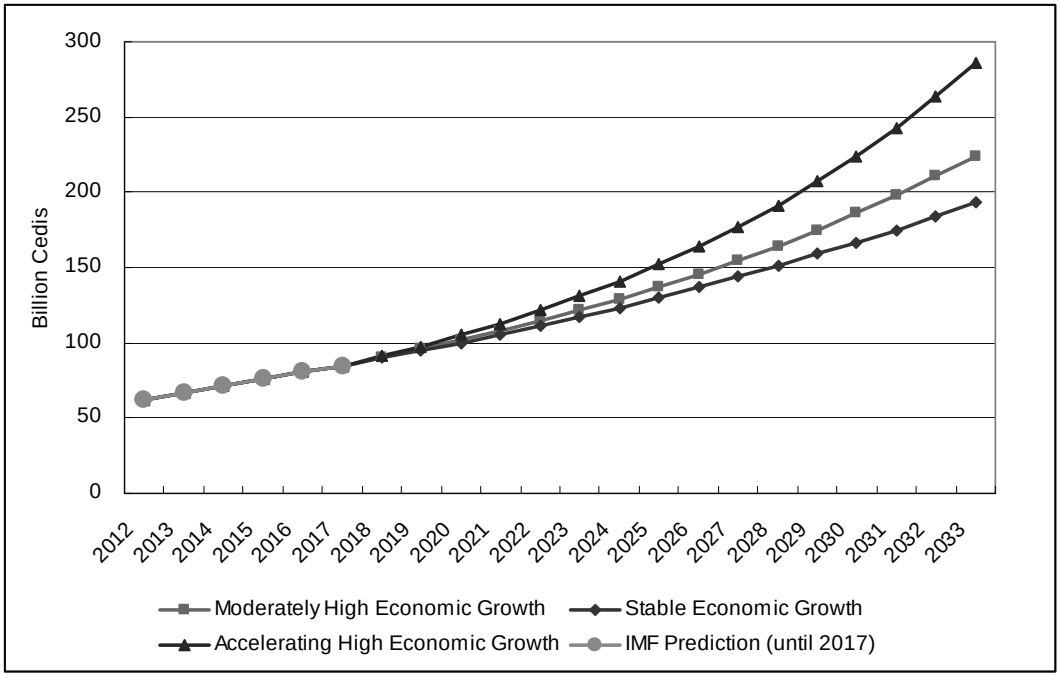
The annual GDP growth rate will continue to increase each year accelerating the economic growth till 2033.

b) Moderate high economic growth

The GDP growth rate will stay above 6% per annum which is at a high rate similar to what it has been in the years since 2005 excluding 2009 when the global economic crisis occurred.

c) Stable economic growth

The GDP will continue to increase at a relatively high rate, however it will start to be a stable growth dropping below 5% by year 2033.



Source: IMF, World Economic Outlook Database 2012 and JICA Study Team

Figure 5.2.2 Future GDP of Ghana 2012-2033 (Base Year 2006)

5.3 Regional GDP and Economically Active Population by Industry in Ashanti Region

(1) Estimation Methodology

Given the estimated population of Ghana above, this section estimates regional GDP and economically active population (EAP) by industry in Ashanti Region from the year 2000 onwards to comprehend the economies by region and for formulation of a simplified spatial framework.

Due to the lack of regional government entities, official regional GDP cannot be obtained. Therefore to understand the regional economy size and GDP as of 2000 and 2010, they are estimated based on the following methods. The following average real GDP per economically active person by industry indicates the labour productivity in each industrial category.

- Firstly, the average real GDP per economically active person by industry is calculated by dividing real GDP by the EAP in each industrial category, and next,
- Real GDP by region is estimated by multiplying the EAP in each region by the above average real GDP per economically active person.

(2) Estimation of Real GDP in Ashanti Region and other Regions

Real GDPs of the Greater Accra Region and the Ashanti Region in the year 2000 is estimated as GHC 5.96 billion and GHC 5.85 billion respectively increasing greatly by the year 2010 and estimated as ¢10.23 billion and ¢9.88 billion respectively as shown in Table 5.3.1.

Table 5.3.1 Estimation of Real GDP by Region in 2000 and 2010

(Billion GHC)

	2000				2010			
Region	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
Ashanti	1.73	1.68	2.45	5.85	2.22	2.79	4.87	9.88
Greater Accra	0.38	1.95	3.64	5.96	0.36	3.56	6.31	10.23
Eastern	1.29	0.68	1.10	3.07	1.88	1.46	2.07	5.40
Northern	1.28	0.38	0.51	2.17	2.64	0.64	0.86	4.14
Western	1.25	0.72	0.85	2.82	1.69	1.47	1.60	4.76
Brong Ahafo	1.44	0.33	0.65	2.42	2.21	0.85	1.32	4.38
Volta	1.03	0.52	0.72	2.27	1.60	1.32	1.31	4.24
Central	0.93	0.56	0.75	2.24	1.38	1.27	1.70	4.35
Upper East	0.58	0.28	0.28	1.14	1.11	0.39	0.41	1.91
Upper West	0.42	0.12	0.18	0.72	0.73	0.26	0.22	1.20
Total	10.31	7.22	11.14	28.67	15.82	14.01	20.67	50.49

Source: JICA Study Team based on GSS, 2000 and 2010 Population and Housing Census

In accordance with this estimate, the GDP of the Greater Accra Region accounted for 20-21% of the total GDP of Ghana as shown in Table 5.3.2. The GDP of Ashanti Region was also around 20% in 2000 and 2010.

From the perspective of the industrial structure, tertiary industry is very prominent in the Greater Accra Region. To the contrary, the contribution of the primary industry to real GDP is relatively high in Ashanti Region (29.5% in year 2000 and 22.5% in year 2010), compared with that in the Greater Accra Region (6.4% in year 2000 and 3.5% in year 2010). Additionally, the contribution of primary, secondary and tertiary industries to the GRDP has also changed in Ashanti Region compared with that in the Greater Accra Region. In year 2000, the composition of GRDP by primary, secondary and tertiary industry in Ashanti Region are 29.5%, 28.6%, and 41.9% respectively while that of 2010 are 22.5%, 28.3% and 49.3% respectively, which shows that the industry has shifted from primary industry to tertiary industry in the past decade (Table 5.3.1). On the other hand, secondary industry only decreased its composition of GRDP only slightly in the decade between year 2000 and 2010.

Comparing the composition of real GRDP by industry, the primary industry has shrunk in most regions in Ghana including Ashanti Region except for the three northern regions, namely the Northern Region, Upper East Region and Upper West Region. These three regions have increased their composition of GDP in the primary industry in the past ten years. The Northern Region also took over the position of being the region with the highest contribution to the primary industry in Ghana which had been Ashanti Region in 2000 (Table 5.3.2).

Table 5.3.2 Composition of Real GDP by Region in 2000 and 2010

	2000				2010			
	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
Ashanti	16.7%	23.2%	22.0%	20.4%	14.0%	19.9%	23.6%	19.6%
Greater Accra	3.7%	27.0%	32.6%	20.8%	2.3%	25.4%	30.5%	20.3%
Eastern	12.5%	9.4%	9.9%	10.7%	11.9%	10.4%	10.0%	10.7%
Northern	12.4%	5.3%	4.6%	7.6%	16.7%	4.5%	4.2%	8.2%
Western	12.1%	10.0%	7.6%	9.8%	10.7%	10.5%	7.7%	9.4%
Brong Ahafo	13.9%	4.6%	5.9%	8.4%	14.0%	6.1%	6.4%	8.7%
Volta	10.0%	7.2%	6.5%	7.9%	10.1%	9.5%	6.3%	8.4%
Central	9.0%	7.7%	6.8%	7.8%	8.7%	9.1%	8.2%	8.6%
Upper East	5.6%	3.9%	2.5%	4.0%	7.0%	2.8%	2.0%	3.8%
Upper West	4.1%	1.7%	1.6%	2.5%	4.6%	1.8%	1.0%	2.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Study Team based on GSS, 2000 and 2010 Population and Housing Census

In the Greater Accra Region, the Western Region and Volta Region, secondary industry has over 30% share in the GRDP, while in Ashanti Region and the Greater Accra Region, tertiary industry have 49.3% and 61.7% shares in the GRDP respectively, which is above the national share (Table 5.3.3).

Table 5.3.3 Composition of Real GRDP by Industry in 2000 and 2010

	2000				**2010**			
Region	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
Ashanti	**29.5%**	**28.6%**	**41.9%**	**100.0%**	**22.5%**	**28.3%**	**49.3%**	**100.0%**
Greater Accra	6.4%	32.7%	61.0%	100.0%	3.5%	34.8%	61.7%	100.0%
Eastern	41.9%	22.2%	35.9%	100.0%	34.7%	27.0%	38.3%	100.0%
Northern	58.9%	17.5%	23.6%	100.0%	63.8%	15.4%	20.8%	100.0%
Western	44.2%	25.7%	30.1%	100.0%	35.5%	30.9%	33.6%	100.0%
Brong Ahafo	59.3%	13.7%	27.0%	100.0%	50.5%	19.5%	30.1%	100.0%
Volta	45.2%	23.0%	31.9%	100.0%	37.9%	31.3%	30.9%	100.0%
Central	41.6%	24.8%	33.6%	100.0%	31.8%	29.2%	39.0%	100.0%
Upper East	50.9%	24.8%	24.4%	100.0%	58.0%	20.3%	21.7%	100.0%
Upper West	58.6%	16.6%	24.8%	100.0%	60.5%	21.5%	18.0%	100.0%
Total	36.0%	25.2%	38.9%	100.0%	31.3%	27.7%	40.9%	100.0%

Source: JICA Study Team based on GSS, 2000 and 2010 Population and Housing Census

5.4 Past Trend and Options of Socio-Economic Framework for Ashanti Region

(1) Trend of Inter-regional Social Migration into Ashanti Region

The population trends by region during the years 1984 to 2010 is described in Table 5.4.1, and the annual growth rate by region are calculated as shown in Table 5.4.2. During the years 1984 to 2000, population from the remote regions migrated into the

Greater Accra Region and Ashanti Region, which can be seen from their annual population growth rate considerably exceeding that of the whole of Ghana. During this period, urbanization rapidly progressed which brought about the prominent population influx into the metropolitan regions.

This phenomenon, however, became less prominent during the years 2000 to 2010; ex. the annual growth rate of Ashanti Region dropped from 3.5% during the years 1984 to 2000 to 2.8% during the years 2000 to 2010. It can be assumed that inter-regional social migration into Ashanti Region will continuously decrease because the annual growth rate of Ashanti Region has dropped to 2.69%, which is the annual growth rate of the whole of Ghana.

Table 5.4.1 Population Trend by Region

	1984	2000	2010
Ghana	**12,296,081**	**18,912,079**	**24,658,823**
Ashanti Region	2,090,100	3,612,950	4,780,380
Greater Accra Region	1,431,099	2,905,726	4,010,054
Eastern Region	1,680,890	2,106,696	2,633,154
Northern Region	1,164,583	1,820,806	2,479,461
Western Region	1,157,807	1,924,577	2,376,021
Brong Ahafo Region	1,206,608	1,815,408	2,310,983
Volta Region	1,211,907	1,635,421	2,118,252
Central Region	1,142,335	1,593,823	2,201,863
Upper East Region	772,744	920,089	1,046,545
Upper West Region	438,008	576,583	702,110

Source: GSS, 1984, 2000 and 2010 Population and Housing Census

Table 5.4.2 Past Annual Population Growth Rates by Region

Unit: Annual%

	1984－2000	2000-2010
Ghana	**2.73%**	**2.69%**
Ashanti Region	3.48%	2.84%
Greater Accra Region	4.53%	3.27%
Eastern Region	1.42%	2.26%
Northern Region	2.83%	3.14%
Western Region	3.23%	2.13%
Brong Ahafo Region	2.59%	2.44%
Volta Region	1.89%	2.62%
Central Region	2.10%	3.28%
Upper East Region	1.10%	1.30%
Upper West Region	1.73%	1.99%

Source: GSS, 2000 and 2010 Population and Housing Census

(2) Options for Socio-Economic Framework of Ashanti Region

The following three options are considered for the socio-economic framework of Ashanti Region. Table 5.4.3 shows the population projected for Ashanti Region in accordance with the options.

a) Option I: High-quantity Inter-regional Social Migration

National land utilization focuses on three major urban regions, namely, Greater Accra, Ashanti and the Western Regions. The future annual population growth rate for Ashanti Region is assumed to be relatively higher with consideration of the past records. The increase in size of urban agglomerations will make it possible to provide urban residents with employment opportunities. However, economic development will not be promoted in rural regions.

b) Option II: Medium-quantity Inter-regional Social Migration

National land utilization focuses on well-balanced sustainable development between urban and rural regions. In this option, social migration will occur moderately in accordance with economic development in urban regions which is balanced by rural development.

c) Option III: Low-quantity Inter-regional Social Migration

National land utilization focuses on economic development in rural regions rather than urban regions. In this option, social migration will gradually decrease to become static in the long term. Investment in urban regions will not be efficient for further development in urban regions.

Table 5.4.3 Population Projection by Option for Ashanti Region

		1984*	2000*	2010*	2013	2018	2023	2028	2033
Option I	Population	2,090,100	3,612,950	4,780,380	5,199,676	5,989,408	6,907,176	7,969,086	9,189,032
	Growth Rate (Annual %)	-	3.5%	2.8%	2.8%	2.9%	2.9%	2.9%	2.9%
Option II	Population	2,090,100	3,612,950	4,780,380	5,187,357	5,929,423	6,758,010	7,681,736	8,709,931
	Growth Rate (Annual %)	-	3.5%	2.8%	2.8%	2.7%	2.7%	2.6%	2.5%
Option III	Population	2,090,100	3,612,950	4,780,380	5,174,961	5,867,988	6,601,005	7,367,623	8,159,685
	Growth Rate (Annual %)	-	3.5%	2.8%	2.7%	2.5%	2.4%	2.2%	2.1%

Source: JICA Study Team
Note*: GSS, 1984, 2000 and 2010 Population and Housing Census

One-sided development will create enriched opportunities in invested regions on a short-term basis. However, social and economic disparities between the urban and rural regions will be obstacles for sustainable development in the long term. Therefore, option II will be selected as the preferable option.

Option II shall compromise a well-balanced sustainable development between urban and rural regions. In this option, social migration will occur moderately in accordance with economic development in urban regions which is balanced by rural development. The future annual population growth rate for Ashanti Region is projected with consideration of the present trend and further development in urban regions. Rural development will be promoted in parallel with economic development in urban regions.

The population framework by region is described in Table 5.3.4. The total of the future population by region is adjusted by the total population of Ghana, which is

estimated in section 5.2.1. The estimated future population of Ashanti Region is estimated to be 6.8 million in the year 2023, 7.7 million in the year 2028 and 8.7 million in the year 2033. The population in the year 2033 is projected to be approximately 182% of the population in year 2010.

Table 5.4.4 Regional Population Framework to Year 2033

Region	1984*	2000*	2010*	2013	2018	2023	2028	2033
Ashanti	2,090,100	3,612,950	4,780,380	5,187,357	5,929,423	6,758,010	7,681,736	8,709,931
Growth Rate (Annual %)	-	3.5%	2.8%	2.8%	2.7%	2.7%	2.6%	2.5%
Greater Accra	1,431,099	2,905,726	4,010,054	4,396,431	5,108,732	5,915,729	6,830,569	7,869,795
Growth Rate (Annual %)	-	4.5%	3.3%	3.1%	3.0%	3.0%	2.9%	2.9%
Eastern	1,680,890	2,106,696	2,633,154	2,813,949	3,112,646	3,400,483	3,667,389	3,901,873
Growth Rate (Annual %)	-	1.4%	2.3%	2.2%	2.0%	1.8%	1.5%	1.2%
Northern	1,164,583	1,820,806	2,479,461	2,709,722	3,109,849	3,522,936	3,937,813	4,340,267
Growth Rate (Annual %)	-	2.8%	3.1%	3.0%	2.8%	2.5%	2.3%	2.0%
Western	1,157,807	1,924,577	2,376,021	2,529,857	2,808,279	3,116,532	3,456,915	3,830,966
Growth Rate (Annual %)	-	3.2%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
Brong Ahafo	1,206,608	1,815,408	2,310,983	2,481,013	2,776,457	3,084,001	3,398,685	3,713,438
Growth Rate (Annual %)	-	2.6%	2.4%	2.4%	2.3%	2.1%	2.0%	1.8%
Volta	1,211,907	1,635,421	2,118,252	2,284,920	2,565,088	2,841,145	3,103,311	3,340,070
Growth Rate (Annual %)	-	1.9%	2.6%	2.6%	2.3%	2.1%	1.8%	1.5%
Central	1,142,335	1,593,823	2,201,863	2,415,940	2,778,118	3,134,632	3,468,683	3,761,245
Growth Rate (Annual %)	-	2.1%	3.3%	3.1%	2.8%	2.4%	2.0%	1.6%
Upper East	772,744	920,089	1,046,545	1,090,917	1,165,139	1,238,986	1,311,314	1,380,525
Growth Rate (Annual %)	-	1.1%	1.3%	1.4%	1.3%	1.2%	1.1%	1.0%
Upper West	438,008	576,583	702,110	745,099	817,640	890,189	961,092	1,028,200
Growth Rate (Annual %)	-	1.7%	2.0%	2.0%	1.9%	1.7%	1.5%	1.4%
Total	12,296,081	18,912,079	24,658,823	26,655,204	30,171,371	33,902,644	37,817,508	41,876,311
Growth Rate (Annual %)	-	2.7%	2.7%	2.6%	2.5%	2.4%	2.2%	2.1%

Source: JICA Study Team
Note*: GSS, 1984, 2000 and 2010 Population and Housing Census

(3) Target Setting based on "Ghana Vision 2020" for Future Composition of Industry

"Ghana Vision 2020" formulated in 1996 articulately stated that Ghana will become a middle-income country with US$3,000 GDP per capita by 2020. "Ghana Vision 2020" also targeted the primary industry to have below 20.0 % of real GDP share and over 37.0% for the contribution of the secondary industry by the year 2020.

The socio-economic framework is based on these targets and the strategies by which to seek to achieve the targets. In the last several years, these visions and targets have been just a difficult dream. However, with the oil found offshore of the Western Region in the recent years, the 2020 target for GDP per capita (US$3,000 per capita)

is likely to be achieved in accordance with the estimate by the IMF (Table 5.4.5).

Table 5.4.5 GDP Prediction of Ghana, IMF (2010-2017)

Year	2010	2011	2012	2013	2014	2015	2016	2017
GDP per capita (US$)	2047.42	2265.74	2401.81	2514.22	2613.57	2710.01	2794.94	2882.06

Source: IMF, World Economic Outlook Database 2012

On the other hand, the contribution of secondary industry to real GDP has been flat in the last decade reaching 27.7% in 2010 (Table 5.3.3). Even with the accelerated effort at industrialization, it is considered that it will not be easy to achieve the target of 37% share of the secondary industry in the GDP. Therefore, the target year for reaching 37% of GRDP is set to be delayed until 2025.

On the other hand, as for Ashanti Region, the target portion of the secondary industry in the GRDP is set to achieve 37% by 2020 for the following reasons:

- Ashanti Regional share of EAP in the secondary industry was 28.3% in 2010 and was slightly higher than the whole of Ghana.
- In Ashanti Region if the secondary industry should be one of the main players in Ghana, Ashanti Region itself should also achieve this target.

The estimation of industrial composition in Ashanti Region is therefore conducted based on the following assumptions.

- The contribution of the primary industry to real GDP will follow the past trend and continue to decrease with primary industry contribution below 20.0% by the year 2020.
- The contribution of the secondary industry will be over 37.0% in the year 2020.

Table 5.4.6 shows the estimated future GDP composition by industry in Ashanti Region. Primary industry's share in the GDP was only 22.5% in 2010 and with the past trend, the share will be below 20% before 2020. On the other hand, secondary industry will need to accelerate its production very intensively in the next decade to achieve the target.

Table 5.4.6 Estimated Future GDP Composition by Industry in Ashanti Region

	2000*	2010*	2013	2018	2023	2028	2033
Primary Industry	30.2%	22.5%	20.1%	16.3%	13.4%	11.3%	9.2%
Secondary Industry	26.4%	28.3%	30.9%	35.3%	37.5%	38.5%	39.4%
Tertiary Industry	43.4%	49.3%	49.0%	48.5%	49.0%	50.2%	51.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Study Team
Note*: GSS, 1984, 2000 and 2010 Population and Housing Census

(4) Economically Active Population by Industry in Ashanti Region

The future proportion of economically active population (EAP) for each industry in Ashanti Region is shown in Table 5.4.7. The primary, secondary, and tertiary industries account for 13.7%, 24.7% and 61.6% respectively in the economically

active population in the year 2033. The share of the primary industry will decrease, and the secondary and tertiary industries will increase in accordance with the above-mentioned target settings.

Table 5.4.7 Estimated Future Composition of Economically Active Population by Industry in Ashanti Region

	2000*	2010*	2103	2018	2023	2028	2033
Primary Industry	47.8%	30.5%	27.9%	23.3%	19.6%	16.7%	13.7%
Secondary Industry	15.2%	16.1%	17.9%	21.2%	23.0%	23.9%	24.7%
Tertiary Industry	37.0%	53.5%	54.2%	55.5%	57.3%	59.4%	61.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Study Team
Note*: GSS, 1984, 2000 and 2010 Population and Housing Census

The estimation of EAP employs the following assumptions.

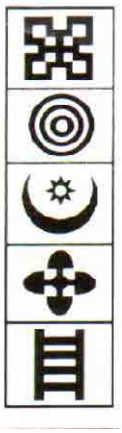
- The future ratio of EAP to the total population of Ghana will increase with the social advancement of women
- The ratio of EAP in Ashanti Region is to increase back to the same level it was at in the year 2000 by the year 2033 based on the consideration of the national increase of EAP ratio

As shown in Table 5.3.8 the EAP in the year 2033 will grow to 3.99 million in total, composed of 0.55 million in the primary, 0.99 million in the secondary and 2.46 million in the tertiary industries. The number employed among the EAP is estimated as 3.79 million in the year 2033. For this estimation, unemployed population is set at 5.0% as a policy target, lower than the 2010 unemployment rate of 7.8%.

Table 5.4.8 Estimated Future Composition of Industry in Ashanti Region

	2000*	2010*	2013	2018	2023	2028	2033
Population	3,612,950	4,780,380	5,187,357	5,929,423	6,758,010	7,681,736	8,709,931
Growth Rate (Annual %)	-	(2.84%)	(2.76%)	(2.71%)	(2.65%)	(2.60%)	(2.54%)
EAP	1,612,467	2,073,016	2,266,012	2,621,626	3,023,826	3,477,890	3,989,607
EAP/Population (%)	(44.6%)	(43.4%)	(43.7%)	(44.2%)	(44.7%)	(45.3%)	(45.8%)
Primary Industry	770,246	631,302	631,268	610,619	593,998	581,034	546,620
Secondary Industry	244,805	333,679	406,606	555,635	696,907	830,383	986,394
Tertiary Industry	597,417	1,108,036	1,228,139	1,455,372	1,732,920	2,066,473	2,456,594
Employed Population	1,430,097	1,972,359	2,098,130	2,443,185	2,863,217	3,283,053	3,790,126
Growth Rate (Annual %)	-	(2.95%)	(3.15%)	(3.09%)	(3.03%)	(2.97%)	(2.91%)

Source: JICA Study Team
Note*: GSS, 1984, 2000 and 2010 Population and Housing Census



PART IV

Spatial Development Framework (SDF) for Greater Kumasi Sub-Region

Chapter 6 Vision and Overall Objectives

6.1 Vision for Greater Kumasi Sub-Region

(1) Visions for Greater Kumasi Sub-Region

Visions for the Future of the Greater Kumasi Sub-Region should be considered by looking at the following two aspects of development:

- National directions of development in the long term, and
- Physical, natural, social and economic characteristics of the Greater Kumasi Sub-Region and Ashanti Region.

Based on the analysis of these two sets of aspects, the following statement of future visions for Greater Kumasi Sub-Region was agreed:

> *"The Greater Kumasi Sub-Region will become a pioneer to transform the current economy to a vibrant, modernized and diversified economy including commerce, logistics, manufacturing and knowledge-based industries, by creating a livable, sustainable and efficient urban space, while maintaining the historical and cultural aspirations of the Ashanti Region."*

In addition to this vision statement, the following nickname for Greater Kumasi Sub-Regional SDF and SP is proposed, in order to give an immediate impression that the future of Greater Kumasi will be a revitalizing, cultural and livable city.

"Greater Kumasi Revitalization 2033: The Heart of the Nation"

Greater Kumasi Sub-Region could achieve the above vision by:

- Revitalizing the economy by promoting knowledge-based industries, as well as by modernizing existing commerce, logistics and small-scale industries
- Developing infrastructures for supporting the economic and social development
- Creating livable urban space not only within Kumasi City but also in adjoining districts to Kumasi City
- Conserving nature and rural areas by controlling urban sprawl
- Aspiring the culture of Ashanti by conserving historical and cultural heritages

(2) Physical, Natural, Social and Economic Characteristics of Greater Kumasi Sub-Region

Greater Kumasi Sub-Region has the following potential resources and features on which the Greater Kumasi Sub-Region could pursue the Vision for the future:

- Greater Kumasi Sub-Region has a long historical and cultural tradition, is the centre for the Ashanti Kingdom, and the site of the Manhyia Palace and administration.
- Greater Kumasi Sub-Region is a commercial and service centre for the agricultural region with good soils and climate.
- Greater Kumasi Sub-Region is the regional capital city in government administration.
- Greater Kumasi Sub-Region is the commercial centre for Ashanti Region and beyond.
- Greater Kumasi Sub-Region has an excellent academic centre.
- Greater Kumasi Sub-Region has clusters of manufacturing sectors in Kumasi and its surrounding areas.
- Greater Kumasi Sub-Region is strategically located in the centre of the country.
- Greater Kumasi Sub-Region is a hub of transportation between the southern and northern parts of Ghana, as well as toward neighbouring inland countries.

6.2 Overall Objectives for Greater Kumasi Sub-Regional Development

6.2.1 Roles and Functions Identified for Greater Kumasi Sub-Region

The following roles and functions are identified for Greater Kumasi Sub-Region:

- Considering their sizes of population and economies, the Greater Kumasi Sub-Region and Ashanti Region are important parts of the national economic development strategies for upgrading the Ghanaian economy and society to attain a middle-income status in the world. The Greater Kumasi Sub-Region should play leading roles in promoting socio-economic development for Ashanti Region, as well as for national development for Ghana. Such leading roles for the Greater Kumasi Sub-Region are essential in contributing to the transformation of the Ghanaian economy from the current factor-driven economy (too much dependence on the natural resource exploitation sector and coco production) to an efficient-driven economy in terms of efficiency of invested capital and labour input.
- For pursuing this strategic direction of national development policies, the Greater Kumasi Sub-Region should promote industrial development, especially the manufacturing sector, by attracting foreign/domestic investment and intelligent/ skilled workers, and by integrating the manufacturing sector with the agricultural sector in Ashanti Region.
- For this purpose, the urban functions of the Greater Kumasi Sub-Region should be enhanced and upgraded to a City with regional headquarter functions of public administration and private corporations, and also a City with providers of advanced urban services including business services, research and education services and top-referral hospitals.
- For enhancing the competitiveness of the Greater Kumasi Sub-Region for economic development, the application of science, technology and trained skills is essential. The Greater Kumasi Sub-Region has a relatively large pool of

scientists, engineers and skilled workers. Policies and measures for mobilizing and utilizing these human resources are required for practical industrial business fields in the Greater Kumasi Sub-Region.

- The location of the Greater Kumasi Sub-Region is very strategic in that Greater Kumasi could become a primary commercial and industrial centre not only for Ashanti Region, but also for the northern part of Ghana , and furthermore for inland neighbouring countries.
- The Greater Kumasi Sub-Region needs to maintain a large size of informal sectors while modernizing and transforming them, not only for providing employment opportunities for migrants from other regions, but also for rapidly increasing populations within the sub-region. For this purpose, the development of formal economic sectors by attracting foreign and domestic private investment is essential because formal sectors could consume goods and services produced by informal sectors.

These roles and functions identified for the Greater Kumasi Sub-Region are based on the following thought and recognition:

- Small-scale agriculture and informal urban sectors including commerce, logistics and car repairing services/manufacturing were very important in the regional economy, and contributed to food security and employment creation in Ashanti Region and Greater Kumasi Sub-Region in the last decades.
- Small-scale processing and informal commercial sectors are likely to grow for some time. Therefore, it is necessary to expand and improve the conditions in which such informal sectors can spring up more. Furthermore, it is necessary to modernize those informal sectors by introducing technology and management to their operations.
- However, the value added created by those small-scale informal sectors was not large enough to make the people and this country join middle-income countries. Those informal sectors are unlikely to create a large amount of value added enough to sustain the economic growth required for supporting rapidly urbanizing Ashanti Region and Greater Kumasi Sub-Region.
- Therefore, it is necessary to pay attention to a wide range of new viable options for socio-economic development policies, and to select and combine them for implementation.

6.2.2 Overall Objectives for Greater Kumasi Sub-Regional Development

Considering the above mentioned characteristics, roles and functions, the following overall objectives for development of Greater Kumasi Sub-Region are set as follows:

- To substantially contribute to national economic development for making and sustaining Ghana a Middle-Income Status
- To promote industrial development, especially manufacturing sector, by attracting foreign/domestic investment and intelligent/skilled workers, and by integrating manufacturing sector with agricultural sector in Ashanti Region.
- To be upgraded to a city with regional headquarter functions (public and private), and also a city with providers of advanced business services, Research and

education services and top-referral hospitals.

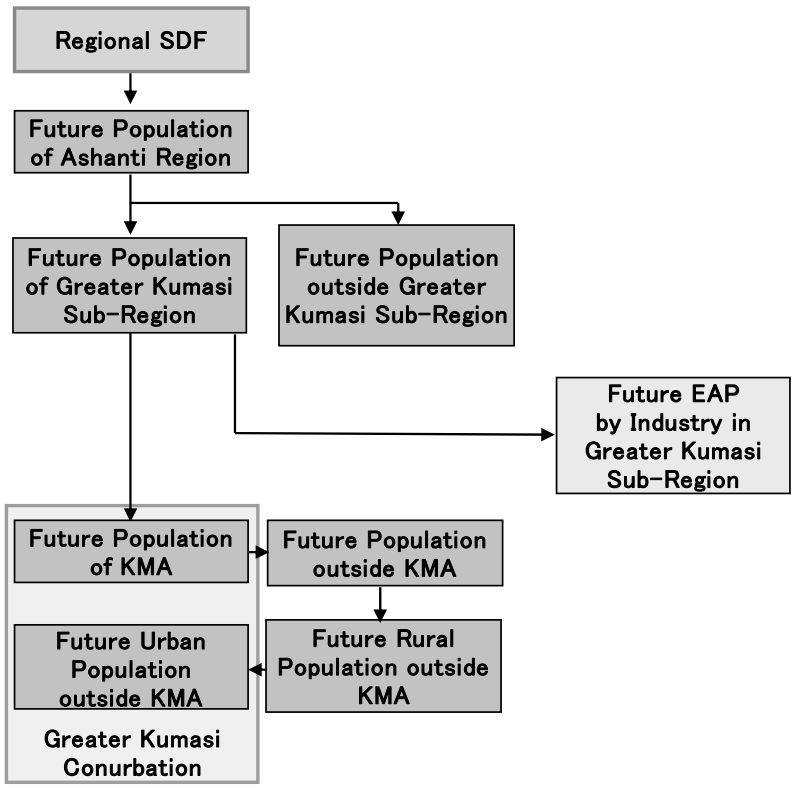
- To be a centre of science and technology and its application to economic development
- To be a primary commercial and industrial centre not only for Ashanti Region, but also for northern part of Ghana and inland neighbouring countries, by taking advantage of strategic location within Ghana and Western Africa
- To be a city with vibrant economy (both formal and informal) to keep generating employment opportunities not only for influx of migrants but also for sub-regional populations
- To provide major destinations for domestic tourists and visitors for recreation and leisure activities
- To maintain the feature of Garden City with productive and open greenery areas within the Sub-Region
- To seek balanced development for Greater Kumasi Sub-Region based on strong and shriving urban-rural linkage
- To keep providing incoming migrants with housing and employment opportunities
- To conserve nature areas, riverside areas and river catchment areas not only for nature conservation but also water resources management

Chapter 7 Socio-Economic Frameworks for Greater Kumasi Sub-Region

7.1 Introduction

In Chapter 5, the socio-economic frameworks consisting of population and economic active population (EAP) by industry are prepared for Ghana as a whole and Ashanti Region. By referring to these two frameworks, in Chapter 7, a socio-economic framework is prepared for Greater Kumasi Sub-Region and furthermore, a sub-framework for KMA and Greater Kumasi Conurbation is also prepared. The socio-economic frameworks are prepared for years 2018, 2023, 2028 and 2033.

The socio-economic framework for Greater Kumasi Sub-Region is prepared as the flowchart below.



Source: JICA Study Team

Figure 7.1.1 Flowchart for Greater Kumasi Sub-Region's Socio-Economic Framework

7.2 Socio-Economic Framework for Greater Kumasi Sub-Region

7.2.1 Population Framework for Greater Kumasi Sub-Region

(1) Introduction

In this section, basic ideas for estimation of Greater Kumasi Sub-Region are explained. The main change in the population of Greater Kumasi Sub-Region is influenced by the following three phenomena:

- Natural population increase within Greater Kumasi Sub-Region
- Social migration into Greater Kumasi Sub-Region from areas outside Greater Kumasi Sub-Region but within Ashanti Region
- Social migration from areas outside of Ashanti Region

The population of Greater Kumasi Sub-Region has changed in a complicated manner. Therefore, the estimation focuses on the areas outside Greater Kumasi Sub-Region within Ashanti Region considering two phenomena which the main change in the population can be comprehended by 1) natural increase within the areas outside Greater Kumasi Sub-Region and 2) social migration into Greater Kumasi Sub-Region from areas outside Greater Kumasi Sub-Region within Ashanti Region. The population of Greater Kumasi Sub-Region can be calculated by subtracting the population of the areas outside of Greater Kumasi Sub-Region within the Ashanti Region from the population of Ashanti Region.

The past annual growth rates of population in the areas outside Greater Kumasi Sub-Region are described in Table 7.2.1. It can be understood that social migration from the areas outside Greater Kumasi Sub-Region within Ashanti Region was accommodated in Greater Kumasi Sub-Region during the years 2000 and 2010 due to the fact that the annual growth rate in the areas outside Greater Kumasi Sub-Region significantly dropped.

Table 7.2.1 Past Annual Growth Rates during the Years 1970 to 2010

	1970	1984	2000	2010
Greater Kumasi Sub-Region	589,861	825,183	1,758,740	2,764,091
Growth Rate: (Annual %)	-	(2.43%)	(4.84%)	(4.62 %)
Outside Greater Kumasi Sub-Region	891,837	1,246,917	1,854,210	2,016,289
Growth Rate: (Annual %)	-	(2.53%)	(2.42%)	(0.84 %)
Ashanti Region	1,481,698	2,090,100	3,612,950	4,780,380
Growth Rate: (Annual %)	-	(2.49%)	(3.48%)	(2.84%)

Source: GSS, 1970, 1984, 2000 and 2010 Population and Housing Census

(2) Options for Estimated Future Population in Greater Kumasi Sub-Region

The following three options for the future population of Greater Kumasi Sub-Region can be considered:

- Option I: Greater Kumasi Sub-Region will rapidly accommodate social migration from the areas outside Ashanti Region and the areas outside Greater

Kumasi Sub-Region within Ashanti Region. Social migration from outside Greater Kumasi Sub-Region into the Sub-Region will continue up to 2033 with the present speed during 2000 to 2010. Greater Kumasi Sub-Region will continuously increase in the size of its urban agglomeration with rapid urbanization, however the areas outside Greater Kumasi Sub-Region will develop more slowly in economic and social dimensions, leading to intra-regional disparity in the rates of expansion.

- Option II: Greater Kumasi Sub-Region will moderately accommodate social migration from the areas outside Ashanti Region and outside Greater Kumasi Sub-Region within Ashanti Region. The future annual population growth for Greater Kumasi Sub-Region is assumed as moderate. Social migration from outside Greater Kumasi Sub-Region into Greater Kumasi Sub-Region will be relatively static as of 2033. Greater Kumasi Sub-Region will have a scale of economy which will enable it to develop higher value-added industries and provide employment opportunities. In addition, the areas outside Greater Kumasi Sub-Region will be developed in a balanced manner.
- Option III: Both Greater Kumasi Sub-Region and the areas outside Greater Kumasi Sub-Region will accommodate social migration from the areas both within and outside Ashanti Region. Social migration into Ashanti Region will be accommodated by outside Greater Kumasi Sub-Region as well as Greater Kumasi Sub-Region. Investment in the areas outside Greater Kumasi Sub-Region will be strongly required to promote rural development and attract social migration.

Greater Kumasi Sub-Region should efficiently promote economic development in balance with rural development to achieve sustainable development. Therefore, Option II will be the preferred option.

Table 7.2.2 Population Projection by Option for Greater Kumasi Sub-Region

		2000*	2010**	2013	2018	2023	2028	2033	Change 2010-2033
Ashanti Region		3,612,950	4,780,380	5,187,357	5,929,423	6,758,010	7,681,736	8,709,931	3,929,551
Growth Rate (Annual %)		3.5%	2.8%	2.8%	2.7%	2.7%	2.6%	2.5%	2.6%
Option I	Greater Kumasi Sub-Region	1,758,740	2764091	3,149,867	3,835,662	4,579,931	5,388,114	6,265,044	3,500,953
	Growth Rate (Annual %)	-	4.6%	4.5%	4.0%	3.6%	3.3%	3.1%	3.6%
	Outside Greater Kumasi Sub-Region	1,854,210	2016289	2,037,490	2,093,762	2,178,079	2,293,622	2,444,886	428,597
	Growth Rate (Annual %)	-	0.8%	0.3%	0.5%	0.8%	1.0%	1.3%	0.8%
Option II	Greater Kumasi Sub-Region	1,758,740	2,764,091	3,127,010	3,749,705	4,393,019	5,050,422	5,761,463	2,997,372
	Growth Rate (Annual %)	-	4.6%	4.2%	3.7%	3.2%	2.8%	2.7%	3.2%
	Outside GKSR	1,854,210	2,016,289	2,060,347	2,179,718	2,364,991	2,631,314	2,948,467	932,178
	Growth Rate (Annual %)	-	0.8%	0.7%	1.1%	1.6%	2.2%	2.3%	1.7%
Option III	Greater Kumasi Sub-Region	1,758,740	2,764,091	3,107,418	3,695,232	4,298,429	4,907,005	5,502,568	2,738,477
	Growth Rate (Annual %)	-	4.6%	4.0%	3.5%	3.1%	2.7%	2.3%	3.0%
	Outside Greater Kumasi Sub-Region	1,854,210	2,016,289	2,079,939	2,234,191	2,459,581	2,774,732	3,207,362	1,191,073
	Growth Rate (Annual %)	-	0.8%	1.0%	1.4%	1.9%	2.4%	2.9%	2.0%

Source: JICA Study Team
Note*: Estimated by JICA Study Team based on GSS, 2000 Population and Housing Census
Note**: GSS, 2010 Population and Housing Census

(3) Estimated Future Population in Greater Kumasi Sub-Region for the Preferred Option (Option II)

With the preferred option, Option II discussed in the previous section, the future population of Greater Kumasi Sub-Region will increase from 2.76 million in the year 2010 to 5.05 million in the year 2028 and then to 5.76 million in the year 2033. The projected population and annual growth rates during the years 2010 to 2033 are indicated in Table 7.2.3.

Table 7.2.3 Estimated Future Population of Greater Kumasi Sub-Region

	2000*	2010**	2013	2018	2023	2028	2033
Population	1,758,740	2,764,091	3,127,010	3,749,705	4,393,019	5,050,422	5,761,463
Growth Rate (Annual %)	-	(4.62%)	(4.20%)	(3.70%)	(3.22%)	(2.83%)	(2.67%)

Source: JICA Study Team
Note*: Estimated by JICA Study Team based on GSS, 2000 Population and Housing Census
Note**: GSS, 2010 Population and Housing Census

7.2.2 Estimated Economically Active Population by Industry in Greater Kumasi Sub-Region

Greater Kumasi Sub-Region is the economic and social centre in Ashanti Region and will play an even more significant role in the future. For this purpose, Greater Kumasi Sub-Region needs to promote labour-intensive industrial development,

especially manufacturing and assembling industries. In addition, higher value-added services with high technology such as ICT should be strongly encouraged for provision of employment opportunities in the tertiary industry. Taking these things into account, the targeted future composition of each industry in EAP in Greater Kumasi Sub-Region is projected as described in Table 7.2.4.

Determination of this composition is also based on comparison between Ashanti Region and Greater Kumasi Sub-Region from the perspective of industrial structure.

Table 7.2.4 Estimated Future Composition of Economically Active Population by Industry in Greater Kumasi Sub-Region

	2000	2010	2013	2018	2023	2028	2033
Primary Industry	22.8%	12.5%	11.2%	9.0%	7.3%	6.1%	4.9%
Secondary Industry	25.0%	22.8%	24.8%	28.1%	29.6%	30.0%	30.4%
Tertiary Industry	52.2%	64.7%	64.0%	63.0%	63.0%	63.9%	64.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Study Team

The estimation of EAP for Greater Kumasi Sub-Region employs the assumption that the ratio of EAP to the total population will follow the trend of Greater Accra Region, which has a higher EAP ratio than the national average by almost 4% in the year 2010.

As a result, the primary, secondary and tertiary industries in the year 2028 are estimated to be 0.15 million, 0.73 million and 1.56 million and in the year 2033 estimated to be 0.14 million, 0.86 million and 1.83 million respectively. The future employed population in the year 2033 is estimated as 2.03 million based on an unemployment rate of 6.0% as a policy target. (Table 7.2.5)

Table 7.2.5 Estimated Future Economically Active Population and Employed Population by Industry in Greater Kumasi Sub-Region

	2000	2010	2013	2018	2023	2028	2033
Population	1,758,740	2,764,091	3,127,010	3,749,705	4,393,019	5,050,422	5,761,463
Growth Rate (Annual %)	-	(4.62%)	(4.20%)	(3.70%)	(3.22%)	(2.83%)	(2.67%)
EAP	788,799	1,255,027	1,434,351	1,749,042	2,083,164	2,434,048	2,821,388
EAP/Population (%)	(44.9%)	(45.4%)	(45.9%)	(46.6%)	(47.4%)	(48.2%)	(49.0%)
Primary Industry	180,166	157,107	160,322	156,846	152,836	148,479	137,988
Secondary Industry	197,061	285,774	355,378	491,166	617,095	730,261	856,972
Tertiary Industry	411,571	812,146	918,651	1,001,031	1,313,233	1,555,307	1,826,473
Employed Population	699,586	1,157,511	1,328,084	1,629,993	1,953,917	2,297,688	2,031,455
Growth Rate (Annual %)	-	(5.16%)	(4.69%)	(4.18%)	(3.69%)	(3.29%)	(3.13%)

Source: JICA Study Team

7.3 Socio-Economic Sub-Framework for Greater Kumasi Sub-Region

The sub-framework for Greater Kumasi Sub-Region determines the population, EAP and the number of jobs by industry in Kumasi Metropolitan Assembly (KMA) and of those in Greater Kumasi Conurbation, and the population and total number of jobs in the each of six adjoining districts of Greater Kumasi Sub-Region.[1]

The sub-framework was formulated by the following procedure.

a) Estimate the future population, EAP and number of jobs by industry in KMA.
b) Estimate the future population, EAP and number of jobs by industry outside Greater Kumasi Conurbation.
c) Calculate the future population, EAP and number of jobs by industry with in Greater Kumasi Conurbation.
d) Estimate the future population and number of jobs in each districts in Greater Kumasi Sub-Region excluding KMA by using future population distribution simulation.

(1) Population, EAP and Number of Jobs in KMA and Outside KMA within Greater Kumasi Sub-Region

1) Population

To formulate the sub-framework, first the population of KMA is estimated based on the following assumptions:

- Ejisu is developed as the secondary centre of Greater Kumasi Sub-Region by the year 2018.
- Suburban centres and district centres will start to be developed to provide services to the inhabitants in the surrounding area by 2023.
- The first phase of new town developments in the surrounding districts will be completed by the year 2023 to accelerate the migration to the surrounding districts.
- The second and third phases of new town developments in the surrounding districts will be completed by 2033.

The developments in the adjoining six districts will assist migration towards these areas and ease the extreme congestion that has been occurring in the past decades within KMA with the population growth of over five per cent per annum. As a result population of KMA and the adjoining districts are estimated to be in the year 2028 3.82 million and 1.23 million and in the year 2033 4.23 million and 1.53 million respectively (Table 7.3.1).

[1] The population of Asokore Mampong Municipality is included in the population of KMA.

Table 7.3.1 Future Population of KMA and Outside KMA within Greater Kumasi Sub-Region

	2000	2010	2028	2033	2000-2010		2010-2028		2010-2033	
					Increase of Population	% p.a.	Increase of Population	% p.a.	Increase of Population	% p.a..
KMA including Asokore Mampong	1,170,270	2,035,064	3,816,007	4,226,860	864,794	5.69%	1,780,943	3.55%	2,191,796	3.23%
Outside KMA	588,470	729,027	1,234,416	1,534,603	140,557	2.16%	505,389	2.97%	805,576	3.29%
Greater Kumasi Sub-Region	1,758,740	2,764,091	5,050,422	5,761,463	1,005,351	4.62%	2,286,331	3.41%	2,997,372	3.24%

Source: JICA Study Team

2) Economically Active Population

The EAP 15 years old and above of KMA and its adjoining districts are estimated based on the assumption that the ratio of EAP for KMA will continue to rise at the same rate as that of Greater Kumasi Sub-Region. Annual growth rate of EAP in the period of 2010-2028 for KMA is 3.90% while that of the adjoining districts is 3.25%. However the annual growth rates of EAP in the period 2010-2033 for KMA and its adjoining districts are 3.57% and 3.63% respectively with the adjoining districts of KMA having higher rates than KMA (Table 7.3.2).

Table 7.3.2 Distribution of Economically Active Population within Greater Kumasi Sub-Region

	2010	2028	2033	2010-2028		2010-2033	
				Increase of EAP	Average Annual Growth Rate (% per annum)	Increase of EAP	Average Annual Growth Rate (% per annum).
KMA including Asokore Mampong	951,470	1,893,767	2,131,396	942,298	3.90%	1,179,926	3.57%
Outside KMA	303,557	540,280	689,992	236,723	3.25%	386,435	3.63%
Greater Kumasi Sub-Region	1,255,027	2,434,048	2,821,388	1,179,021	3.75%	1,566,362	3.58%

Source: JICA Study Team

3) Jobs at Workplace

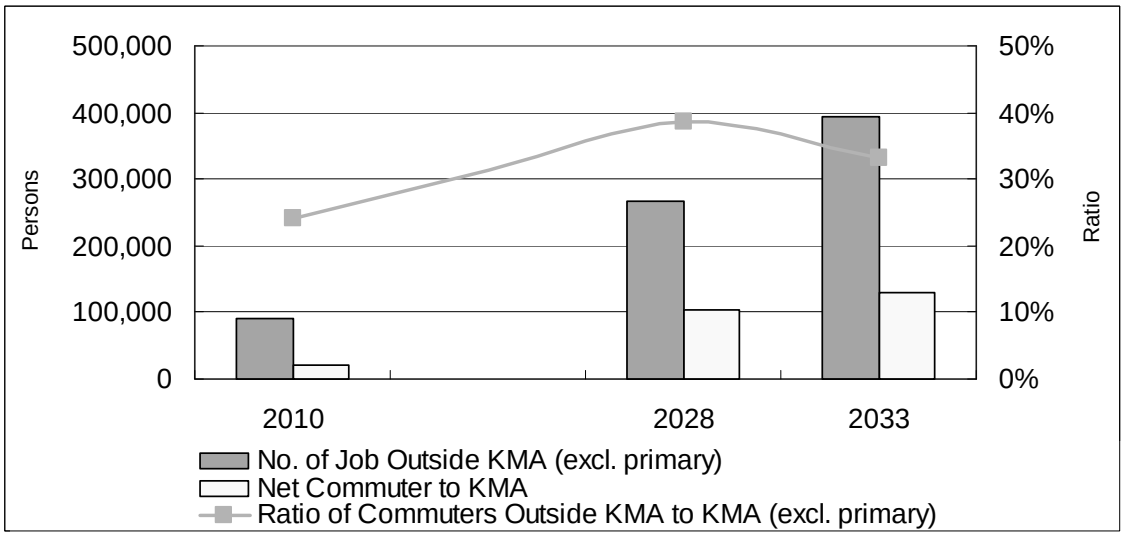
Number of jobs at workplace is the number of employed persons at workplace including both formal and informal jobs. This number is based on the assumption that despite the development of service facilities and industrial areas in the districts adjoining KMA, people will continue to rely on KMA for secondary and tertiary industry workplaces, commuting to KMA in the next two decades. The unemployment rate for KMA is assumed to decrease along with the decreasing unemployment rate of Greater Kumasi Sub-Region.

With the above assumptions, the number of jobs in KMA and the adjoining districts is to increase by 0.99 million and 0.15 million respectively between 2010 and 2028 and 1.25 million and 0.27 million respectively between 2010 and 2033 (Table 7.3.3).

Table 7.3.3 Distribution of Jobs within Greater Kumasi Sub-Region

	2010	2028	2033	2010-2028		2010-2033	
				Increase of Jobs	Average Annual Growth Rate (% per annum)	Increase of Jobs	Average Annual Growth Rate (% per annum)
KMA including Asokore Mampong	939,338	1,929,193	2,189,892	989,856	4.08%	1,250,554	3.75%
Outside KMA	218,174	368,495	490,427	150,321	2.95%	272,254	3.58%
Greater Kumasi Sub-Region	1,157,511	2,297,688	2,680,319	1,140,177	3.88%	1,522,808	3.72%

Source: JICA Study Team



Source: JICA Study Team

Figure 7.3.1 Jobs and Commuters in KMA

The number of jobs by industry in year 2028 and 2033 are shown in Table 7.3.4.

Table 7.3.4 Number of Jobs by Industry in KMA

Industry		2010	2028	2033	2010-2028		2010-2033	
					Increase of Jobs	Average Annual Growth Rate (% per annum)	Increase of Jobs	Average Annual Growth Rate (% per annum)
Primary	KMA including Asokore Mampong	40,171	38,531	34,766	-1,640	-0.23%	-5,405	-0.63%
	Outside KMA	128,379	101,630	96,323	-26,749	-1.29%	-32,056	-1.24%
	Greater Kumasi Sub-Region	168,550	140,161	131,089	-28,389	-1.02%	-37,461	-1.09%
Secondary	KMA including Asokore Mampong	220,065	570,740	650,228	350,675	5.44%	430,163	4.82%
	Outside KMA	43,504	118,610	163,852	75,106	5.73%	120,348	5.94%
	Greater Kumasi Sub-Region	263,569	689,351	814,081	425,782	5.49%	550,512	5.03%
Tertiary	KMA including Asokore Mampong	679,102	1,319,921	1,504,897	640,820	3.76%	825,796	3.52%
	Outside KMA	69,941	148,255	230,252	78,314	4.26%	160,311	5.32%
	Greater Kumasi Sub-Region	749,043	1,468,176	1,735,150	719,134	3.81%	986,107	3.72%

Source: JICA Study Team

(2) Population and Number of Jobs in Greater Kumasi Conurbation

1) Population

Along with the estimation of KMA, the population of Greater Kumasi Conurbation is estimated as part of the procedure to formulate socio-economic sub-framework for Greater Kumasi Sub-Region. The future population of Greater Kumasi Conurbation is estimated by estimating the rural and urban population outside Greater Kumasi Conurbation. Table 7.3.5 shows the estimated future population of Greater Kumasi Conurbation and Table 7.3.6 shows the annual population growth rate between 2000 and 2010, 2010 and 2028, and 2010 and 2033.

Table 7.3.5 Population of Greater Kumasi Conurbation

	2000	2010	2028	2033
KMA including Asokore Mampong	1,170,270	2,035,064	3,816,007	4,226,860
Outside KMA in Conurbation	276,123	423,951	930,526	1,242,856
Greater Kumasi Conurbation	1,446,393	2,459,015	4,746,532	5,469,717
Outside Greater Kumasi Conurbation	312,347	305,076	303,890	291,747
Greater Kumasi Sub-Region	1,758,740	2,764,091	5,050,422	5,761,463

Source: JICA Study Team

Table 7.3.6 Increase of Population in Greater Kumasi Conurbation

	Increase No. 2000-2010	Annual Growth Rate 2000-2010	Increase No. 2010-2028	Annual Growth Rate 2010-2028	Increase No. 2010-2033	Annual Growth Rate 2010-2033
KMA including Asokore Mampong	864,794	5.69%	1,780,943	3.55%	2,191,796	3.23%
Outside KMA in Conurbation	147,828	4.38%	506,575	4.46%	818,905	4.79%
Greater Kumasi Conurbation	1,012,622	5.45%	2,287,518	3.72%	3,010,702	3.54%
Outside Greater Kumasi Conurbation	-7,271	-0.24%	-1,186	-0.02%	-13,330	-0.19%
Greater Kumasi Sub-Region	1,005,351	4.62%	2,286,331	3.41%	2,997,372	3.24%

Source: JICA Study Team

2) Number of Jobs

The number of jobs in Greater Kumasi Conurbation is estimated considering that the increase in secondary industry outside KMA will be concentrated within the conurbation area.

With the decrease of agricultural jobs in Greater Kumasi Sub-Region, the number of jobs will decrease outside Greater Kumasi Conurbation. Table 7.3.7 shows the estimated number of jobs in each area.

Table 7.3.7 Number of Jobs in Greater Kumasi Conurbation

	2010	2028	2033	Increase of Jobs 2010-28	Annual Growth Rate 2010-28	Increase No. 2010-33	Annual Growth Rate 2010-33
KMA including Asokore Mampong	939,338	1,929,193	2,189,892	989,856	4.08%	1,250,554	3.75%
Outside KMA in Conurbation	200,287	404,996	554,185	204,709	3.99%	353,898	4.52%
Greater Kumasi Conurbation	1,139,624	2,334,189	2,744,076	1,194,565	4.06%	1,604,452	3.89%
Outside Greater Kumasi Conurbation	115,403	99,859	77,312	-15,544	-0.80%	-38,091	-1.73%
Greater Kumasi Sub-Region	1,255,027	2,434,048	2,821,388	1,179,021	3.75%	1,566,362	3.58%

Source: JICA Study Team

(3) Population and Number of Jobs by District in Greater Kumasi Sub-Region

Based on the estimated future population of KMA and Greater Kumasi Conurbation, the distribution of population and number of jobs by each district in Greater Kumasi Sub-Region for the year 2028 and 2033 are estimated.

1) Simulation of Future Population Distribution

The simulation of future population distribution for Greater Kumasi Sub-Region was proceeded for year 2028 and 2033. This simulation of future population distribution is used to calculate the distribution of future population and number of jobs.

2) Population

The population by district for all the districts in Greater Kumasi Sub-Region is shown in Table 7.3.8.

Table 7.3.8 Population by District in Greater Kumasi Sub-Region

	2000	2010	2023	2028	2033	Average Annual Increase Rate (% per annum) 2000-2010	Average Annual Increase Rate (% per annum) 2010-2033
KMA including Asokore Mampong	1,170,270	2,035,064	3,369,716	3,816,007	4,226,860	5.69%	3.23%
Afigya-Kwabre	89,967	136,140	209,845	228,828	259,891	4.23%	2.85%
Atwima Kwanmowa	73,014	90,634	130,405	154,039	198,629	2.19%	3.47%
Atwima Nwabiagya	126,183	149,025	192,935	196,520	251,548	1.68%	2.30%
Bosomtwe	62,450	93,910	139,881	147,711	165,273	4.16%	2.49%
Ejisu-Juaben	124,176	143,762	209,315	323,297	438,940	1.48%	4.97%
Kwabre East	102,310	115,556	148,960	180,871	220,322	1.22%	2.85%
Greater Kumasi Sub-Region	1,748,370	2,764,091	4,401,057	5,047,272	5,761,463	4.69%	3.24%

Source: JICA Study Team

3) Number of Jobs

The number of jobs in each districts of Greaer Kumasi Sub-Region and its job-population ratio is shown in the table below.

Table 7.3.9 Number of Jobs by District in Greater Kumasi Sub-Region

	Number of Jobs 2028	Number of Jobs 2033	Job2028/ Populaion2028	Job33/ Population33
KMA including Asokore Mampong	1,929,193	2,189,892	50.6%	51.8%
Afigya-Kwabre	62,838	78,148	27.9%	30.1%
Atwima Kwanmowa	34,086	46,829	22.4%	23.6%
Atwima Nwabiagya	47,511	58,836	25.6%	23.4%
Bosomtwe	34,787	39,552	24.1%	23.9%
Ejisu-Juaben	127,241	181,009	37.0%	41.2%
Kwabre East	62,031	86,054	33.9%	39.1%
Greater Kumasi Sub-Region	2,297,688	2,680,319	45.5%	46.5%

Source: JICA Study Team

Chapter 8 Sub-Regional Strategies for Socio-Economic and Spatial Development

8.1 Overall Development Strategies and Scenarios

8.1.1 Overall Issues and Strategic Directions on Socio-Economic Development

(1) Overall Issues on Socio-Economic Development

The present economies of Greater Kumasi Sub-Region are characterized by the dominance of informal sectors in urban areas, and by small farmers in rural areas. The common features of the urban and rural sectors are low productivity and limitation of economic growth.

Although the urban informal sector has provided employment opportunities for a majority of urban people and has absorbed a rapidly increasing number of workers, their productivity is low and not easy to enhance. At the same time, small-scale agriculture's productivity is low because of low input of chemicals and little utilization of improved varieties.

Therefore, Greater Kumasi has weak driving force to promote economic development, including poor provision of economic and social infrastructures both in central areas and suburban areas.

(2) Overall Strategic Directions for Socio-Economic Development

Considering the economic characteristics of Greater Kumasi Sub-Region, it is essential to embark on development of formal and high-productivity economic development for sustainable economic growth of the Sub-Region, while it is also necessary to make an effort at modernizing or upgrading the current traditional economic sectors (mostly informal sectors), such as commerce, logistics and small-scale industries.

The development of formal economic sectors could directly and indirectly increase consumption of goods and services produced by informal sectors.

Kumasi City used to have a variety of manufacturing industries and at present Kumasi City still maintains many technicians in car repairing services/industries. Manufacturing industries could, therefore, be a target sector for economic development. Moreover, agro-processing industries have relative advantages in Greater Kumasi Sub-Region because of its proximity to good agricultural areas in Ashanti Region.

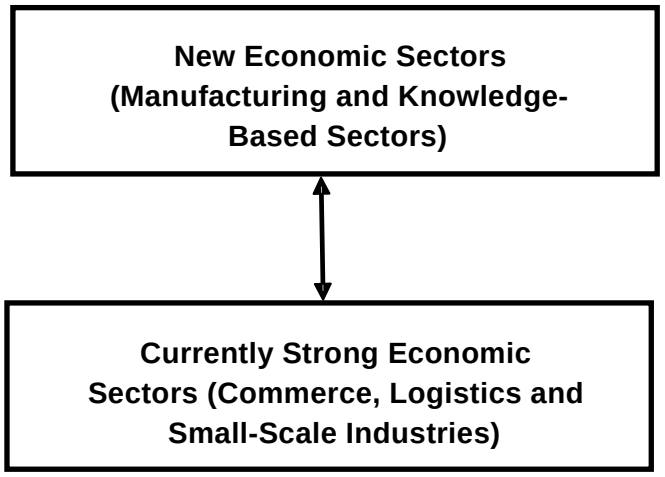
Since Kumasi City has higher education-research institutions, including KNUST,

CSIR and BRRI, Kumasi has attracted excellent researchers and students. These knowledge-based resources should be exploited effectively for promoting economic development in Greater Kumasi Sub-Region.

Information and Communication Technology (ICT) and Business Processing Outsourcing (BPO) could be important sectors for Greater Kumasi Sub-Region, because ICT-BPO sectors are not so dependent on transportation, and inland locations like Greater Kumasi are not always obstacles for ICT-BPO sector development.

In conclusion, the overall strategies for socio-economic development for Greater Kumasi Sub-Region should be based on the following:

"Focus on both manufacturing and knowledge-based sectors, while seeking modernization/upgrading of the current strong economic sectors (commerce, logistics and small-scale industries)"



Source: JICA Study Team

Figure 8.1.1 Two Types of Economic Sectors for Greater Kumasi Sub-Region

Although the development efforts for manufacturing and knowledge-based sectors are very important for the middle and long-term future of Greater Kumasi Sub-Region, it is also important to simultaneously make an effort at modernization of the currently strong economic sectors, but also important to create linkage between these new industries and the currently dominant economic activities like commerce, logistics and small-scale industries.

8.1.2 Overall Issues and Strategic Directions on Spatial Development

(1) Overall Issues on Spatial Development

In 1984, the population of Kumasi City was 488,000. In 2000, its population increased to 1,170,000. In 2010, Kumasi increased its population to 2,035,000. In 1986, urbanization was taking place mostly within Kumasi City (254 km^2). In 2007 and 2008, urbanization was occurring within and beyond the administrative boundaries of Kumasi City. From 1984 to 2000, Kumasi City's population increase rate was over 5.6% per annum. Between 2000 and 2010, the average increase rate of

the population was again as high as 5.7 per annum.

On the other hand, the adjoining districts had also gained a lot of population in these years. From 1984 to 2000, the six adjoining districts increased their populations from 309,000 to 588,000. The population increase rate was 4.1% per annum in those years. However, from 2000 to 2010, the population increase rate of the adjoining districts dropped to 2.2% per annum.

These changes of the population pattern imply that Kumasi City has been expanding urbanized areas beyond its administrative boundaries, but at the same time, Kumasi continued to absorb an increasing amount of population within its city boundaries.

This is partly because urban functions in the Greater Kumasi Sub-Region concentrate within Kumasi City. Kumasi City is rich, especially in private health and education institutions. Moreover, Kumasi City's government functions are located in small central areas, causing heavy concentration of traffic.

The overall issues on spatial development for Greater Kumasi Sub-Region are summarized are listed below:

- Relatively poor availability of advanced urban functions
- Inefficient utilization of space both in urban areas and rural areas including uncontrolled urban sprawl and destruction of good agricultural land
- Severe traffic congestion due to poor capacity and quality of public transportation
- Unbalanced population distribution among Kumasi City and the suburban areas outside Kumasi City

(2) Overall Strategic Direction for Spatial Development

Considering the difficulty in investing in high-functional infrastructure, such as motorways and metros (underground railways), it is necessary to avoid traffic concentration in Kumasi City, as well as its central areas. The most effective measures for this objective are two types of functional decentralization. The first measure is to decentralize urban functions from Kumasi City to suburban areas within the Greater Kumasi Sub-Region. The second measure is to expand the present small central area to a larger central area for urban functions in Kumasi. For both cases, it is important to secure strong integration between the centre and decentralized ones for achieving higher urban functionality of the Greater Kumasi Sub-Region.

In conclusion, the overall spatial development strategies should be in the following direction, as shown in Figure 8.1.2:

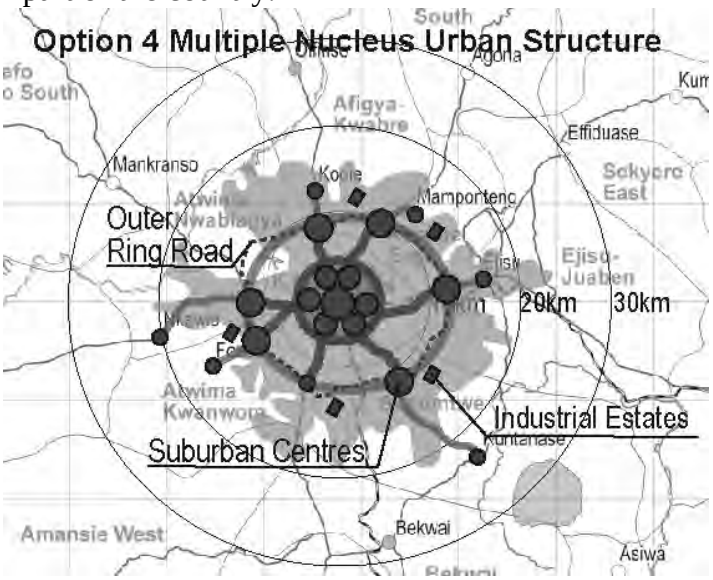
"Transforming the current mono-centric spatial structure which has too much functional concentration in Kumasi City to a Multi-Nucleus Urban Structure with suburban centres and suburban industrial functions"

This direction can be also described as follows:

- Urban functions should not be too much concentrated only in Kumasi's central

area.

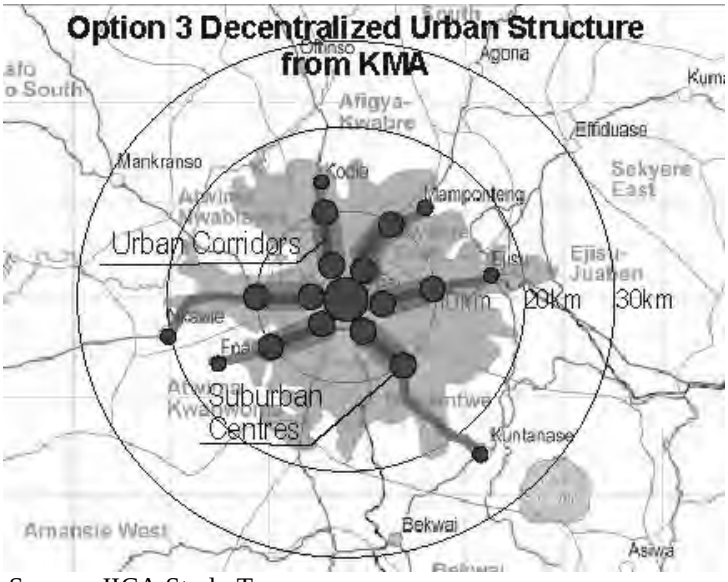
- It should be multi-nucleus by utilization of space widely within the Greater Kumasi Sub-Region by promoting the development of suburban residential areas, as well as by forming suburban centres and district centres.
- However, urbanized areas should be contained within an area of reasonable size for efficient provision of infrastructures and services.
- More advanced urban functions should be developed and provided in Kumasi's central area for providing services more widely not only Ashanti Region but also northern part of the country.



Source: JICA Study Team

Figure 8.1.2 Multiple Nucleus Urban Structure for Greater Kumasi Sub-Region

However, from consideration of viability and practicality, an urban structure based on urban corridors and suburban centres (as shown in Figure 8.1.3) is also considered useful for achieving a decentralized spatial structure.



Source: JICA Study Team

Figure 8.1.3 Decentralized Urban Structure from KMA by Urban Corridors

8.1.3 Overall Spatial Structure and Overall Spatial Development Strategies for the Greater Kumasi Sub-Region

(1) Overall Spatial Structure

Considering the above mentioned spatial development strategies, a hybrid type of spatial structure combining the option based on Multiple Nucleus Structure (shown in Figure 8.1.2) and the option of Urban Corridors (shown in Figure 8.1.3) is recommended for Greater Kumasi Sub-Region.

The diagram of the overall spatial structure (the hybrid of Multiple Nucleus and Urban Corridors) for Greater Kumasi Sub-Region is shown in Figures 8.1.5 and 8.1.6. Figure 8.1.5 covers the whole of the Sub-Region including rural areas. On the other hand, Figure 8.1.6 covers KMA and its adjoining urbanising areas, which are called Greater Kumasi Conurbation.

The overall spatial structure for the Greater Kumasi Sub-Region in the long-term future is characterized by the following features:

- Rural areas (containing rural towns, settlements greenery open space, agricultural lands and wood lands) should be conserved outside the conurbation areas (urban growth boundary) for rural life including agricultural production, natural environment and recreational and open areas.
- Kumasi City Centre (within Inner Ring Road) should continue to be the Primary Center for Greater Kumasi Sub-Region.
- Ejisu City Centre should become a Secondary Centre.
- A Primary Urban Corridor should be developed between Kumasi City Centre and Ejisu City Centre, centring on Bus Rapid Transit (BRT) on Accra Road and being supported by a Parallel Road along Accra Road. The Kumasi-Ejisu Urban Corridor is a mixed development urban area accommodating commercial/ business areas, new light industrial areas, new towns and other residential areas including multi-storey housings.
- Boankra area should become an Industrial-Logistics Centre by accommodating a dry port and an export processing zone.
- A proposed Outer Ring Road should be constructed connecting suburban residential areas, district centres and suburban centres to radial major arterial roads, on which BRT routes are operated.
- Current district capital towns and suburban towns should be upgraded as district centres and suburban centres for supporting suburban residential areas.
- Six primary urban arterial roads should be well developed with at least six-lane width in order to accommodate BRT routes connecting the Outer Ring Road with the Kumasi City Centre. See Figure 8.1.7.
- New Towns should be developed in order to provide orderly suburban residential areas with basic infrastructures by a joint initiative of private developers and chiefs (land owners).

Overall issues on socio-economic development and those on spatial development are closely related to various issues on individual themes.

(2) Overall Spatial Development Strategies and Individual Strategies

The overall strategic directions for socio-economic development, as well as for spatial development, are pursued by implementing various individual strategies, described in Sections 8.2 through 8.13 as shown in Figure 8.1.4.

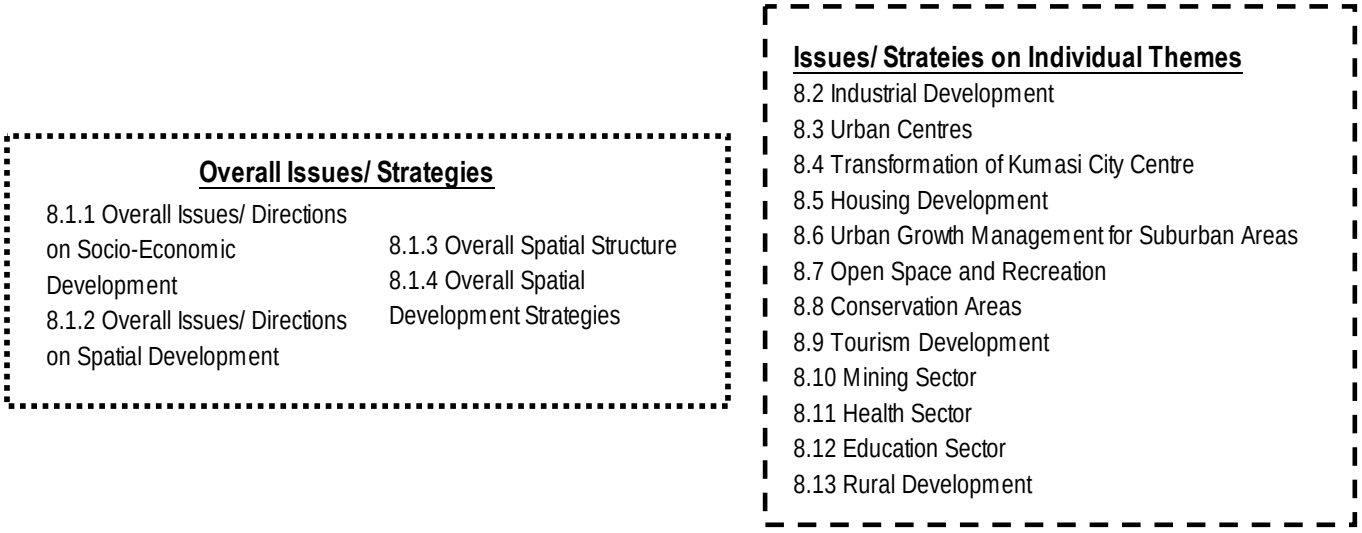


Figure 8.1.4 Overall Issues/ Strategies and Individual Issues/ Strategies

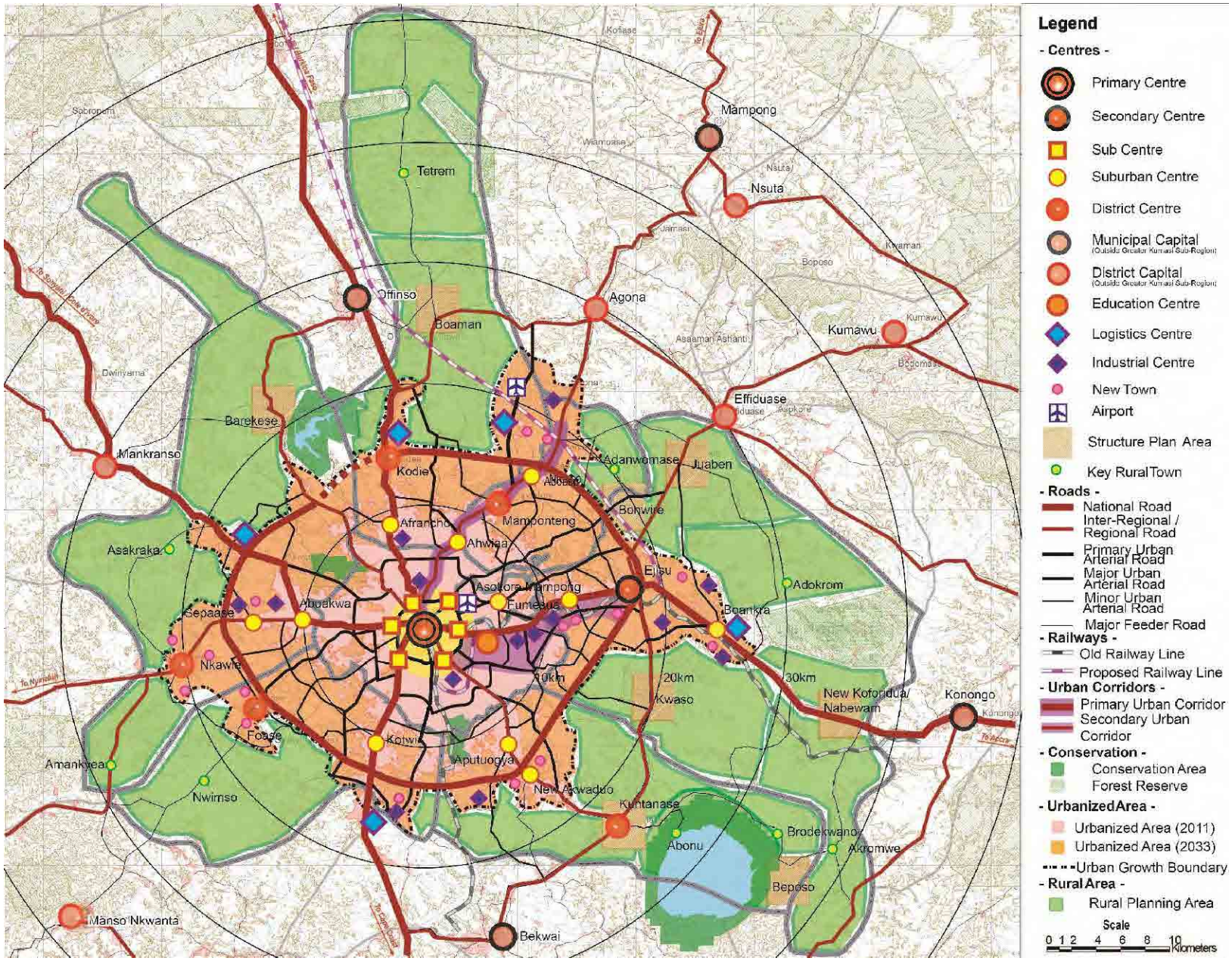
The overall strategic directions are to revitalize formal economic sectors and to decentralize urban functions and population outside Kumasi City by integrating the Kumasi City Centre and suburban area, as well as to create linkage between formal and informal sectors.

In order to transform the existing mono-centric spatial structure to a decentralized one, and to encourage revitalization of industries, it is necessary to promote the following development strategies for the Greater Kumasi Sub-Region proposed in the subsequent sections of Chapter 8:

- To distribute industrial areas in suburban areas by developing industrial parks to accommodate formal economic sectors and provide employment opportunities in response to the future large population increase.
- To distribute/decentralize commercial/business/service functions to suburban areas by developing urban centres in suburban areas to increase residential populations in suburban areas.
- To restructure and expand the central area of Kumasi City to upgrade the urban functions of Kumasi City Centre.
- To widen major radial roads not only to induce decentralization of urban functions to suburban areas from Kumasi City Centre, but also to achieve stronger integration between the central and suburban areas.
- To establish Bus Rapid Transit (BRT) routes on major radial roads and to develop an Outer Ring Road to promote the development of residential areas and

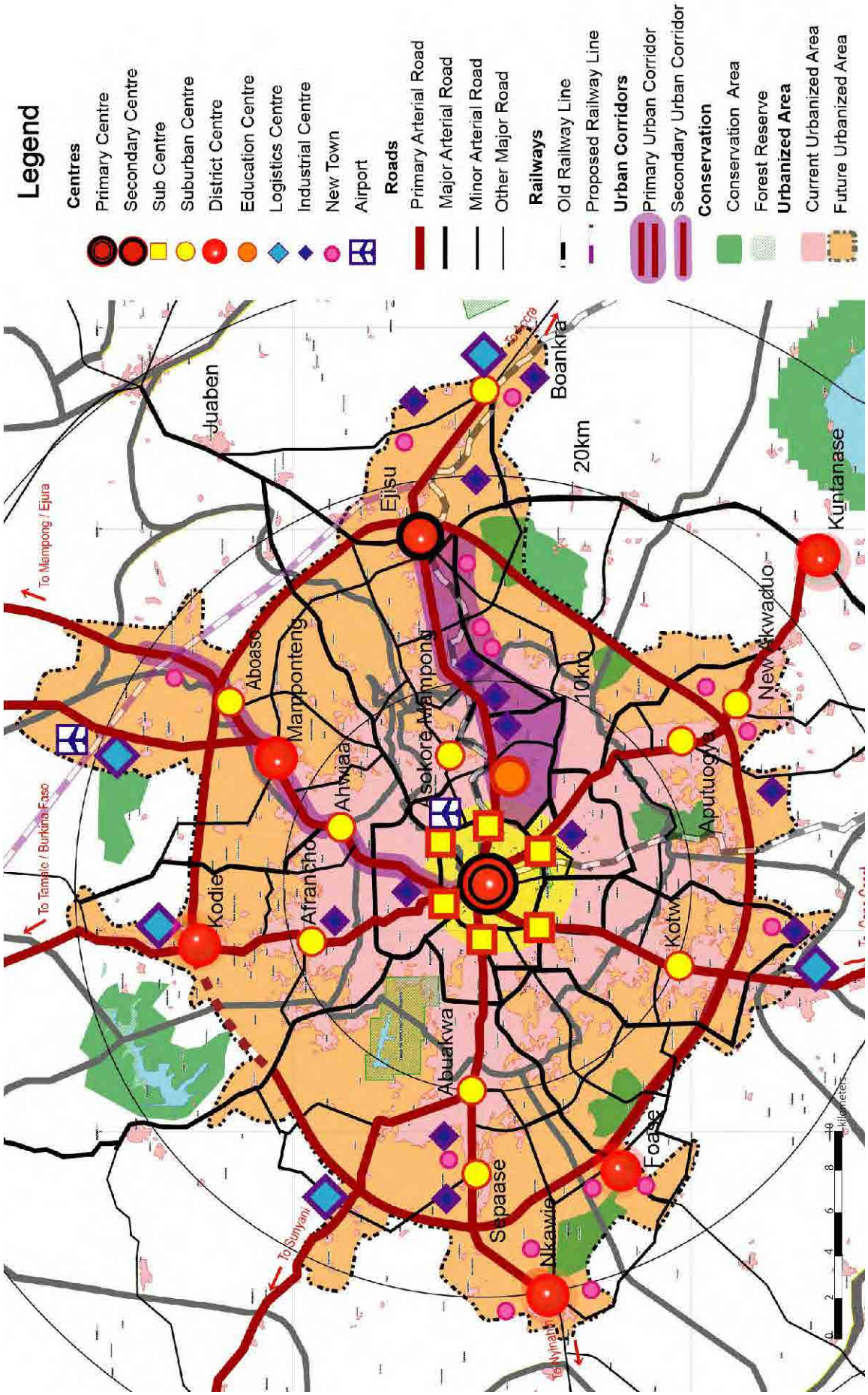
urban centres in suburban areas.(Although railway does not play an important role in urban public transportation by 2033 or so, the BRT dedicated lanes could be a good base for future development of rail-based public transportation in the very long term beyond 2033.)

- To promote development of multi-storey housing in the central area of Kumasi City Centre by urban renewal measures for restructuring and enhancement of the urban functions of the Kumasi City Centre, and near urban centres in suburban areas to support the development of urban functions in suburban areas.
- To designate and utilize urban growth boundaries and control the official approval of layout plans (or local plans) to guide suburban housing development towards desirable areas.
- To designate and develop open spaces, river buffer zones and conservation areas to promote recreational activities and healthy lifestyles, as well as to improve the urban environment and amenities.
- To implement other strategies for aspects of tourism, mining, health, education and rural development



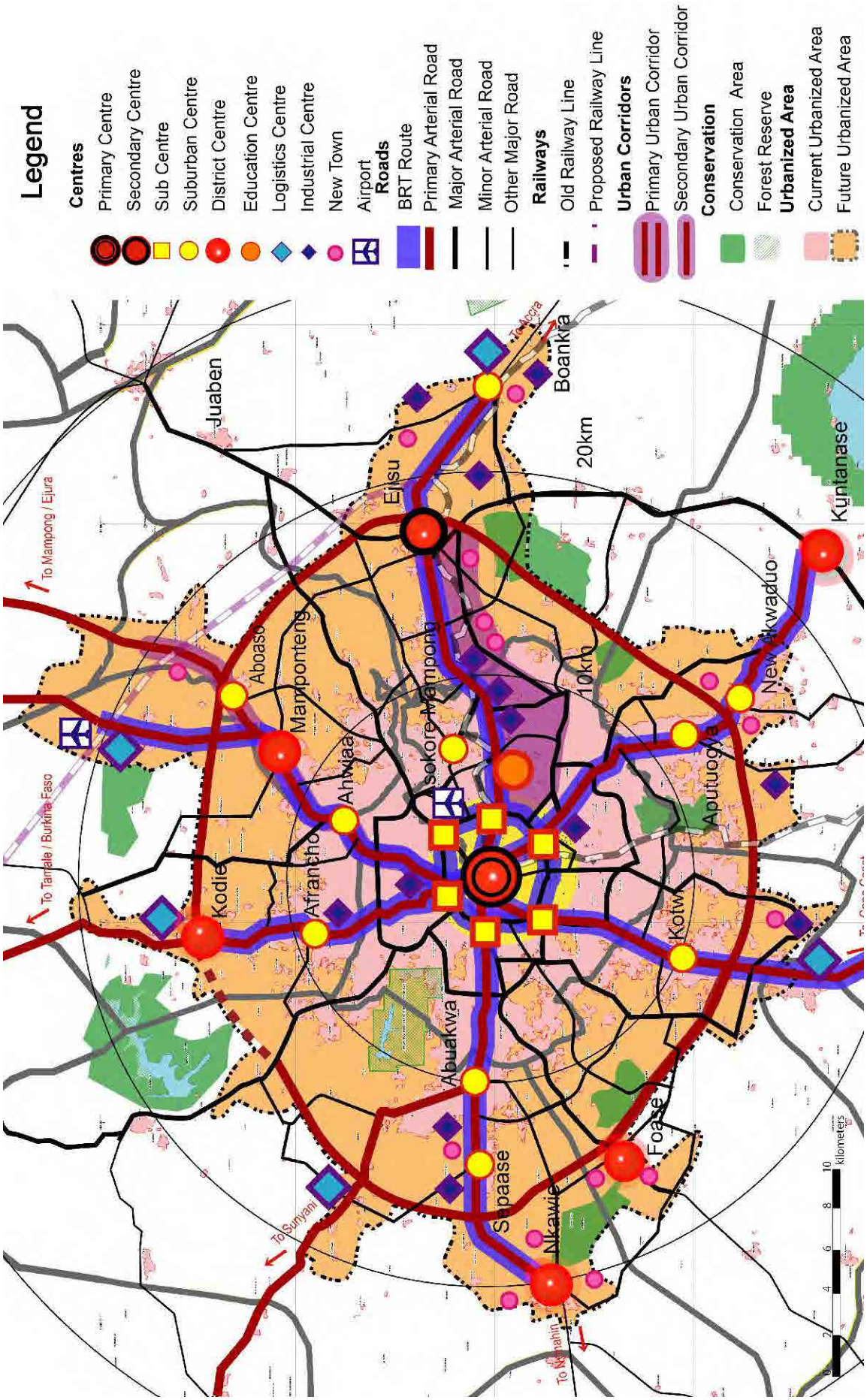
Source: JICA Study Team

Figure 8.1.5 Diagram of Spatial Development Framework for Greater Kumasi Sub-Region, 2033



Source: JICA Study Team

Figure 8.1.6 Diagram of Spatial Development Framework for Greater Kumasi Conurbation, 2033



Source: JICA Study Team

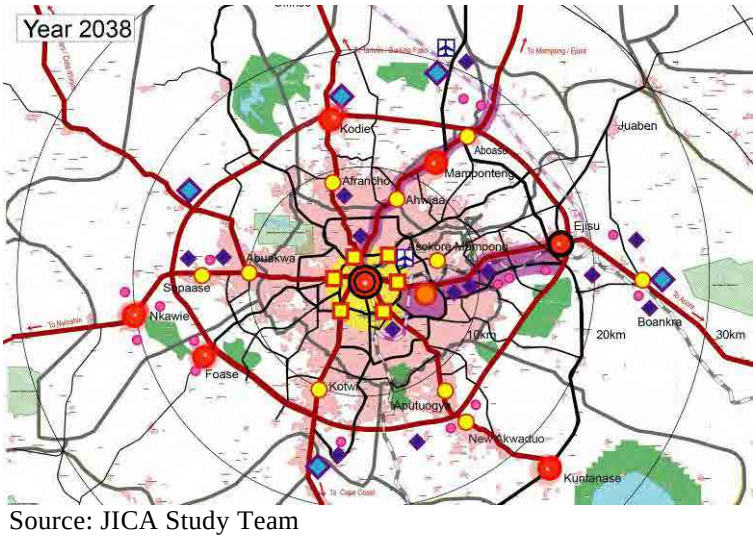
Figure 8.1.7 Diagram for Transportation in Greater Kumasi Conurbation, 2033

8.1.4 Phased Spatial Development Scenarios

The following phased development scenarios were recommended from a very strategic point of view. Even at the full-scale spatial development stage in 2033, a Northern-Western section of the Outer Ring Road and the airport city in Afigya Kwabre District and Kwabre East District will not be completed yet. In 2038, all spatial development is to be completed (Figure 8.1.9).

Source: JICA Study Team

Figure 8.1.8 Recommended Phased Spatial Development for Greater Kumasi Sub-Region



Source: JICA Study Team

Figure 8.1.9 Completed Phased Spatial Development for Greater Kumasi Sub-Region, 2038

a) Phase 1 (2013-2023): Industrial development in Kumasi City and Boankra / Kumasi-Ejisu Urban Corridor development

In the first ten years (2013-2023) of the selected scenario, the following developments should be completed:

- Upgrading of Ejisu-Kuntanase-Bekwai Road (currently Regional Road) to Inter-Regional Road
- Upgrading of Lake Road (currently Regional Road) to Inter-Regional Road
- Development of Middle Ring Road Connection (currently under progress by Department of Urban Road)
- Development of Second Middle Ring Road Connection
- North-Eastern Section of the Outer Ring Road
- The First Phase of Kumasi-Ejisu Urban Corridor including the following:
  - Parallel Road along Accra Road
  - Widening of Accra Road for Accommodating Dedicated Lanes for BRT
  - Development of Kumasi Primary Centre and Ejisu Secondary Centre
  - First Knowledge-Based Industrial Area
  - First New Town
- Boankra Export Processing Zone
- Boankra Inland Port
- The first phase of Kumasi-Mamponteng Urban Corridor by widening the Kumasi-Mampong Road
- Development of New Towns
  - New Town near Boankra
  - New Town near Sepaase
- Development of District Centres
  - Mamoponteng District Centre
  - Development of Kodie District Centre
- Development of Suburban Centres
  - Aboaso Suburban Centre
  - Afratwo Suburban Centre
  - Ahwiaa Suburban Centre
  - Aputuogya Suburban Centre
  - Abuakwa
  - Boankra
- Redevelopment of Kaase Industrial Area
- Development of Industrial Areas
  - Industrial Area near Abuakwa (accepting relocation of Suame Magazine)
  - Industrial Area new Afrancho (accepting relocation of Suame Magazine)
  - Industrial Area to the South of Ejisu Town
- Development of Logistics Centre
  - Boankra Logistics Centre
  - Kodie Logistics Centre

b) Phase 2 (2023-2028): Acceleration of development for District Centres, New Towns and Industrial Areas in the suburban areas

Between 2023 from 2028, the following developments should take place:

- South-Western Section of the Outer Ring Road
- Development of urban arterial roads
- The Second Phase of Kumasi-Ejisu Urban Corridor including the following:
  - Second New Town in the Kumasi-Ejisu Urban Corridor
  - Second Knowledge-Based Industrial Zone in the Kumasi-Ejisu Urban Corridor
- Development of Industrial Areas
  - Industrial Area to the south of Kotwi
  - Industrial Area near Sepaase
  - Industrial Area in the north of Boankra
- Development of New Town
  - First and Second New Town near Nkawie
  - First New Town near Foase
  - New Town to the south of Kotwi
  - New Town to the south of Aputuogya
- Development of District Centre
  - Nkawie District Centre
  - Foase District Centre
  - Kuntanase District Centre
- Development of Suburban Centre
  - Asokore Mampong
  - Kotwi
  - Sepaase
  - Afrancho
- Development of Logistics Centre
  - Bekwai Road Logistics Centre
  - Sunyani Road Logistics Centre

c) Phase 3 (2028-2033): Airport City development

Between 2028 and 2033, the following developments should take place:

- The First Phase of Airport City
  - New Town of Airport City
  - Light Industrial Area of Airport City
- South-Eastern Section of Outer Ring Road
- Part of North-Western Section of Outer Ring Road between Sunyani Road and Barakese Road
- The Third Phase of Kumasi-Ejisu Urban Corridor Development including the following:
  - Third New Town in the Kumasi-Ejisu Urban Corridor
  - Third Knowledge-Based Industrial Zone in the Kumasi-Ejisu Urban Corridor
- Development of New Town

- New Town north of New Akwaduo
- Third New Town near Nkawie
- Second New Town near Foase
- New Town north of Boankra

- Development of Suburban Centre
  - New Akwaduo
- Development of Industrial Areas
  - Industrial Area to the south of Auptuogya

d) Phase 4 (2033-2038): Completion of Airport City and Outer Ring Road

Between 2033 and 2038 the following development should take place:

- Second Phase of Airport City
  - Second New Town of Airport City
  - Industrial Area of Airport City
- Remaining North-Western Section of Outer Ring Road

8.2 Industrial Development

8.2.1 Background on Industrial Development

The industrial development strategies which are discussed in this section are intended to promote industrialization in transformation of the spatial structure. The proposed strategies are formulated to aim at reviving industries and diversification of economic sectors in Greater Kumasi. Kumasi has grown as a "Commercial and Consumption City", while it used to have substantial industrial bases.

However, in the period of 2000-2010, the manufacturing sector in Ashanti Region had been stagnant in terms of increase of economic active population as shown in Table 8.2.1. On the other hand, other regions (Brong Ahafo, Volta, Central and Eastern Regions) had largely increased their economic active population of manufacturing sector.

Table 8.2.1 Economic Active Population of Manufacturing Sector, 2000 and 2010

		2000	2010	Increased	Annual
		Number	Number	Number	Growth Rate
1	Ashanti Region	200,556	206,543	5,987	0.29%
2	Western Region	87,309	102,892	15,583	1.66%
3	Central Region	71,126	104,073	32,947	3.88%
4	Greater Accra Region	229,808	273,448	43,640	1.75%
5	Volta Region	71,385	124,583	53,198	5.73%
6	Eastern Region	84,505	116,255	31,750	3.24%
7	Brong Ahafo Region	36,290	70,396	34,106	6.85%
8	Northern Region	51,708	61,847	10,139	1.81%
9	Upper East Region	40,697	35,449	-5,248	-1.37%
10	Upper West Region	21,468	24,636	3,168	1.39%
	Ghana	894,852	1,120,122	225,270	2.27%

Source: GSS, 2000 and 2010 Population and Housing Census

Historically, Kumasi urban area has been developed centering on Kumasi station mainly for cargo transport in the relatively small area where warehouses and manufacturing related to freight distribution (cocoa, cola, rubber, cattle and livestock) in addition to trade/commercial and service sectors have been accumulated (warehouses along the rail line). Outward relocation of the manufacturing from the central area into newly designated industrial zones was then promoted. In the 1950s-1960s, Suame Magazine moved from central Kumasi to its current location, and new industrial zones such as those of Asafo Magazine (mechanical workshop cluster), Kaase-Asokwa Industrial Enclave (including a beverage cluster and woodworking), and Sokoban Wood Village (woodworking cluster relocated from Anloga Junction areas) were subsequently developed.

Suame Magazine's car repairing services/industries have the following problems:

- Suame Magazine is already enclosed by the built-up areas and accordingly complicated/conflicted with the surrounding houses and commercial activities. (Land value is higher for commercial use than industrial use)
- Suame Magazine is designated only as industrial areas where site infrastructures are not well provided.
- The industries operating in the area are mostly informal/small-scale/ unregistered/ unregulated and their production systems and operations are less modernized with low productivity.

On the other hand, Kaase-Asokwa Industrial Area has suffered loss of factories in the last two decades. A lot of industrial lands are not being used productively while those lands are well located close to major roads, and water and electricity are available. Since unused lots in the industrial area are large, it is difficult to find investors and industries for such large lots. Mal-utilization of the existing industrial resources is an issue. Conversion of some of this land to other uses is an issue.

For starting revitalization of industries in Greater Kumasi, it is very important to utilize currently available resources, such as unused lands of Kaase-Asokwa Industrial Area. Indeed, Kaase-Asokwa is a good starting point for re-industrialization. However, Kaase-Asokwa Area is located too close to the Kumasi City Centre and it is in part of the traffic congested areas. For industrial investors, suburban reasonable priced lands are more attractive for the future. In this sense, Greater Kumasi's industrial strategies should also consider additional industrial areas in suburban areas.

Overall Spatial Structure for Greater Kumasi Sub-Region in the previous section shows the spatial direction of the industrialization as proposed above, where industrial development strategies are proposed.

8.2.2 Issues on Industrial Development

Issues on industrial development for Greater Kumasi Sub-Region are identified as follows:

- Lack of core strong economic sectors

- Shortage of private investment to revitalize industries and to develop formal economic sectors
- Shrinking manufacturing industries, decreasing in number and production amounts in Kumasi and its surrounding areas
- Falling timber processing industries due to shortage of timber produced
- Dominant small-scale informal manufacturing industries
- Inland location of Greater Kumasi which is not so advantageous as Accra-Tema and Sekondi-Takoradi
- Severe traffic congestion in the central area of Kumasi City disturbing goods transport for operation of manufacturing industries
- Unstable supply of agricultural product causing difficulties for agro-processing industries
- Unstable and insufficient electricity supply to attract private investments in manufacturing industries
- Unstable water supply to attract private investments in manufacturing industries

In these ways, Greater Kumasi Sub-Region does not seem to have any good enabling environment for business or industrial development. However, Greater Kumasi Sub-Region has potentials for economic development as follows:

- Greater Kumasi Sub-Region has over 2 million urban populations and its urban populations are rapidly increasing in number, which would provide a large market opportunity for businesses.
- Greater Kumasi Sub-Region has a number of educated and capable people, who could be a good workforce for industrial development.
- Greater Kumasi Sub-Region has active informal sectors and research & development institutes. These two sectors could make a good linkage for the modernization of informal sector.
- Greater Kumasi Sub-Region is located on the central corridor connecting Tema/Accra and the Northern Region, as well as served by National Road No.8.
- Greater Kumasi Sub-Region is served by fibre optic backbones, which have been strengthened by Chinese and Danish assistance.
- Greater Kumasi Sub-Region is surrounded by good agricultural areas in Ashanti Region. It is possible to secure raw material of agricultural produce if private investments are made in the agricultural sectors.
- Greater Kumasi Sub-Region is located almost in the centre of Ghana. Greater Kumasi Sub-Region is a gateway connecting the northern part of the country with Accra and the southern regions.

8.2.3 Objectives for Industrial Development

The objectives for industrial development for Greater Kumasi Sub-Region are set as follows:

- Revitalize industrial development in Greater Kumasi Sub-Region by attracting private investments
- Develop formal industrial sectors by promoting necessary infrastructure provision

- Modernization of informal sectors by creating linkage with formal sectors

In order to achieve these objectives, it is necessary to take actions immediately in the short term. In this sense, it is necessary to consider the utilization of economic resources already available in Greater Kumasi Sub-Region.

8.2.4 Strategies for Industrial Development

Strategies for industrial development were identified and set for Greater Kumasi Sub-Region as follows:

1) Short-Term Strategies

- Start making an effort at revitalizing economic and industrial development using the following existing resources:
- Unused lands and existing infrastructures available in the Kaase Industrial Area
- Teachers, researchers and students (graduates) of KNUST and land available for development in KNUST Campus
- Develop an Export Processing Zone in Boankra for attracting private investment
- Improve Ejisu-Kuntanase road (existing road) and designate industrial areas for promoting development of factories
- Major focus would be made on the agro-processing industry.
- Linkage between informal sectors and formal sectors (including research institutes) should be created for modernizing the informal sectors.

2) Medium and Long-Term Strategies

- Promote industrial development in Kodie, New Bekwai Road and Nkawie by securing stable water supply
- Construct an Outer Ring Road and develop industrial estates along the Outer Ring Road, by providing stable electricity and water

In order to implement these industrial development strategies, electricity and water supply are very essential. At the same time, the expected huge population increase in Greater Kumasi Sub-Region would also require upgrading of the capacity of electricity and water supply.

The water supply to Boanka export processing zone and Ejisu-Kuntanase Road's industrial areas should start with utilization of ground water. It is because Ghana Water's water supply capacity would be limited until new water sources are developed.

8.3 Urban Centres and Urban Corridors

8.3.1 Background on Urban Centres

Following the recommendations on overall spatial structure described in Section 8.1.3, spatial development strategies for urban centres and urban corridors are presented in this section. These are to contain urban functions, in response to urban growth and expansion of Greater Kumasi Sub-Region.

At present, various urban activities (retail/wholesale shops/service, logistics, public

services) are concentrated in the existing urban centre such as:

- Central Market: the largest single open-air market in Ghana
- Kejetia Terminal: selling mostly non-consumable goods at a parking facility for the Central Market
- Adum Shopping Centre: main commercial centre of non-consumable goods and also accommodating government and private offices

This situation created an extremely concentrated single centred pattern. In contrast, suburban service centres supporting suburbanization of population have not been well developed. It may be said that this urban centre pattern does not provide a convenient environment for shopping for most Kumasi people.

The existing urban centre (or central area) of Kumasi is plagued with over-crowding and congestion resulting from concentration of various urban activities including even daily-commodity retail shops which should be normally located close to residential areas rather than in the central area. On the other hand, specialized shops and specialty shops should be located in the central area of the city.

In Kumasi, most formal shops still have both wholesale and retail functions. In developed economies, wholesale and retail functions are specialised in a separate manner. Then wholesale functions prefer to not be located in the central area, and they tend to move out to suburban areas near major inter-regional corridors.

In fact, new urban and commercial activities tend to locate themselves outward (outside the Inner Ring Road) in such a manner as to avoid congestion of the existing urban centre (new development in Atonsu, Tafo, Abuakwa and others). Demand and needs for commerce and services have been increasing in suburban areas in accordance with the rapid population suburbanization. However, suburban urban centres providing commercial/services have not been sufficiently developed yet.

In general, unnecessary urban functions in the central area should be relocated to suburban areas, and high-degree urban functions should be more developed in the central area.

On the other hand, suburban urban centres can provide convenient and sufficient urban services for suburban residents.

Such suburban centres should be planned not only for providing services to surrounding residents, but also as places for employment opportunities in suburban areas.

8.3.2 Issues on Urban Centres

As described in the background above, various problems are observed in urban centre systems of Greater Kumasi Sub-Region. The following issues are identified for spatial development planning for Greater Kumasi Sub-Region:

- Too much concentration of urban centre functions in Kumasi City, especially in the central area of Kumasi City
- Inefficiency of urban centres due to traffic congestion and overcrowding of

vendors over streets
- Lack of development of urban functions of commerce and services in suburban areas outside Kumasi City
- Ribbon development along roads is a dominant form of land use for commercial and services, discouraging the development of urban centres in suburban areas.
- Weak provision of business services, as well as daily commercial services in capital towns of adjoining districts of Kumasi City
- Few employment opportunities in suburban areas outside Kumasi City

8.3.3 Objectives for Urban Centre Development

In order to tackle the issues identified above and to achieve the vision for Greater Kumasi Sub-Region, the following objectives for urban centre development are set:

- Create a City Centre for Kumasi with advanced high urban functions to support and sustain socio-economic development of Greater Kumasi Sub-Region and Ashanti Region as a whole
- Maintain the Kumasi City Centre as the capital of Ashanti culture and people
- Decentralize urban functions from Kumasi City toward suburban areas within Greater Kumasi Sub-Region in order to solve too much concentration of traffic in Kumasi City Centre
- Develop District Capitals and Suburban Centres which could provide jobs and services for their surrounding suburban areas including rural areas
- Integrate the Kumasi City Centre and urban functions in suburban areas strongly by efficient transportation and communication systems

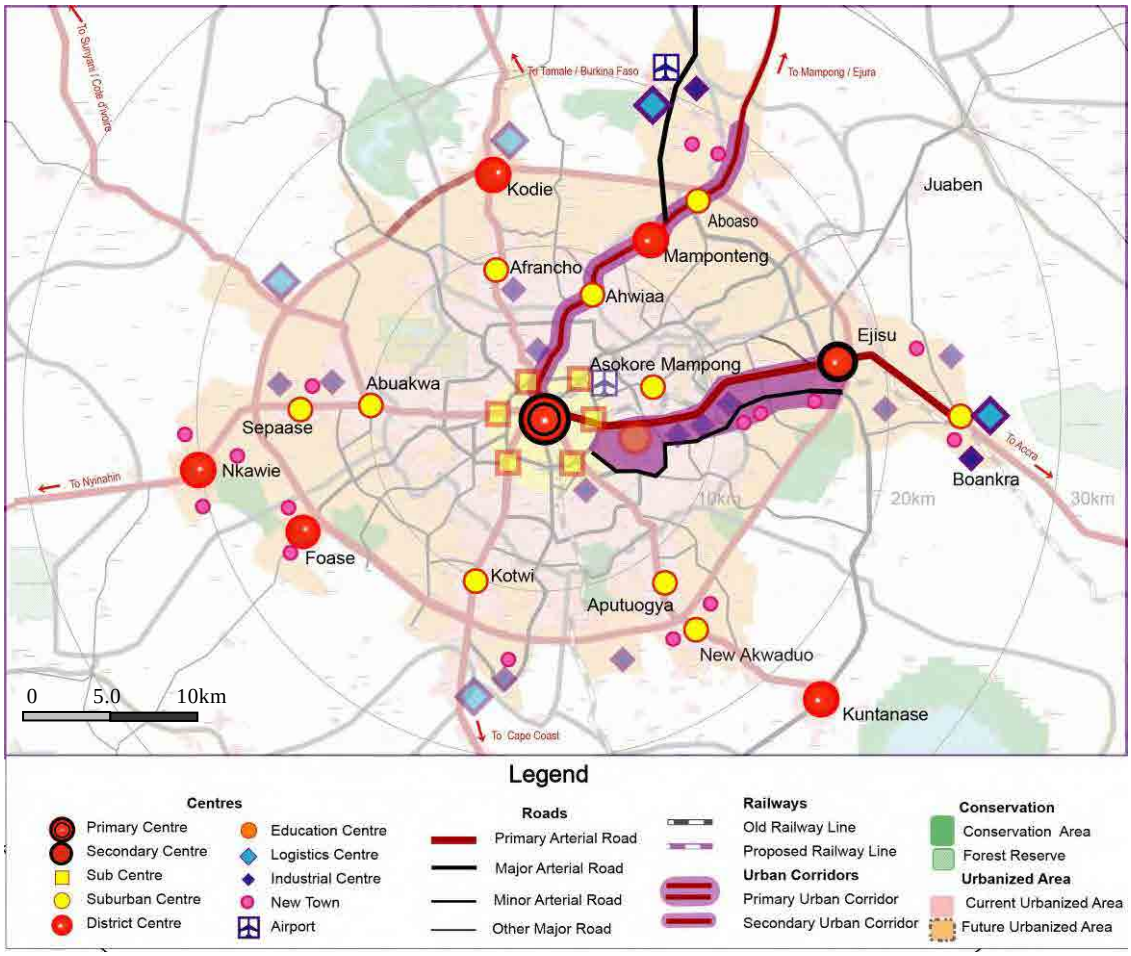
8.3.4 Strategies for Urban Centre Development

(1) Hierarchy of Urban Centres within Greater Kumasi Sub-Region

In order to achieve a multi nucleus spatial structure also based on urban corridors, the following hierarchy of urban centres is recommended for the Greater Kumasi Sub-Region:

- Primary Centre (Kumasi City Centre): Central Core and Sub Centres along the Inner Ring Road
- Central Core: Areas within the Inner Ring Road
- Sub Centres: Centres near Main Roundabouts along the Inner Ring Roads
- Secondary Centre (Ejisu City Centre): Ejisu-Juaben Municipality Capital Town
- Primary Urban Corridor (Kumasi-Ejisu Urban Corridor): Belt area to be developed along Kumasi-Ejisu Road by building another road in parallel with Kumasi-Ejisu Road
- Secondary Urban Corridor (Kumasi-Mamponteng Urban Corridor): Corridor to be developed along Kumasi-Mampong Road
- Tertiary Centres (District Centres): District Capital Towns at Mamponteng, Kodie, Nkawie, Foase and Kuntanase
- Suburban Centres: Within the Greater Kumasi Conurbation are Ahiwaa (Kwabre East), Afrancho (Afigya-Kwabre), Abuakwa (Atwima Nwabiagya), Sepaase (Atwima Nwabiagya), Kotwi, (Atwima Kwanwoma), Aputuogya (Bosomtwe),

New Akwaduo (Bosomtwe), Asokore Mampong (Asokore Mampong) and Boankra (Ejisu-Juaben)



Source: JICA Study Team

Figure 8.3.1 Diagram of Urban Centres and Urban Corridor

(2) Kumasi City Centre Strategies

Kumasi City Centre is defined as the highly urbanized area within the Inner Ring Road. Kumasi City Centre is composed of the Central Core and Sub Centres along the Inner Ring Road.

- Develop and strengthen the functions and amenities of Kumasi City Centre as the Primary Centre of Greater Kumasi Sub-Region
- Provide high-class infrastructure for Kumasi City Centre by constructing new roads and establishing BRT routes and BRT terminals

The Kumasi City Centre should have the following urban functions:

- Central Business District (CBD) accommodating regional headquarters of public institutions and private corporations
- Modern shopping centres including high-end retail commerce of regional importance
- Cultural facilities
- Open spaces and sports facilities of regional importance

- Residence (low-rise and mid-rise)
- Neighbourhood retail commerce

These strategies are elaborated in Section 8.5 later in this report.

(3) Ejisu City Centre Strategies

The functions and amenities of Ejisu City Centre should be developed and strengthened as the Secondary Centre of Greater Kumasi Sub-Region. Ejisu City Centre should be developed to accommodate business offices and administrative services offices for serving the surrounding urban areas including industrial areas in Boankra and along Ejisu-Kuntanase Road. The following points are strategies for developing Ejisu City Centre:

- Provide stable electricity and water supply to Ejisu City Centre together with Boankra Industrial-Logistics Centre.
- Construct the first section (connecting Ejisu and Kodie) of the proposed Outer Ring Road
- Provide grade separation at the junction of Accra Road and Ejisu-Kuntanase Road
- Link Ejisu City Centre with Boankra Industrial-Logistics Centre functionally and strongly

The following urban functions should be developed for Ejisu City Centre:

- Central Business District (CBD) accommodating sub-regional headquarters of public institutions and private corporations
- Modern Suburban Shopping Centres
- Wholesale commerce
- Suburban retail commerce
- Cultural facilities
- Health and education institutions of sub-regional importance
- Open spaces and sports facilities of sub-regional importance
- Low-rise and mid-rise residence
- Neighbourhood retail commerce

(4) Kumasi-Ejisu Urban Corridor Strategies

Again, in response to the proposal to combine suburban centres and district centres with urban corridors in 8.1.3 above, Kumasi-Ejisu Urban Corridor should be developed as the Primary Urban Corridor of Greater Kumasi Sub-Region. The Kumasi-Ejisu Urban Corridor should be developed to accommodate mixed uses including business offices, shopping centres, government administrative offices and housing areas. The Kumasi-Ejisu Urban Corridor has national research institutions, such as KNUST and CSIR. As in many other cities, the co-location of these institutions can provide the basis for developing knowledge-based industries in the area, thus making the corridor also a “Knowledge Corridor”. International exhibition and conference halls could also be one of the urban functions which Greater Kumasi Sub-Region has in the Kumasi-Ejisu Urban Corridor.

For establishing the Kumasi-Ejisu Urban Corridor, the following strategies should be implemented:

- To introduce large buses and BRT services on Accra Road for strongly connecting Kumasi and Ejisu
- To construct another urban arterial road in parallel with Accra Road for strengthening the function of accommodating through-traffic

The following urban functions should be developed for Kumasi-Ejisu Urban Corridor:

- Knowledge City accommodating technology companies and ICT-BPO companies
- Business offices
- High-class hotels and conference facilities
- Modern shopping centres of sub-regional importance
- Health and education institutions of sub-regional importance
- Low-rise and mid-rise residence

(5) Kumasi-Mamponteng Urban Corridor Strategies

Kumasi-Mamponteng Urban Corridor should be developed as the Secondary Urban Corridor of Greater Kumasi Sub-Region. At the end of Kumasi-Mamponteng Urban Corridor, an airport city should be developed in the vicinity of the proposed International Airport (in Ankaase) where light industries and the logistics sector could be developed.

For establishing the Kumasi-Mamponteng Urban Corridor, the following strategies should be implemented:

- Introduce large buses and BRT services on Kumasi-Mampong Road for strongly connecting Kumasi and Mamponteng
- Provide strong access to an international airport and its surrounding airport city.

The following urban functions should be developed for Kumasi-Mamponteng Urban Corridor:

- Modern shopping centres of sub-regional importance
- Business offices
- Suburban retail commerce
- Light industries
- Health and education institutions of sub-regional importance
- Low-rise and mid-rise residence

(6) District Centres Strategies

District Centres should be developed as the Tertiary Centres of Greater Kumasi Sub-Region. Mamponteng and Kodie are considered to have high urban development potential among the five District Centres.

One of the most important strategies for promoting the development of these District

Centres is to construct the first section (between Ejisu and Kodie) of the Outer Ring Road in a timely manner.

The following urban functions should be developed for District Centres:

- Government offices of district importance
- Suburban modern shopping centres of district importance
- Business offices
- Suburban retail commerce
- Health and education institutions of district importance
- Low-rise and mid-rise residence

(7) Suburban Centres Strategies

Suburban Centres have been emerging as thriving suburban market towns and residential areas within the Greater Kumasi Sub-Region. These Suburban Centres should be developed further for accelerating ordered suburbanization and for providing urban services to their surrounding areas. Kotwi, Aputuogya, Aboaso and Sepaase are Suburban Centres which have high urban development potential.

The following urban functions should be developed for Suburban Centres:

- Suburban modern shopping centres of district importance
- Business offices
- Suburban retail commerce
- Health and education institutions
- Low-rise and mid-rise residence

(8) New Town Development Strategies

It is proposed to develop mid-size new towns in suburban areas in the following areas:

- In surrounding areas of Nkawie District Centre in Atwima Nwabiagya District
- In surrounding areas of Foase District Centre in Atwima Kwanwoma District
- To the south of Kotwi Suburban Centre outside the Outer Ring Road in Atwima Kwanwoma District
- In the south of Ejisu Secondary Centre in Ejisu-Juaben Municipality
- Near the new international airport in Afgya-Kwabre District and Kwabre East District
- To the south of Aputuogya Suburban Centre in Bosomtwe District
- In the surrounding area of Boankra Suburban Center in Ejisu-Juaben Municipality
- Between Ejisu Secondary Centre and Boankra Suburban Cetnre in Ejisu-Juaben Municipality
- In the north of Sepaase Suburban Centre in Atwima Nwabiagya District

These new towns are to be developed by private developers. Such new towns should be developed and equipped with infrastructures in order to encourage people to start moving in immediately after the completion of construction of the new towns.

For developing each new town, the following strategies should be considered for implementation:

- Develop a New Town Centre for shopping and services as a service and employment centre for the New Town.
- Promote to develop employment opportunities by attracting private investment in the Information Communications Technology-Business Processing Outsourcing (ICT-BPO) Sectors and other formal light industrial sectors in the New Town Centre.

8.4 Transformation of Kumasi City Centre

8.4.1 Background on Kumasi City Centre

Kumasi City Centre is the central part of Kumasi City, which is generally defined as the area within the Inner Ring Road, including the areas along the Inner Ring Road. Kumasi City Centre is proposed to be composed of a Central Core and Sub Centres.

The strategies for Kumasi City Centre development which are discussed in this section are to transform and expand the old structure of Kumasi City Centre to a modern urban centre in response to the development and expansion of Greater Kumasi Sub-Region.

As described in Sections 8.2 and 8.3, Kumasi City Centre has grown on the old urban structure which was developed in the 1950s, in a relatively small area. A variety of old and new urban functions and industries have excessively accumulated, resulting in overcrowding and congestion, causing functional paralysis of Kumasi City Centre.

Thus, in this City Centre, various kinds of functions and industries gather together as the time passes. As a result, the following characteristics are observed in Kumasi City Centre:

- Informal industries featured with small scale businesses (individual and family run) and non-modern management
- Traditional industries as well as modern industries
- Those which are needed in the city centre as well as those not needed (manufacturing, wholesale, logistics and retail selling daily products)
- Presence of low density land uses, which are not efficient and not suitable for the City Centre
- The concentrated and mixed pattern described above was very effective and convenient for a city centre when the city was relatively small in the size of urban areas and populations.
- The small-scale transport modes, such as taxis (collective/shared taxi) and trotro (minivan-type bus) which are predominant on urban roads at present, were convenient for Kumasi people when their traffic volume and trip length were small.

It is apparent that this type of urban centre cannot cope with increasing traffic

demands in accordance with the growth of Greater Kumasi Sub-Region. In this context, development strategies to transform the old city centre structure to a modern one including an urban transport system are proposed.

This is expected to lead to arranging the congested land use in better order. This structural transformation becomes feasible only with establishment and implementation of public transport development strategies and with decentralizing urban functions to suburban areas (district centres and suburban centres).

The congested/mixed land use should be rearranged through relocating the manufacturing, wholesale, logistics, and others, which are no longer needed in the city centre, toward new industrial areas or logistic centres and wholesale markets to be constructed in suburban areas. With this policy, a limit could be placed on the size and types of truck loads which can be taken into the city centre.

In parallel with the relocation of certain types of urban functions, a new and modernized Central Business District (CBD) should be developed in order to promote high-grade and advanced urban functions in Kumasi.

In addition to the improved access to the City Centre from suburban areas, it is important to secure mobility within the City Centre (within the Inner Ring Road). For transformation of the Kumasi City Centre, it is imperative to install an organized modern public transport system (large bus system or BRT) in place of the small-capacity vehicles like taxis and trotros.

Also proposed are strategies for redevelopment, effective utilization of unused/underused land or abandoned land for creating a new CBD taking into consideration the great development effects of BRT.

The proposal also includes the strategies to develop the sub centres for accommodating the increasing demand of urban centre functions/ activities around the transport nodes at the cross points of the Inner Ring Road and the radial roads on which BRT lines are planned to operate. These sub centres are supposed to complement the Central Core of Kumasi City Centre responding to the increasing demand for commercial/business space in Kumasi.

8.4.2 Issues on Kumasi City Centre

In relation to the central area of Kumasi City (Kumasi City Centre), the following issues are identified for spatial transformation:

- Traffic congestion choking the effective and efficient functioning of the CBD due to too much concentration of urban functions in the limited space of the current CBD
- Shortage of urban space to accommodate commercial/business functions in the city centre of Kumasi for seeking higher-grade of urban functions
- Poor transportation system including public transportation
- Underutilization of prime areas in the central area of Kumasi City Centre
- Mixed presence of retail, wholesale and logistics functions, causing traffic problems due to cargo trucks, in Kumasi City Centre

- Little regulation/restriction over truck traffic within Kumasi City Centre, causing traffic congestion and delaying relocation of logistics and wholesale functions from Kumasi City Centre
- Low population density in the Kumasi City Centre

8.4.3 Objectives for Transformation of Kumasi City Centre

For achieving the vision identified for Greater Kumasi Sub-Region and tackling the issues identified above, the following objectives are set:

- Upgrade the physical and functional capacity of the CBD of Kumasi City Centre (Kumasi's Central Area)
- Upgrade the physical and functional capacity of immediately surrounding areas of Kumasi's CBD
- Increase the residential capacity of Kumasi City Centre
- Enhance the traffic capacity of Kumasi's Central Area
- Strengthen integration between Kumasi City Centre and its surrounding areas by improving transportation
- Improve urban amenities for residents and visitors within Kumasi City Centre
- Improve the walking environment within Kumasi City Centre
- Improve the sense of the Ashanti cultural and social centre in Kumasi City Centre as the Ashanti cultural and social centre

8.4.4 Strategies for Transformation of Kumasi City Centre

(1) Strategies for the Central Core

The Central Core of Kumasi City Centre will have the following major land uses (See Figure 8.4.1) in the future:

- The Central Business District (CBD), which is defined as the central areas has a concentration of government offices, business headquarters and central commercial areas
- Other commercial areas along major roads
- Historical and Cultural Areas, such as Manhyia Palace, the Cultural Centre and Zoological Garden
- Public functions, such as health and education facilities
- Open space including parks and green areas
- Other housing areas

For upgrading the urban functions and urban amenities of the Central Core of Kumasi City Centre, the following strategies are recommended:

- Establish a larger CBD area by developing a new CBD and by strongly integrating the new CBD and the existing CBD (Adum area) in order to upgrade functions and physical space for Kumasi's CBD by the following measures:
- Construct new roads and BRT routes for strongly integrating the new CBD, and the existing CBD
- Make an expanded new CBD, functionally complementary with the existing CBD (Adum area)

- Redevelop army barracks, old housing areas and others, which have occupied good central locations for increasing:
- Introduce mid-rise housing buildings, as well as for introducing mixed development in the Central Core of Kumasi
- Conserve historical and cultural areas with historical buildings in order to maintain the identity of the Ashanti by designating them as important
- Modernize the Central Market, relocate part of the Central Market to satellite markets or suburban centres and reduce the number of roadside hawkers
- Maintain open space including parks and green areas in the Central Core
- Establish pedestrian zones for enabling safe and comfortable walking and bicycling
- Restrict entry of cargo trucks into the Kumasi City Centre, especially the Central Core during the day time

Source: JICA Study Team

Figure 8.4.1 Diagram of Proposed Spatial Structure for Kumasi City Centre, 2033

(2) Strategies for Sub Centres and Inner Ring Road Areas

1) Strategies for Sub Centres

In addition to the Central Core, Sub Centres will be important elements of Kumasi City Centre. To establish Sub Centres is one of the important strategies for transformation of Kumasi City Centre. Those Sub Centres are recommended to be located in the areas surrounding major junctions on the Inner Ring Road and radial urban arterials. See Figure 8.4.1.

- Establish Sub Centres by the following measures:
  - Designate "Action Areas for Commercial and Business Uses" in the Structure Plan for Greater Kumasi Conurbation
  - Give incentives for Larger Volume of Development through Rezoning
  - Develop flyovers for grade separation of the junctions at the Inner Ring Road and major radial urban arterial roads (in the Sub Centres)
  - Establish BRT major stations, where people can change BRT routes and bus routes, near the junctions (in the Sub Centres)

2) Strategies for Inner Ring Road Areas

The areas along the Inner Ring Roads are also an important part of Kumasi City Centre. The following points are strategies for Inner Ring Road Areas:

- Designate Mixed Development Areas for accommodating commercial and business uses, as well as residential uses along the Inner Ring Road
- Designate mid-rise housing areas (for middle-income people) behind the Mixed Development Areas along the Inner Ring Road by rezoning in the Structure Plan for Greater Kumasi Conurbation
- Access to those mid-rise and high-rise housing areas should not be made directly from the Inner Ring Road. Access roads are required for locating mid-rise residential buildings.
- Relocate part of the existing Suame Magazine to other areas for reducing traffic congestion

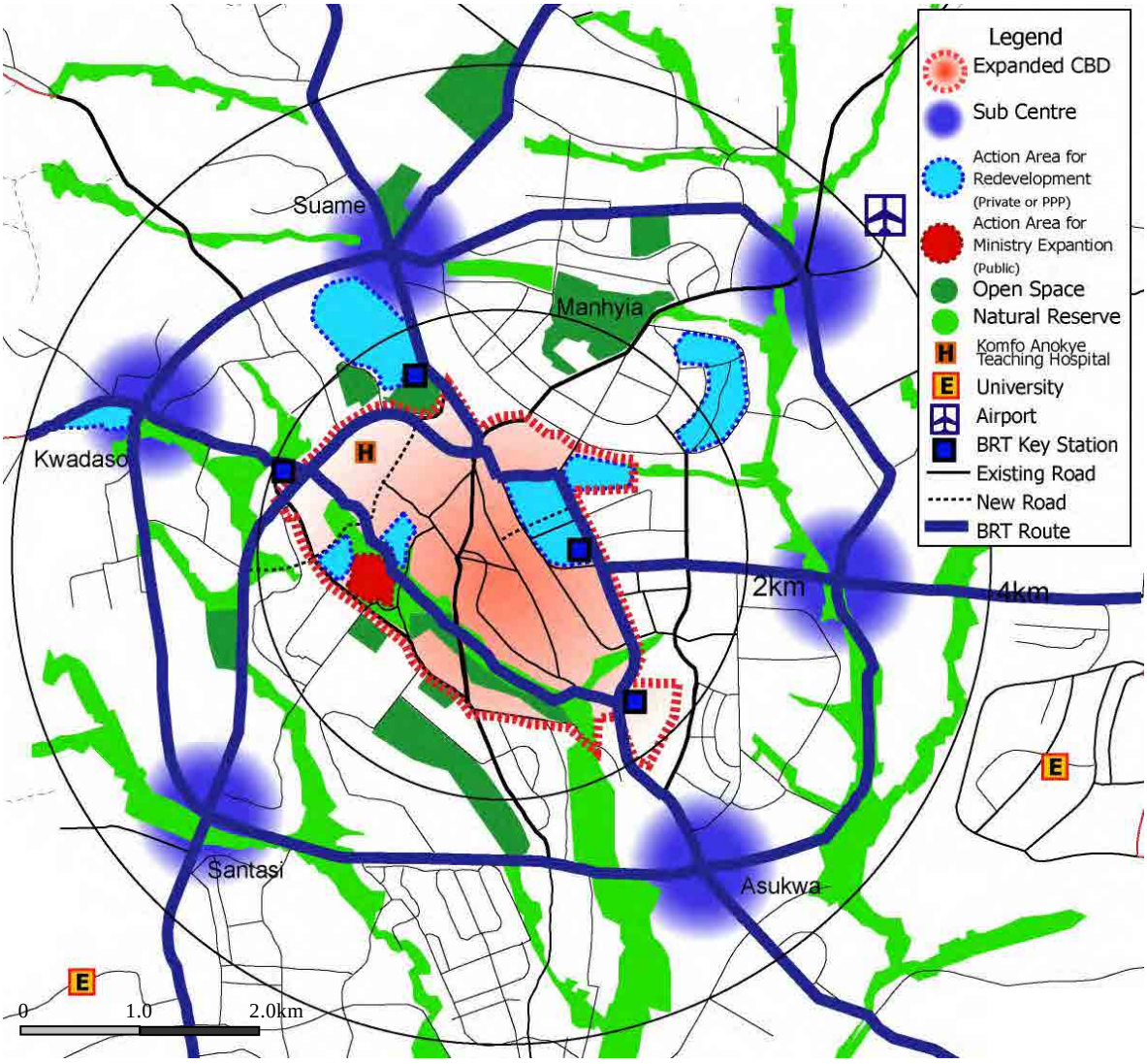
(3) BRT Routes and BRT Key Stations within Kumasi City Centre

Bus Rapid Transit (BRT) Routes should be backbones not only for the connection between Kumasi City Centre and suburban areas, but also for mobility within the Kumasi City Centre. The following points are strategies for public transportation for Kumasi City Centre (See Figure 8.4.2 below):

- BRT Routes are to be arranged for connecting District Centres/Suburban Centres with Kumasi City Centre.
- The BRT Routes coming from suburban areas have four key stations (major BRT transfer stations) within Kumasi City Centre.
  - Bantama
  - Zoological Garden (or Kejetia)
  - Fanti New Town

- Kumasi South (Dadiesoaba)

- These four BRT key stations should be created by implementing urban redevelopment projects, which could provide business and commercial spaces.
- The four BRT key stations should also have car parking buildings so that car drivers could park their cars and transfer to BRTs.
- Within Kumasi City Centre, an inner route for BRT is to be operated connecting the four BRT key stations and surrounding the Central Core.
- Part of the BRT inner route would use the space of the former railway line.



Source: JICA Study Team

Figure 8.4.2 Diagram for Proposed BRT Routes and BRT Key Stations

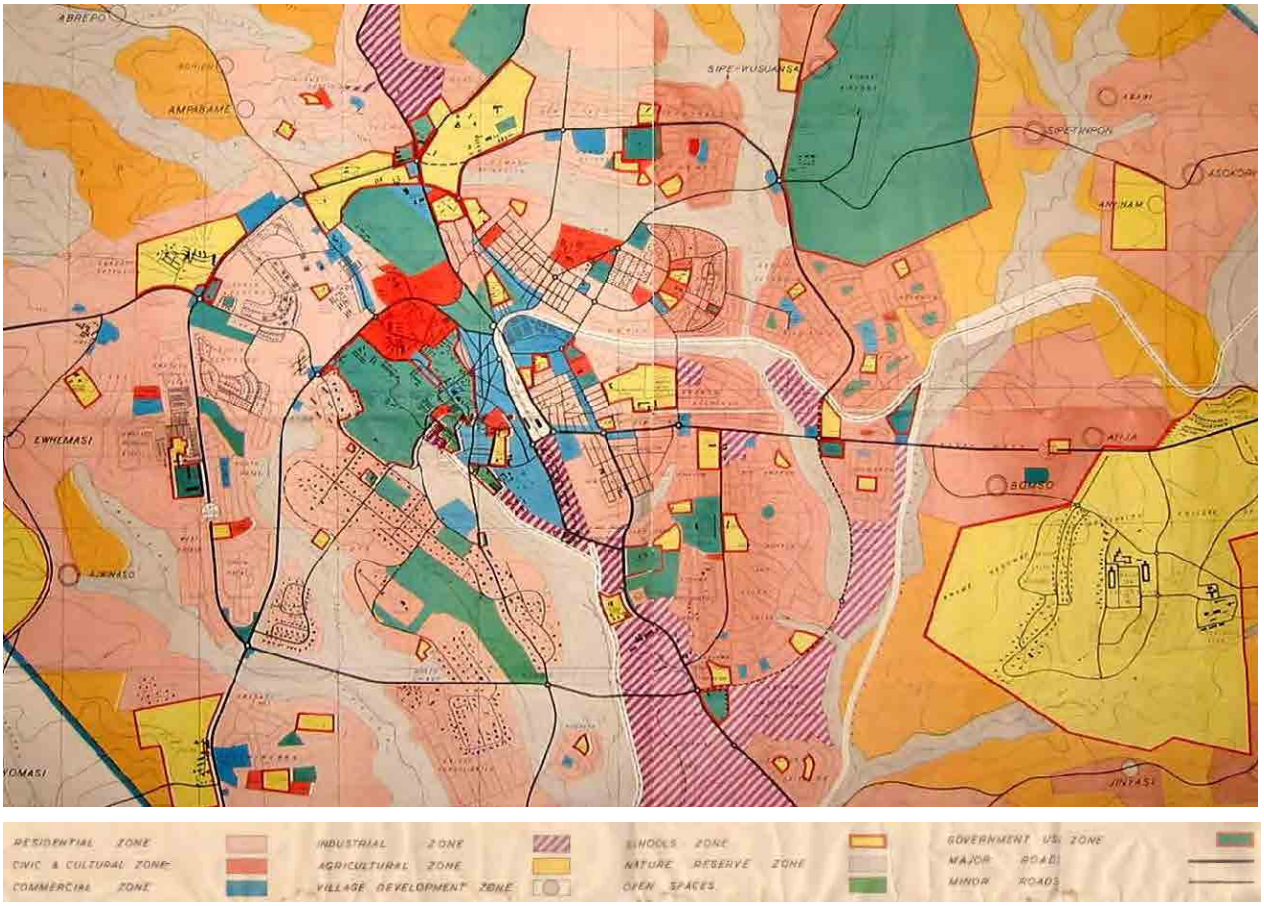
(4) Pedestrian Zones in Kumasi Centre

By operating BRT services on Kumasi City Centre-Suburban Routes and Inner Circle Routes for the Kumasi City Centre, car usage can be restricted to a certain extent and higher priority can be given to pedestrians in the future.

(5) Open Space Strategies in Kumasi City Centre

Open Spaces and parks were proposed by the Planning Scheme for Kumasi City

prepared in 1963. See Figure 8.5.3. The open spaces and parks have been mostly protected from other uses. However, the utilization of those spaces by people has been minimal. It is necessary to enable people to use and enjoy those open spaces and parks by providing proper access, facilities and equipment to them.



Source: Town and Country Division of Ashanti Region, Ministry of Works and Housing, 1963

Figure 8.4.3 Planning Scheme 1963 for Kumasi Metropolis

8.5 Housing Development

8.5.1 Background on Housing Development

The housing development strategies which are discussed in this section are to present strategies providing housing and sites in the process of spatial development to residents in response to the rapidly increasing population in Greater Kumasi Sub-Region.

Kumasi City has unique characteristics and problems of housing provision as follows:

- In KMA, only 15.7% of people live in separate houses in 2010, while this percentage increased slightly from 12.9% in 2000.
- Over half of dwelling units in KMA were rooms of compound houses in 2010. Between 2000 and 2010, the share of the compound houses out of the all

dwelling units in KMA has not changed much (53.1% in 2000, 55.2% in 2010). This trend was similar in the adjoining districts of KMA.

- Annual population growth rate of KMA between 2000 and 2010 was 5.69%. On the other hand the annual growth rate of household was 8.27%. This means that the number of smaller sized households including 1 person households have increased largely.
- 64.4% of households reside in one-room dwelling units in KMA.
- The average number of persons residing in one dwelling unit was 4.0 persons in 2010 in KMA. In this way, the population density in dwelling units has reduced slowly.
- However, still in 2010, basic facilities (water supply and toilet) for housing units were very poor in KMA.
- Although housing lots and road space are anyway provided, roadbed, road surface and draining trenches are poorly developed.
- Less intensive land use at the advantageous locations (Low density housing areas have been developing regardless of their advantageous location)

Table 8.5.1 Share of Dwelling Types in KMA and Ashanti Region

Unit: %

Dwelling Types	KMA		Ashanti Region	
	2000	2010	2000	2010
Compound House	53.1	55.2	52.5	52.2
Separate House	12.9	15.7	21.7	24.7
Semi-Detached House	11.2	9.1	11.0	7.9
Flat / Apartment	13.4	12.4	8.0	8.0
Huts / Buildings	2.5	0.8	4.0	2.4
Improvised Home (Kiosk / Container etc.)	2.4	2.9	1.3	1.9
Tent	0.2	0.2	0.1	1.6
Living Quarters attached to Office / Shop	0.6	0.5	0.4	0.4
Other	3.5	0.2	2.9	0.2
Under Construction	-	3.0	-	2.5

Source: GSS, 2000 and 2010 Population and Housing Census

In addition to these physical problems on housing, it is noticeable that land markets have been less developed and private developers (companies) are not so active in estate development. This is partly because of the complicated land ownership system of the Ashanti Region, of which lands are mostly owned by chiefs. In most cases, either Chiefs or private developers do not sell land with basic infrastructures, such as access roads, water and electricity in Greater Kumasi Sub-Region.

This situation of mal-development of land markets and private developers is due to the low affordability of people to purchase lands or to purchase houses or to build houses by themselves in Greater Kumasi Sub-Region.

In the SDF, it is recommended that urban growth boundaries should be set (See Section 8.6) and within the urban growth boundaries, housing provision should be

promoted in parallel with infrastructure development.

In order to encourage the development of housing units for accommodating the rapidly increasing number of people and households, it is necessary to promote residential area development in an enterprising manner.

Similarly, in order to utilize prime lands on good locations more efficiently for other purposes than low-rise residential buildings, it is necessary to promote redevelopment of old housing areas within Kumasi City Centre for constructing mid-rise and high-rise residential buildings with commerce/business functions on the ground floor.

8.5.2 Issues on Housing Development

In Greater Kumasi Sub-Region, a variety of housing problems are identified as follows:

- In Kumasi City Centre, currently, land utilization is inefficient which is covered with detached and low-rise housing areas although their locational potential is very high with good accessibility to various urban functions.
- In suburban areas, currently, a lot of buildings are under construction because people tend to build their own houses step by step while working and saving money for building materials and hiring carpenters and even partially completed residential buildings are not occupied for many years.
- The living environment is relatively bad
- There are extremely high-density residential areas with poor living conditions in and around Kumasi City Centre.
- The housing stock in Kumasi used to be insufficient and housing rents are relatively high. However, housing markets are not matured enough to provide housing for citizens of various income levels.

8.5.3 Objectives for Housing Development

In Greater Kumasi Sub-Region, the following objectives are set for housing development:

- Provision of an adequate volume of housing units for the rapidly increasing urban populations
- Housing development in response to restructuring of the urban structure
- Improvement of living environments both in central areas and in suburban areas
- Creation of sound housing markets

These objectives are explained briefly in the following section.

(1) Provision of an Adequate Volume of Housing Units for the Rapidly Increasing and Massive Urban Populations

This objective is related to the quantity of housing units which are to be provided in the Greater Kumasi Sub-Region in the future. In the last decade (2000-2010), about 5.7% per annum of population increase took place in KMA. This massive population influx is due to both in-migration and natural increase and must have created serious

shortage of housing units for residential households in KMA. This shortage might be caused by a variety of reasons including availability of land, availability of basic infrastructures and services and the affordability of the people.

Spatial development strategies should be formulated in order to respond to this rapidly increasing demand for housing units in the future.

(2) Housing Development in Response to Restructuring of Urban Structure

Greater Kumasi Sub-Region requires transformation of its spatial structure in order to become a functional and livable city. Housing development should be promoted in order to support such restructuring of the urban space, while accommodating rapidly increasing populations and improving the residential environment.

(3) Improvement of Residential Environment both in Central Areas and in Suburban Areas

The bad housing situation in the central and northern areas of Kumasi City is characterized by too high density of population in housing units and lack of basic infrastructures, such as toilets and piped water.

On the other hand, the poor residential environment in suburban areas of Kumasi's adjoining districts is characterized by the developing situation of residential areas as follows:

- There are not very many houses existing in one residential area
- Most houses are under construction
- In many cases, no electricity is supplied
- No piped water is supplied
- No garbage is collected
- No junior high schools or clinics are available in its vicinity

To improve these situations on housing and the residential environment is one of the key objectives for housing development.

(4) Creation of Sound Housing Markets

For creation of adequate housing markets, housing construction should be made easier in order to increase housing stock for various users by the following measures:

- Provide easier funds for those who seek land and houses
- Provide ample land with infrastructures in accessible locations
- Provide a certain amount of public/social housing units

8.5.4 Strategies for Housing Development

For achieving the above objectives for the Greater Kumasi Sub-Region, the following five strategies for housing development are recommended for implementation:

- Redevelopment for mid- and high-rise housing provision in Kumasi City Centre
- Mid-rise residential development in suburban areas

- New town development outside the Outer Ring Road
- Housing market development
- Monitoring the housing situation to reduce overcrowding and also to enforce installation of toilet facilities to property owners of housing units

(1) Redevelopment for Mid and High-Rise Housing Provision in Kumasi City Centre

1) Strategic Directions

In Kumasi City Centre, land use intensification and densification for residential functions should be promoted for provision of more residential functions and increasing of the housing stock, especially alongside commercial roads within Kumasi City Centre.

In Kumasi City Centre, high-density residential areas should be developed in the areas surrounding the Sub Centres along the Inner Ring Road.

In Kumasi City Centre, low-, mid- and high-density residential areas should be developed in a well-balanced manner to provide residential units of different kinds.

In Kumasi City Centre, low-density residential areas of high quality should be protected to maintain their living environment.

2) Strategic Measures

a) Zoning-based Urban Transformation

Promote land use intensification and densification of residential functions in low-density residential areas and alongside commercial roads. Construction of mid- and high-rise complex buildings, which allocate commercial functions on the lower floors and residential on higher floors, should be promoted by zoning incentives.

Source: JICA Study Team

Figure 8.5.1 Modern Mixed Use Buildings with Commercial and Housing Facilities

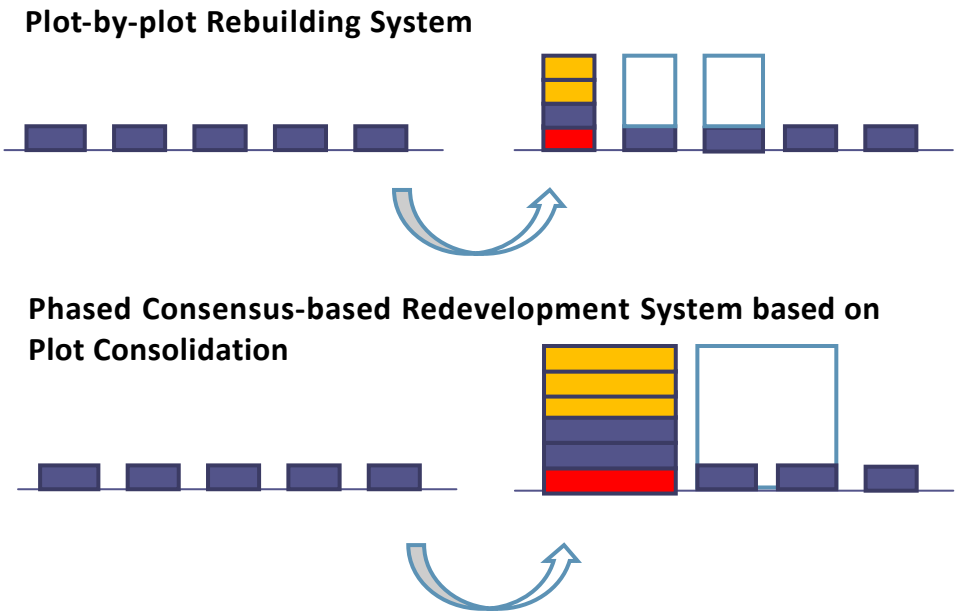
b) Project-based Urban Transformation

Implement urban (re-)development projects by public entities, private developers, or

public-private partnerships for housing provision.

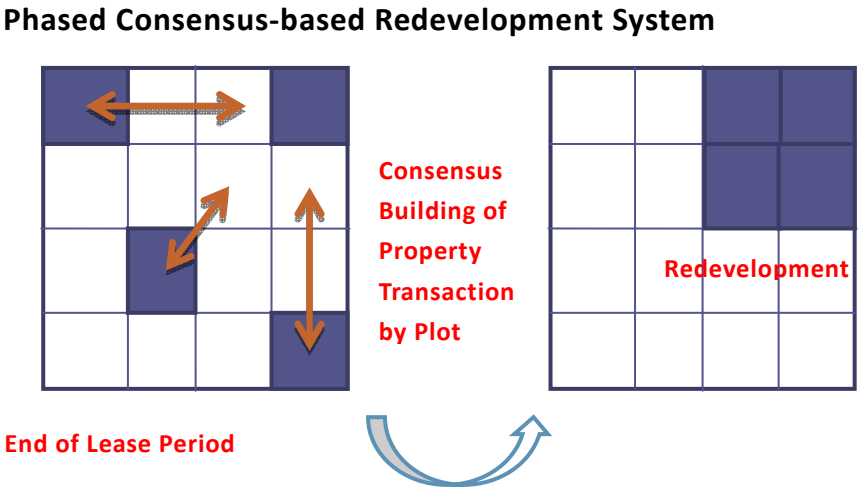
c) Implementation for Redevelopment for Middle and High-rise Residential Buildings

There are broadly two types of redevelopment in terms of consolidation of different plots, as shown in Figure 8.5.2. One is rebuilding based on plot by plot. The other is redevelopment by consolidating plots. In order to create larger benefits by redevelopment, it is necessary to consolidate existing plots for redevelopment by strategically securing lands, as explained in the next section.



Source: JICA Study Team

Figure 8.5.2 Two Types of Redevelopment Systems in terms of Plot Consolidation



Source: JICA Study Team

Figure 8.5.3 Phased Consensus-Based Redevelopment System by Plot Consolidation

d) Strategic Land Acquisition for Urban Redevelopment in Kumasi City Centre

Underutilized lands in Kumasi City Centre should be, in a strategically planned manner, acquired by public entities and also private sectors for purposes of redevelopment in accordance with the Sub-Regional Structure Plan. The acquired lands should be developed for provision of mixed uses including commercial and residential functions in a timely and phased manner, in accordance with the Sub-Regional Structure Plan.

During the lease period, it is quite difficult to acquire parcels of land even if it is possible to acquire them by strong mandatory forces with compensation (cost of land, buildings, and other benefits). Especially, the prices of land in Kumasi City Centre have been increasing in the recent decade. Therefore, land in which the leases will be nearly ending should be targeted for timely acquisition for public and private purposes without financial problems.

As for potential sites for redevelopment, refer to Section 8.5 “Transformation of Kumasi City Centre”.

(2) Mid-Rise Residential Development in Suburban Areas

Mid-rise residential functions should be allocated in the course of restructuring of the existing urban space including the following locations:

- Alongside the primary/secondary urban corridors: Integrated with BRT bus stops
- In the areas surrounding the Suburban Centres: Afrantwo (Afigya-Kwabre District), Ahiwaa (Kwabre East District), Aputuogya (Bosomtwe District), Kotwi (Atwima Kwanwoma District) and Abuakwa (Atwima Nwabiagya District)
- In the areas surrounding interchanges of the Outer Ring Roads

These developments will be mostly implemented by private developers or public-private partnerships with zoning incentives. In the areas with low development potential, complex development projects should be strategically implemented by public entities to encourage private development.

(3) New Town Development outside the Outer Ring Road

In order to provide housing units in a large quantity with better environment, new town development should be promoted by Public-Private Partnership (PPP) initiatives outside the proposed Outer Ring Road. Possible locations include the following:

- New Towns in the South Western Suburban Area outside the Outer Ring Road near Atwima Nwabiagya District Centre (Nkawie) and Atwima Kwanwoma District Centre (Foase)
- New Towns in the Northern Suburban Area, part of the proposed Airport City: one near the proposed new international airport in Afgya- Kwabre District and the other near the Kumasi-Mamponteng Corridor in Kwabre East District
- New Towns in the Eastern Suburban Area: Two in the Kumasi-Ejisu Urban

Corridor, one near Ejisu and two near Boankra in Ejisu-Juaben Municipality
- New Towns in the South Eastern Suburban Area along the Lake Road in Bosomtwe District

These new towns should be developed as new residential areas, consisting of single family houses and multi-family/multi-storey apartment buildings, together with new town centres for providing services and working places.

(4) Housing Market Development

Increasing of the housing stock and provision of more housing choices are necessary for accelerating relocation of mid- and high-income people.

Profitable mid and high-rise residential development should be promoted for mid and high-income people within Kumasi City Centre and alongside the primary/secondary urban corridors. Some development should be supported by subsidies from public funds.

By encouraging the relocation of mid and high-income people to mid and high-rise housing buildings and suburban housing areas, old houses will provide opportunities for low-income people to rent them. These relocations will stabilize housing markets.

Provision of public/social housing for low-income people should also be promoted to strengthen housing markets.

(5) Monitoring of Housing Situation to Reduce Overcrowding

The standards for residential units, including the number of persons occupying a residential unit and facilities were proposed by TCPD and are being adopted by the government.

Public entities should establish and operate a monitoring system to achieve these standards and to reduce overcrowding.

8.6 Urban Growth Management for Suburban Areas

8.6.1 Background on Urban Growth Management for Suburban Areas

Urban Growth Management, which is discussed in this section, is to present the strategies for urban growth management aiming at the following:

- Efficient and optimal use of land resources through controlling outward expansion of urban areas (urban expansion with low population density results in waste of urban land and agricultural land),
- Optimization of total costs for providing urban infrastructure (Urban sprawl tends to increase the amount of infrastructure costs by 2-3 times more than the case of compact urban areas),
- Agricultural promotion by preservation of good agricultural lands (Stable and fresh food supply to urban people)

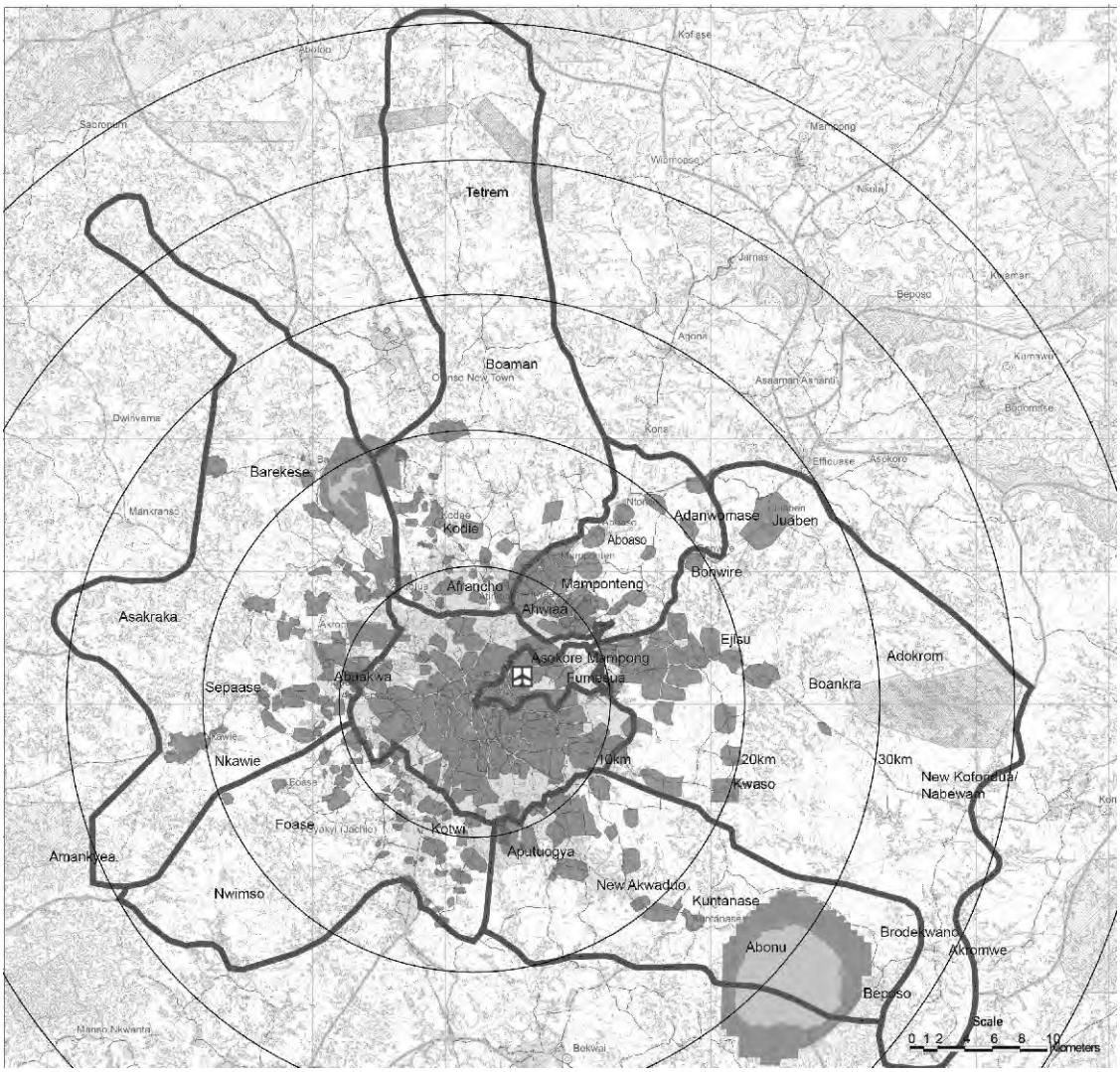
Urbanization pressures have been very high due to rapid urban population increase of Greater Kumasi Sub-Region, resulting in disorderly urban development and development in a leapfrog manner (sprawl). Please see Figure 3.3.1. This has been partly due to the current layout plan approval system.

Layout plans are local-level site development plans. The current layout plan system, which has no district-level land use plans to indicate where land and urban developments are permissible is not effective in controlling such urban sprawl. As a result, applications of most layout plans in the past were approved, albeit with modifications, causing a "Sprawl of Layout Plans". Such sprawling distribution of approved layout plans is shown in Figure 8.6.1.

Responding to this situation the JICA Study Team has proposed the designation of an Urban Growth Boundary, so as to contain the expanding urban areas. Outside the Urban Growth Boundary, urban development is discouraged, and making of layout plans or local plans is prohibited. Within the Urban Growth Boundary, development of urban infrastructure is to be aggressively promoted so as to provide a sufficient amount of serviced land and housing.

Sprawl control through the designation of an Urban Growth Boundary may not work efficiently if there is an insufficient amount of land and houses within the Urban Growth Boundary. This raises the pressure of development outside the boundary. In this regard it is very important to implement housing strategies which prioritize the infrastructure provision and which increase housing densities (horizontally and vertically) especially within the Boundary.

The Urban Growth Boundary is designated as a boundary limiting the conurbation area, outside of which development policies for suburban agriculture and rural tourism & recreation are intensively implemented so that farmers and rural entrepreneurs can gain enough income from farming and tourism/recreation businesses, thus preventing abandonment of their farmland and woodland.



Source: JICA Study Team based on collected data from Districts

Figure 8.6.1 Sprawling Distribution of Approved Layout Plans

8.6.2 Issues on Urban Growth Management for Suburban Areas

Suburban developments in districts adjacent to Kumasi City have the following problems:

- Excessive urban sprawl (in terms of land development) coming from KMA along major radial roads toward adjacent districts resulting in difficulty in proper infrastructure provision in suburban areas
- No guidance for preparation of layout plans (local plans under the New Spatial Planning System) resulting in the following:
  - Large areas covered by layout plans, which are very far from the Kumasi City Centre
  - Areas of development not covered by approved layout plans
  - Difficulty in proper infrastructure provision in too large areas in suburban areas
- Not enough people residing in suburban residential areas because of lack of infrastructure and services resulting in too much concentration of populations,

service providers and businesses in Kumasi City

8.6.3 Objectives for Urban Growth Management for Suburban Areas

It is necessary for Greater Kumasi Sub-Region to manage urban growth in suburban areas for the following objectives:

- Create better and attractive environments for residents and businesses in suburban areas of Greater Kumasi Conurbation by providing appropriate basic infrastructure and services
- Make Kumasi into a compact conurbation area within Greater Kumasi Sub-Region

8.6.4 Strategies for Urban Growth Management for Suburban Areas

(1) Strategies for Urban Growth Management for Suburban Areas

In order to achieve the objectives set in the previous section, the following strategic direction should be pursed:

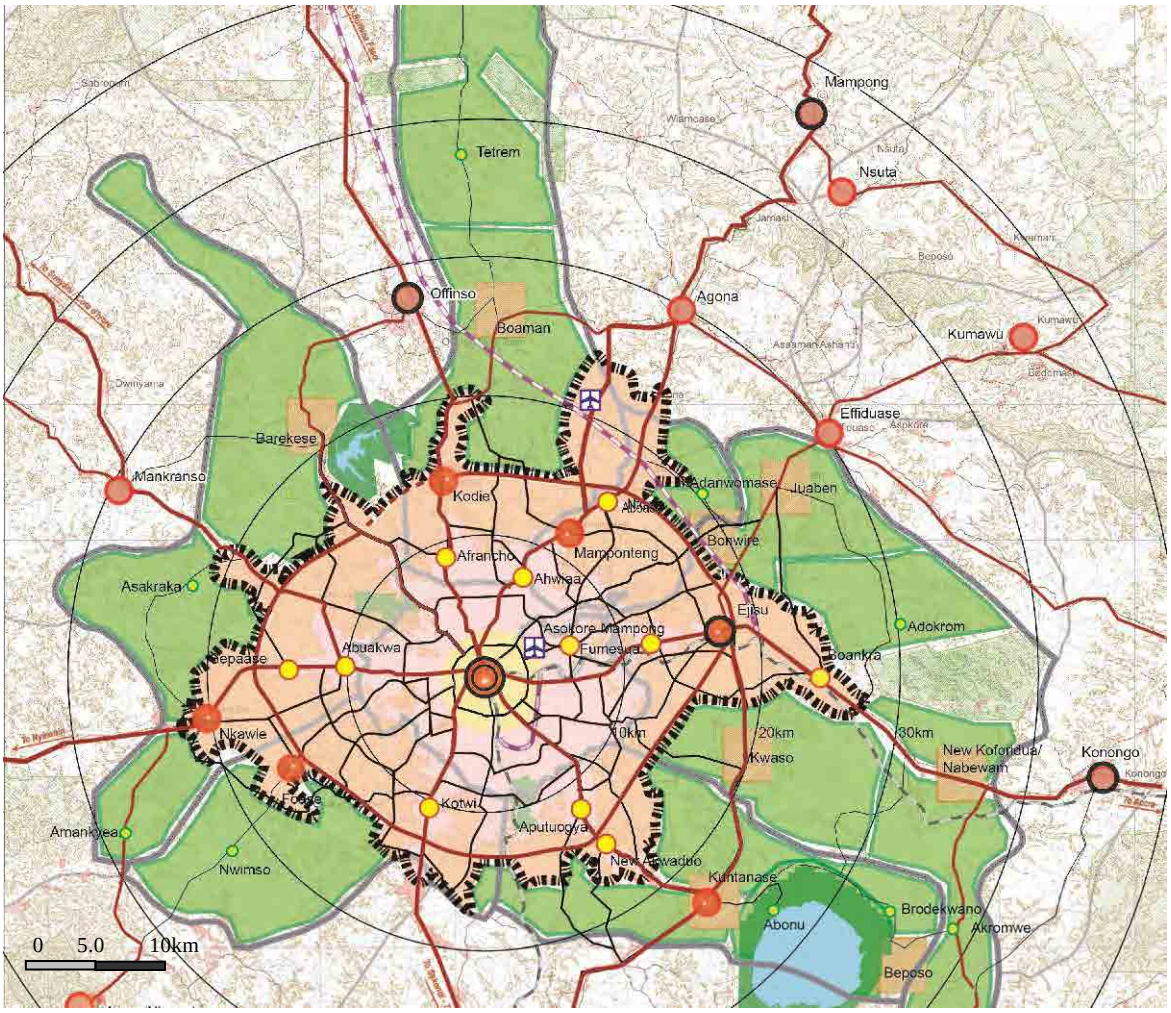
- Control and guide urban sprawl of residential area development in fringe areas adjacent to Kumasi City by seeking the following directions:
  - Selectively providing basic infrastructure and services
  - Selectively controlling permits for land use and buildings

(2) Measures for Urban Growth Management in Suburban Areas

In order to purse the above mentioned strategic direction, an Urban Growth Boundary (UGB) should be set for the objectives for urban growth management in suburban areas of Greater Kumasi Sub-Region.

The UGB is the same as the boundary for the Structure Plan Area for Greater Kumasi Conurbation. The UGB should be designated and used for controlling urban development as follows:

- Outside the UGB, principally no urban developments should be allowed.
- Outside the UGB, preparation and approval of local plans (layout plans) should be strongly restricted.
- Outside the UGB, high priority should not been given to provision of urban infrastructures/services and it should be restricted.
- Outside the UGB, special large-scale planned urban development projects could be approved for implementation if proper infrastructure and services are provided by the project.



Source: JICA Study Team

Figure 8.6.2 Urban Growth Boundary for Greater Kumasi Sub-Region, 2033

(3) Green Space outside Urban Growth Boundary

Outside the UGB, rural-agricultural-natural environments should be conserved for rural life including agricultural production and natural environments in suburban contexts in vicinity to Kumasi City.

By implementing the measures of using UGB, urbanization pressures outside the Urban Growth Boundaries will be reduced. As a result, it is expected more areas of agriculture and other green spaces will remain undeveloped or un-urbanized. More green space like agriculture land, wood land and water bodies will be conserved by implementing urban growth management using urban growth boundaries.

Rural Areas outside the Urban Growth Boundary (Conurbation Boundary) would contain the following land uses:

- Rural towns
- Rural settlements
- Recreational areas
- Greenery open space
- Agricultural lands

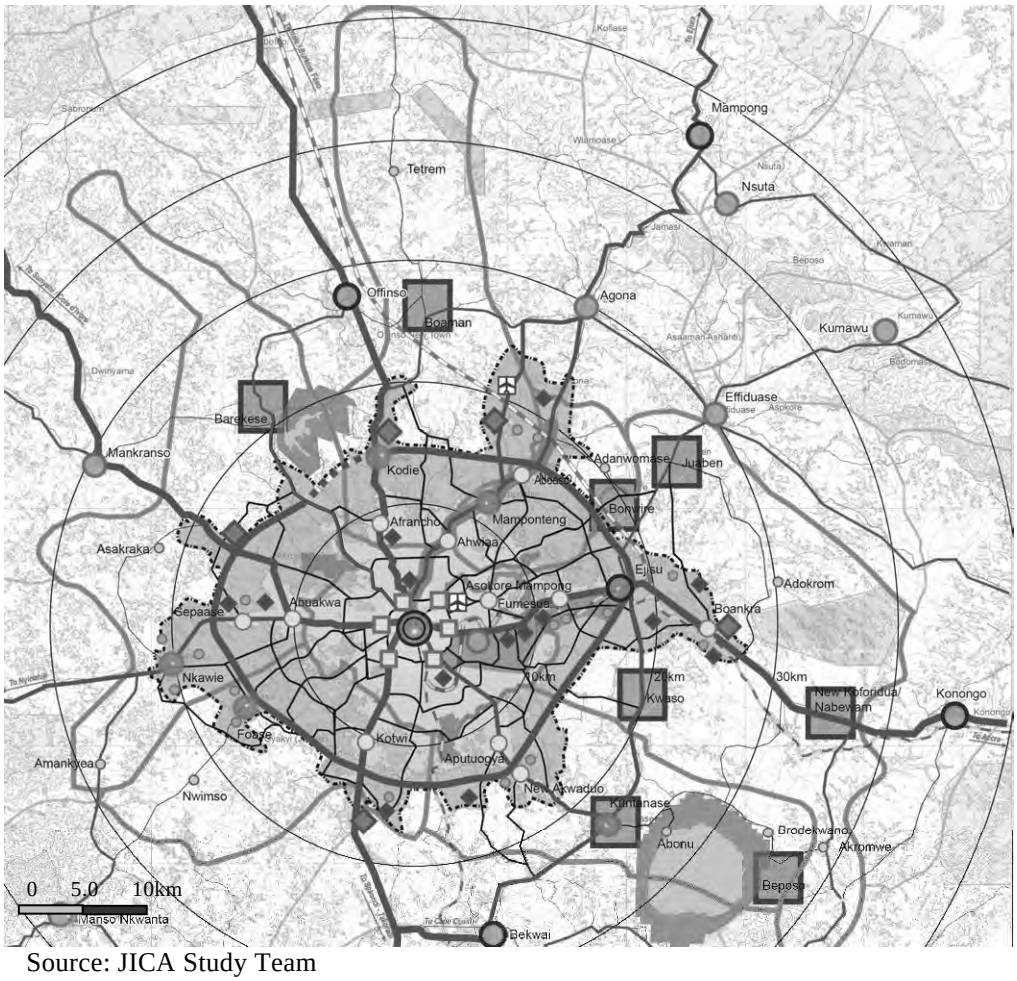
- Woodland
- Water bodies

(4) Structure Plan Areas to be Designated by the Sub-Regional SDF

The SDF for Greater Kumasi Sub-Region should designate structure plan areas (areas in which district-level structure plans should be prepared). In addition to Greater Kumasi Conurbation, structure plans should be formulated for the following town areas:

- Kuntanase Town in Bosomtwe District
- Beposo Town in Bosomtwe District
- Boaman/Amoako/Chinikurom/Maase Towns in Afigya Kwabre District
- Juaben Town in Ejisu-Juaben Municipality
- Bonwire Town in Ejisu-Juaben Municipality
- Kwaso Town in Ejisu-Juaben Municipality
- Nobewam/New Korforidua Town in Ejisu-Juaben Municipality
- Barekese Town in Atwima Nwabiagya District

Layout plans or local plans could be allowed to be prepared within these structure plan areas.



Source: JICA Study Team

Figure 8.6.3 Structure Plan Areas outside Greater Kumasi Conurbation, 2033

8.7 Open Space and Recreation

8.7.1 Background on Open Space and Recreation

Open spaces in urbanized areas are generally open to the public and can be either public or private spaces. Open spaces are free of development. Open spaces can be categorized as follows:

- Spaces for active recreation, such as sports facilities for indoor games and field sports,
- Spaces for passive recreation, such as parks and gardens, children's playgrounds and palava grounds or durbar grounds, or
- Other open spaces, such as green spaces, open areas used for buffers between industrial and other land use activities, and most areas adjacent to streams and major drains.

Open spaces including unused open lands in KMA amounted to about 24 square kilometres in 2010, which was an increase of about 4 square kilometres in the previous 22 years as shown in Table 8.7.1.

Table 8.7.1 Changes of Land Use in Kumasi Metropolis

Land Use	1988		1995		2000		2005		2010*	
	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
Residential	76.9	30%	83.1	33%	85.1	33%	88.0	35%	90.9	36%
Commercial	3.9	2%	4.5	2%	4.6	2%	4.8	2%	5.0	2%
Industrial	7.2	3%	7.9	3%	8.0	3%	8.0	3%	8.3	3%
Education	32.6	13%	33.2	13%	34.1	13%	34.7	14%	35.7	14%
Civic & Culture**	13.8	5%	14.3	6%	14.5	6%	14.6	6%	14.9	6%
Open Space	19.8	8%	21.8	9%	22.3	9%	23.1	9%	23.8	9%
Circulation	22.2	9%	25.3	10%	26.0	10%	27.3	11%	28.1	11%
Total Developed Area	176	69%	190	75%	195	77%	201	79%	207	81%
Undeveloped	78	31%	64	25%	60	23%	54	21%	48	19%
Total Area	254	100%	254	100%	254	100%	254	100%	254	100%

Source: Metro Town and Country Planning Development, 2006

* Estimate by Metro Town and Country Planning Department, 2010

** Public and private offices, health delivery facilities, security establishments and centres for religious and social functions

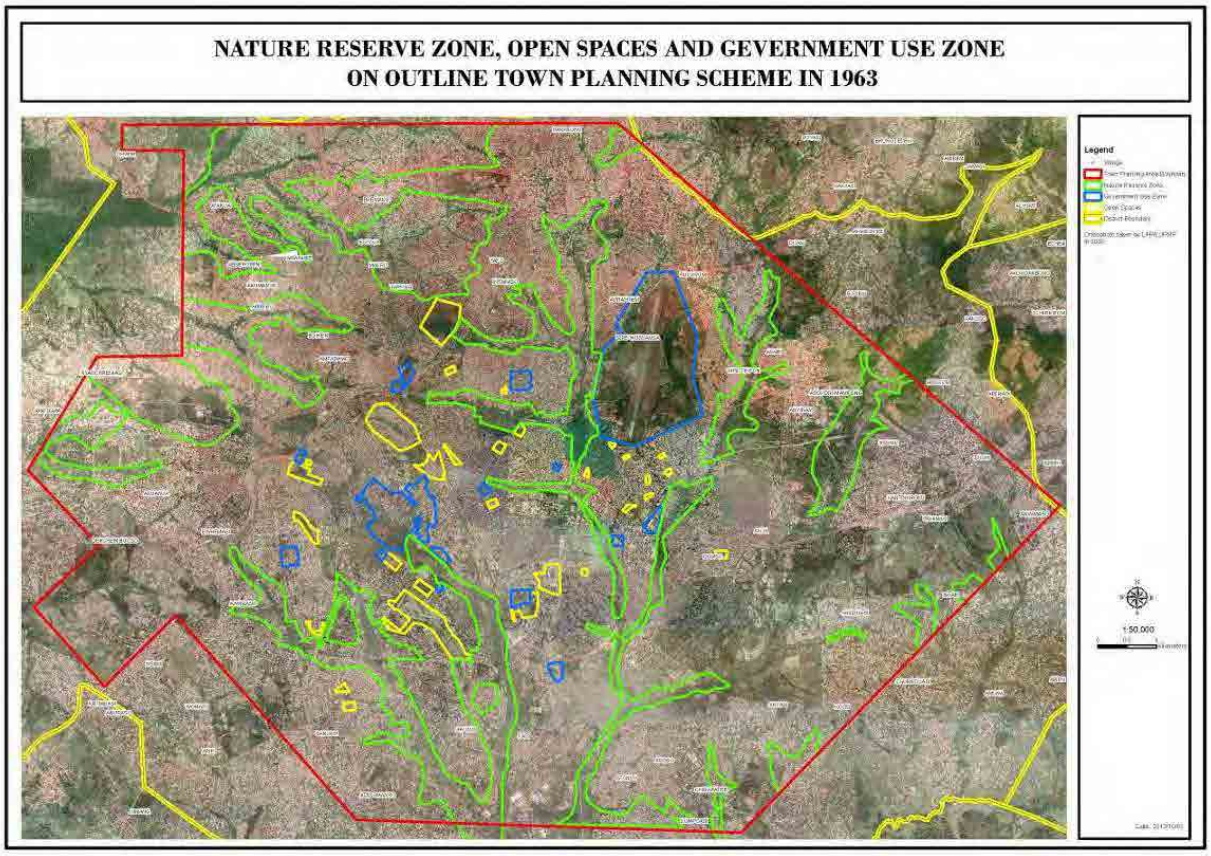
These open spaces and natural areas existing in KMA are remnants of the areas designated as Nature Reserve Zone and the Open Space in the Planning Scheme for Kumasi City established in 1963. Much area of the Nature Reserve Zones, which are riverside flood plains, has changed to residential areas in the last 50 years. See Figure 8.7.1. The existing open spaces in urban areas have not been well developed or maintained. Most of them neither have proper access roads nor facilities, such as public toilets, benches and playground equipment. As a result, the open spaces have not been well utilized.

On the other hand, the parks and sports grounds in KMA are limited to about 95 ha, as shown in Table 8.7.2.

Table 8.7.2 Parks and Sports Grounds in KMA

Name of Park	Size (ha)
Kejetia Playground	1.5
Asantehene Children's Park	3.7
Suntreso Park	5.5
Golf Course	36
Yara Baba Sports Stadium	11
Former Polo Ground	4.7
Manhyia Palace Forest	29.2
Ridge Open Ground	3.3
Total (Existing Parks and Sports Groun	94.9

Source: JICA Study Team



Source: Orthophoto prepared by LAP/LUPMP in 2008 and Planning Scheme for Kumasi 1963
Note: Designated areas for nature reserve zones and open spaces are shown on the Orthopoto in 2008.

Figure 8.7.1 Comparison between 1963 Planning Scheme and 2008 Existing Open Spaces

8.7.2 Issues on Open Space and Recreation

The principal issues with regard to recreation and open space are as follows.

- Quite large areas of the nature reserve zone and open space designated by 1963 Planning Scheme for Kumasi City have remained. However, most of them have

not been well utilized as parks and gardens open to the public. Moreover, they had been gradually disappearing due to encroachment of mostly residential areas.

- As a result, there are limited open spaces, such as parks and gardens including amusement parks, for civic recreational activities and leisure activities in urban areas.
- In most layout plans, open spaces were designed. However, they have not been actually utilized for parks and gardens because of government fund shortage for construction and management or operation.

8.7.3 Objectives for Open Space and Recreation Facility Development

Based on the above-mentioned backgrounds and issues, the objectives for open space and recreation in Sub-Regional SDF are set as follows:

- Preserve existing open spaces as much as possible
- Improve existing open spaces for people's unitization physically and operationally
- Encourage people to participate in sports, recreational and leisure activities as healthy lifestyles
- Develop open spaces and recreational facilities for increasing urban populations
- Promote conservation of cultural heritage and nature in both urban and rural areas

8.7.4 Strategies for Open Space and Recreation Facility Development

(1) Strategies for Open Space and Recreation Facility Development

In order to achieve the above-mentioned objectives, the strategies for open space and recreation facility development are set as follows:

- Secure existing parks and open spaces located in Kumasi City Centre. Since some of those lands have been vested in some government organizations, make effective use of those parks and open spaces in cooperation with those government organizations
- Make effective use of existing parks and open spaces in Kumasi City Centre by encouraging private sectors to operate those parks and open spaces, in which commercial functions, such as kiosk, public toilets and restaurants are allowed to operate
- Secure, develop and utilize open spaces and vacant lands located in suburban areas for parks, recreational areas and open spaces, by applying PPP approach, in which private sectors should development and operate those recreational facilities and open space and at the same time, private sectors can get commercial opportunities using part of the space.
- Designate wide unused areas outside the UGB for nature conservation and recreation areas by designating and enforcement the UGB
- Identify sites and prepare proposals for local field sport facilities and public open space which are at accessible location from urban centres. Those proposals should be included in the district-level Structure Plans

- Promote utilization of the existing open spaces including maintenance and management so that they may not be converted to other land use
- Establish and take action for a hierarchical system of parks and recreational facilities as shown in Table 8.7.2

(2) Hierarchy of Parks and Sports Facilities

Greater Kumasi Sub-Region needs a hierarchical system for urban parkas and open space consisting of different types and categories for satisfying diverse needs for urban parks and open space. Greater Kumasi Sub-Region also needs practical targets for developing urban parks and open space. Accordingly, the following types of urban parks and open space and long-term targets (20-years in the future) are proposed for Greater Kumasi Sub-Region.

Table 8.7.3 Hierarchy of Parks and Sports Facilities

National Parks	The Wildlife Division of the Forestry Commission is responsible for the protection and management of twenty one (21) wildlife protected areas (WPAs) including 7 National Parks. No National Parks are designated in the Ashanti Region.
National Sports Complex	Service area: the whole country Size of site: 10-15ha General location: in Accra with good vehicular linkages including air link Minimum facilities: to cater for both active and spectator participation in a wide range of sporting activities up to national level
Regional Parks/ Regional Sports Facilities	Service area: the whole region Size of site: 10-15ha General location: relatively easy accessibility to public transportation and car parks Facilities: large open space, a variety of outdoor activities One example of this type of regional sports facility is Baba Yara Sports Stadium Kumasi with a capacity of 40,500 (approximately 15ha) Regional parks should have large open spaces (10-15 ha) and relatively easy accessibility to public buses and car parks. Families, young couples and youth groups can enjoy not only its large open space, but also a variety of outdoor activities. Currently in Ashanti Region, there are no such regional parks with pubic open space for passive recreation and which could form part of urban landscape. The following areas could be transformed or developed for regional parks: Parks and green space being under the control of the Department of Parks and Gardens Areas adjacent to Bobiri Forest Reserve and Bosomtwe Lake Considering the increasing urban population of Greater Kumasi Sub-Region and the size of Ashanti Region's population in the future, Greater Kumasi Sub-Region should establish two (2) regional parks (1 for Kumasi City and 1 in an adjoining district) in the long-term. By satisfying these targets, 20-30 ha of regional parks should be created.
District Parks/ District Sports Facilities	Population to be served: up to 35,000 people Size of site: 5-10ha At least one District Park in each District General location: centrally located and within easy reach within each district Minimum requirement facilities: a variety of sports fields and indoor facilities, including football field, tennis courts, large hall for table tennis, badminton and a squash court, toilets, washrooms and changing rooms. Minimum site facilities: Water and electricity District Parks have relatively large open spaces (5-10 ha), in which people can enjoy sports and other outdoor activities formally and informally. People need to come to town parks either by cars/buses or walking. The long-term target of developing district parks in Greater Kumasi Sub-Region is one each for adjoining districts. The total increase in district parks would be 30-60 ha in the

	long term. Primary district parks and district sports facilities should be established within the district centres of six adjoining districts.
Local Parks/ Local field sport facilities	Local Parks/Public Open Space Population to be served: minimum of 2,500 persons Size of site: 0.5ha per 1000 person or not less than 10% of development area General location: equally distributed over settlement area Site facilities: an adequate number of public seats appropriate to the location Examples: Amakom (Children's) Park, Jackson (Jubilee) Park Durbar Ground Population to be served: up to 35,000 people Size of site: from 0.2ha to 1ha General location: in settlement centre with good access to public transport terminal Site facilities: adequate public seats at appropriate locations Local field sport facilities Population to be served: Up to 5,000 persons Size of Site: 0.5 ha. per 1,000 persons with Minimum total area of 2.0 - 2.5 ha General location: generally located with good access to public transport Site Facilities: Football field, volley and netball fields and lawn tennis court and car parking space Minimum site service: water
Riverside Parks	Riverside parks utilizing the open space along rivers/streams should be proactively prepared in Kumasi Metropolis, since it is necessary to prepare many parks considering the future population.
Other Recreational Facilities	Kumasi Zoo, KNUST Botanical Garden

Source: JICA Study Team

(3) Regional Parks and Regional Sports Facilities

Considering the above recommendation of the hierarchy of parks and sports facilities, the following locations could have regional parks, sports facilities and other recreational functions:

- Riverside Park in North Patase
- Riverside Park between Adum and Ridge
- Owabi Eco-Park: Regional Park with a Botanical Garden
- Barekese Eco-Park: Regional Park with Forest Trails and Cycling Routes
- Airport Amusement Park: Regional Park with an Amusement Centre
- Bobiri Regional Park which has a large open space and recreational areas in the vicinity of Bobiri Wildlife Reserve
- Kuntanase National Football Stadium with Other Sports Facilities

(4) Numerical Target for Developing Parks, Sports Facilities and Other Open Space

The existing and utilized open space is very limited, around 19 ha for 2 million population in KMA in 2010. This means that 0.47 m^2 per person. This parameter is not incomparable at all to western standards, such as 26.9 m^2 per person in London, 9.3 m^2 in New York, 11.8 m^2 in Paris. Rather than establishing unachievable targets, it is necessary to set more practical targets for action as follows:

- Develop two riverside regional parks in KMA as mentioned above (2 sites x 12

ha = 24 ha).

- Develop five regional parks or sports facilities mentioned above (5 sites x 20 ha =100 ha).
- Develop one district park for each submetro except Subin Submetro and Tafo Submetro within KMA (7 sites x 3 ha =21 ha).
- Develop one district park for each district outside KMA (7 sites x 8 ha= 56 ha).

By implementing these developments, the total area for parks and sports facilities within Greater Kumasi Sub-Region will become 296 ha, which attains 0.51 m^2 per person of parks and sports facilities in 2033.

8.8 Conservation Areas

8.8.1 Background on Conservation of Natural Environment and Water Resources

The explosive population increase in KMA and the rapid urbanization of Greater Kumasi Sub-Region have caused a variety of problems as follows.

- Traffic congestion in the city centre throughout the day
- Expansion of suburban residential areas without proper infrastructure provision (roads, roadside drainage, water supply, electricity supply) in surrounding districts
- Expansion of suburban residential areas of low population density in surrounding districts
- Decrease of agricultural lands in surrounding districts

These problems have eventually militated against natural resources and the environment. However, in the past, somewhat ineffective efforts at nature conservation were conducted in Ashanti Region, including Kumasi and its adjoining districts.

8.8.2 Issues on Conservation of Natural Environment and Water Resources

The principal issues with regard to conservation of the natural environment and resources are as follows:

- Great pressure on natural resources and the environment
- Deforestation including illegal felling of timber and agricultural encroachment into forest reserve
- Alteration of the natural environment by human activities,, especially forests that were found originally along water courses
- Illegal sand winning and illegal mining activities causing environmental hazards
- Depletion of vegetative cover as a result of bush fires
- Decrease in water storage capacity and deterioration in water quality of the existing dams, Owabi Dam and Barekese Dam
- Increasing frequency and impact of droughts, floods, forest fires, and other natural disasters in both urban and rural areas

8.8.3 Objectives for Conservation of Natural Environment and Water Resources

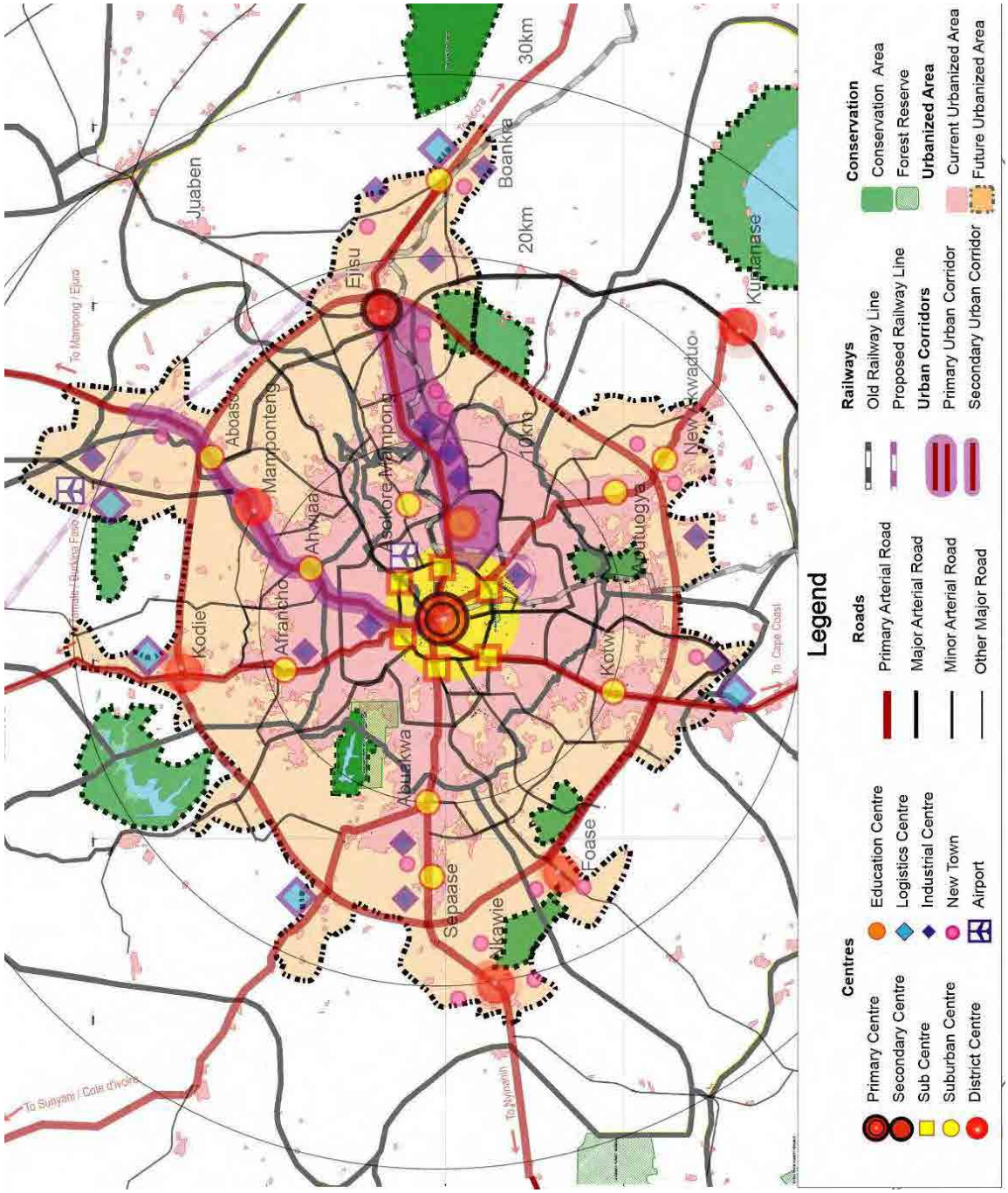
Based on the above-mentioned backgrounds and issues, the objectives regarding the conservation of the natural environment and resources in Sub-Regional SDF are set as follows:

- Conserve areas of high biodiversity and wildlife value
- Conserve immediate catchment areas of existing dams for increasing/maintaining storage capacity and improving water quality
- Secure possible reservoir areas and catchment areas for future dam development
- Protect the inhabited environment from the bad effects of solid waste disposal sites

8.8.4 Strategies for Conservation of Natural Environment and Water Resources

In order to achieve the above-mentioned objectives, the strategies on conservation of the natural environment and water resources are set as follows.

- Reinforce law enforcement and conservation activities for the following reserves:
  - Bobiri Wildlife Reserve
  - Forest Reserves (Bobiri, Gianima, Asufu Shelter Belt West, and Kumasi)
- Conserve the surrounding areas of Bosomtwe Lake by designating them as a conservation area where only limited development is permitted, for conserving precious nature, as well as for sustainable tourism development
- Restrict construction of structures in flood-prone areas by designating conservation areas over certain flood-prone areas and by enhancing law enforcement
- Strengthen law enforcement in Owabi Wildlife Reserve for protecting sources of water supply
- Conserve the surrounding areas of Barekese Dam by designating them as a conservation area where no new development is permitted
- Prevent waste water from flowing into the reservoirs of Owabi Dam and Barekese Dam
- Prevent dumping of solid waste into rivers, especially in the catchment areas of Owabi Dam and Barekese Dam
- Take effective, prompt and continuing measures to protect the catchment area of new surface water resources for water supply to Greater Kumasi Sub-Region, because the surface water resources endowed in Greater Kumasi Sub-Region are limited
- Conserve the natural environment in suburban areas, such as greenery open space, woodland and water bodies by implementing measures using UGB



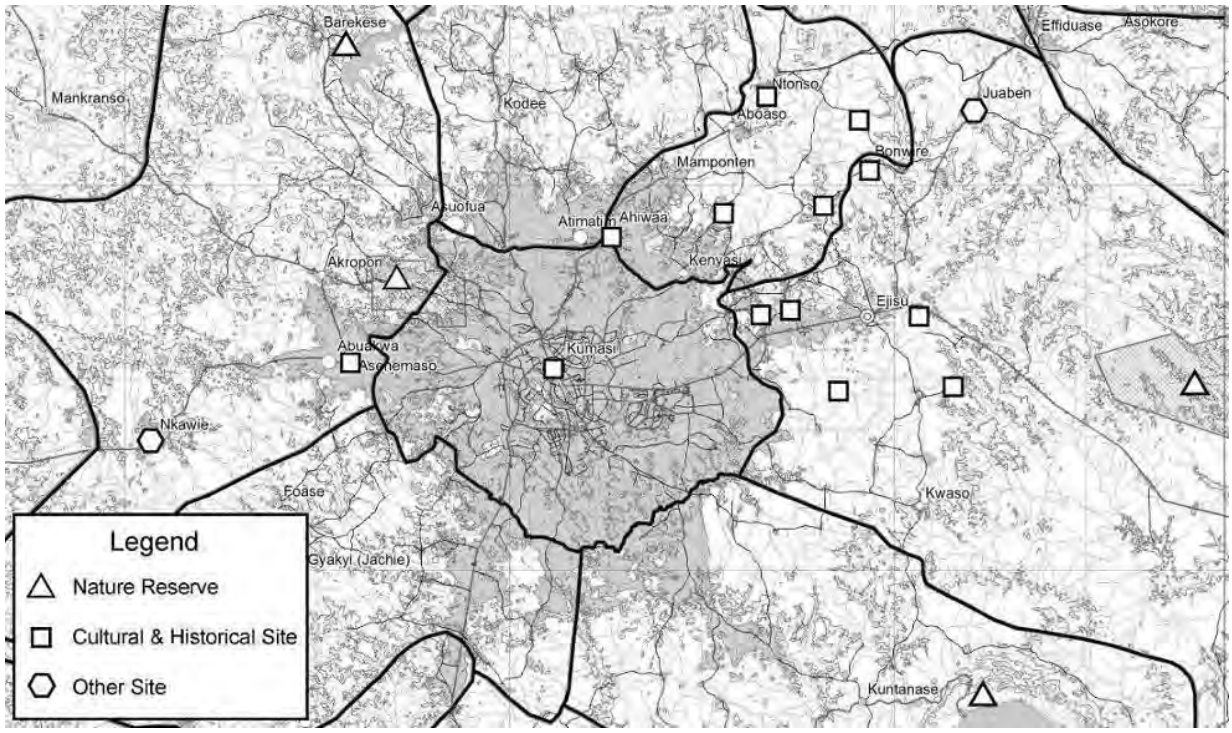
Source: JICA Study Team

Figure 8.8.1 Diagram of Conservaition Areas for Greater Kumasi Sub-Region, 2033

8.9 Tourism Development

8.9.1 Background on Tourism Development

Kumasi, the capital of the Golden Kingdom of Ashanti which once was called "Garden City of West Africa" and the communities of the surrounding districts have a variety of tourist attractions such as traditional palaces, shrines, some of which are UNESCO heritage sites as well as natural sites including wild life sanctuaries and Bosomtwe Lake. With its locational and historical advantage, approximately sixty per cent of tourists in Ghana currently visit Kumasi (Ghana Tourism Authority).



Source: JICA Study Team

Figure 8.9.1 Major Tourist Sites in Greater Kumasi Sub-Region

8.9.2 Issues on Tourism Development

The attractiveness of Greater Kumasi Sub-Region from the tourism perspective is decaying due to poor maintenance of cultural sites, outmoded materials and equipment, poor publicity and underutilization.

Source: JICA Study Team

Figure 8.9.2 Traditional Shrine at Besease (UNESCO World Heritage Site)

The numbers of visitors at some major tourist facilities in Greater Kumasi Sub-Region are shown in the following table.

Table 8.9.1 Visitors at Tourist Facilities of Greater Kumasi Sub-Region

Tourist Facilities	Year		
	2008	2009	2010
Manhyia Palace Museum	35,113	37,876	42,115
Bobiri Butterfly Sanctuary	1,764	1,207	1,723
Military Museum	7,938	5,497	7,042
Prempeh II Museum	7,991	9,110	6,440
Kumasi Zoo	114,693	77,824	57,294

Source: Ghana Tourism Authority

The number of visitors per year is small in most major tourist facilities in Greater Kumasi Sub-Region. Not only is the number of visitors to Kumasi Zoo small, it has decreased dramatically in the past three years.

Poor road accessibility to and between each tourist site is also a notable issue in the surrounding districts of Greater Kumasi Sub-Region, especially between the handcraft villages in Ejisu-Juaben and Kwabre East.

8.9.3 Objectives for Tourism Development

The objectives for tourism development for Greater Kumasi Sub-Region are to attract more domestic and international tourists to existing tourist sites and facilities and to provide better opportunities for cultural and recreational experiences for residents and visitors.

8.9.4 Strategies for Tourism Development

As the Primary City of Ashanti Region and a cosmopolitan city of Western Africa, Greater Kumasi Sub-Region should provide a variety of tourist attractions and recreational sites for providing cultural and entertaining experiences both to visitors and residents. For these purposes, the following strategies are recommended in relation to spatial development for the sub-region.

(1) Conservation of Tourism Areas and Improvement of Access to Tourist Areas for Promoting Tourism

In the SDF, it is important to identify potential tourism areas for conserving their resources and environment, as well as to secure proper access to them. The following tourism areas are potential sites in this aspect:

a) Cultural Tourism Area in Kumasi City Centre
Manhyia Palace
Historical Conservation Area near Manhyia
Cultural Centre
Zoological Garden

b) Ejisu-Kwabre Tourism Area covering the following destinations:
Traditional Shrines in the surrounding villages of Ejisu (World Heritage Sites)
Handicraft, Woodcarving in Ahwiaa
Kente Weaving, Adinkra Symbol Cloth Printing in Bonwire, Adanwomase and Ntonso

c) Asenemaso Shrine in Atwima Nwabiagya

d) Nature Reserve Areas in the following areas:
Bosomtwe Lake Tourism and Resort Area
Eco-tourism in Bobiri Wildlife Sanctuary
Eco-tourism in Owabi Wildlife Sanctuary

(2) Development of Tourist Attraction in Agricultural Areas

Agriculture or agro-industry related tourist attractions are possible in Greater Kumasi Sub-Region, including the following two:

a) Agricultural Fair at Nkawie
b) Palm Oil Factory at Juaben

(3) Development of International Standard Convention and Exhibition Centres in Kumasi-Ejisu Urban Corridor

A cosmopolitan city like Greater Kumasi Sub-Region needs high-standard exhibition and conference centres. The Kumasi-Ejisu Urban Corridor is a potential site for the following functions:

a) Exhibition Centre
b) Conference Centre
c) Hotels

8.10 Mining Sector

8.10.1 Background on Mining Sector

The mining sector is a major contributor to employment in Ghana and could have important spin off effects in the sub-region's economy. However, land use planning and controls have not been able to cope adequately with the growth of the mining settlements; often characterized by unstructured and ill-serviced informal settlements. Another issue in the mining areas is the extent of environmental degradation.

Districts do not seem to have the required mandate and influence to enforce their needs on proposals put forward by the mining companies. There is a strong need for responsibly mandated actors and more resolute collaboration between the regulatory bodies, Districts and the traditional authorities. Improved long term planning for mining areas is necessary.

Two of the seven Greater Kumasi Districts have deposits of valuable minerals such as gold and diamonds in them. These may be alluvial (river bed) deposits or in hard rock formations. Although these are identified in Medium Term Development Plans

(MTDPs), this is not carried through into proposals for economic development.

The viability of mining can vary widely depending on the gold price, which can be very irregular. A major problem is that concessions are granted on a short term basis (five years) by the Minerals Commission, seemingly without consultation at local level. Districts should seek to discuss this with the Commission, to enable proper and long term planning of settlements and other land uses. Such discussions may also enable untapped mineral resources to begin to be exploited, which can be beneficial if done in a controlled and environmentally responsible manner. Districts should seek to have the minerals in them identified and designated for a reasonable period of at least 20 years, in a zoning map. Where settlements, conservation areas, forest reserves, or other land uses have greater priority for Districts, concessions should not granted.

Where there are unregulated and illegal mining activities the risk of damage to the populous and the environment is great. Today such activities provide a considerable number of jobs, especially for the youth. Efforts to regularize this activity should also be considered in terms of physical planning as they raise important questions of housing, infrastructure and environmental hazards, management and protection.

(1) Quarrying and Sand Winning

In regard to quarrying and sand winning, some districts identify quarrying of rock deposits as an opportunity, but this is not taken into the economic priorities or potentials in their MTDPs.

Also, a great deal of damage is being done to the environment by illegal activities. Landowners may allow those responsible, for minimal fees, to strip topsoil, and remove a relatively thin layer of sand or laterite and get away without carrying out any reinstatement works. The areas surrounding expanding conurbations such as Kumasi are under great pressure from these activities to service construction work, since the profitability of these operations is strongly affected by the distance which trucks have to travel to bring them to sites.

Here again, policing of illegal activities and working with the Minerals Commission to identify sources of rock and sand which can be mined responsibly needs to be an objective of every district, in peri-urban areas. Responsible private sector operators could be drawn into strategies which take a positive view of the potentials. The active investment in rock and clay deposits could play a more significant role in economic development, but only if the environmental issues are addressed responsibly.

(2) Mining and Quarrying in rural Districts' Medium Term Development Plans

1) Afigya-Kwabre

The mass presence of granite rock in the district supports the quarry industry. The rocky hills of the Nyanao – Opimo association around Buoho is important with quarries established in the area. The rocky hills and outcrops around Ntiribuoho,

Nkukua-Buoho and Afrancho, constitute a potential for investment and employment creation in view of the growing residential development in and out of the district as well as for road construction.

2) Atwima Nwabyiagia

The Barekese and Owabi Forest Reserves have been encroached upon by sand winners. These practices continue to threaten the Offin and Owabi Rivers, and the Barekese and Owabi reservoirs.

Residential activities and sand winning have currently taken portions of good agriculture lands at Nerebehi, Abuakwa, Nkawie, Toase, Amanchia, and Seidi.

Mfensi has good clay deposits for ceramics and brick making.

Quarrying is another business that has a lot of potential in the district because of the availability of huge rock deposits at Barekese and Ntesere. There are two active quarry industries in the district at Barekese.

3) Bosomtwe

The following mineral deposits are found in Bosomtwe District:

- Gold deposits are located in Beposo, Nyameani and within the Lake.
- Diamond deposits are also located in River Afoa, Atasuo, Atetesua, Obo and Kwabena.
- The sand and stone deposits are extensively exploited by the building industry in Adagya, Sawuah, Ayuom, Tetrefu, Atobiase, Jachie, Abuontem, Oyoko, and Nnuaso.
- The clay deposits are mainly found in Kokobriko, Oyoko, Nuaso and New Kokobriko and Krom-Adwafo. The deposits are of diverse colouring and can be tapped for use in brick and tile industries as well as pottery and ceramics.

4) Ejisu-Juaben

There are no mining opportunities here, and no mention of sand winning or quarrying in the Districts MTDP.

5) Kwabre East

Kwabre East has the following mining potentials:

- Fine textured granitic soils found in areas like Antoa, Abira, Sakaro Wonoo, Wadie Adwumakase and Kenyase.
- A number of large rocky outcrops (biotite gneiss and granitized biotites) in Kenyase and Aboaso.
- Low-grade alluvial gold deposits at Sakora Wonoo.
- Diamonds at Safo and Kasaam in the northeast.
- Clay and sand deposits in the central portion of the District
- Low grade alluvial gold deposits at Sakra Wonoo

8.10.2 Issues on Management of the Mining Sector

In order to utilize mining potentials for economic development and at the same time, to maintain the natural and urban environments, the following issues are identified:

- Uncontrolled mining activities in nature conservation areas, such as forest reserves
- Uncontrolled mining activities in areas where conservation is necessary for water resources
- Uncontrolled mining activities in urbanizing areas
- Mining activities taking good agricultural lands away from agriculture
- Inadequate public education on the impact of mining activities

8.10.3 Objectives for Management of the Mining Sector

For spatial development in Greater Kumasi Sub-Region, the following two items are objectives for management and development of the Mining Sector:

- Provide an adequate enabling environment for the mining sector, which is part of the important resources for economic development
- Mitigate negative impacts on agriculture, the natural environment and urban environment

8.10.4 Strategies for Management of the Mining Sector

For spatial development in Greater Kumasi Sub-Region, the following two strategies are recommended for management of the mining sector.

(1) Small-Scale Gold Mining

Designation of small-scale mining activities and registration of small-scale miners with the Mineral Commission in consultation with District Assemblies should be implemented so that small-scale miners should follow certain conditions/regulations for reinstatement of degraded land, control of pollution and payment of royalties and taxes.

(2) Approval of Areas for Mining and Rock Quarrying and Sand Winning

Quite a few communities in Greater Kumasi Sub-Region have potential for rock quarrying and sand winning. In many communities, mining activities are going on. When we see the future extent of urbanization in the surrounding districts of KMA, it is necessary to regulate them in a proper manner within urbanizing areas.

In order to avoid nuisance and negative impacts, it is necessary for district structure plans to designate certain areas for prohibiting rock quarrying and sand winning, prohibiting them especially in urbanized areas, even though those areas have potential for quarrying and sand wining.

In order to prevent destruction of good agricultural land by mining activities, it is necessary for district spatial development frameworks to designate certain rural areas for prohibiting mining activities in consultation with the Minerals Commission, thus prohibiting mining elsewhere.

8.11 Health Sector

8.11.1 Background

Ashanti Region has the largest population in Ghana out of the ten regions, however in 2009, Ashanti Region was the only region which did not have a regional hospital. Komfo Anokye Teaching Hospital (KATH), which is located in the centre of Kumasi is one of the three teaching hospitals in the nation, which have been functioning as the regional hospital. However, KATH has been experiencing an extreme pressure caused by factors such as rapid population increase in the region, especially in KMA, as well as lack of a hospital with intensive care service in the area.

Table 8.11.1 Health Facility by Type and Ownership in Regions, 2009

Region	Teaching Hospitals	Regional Hospitals	Other Hospitals			Polyclinic	Health Centres & Clinics		
	Gov't	Gov't	Gov't	Private	Others	Gov't	Gov't	Private	Others
Ashanti	1	0	22	48	22	0	141	161	43
Brong Ahafo	0	1	8	6	12	1	149	24	13
Central	0	1	10	7	6	0	80	75	11
Eastern	0	1	12	5	8	0	166	63	26
Greater Accra	1	1	9	79	11	7	44	232	23
Northern	1	1	9	0	8	0	122	20	36
Upper East	0	1	4	0	1	0	54	11	16
Upper West	0	1	3	1	4	0	60	4	17
Volta	0	1	11	7	9	1	192	23	9
Western	0	1	11	3	10	2	98	119	51

Source: The Health Sector in Ghana, Facts and Figures 2010

To resolve this situation, a regional hospital for Ashanti Region has been proposed in Sawuah in Bosomtwe District.

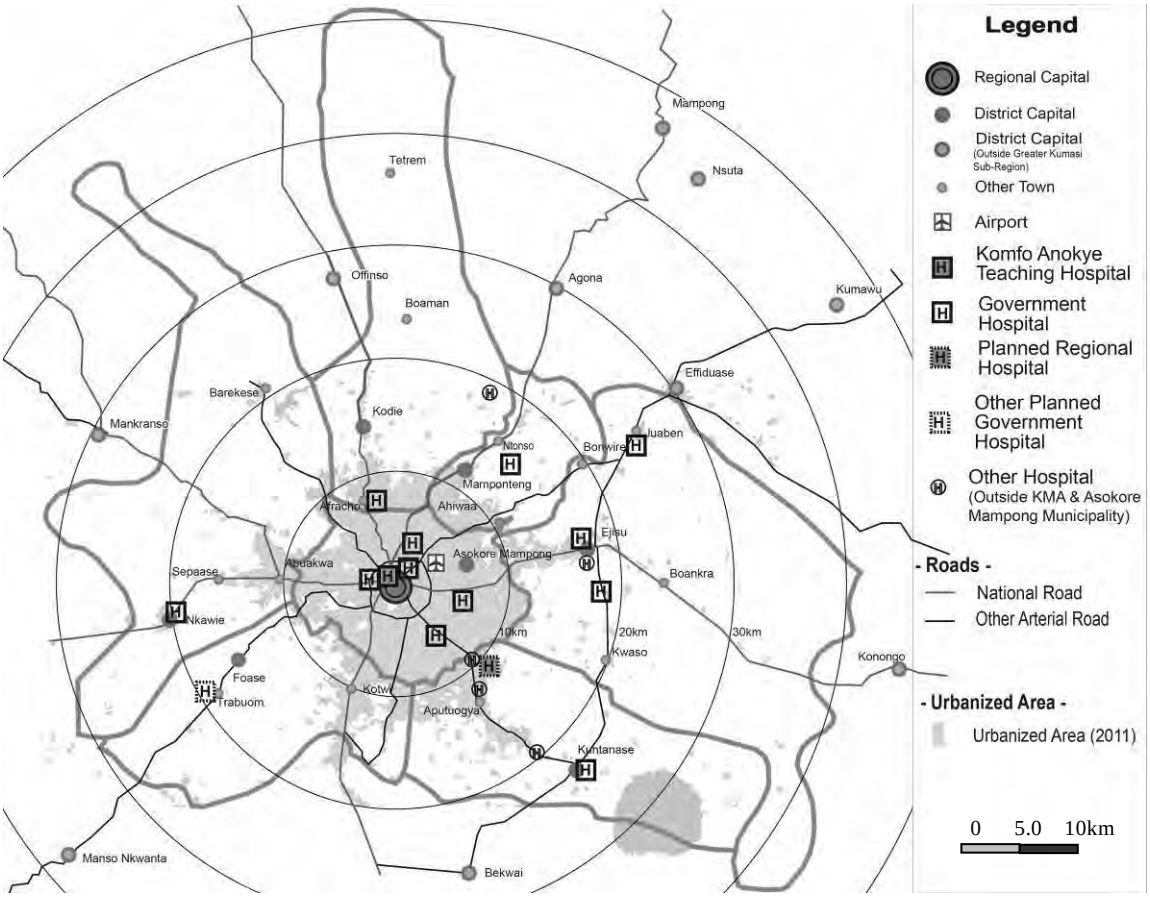
Table 8.11.2 shows the distribution of health facilities in Greater Kumasi Sub-Region. The distribution of hospitals and health centres in each district in Greater Kumasi Sub-Region is unbalanced with most of the government hospitals located in either KMA or Ejisu-Juaben Municipality, which both also have enough private hospitals for its current population while Atwima Kwanwoma currently does not have any and some other districts only one. The health centre in Trabuom or the one in Foase in Atwima Kwanwoma has been proposed to be upgraded to a hospital in the MTDP 2008-2012.

The location of the hospitals in the Sub-Region outside KMA is also concentrated along or close to Lake Road while there is only one hospital between Atwima Nwabiagya and Atwima Kwanwoma (western side of KMA).

Table 8.11.2 Health Facility by Type and Ownership in Greater Kumasi Sub-Region

District	Hospital		Health Centre	
	Gov't	Other	Gov't	Other
KMA	6	35	2	0
Asokore Mampong	0		0	0
Ejisu-Juaben	3	5	3	1
Bosomtwe	1	3	2	0
Atwima Kwanwoma	0	0	4	0
Atwima Nwabiagya	1	0	4	0
Afigya Kwabre	1	1	10	0
Kwabre East	1	0	5	0

Source: JICA Study Team based on the data from Ghana Health Service (http://www.ghanahealthservice.org/index.php), 2013 and MTDP 2010-13



Source: JICA Study Team based on the data from Ghana Health Service (http://www.ghanahealthservice.org/index.php), 2013 and MTDP 2010-13

Figure 8.11.1 Location of Hospitals in Greater Kumasi Sub-Region

According to TCPD's Zoning Guidelines and Planning Standards of Ghana, a District Hospital is to serve up to 200,000 persons. In order to satisfy this standard, the sufficient number of hospitals for the future population of each district is shown in Table 8.11.3.

Table 8.11.3 Future Population and Number of New District Hospital Necessary in Greater Kumasi Sub-Region

District	2010			2033	
	Population	District Hospital & Private Hospital	Population / Hospital	Future Population	Necessary New District Hospital
KMA (incl. Asokore Mampong)	2,035,064	40	49,636	4,226,860	-
Ejisu-Juaben	143,762	8	17,970	438,940	-
Bosomtwe	93,910	4	23,478	165,273	-
Atwima Kwanwoma	90,634	0	-	198,629	1
Atwima Nwabiagya	149,025	1	149,025	251,548	1
Afigya Kwabre	136,140	2	68,070	259,891	-
Kwabre East	115,556	1	115,556	220,322	1

Source: JICA Study Team based on Ghana Health Service 2010 and Ghana Statistical Service 2010

According to TCPD's Zoning Guidelines and Planning Standards of Ghana (November, 2011), a Urban Health Centre or Polyclinic is to serve 60,000 to 100,000, and a Health Centre is to serve a sub-district centre and its surrounding settlements up to 8 to 16 km.

8.11.2 Issues in the Health Sector

Based on the current situation in the health sector and the future population framework, the following issues exist in the health sector:

- Insufficient number of highly-specialized hospitals for tertiary care services, causing extreme concentration at Komfo Anokye Teaching Hospital (KATH)
- Not enough number of hospitals in the districts adjacent to KMA, partly due to rapidly increasing suburban population
- Shortage of health centres in suburban areas of high population increase
- Absence of health centres in some rural areas

8.11.3 Objective for the Health Sector

The objective for the health sector is to provide people with the necessary access to health facilities in both KMA and adjoining districts, by increasing the number of health facilities in the adjoining district and to balance the spatial distribution of health facilities in the Greater Kumasi Sub-Region, as well as by improving the quality of health services to be provided.

8.11.4 Strategies for the Health Sector

To achieve the above objective, the strategies for the health sector are:

- To establish a regional hospital in Sawuah of Bosomtwe District
- To promote the establishment of another Regional Hospital [1] in the Kumasi-Ejisu Urban Corridor outside KMA within the Greater Kumasi Conurbation in response to its population increase

[1] According to "Zoning Guideline and Planning Standards" published by TCPD (November 2011), one Regional Hospital is to serve up to 1,000,000 persons.

- To promote the establishment of district hospitals in the newly established districts such as:
  - Atwima Kwanwoma District, and
  - Asokore Mampong Municipality
- To promote the establishment of a second district hospital in the districts which do not have district hospitals in either the District Centre or Suburban Centre, which are:
  - Atwima Nwabiagya District (Abuakwa),
  - Afigya Kwabre District (Kodie), and
  - Kwabre East District (Mampongteng or Ahiwaa)
- To promote the establishment of urban health centres in suburban areas of Greater Kumasi Conurbation.
- To promote the establishment of health centres in the following Key Rural Towns:
  - Abonu (Bosomtwe)
  - Brodekwano (Bosomtwe)
  - Amankyea (Atwima Nwabiagya)
  - Asakraka (Atwima Nwabiagya)
  - Nyama Yaede (Ejisu-Juaben)

8.12 Education Sector

8.12.1 Background of Education Sector

(1) Primary School and Junior High School

Ghana has been increasing its population as a whole for the last decades with an annual growth rate of over 2.6% mostly due to natural growth. This natural growth of population has increased the number of pupils and students in primary schools and junior high schools across the nation with an average annual growth rate of 4.9% in both primary school and junior high school between 2001/02 and 2010/11. (Table 8.12.1 and 8.12.2)

Table 8.12.1 Number of Primary Schools and Pupils by Region

		Public			Private			Total		
Region	Year	Pupil	School	Pupil School Ratio	Pupil	School	Pupil School Ratio	Pupil	School	Pupil School Ratio
Ashanti	2001/02	360,477	1,862	194	123,819	732	169	484,296	2,594	187
	2010/11	518,379	2,192	236	192,519	1,177	164	710,898	3,369	211
	Annual Growth Rate	**4.1%**	**1.8%**	**2.2%**	**5.0%**	**5.4%**	**-0.4%**	**4.4%**	**2.9%**	**1.4%**
Brong Ahafo	2001/02	218,951	1,434	153	40,860	227	180	259,811	1,661	156
	2010/11	326,902	1,598	205	71,346	432	165	398,248	2,030	196
	A. G. R.	4.6%	1.2%	3.3%	6.4%	7.4%	-1.0%	4.9%	2.3%	2.5%
Central	2001/02	216,990	1,213	179	45,078	286	158	262,068	1,499	175
	2010/11	311,979	1,401	223	109,067	846	129	421,046	2,247	187
	A. G. R.	4.1%	1.6%	2.5%	10.3%	12.8%	-2.2%	5.4%	4.6%	0.8%
Eastern	2001/02	280,698	1,899	148	46,599	329	142	327,297	2,228	147
	2010/11	335,813	1,877	179	73,116	627	117	408,929	2,504	163
	A. G. R.	2.0%	-0.1%	2.1%	5.1%	7.4%	-2.1%	2.5%	1.3%	1.2%
Greater Accra	2001/02	193,944	780	249	132,687	773	172	326,631	1,553	210
	2010/11	357,459	916	390	154,596	1,030	150	512,055	1,946	263
	A. G. R.	7.0%	1.8%	5.1%	1.7%	3.2%	-1.5%	5.1%	2.5%	2.5%
Northern	2001/02	215,262	1,447	149	5,065	48	106	220,327	1,495	147
	2010/11	392,624	1,990	197	16,345	166	98	408,969	2,156	190
	A. G. R.	6.9%	3.6%	3.2%	13.9%	14.8%	-0.8%	7.1%	4.2%	2.8%
Upper East	2001/02	117,080	460	255	2,811	17	165	119,891	477	251
	2010/11	194,981	630	309	15,421	71	217	210,402	701	300
	A. G. R.	5.8%	3.6%	2.2%	20.8%	17.2%	3.1%	6.4%	4.4%	2.0%
Upper West	2001/02	66,700	380	176	1,610	7	230	68,310	387	177
	2010/11	132,858	552	241	3,753	29	129	136,611	581	235
	A. G. R.	8.0%	4.2%	3.6%	9.9%	17.1%	-6.2%	8.0%	4.6%	3.2%
Volta	2001/02	212,127	1,484	143	21,271	156	136	233,398	1,640	142
	2010/11	288,982	1,709	169	45,536	365	125	334,518	2,074	161
	A. G. R.	3.5%	1.6%	1.9%	8.8%	9.9%	-1.0%	4.1%	2.6%	1.4%
Western	2001/02	231,520	1,376	168	52,885	375	141	284,405	1,751	162
	2010/11	338,543	1,566	216	82,560	549	150	421,103	2,115	199
	A. G. R.	4.3%	1.4%	2.8%	5.1%	4.3%	0.7%	4.5%	2.1%	2.3%
Ghana	2001/02	2,113,749	12,335	171	472,685	2,950	160	2,586,434	15,285	169
	2010/11	3,198,520	14,431	222	764,259	5,292	144	3,962,779	19,7023	201
	A. G. R.	**4.7%**	**1.8%**	**2.9%**	**5.5%**	**6.7%**	**-1.1%**	**4.9%**	**2.9%**	**1.9%**

Source: Ministry of Education

Table 8.12.2 Number of Junior High Schools and Students by Region

		Public			Private			Total		
Region	Year	Student	School	Student School Ratio	Student	School	Student School Ratio	Student	School	Student School Ratio
Ashanti	2001/02	142,942	1,038	138	29,370	276	106	172,312	1,314	131
	2010/11	212,872	1,454	146	54,396	692	79	267,268	2,146	125
	Annual Growth Rate	**4.5%**	**3.8%**	**0.7%**	**7.1%**	**10.8%**	**-3.3%**	**5.0%**	**5.6%**	**-0.6%**
Brong Ahafo	2001/02	71,877	718	100	9,366	77	122	81,243	795	102
	2010/11	108,832	929	117	21,633	259	84	130,465	1,188	110
	A. G. R.	4.7%	2.9%	1.8%	9.7%	14.4%	-4.1%	5.4%	4.6%	0.8%
Central	2001/02	82,007	861	95	9,930	111	89	91,937	972	95
	2010/11	116,096	1,087	107	32,935	510	65	149,031	1,597	93
	A. G. R.	3.9%	2.6%	1.3%	14.3%	18.5%	-3.6%	5.5%	5.7%	-0.1%
Eastern	2001/02	101,107	1,026	99	9,948	102	98	111,055	1,128	98
	2010/11	124,193	1,145	108	20,472	389	53	144,665	1,534	94
	A. G. R.	2.3%	1.2%	1.1%	8.3%	16.0%	-6.6%	3.0%	3.5%	-0.5%
Greater Accra	2001/02	105,825	536	197	47,637	416	115	153,462	952	161
	2010/11	125,547	681	184	56,560	714	79	182,107	1,395	131
	A. G. R.	1.9%	2.7%	-0.8%	1.9%	6.2%	-4.0%	1.9%	4.3%	-2.3%
Northern	2001/02	42,567	327	130	352	4	88	42,919	331	130
	2010/11	105,708	554	191	1,287	45	29	106,995	599	179
	A. G. R.	10.6%	6.0%	4.3%	15.5%	30.9%	-11.7%	10.7%	6.8%	3.6%
Upper East	2001/02	24,910	189	132	405	11	37	25,315	200	127
	2010/11	59,992	332	181	2,028	25	81	62,020	357	174
	A. G. R.	10.3%	6.5%	3.6%	19.6%	9.6%	9.2%	10.5%	6.6%	3.6%
Upper West	2001/02	17,254	233	74	348	4	87	17,602	237	74
	2010/11	38,939	357	109	1,002	15	67	39,941	372	107
	A. G. R.	9.5%	4.9%	4.4%	12.5%	15.8%	-2.9%	9.5%	5.1%	4.2%
Volta	2001/02	77,014	757	102	5,374	53	101	82,388	810	102
	2010/11	97,691	1,029	95	15,742	231	68	113,433	1,260	90
	A. G. R.	2.7%	3.5%	-0.8%	12.7%	17.8%	-4.3%	3.6%	5.0%	-1.3%
Western	2001/02	76,392	729	105	11,011	124	89	87,403	853	102
	2010/11	110,801	894	124	28,674	367	78	139,475	1,261	111
	A. G. R.	4.2%	2.3%	1.9%	11.2%	12.8%	-1.4%	5.3%	4.4%	0.9%
Ghana	2001/02	741,895	6,414	116	123,741	1,178	105	865,636	7,592	114
	2010/11	1,100,671	8,462	130	234,729	3,247	72	1,335,400	11,709	114
	A. G. R.	**4.5%**	**3.1%**	**1.3%**	**7.4%**	**11.9%**	**-4.1%**	**4.9%**	**4.9%**	**0.0%**

Source: Ministry of Education

In most regions the numbers of pupil and student at private school have been increasing at a higher rate than the public schools in both primary and junior high school. Although the number of private schools is still much less than the number of public school, the importance of private schools is increasing especially in the urban areas. In Greater Accra Region the number of private school have exceeded the number of public school in 2010/11.

As for the schools in Greater Kumasi Sub-Region, there are more private schools than public schools in KMA, which follows the development trend in Greater Accra Region. The average pupil-school ratio and student-school ration in Greater Kumasi Sub-Region are both larger than that of national average. The highest pupil-school ratio in Greater Kumasi Sub-Region is the public primary schools with one public primary school for every 372 pupils. (Table 8.12.3 and Table 8.12.4) The location of each school's service area should also be discussed at the district level for primary schools and junior high schools.

Table 8.12.3 Number of Primary Schools and Pupils by District in Greater Kumasi Sub-Region (Year 2010/11)

	Public			Private			Total		
	Pupil	School	Pupil School Ratio	Pupil	School	Pupil School Ratio	Pupil	School	Pupil School Ratio
Atwima Nwabiagya	25,290	86	294	12,567	74	170	37,857	160	237
Bosomtwe	12,362	59	210	4,556	44	104	16,918	103	164
Ejisu-Juaben	22,343	91	246	3,986	44	91	26,329	135	195
Kumasi	92,319	248	372	88,925	428	208	181,244	676	268
Kwabre East	14,778	64	231	8,170	80	102	22,948	144	159
Afigya-Kwabre	16,666	65	256	5,441	32	170	22,107	97	228
Atwima Kwanwoma	12,961	50	259	6,390	38	168	19,351	88	220
Greater Kumasi Sub-Region	196,719	663	297	130,035	740	176	326,754	1,403	233

Source: Ministry of Education

Table 8.12.4 Number of Junior High Schools and Students by District in Greater Kumasi Sub-Region (Year 2010/11)

	Public			Private			Total		
	Student	School	Student School Ratio	Student	School	Student School Ratio	Student	School	Student School Ratio
Atwima Nwabiagya	11,484	65	177	3,572	46	78	15,056	111	136
Bosomtwe	5,726	50	115	1,260	24	53	6,986	74	94
Ejisu-Juaben	8,892	61	146	963	24	40	9,855	85	116
Kumasi	51,801	195	266	27,283	275	99	79,084	470	168
Kwabre East	7,360	52	142	2,146	52	41	9,506	104	91
Afigya-Kwabre	8,040	59	136	1,184	15	79	9,224	74	125
Atwima Kwanwoma	6,090	40	152	1,463	20	73	7,553	60	126
Greater Kumasi Sub-Region	99,393	522	190	37,871	456	83	137,264	978	140

Source: Ministry of Education

(2) Senior High School

Although the numbers of pupils and students in primary schools and junior high schools have both been increasing rapidly in the past decade, the number of students in senior high school is still not large with approximately 350 thousand students, which is approximately 13.7% of the population aged between 15 and 19. The two regions which have the higher enrolment rate are Greater Accra Region and Ashanti Region, which were 19.4% and 17.1% respectively in the year 2010/11. (Table 8.12.5)

Comparing the figures of Ghana with some countries around the world, the gap is still quite large. However for example Turkey had around 30% of enrolment rate in 1995 and increased to almost 60% in 2010. In general, the enrolment rate of senior high school level education increases along with the economical development. Therefore the number of senior high school student is assumed to increase rapidly in the next decades in Ghana due to the economical development and natural increase of population.

Table 8.12.5 Number of Senior High School Sutdents and Senior High School Enrolment Ratio by Region
(School Year 2010/11)

	Senior High School Student	Pop 15-19	Ratio of Senior High School Student in Pop Age 15-19
Ashanti	88,035	514,803	17.1%
Brong Ahafo	30,484	253,449	12.0%
Central	34,219	244,020	14.0%
Eastern	32,108	279,234	11.5%
Greater Accra	75,337	388,403	19.4%
Northern	21,675	261,935	8.3%
Upper East	10,254	115,952	8.8%
Upper West	6,532	78,336	8.3%
Volta	26,338	222,553	11.8%
Western	33,282	251,304	13.2%
Ghana	358,264	2,609,989	13.7%

Source: JICA Study Team based on Ministry of Education and Ghana Statistical Service

The student school ratio for senior high school in year 2010/11 by region shows that the regions which have higher enrolment rate have higher student school ratio such as Ashanti Region and Greater Accra Region. (Table 8.12.6) The student school ratio also are larger in the region where there are larger cities, which are Accra (Greater Accra Region), Kumasi (Ashanti Region), Sekondi-Takoradi (Western Region) and Tamale (Northern Region).

Table 8.12.6 Student School Ratio of Senoir High School by Region in Year 2010/11

Region	Number of Senior High School	Number of Senior High School Student	Student School Ratio
Ashanti	126	88,035	699
Brong Ahafo	82	30,484	372
Central	91	34,219	376
Eastern	102	32,108	315
Greater Accra	79	75,337	954
Northern	49	21,675	442
Upper East	28	10,254	366
Upper West	19	6,532	344
Volta	93	26,338	283
Western	51	33,282	653
Total	720	358,264	498

Source: Ministry of Education, Ghana

On the other hand the number of senior high school is tended to be larger in rural area where there is more space available (Table 8.12.7).

Table 8.12.7 Senior High School by Ownership and Location by Region in Year 2010/11

Region	Public		Private		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
Ashanti	38	54	11	23	49	77
Brong Ahafo	25	31	10	16	35	47
Central	24	27	12	28	36	55
Eastern	41	39	8	14	49	53
Greater Accra	6	34	4	35	10	69
Northern	13	24	5	7	18	31
Upper East	21	2	3	2	24	4
Upper West	12	6	0	1	12	7
Volta	58	15	10	10	68	25
Western	18	23	2	8	20	31
Ghana	256	255	65	144	321	399

Source: Ministry of Education

Within Ashanti Region the distribution of public senior high school is concentrated in KMA (including Asokore Mampong Municipality) with 19 out of 92 senior high school of Ashanti Region in KMA, responding to the extreme population concentration in KMA. Additionally 40 public senior high school within Ashanti Region are located in Greater Kumasi Sub-Region, which is almost half of the public senior high school in the region. As for private schools, the number of private secondary education level schools acknowledged by the Ministry of Education at the national level and regional office differ greatly. One of the reasons may be because the figures from the regional office are one year after the data available at the national level. Other reasons may be that some of the private schools may not be currently recognized or registered at the national level and the unclear definition of category among the types of secondary education schools. Overall it can be said that there is a concentration of private senior high school in KMA but otherwise the other private senior high school are located for example in the rural area of Bosomtwe District. (Table 8.12.8)

Table 8.12.8 Senior High School by Ownership by District in Greater Kumasi Sub-Region (School Year 2011/12)

District	Public Senior High School	Private Senior High School	Total Senior High School
KMA (incl. Asokore Mampong)	19	53	73
Ejisu-Juaben	5	2	7
Kwabre East	6	1	7
Afigya Kwabre	2	0	2
Atwima Kwanwoma	2	1	3
Atwima Nwabiagya	4	1	5
Bosomtwe	2	8	10
Greater Kumasi Sub-Region	40	66	106

Source: Ministry of Education (Ashanti Regional Office)

The location of public senior high school in Greater Kumasi Sub-Region is shown in Figure 8.12.1. In most of the districts, the public senior high schools are located in

the rural area of their districts such as Tetrem (Atwima Kwanwoma), Trabuom (Afigya Kwabre), Adanwomase (Kwabre East) and Beposo (Bosomtwe).

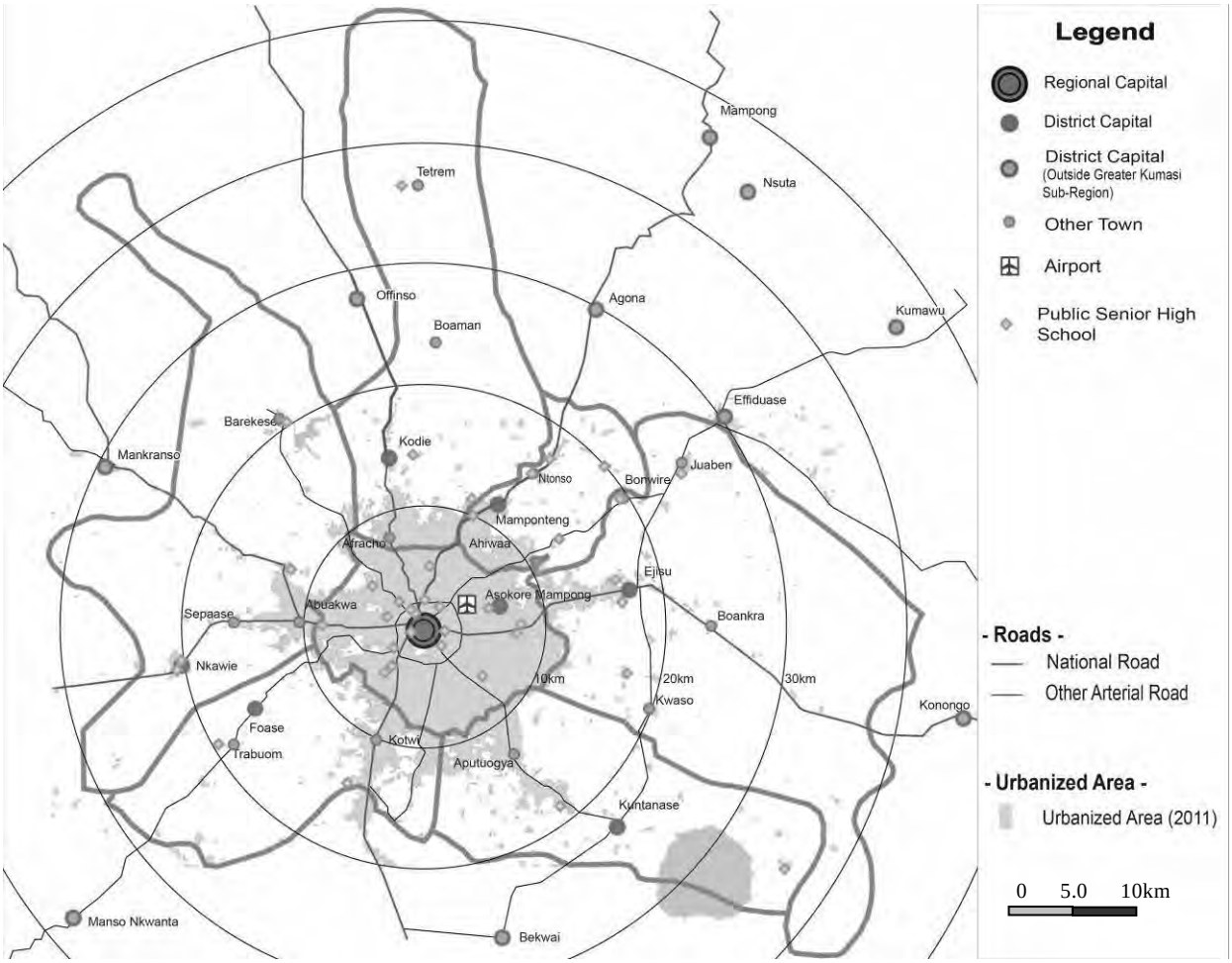


Figure 8.12.1 Location of Public Senior High Schools in Greater Kumasi Sub-Region (Year 2011/12)

(3) Higher Education

In Ghana, the percentage of people who have finished university and post graduate degree courses was only 3.2% out of those who attended formal schools. In 2011, the net enrollment ratio in 2011 was 12% of those of tertiary education age. Since Ghana will achieve to be a middle income status, the number of university graduates is expected to increase more.

8.12.2 Issues of Education Sector

Issues of education sector to be addressed at the Sub-Regional Level are as follows:

- The number of senior high schools in total is in short in commutable distance within Greater Kumasi Sub-Region.
- The spatial distribution of senior high schools is skewed to KMA.
- Lack of senior high schools, as well as junior high schools in suburban areas for the future demand, which can be one of the factors to delay to promote orderly suburbanization.

- More universities and polytechnics should be located in suburban areas of adjoining districts.
- The linkage of higher education and local economic sectors is weak.

8.12.3 Objectives of Education Sector

Schools at the basic education level, which are primary schools and junior high schools, should be dealt with by the district level policies and plans by following future population increase in each district and considering the current distribution of schools. On the other hand, the sub-regional level education policy and plans should deal with senior high schools. In rapidly urbanizing areas like Greater Kumasi Conurbation, more people want to attend senior high schools and high education institutions (such as universities and polytechnics). To satisfy the increasing demand for attending senior high schools and high education institutions is important for Ghana because the percentages of the people who had finished senior high schools and higher education are still relatively low.

The objectives for the education sector at the Sub-Regional Level for Greater Kumasi are:

- To provide people with the necessary access to senior high schools in both KMA and adjoining districts, especially by increasing the number of senior high schools in the adjoining district and to balance the spatial distribution of senior high schools in the Greater Kumasi Sub-Region, as well as by improving the quality of educational services at the senior high schools to be provided.
- To provide necessary senior high schools in rural areas within the Greater Kumasi Sub-Region.
- To attract or promote high educational institutions in Greater Kumasi Sub-Region for maintaining the status of national education centre in Ghana

8.12.4 Strategies for Education Sector

In order to achieve the objectives above, the strategies for the education sector are as below.

- To promote the establishment of senior high schools in suburban areas of Greater Kumasi Conurbation for covering the future population growth, especially to attract private senior high schools for satisfying the needs for increasing suburban population
- To promote the establishment of senior high schools in identified Key Rural Towns, which do not have senior high schools yet
- To provide enable environment (for example, by providing lands and necessary access) to attract or promote development of high education institutions within the Greater Kumasi Sub-Region
- To strengthen the linkage between higher education institutes (KNUST etc.) and the industry by advancing the research work of the education institutes and putting effort into ICT industry

8.13 Rural Development

8.13.1 Background on Rural Development

The areas outside the conurbation of Greater Kumasi are generally rural in their landscape and socio-economic activities.

The present population in these rural areas of Greater Kumasi Sub-Region is estimated at about 305,000 in 2010. In the last decade (2000-2010), the population of these rural areas decreased, largely due to outmigration to urban areas and other regions.

In the rural areas, settlements are scattered. Most rural populations live in those settlements. Among those rural settlements, some of them are considered rural towns, which have service centre functions including government administrations, schools, selling of groceries to surrounding communities, buying agricultural produce from surrounding farms and repair services.

Those rural towns are connected with district towns and other suburban towns by rural roads, which are mostly earth roads.

While urban population is increasing and urbanization is spatially expanding its areas, the rural areas outside the urbanizing areas are still important in agricultural production and as people's living places.

In the future, those rural areas will become more important in providing spacious recreation areas and green areas for urban dwellers, while the rural areas continue to provide urban people with fresh vegetables and fruits.

Such rural areas are considered to attract not only domestic tourists but also visitors from nearby urban areas for spending their leisure time.

8.13.2 Issues on Rural Development

Considering the background and current situation, the following issues are identified for spatial development for Greater Kumasi Sub-Region:

- Low productivity in agriculture in rural areas
- Poor rural roads hindering marketing of agricultural produce from rural areas
- High outmigration rates from rural areas
- Uncontrolled conversion of agricultural land to residential land under strong pressure for suburbanization from Kumasi
- Poor diversity of economic sectors, mostly small-scale agriculture
- Little private investment in economic sectors in rural areas
- Little private investment in agriculture, especially suburban agriculture sector
- Underdevelopment of formal industrial sector
- Low utilization of spacious land and green areas for recreational activities
- Prevalent and uncontrolled illegal mining, quarrying and sand winning activities in rural areas resulting in adverse environmental impacts

8.13.3 Objectives for Rural Development

Considering the above mentioned issues, the following objectives for rural development are set:

- Enhance urban-rural linkage in the socio-economy of the Greater Kumasi Sub-Region
- Protect and promote use of good agricultural land outside the Greater Kumasi Conurbation for farming
- Identify and develop rural towns which could be rural service centres with strong integration with Greater Kumasi Conurbation area
- Diversify economic sectors in rural areas by targeting the expanding urban and suburban markets of Greater Kumasi Conurbation
- Promote development of the formal industrial sector, especially in agro-processing industries together with promotion of private investment in agriculture for supply of raw material to agro-processing industries
- Promote responsible development of mining and quarrying activities
- Designate new and manage existing forests and conservation areas as well as management and protection of the environment in rural areas

8.13.4 Strategies for Rural Development

(1) Overall Strategies for Rural Development

For achieving the objectives set in the previous section, a variety of strategies for rural development are recommended as follows:

- Promote suburban agriculture which is to produce fresh vegetable and fruits, targeting at selling to an increasing number of middle-income urban dwellers in Greater Kumasi Conurbation
- Identify and protect good agricultural lands from uncontrolled urban sprawl by preparing District SDFs
- Designate and develop key rural towns so that the key rural towns could play roles of not only rural service centres but also agricultural centres
- Designate and improve key feeder roads connecting key rural towns and District Centres/Suburban Centres for stronger integration between rural areas and Greater Kumasi Conurbation
- Designate “Rural Planning Areas” for promoting integrated rural development with diversified economic sectors including agriculture, tourism (domestic tourism, recreation for urban dwellers), mining and agro-processing industries.
- Promote private investment in both agro-processing industries and agriculture in an integrated manner
- Development of destinations for recreational and leisure activities for domestic tourists and urban visitors
- Establish information centres at rural towns for domestic tourists and urban visitors
- Implement enforcement of laws and regulations both for promoting development of mining activities and management of the environment

- Demarcate existing and designate new forests and nature and wildlife conservation sites and policies and programmes for protection and management of the natural environment

(2) Rural Town Development for Enhancing Urban-Rural Linkage

Within the Greater Kumasi Sub-Region, twelve rural planning areas and Key Rural Towns are identified. See Figure 8.1.5.

- Each rural planning area has its own characteristics in agriculture, tourism and small industries.
- Key Rural Towns are not only service centres for rural people's lives in surrounding communities but also agricultural centres for providing chemical inputs, farming equipment and trading agricultural produce.
- Key Rural Towns are connected to district centres or regional roads through feeder roads.

1) Agricultural Centres

- Key Rural Towns are intermediate points linking farming areas and urban areas, distributing goods (fertilizers/pesticides, farming equipment, seedlings and others) to farmers and consumption products for farmers' families from urban areas to farming areas and collecting/processing and transporting agricultural produce from farming areas to urban areas.
- Such Key Rural Towns will become more important not only for increasing productivity of agriculture sectors but also for supplying raw materials (agricultural produce) to agro-processing industries.

2) Tourist and Recreational Centres

- In the future, Key Rural Towns will become more important as tourist and recreational gateways to their rural planning areas because increasing urban populations need rural, open and recreational space in surrounding areas of congested urban areas.
- Key Rural Towns should provide services (selling special products, art crafts, souvenirs and meals/resting, and others) for the tourists and visitors to recreation/sport areas.

(3) Agricultural Development Strategies for Rural Areas within Greater Kumasi Sub-Region

Agricultural development is one of the important components for rural development strategies in rural areas outside the Greater Kumasi Conurbation. The following points are part of the agricultural development strategies:

- Promote private business development of suburban agriculture in response to massive urban population increase
- Promote linkage among suburban agricultural businesses, government and universities (Agricultural College, CSIR, KNUST)
- Develop agricultural market places in Suburban Centres and District Centres

- Attract agricultural investments through promoting establishment of industrial estates for agro-processing industries

8.13.5 Specific Strategies for Each District

In addition to the overall strategies for rural development, each district has different focuses as follows depending on its own characteristics.

(1) Atwima Nwabiagya District

- Promoting agricultural production and development of agro-processing industries using orange and ginger
- Nkawie is the district centre with government administration functions and locations for agricultural market places and agro-processing industries

(2) Atwima Kwanwoma District

- Transform agricultural practice and agricultural product by targeting the urban and suburban markets to emerge in Greater Kumasi Conurbation and by improving feeder roads
- Promote private investment in agro-processing industries by ensuring stable supply of water and electricity (near New Bekwai Road)
- Modernize and upgrade metal work currently practiced in Ampeyoo and Krofrom
- Promote development of wood carving currently popular in Foase, Trabuom and Nweneso, aimed at domestic tourists and urban visitors
- Seek feasibility of gold mining in Adwuampong, Ampabame No. 1, Ahenema Kokoben, Nkoraza, Trede, Trabuom, Keykyebon and Aduwamse and protect them from illegal mining activities
- Regulate operators of sand winning to minimize negative environmental impacts in Konkori, Trabuom, Twedie, Adumwamse, Dida, Gyakye, Afrancho and Asago

(3) Bosomtwe District

- Conduct inventory of agricultural land and put measures in place to protect good agricultural land from suburbanization and illegal mining activities (e.g., by establishing agricultural protection zones)
- Promote development of gardens, children's play grounds, and golf courses for promoting recreational activities and attracting urban dwellers
- Promote private investment in agro-processing industries using cassava and others
- Organize events for traditional holidays and traditional food as part of tourism development strategies

(4) Ejisu-Juaben Municipality

- Promote vegetable and fruit production for urban residents in Ejisu and Juaben, as well as in Kumasi City
- Expand further oil palm production and agro-processing of oil palm
- Promote tourism attraction of oil palm plantations and palm oil factories

- Promote Juaben as a tourist attraction, which is a town with charm for tourism attraction and agro-processing industries

(5) Kwabre East District

Kwabre East District has almost no rural areas within the District. However, the following strategy is useful in the context of suburbanization:

- Promote suburban agriculture (even at small-scale) taking advantage of proximity to urban residential populations
- Promote and expand traditional textile industry (kente weaving and wood carving)
- Improve and promote tourist attraction of Adanwomase Tourism Management Organisation, Adinkra Craft Village and tourist information centre at Ntonso

(6) Afigya-Kwabre District

- Promote agricultural investment and agro-processing industries in the northern part of Afigya-Kwabre.
- Strengthen enforcement of laws and regulations against illegal and informal mining activities for protecting good agricultural land from such mining activities.

Chapter 9 Sub-Regional Strategies for Infrastructure Sectors

9.1 Transportation

9.1.1 Background on Transportation Development and Management

Transportation is one of the key elements to compose the spatial structure of Greater Kumasi Sub-Region, as well as one of the important functions to support social and economic activities of people in the Sub-Region. It is a big challenge to establish a well functioning transportation system that could satisfy the needs of Kumasi and its neighbouring districts, which are rapidly increasing their populations.

At the outset, the public transportation services are inefficient and this is due to various reasons. For instance, traffic congestion results in long and uncertain lengths of travel time among commuters. Waiting passengers at the terminal are deprived of basic services due to lack of toilets, urinals, benches, sheds, among other things which could make their waiting comfortable.

The imbalance of road development between Kumasi and surrounding districts was also noted. Although road connections and road surfaces were observed to be good in Kumasi City, the same observation can not be found in the surrounding districts. The road network of neighbouring districts is characterized by deteriorated road surfaces and missing links. As far as provision of alternative routes is concern to people living in the surrounding districts, the proposed Outer Ring Road will have a tremendous impact that would give travellers several options. However, it is not easy to choose and secure lands for constructing an Outer Ring Road.

Concerning freight transportation, traffic congestion is one of the serious issues affecting the economic sectors. Poor supply of infrastructure that supports the freight industry is also notable and partly manifested by indiscriminate parking of trucks observed along the major roads of Kumasi and its adjoining districts. Likewise, a high number of pot holes and other types of damages on the road surface along Kumasi – Tamale corridor were observed. Overloaded trucks were observed in great numbers in the corridors of Kumasi-Tamale and Kumasi-Accra. Likewise, a number of truck accidents were also witnessed which might be attributed to overloading and driving error.

The situation for pedestrians in the CBD is not encouraging either. Pedestrian walkways are uninviting for various reasons such as existence of illegal structures, presence of vendors, and cars treating the space as car parking among others. These

obstructions impede pedestrians' movements which often results in overflow of pedestrians onto the road. This reduces the capacity of the road and exposes pedestrians to danger. The Central Market is the best place to observe this scenario.

In order to address these issues, it is necessary to integrate transportation development and urban development (land use formation) not only at the stage of planning but also implementation.

9.1.2 Issues on Transportation

The following characterize the transportation issues of Greater Kumasi Sub-Region:

- The road network is dominated by a low capacity mode of transport at around 82% (cars, taxis and trotro).
- The public transportation services are inefficient.
- Traffic congestion is particularly severe in the city centre.
- Traffic congestion during peak hours is also strongly felt at major junctions.
- Long and uncertain length of travel time characterizes travellers' journeys.
- Road connection is observed to be good in Kumasi but not in the surrounding districts.
- Of the 1,753 km road network of Greater Kumasi Sub-Region, more than half (62%) are still unpaved.
- Most public transport terminals lack necessary facilities (e.g. sheds, toilets, or benches).
- Overloaded trucks are believed to cause major damage to arterial roads.
- Indiscriminate parking of trucks is observed along major roads.
- The pedestrian environment in the city centre is not conducive for walking.

9.1.3 Urban Transportation Vision

The transport vision for Greater Kumasi Sub-Region has to recognize the national transport vision of the country as well as the dire condition of the transportation system of the region. Taking into account the above, the urban transportation vision shall be:

"A Transportation System that economically and securely moves people and goods anytime, on time and compatible with the environment to contribute in the promotion of urban-based economic development and in realization of the quality of life."

9.1.4 Objectives for Transportation Development and Management

The objectives of the transport sector development and management are the following:

- To provide high quality of transportation infrastructure to strengthen socioeconomic linkage of Kumasi to surrounding districts and other regions
- To establish efficient public transportation along the key corridors of Greater Kumasi Sub-Region to facilitate mass movement of people and goods efficiently
- To support socio-economic development of Greater Kumasi Sub-Region and induce development along key corridors and surrounding districts

9.1.5 Policy on Urban Transportation System

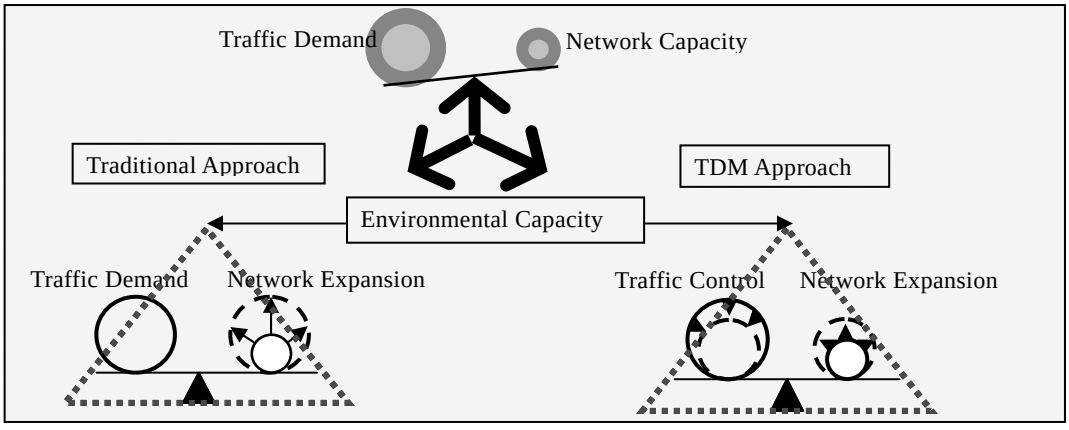
(1) Policy on Transport Corridor Development

Policy direction for urban transportation will gear towards the realization of the urban transportation vision. This policy will underscore the important role of public transport where the majority of commuters are relying on its services. Thus the objectives for urban transport policy shall be:

- Develop a transport system that contributes to realization of the national transport vision of the country which is to make Ghana the hub for the West African Subregion,
- Prioritize creation of mass transportation services along strategic corridors to improve mobility,
- Integrate land use and transportation planning (e.g. by ensuring that high traffic attracting/generating developments are well located within the transportation system or by requiring traffic impact assessments to be carried out for large scale developments),
- Create a framework where participation of the private sector in transport infrastructure development is encouraged, and
- Strengthen the link between Kumasi and surrounding districts by expanding the network capacity (e.g. widening of key arterial roads like Mampong Road, Lake Road, Sunyani Road, etc.).

(2) Policy on Transportation Demand Management (TDM)

In view of the limited resources to fund infrastructure development, it is necessary to explore other measures which have potential to contribute in addressing transportation problems of Greater Kumasi Sub-Region. Transportation Demand Management (TDM) is a general term for strategies that result in more efficient use of transportation resources, as opposed to increasing transportation system supply by expanding roads, parking facilities, airports and other motor vehicle facilities (Mobility Management, GTZ, 2003).



Source: JICA Study Team

Figure 9.1.1 Concept of TDM Approach

TDM operates through legislative, traffic engineering, and operational measures to attain the goal of a better traffic environment. Unlike infrastructure-based (or hard measures), TDM does not require huge capital investment making it an attractive option to policy makers.

9.1.6 Strategies of Transportation Development and Management

(1) Strategies for Highway Network System

The highway network of Greater Kumasi Sub-Region has shown stress in some areas due to the volume of users exceeding the limited capacity of some junctions. The road network of the core of the city is well developed and capacity expansion might be difficult due to built up areas. However there are some areas where capacity expansion is crucial and also possible. The following are necessary to improve the function of the network.

- Reorganize the hierarchy of roads within the Greater Kumasi Sub-Region/ Greater Kumasi Conurbation:
  - By identifying "Urban Arterial Roads" composing major roads/streets for Greater Kumasi Sub-Region/Greater Kumasi Conurbation.
  - By upgrading minor local roads to regional roads, which should serve as the connections between major radial roads within a 10km radius from the city centre
  - By identifying collectors/distributors among small roads
- Develop the mass transportation network's infrastructure composed of the following corridors: Mampong Road, Offinso Road, Sunyani Road, Bekwai Road, Lake Road, Accra Road, Antoa Road, Abrepo Road, Old Bekwai Road and the Inner Ring Road. Widening of these corridors to at least two-lane per direction to accommodate a dedicated lane for a mass transportation system is desirable.
- Develop the Outer Ring Road to enhance the function of the road network and to eliminate transit traffic through urban areas of Kumasi and also to disperse incoming traffic to urban centres.
- Recognize the importance of constructing the first section of the Outer Ring Road between Ejisu and Kodie to accelerate new development in Mamponteng and Kodie.
- In addition to the Inner Ring Road and Outer Ring Road, promote the realization of a middle ring road for better traffic circulation by identifying existing roads that can be improved to form a Middle Ring Road.
- Develop a new arterial road from Ejisu to Kumasi that runs parallel to Accra Road to provide an alternative route and to further strengthen the connection between the two key towns.
- Recognize the necessity to increase the road capacity by widening critical roads for traffic such as the Western Bypass section, Southern Bypass section, Lake Road, Mampong Road, Harpor Road, New Bekwai Road, Antoa Road. Coupled with this effort, the construction of missing links like connecting Lake Road to Century Hall Road, and Old Bekwai Road to New Bekwai Road could provide

more direct routes.

- Consider construction of grade separation at critical junctions like Suame, Abrepo, Sofoline, Anloga, and Bewai to reduce snarled traffic and improve traffic flow.

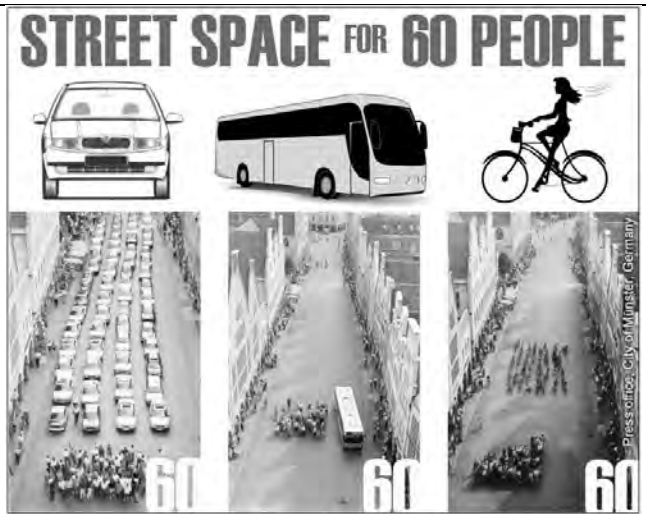
(2) Strategies for Public Transport System

Public transport is the mobility means of the majority of travellers in Greater Kumasi Sub-Region. Enhancement of the system to make it a truly public transport oriented system is therefore desirable. The following will be crucial in this direction:

- Promotion of a shift from low capacity (trotro) to high capacity public transport system (large bus) as a backbone of the transportation system. To ensure higher success of bus-oriented transportation, trotro routes should not compete with bus routes. Trotro can operate as feeders to buses or other roles that are complementary to bus service.
- Development of BRT and a bus network that covers the nine radial roads and Inner Ring Road.
- Development of "Urban Arterial Roads" to establish these public transport corridors, where large buses are operated, and some of which are used for BRTs.
- Development of Transfer Points/Interchange Hubs in Tafo, Anloga, Kwadaso, Abinkyi, and Ejisu where long distance trips terminate. Trips to their final destinations will be facilitated by another transport mode.

As for the role of the railway, it is considered that by 2033, the railway plays an limited role only by rehabilitation of the existing railway lines (between Boankra/Ejisu and Kumasi and between Bekwai and Kumasi). For Greater Kumasi, heavy railway is considered too expensive to operate at least by 2033. However, the establishment of BRT routes on six major radial roads could prepare the foundation for railway's future development by utilizing the space (dedicated lanes) for BRT.

- Amount of space required to transport the same number of passengers (60) by car, bus, or bicycle.
- The space used by cars is good for 16 buses (equivalent to transporting 960 passengers)



Source: Transportation Demand Management, April 2009, GTZ

Figure 9.1.2 Efficient Road Space Usage

(3) Strategies for Traffic Control and Demand Management System

Transportation Demand Management (TDM) measures play significant roles in restraining traffic demand particularly in the Kumasi City Centre. Some of the policies that might be helpful to restrain traffic in Kumasi include:

- Integrate public transport services – physical integration and operational integration (e.g. coordinated arrival schedule between BRT and feeder services)
- Prioritize public transport over private transport by provision of priority lanes for buses particularly BRT
- Prioritize bus and BRT at intersections to improve service reliability
- Optimization of traffic light signals in Abrepo Junction, Kofron Junction, Zoo Junction, Aboabo Junction, Top High Junction, Anloga Junction and Amakom Junction to improve traffic flow.
- Apply vehicle access restrictions (e.g. one-way restriction) in areas with a high number of pedestrians like Adum and Central Market.
- In the future, consider implementing truck access restrictions (truck ban) on heavy trucks (e.g. 3.5 ton) from entering the Inner Ring road to contribute to decongestion.

1) Strategies for Parking Management System

Provision of paid parking spaces particularly in high density areas like the CBD will reduce the problem of illegal parking on the road's shoulder which affects traffic flow. Paid parking is already implemented in the CBD of Kumasi (793 slots for off-street and 1,278 slots for on-street) and has been successful. Further measures that can be considered are:

- Expansion of paid parking (both off-street and on-street) to other areas in the CBD
- In the view of the limited space, consider multi-storey car parking in the CBD
- Development of a framework for participation of the private sector in parking provision
- Integration of parking facilities in local plans

2) Strategies for Walking and Cycling Systems

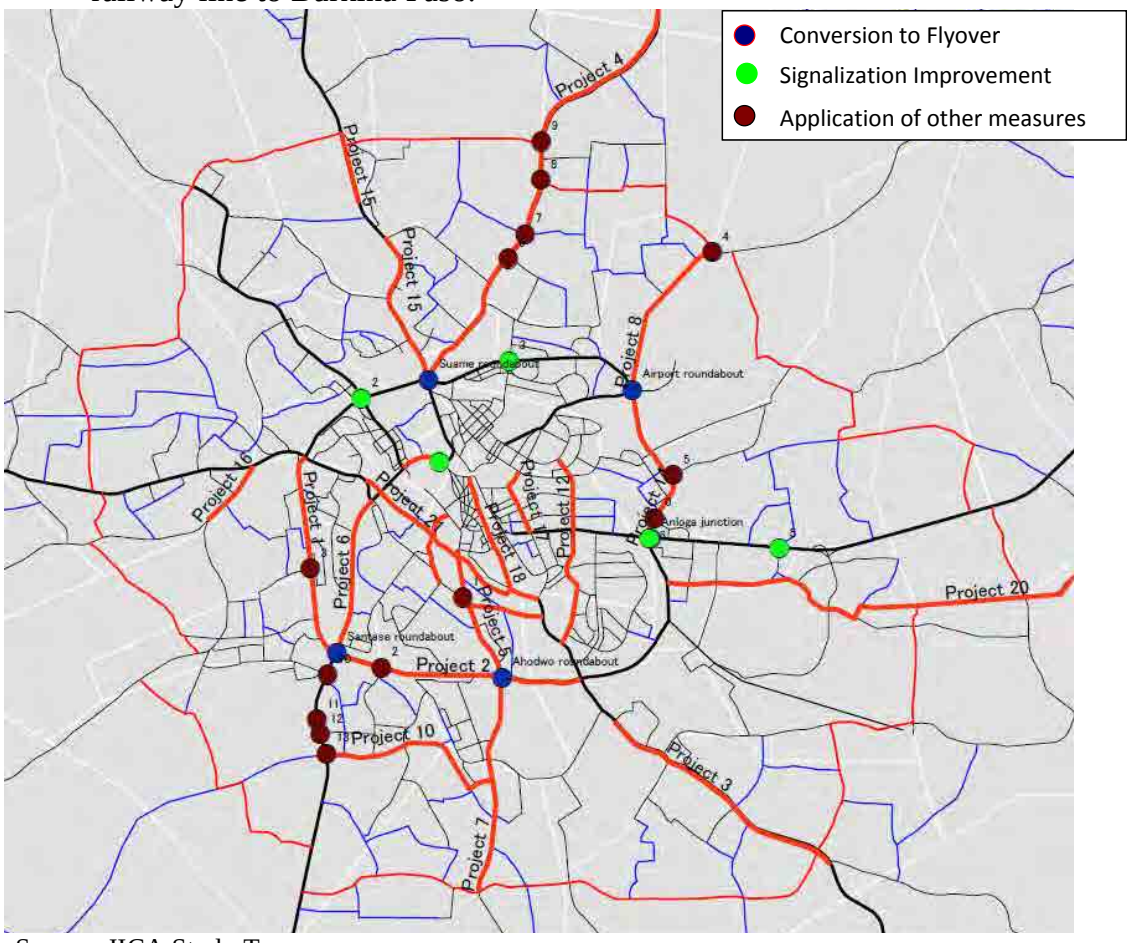
Walking and cycling are desirable for short distance travel. These two modes can contribute to decongest the overloaded road network. The following should be pursued to promote walking and cycling.

- Encourage walking and cycling by improving walkways, street crossings, protection from fast vehicular traffic, and providing street amenities like trees, awnings, benches, etc.
- Prevent vendors, pavement dwellers, vehicle parking and other uses from blocking walkways.
- Establish walkway network in highly dense areas like Adum and Central Market
- Integration of walking and cycling lanes in local plans and new developments

(4) Strategies for Freight Transport System

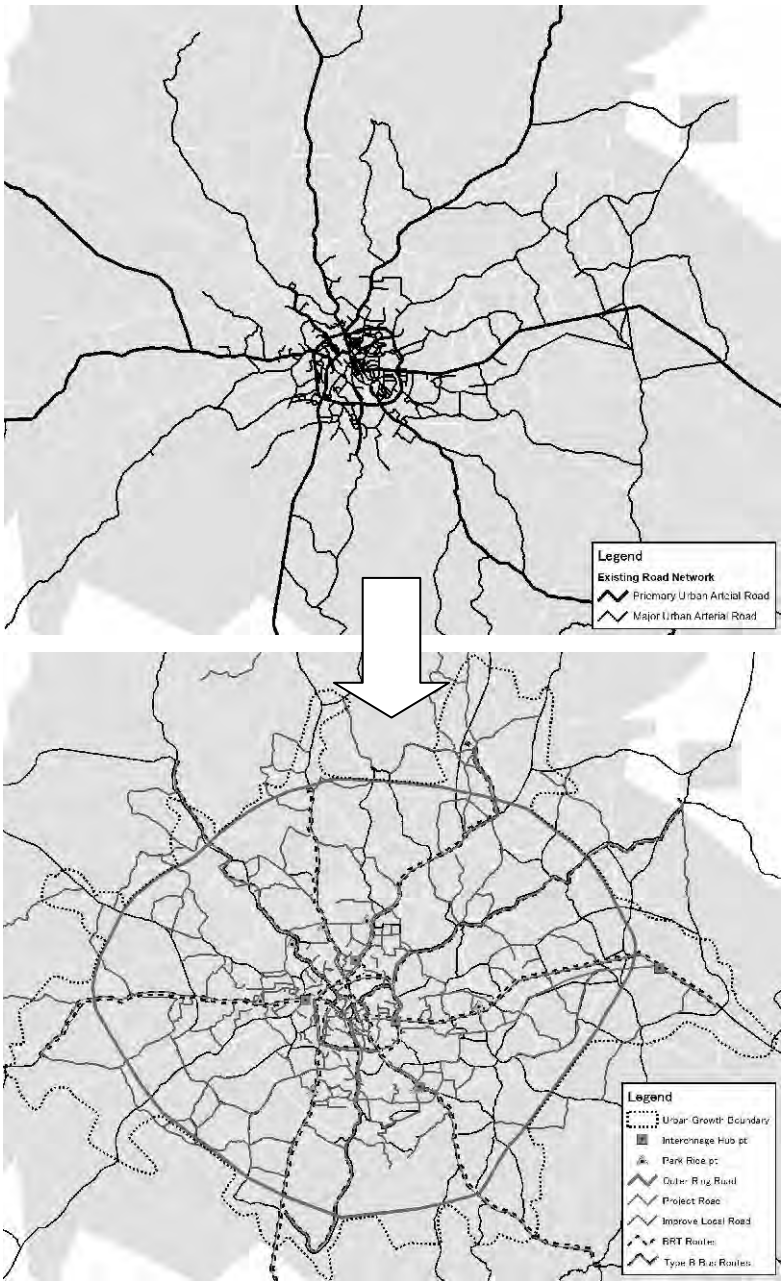
The central location of Greater Kumasi Sub-Region within the country will enable it to act as logistics hub for both Ghana and neighbouring landlocked countries. Trade facilitation at ports has been tremendously improved by the introduction of state-of-the-art GCNet (Ghana Community Network Services Limited) which reduced processing time for trade documents from 2-7 days to 2 minutes. Kumasi will benefit from this improvement in its effort to become a logistics hub. The following measures can further reinforce Kumasi's development as a logistics hub:

- Strengthen the following logistics corridors by means of better road maintenance and road widening.
- Accra-Kumasi; Kumasi-Tamale-Burkina Faso; Takoradi –Tamale.
- Strengthen monitoring of overloaded trucks along the logistics corridors to protect road assets and to reduce accidents.
- Support full operation of the dry port in Boankra by early construction of a railway and consider expansion of functions to become a Logistics centre.
- Promote rehabilitation of freight rail and push for connection via railway from Boankra Dry Port to Tema port and Takoradi Port and eventually extend a new railway line to Burkina Faso.



Source: JICA Study Team

Figure 9.1.3 Location of Proposed Projects for Road and Intersection Improvement



Source: JICA Study Team

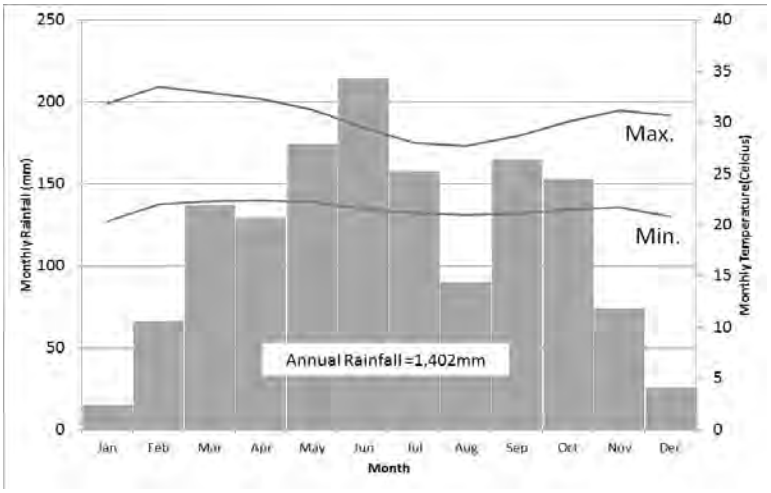
Figure 9.1.4 Transportation Sector Diagram

9.2 Water Resources

9.2.1 Background

(1) Climate Aspect

The climate of Kumasi area is wet and semi equatorial with a mean annual rainfall of 1,402 mm (1961-1990). Minimum and maximum temperatures are around 21°C and 30°C, respectively, with little variability throughout the year. Rainfall is slightly bimodal with a short dry period in August. Nearly 90% of the rainfall is recorded in the seven months of the two wet seasons (from March to July and September to October).



Source: WMO Internet Site

Figure 9.2.1 Monthly Rainfall and Temperature in Kumasi (1961-1990)

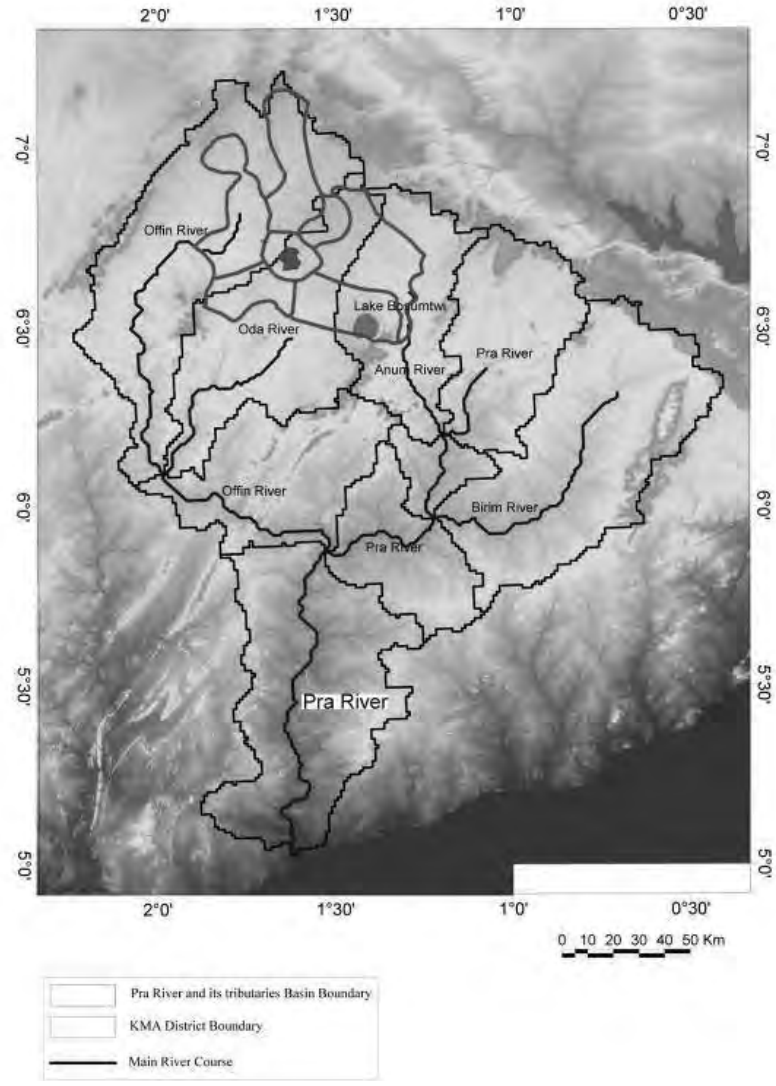
In terms of the water resources aspect, from the above climate condition two significant issues can be pointed out as follows:

- Because of the small variation of monthly temperature, the evapotranspiration from Kumasi area can be assumed to be constant throughout the year as well as annually.
- Because of distinct rainy and dry seasons, the river flow also has significant seasonal variation, so that taking river water without interruption for water use is difficult. This means storage of river water behind a dam is necessary to obtain a constant supply of water from the river.

Next, the more significant feature for Kumasi surface water resources can be derived from its hydrological location.

(2) Hydrological Aspect

Kumasi is located on the most upper part of the Pra River Basin as shown in Figure 9.2.2.



Source: JICA Study Team

Figure 9.2.2 Location of Kumasi (KMA) in Pra River Basin

The Pra River rises in the Kwahu Plateau near Mpraeso and flows southward for 240 km through rich cocoa and farming areas and valuable forests in the Akan lowlands, and enters the Gulf of Guinea east of Takoradi. The entire catchment area is about 23,700km^2. The right tributary of the Pra River is the Offin River, and the Oda River joins the Offin River from the left side. The catchment area of the Offin River at the Oda River confluence is 4,400 km^2. The catchment area of the Oda River is 2,800 km^2.

(3) Topographical Aspect

Kumasi is located on a drainage divide of the Offin and the Oda Rivers. Over 25% of the developed area drains to the west, eventually joining the Offin River. About 75% of the developed area drains to the Oda River in the south of the city.

Greater Kumasi Sub-Region is located on the upper part of the Pra River basin and KMA and urbanizing portions of adjoining districts (herein after called KMA) has been developed on the watershed divide of Oda River and Offin River.

(4) Geological Aspect

The Basement Complex underlying KMA is made up of rocks of the Birimian System and associated granites and the Voltaian System in the north-east of KMA consists mainly of Lower Voltaian type of rocks such as quartz-sandstone and pebbly grits. The rocks of the basement complex and the Voltaian formation have little or no primary porosity.

Groundwater occurrence is thus associated with the development of secondary porosity as a result of jointing, shearing, fracturing and weathering. This has given rise to two main types of aquifers; the weathered zone aquifers and the fractured zone aquifers.

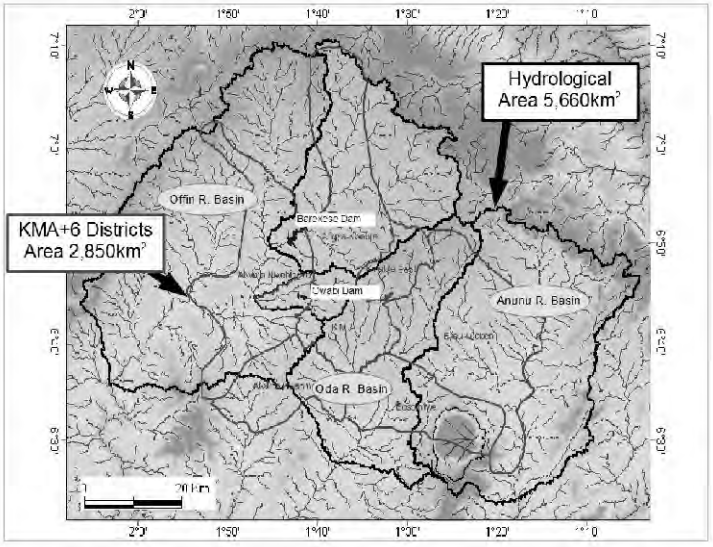
The weathered zone aquifers usually occur at the base of the thick weathered layer. The weathered layer varies from 0 m (at outcrops) to about 100 m and is estimated to reach an average thickness of some 30 to 40 metres around KMA.

The fractured zone aquifers usually occur at some depth beneath the weathered zone. Both types of aquifers are normally discontinuous and limited in area. Due to the sandy clay nature of the weathered overburden, the groundwater occurs mostly under semi-confined or leaky conditions.

(5) Water Resources Aspect

In terms of the water resources aspect, from the above topographical condition two significant issues can be pointed out as follows:

- Because of the location of Kumasi within the Pra River Basin, the usable river basin area for water resources development is limited to the most upper part of the Offin and Oda River catchments.
- Since Kumasi is located on the most upper part of the Pra River system, the effect on downstream areas by any development in Kumasi should be taken into consideration in terms of the surface water related environment.



Source: JICA Study Team

Figure 9.2.3 Designated Hydrological Area for Greater Kumasi Sub-Region

(6) Summary of Characteristics of Water Resources for Greater Kumasi Sub-Region

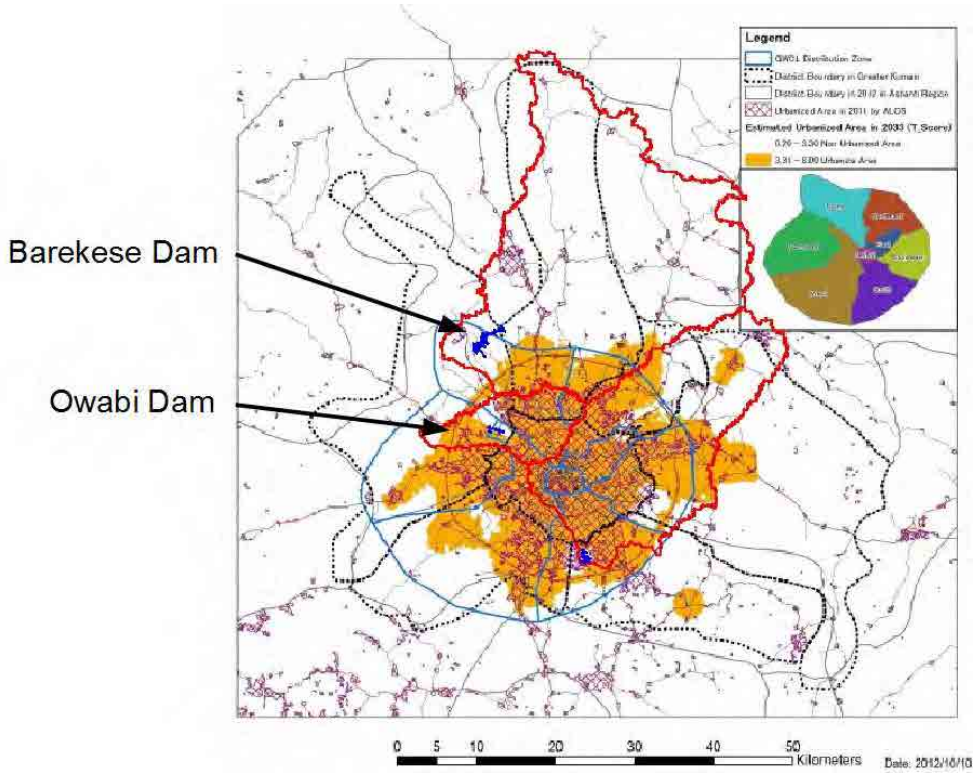
The following points are a summary of the characteristics of water resources for Greater Kumasi Sub-Region:

- The above features mean that Greater Kumasi Sub-Region is faced with a great challenge to develop sustainable water resources. In terms of surface water, Greater Kumasi Sub-Region has only a very small river catchment in the upper area for surface water potential (amount). In terms of groundwater, KMA has a smaller size of recharge area because it is on a watershed divide.
- If KMA seeks surface water sources from outside of the Greater Kumasi Sub-Region, the water can become more expensive because of the long distance for transport and pumping of water.
- Surface water is "flow" and groundwater is "stock". In general, water supply for mega cities should be based on surface water resources ("flow"), while groundwater should be used in a supplemental way.
- Therefore, Greater Kumasi Sub-Region should face a lot of challenges to ensure sustainable water resources development.

9.2.2 Issues on Water Resources Development

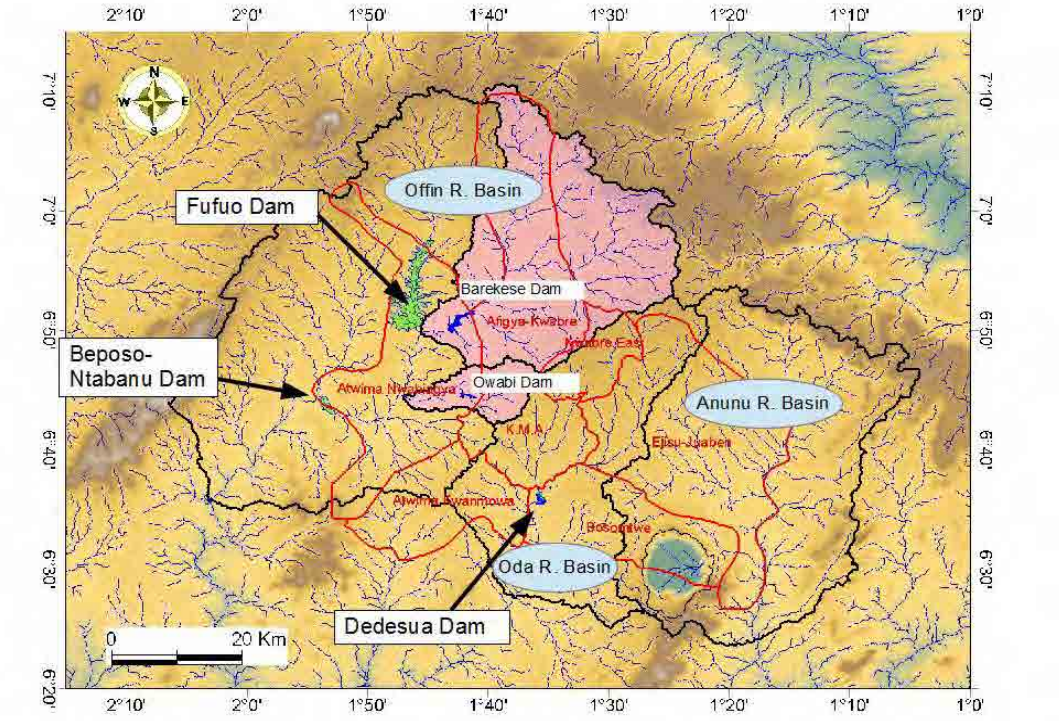
The following issues on water resources development are identified for Greater Kumasi Sub-Region:

- Surface water (taken from Barekese Reservoir / Owabi Reservoir as shown in Figure 9.2.4) and groundwater are used in Greater Kumasi Sub-Region. At present, quite a few people in the urban area rely on private groundwater usage because of insufficient pipe-borne water supply based on surface water.
- Storage capacity of Owabi Dam's reservoir has decreased because of sedimentation due to erosion caused by illegal logging and development in the catchment of the reservoir.
- Owabi's water quality is worsening due to (1) liquid/solid waste from illegal inhabitations in and around the area reserved for water catchment, and (2) liquid waste flowing from urbanized areas outside of the area reserved for catchment.
- Due to the population increase in the future, additional development of surface water resources will be necessary. However, additional surface water resources to be developed have not been decided yet. As a result, it is not possible to identify areas to be protected at this moment.
- Currently, Ghana Water Company Limited (GWCL) is considering the 3 locations as shown in Figure 9.2.5. However no decision has been made by the Government (Ministry of Water Resources) because no feasibility study has been done yet.
- Ground water has not been monitored; thus, it is difficult to exactly know the situation of the ground water.



Source: JICA Study Team

Figure 9.2.4 Location of Water Supply Dam Basins and Future Urban Areas (Tentative) of Greater Kumasi Conurbation



Source: JICA Study Team

Figure 9.2.5 Location of New Water Sources Studied by GWCL

9.2.3 Objectives for Water Resources Development

After consideration of the present situation and issues identified, the following objectives for water resources development are set for Greater Kumasi Sub-Region:

- To increase/maintain storage capacity of the existing dams because, currently, the existing dams are underutilized due to sedimentation.
- To preserve new water sources for surface water for prospective dam development from hydrological designated areas in and around Greater Kumasi Sub-Region because it is anticipated that a substantial water shortage will take place due to the increase of water usage in the area.
- To clarify water budget among surface water and groundwater in hydrologically designated areas based on hydrological monitoring data because sustainable water resources management is necessary to make full use of the amount of naturally available water resources.
- To decide and implement the utilization of an appropriate amount of groundwater since the groundwater resources in Greater Kumasi Sub-Region are limited and fragile because of its location on the head waters of Oda River, Offin River and Anum River.

9.2.4 Strategies for Water Resources Development

(1) To designate the hydrological area for Greater Kumasi Sub-Region

The hydrologically defined area of 5,660 km^2 is designated as the water resources planning unit as shown in Figure 9.2.3.

(2) Protection/Rehabilitation of Existing Dams

It is essential to protect existing water resources available from the existing reservoirs of Owabi Dam and Barakese Dam by implementing the following strategies:

1) Protection/Rehabilitation of Owabi dam and the Catchment Area

Owabi dam is aged (constructed in 1928). Rehabilitation of the dam structure might be necessary. The capital and maintenance dredging in the reservoir are the first priority.

The catchment of Barekese Dam reservoir as a drinking water source shall be protected from any pollution in principle. Controlling efforts against illegal logging and housing development in the reserved area surrounding the reservoir are essential. As efforts of the drainage and liquid waste management sectors, waste water flowing into Owabi Reservoir should be prohibited. Solid waste must not be dumped into the rivers.

2) Protection/Rehabilitation of Barekese Dam and its Catchment Area

In order to protect the water resources of Barekese, the following strategies should be implemented:

The capital and maintenance dredging in the reservoir are the first priority. The dredged volume as the capital dredging is about 10,000,000 m^3. The same strategy as the first one should also be conducted in the catchment of Barekese as the designated hydrological area.

The catchment of Barekese Dam reservoir as a drinking water source should be protected from any pollution in principle. If large-scale new development within the catchment is planned, its waste water control should be strictly conducted.

(3) Development of New Surface Water Resources

1) Development of Water Resources and Protect the Catchment Area

Further studies should be conducted to identify appropriate locations and examine the feasibility of the project for water resources development.

2) Conservation of Dam and Reservoir Sites

It is essential to secure candidate areas for the development of dams and reservoirs even in if water resources development is not necessary until some years in the future.

(4) Strengthening of Hydrological Monitoring in the designated hydrological area

The following locations are to be prioritized for daily discharge measurement.

- Barekese Dam outflow
- Owabi Dam outflow
- Dedesua
- Beposo-Ntabanu
- Fufuo

(5) Introduction of Ground Water Monitoring System

In order to conduct a study to grasp appropriate ground water usage, it is essential to first collect data regarding ground water usage including:

- Inventory of existing boreholes
- Water level monitoring (monthly)
- Recording of abstracted water volume for each borehole
- Hydrologeological survey to clarify the aquifer conditions in the designated area.

9.3 Water Supply

9.3.1 Background on Water Supply

(1) Water Supply for Urban Areas by Ghana Water Company Limited (GWCL)

1) Water Treatment Plants

Barekese Water Treatment Plant and Owabi Water Treatment Plant are the waterworks which produce piped water for the water supply areas of Ghana Water Company Limited (GWCL). The capacities of Barekese Water Treatment Plant and Owabi Water Treatment Plant are 110,000 m^3/day and 13,500m^3 respectively.

Treated water is pumped from Barekese and Owabi Water Treatment Plants to Suame Water Tanks. In Suame, there are three underground tanks and one elevated tank. The storage capacity of those tanks is 19,090 m^3.

2) Water Pipelines

The total length of GWCL's water distribution network is about 1,050 km, according to GWCL. Those pipelines' diameters range from 13 mm to 900 mm.

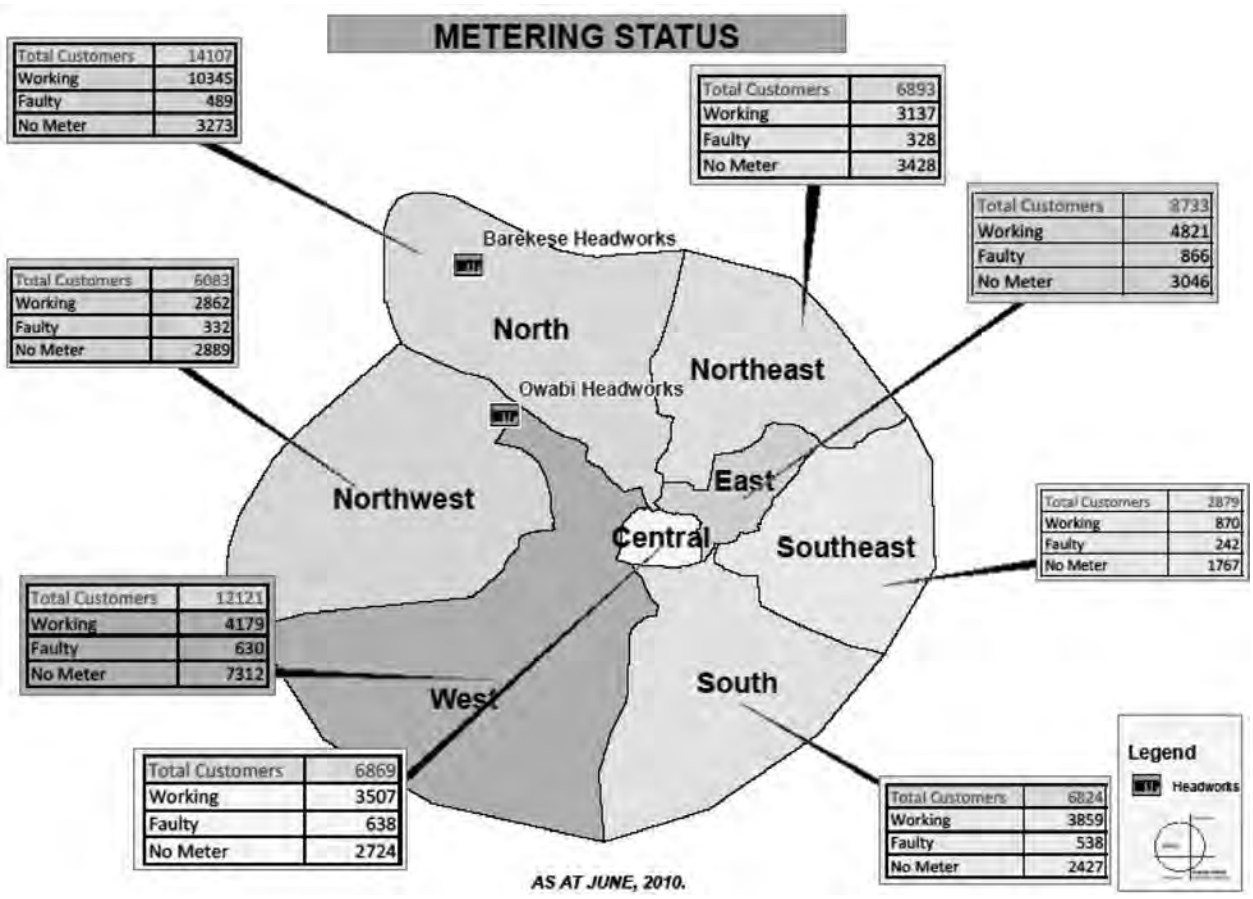
The areas administered by GWCL are KMA and its adjoining districts, as shown in Figure 9.3.1. The coverage of water supply by GWCL is limited to urban areas mostly within KMA and small areas of adjoining districts. The population with access to GWCL piped water supply is estimated to be 1.6 million out of the 2.8 million population (in 2010) in the Greater Kumasi Sub-Region. The access rate of those who have access to piped water is just 60% in Greater Kumasi Sub-Region.

3) Groundwater Utilization

In addition to water treated at the water treatment plants, groundwater is also widely used in the GWCL area. GWCL has drilled boreholes for supplying groundwater to private/ institutional customers on a commercial basis, but not for the piped water distribution system.

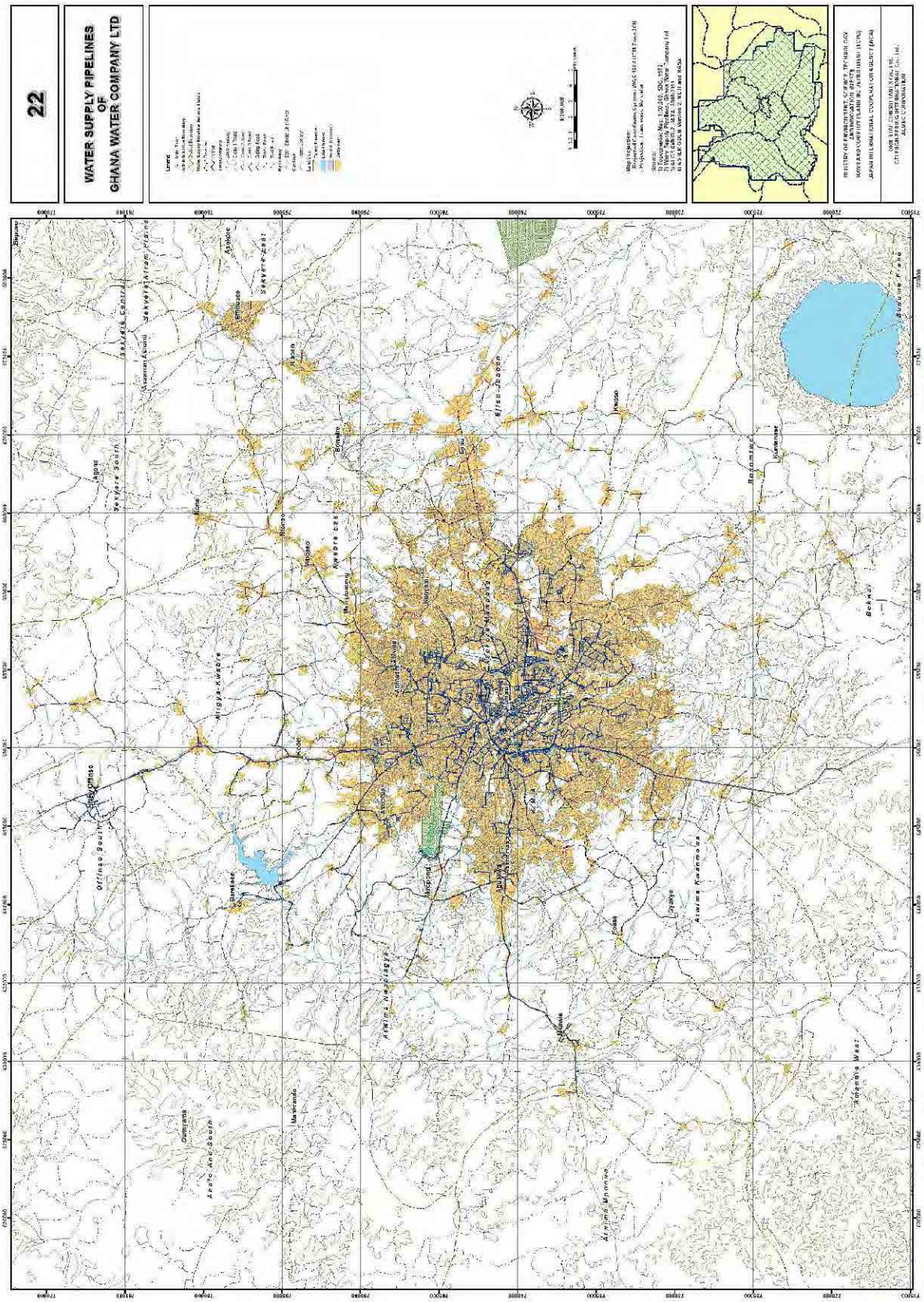
(2) Water Supply for Suburban and Rural Towns

In suburban and rural areas, where piped water supply is not available, residents generally use groundwater from wells. The construction of the wells for rural towns is conducted by a Committee of the Water and Sanitation Agency based on a request from district assemblies or KMA.



Source: GWCL, cited by Colombia University, 2010, MCI Social Sector Working Paper Series No.16, A Water and Sanitation Needs Assessment for Kumasi, Ghana

Figure 9.3.1 Business Areas of Ghana Water Company Limited in Greater Kumasi Sub-Region, as of June 2010



Source: GWCL, 2012

Figure 9.3.2 Main Water Pipelines of Ghana Water Company Limited in Greater Kumasi Sub-Region

9.3.2 Issues on Water Supply

(1) Shortage of Capacity of Water Supply Facilities to Fulfil Increasing Water Demand

Within Greater Kumasi Conurbation, only 50% of the urban population is served by the piped water supply of GWCL, while 90% of the KMA people have access to piped water. Since the population increase rates of Greater Kumasi Conurbation are as high as 8% per annum in accordance with the future population framework (2010-2028), it is too difficult for GWCL to upgrade the capacity of piped water supply to fully satisfy the increasing demand for water in the future. Although it is important to make an effort at largely upgrading the water supply capacity (by developing additional water sources, installing additional water treatment modules and by extending pipelines), it is necessary to strategically select the target areas for piped water supply by considering the efficiency of the water supply system and urban/industrial development.

(2) Limited Capacity of Water Supply with Pipelines

If all the population of GWCL's target water supply area is provided with pipelines, a new dam with a capacity almost equal to Barekese Dam will need to be developed. But in order to construct a new dam, substantial investments including pipeline installation are needed and the term of construction is very long. Therefore it is important for GWCL to take strategic measures for utilizing the existing water resources.

(3) High Rates of Non-Revenue Water

The rate of Non-Revenue Water (NRW) in 2008 was about 40%. Revenues from water supply are important financial sources for GWCL to be able to continue rehabilitating water supply facilities and to upgrade the capacity of the water supply in response to increasing water demand. In this sense, it is essential to substantially reduce NRW to as low as 10-15% by 2033.

(4) Numerous Old Pipelines in the Distribution System

The present water distribution system is relatively old. Therefore, rehabilitation or replacement of water pipes is substantially necessary. It is especially necessary to replace those pipes made of asbestos cement in order to prevent pipes from bursting and leaking.

(5) Low Rates of Installation of Water Meters

There are a substantial number of customers without water meters. The rate of working water meters was 53% of the total costumers in 2010. In order to reduce NRW and increase revenue, it is required for GWCL to increase the number of water meters.

(6) Insufficient Water Supply in Rural Towns

The number of boreholes for water supply to rural towns is currently insufficient in Greater Kumasi Sub-Region. It is necessary to drill new boreholes to supply water for rural towns.

9.3.3 Objectives for Water Supply Development

The objectives of water supply development are as follows:

(1) Expanding to satisfy the increase in demand for water due to population growth and urbanization

At present there are still many residents that use water from unprotected wells, springs and rivers. And many users of piped water and protected wells can't get enough water.

Besides, the quality of piped water does not always comply with Ghana's Standards, especially for Turbidity and Total iron. And regarding quality of groundwater, there is no information about sampling tests.

The target in this aspect for 2033 is that all residents should be provided with an adequate quantity of clean water that complies with Ghana's Standards from pipes or protected wells.

(2) To provide stable water supply depending on the condition of each area

Expansion of the piped water supply area and locating new water sources is planned.

But it is difficult to satisfy the demand, because the speed of population growth is too great to expand the piped water supply area at the same rate which also requires finding and constructing new water sources.

Therefore, in the near future, it will be necessary to select water supply methods in accordance with the conditions of each area.

(3) To improve the management of the water supply business

At present, GWCL cannot provide a stable and adequate supply of clean water. Moreover, GWCL has not been able to ensure a proper income because of the large amount of Non-Revenue water. The target for 2033 is to improve the management of the water supply business.

9.3.4 Strategies for Water Supply Development

(1) Effective Utilization of Existing Facilities

It is necessary to extend, upgrade and rehabilitate existing facilities such as the water treatment plant and water pipes in order to respond to the rapidly increasing demand for piped water supply and comply with Ghana's water quality Standards.

- Increase the capacity of the existing water treatment plant and water tanks
- Upgrade the capacity of the water transportation lines
- Rehabilitate and replace water pipelines with problems

9.4 Liquid Waste Treatment

9.4.1 Background on Liquid Waste Treatment

(1) Toilet Facilities

The 2011 annual report prepared by the Kumasi Metropolitan Assembly Waste Management Department (KMA-WMD) states that out of over 2 million population in KMA, 35% rely on public toilets, about 50% have access to household toilets (most rely on on-site holding facilities, such as septic tanks) and the remaining defecate indiscriminately. In the Districts and Municipality surrounding KMA, there are higher rates of people who rely on public toilets and defecate indiscriminately.

(2) Liquid Waste Facilities

Of all the communities in Kumasi, only three (Asafo, Ahinsan and Chirapatre) are equipped with sewerage treatment systems, in which black water from toilets are collected by pipes and carried to stabilization ponds. According to the 2010 Population and Housing Census, only 5% of households in KMA are connected to the sewerage system.

Septic tanks need facilities to treat and dispose of the septage. At present, in the Greater Kumasi Sub-Region, there is only one septage treatment and disposal facility, which is Oti Septage Treatment Pond.

(3) Effluent Waste Water from Industries

There are some large factories for industries, and some of them have not installed waste treatment plants on the sites, in accordance with Environmental Health Officers.

(4) Past and Existing Development Plans and Projects for Liquid Waste Sector

Under the UNDP Water and Sanitation Program, KMA had produced a Strategic Sanitation Plan for Kumasi (SSP-Kumasi) in 1999. This plan recommended different sanitation systems for different areas of the city.

According to KMA-WMD, SSP-Kumasi was not finalized; thus no detailed plan was proposed in the report. Moreover, due to population growth in KMA, the situation has changed since 1999. Therefore, it is clear that an updated sanitation plan is necessary.

All the districts and municipality surrounding KMA have an Environmental Sanitation Action Plan. The plans generally propose the construction of toilets; however, it seems that there is difficulty in implementation. Although MMDAs should ensure the availability of facilities for the liquid waste, it seems that the districts and the municipality have been receiving assistance from the Community Water and Sanitation Agency (CWSA) for the provision of toilets in the past.

Furthermore, a few assemblies are taking action to construct septage treatment facilities in their own areas; for instance, Kwabre East District Assembly is

negotiating with the land owners to build septage facilities at Kenyase and Abirem, and Ejisu-Juaben Municipality Assembly is planning to construct a sewage treatment plant of not less than 100 ha in size along the Oda River. However, definite plans are not yet available.

9.4.2 Issues on Liquid Waste Treatment

(1) Low Accessibility to Hygienic Toilets

Although there are some public toilets in KMA and the surrounding District and Municipality, most of the households use public toilets (86%)[1], but they were not satisfied with the cleanliness or odours. Moreover 3% of the people in KMA and a higher percentage in the surrounding District and Municipality cannot access household toilets or public toilets[2].

In the future, the expected population growth will cause an even greater shortage of access to hygienic toilets facilities.

(2) Insufficient Sewerage System

Although SSP-Kumasi had concluded that a simplified sewerage system is the most economic system for the liquid waste treatment, only 3 communities (approximately 5% of the households) in KMA are sewered. Therefore, more sewerage systems are necessary in the future.

(3) Non-compliance of Industry with Environmental Standards

As stipulated in the Environmental Sanitation Policy, liquid industrial effluents must be pre-treated by industries to prescribed standards before discharging into the water bodies. However, an abattoir is not equipped with this waste treatment facility hence it has been discharging its untreated effluents into the water bodies.

In the future, more industries are expected to arise as economic development is promoted; thus it is essential for local governments to take more efforts to regulate / enforce industries to install treatment plants on their sites to ensure that their wastewater discharge into the water bodies is not contaminated.

(4) Districts and Municipality surrounding KMA

Due to the population growth in the Greater Kumasi area, all the districts and municipality surrounding KMA will face the issues KMA is currently facing.

Currently, septage and wastewater of surrounding districts and municipality is conveyed to and treated at Oti Septage Treatment Pond so the transport of septage is costly for surrounding districts and municipality due to their distance to the pond.

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[1] S.Oduro Kwareteng, E.Awuhah & K.B. Nyarko (2009) Shifting from public shared toilets to home toilets in urban settlements: Implications of household demand in Kumasi, Ghana (34th WEDC International Conference)

[2] 2000 Population and Housing Census Ashanti Region Analysis of District Data and Implications for Planning

(5) No Comprehensive Study in Greater Kumasi Sub-Region

In the future, a conventional sewage system will be necessary in Greater Kumasi Sub-Region, especially in urbanized areas (Greater Kumasi Conurbation area), because of population growth and change of life style. Moreover, grey water generated from domestic processes such as washing dishes, laundry and bathing is not treated, but in the future it is essential to treat grey water.

9.4.3 Objectives for Liquid Waste Treatment

(1) Access to Hygienic Toilets

There are many residents defecating indiscriminately, so the target for 2033 is that all residents should have access to hygienic toilets, public toilets facilities at least.

(2) Adequate Treatment of Liquid Waste

There are some cases of treatment for Liquid Waste in KMA and the surrounding Districts and Municipality, so the target for 2033 is that appropriate treatment methods should be applied based on the type of wastewater, population density and etc.

(3) Improve Sanitation Environment Gradually

In the short term, it is recommended to treat industrial effluent and black water discharged from domestic and commercial sources. But in the future all waste water, including grey water, should be treated, so the target for 2033 is preparation of conventional sewerage systems.

9.4.4 Strategies for Liquid Waste Treatment

(1) Increase Access to Hygienic Toilets

Firstly, it is important and essential to educate the people regarding the importance of hygienic toilets.

Secondly, construct public toilet facilities to reduce the percentage of the population which defecate indiscriminately, although, according to the UNICEF / WHO Joint Monitoring Programme on sanitation, public shared toilets (and home toilet facilities shared by more than one household) are not considered as improved sanitation.

Thirdly, provide financial support to residences for the construction of household toilets.

In order to increase the access rate to hygienic toilets, these above three strategies are the most important in the short term.

(2) Construct Sewerage Systems in Highly Populated Areas

In the areas with high density population, sewerage is the only viable option, as there is insufficient open space for Water Closet (WC) / septic tank drain fields, inadequate room on the ground floor for Ventilated Improved Pit (VIP) latrines, and interference from the multi-storey buildings themselves with the wind flow needed

for proper ventilation of VIP latrines.

Liquid waste collected will be treated at the stabilization pond. Thus, it is essential to reserve land (relatively low lying area) for the stabilization pond near to the highly populated areas to collect liquid waste efficiently.

(3) Enforce the Environmental Policy and Regulations

To enforce laws to ensure industry, commercial and individuals comply with the environmental sanitation policy is an essential strategy.

(4) Construct Septage Treatment Pond in Each District

Regarding a solid waste management sub-sector programme, it is recommended to construct small-scale final landfill sites in each district. Since in this case, final landfill sites should treat leachate, it is recommended to construct septage treatment ponds along with final landfill sites and treat the septage discharged from the district.

Construction of a final landfill site and a septage treatment pond in the same site will reduce transport cost of septage and wastewater.

9.5 Solid Waste Management

9.5.1 Background on Solid Waste Management

In recent years, due to the rapid rate of urbanization and population increase in the Greater Kumasi Sub-Region, Kumasi Metropolitan Assembly (KMA) and the adjoining five District Assemblies and one Municipality Assembly seem no longer be tolerated technically and environmentally. Many environmental challenges on Solid Waste Management (SWM) have been caused by the uncontrolled dumping over the years in the past which have serious consequences on public health and environmental hazards.

According to a 1999-study, it was estimated that two-thirds of residential waste was dumped in open lots or on the banks of natural streams (Post, 1999). The collected waste posed a serious health hazard and contaminated surface water sources. The KMA has responded to the major challenge of maintaining clean environmental sanitation status over the years. In 2008, the Kumasi Metropolitan Assembly Waste Management Department (WMD-KMA) presented "the Case of Kumasi, Solving the Fundamental Challenges" to the public, on how filthy the open dumping sites in the KMA were and how the dump sites were drastically changed before and after the significant impacts of the strategies that had been undertaken.

Through the Urban Environmental Sanitation Programme II (UESP II) funded by the World Bank, consideration regarding the SWM problems brought about the construction and use of a properly-engineered landfill site in KMA. In 2004, the KMA succeeded in construction of the sanitary landfill with the land area of 40 ha in Oti within KMA, and it is now in operation. In KMA, the current waste collection rate is 87%. This is a result of the improvement of urban infrastructure of solid waste management being conducted in the city urban areas. In KMA, the seven contractual service providers for the 10 Sub-Metropolitan Areas have been conducting the services since 2008 for waste collection, transportation and disposal at the existing Oti Sanitary Landfill in KMA.

On the other hand, however, the open dumping method is still employed in the other major urban areas of the adjoining five districts and municipality. The current solid waste collection rates in the adjoining five districts and municipality are still about 30~80 %. Although the waste collection, transportation and disposal practices in the adjoining five districts and municipality have been conducted since 2006, the waste situation has become worse and it has become a pressing issue and requires concerted actions.

Under these circumstances, issues and problems of the current SWM in the Greater Kumasi Sub-Region are revealed and issues to be addressed have emerged. In general, solid waste is divided into 3 items, namely, (i) domestic solid waste, (ii) industrial waste, and (iii) medical hazardous waste.

9.5.2 Issues on Solid Waste Management

The following are major issues to be addressed to improve the present conditions of SWM for the Greater Kumasi Sub-Region as mentioned in subclause 8.4.1.

- As stated, "Primary Responsibility for Solid Waste Management rests with the Assembly" and "the Polluter-pays-principle" based on "the Environmental Sanitation Policy (Revised 2009), Ghana", the Assembly should be responsible for wastes discharged in the Assembly area and treat them properly within the Assembly.
- Open dumping methods are used in major urban areas of the Sub-Region Conurbation area, while the KMA uses the final sanitary landfill. Although the waste collection and disposal practices in the surrounding five districts and municipality have been conducted since 2006, the waste situation has become worse and it is one of the pressing issues requiring concerted actions.
- Low collection rate and lack of well planned existing final disposal sites are the major issues in SWM for Greater Kumasi Sub-Region.
- All unapproved disposal sites should be controlled as the responsibility of the adjoining five districts and municipality in conformity with the Environmental Sanitation Policy.
- The final disposal sites which are to be located within the Metropolitan, Municipality and District Assemblies (MMDAs) should be adequately planned so as to accommodate all the wastes to be generated by the target year of 2033.
- It is considered that recycling the organic waste into compost for agricultural use should be assisted by the private sector.
- It is considered that recycling the organic waste into compost for agricultural use should be assisted by the private sector that experiences in composting for the KCRP (Kumasi Composting & Recycling Plant) and related local governments/ NGOs.
- Waste collection and transportation by service providers should be enhanced and planed based on a proper system, and additional refuse containers and loader trucks for the collection and transportation system are required in the adjoining five districts and municipality. Also, the transfer station system should be enhanced and planned properly.
- Well-documented solid waste management is needed because currently there is a lack of accurate data, making it difficult to plan the collection and treatment of household waste, particularly in the adjoining five districts and municipality.
- Intensive hygiene and sanitation education to the public are necessary for the proper SWM in the Greater Kumasi Sub-Region, and in order to improve the current SWM system, all the concerned MMDAs, related agencies, residents, NGOs, and private sector entities involved should all enhance their capabilities through the IEC (Information, Education and Communication) campaign.
- The following are recommendations to be considered in the improvement and development of the hazardous waste management system in MMDAs in conformity with the related Government standards or regulations of Ministry of Local Government and Rural Development (MLGRD) and Environmental

Protection Agency (EPA) :

- Provide a separate cell at the proposed sanitary landfill for the ashes of incinerated hazardous wastes in the future;
- The Environmental Sanitation Policy (Revised 2009) of the MLGRD (Revised 2010) and (draft) Urban Environmental Sanitation Bye-Laws (2004), should be properly implemented and enhanced with common standards to be followed;
- KMA and the adjoining five districts and municipality in the Greater Kumasi Sub-Region should implement policies or guidelines that will centralize the hazardous waste management system; and
- Specific policies and regulations on medical waste should be developed. These should govern the handling process from collection to final disposal, and licensing of the key actors. A collection system needs to be developed, and a consumer awareness campaign launched. Waste should be sorted at the source, and this should be enforced by the local authorities. Capacity development programs should be launched in the sector.

9.5.3 Objectives for Solid Waste Management

From the viewpoints of the proper SWM implementation in the Greater Kumasi Sub-Region by 2033, the present waste treatment system of collection, transportation, intermediate treatment (composting and recycling) and final disposal being conducting by the MMDAs through the private service providers, should be emphasized systematically. In particular, it is found that the adjoining districts and municipality of the Sub-Region are required to take more realistic actions in terms of SWM final disposal landfilling such as the final sanitary landfill sites towards the year of 2033.

As a consequence, the development strategies and spatial plans formulated under the SDF and SP for the Greater Kumasi Sub-Region will be verified from the SWM sector sub-programme under the programme formulation and implementation/ construction of the small-scaled final sanitary landfills at each district of the Sub-Region towards 2033, so that the MMDAs of the Sub-Region will be able to be kept clean and healthy through proper management of solid waste. The following are objectives of the SWM sector sub-programme in the future;

a) The smooth operation of the Phase 2 area of the existing Oti Sanitary Landfill for KMA
b) The proper preparation and implementation (construction and operation) of the proposed final small-scaled sanitary landfills scheme for the adjoining five districts and municipality, in conformity with national landfill guideline for planning and design.
c) “Primary responsibility for solid waste management rests with the Assembly” and “the polluter-pays-principle”. Based on “the Environmental Sanitation Policy (Revised 2009), Ghana”.
d) The overall goal of the Environmental Sanitary Policy of Ghana is defined as "To develop a clear and nationally accepted vision of environmental sanitation as an

essential social service and major determinant for improving health and quality of life in Ghana."

e) "To keep Kumasi clean and healthy through the provision and delivery of cost effective and environmentally acceptable waste management services in collaboration with all stakeholders to promote development and healthy living" from the mission statement and "To make Kumasi one of the top five cleanest cities in Africa by 2025" from the vision for KMA.

f) Site acquisition for facilities for treatment and disposal of wastes such as landfills, compositing facilities, waste stabilization ponds, trickling filters, septage treatment plants, etc. shall be located so as not to create safety hazards or aesthetic problems in the surrounding area. In order to ensure adequate provision of such sites, all MDAs should be required to:
   - produce medium and long term plans for the provision of treatment and disposal sites, including the preparation of environmental impact assessments;
   - acquire sufficient land and secure title with payment of due compensation for the land for immediate and future use and protect such acquisitions by proper demarcation, fencing, etc.;
   - ensure that the sites are managed so as to satisfy approved environmental protection standards; and
   - ensure that relevant legislation on the acquisition of land for treatment and disposal sites shall be reviewed and legislative and administrative provisions established to facilitate site valuation, negotiation and payment of compensation by the district assemblies.

9.5.4 Strategies for Solid Waste Management

(1) Basic Policies and Principles on Solid Waste Management

In Ghana, the following basic policies and principles are applied to solid waste management:

- "Primary responsibility for solid waste management rests with the Assembly", which is derived from Annex 3 of the Environmental Sanitation Policy (Revised 2009).
- The polluter-pays-principle. (The Environmental Sanitation Policy (Revised 2009).

(2) Strategies and Actions to be Taken for Solid Waste Management in Greater Kumasi

The SWM Strategies in the Greater Kumasi Sub-Region are summarized in terms of issues to be resolved, and actions to be taken for Greater Kumasi Sub-Region as follows:

Table 9.5.1 Issues to be discussed and resolved and Action Programme for Solid Waste Disposal in Greater Kumasi Sub-Region

Stage	Situations and Issues to be resolved	Strategies and Actions to be taken
1st Stage SWM in Greater Kumasi Sub-Region	(1) Wastes which are discharged and collected in KMA, are increasing year by year, and disposed of in the Oti Sanitary Landfill site. (2) In the original design of the existing Oti Sanitary Landfill site in 2002, the total required waste capacity of the landfill consisting of Phases 1 to 3 disposal sites was planned for 15 year waste amounts, namely, by 2019 (2004+15 years). After that, it is found that Phase 1 can last till the end of 2012. However, it is anticipated that due to rapid population growth in MMDAs, the cumulative total void airspace of Phases 2 & 3 disposal sites may become full in 5~ 8 years respectively. (3) Some of the wastes collected from the Peri-urban areas in the adjoining districts and municipality are currently allowed to be conveyed to the existing Oti Sanitary Landfill site by KMA. (4) It seems hard for the surrounding districts and municipality to look for suitable final disposal sites within the area of their districts because the residents mainly oppose building an open dumping disposal site near their backyards.	Enhancement of training through OJT of SWM unit- Environmental Health Department, MMDAs, especially MDAs is quite essential as follows; • Needs of 3Rs (reduce, reuse, recycling) & composting • Preparation of small-scale sanitary landfills • IEC campaign on SWM • Capacity development.
2nd Stage SWM in Greater Kumasi Sub-Region	It is assumed that due to experiencing rapid population growth largely in the Peri-Urban Areas in the adjoining districts and municipality in Greater Kumasi Sub-Region (the Greater Kumasi Conurbation area), waste amounts from the areas will also increase rapidly. It is then anticipated that wastes collected from these areas may not be accepted by the existing Oti Landfill site anymore due to decreasing of the availability of cumulative total void space of the landfill.	It is a basic policy that wastes discharged in a district should be treated carefully within the local district where the wastes are originally produced. Suitable disposal sites should be selected carefully by all the concerned parties for not only the peri-urban areas of Greater Kumasi Sub-Region but also the rest of the District in Greater Kumasi Sub-Region. The target collection rate of 100% in year 2033 from the current rate of 87% is an ideal goal for all the residents of KMA, while 100% will be the target rate for the adjoining districts and municipality, except for self-disposal areas. It is necessary to conduct waste reduction and enhancement of 3Rs campaign.
3rd Stage SWM in Greater Kumasi Sub-Region	Urgent selection of alternative landfill sites is required before the existing Oti Sanitary Landfill for KMA and other final disposal sites become full.	After the existing Oti sanitary landfill site is full, it may be found that the Kumasi composting & recycling plant area will be very essential for a promising landfill site for KMA. Because of its huge compound and looking to enhancement of 3R (reduce, reuse, recycling) & composting it will be for KMA and other adjoining districts and municipality a promising composting and recycling plant for the Greater Kumasi Sub-Region. In implementation of construction of proposed small-scale sanitary landfills in the adjoining districts and municipality, the living environment aspect should be considered in layout planning. Need for implementation of waste reduction and enhancement of 3Rs campaign. There are 3 stages of the current and future conditions of the solid waste management for Greater Kumasi Sub-Region, in particular, aspects of final disposal sites, overlapping the target years of 2033 and 2028 for SDF and SP respectively. Monitoring of each staging about SDF and SP is required.

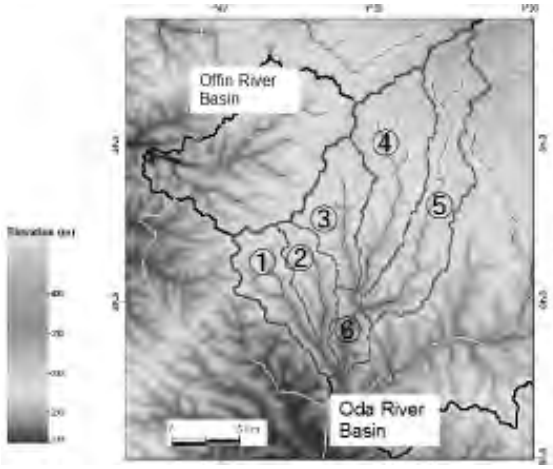
9.6 Drainage

9.6.1 Background on Drainage

(1) Drainage Condition

There are 5 main drainage basins in Kumasi Metropolitan Assembly, namely Aboabo, Kwadaso, Nsuben, Sisai and Wiwi drainage basins, which generally run in a north-south direction. The total drain length is about 141 km and most of them are in their natural unlined states. Lined sections can only be found along some sections in the Aboabo, Nsuben and Sisai drainages.

Refuse in Drains, resulting from dumping of refuse along drain banks is common. Moreover, developers continue to encroach upon stream valleys and hamper drain maintenance.



Name of Drainage Basin	Basin Area (km2)
①Kwadaso	20.3
②Nsuben	13.9
③Aboabo	22.4
④Sisai	39.9
⑤Wiwi	44.8
⑥Wiwi Downstream	8.8
TOTAL	150.1

Source: JICA Study Team

Figure 9.6.1 Primary Area for Drainage Basin and Area (km^2)[3]

(2) Flooding and Erosion

KMA is located in the most upper part of the Pra River basin on the catchment divide between the Offin and Oda Rivers. In this topographical sense, KMA is free from danger of prolonged flooding due to high water in the rivers.

But KMA and its surrounding Districts and Municipality have few lined drains. Due to insufficient drains, erosion occurs and buildings might collapse if the erosion continues.

9.6.2 Issues on Drainage

(1) Insufficient Drainage Maintenance / Lined Drainage

The current condition of the unlined drainage courses creates sanitary nuisances, vector breeding, and the physical hazards of flooding.

[3] The basin area was calculated based on GIS using SRTM3.

And it is obvious that if more sections are lined, erosion, siltation or forming of islets will be reduced. In other words, if more sections are lined, not only flow capacity of the drainage will be secured but also the maintenance cost for de-siltation can be reduced. Only 16.8%[4] of the total length of the drainage in KMA is lined, and this is insufficient.

(2) Rainwater Stagnation in Urban Areas and Erosion

KMA has a serious potential that Offin and Oda Rivers could be troubled by flooding and erosion. The KMA area having densely developed drainage patterns is prone to erosion as well as flooding due to high intensity rainfall and soft surface soil condition.

Erosion is also a serious issue in KMA. Erosion has degraded some settlements leaving many buildings hanging. This is mainly due to inadequate drainage systems.

(3) Flooding in Downstream River Sections

KMA is located on the catchment boundary thereby such rainwater drainage improvement would cause the increase of rainwater runoff to downstream. It is anticipated that flooding in downstream sections, especially in the Oda River, would be more serious.

9.6.3 Objectives for Drainage Improvement

(1) To Limit Sanitary Nuisances and Vector Breeding

For the target for 2033, in order to limit sanitary nuisances and vector breeding, the lined drainage rate should be up to 40%, in other words, 60 km of the primary drainage should be lined.

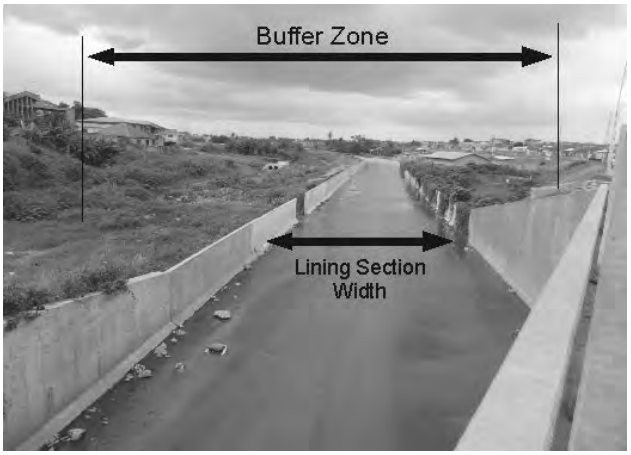
(2) To Prevent Rainwater Stagnation and Erosion

To respond to the expansion of the urban areas, the target for 2033 should be the pavement of streets not only in business areas but also in the residential areas.

(3) To Prevent Serious Flooding in Downstream River Sections

As the pavement of streets and the street drainage systems progress, in order to prevent flooding in downstream river sections, implementation of lining works and enforcing the laws to ensure a buffer zone beyond the water bodies will be secured.

[4] <Definition of Drainage> KMA (2007), Preparation of a stormwater drain maintenance programme - Drainage Inventory Report, Volume I - Main Report, and Lined/Unlined lengths are calculated by reports from the director of KMA-WMD.



Source: JICA Study Team

Figure 9.6.2 Lining and Buffer Zone

9.6.4 Strategies for Drainage Improvement

(1) Adequate Drainage Maintenance

In order to limit sanitary nuisances and vector breeding, drainage management should be integrated, and continuous improvement of the drainage system should be conducted, and a Drain Maintenance Unit (DMU) should be established.

From other aspects, assemblies are making efforts to provide containers for solid waste in the communities so that people will not dump rubbish in the drains. Additionally it is also essential to educate people for not littering through campaigns.

(2) Continuous Lining of Drainage and Erosion Control

Lining already proposed by KMA for the remaining sections should be continuously conducted by KMA (DMU) to limit sanitary nuisances, vector breeding, and the physical hazards of flooding and to reduce the future maintenance cost.

(3) Prevent Flooding in Downstream River Sections

The lined river sections in the Oda River catchment could basically accept the flood flow from upstream urban areas. As the expansion of current urban areas progresses, comprehensive stormwater management planning should be conducted by KMA with coordination by the Water Resources Commission.

The comprehensive stormwater management shall include the following,

- Introduction of an integrated watershed management concept coordinated by WRC
- Basin-wide flood control based on hydrological analysis
- Rainwater storage in urban areas
- Lining works applying a Buffer Zone Policy for Managing River Basins in Ghana.

9.7 Electricity

9.7.1 Background on Electricity Sector

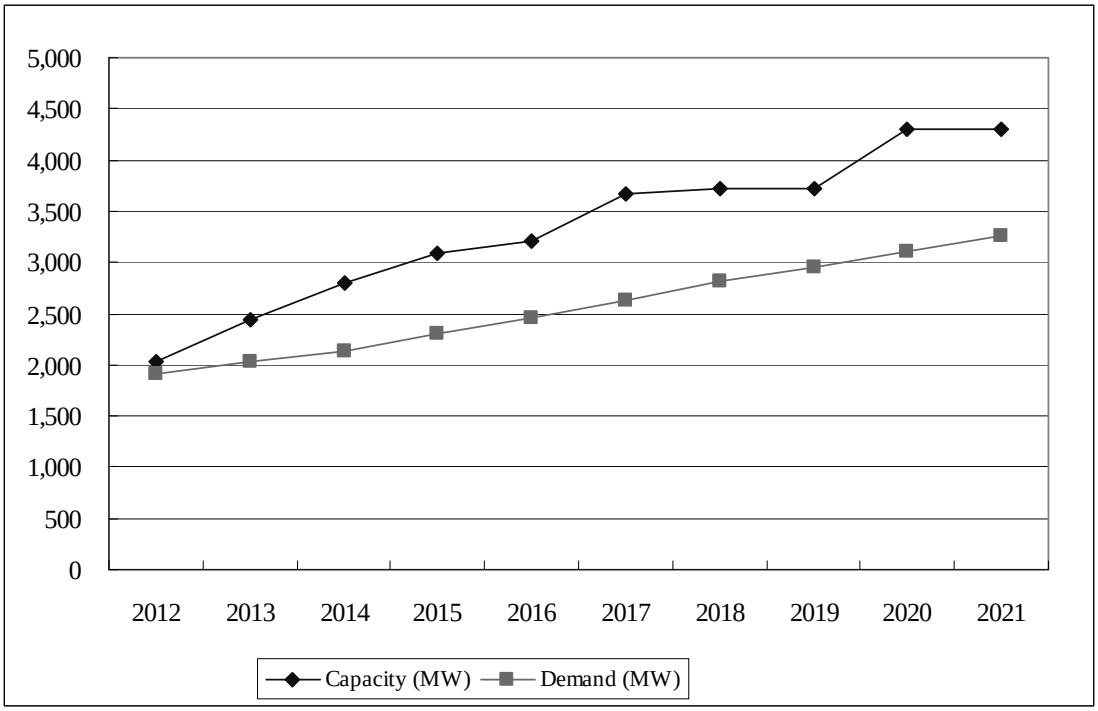
Following is the current status of the Electrical Sector

(1) Power Generation Capacity in Ghana

Total power generation capacity of Ghana is about 2,000MW as of year 2012. According to "The Energy Sector Strategy and Development Plan, 2010", various power generation plants are planed to cover future growing electrical demand in Ghana.

Once all planed projects are commissioned, the generation capacity will be increased to 4294MW by 2021. (source: Volata River Authority (VRA) Ten Year Capacity and Supply Balance)

The relationship between the expected Generation Capacity and forecast Max Demand in Ghana is shown in Figure 9.7.1



Source : The Energy Sector Strategy and Development Plan, 2010

Figure 9.7.1 Power Generation Capacity & Max. Demand in Ghana

(2) Transmission Lines and Bulk Supply Point (BSP) in Greater Kumasi Sub-Regions

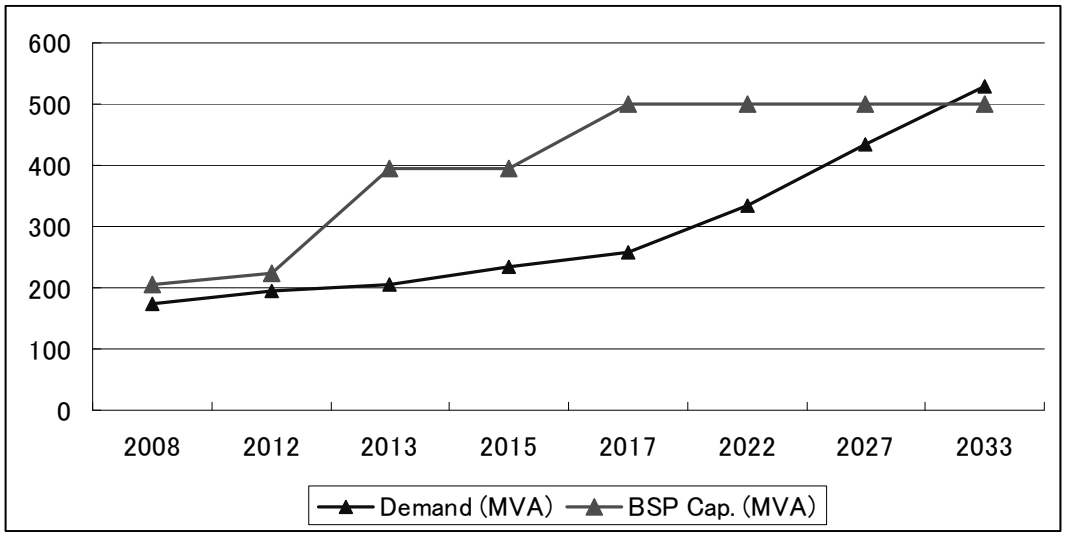
Currently, 116kV Transmission lines are connected to a BSP and the total transformer capacity of the existing BSP is 223MVA. The current existing 25MVA line is also being replaced by a new 66MVA line. To cover the growing demand in Kumasi, a second BSP is now under construction and that will be commissioned in

the end of 2012. The transformer capacity of the second BSP is 132MVA (66MVA-2 units). After commissioning, total capacity of BSPs will be 396MVA.

The maximum demand in 2011 of Greater Kumasi Sub-Region was about 175MVA, therefore, the BSPs capacity will be considered to be enough for the mean time.

In addition to the above second BSP, Ghana Grid Company Limited (GRIDCo) has a future plan to install a third BSP in Kumasi in 2014 and the transformer capacity will be the same as the second BSP.

The relationship between the expected transformer capacity of the Kumasi BSP and forecast max demand of Greater Kumasi Sub-Region is shown in Figure 9.7.2



Source : GRIDCo and JICA Study Team

Figure 9.7.2 BSP Capacity & Max Demand of Kumasi Sub-Region

(3) Sub-transmission line and Low Voltage Distribution system

From the BSP, 33kV sub-transmission lines are distributed in Kumasi Sub-Region area. Currently, those sub-transmission lines are connected to 9 primary substations (33kV/11kV). Most of the primary substations are equipped with 40MVA (20MVA-2) transformers.

In three of the 9 primary substations, 11kV and low voltage distribution lines to consumers are owned, managed and maintained by ECG East, and the rest are by Electricity Company of Ghana (ECG) West.

However, the reliability of the power supply is low due to deteriorated distribution grid/equipment. At the ECG Ashanti Western, there were 1,724 power outages in fiscal 2006.

9.7.2 Issues in the Electricity Sector

As stated above, the power supply is not stable or reliable in Greater Kumasi Sub-Region.

(1) Unstable Electrical Power Supply

In 2011, power breakdown caused by distribution line outage in the area covered by ECG was recorded about 900 times, therefore the level of power supply reliability is not considered to be sufficient. Table 9.7.1 shows the record of troubles in 2011 and 2012.

Table 9.7.1 Trouble in Distribution Lines

Unit: times

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ECG (2011)	63	59	57	90	86	119	76	44	96	76	79	68	913
ECG (2012)	39	63	130	79	123	78	86	74	87				759

Source: ECG

The following case examples are considered as typical causes of the trouble:

1) Clearance between Street Trees and 11kV Sub-Transmission Line / Low Voltage Distribution Line

In Kumasi, some parts of the 11kV sub-transmission and low voltage distribution overhead lines are very close to street trees. Proper clearance between trees and lines should be maintained, since most of the above lines are bare wires, when a branch of a tree contacts a live wire during a rainstorm it leads an electrical accident such as a short circuit/earth leakage.

2) Deteriorated Distribution Lines / Equipment

Currently, many deteriorated distribution lines and equipment exist in the distribution system and ECG is aware of that problem.

ECG has a standard service life for wires/equipment of the distribution system and ECG plans to replace the deteriorated components based on the service life of the equipment, however due to budgetary constraints, such deteriorated equipment has not been replaced during its service life.

Table 9.7.2 Standard Service Life

Equipment	Service Life (yrs.)
33kV Circuit Breakers	25
33kV Gas Circuit Breakers	40
11kV Circuit Breakers	25
11kV Gas Circuit Breakers	40
33kV Overhead Lines (wood poles)	30
11kV Overhead Lines	35
33kV underground Cables	40
11kV underground Cables	40
Low Voltage Overhead lines & Underground Cables	25
Service lines	25
33/11kV Transformers	40
33/0.4kV Transformers	30
11/0.4kV Transformers	30

Source: ECG Sub-transmission and Distribution Design Guidelines

(2) Power Loss and Voltage Fluctuation

Power loss is one of the critical issues in Ghana. Improvement of power losses is

also stated in the "Energy Sector Strategy and Development Plan" by the Ministry of Energy. According to the above Plan, the object is "Improve and modernize electricity distribution infrastructure to reduce system loss from 25% to 18% by 2015".

Power losses in the distribution infrastructure of ECG/NED from 2000 to 2008 are shown in the table below.

Table 9.7.3 Electricity Sales and Losses

Details / Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Supplied (ECG & NED)	4,320	4,530	4,709	4,920	5,298	5,546	5,759	5,643	6,328
Total Sales (ECG & NED)	3,142	3,330	3,465	3,626	3,865	4,127	4,334	4,271	4,727
Total Losses	1,178	1,200	1,244	1,294	1,433	1,419	1,425	1,372	1,601
Total Losses (%)	27.3%	26.5%	26.4%	26.3%	27.0%	25.6%	24.7%	24.3%	25.3%

Source: Energy Commission Annual Reports for 2007 & 2008, Unit: GWh

In addition to the above power loss, voltage fluctuation is also a major issue caused by improper wire size (small size) of the sub-transmission lines and low voltage distribution lines.

(3) Budgetary Restrictions of ECG

ECG has a plan to replace deteriorated equipment as per the service life and maintenance programme. However, that replacement and maintenance could not be carried out timely due to budgetary restrictions.

According to the Energy Commission Annual Reports for 2007 & 2008, ECG has posted negative net revenues.

9.7.3 Objectives for Electricity Sector Development

The objective of the electrical sector is "Stable and Reliable Power Supply" to the consumers.

Industrial areas especially need "Stable and Reliable Power Supply" for their competitive operation.

9.7.4 Strategies for Electricity Sector Development

The following strategy will be proposed to achieve the objective.

(1) Power Generation Capacity

As mentioned in 9.7.1, (1) Electrical Generation Capacity in Ghana, if planed power stations will be constructed on schedule, the power generation capacity is deemed to be adequate for the mean time.

(2) 161kV Transmission Line and Bulk Supply Point (BSP)

Two 161kV Transmission Lines are connected to the BSP and an expected transformer capacity of the BSPs will cover the forecast maximum demand of Kumasi Sub-Regions. Further expansion of the BSP would not be required in the

near future.

(3) Enhancement and Improvement of Distribution System for Stable and Reliable Power Supply

1) Improvement and Modernization of Sub-Transmission Lines and Low Voltage Distribution System

Small size overhead wires should be replaced by proper size wires for reducing technical loss of electricity and the voltage fluctuation.

The clearance between overhead lines and obstacles such as trees should be monitored and if the clearance is less than ECG standard, measures such as tree trimming/replacing overhead poles should be taken to maintain necessary clearance. By this measure, distribution troubles such as short-circuits and earth faults can be drastically decreased.

Power factor correction on sub-transmission lines and the low voltage distribution system is also one of the major methods to reduce the current in respective distribution lines.

2) Replacement of Deteriorated Equipment

Deteriorated equipment such as insulators, overhead wires and cables should be replaced by new ones in order to reduce technical loss of electricity and to reduce the number of blackouts, as well as to assure a stable supply of electricity.

3) Management of ECG

For reducing commercial losses, measure proposed will be:

To tighten enforcement toward un-paid consumers by providing pre-paid meters.

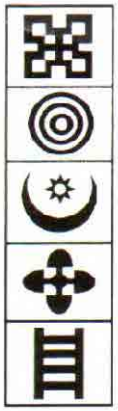
(4) Expansion of Sub-Transmission and Distribution Lines

Sub-transmission/distribution lines should be expanded for supplying stable and reliable power to the areas with high priority for infrastructure provision as shown in the proposed Diagram for Greater Kumasi Sub-Region (Figure 8.1.4).

In the beginning, only sub-transmission/distribution lines should be provided in accordance with the Industrial Development Strategies proposed in Chapter 8, and in the second stage, transformers should be installed based on actual demand of consumers.

(5) Electrification in Rural Areas

As per the “Energy Sector Strategy and Development Plan (by Ministry of Energy, 2010) and the National Energy Policy (by Ministry of Energy, 2010), the target percentage of access to electricity is set to increase to 80% by 2015 and to 100% by 2020.



PART V

Structure Plan (SP)
for Greater Kumasi Conurbation

Chapter 10 Land Use Management System

10.1 Land Use Management Systems and Procedure

Land use control is to be enforced on the development activities of people and corporates on the land whose right and transactions are secured by the land system of the Nation. The land transactions and development permit system and procedures through which land use is controlled in Ghana are shown in Figures 10.1.1 and 10.1.2 respectively and outlined below.

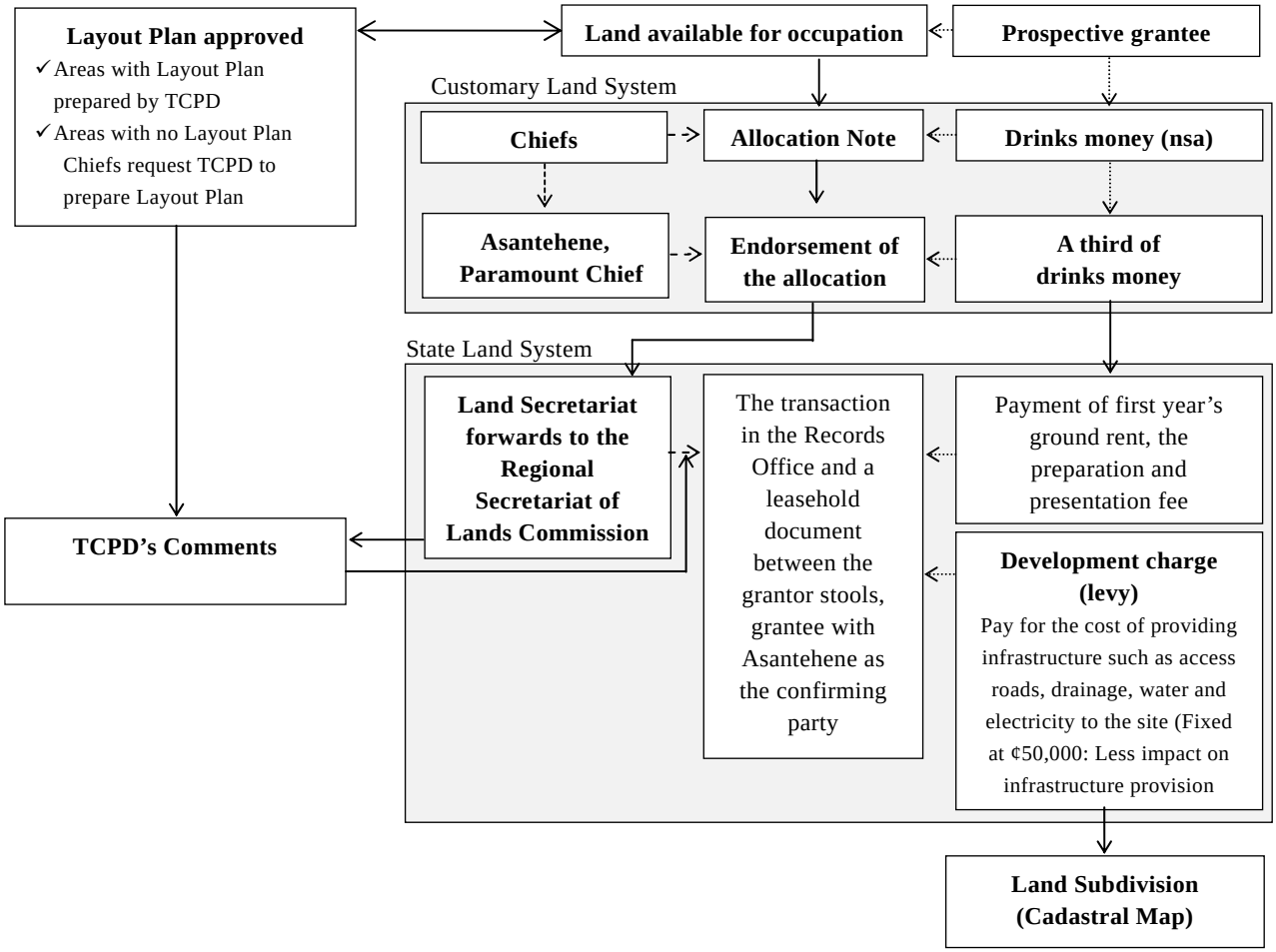


Figure 10.1.1 Land Transaction System and Procedure

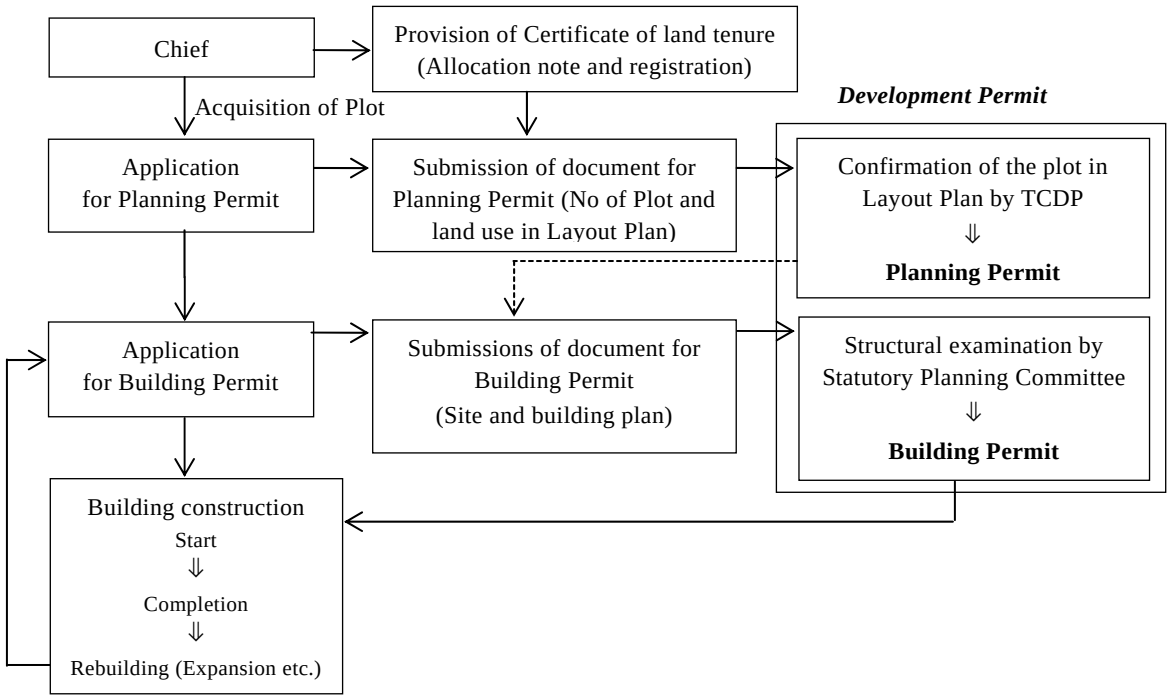


Figure 10.1.2 Development Permit System and Procedure

The Ghana land system features a dualism: combination of traditional and state land systems. Land rights and transactions (lease contract) cannot be registered in the State land system (office) for securing the land right without a chief's allocation note and Asantehene's endorsement on it. As land rights are registered through this procedure, most stool land which is not yet developed is not registered in the land office of the government. This fact makes it very difficult for prospective buyers (land seekers for housing, industries and others) to find the land right holders to negotiate for land transactions in contrast with the countries with modern land market systems based on a land registration system where such information on plots such as boundaries and sizes, legal owners and vested/attached rights (mortgages, leases and others) are easily obtainable at the land registration offices of the Government. This land system imposes a long time and large cost for land transactions so as to hinder an efficient land market, and subsequently has relevance to land use management practices as discussed below.

Land use and building control in Ghana is enforced under a layout plan system based on which the development permit consisting of a planning permit and building permit is granted as shown in Figure 10.1.2. The plot owner to whom the lease right is transferred from the Chief makes an application for confirmation (planning permit) of his plot in the layout plan by TCPD. The application documents include a map indicating his plot and its block number in the copy of the layout plan which the Chief is due to provide. Accordingly, with the confirmation by TCDP, the plot owner submits site and building plans to TCPD for a building permit.

However, without evidence of title to any land proposed for building development, local authorities cannot issue the necessary consent or permits for project

implementation. As stated above, the traditional land system takes time to provide necessary documents on land title, especially disputable land, so that it also delays the issuance of development permits by the local government. With rapid physical development all over, land-related disputes contribute to push developers into developing their properties illegally instead of losing huge sums used in acquiring such lands.

10.2 Present Conditions of Land Use and Building Enforcement

It is reported that the majority of buildings in terms of number in Kumasi were without development or building permits. In fact, unauthorized houses totalled 80% as of around 2002, but the situation was improved to around to 60 % at present.

The many factors which are attributed to the growth of unauthorized building have been generally claimed and reported as follows:

a) Socio-economic

1. Low level of income, 2. Low level of education, 3. Rural-urban migration,

4. High rent charges elsewhere, 5. Employment, 6. Social contacts

b) Cultural

1. Marriage, 2. Religious reasons, 3. Family ties

c) Physical

1. Advantageous location of the area, 2. The nature of the land

d) Political

1. Inadequate housing policy by government, 2. Political instability (conflict),

3. Lack of political will to prevent unauthorised structures

e) Historical

1. Ancestral lineage

f) Institutional

1. Delays in getting building documents, 2. Lack of enforcement of building regulations, 3. Lack of sanctions against offenders.

It is stated that the reasons for the delay in issuing the permits include the following:

- The requirement for a lease (land certification) before one applies for a permit has also been cited as a major obstacle. Acquisition of lease documents or title, to obtain the granting of a permit is not easy. It takes a long time getting permits not to mention the acquisition of leases
- Flawed building development proposals not meeting required standards and requirements that causes further delays when considering applications
- Appointed approving planning Committees do not meet regularly.

District Governments identified the problems on development permits and

management in their administrations as follows:

- Out dated base maps in built up areas
- Lack of base maps in new areas
- Inadequate logistics
- Delays and non-release of funds for plan preparation activities
- Haphazardous development due to the collusion of charlatans with landowners.
- Lack of a comprehensive study (Strategic plan)
- Litigation by landowners
- Physical development outpacing scheme/layout preparation

Poor development management seems to be due to the following situation:

- Non adherence to approved plan proposals
- Weak enforcement of legislations/laws on physical development
- Non respect to layout plans by land owners and prospective developers
- Non availability of funds for development inspections and abatement of nuisances
- Lack of discipline on the part of prospective developers/landowners culminating in unauthorized development
- Some Assembly members thwarting the efforts of development managers
- Mutilation of scheme/layout proposals by some staff colluding with landowners/ prospective developers.
- Litigation against effective development monitoring.

10.3 Emerging Land Use without Development Permits

While land use without development permits may have been creating an inappropriate urban environment in their localities, the major symptoms caused by the no-permit development in the urban areas of Kumasi and the suburban areas in the surrounding districts are outlined as follows:

a) Densification of buildings

Building expansion/annexation, addition of buildings on the same plot, subdivision and demolish/rebuilding for accommodating more people and families, which all need building permits, are carried out mostly without building permits, resulting in the expansion of high-density areas encroaching over the low-density areas.

b) Proliferation of commercial uses

Since trading, including formal and informal, is one of the popular means of livelihood for people of Kumasi, which is a large commercial centre in Ghana, plots of land are likely to be used for commercial purposes here and there even in residential areas, more specifically along the roads (either arterial or collector roads). It seems that although changes of land use to commercial use is subject to a building permit, commercial activities on the plots are de facto recognition.

c) Encroachment of buildings in water courses and vegetation areas that are meant to be conserved

Narrow green belts along water courses stretching into Kumasi built-up areas have been left as unusable land for building when developed because of risks of flooding. As the urban areas are chocked with buildings nowadays, these unusable lands became valuable for housing and other urban uses. Accordingly, buildings encroached on the green belt and water courses. The permanent buildings along the rivers have been earmarked for demolition by KMA.

d) Disorderly development in suburban areas without layout plans

In some localities in the suburban areas of Greater Kumasi, land development and building without layout plans are in progress either with or without knowledge of the layout plan.

10.4 Government Measures to Improve Land Use Management

The Ghana Government has been taking measures to improve the situation of no-permit development and building among which major ones are listed below:

a) Time-shortening of decision-making for development permits

The government set up the 1996 National Building Regulation1 L.I. 1630 Section 8 (1 and 2) aiming at avoiding unreasonable delays by setting a time limit of three months for decision making on the application for a permit, and commencement of development after the expiry of three months.

b) Strengthening enforcement of development permit regulation

KMA commenced an exercise to demolish unauthorised buildings sited on watercourses in order to stop what authorities described as human-induced flooding in the city. KMA expressed the hope that the exercise would serve as a deterrent to other people who would want to flout the assembly's bye-laws. This is in line with the presidential directive that all structures built on watercourses should be demolished to minimise the devastating effects of floods

c) Land Administration Project

The LAP is aimed to create an effective land use management system through establishing a spatial planning system coupled with an improved land market based on reformed land registration systems. The project components include the following:

- Harmonizing Land Policy and Regulatory Framework for sustainable Land

[1] 1996 National Building Regulation
"Where a person submits an application for a building permit the District Planning Authority shall notify him within seven days of the receipt of the application and shall within a period of three months thereafter notify the applicant whether the application is granted or refused". It goes on to conclude that "an applicant not informed about the grant or refusal of his/her application may after the expiry of the three months commence development on the basis that the application is acceptable to the District Planning Authority"

Administration.
- Institutional Reform and Development.
- Improving Land Titling, Registration, Valuation, Land Use Planning and Information Systems and
- Project Management, Monitoring and Evaluation.

Efficient and equitable land markets are a prerequisite for well-functioning cities, more specifically, for land use. Efficient functioning of land markets requires efficient and updated land registration systems which clearly indicate legal ownership of land.

d) Land Use and Planning Bill

The bill is to establish a Spatial Planning System which sets forth spatial plans including a Spatial Development Framework and Structure Plan containing Land Use Plans. Land use management is designed to be exercised through the spatial plans; more specifically, in such a system that development and building permits are granted only in conformity with the spatial plans. For making this system work efficiently special attentions in the bill are given to the following items, in other words so as to address some important problems hindering effective land use management as specified in the preceding section. These include manifestation of prohibiting development without a permit, enforcement notice for immediate stop, notice to the owners who are or have been constructing a building, order to remove, compulsory execution, penal regulations, and others which are outlined below.

- Prohibiting development without a permit: (1) A physical development shall not be carried out in a district without prior approval in the form of a written permit granted by the district planning authority. (2) The procedure and manner for securing a permit under subsection (1) shall be prescribed by Regulations.
- Enforcement Notices to the owner occupier or developer without development permit, demanding the immediate stoppage of the execution of any development or works carried out contrary to this Act (Article 117).
- Notice to the owner occupier or developer who (a) is constructing a building or (b) has constructed a building or (c) is working or executing a work.
- Order to remove: The District Assembly shall, by notice order the owner, occupier or developer within sixty (60) days to remove, alter or pull down the building, structure, physical development or other work at the expense of the owner, occupier or developer.
- Compulsory execution: The district planning authority may carry out the removal, alteration or pulling down, and recover the expense from the owner, occupier or developer, as if it were a debt from that person to the District Assembly.
- Penal regulation: Conviction results in a fine not exceeding five hundred penalty units or to a term of imprisonment not exceeding six months.

Chapter 11 Sub-Regional Land Use Plan for Structure Plan for Greater Kumasi Conurbation

11.1 Sub-Regional Land Use Plan for Greater Kumasi Conurbation

11.1.1 Sub-Regional Level Land Use Plan

The Structure Plan is a spatial plan consisting of land use plans and sector infrastructure plans. The Land Use Plan for Greater Kumasi Conurbation is an important part of the Structure Plan, which provides a spatial platform for integrating land uses and the various infrastructures.

The Land Use Plan for Greater Kumasi Conurbation is also a plan which has to be formulated at the Sub-Regional level, so that the overall spatial structure of the Sub-Region can be analysed as a whole. It is not a plan which can be made by gluing District-level Land Use Plans together into one plan.

The Sub-Regional level Land Use Plan shows the desired directions for future land uses, which are considered in terms of rational and/or effective use of land, which is a scarce resource. It is also a plan which shows how the precise disposition and scale of the elements encompassed by social, economic and environmental policies can be achieved most efficiently and effectively. It is based on the Spatial Development Framework, which is diagrammatic in nature as illustrated in Figure 11.1.1.

These policies have been developed in Chapter 8 as “Strategies for Socio Economic and Spatial Development” which form the basis of the Sub-Regional Spatial Development Framework. They included an Urban Growth Boundary for Greater Kumasi within which development should be confined over the next twenty years to prevent sprawl and unnecessary degradation of agricultural land; a strategy for intensifying land use in the City Centre while also relieving the pressure on it by creating other centres; these are near main intersections on the Inner Ring Road and other urban centres within the conurbation; they include a “secondary urban centre” joined by a primary urban corridor to Ejisu; creation of a secondary urban corridor along Kumasi-Mampong road; creation of tertiary district centres at District Capitals; proposals for extension, relocation of existing, and some new industrial development areas linked to a new outer ring road; strategies for suburban and adjoining agricultural areas and towns,

Chapter 8 has also set out the programme for Phased Spatial Development in three periods, to 2023, to 2028 and to2033 in which the financing and construction of the new Outer Ring Road, beginning with the by-pass of Kumasi by Ghana’s main

north-south highway and the construction of a new airport are key drivers.

Source: JICA Study Team

Figure 11.1.1 Diagrammatic Nature of the SDF 2033

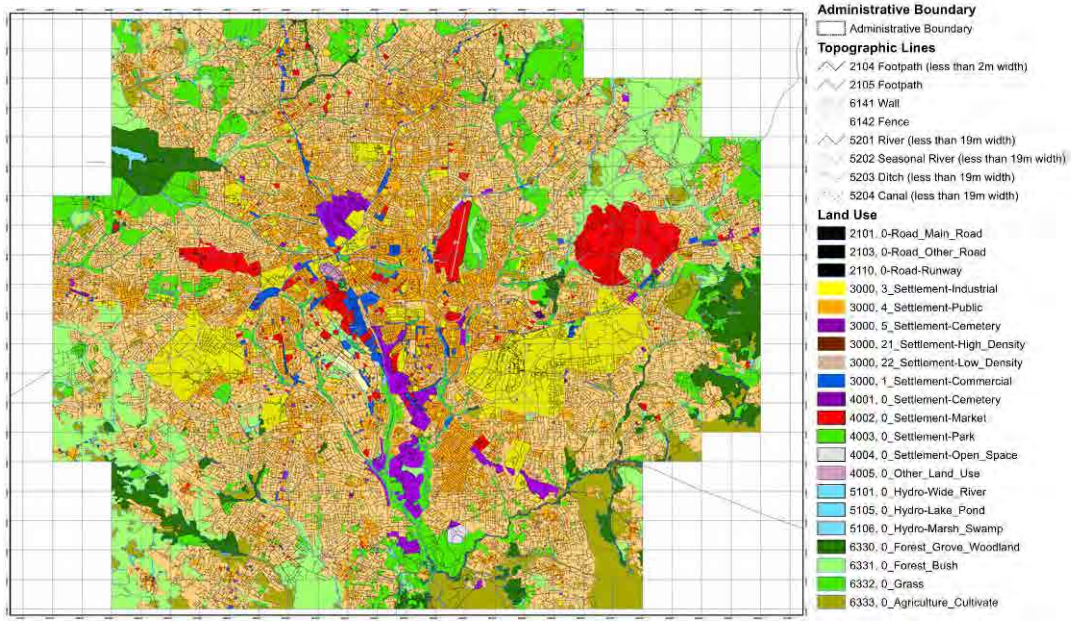
Chapter 7 has laid out the population growth and employment needs projections on which the dimensioning of space and infrastructure in the Structure Plan is based.

District-level Land Use Plans are too detailed for showing large perspectives for guiding Metropolitan Conurbations like Greater Kumasi Conurbation. Sub-Regional level Land Use Plans are expected to show general policies from macro perspectives covering the whole conurbation. These include the overall directions and required areas for growth, the needs for large-scale infrastructure such as dams, the position of watersheds and major radial and ring road networks. All of these should be planned from macro perspectives beyond the district level.

11.1.2 Objectives of Formulating Sub-Regional Land Use Plan

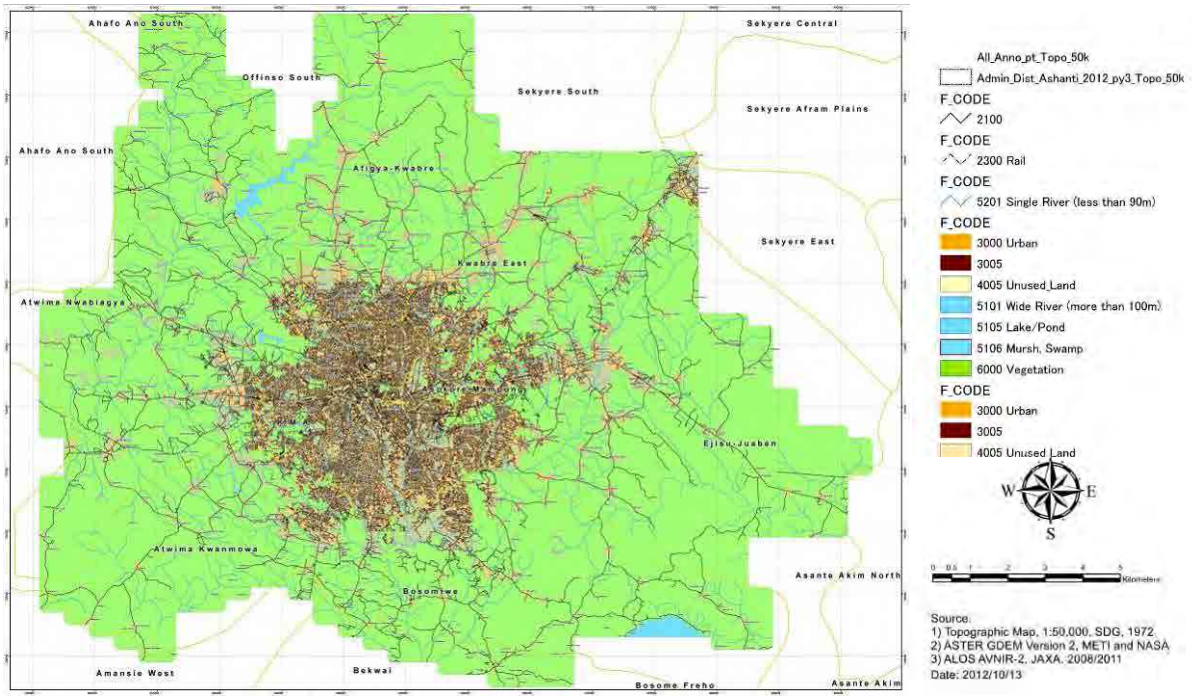
Considering the above mentioned necessary characteristics of Sub-Regional Land Use Plans, there are the following two main objectives for the formulation of a Sub-Regional level Land Use Plan:

- To guide the transformation of spatial structure by showing the dimensions, actual use of space and precise location of key elements in the development process for Greater Kumasi Conurbation.
- To provide guidance for District-level Structure Plans (SPs) for regulating of land use and development in the Greater Kumasi Conurbation.



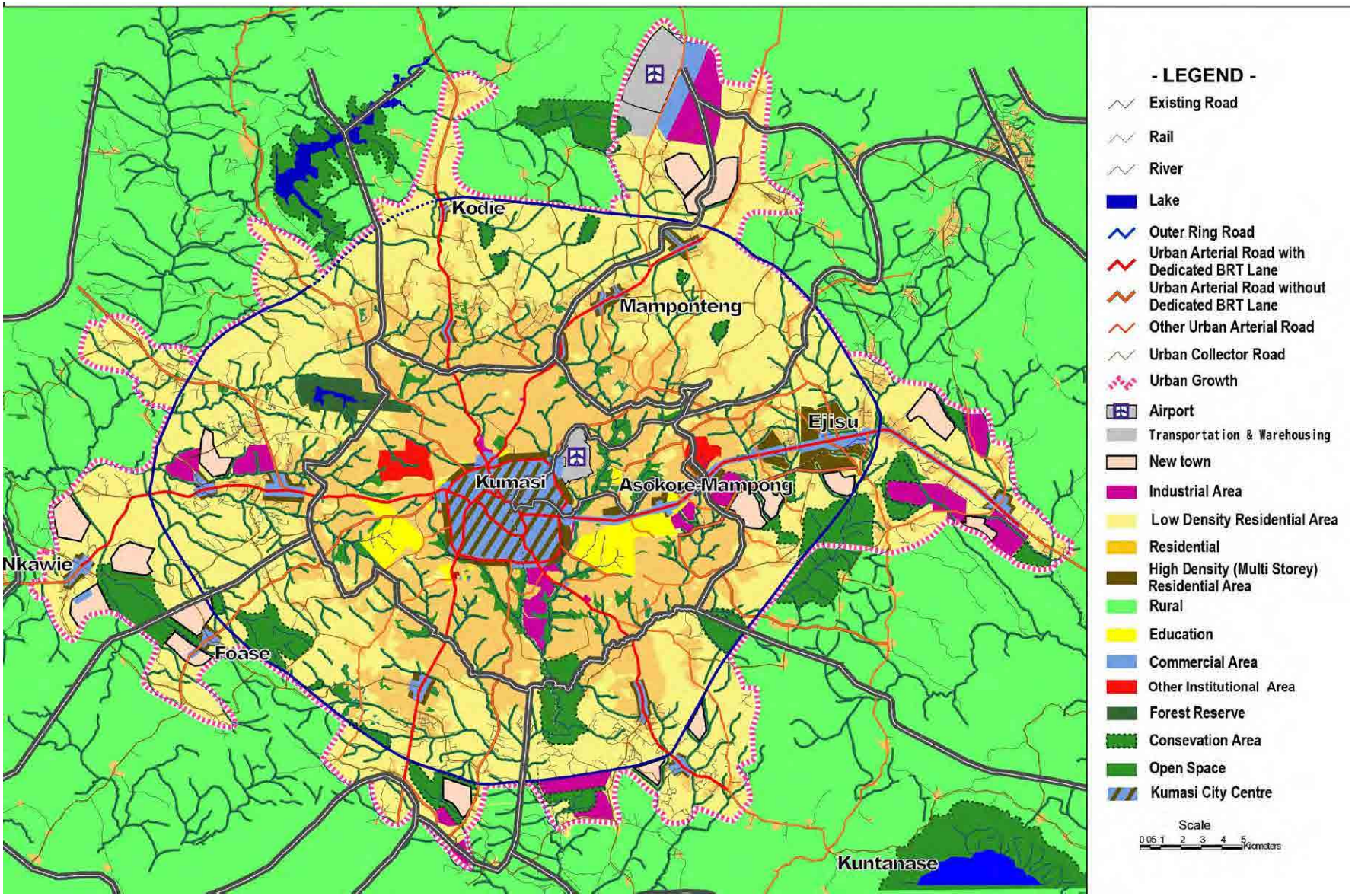
Source: JICA Study Team

Figure 11.1.2 Existing Land Use based on Orthophoto (2008)



Source: JICA Study Team

Figure 11.1.3 Existing Land Use based on ALOS Satellite Image 2008 & 2011



Source: JICA Study Team

Figure 11.1.4 General Land Use Plan for Greater Kumasi Conurbation, 2028

11.2 Future Land Use Policies by Land Use Category

11.2.1 Residential Land Use

In 1984, the population of Kumasi City was 488,000. In 2000, its population increased to 1,170,000. In 2010, Kumasi increased its population to 2,035,000. In 1986, urbanization was taking place mostly within Kumasi City (254 km^2). In 2007 and 2008, urbanization was occurring within and beyond the administrative boundaries of Kumasi City. From 1984 to 2000, Kumasi City's population increase rate was over 5.6% per annum. Between 2000 and 2010, the average increase rate of the population was again as high as 5.7 per annum.

(1) Residential Land Use Policy

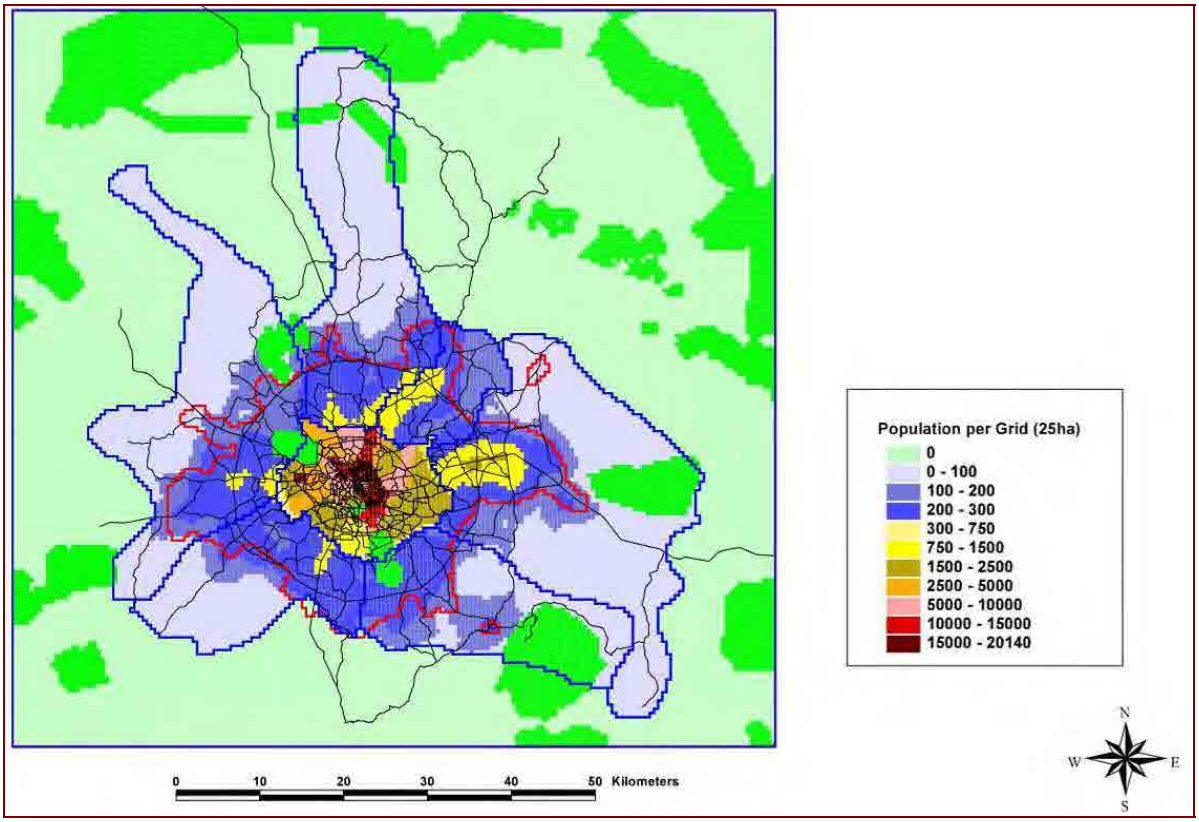
In order to guide the residential land use in the future, the following policies are applied:

- Higher density of residential population is promoted by allowing and enabling the development of multi-storey buildings.
  - In the central areas of KMA
  - In the areas along major roads
  - In the areas surrounding suburban centres and district centres
- Middle density of residential population is promoted within the Middle Ring Road Connection by applying certain zoning regulations.
- Outside the Middle Ring Road, lower density residential areas are promoted.
- Outside the Outer Ring Road, the development of new towns are promoted in order to speed up well-ordered suburbanization.

(2) Urban Growth Boundaries

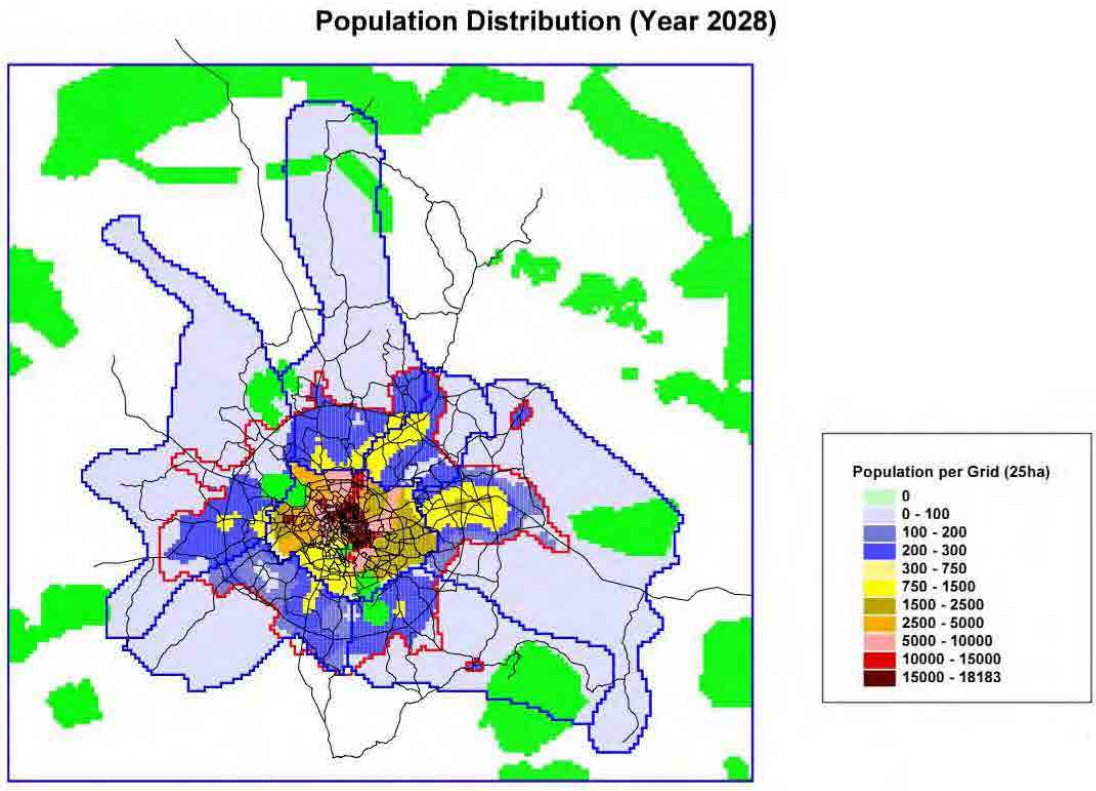
Uncontrolled expansion is a problem because it is an inefficient use of land which could be productive, and because of the high cost of servicing residents which are widely scattered. In order to avoid uncontrolled expansion an Urban Growth Boundary must be established, beyond which the expansion of Greater Kumasi Conurbation should be prevented. Figure 11.2.1 below shows the projected uncontrolled expansion of Greater Kumasi Conurbation (the blue areas) which, if uncontrolled, will go well beyond the Urban Growth Boundary (shown in red).

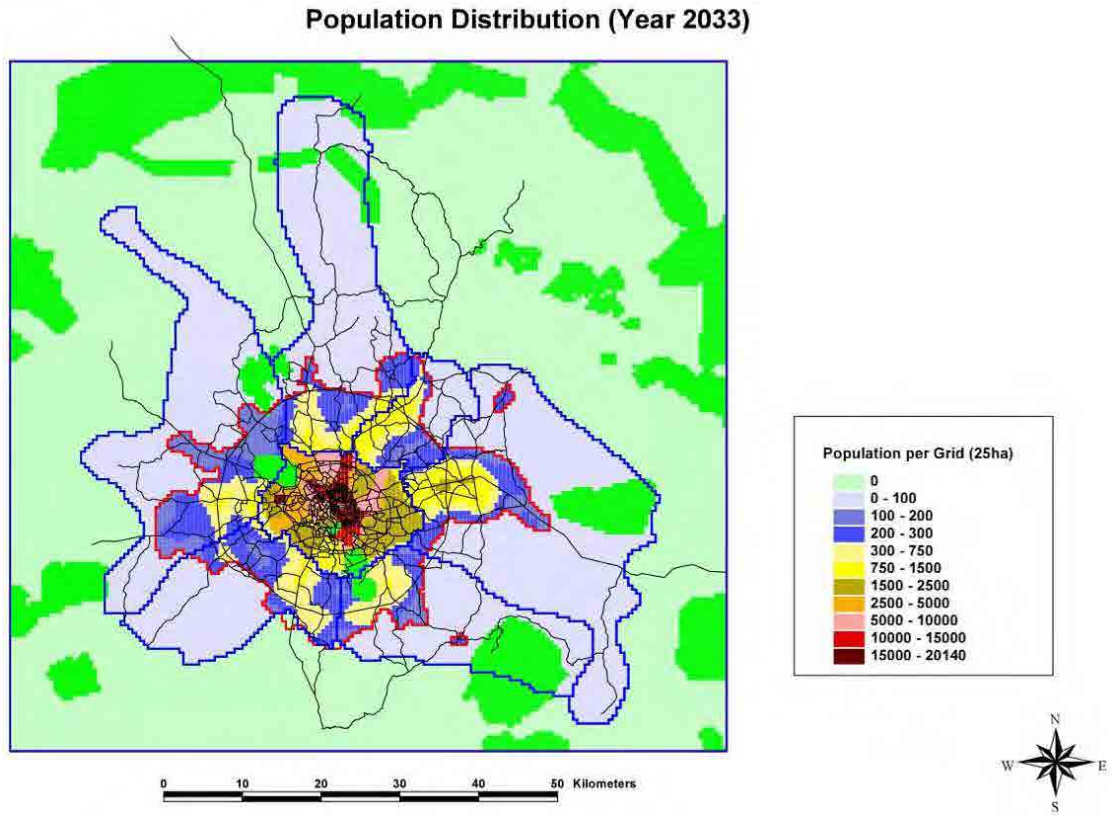
The proposed controlled expansion by creating the Urban Growth Boundary and housing density policies is shown in Figure 11.2.2.



Source: JICA Study Team

Figure 11.2.1 Predicted Population Distribution without Urban Growth Boundary 2033 (Uncontrolled Expansion)





Source: JICA Study Team

Figure 11.2.2 Population Distribution Simulation of Greater Kumasi Sub-Region, 2028 and 2033 (Controlled Expansion under Urban Growth Boundary)

The future population increase is accommodated by expansion of residential areas as shown in Figure 11.1.4 and in Table 11.2.1, as well as by increase of population density shown in Figure 11.2.2.

Table 11.2.1 Increase of Population and Residential Area within Greater Kumasi Conurbation

	Population (persons)	Residential Areas (ha)	Gross Population Density of Residential Areas (persons/ha)	Populations (persons)	Residential Areas (ha)	Gross Population Density of Residential Areas (persons/ha)
	2010			2033		
K.M.A	2,035,064	12,761	159	4,226,860	15,163	279
Outside KMA within Conurbation	423,951	23,760	18	1,242,856	59,742	21
Greater Kumasi Conurbation	2,459,015	36,521	67	5,469,717	74,905	73

Source: JICA Study Team

In Table 11.2.2 below it will be seen that the projected population increase (Chapter 7) can only be taken up within the KMA boundary by additional 2,400 hectares (19% increase) but it will need a very large increase in population density. This is due to the lack of available land, which already causes a large amount of higher density housing (as seen in Figure 11.2.2, dark brown areas, above).

For the area outside KMA within the Urban Growth Boundary, the existing low population densities and the available undeveloped land means that a much greater increase in residential land use is planned.

Table 11.2.2 Increase of Residential Area by Area

	2010	2033	2010-2033	2010-2033
	Residential Areas (ha) [A]	Residential Areas (ha) [B]	Increase of Residential Area (ha) [C] = [B] - [A]	Increase (%) [D] = [C] / [A] (%)
K.M.A	12,761	15,163	2,402	19%
Between KMA Boundary and Outer Ring Road	17,430	41,166	23,736	136%
Between Outer Ring Road and Greater Kumasi Conurbation Boundary	6,330	18,576	12,246	193%
Greater Kumasi Conurbation	36,521	74,905	38,384	105%

Source: JICA Study Team

Population increase and residential area increase underlie the rationale for the Urban Growth Boundary as shown in the proposed General Land use Plan 2028.

As a result of the analysis of population growth, existing housing use and density, and the above predictions of the demands on land use up tom 2028, the following residential land use policies are put forward for the areas within Greater Kumasi Conurbation:

- In suburban areas outside KMA, and within KMA outside of the middle ring road, low density residential areas should generally promoted.
- However, near the District Centres and Suburban Centres, development of multi-storey residential buildings should be promoted. This would also apply to the Kumasi-Ejisu Urban Corridor.
- Within KMA, where densities will need to be greatly increased, in areas between the Middle Ring Road and Inner Ring Road, where lot sizes are relatively large, they have a piped water supply, and relatively dense road networks are available:
  - Building more dwellings within the same lot, subdivision of the original lots should be formally allowed.
- Within KMA in order to cope with existing high-density residential areas:
  - Set standards for controlling overcrowding and decreasing the number of households within a dwelling unit
  - Conduct monitoring and enforcement measures
- The development of high-density multi-storey residential buildings should also be promoted behind the commercial/business areas along the Inner Ring Road.
- In order to accelerate housing development and provide quality residential areas with basic infrastructures in suburban areas, new town developments should be promoted mainly outside the Outer Ring Road within the Conurbation Area.

Table 11.2.3 Land Uses in City Centre, Middle and Suburban Areas 2013-38

(1) Kumasi City Centre (Central Areas within Inner Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
High Density Residential Area	Over 20% of the area is occupied by high-density residential areas.	The percentage of high-density residential areas will increase substantially.	Some high-density residential areas will be redeveloped into multi-storey mixed use developments.
High Density Multi-Storey Residential Area	Small areas are occupied by multi-storey residential buildings.	Gradually multi-storey residential buildings will increase in the areas well equipped with basic infrastructures along the Inner Ring Road.	Large-scale urban renewal projects will be implemented for mixed use development of commerce/business (at the first floor or so) and residential (at higher floors).
Low Density Residential Area	There are still large areas of low density residential areas within the Inner Ring Road.	Gradually more residential buildings will be constructed on former low-density residential areas, while some low-density residential areas will remain.	Large-scale modern mixed use development will take place in some former low-density residential areas in the southern part of Kumasi City Centre.

(2) Middle Areas (Areas between Inner Ring Road and Middle Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
High Density Residential Area	High-density residential areas are increasing by subdividing existing housing lots or by building extra buildings in the same lots.	Subdividing of plots and building of extra buildings in the same plots will continue in these residential areas.	Subdividing of plots and construction of additional buildings in the same plots will continue.
High Density Multi-Storey Residential Area	Few	In some areas, multi-storey buildings will be located in response to the increasing population.	High density multi-storey residential areas will be increased.
Low Density Residential Area	Low density residential areas are extensively located.	Gradually part of the low density residential areas will become high density residential areas as described above.	There will be less low density residential areas due to increase in both high density residential areas and high density multi-storey residential areas.

(3) Suburban Areas (Areas between Middle Ring Road and Outer Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
High Density Residential Area	Less	In some areas, high density residential areas will increase.	Expansion of high density residential areas will be limited.
High Density Multi-Storey Residential Area	Less	In the Kumasi-Ejisu Urban Corridor, development of high density multi-storey residential areas will be promoted.	In the Kumasi-Ejisu Urban Corridor and Kumasi-Mamponteng Urban Corridor, development of high density multi-storey residential areas will be promoted.
Low Density Residential Area	Low density residential areas are expanding toward outside. But still there are extensive unurbanized areas.	More expansion of low density residential areas will take place.	More expansion of low density residential areas will take place.

(4) District Centres and their Surrounding Areas (Within the Greater Kumasi Conurbation – within the Urban Growth Boundary)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
High Density Residential Area	Limited	Limited	Limited
High Density Multi-Storey Residential Area	Few	In new towns, a few high density multi-storey residential areas will be developed.	In new towns, more high density multi-storey residential areas will be developed. In Ejisu Centre, behind central commercial/ business areas, high density multi-storey residential areas will be developed.
Low Density Residential Area	Not so extensive	Low density residential areas will expand gradually along major roads and near District Centres.	Low density residential areas will expand both inside and outside new towns.

Source: JICA Study Team

11.2.2 Commercial/Business Land Use

In Greater Kumasi, there are issues and challenges concerning urban centres, commercial/business land uses and residential populations as follows:

Table 11.2.4 Problems and Challenges concerning Urban Centres and Commercial/Business Land Uses

	Problems	Challenges
Urban Core of Kumasi City Centre	Too much concentration of urban functions is found within Urban Core of Kumasi City Centre. However, the Urban Core has only small commercial/ business areas and is dominated by low-rise houses/ buildings. Therefore, it is not possible to enable further commercial/business development in the central area of KMA due to limited space and poor infrastructures.	To provide advanced urban functions at the Urban Core of this Kumasi City Centre not only for Greater Kumasi but also for Ashanti Region and northern areas To provide necessary infrastructure to support the performance of such advanced urban functions To relocate unnecessary functions to suburban areas/suburban centres/district centres
Sub Centres of Kumasi City Centre	There is little development of commercial/ business functions outside the Urban Core of Kumasi City Centre.	To develop Sub Centres along the Inner Ring Road to accommodate commercial/ business functions
Outside Kumasi City Centre within KMA	Commercial/business land uses are distributed mostly along major roads (ribbon type development). Efforts at satellite market places have been made, but they have been not so successful.	To reduce the prevalence of ribbon development of commercial/ business functions along roads by promoting urban centre development
Suburban Areas outside KMA	There are no many urban service functions, such as commercial/business, as well as public services, for serving suburban residential populations.	To promote the development of suburban centres and district centres with commercial/ business functions for serving suburban residents To promote the orderly development of suburban residential areas

Land use changes for commercial/business are expected to take place in the directions described in Table 11.2.5. The following major commercial/business land use policies are recommended for the areas within Greater Kumasi Conurbation:

- Within Kumasi City Centre, more commercial/business land uses should be allowed, by change from low-density residential use to encouraging multi-storey buildings with first or second floor for commercial/business use and upper floors for residential use.
- Between the Inner Ring Road and Middle Ring Road, commercial/business land

uses could be located by change from low-density residential use along the major roads. That is, ribbon development of commercial/business will be allowed to take place along the major roads in these areas.

- In the Kumasi-Ejisu Urban Corridor, the development of commercial/business multi-storey buildings should be promoted including by change from low-density residential use.
- At District Cenres and Suburban Centres, area development of commercial/ business land uses including multi-storey buildings should be promoted by change from low-density residential use and by providing better local street networks within the centre areas.

Table 11.2.5 Commercial Land Uses in City Centre, Middle and Suburban Areas 2013-38

(1) Kumasi City Centre (Central Areas within Inner Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
Retail Commercial Shops	Numerous small-scale retail shops concentrate in the City Centre.	Some retail commercial shops will move to near satellite markets, which would have bulk breaking points. Modern multi-storey shopping facilities will increase along the Inner Ring Road.	Special retail shops (shops for traditional and specialty items, as well as modern department stores) will continue to be located in the central area, while other retail shops (neighbourhood types) will move to suburban areas.
Wholesale Commercial Shops	Wholesale commercial functions are combined with retail commerce and concentrated in the central area.	Some wholesale functions will move out from the central area near the Middle Ring Road.	Wholesale functions will move out from the central area to suburban areas near the Outer Ring Road.
Private Business Offices	Only a limited number of private companies have their offices in the central area.	Demand for private business offices will increase in the central area, because of the increasing traffic congestion.	More private business offices of regional headquarters functions will be located in the central area.
Government Offices	Ministry department offices and KMA offices are located in the central area.	A new ministry sector will be developed for accommodating new government office buildings.	Renovation of old government offices will continue to be multi-storey buildings and some office buildings will accommodate non-governmental business offices.

(2) Middle Areas (Areas between Inner Ring Road and Middle Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
Retail Commercial Shops	Modern and middle-sized retail stores are emerging.	Due to limited spaces available within the central areas, more shops of modern and middle-sized retail commerce will be located in these middle areas. At the same time, small informal retail shops will be located along major roads and sometime non-major roads (commercial ribbon development will continue to flourish).	Since ribbon pattern of commercial developments are largely increased and concentrated, it is convenient for shoppers to do shopping on the roads. As a result, traffic congestion will intensify on the roads due to those developments, in despite of transformation effort at Kumasi City Centre and development effort at suburban and district centres.
Wholesale Commercial Shops	Few	Few	Few
Private Business Offices	Some private business offices are located along major roads and within convenient residential areas.	Due to limited spaces available within the central areas, more private business offices will be located in these middle areas.	Private business offices will be located in a ribbon pattern along the roads. Because of close to the Kumasi City Centre, it is a convenient place for business offices. As a result, traffic congestion will intensify on the roads due to those developments, in despite of transformation effort at Kumasi City Centre and development effort at Suburban and District Centres.
Government Offices	Few	Few	Some government services offices will be located on these commercial roads.

(3) Suburban Areas (Areas between Middle Ring Road and Outer Ring Road)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
Retail Commercial Shops	Neighbourhood retail commercial functions are weak in this area.	Modern shops will be located in designated Suburban Centres. Small/ informal shops will also increase in and near designated Suburban Centres.	New developments for modern and large-scale shops will be located in designated Suburban Centres.
Wholesale Commercial Shops	Very few or none	Bulk breaking points will be located near satellite markets.	Bulk breaking points and satellite markets will continue to function.

Private Business Offices	Few	Banks and other financial institutions will be located for serving suburban areas.	Private business offices will increase in number in designated Suburban Centres.
Government Offices	Few	Some government service branch offices will be located in designated Suburban Centres.	Relatively large complexes of government institutions will be located or relocated in designated Suburban Centres.

(4) District Centres and their Surrounding Areas (Within the Conurbation – within the Urban Growth Boundary)			
	Present & Short Term (2013-2018)	**Middle Term (2018-2023-2028)**	**Long Term (2028-2033-2038)**
Retail Commercial Shops	Neighbourhood retail commercial functions are weak in this area.	Small/informal retail shops will increase in response to increasing suburban populations.	More modern retail shopping facilities will be located in District Centres and New Town Centres for serving suburban neighbourhoods.
Wholesale Commercial Shops	Very few or none	Few	Few
Private Business Offices	Very few	Some satellite offices for private businesses will be located.	Light industries and ICT-BPO sectors will be located near District Centres.
Government Offices	District-related government offices and services are located.	District-related public facilities, such as district hospitals, will be added to District Centres.	Other government functions will be relocated from the Kumasi City Centre to surrounding areas of District Centres.

Source: JICA Study Team

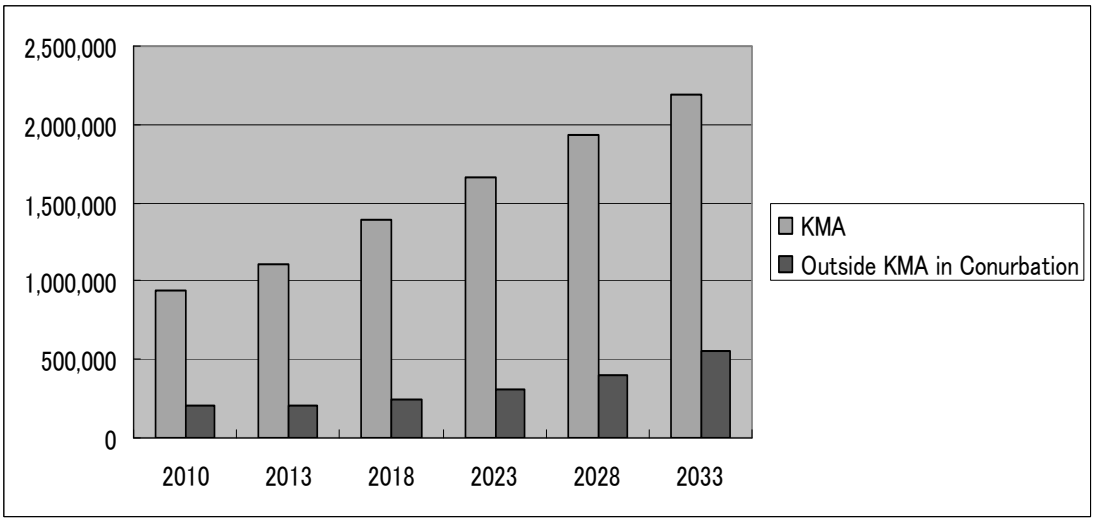
11.2.3 Industrial Land Use

(1) Re-Industrialization Policy

Ghana has been clear about its commitment to transforming its economy from mineral/cocoa dependency to more efficiency driven economy. Manufacturing industrial development is one of the core areas for economic development, not only oil-related and energy related development, but also agriculture-related, such as agro-processing industries. Accra-Tema, Greater Kumasi and Secondi-Takoradi are three major urban clusters of industries. Greater Kumasi also should contribute to national economic development through revising of manufacturing industries and also development of knowledge-based sectors.

(2) Economy, Population and Jobs

Projections for the total number of jobs which will be needed, based on analysis in Chapter 7 is summarised in Figure 11.2.3.



Source: JICA Study Team

Figure 11.2.3 Number of Jobs Needed by Population 2010-33

Of these totals, Primary Industry is projected to decline strongly, manufacturing and services are expected to grow, the latter more than the former (see Table 11.2.6 below). Since most of the service sector jobs are likely to be found in Kumasi City Centre, (which explains the relatively strong increase in KMA jobs in Figure 11.2.3) the land use strategy seeks an increase in commercial uses in KMA, by conversion from low density residential to high density commercial in the CBD. The result will be that a majority of those living in the expanding residential areas between KMA and the Urban Growth Boundary will need to commute into KMA for work. This places emphasis on need for provision of good transportation systems.

Table 11.2.6 Greater Kumasi Population and Employment in Industrial Sectors 2000-2033

	2000	2010	2013	2018	2023	2028	2033
Population	1,758,740	2,764,091	3,127,010	3,749,705	4,393,019	5,050,422	5,761,463
(Annual Growth Rate)	-	(4.62%)	(4.20%)	(3.70%)	(3.22%)	(2.83%)	(2.67%)
EAP	788,799	1,255,027	1,434,351	1,749,042	2,083,164	2,434,048	2,821,388
(EAP/Population)	(44.9%)	(45.4%)	(45.9%)	(46.6%)	(47.4%)	(48.2%)	(49.0%)
Primary Industry	180,166	157,107	160,322	156,846	152,836	148,479	137,988
Secondary Industry	197,061	285,774	355,378	491,166	617,095	730,261	856,972
Tertiary Industry	411,571	812,146	918,651	1,001,031	1,313,233	1,555,307	1,826,473
Employed Population	699,586	1,157,511	1,328,084	1,629,993	1,953,917	2,297,688	2,031,455
(Annual Growth Rate)	-	(5.16%)	(4.69%)	(4.18%)	(3.69%)	(3.29%)	(3.13%)

Source: JICA Study Team and Ghana Statistical Service

Table 11.2.7 Number of Jobs in Economic Sectors Outside KMA within Greater Kumasi Sub-Region, Formal and Informal 2010-33

	Number of Jobs in 2010	Number of Jobs in 2033
Secondary Industry Jobs	54,800	216,900
Manufacturing Jobs	35,600	141,000
Case 1: Formal Manufacturing Jobs (10% of Manufacturing Jobs)	35,600	14,100
Case 2: Formal Manufacturing Jobs (30% of Manufacturing Jobs)	10,700	42,300

Source: JICA Study Team

However, the extent of the formal, versus the informal nature of jobs is a major factor which will affect the likelihood of employment needing to be provided for by serviced industrial areas as opposed to informal settings which are evident today.

The outline in this section, which is more fully developed in Chapter 7, provides the background to the proposals for commercial and industrial land uses which follow.

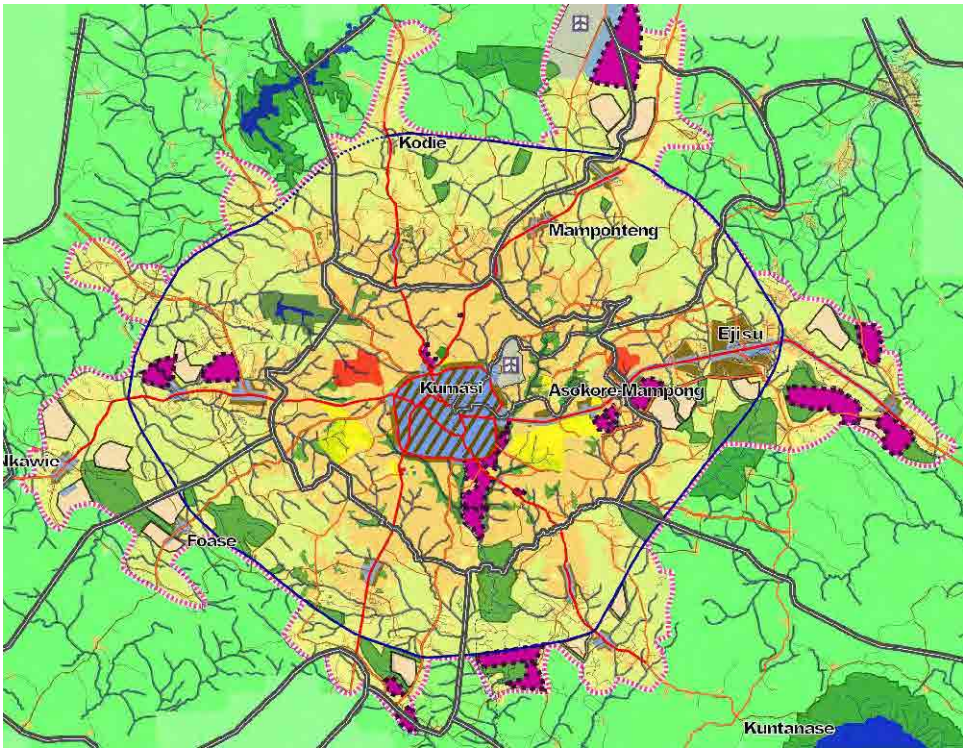
(3) Industrial Areas

Industrial Areas proposed for Greater Kumasi as shown in Table 11.2.8 and Figure 11.2.4 are mostly based on new sites that have been identified. Those New Industrial Areas are located close not only to the existing major roads, but also to the proposed Outer Ring Road.

Table 11.2.8 Necessary Area of Industrial Sites in 2033 Land Use Plan

	Name	Area (ha) High Case	Area (ha) Middle Case
Afigya Kwabre	Airport City	700	0
Atwima Nwabiagya	Sepaase North 1	80	80
	Sepaase North 2	100	100
	Abuakwa North	200	200
Atwima Kwanwoma	New Bekwai Road South 1	50	50
	New Bekwai Road South 2	110	110
	Nkwanta 1	120	120
	Nkwanta 2	250	0
Ejisu-Juaben	Fumesua	140	140
	Ejisu	400	400
	Bankra North	150	150
	Boankra	30	30
Outside KMA Sub-Total		2,330	1,380
KMA	Boadi 1	70	0
	Boadi 2	50	0
KMA Sub-Total		120	0
Greater Kumasi Sub-Region		2,450	1,380

Source: JICA Study Team



Source: JICA Study Team

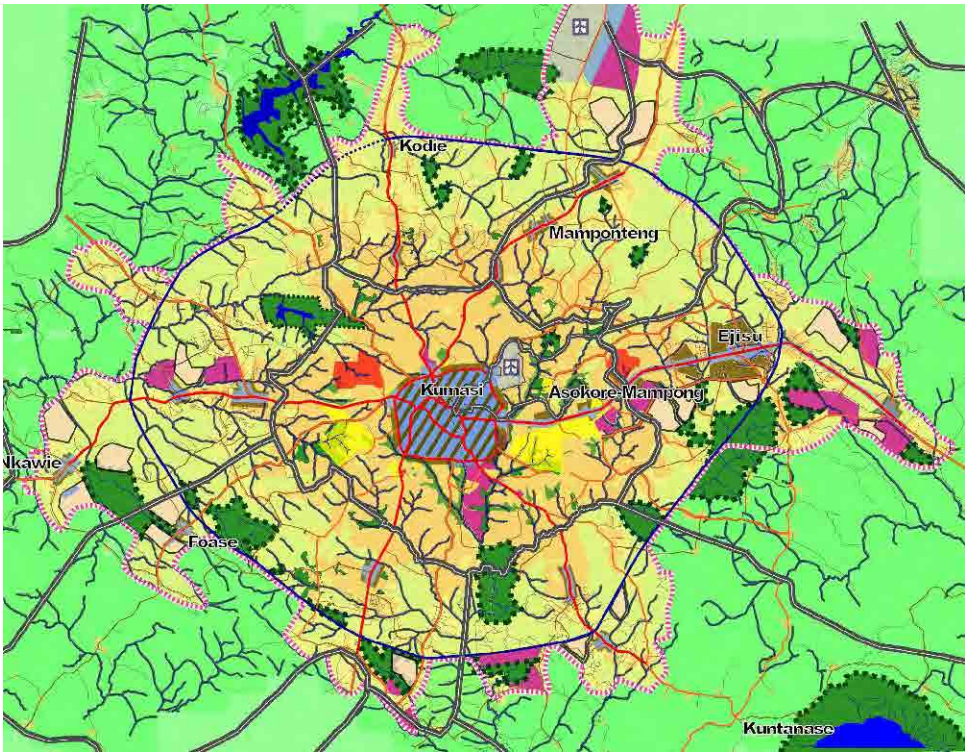
Figure 11.2.4 Industrial Land Uses shown in Purple in the 2028 General Land Use Plan (Proposed)

The estimated capacity of these sites to create jobs is in the order of 30,000-50,000 jobs. These would be in the formal, secondary, manufacturing sector. The provision of adequately serviced and accessed sites attracts manufacturing. The main locations are at and around Boankra, the point of arrival from Accra and link to the centre via the Kumasi-Ejisu Urban Corridor; at the new airport; around the existing manufacturing area at Boadi and to the west of the city on the route to Bibiani and Cote d'Ivoire where sites have been identified for the extension or relocation of Suame Magazine.

11.2.4 Conservation Areas and City Parks Land Uses

Formerly the "Garden City", since the 1950s Kumasi has lost much of its designated Forest Reserves and other open space including flood plains and water courses to illegal encroachments, as shown in Figure 8.7.1. However, several of these remain within the City Centre and extending into KMA beyond the Inner Ring Road. Standards of provision of open space in KMA are well below those required by the Government's Planning Standards. If current practices continue, this may become the prevailing condition in the new conurbation.

Therefore it is essential that existing open spaces within the City Centre are strongly defended, and that new areas are designated in KMA outside of the Inner Ring Road as shown in an excerpt from the Land Use Plan 2033 below.



Source: JICA Study Team

Figure 11.2.5 Conservation Areas shown in Green in the 2028 General Land Use Plan (Proposed)

For promoting nature conservation in Greater Kumasi Sub-Region, the following measures should be taken:

- Protection of existing water courses and enforcement of buffers in all areas
- Identify and designate conservation areas as show in the proposed Land Use Plan above
- Enforce protection of any remaining Forest Reserves
- Active landscaping and management of open spaces in partnership with private individuals and companies for leisure and urban agricultural uses.

The following conservation areas are proposed as shown in Figure 11.2.1:

- Owabi Reserve to protect immediate catchment areas of Owabi Dam
- Barekese Reserve to protect immediate catchment areas of Barekese Dam
- Oti Reserve to secure buffer areas for keeping residential areas away from the Oti Landfill Site
- Dedesua Reserve to protect the areas for a potential site and immediate catchment of a future dam in Dedesua area
- Riverside buffers of water courses, in accordance to the national policy for protecting riversides from encroachment
- Large Green Open Space between Oda River and the Outer Ring Road, which is located to the south of Ejisu Town
- Area surrounding two dams used for aquaculture near Foase
- Large Green Open Space to the south of Nkawie Town
- Large Green Open Space to the west of Airport City

11.2.5 Health, Education, Security, Fire and Other Services' Land Uses

Although the bulk of public services including places of worship, cemeteries and education up to tertiary level and health up to district and regional hospital level, there are certain key uses which fall under the institutional land use category and for which land uses should be shown in the Sub-Regional Structure Plan. However, a limited number of such land uses including tertiary education facilities and tertiary health facilities should be shown in the sub-regional level general land use plan. Other land uses on health, education, security, fire and other public services should be designated at the district level land use plan or zoning plan.

11.3 Future Land Use Policies by Area

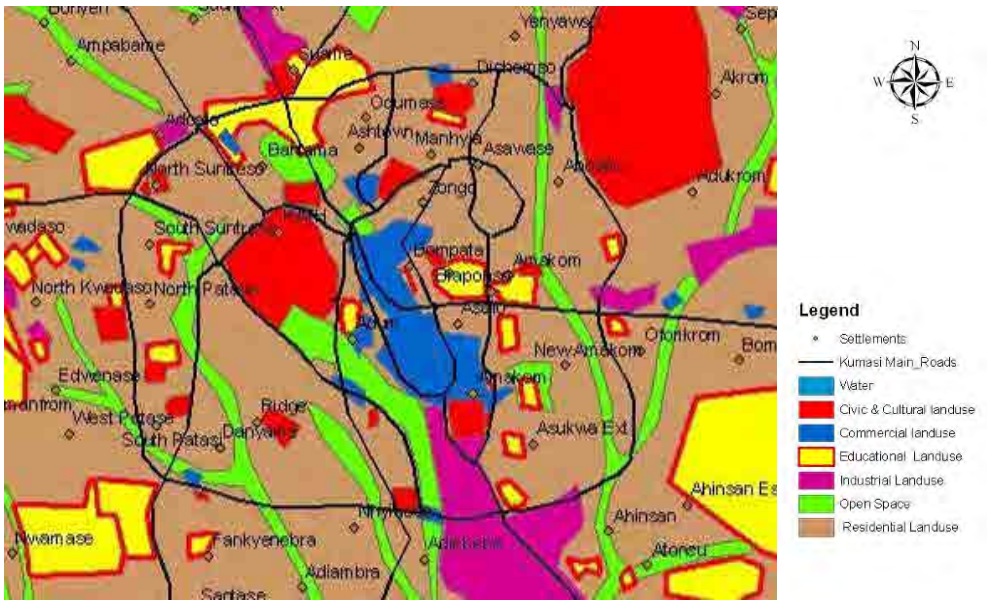
11.3.1 General Land Use Plan for Kumasi City Centre

(1) Present Land Use

At present, various urban activities (retail/wholesale shops/service, logistics, public services) are concentrated in the existing urban centre (Central Market: the largest single open-air market in Ghana, Kejetia Terminal: selling mostly non-consumable goods at a parking facility for the Central Market, Adum Shopping Centre: main commercial centre of non-consumable goods and also accommodating government and private offices). This situation created an extremely single centred concentration pattern. In contrast, suburban service centres supporting suburbanization of population have not been well developed. It may be said that this urban centre pattern does not provide a convenient environment for shopping for most Kumasi people.

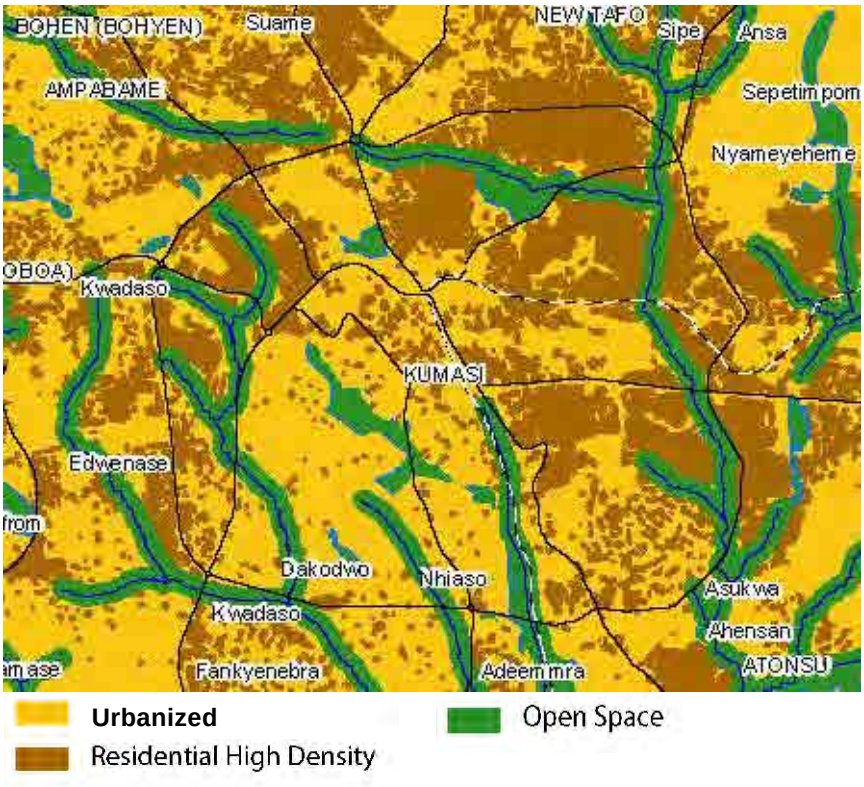
The existing Kumasi City Centre is plagued with over-crowding and congestion resulting from concentration of various urban activities including even daily-commodity retail shops which should be normally located close to residential areas rather than in the central area. On the other hand, specialized shops and specialty shops should be located in the central area of the city.

In the northern part of the existing central area of Kumasi, building and population densities are high. In the low density residential areas also, the number of buildings have increased. More demand for residential and commercial/business uses is expected in the City Centre of Kumasi. See the current land use in Figures 11.3.1 and 11.3.2.



Source: TCPD KMA

Figure 11.3.1 Present Land Use Map in the Central Area of KMA



Source: JICA Study Team

Figure 11.3.2 Present Land Use Map showing High Density Residential Areas (based on Orthophoto Imagery)

(2) Strategies for the City Centre on which Land Use Plan is Based

In the Sub-Regional SDF Kumasi City Centre is defined as the highly urbanized area within the Inner Ring Road, which is composed of the Central Core (CBD) and Sub Centres along the Inner Ring Road.

The SDF for Greater Kumasi Sub-Region recommends transforming Kumasi's City Centre, defined as the area within the Inner Ring Road, to be equipped with much advanced/enhanced urban functions and more space for accommodating commerce/business and residence, while promoting physically and functionally decentralization of retail/wholesale shops/services, logistics and other unnecessary urban functions to District Centres and Suburban Centres.

The SDF proposes that the functions and amenity of Kumasi City Centre as the Primary Centre of Greater Kumasi Sub-Region should be developed and strengthened. High-class infrastructure should be provided for Kumasi City Centre by constructing new roads and establishing BRT routes and BRT major stations.

Strategies for the Central Core include:

- In order to expand the functions and space, establish a new CBD, complimentary with the existing in Adum Area, and connect the two strongly by constructing new roads and BRT routes.
- Promote redevelopment of old housing areas in good locations for increasing mid-rise housing, as well as for introducing mixed use development.
- Conserve historic areas with historic buildings in order to maintain the identity of Ashanti by designating "Historical Conservation Action Areas". (This needs to be carried into not only the Sub-Regional Structure Plan as a whole).
- Modernize the Central Market to reduce roadside hawking.

Strategies for the Sub Centres include:

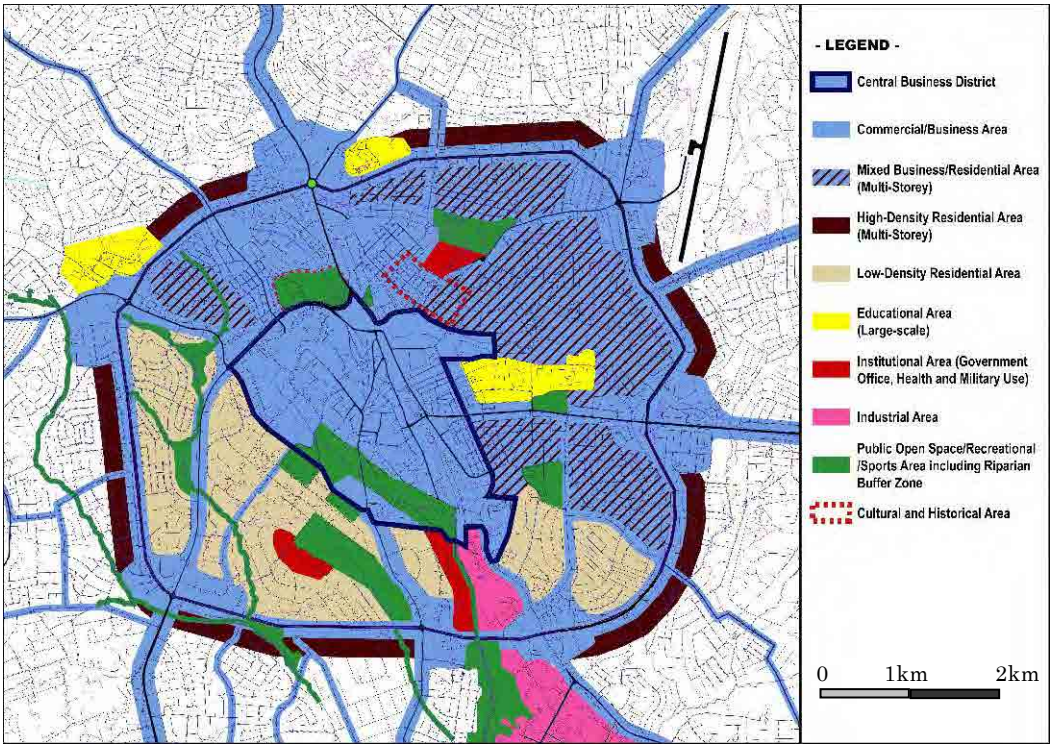
- Develop flyovers for grade separation of the junctions at the Inner Ring Road and major radial urban arterial roads
- Establish BRT major stations, where people can change BRT routes and bus routes, near the junctions
- Give incentives, through revised Local Plans and re-zoning, for establishment of "Mixed Use Development Areas" at major junctions on the Inner Ring Road and radial urban arteries.
- Designate mid-rise, middle-income housing areas behind the Mixed Use Development Areas in the KMA Structure Plan.

(3) Designation of Land Use Categories in Kumasi City Centre

In order to achieve the proposed strategies for transforming the Kumasi City Centre, the proposed Land Use Plan for the City Centre, as shown in Figure 11.3.3, has the following main characteristics:

- Allow and encourage the already dense areas to continue to change from residential areas to mixed business/residential areas, as hatched blue in Figure 11.3.3.
- Allow and encourage the development of multi-storey buildings for mixed business/residential areas.
- Allow changes of use to commercial use along the ring road and along all major roads.

- Encourage and permit mid-rise residential areas behind the commercial uses on the outer edge of the inner ring road:
- Retain and safeguard the existing low-rise residential areas which have a good living environment.
- Safeguard large-scale existing educational, industrial, public open space/leisure uses.
- Designate and apply appropriate policies to the Cultural and Historical areas as shown above: necessary to identify the important areas



Source: JICA Study Team

Figure 11.3.3 General Land Use Plan for Kumasi City Centre, 2028

11.3.2 Land Use Policy for between the Inner Ring Road and the Urban Growth Boundary

In the general land use plan for Greater Kumasi Conurbation, the expansion of suburban residential areas is allowed and encouraged by the following measures:

- Upgrading minor radial roads to major radial roads toward suburban areas
- Establishment and upgrading of a set of roads composing a Middle Ring Road Connection
- Promoting the development of Suburban Centres for providing commercial and other services
- Permitting development in any area up to the Urban Growth Boundary (as described in 8.2.2 above), but
- Preparing a phased programme of provision of infrastructure and services to new settlement areas.

In general, unnecessary urban functions in the central area should be relocated to

these suburban areas, while high-degree urban functions should be more developed in the central area.

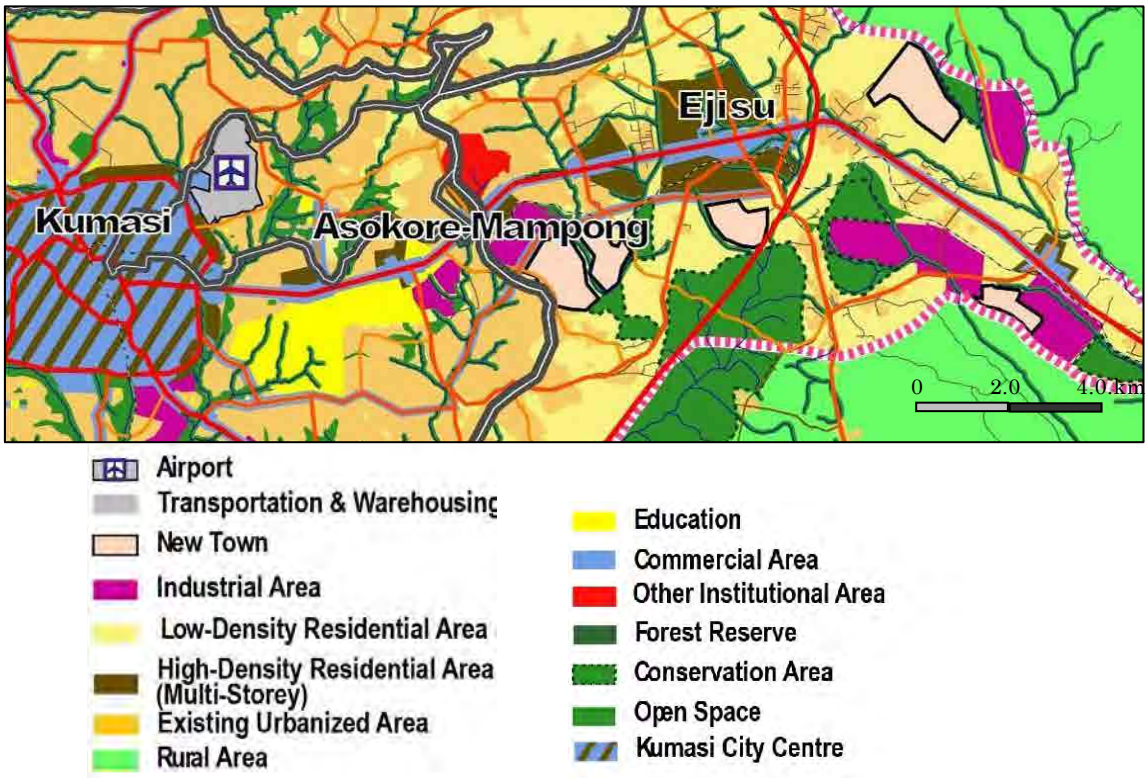
Suburban urban centres can provide perfectly adequate urban services which will prevent suburban residents from having to travel to the City Centre, if they are well planned and organised (for example smaller modern supermarkets, as well as modernized satellite markets). Such suburban centres should be planned not only for providing services to surrounding residents, but also as places for employment opportunities in suburban areas.

In the case between the Inner Ring Road and Middle Ring Road, commercial/ business uses should be allowed to develop along major roads since it is not so easy to develop necessary urban functions at Suburban Centres.

On the other hand, in the case between the Middle Ring Road and Outer Ring Road, commercial/business uses should be discouraged from developing along major roads in favour of development of the identified Suburban Centres at Ahwiaa (Kwabre East), Afrantwo (Afigya Kwabre), Sepaase (Atwima Nwabiagya), Kotwi, (Atwima Kwanwoma), Aputuogya (Bosomtwe), New Akwaduo (Bosomtwe) and Asokore Mampong (Asokore Mampong), and District Centres including Mamponteng, and Kodie. A model measure for upgrading and expanding suburban centres development is given in Figure 11.5.1. This figure shows the ways to add local streets for expanding commercial/business areas at Suburban Centres/ District Centres.

11.3.3 General Land Use Plan for Kumasi-Ejisu Urban Corridor

The Kumasi-Ejisu Urban Corridor should be developed to accommodate business offices, shopping centres, government administrative offices and housing areas, but to have an overall theme of a “Knowledge Corridor” with facilities such as free wireless internet and meeting points for higher education students and graduates with business funders. International exhibition and conference halls could be one of the urban functions which is part of the mixed use development.



Source: JICA Study Team

Figure 11.3.4 Proposed General Land Use Plan for Kumasi-Ejisu Urban Corridor

The development of the Kumasi-Ejisu Urban Corridor proposed in the SDF for Greater Kumasi Sub-Region should be encouraged by the following hardware and software measures:

Road and BRT Development

- Widening of Accra Road to accommodate dedicated BRT lanes (2 lanes)
- Construction of a new major road in parallel with Accra Road
- Establishment of BRT route and BRT stations on Accra Road

Land Use Plan and Regulations

- Set Commercial/Business Land Use Areas along Accra Road in the Land Use Plan
- Set larger areas for Commercial/Business Land Use in surrounding areas of BRT key stations in the Land Use Plan
- Set Multi-Storey Residential Areas behind the Commercial/Business Areas along Accra Road

New Area Development

- Development of Industrial Areas for Knowledge-Based Sectors between Accra Road and the Parallel Road
- Development of New Towns in the south of the Parallel Road

A key Element of this urban corridor development is that the functions and amenities of Ejisu City Centre should be developed and strengthened as the Secondary Centre of Greater Kumasi Sub-Region. Ejisu City Centre should be developed to accommodate business offices and administrative services offices for serving the

surrounding urban areas including industrial areas. Therefore this is designated as a high rise, high density area.

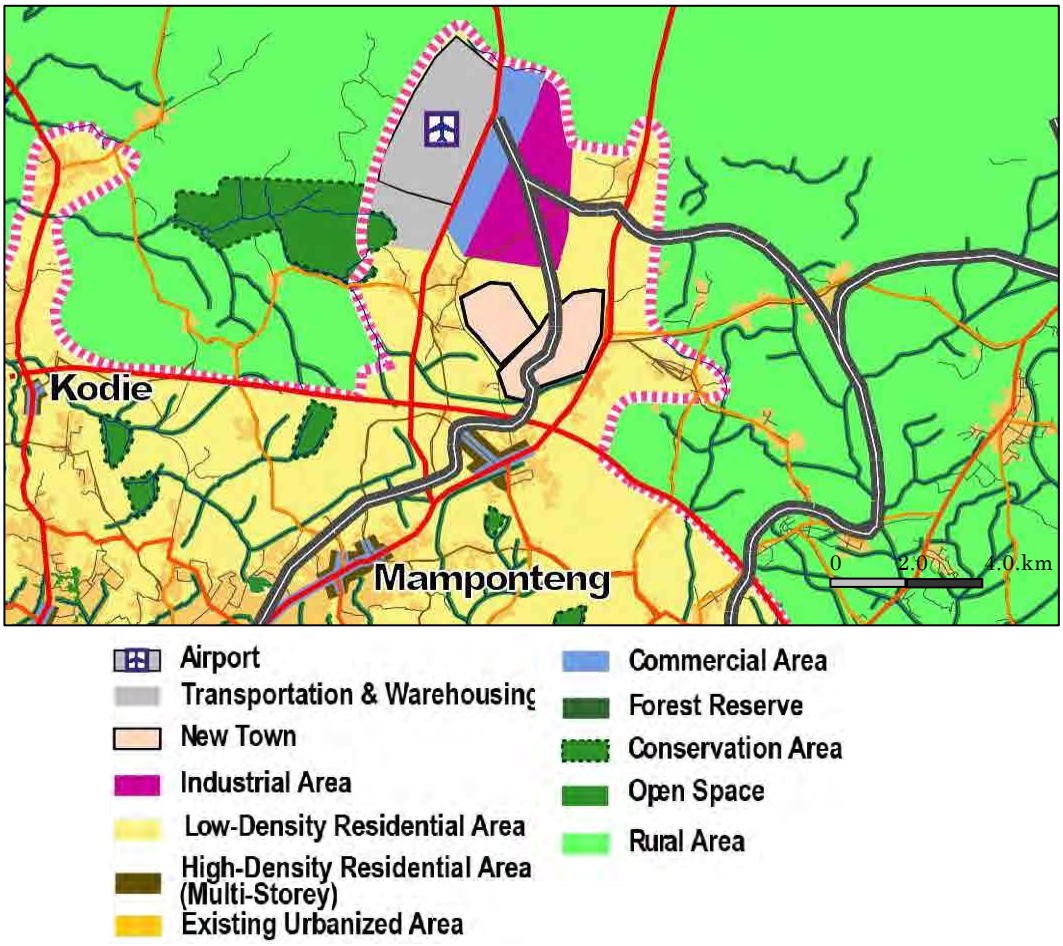
11.3.4 General Land Use Plan for Airport City

An airport city is proposed in conjunction with the proposed new international airport for Kumasi. The Airport City is composed of the following components as shown in Figure 11.3.5:

- International Airport
- Commercial/Business Area
- Light Industrial Area including Logistics Centre
- New Town

This Airport City is to have the following transport accesses:

- BRT route connecting Kumasi City Centre and a new airport terminal through Kumasi-Mamponteng Urban Corridor
- Expressway connecting between the Outer Ring Road and the new airport terminal
- Major Roads connecting Mamponteng District Centre and Aboaso Suburban Centre with the new airport terminal



Source: JICA Study Team

Figure 11.3.5 Proposed General Land Use Plan for Greater Kumasi Airport City

11.4 New Town Development outside the Outer Ring Road and in Urban Corridor

In order to accelerate the speed of suburban development in orderly manner, new town development is recommended for Greater Kumasi Conurbation. Such new towns should be developed for satisfying diversified residential needs ranging from low-rise single family housing to multi-storey multi-family housing.

Eleven new town sites are identified as shown in Table 11.4.1. The proposed new towns are located in Kumasi-Ejisu Urban Corridor (Figure 11.3.4), Airport City (Figure 11.3.5), along New Bekwai Road and Lake Road (Figure 11.4.1) and near Nkawie and Foase (Figure 11.4.2). These new towns could provide residential capacity of about 300,000 populations. This accounts for over 30% of the future population increase outside KMA within the Greater Kumasi Conurbation.

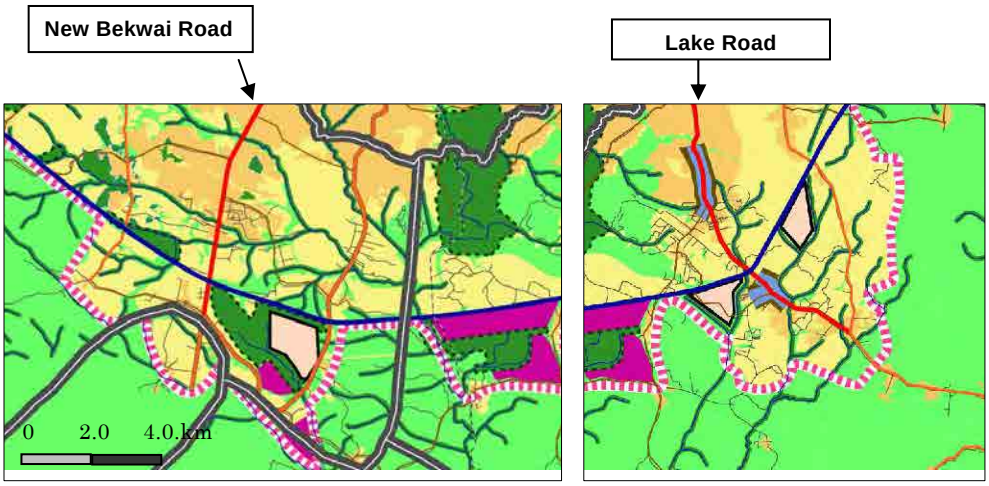
These new towns are mostly located outside the Outer Ring Road since the proposed new town development should be middle-sized area development requiring around 100-200 hectare.

These new towns are to be developed by private developers. Lands for such new town development should be arranged by traditional and government authorities. Such new towns should be developed and equipped with infrastructures in order to encourage people to start moving in immediately after the completion of construction of the new towns.

Table 11.4.1 New Towns Proposed for Greater Kumasi Conurbation

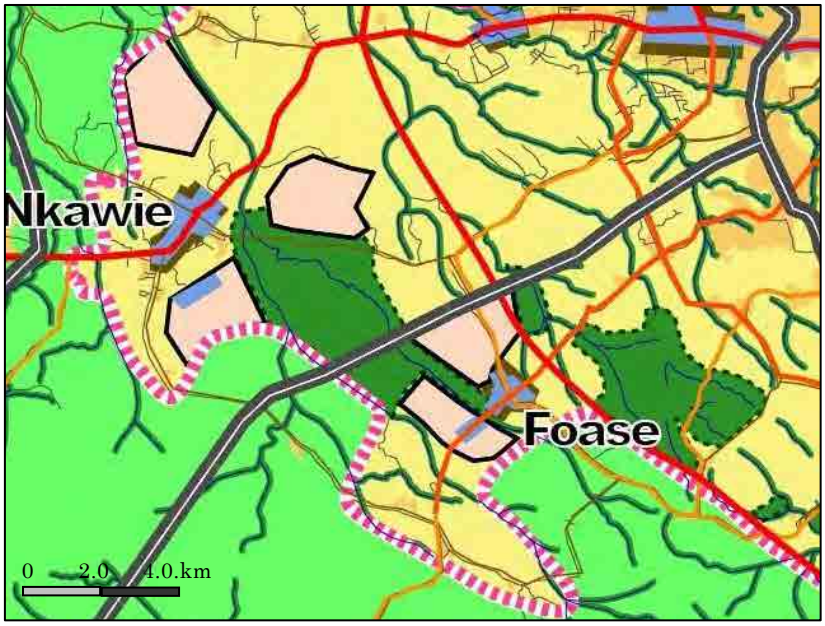
	Name	Area (ha)
Afigya Kwabre	Airport City New Town 1	200
	Airport City New Town 2	200
Atwima Nwabiagya	Nkawie New Town 1	200
	Nkawie New Town 2	210
	Nkawie New Town 3	280
Atwima Kwanwoma	New Bekwai Road South New Town	130
	Foase New Town 1	130
	Foase New Town 2	230
Ejisu-Juaben	Ejisu New Town 1	190
	Ejisu New Town 2	120
	Ejisu New Town 3	110
Outside KMA Sub-Total		2,000
KMA Sub-Total		0
Greater Kumasi Sub-Region		2,000

Source: JICA Study Team



Source: JICA Study Team

Figure 11.4.1 Proposed New Towns along New Bekwai Road and Lake Road in Greater Kumasi Conurbation



Source: JICA Study Team

Figure 11.4.2 Proposed New Towns near Nkawie and Foase in Greater Kumasi Conurbation

11.5 Land Use Plans for Suburban Centres and District Centres Existing

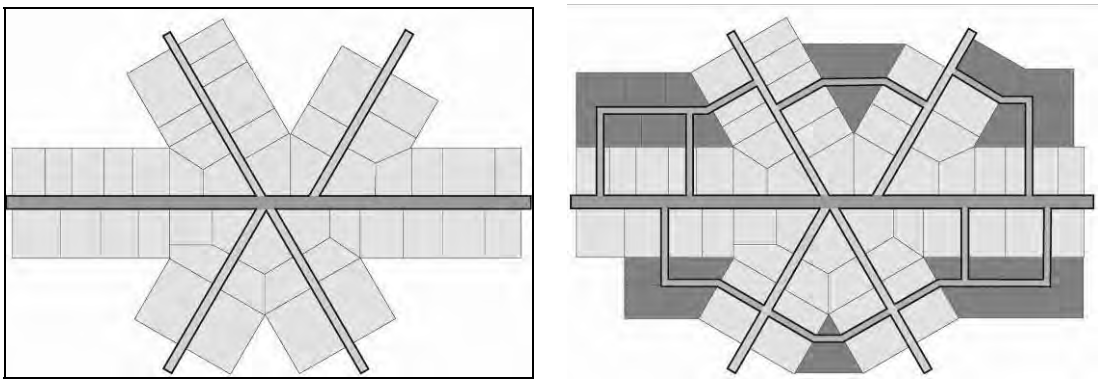
In the Spatial Development Framework (SDF) for Greater Kumasi Sub-Region, district centres and suburban centres are designated. However, currently the areas in which district centres and suburban centres are designated are currently occupied by houses and retail shops.

In order to achieve the desirable spatial structure delineated by the Sub-Regional SDF, the development of commercial/business functions for providing services to suburban residential populations, but also for employment opportunities in suburban areas. For this purpose, it is necessary to provide local roads within designated urban

centres and to designate commercial/business land uses as permissible uses in the land use zoning to be provided by district-level Structure Plans.

The left-side graphic of Figure 11.5.1 is a typical cross section found in suburban centres and district centres. It is a road and land use pattern of ribbon development along roads. Then the right-side graphic of Figure 11.5.1 shows model measures for provision of local roads and designation of commercial/business land use designation in order to solve problems related to ribbon development. .

Local plans for suburban centres and district centres should be prepared and approved to incorporate this kind of measures. Sub-Regional Structure Plans should generally specify which towns should be suburban centres and district centres and to what extent areas should be designated as commercial/business areas. These basic features and parameters specified by the Sub-Regional SP will be translated into a land use plan and zoning plan at the district level.



Source: JICA Study Team

Figure 11.5.1 Model Measures for Upgrading Suburban Centres and District Centres