

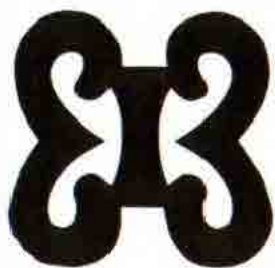
Ministry of Environment, Science, Technology and Innovation (MESTI)

Town and Country Planning Department (TCPD)

THE STUDY  
ON  
Asaaman Ashanti  
THE COMPREHENSIVE URBAN  
DEVELOPMENT PLAN  
FOR

# GREATER KUMASI

IN Juaben  
THE REPUBLIC OF GHANA



FINAL REPORT  
SUPPORTING DOCUMENT

September 2013

Japan International Cooperation Agency (JICA)

ORIENTAL CONSULTANTS CO., LTD.

CTI ENGINEERING INTERNATIONAL CO., LTD.

ALMEC CORPORATION

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**The Study on the Comprehensive Urban Development Plan  
for Greater Kumasi in the Republic of Ghana  
Final Report  
Supporting Document**

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### List of Abbreviation

AFD	Agence Française de Développement
AIDS	Acquired Immune Deficiency Syndrome
BRRRI	Building and Road Research Institute
BRT	Bus Rapid Transit
BSP	Bulk Supply Point
CAP 84	Town and Country Planning Ordinance, 1945
CBD	Central Business District
CHPS	Community-based Health Planning and Services
CSIR	Council for Scientific and Industrial Research
CWSA	Community Water and Sanitation Agency
DACF	District Assembly Common Fund
DDF	District Development Fund
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
ECOWAS	Economic Community of West African States
EHD	Environmental Health Department
EIA	U.S. Energy Information Administration
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EPO	Economic Planning Officer
FAO	Food and Agriculture Organization
FAOSAT	The Statistical Division of the Food and Agriculture Organization
FRHP	Focus Region Health Project
F/S	Feasibility Study
GCAA	Ghana Civil Aviation Authority
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
GMA	Ghana Metrological Agency
GNFS	Ghana National Fire Service
GoG	Government of Ghana
GPHA	Ghana Ports and Harbors Authority
GPRTU	Ghana Private Road Transport Union
GRDP	Gross Regional Domestic Product
GRIDCo	Ghana Grid Company Limited
GSC	Ghana Shippers Council
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit German Technical Cooperation Agency
GUMPP	Ghana Urban Management Pilop Project
GWCL	Ghana Water Company Limited
HIV	Human Immunodeficiency Virus
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
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-Improved 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
METASIP	Medium Term Agriculture Sector Investment Plan
MLGRD	Ministry of Local Government and Rural Development
MMDA	Metropolitan, Municipality, District Assembly
MMT	Metro Mass Transit
MOFA	Ministry of Food and Agriculture
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
NRW	Non-Revenue Water
O&M	Operation and Maintenance
NUP	National Urban Policy
PCU	Passenger Car Unit
PV	Photovoltaics
RCC	Regional Co-ordinating Council
ROW	Right of Way
RPCU	Regional Planning Co-ordinating Unit
SCWSP	Small Communities Water & Sanitation Policy
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SIP	Strategic Investment Programme
SMTDP	Sector Medium-Term Development Plan
SP	Structure Plan
SRTM	Shuttle Radar Topography Mission
SSP	Strategic Sanitation Plan
SWM	Solid Waste Management

TCPD	Town and Country Planning Department
UESP	Urban Environmental Sanitation Programme
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UPTUs	Urban Passenger Transport Units
VIP	Ventilated Improved Pit
VOC	Vehicle Operating Cost
VRA	Volta River Authority
WB	World Bank
WC	Water Closet
WD	Works Department
WACIP	West African Common Industrial Policy
WEDC	Water, Engineering and Development Centre
WHO	World Health Organization
WRC	Water Resources Commission
WRS	Water Resource Study

## **Brief on the Study Project**

<b>Country:</b>	The Republic of Ghana
<b>Study Project Name:</b>	Project on the Comprehensive Urban Development Plan for Greater Kumasi in the Republic of Ghana
<b>Study Project Period:</b>	January 2012 to September 2013
<b>Executive Agency:</b>	Ministry of Environment, Science, Technology and Innovation (MESTI)
<b>Implementation Agency:</b>	Town and Country Planning Department (TCPD)
<b>Study Area:</b>	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:**

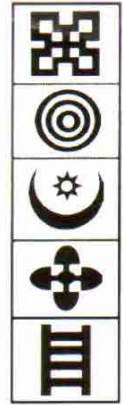
- To formulate a Sub-Regional Spatial Development Framework (SDF) for the Greater Kumasi Sub-Region.
- To formulate a Sub-Regional Structure Plan (SP) to guide the development and/or redevelopment of the urbanizing portion of the Greater Kumasi Sub-Region, which is defined as the Greater Kumasi Conurbation.
- 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





# PART I

## Present Situation of Ghana





## Chapter 1 Past Trends of Development of Ghana

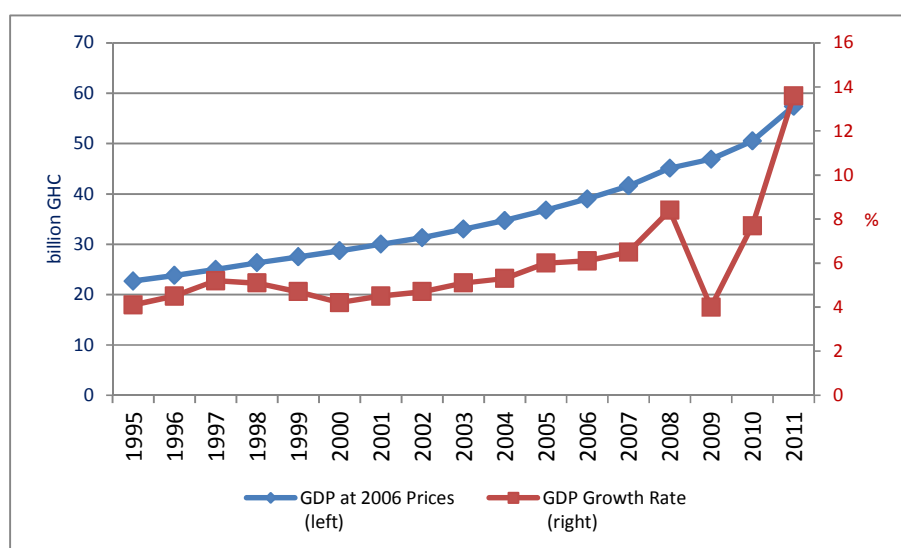
### 1.1 Review of Past Development Situation of Ghana

#### 1.1.1 Review of Past Economic Development of Ghana

##### (1) Trends of Ghana's GDP

Since the 1990s, Ghana's economic development has been steady but slow. The real GDP growth rate has been around 5% per annum (Figure 1.1.1) and the real per capita GDP growth rate has been around 3% with an annual population growth rate of around 2.2%.

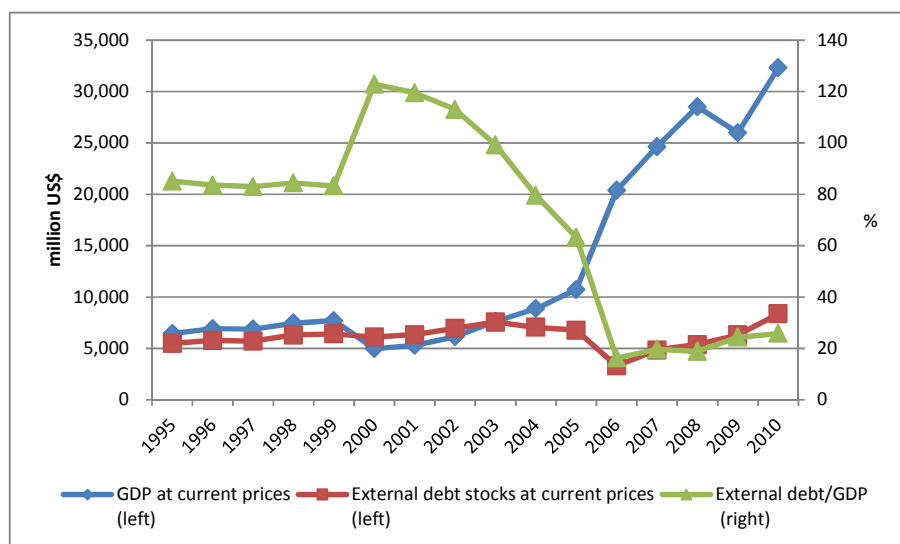
When it comes to the years after 2005, Ghana's GDP grew at over 6% per annum, due to the favourable prices of cacao and gold.



Source: IMF, World Economic Outlook Database, 2012

**Figure 1.1.1 GDP at 2006 Prices and GDP Growth Rate**

On the other hand, the total external debt of Ghana kept increasing and it reached US\$6,311 million in 1998. The ratio of the debt amount to GDP also increased, and in 2000 it jumped to 122.9% due to a fall of GDP in the year. See Figure 1.1.2.



Source: WB, World Development Indicators, 2012

**Figure 1.1.2 GDP at 2006 Prices and GDP Growth Rate of Ghana**

In 2001, the International Monetary Fund and the World Bank (the International Development Association) dispatched missions to assess Ghana's eligibility for assistance under the enhanced Initiative for Heavily Indebted Poor Countries. In 2002, the assistance was approved. In 2005, Ghana reached its completion point under the initiative by taking necessary steps so that it was allowed to receive the full debt relief.

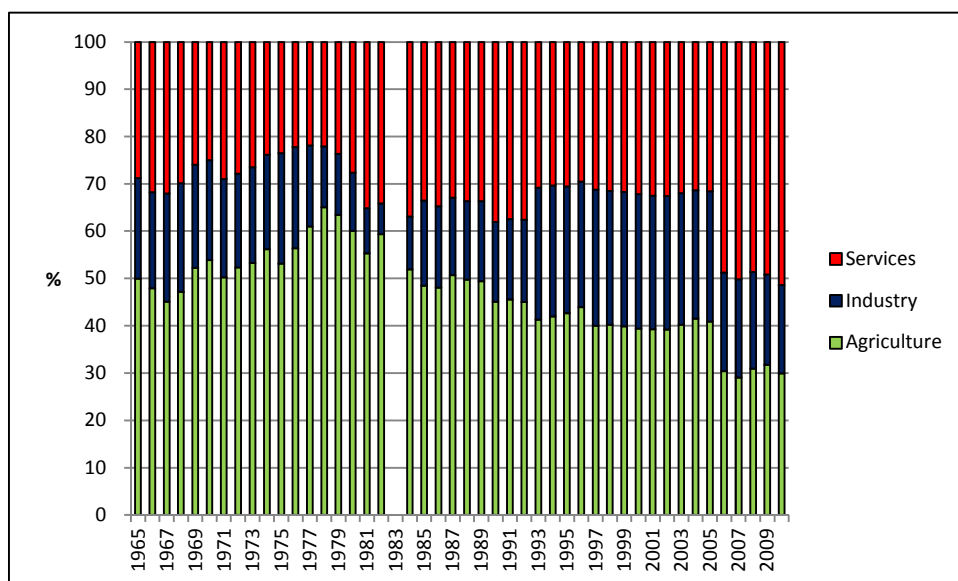
In the period between 2006 and until 2009, the debt ratios to GDP had decreased to 20-30%. However, since 2010, Ghana's debt ratios have increased to over 40% because of its increased borrowing by issuing bonds in the international financial markets and from China.

## (2) Trend of Shares of Economic Sectors

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 (Figure 1.1.3). 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. In 2010, the shares of agriculture, industry and services were 29.9%, 18.6% and 51.4% respectively.

While the mining sub-sector is strong and the oil and gas industry is coming up, the manufacturing sub-sector, which should have led in the economic development and economic transformation of Ghana, experienced shrinking of GDP by 2.3% in 2007 and 1.3% in 2009. Its share in GDP continued to fall from 10.2% in 2006 to 6.8% in 2010.

According to the Gross Domestic Product 2011 revised by the Ghana Statistical Service in April 2012, "crude oil" accounts for 5.2% of GDP at basic prices (Table 1.1.1). Following this new activity, increasing shares are found in "construction", "trade and repair of vehicles and household goods", "information & communication", "cocoa", and "other community, social & personal services". On the other hand, "transport & storage", "hotels and restaurants", "manufacturing", and activities under agriculture except "cocoa" considerably decreased their shares with their relatively slow growth.



Source: WB, World Development Indicators, 2012

Figure 1.1.3 Trend of Sector Shares in Ghana

Table 1.1.1 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	%
<b>Agriculture</b>	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
<b>Industry</b>	3,930	21.1	4,522	22.2	4,725	22.0	5,053	21.8	7,132	27.1
Mining & quarrying	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
<b>Services</b>	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
<b>GDP at basic prices</b>	<b>18,610</b>	<b>100.0</b>	<b>20,344</b>	<b>100.0</b>	<b>21,521</b>	<b>100.0</b>	<b>23,220</b>	<b>100.0</b>	<b>26,328</b>	<b>100.0</b>
<b>Net indirect taxes</b>	<b>1,303</b>		<b>1,248</b>		<b>934</b>		<b>1,032</b>		<b>1,414</b>	
<b>GDP in purchasers' value</b>	<b>19,913</b>		<b>21,592</b>		<b>22,454</b>		<b>24,252</b>		<b>27,742</b>	

Source: Ghana Statistical Service, 2012, Revised Gross Domestic Product 2011

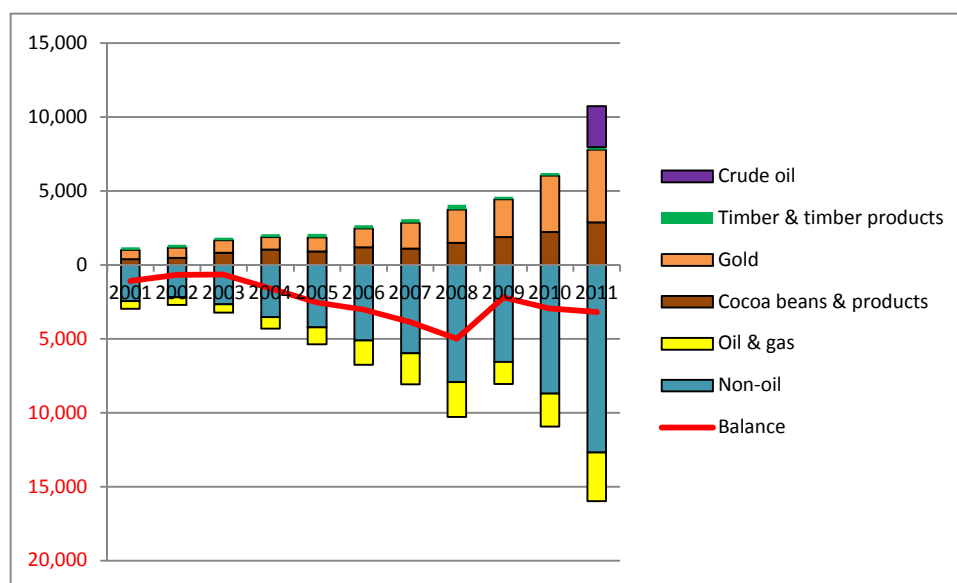
### (3) Merchandise Trade

Ghana's merchandise trade deficit has been persistent (Figure 1.1.4). In spite of a considerable amount of net inflow of private and official transfers, the current account has also been in deficit. In the export, gold and cocoa beans and products have been two dominant commodities. In 2010, gold accounted for 47.8% of all the exports and cocoa (cocoa beans and cocoa products) accounted for 27.9%. Export of timber and timber products has been stagnant and lowered its share from 9.1% in 2001 to 2.4% in 2010 after the world recession. Ghana started export of crude oil on a commercial scale in 2011 and it accounted for 21.7% in 2011 according to provisional data of the Bank of

Ghana, although payment for imported oil products exceeds earnings of exported crude oil.

The share of cocoa products (cocoa paste and cocoa butter) is minor but increasing. The share in terms of volume increased from 10.7% of the total export volume of cocoa beans and cocoa products in 2006 to 23.1% as a provisional estimate for 2010, indicating that cocoa processing is being steadily developed.

In the imports, oil accounts for about 20%. Gas import started in 2011. In the non-oil imports, industrial supplies and other capital goods have a dominant share.



Source: Bank of Ghana, 2011

Figure 1.1.4 Merchandise Trade of Ghana

## 1.1.2 Outline of Economic Activities in Ghana

### (1) Agriculture

**Agriculture is an important economic sector for Ghana, contributing 32 percent of Ghana's GDP (2009, World Bank) and employing 51 percent of the country's labour force including forestry (MoFA).**

**Agricultural output grew by 7.2 percent in 2009 and 5.3 percent in 2010 as shown in**

Table 1.1.2, significantly contributing to the country's aggregate economic growth in these years, at 4.0 percent and 7.7 percent respectively.

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). The following tables (Table 1.1.3 through 4.1.5) show the evolution of the volumes and average annual growth rates of major food and cash crops' production and import.

**Table 1.1.2 GDP Growth Rates by Sector, 2008-2010**

	2008	2009	2010
GDP at factor cost	8.4	4.0	7.7
Agriculture	7.4	7.2	5.3
Crops	8.6	10.2	5.0
o.w. Cocoa	3.22	5.0	26.6
Livestock	5.09	4.4	4.6
Forestry and Logging	(3.33)	0.7	10.1
Industry	15.07	4.5	5.6
Services	7.99	5.6	9.8

Source: MoFEP 2012 Budget Statement

**Table 1.1.3 Staple Food Production in Ghana**

Unit: 1,000 MT

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Annual Growth Rate
Cassava	8,965.8	9,731.0	10,239.3	9,738.8	9,567.0	9,638.0	10,217.9	11,351.1	12,230.6	13,504.1	4.7%
Yams	3,546.7	3,900.0	3,812.8	3,892.3	3,923.0	4,288.0	4,376.0	4,894.9	5,777.9	5,960.5	5.9%
Plantains	2,073.8	2,278.8	2,328.6	2,380.9	2,792.0	2,900.0	3,233.8	3,337.7	3,562.5	3,537.7	6.1%
Maize	938.0	1,400.0	1,288.6	1,157.6	1,171.0	1,189.0	1,219.6	1,470.1	1,619.6	1,871.7	8.0%
Taro (cocoyam)	1,687.5	1,860.0	1,804.7	1,716.0	1,686.0	1,660.0	1,690.1	1,688.3	1,504.0	1,354.8	-2.4%
Rice, paddy	274.6	280.0	238.8	241.8	287.0	250.0	185.3	301.9	391.4	491.6	6.7%
Sorghum	279.7	316.1	337.7	287.0	305.0	315.0	154.8	331.0	350.6	324.4	1.7%

Source: FAOSTAT

**Table 1.1.4 Staple Food Import in Ghana**

Unit: 1,000 MT

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Wheat	152.1	147.1	213.0	250.0	369.8	344.0	357.7	337.2	347.5
Flour of Wheat	28.7	45.4	6.9	7.8	10.3	9.3	20.0	17.6	22.7
Maize	10.6	10.5	0.2	50.0	55.0	100.0	3.2	63.9	9.5
Flour of Maize	0.1	0.2	0.0	0.0	0.0	0.2	0.0	0.2	0.2
Rice Paddy	51.3	22.2	0.0	0.0	0.2	0.2	0.0	1.1	1.1
Rice Milled	167.5	180.2	134.3	384.4	47.9	35.4	69.8	116.3	163.7

Source: FAOSTAT

**Table 1.1.5 Major Cash Crop Production in Ghana**

Unit: 1,000 MT

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Annual Growth Rate
Cocoa beans	389.6	340.6	497.0	737.0	740.0	734.0	614.5	680.8	710.6	632.0	5.5%
Oranges	300.0	329.7	336.9	400.0	500.0	470.0	480.0	550.0	560.0	556.1	7.1%
Groundnuts, with shell	258.0	520.0	439.0	389.6	420.0	520.0	301.8	470.1	485.1	530.9	8.3%
Tomatoes	175.1	205.2	202.1	223.5	200.3	176.3	180.0	284.0	317.5	350.0	8.0%
Coconuts	315.0	315.0	315.0	315.0	315.0	315.0	316.0	316.3	273.8	297.9	-0.6%
Chillies and peppers, green	191.0	212.4	175.5	229.2	243.7	277.0	279.0	282.2	176.2	294.1	4.9%
Palm oil	108.0	108.0	108.4	114.0	117.0	121.0	122.0	128.0	130.0	120.0	1.2%
Pinapples	63.8	70.1	71.6	67.0	60.0	66.0	68.0	70.0	74.7	73.7	1.6%
Bananas	12.0	14.0	16.0	18.0	26.3	56.0	57.5	63.0	65.0	64.5	20.5%
Cashew nuts, with shell	8.3	9.0	16.5	25.0	29.0	34.0	40.5	22.0	27.0	28.4	14.6%

Source: FAOSTAT, 2012

The increase in the production of the above crops has been mostly attributable to the increase in their planted areas. The following table shows the mean annual growth rates of the planted areas of major food crops.

**Table 1.1.6 Mean Annual Growth Rates of the Areas Planted with Selected Food Crops in Ghana**

Crop	Average Area ('000HA)		Growth Rate (%) <sup>a</sup>	Average Area ('000HA)		Growth Rate (%) <sup>a</sup>
	1997—1999	2000—2002		2003—2005	2007—2009	
<i>Roots &amp; Tubers:</i>						
Cassava	619.8	727.0	5.32	780.4	842.1	2.54
Cocoyam	265.5	264.0	-0.18	267.1	244.7	-2.92
Yam	213.7	282.8	9.34	310.8	350.0	3.96
Plantain	241.1	262.1	2.79	285.9	342.4	3.13
<i>Cereals:</i>						
Maize	681.7	782.5	4.60	754.9	863.6	4.48
Millet	179.0	199.8	3.66	191.3	177.2	-2.55
Sorghum	322.6	318.3	-0.44	316.4	250.5	-7.78
Rice (Paddy)	117.8	101.5	-4.98	119.0	134.7	4.12
<i>Legumes:</i>						
Groundnuts		285.8		448.8	342.9	-8.77
Beans		141.1		184.6	154.3	-5.98

Source: MOFA, 2009, Agriculture in Ghana, Facts and Figures 2009

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 (MOFA 2010). Although Ghana, due to an increase in the production of staple food crops, does not face food deficits, 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; cocoa production has achieved a growth rate of 5.1 percent per annum from 2001 to 2009<sup>1</sup>. On the other hand, export crops such as cashew nuts, pineapples and oranges have been suffering acute fluctuations in their export volumes, exposed to international competition without having specific advantages. The following table shows the export volumes of major cash crops from 2001 to 2009 (remark: Ghana is a net importer of palm oil although the country is exporting the oil).

After 2003, the European demand for pineapples shifted from traditional varieties to MD2. Ghanaian producers were obliged to change the variety from Smooth Cayenne to MD2 that does not necessarily fit Ghanaian natural conditions and thus requires the use of more inputs. This resulted in a significant erosion of profitability for farmers, bringing Ghana's pineapple exporting industry to the verge of collapse. The change of variety also severely affected pineapple juice producers; the supply volume of second-grade pineapples is no longer sufficient to maintain their production cost at the competitive level. On the other hand, processing of orange juice is gradually but steadily expanding in Ghana since the fresh Ghanaian oranges are not favoured on the international market because of their green colour, thus juice factories are able to get abundant supply of oranges at relatively low prices.

<sup>1</sup> The growth rate was calculated based on the data obtained from FAOSTAT.



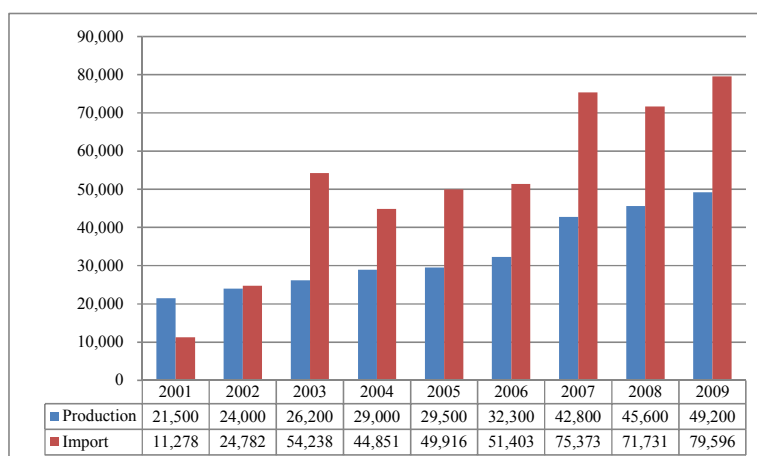
**Table 1.1.7 Major Cash Crop Export of Ghana**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
	Unit: 1,000 MT								
Cocoa beans	396,000	480,964	676,090	850,000	792,151	1,060,000	895,703	979,098	1,151,370
Palm oil	7,936	9,000	23,000	25,350	11,875	36,000	61,500	64,000	42,000
Cashew nuts, with shell	89	1,450	2,602	19,690	32,828	28,113	10,272	111,890	33,308
Pineapples	7,933	15,520	33,403	68,343	15,644	51,367	9,950	6,260	6,260
Pineapple Juice	36	177	339	1,183	1,164	2,288	279	0	0
Oranges	126	672	256	28	59	478	290	588	1,866
Orange Juice	0	0	0	0	34	0	0	486	486
Groundnuts Shelled	14	101	4,973	8,102	2,750	2,200	363	35	54
(Reference)									
Palm oil (Import)	13,500	11,565	13,668	59,000	54,335	112,000	130,000	162,250	119,800

Source: FAOSTAT, 2012

## (2) Livestock

Although Ghana has a large stock of chickens, commercial poultry has not been well developed. In terms of prices, domestic chicken meat cannot compete with imported, mass-produced frozen chicken meat. As the following figure shows, Ghana's market is dominated by imported chicken meat, mostly originating from Brazil, Netherlands and the U.S.A. Ghana imported approximately 80 million tons of chicken meat in 2009.



Source: FAOSTAT, 2012

Unit: tons

**Figure 1.1.5 Production and Import of Chicken Meat of Ghana**

Ghana is also a net importer of cattle. According to the interviews conducted by the Study Team and TCPD staff at the central market in Kumasi, a large number of cattle are transported in trucks from Burkina Faso where larger-sized breeds are raised. They are slaughtered at abattoirs in Ghana and sold in major cities. The following table shows the import values of major livestock and meat.

**Table 1.1.8 Import Values of Major Livestock and Meat of Ghana**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
	Unit: 1,000 USD								
Cattle	11,000	12,500	14,000	11,000	11,800	9,000	6,000	8,000	8,000
Cattle meat	50	234	127	637	1,712	167	1,679	985	1,020
Chickens	1,171	1,531	152	1,987	3,087	1,705	3,776	3,695	1,814
Chicken meat	8,303	17,120	24,111	34,657	67,304	41,673	61,936	78,473	85,374
Pig meat	108	494	949	877	1,304	1,324	367	607	958
Bacon and Ham	1,139	1,646	1,747	1,006	2,914	1,353	1,623	1,474	1,681

Source: FAOSTAT, 2012

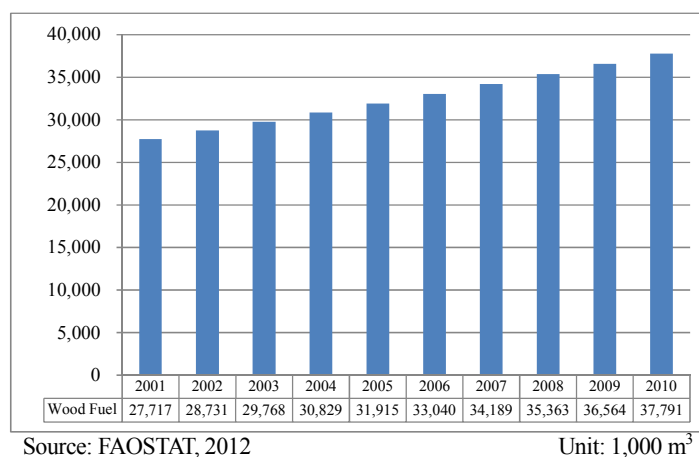
### (3) Timber and Forest Products

According to the Food and Agriculture Organization (FAO) reports, Ghana’s forest coverage was 5,574,000 hectares in 2005, representing 24 percent of the country’s land. This coverage is down from the 1990 figure of 33 percent of land area, a decline of 35 percent over a fifteen-year period. Exotic woods are Ghana’s third largest export commodity after gold and cocoa; forest products earned USD 316.8 million in 2008, accounting for 6 percent of the total export revenue (Bank of Ghana, Annual Report 2010). Tropical high forest, which is concentrated in the central to south-western parts of the country, has declined from 8 million hectares to 1.6 million hectares<sup>2</sup> (Amelia et al, 2007) because of deforestation and poor forest management. According to the Ghana Forestry Commission, the deforestation rate in Ghana stands at 65,000 hectares per annum (Tropenbos, 2005)<sup>3</sup>.

Fuel wood accounts for approximately 90 percent of wood consumption in Ghana, according to FAO’s statistics. The consumption of fuel wood continues to grow. On the other hand, the production and export of forest products have been decreasing in recent years. According to the Kumasi Wood Cluster Association, the transaction volume of lumbering has decreased to a half of the peak year. The export earning of forest products dropped from USD 296.8 million in 2007 to USD 175.2 million in 2009. This apparently reflects the reduction in the accessibility and availability of domestic high-grade timber wood, caused by the depletion of forests. According to the interviews conducted at the Sokoban Wood Village by the Study Team and TCPD staff, illegal logging is conducted throughout the country and the shortage of wood is resulting in a smuggling of logs from the Ivory Coast. The main importers of Ghanaian forest products in 2009 were Burkina Faso, India, Italy, Nigeria, and U.S.A (FAOSTAT).

Figure 1.1.6 and 1.1.7 show the evolution of wood fuel production and the production and export volumes of timber and wood products.

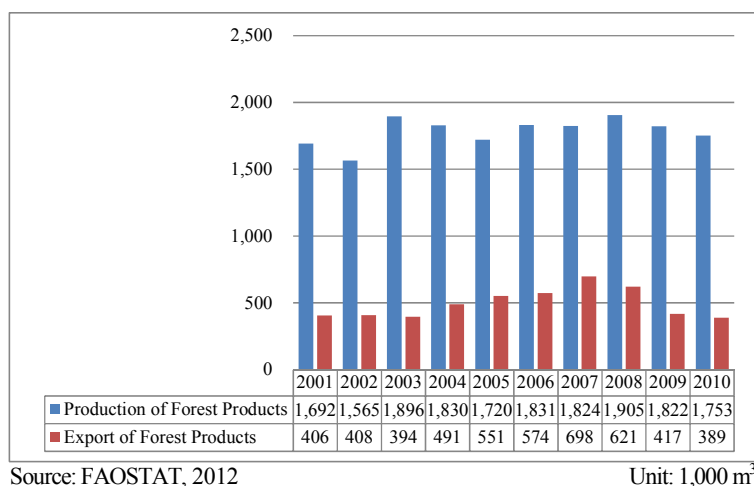
Large-sized lumbering companies in Ghana are concentrated in the Asokwa-Ahinsan-Kaase areas of Kumasi due to the proximity to the materials and the convenience in land transport.



**Figure 1.1.6 Wood Fuel Production of Ghana**

<sup>2</sup> Amelia et al (2007). “Strengthening Voices for Better Choices” Ghana Assessment Report, Amelia et al, April 2007

<sup>3</sup> Tropenbos (2005). Reconciling Policy Reforms with Forest Legislation” Tropenbos International – Ghana, 2005.



**Figure 1.1.7 Production and Export of Forest Products of Ghana**

#### (4) Manufacturing Sub-Sector

The recent rapid contraction in the manufacturing sub-sector is mainly due to the energy crisis, including the rapid increase in petroleum prices and unstable electricity supply. Other factors for declining performance of the manufacturing sub-sector is attributed partly to the massive influx of cheap imported goods, unstable supply and low quality of raw materials, and high cost of credit.

Most textile industries in Ghana have collapsed partly by abolishment of government protection measures and importation of cheap second-hand clothes to the domestic market, while textile industries had been surviving with government protection prior to 1983.

The food processing and beverages sub-sector contributed about 15% to the manufacturing output. Main food products include cocoa products, dairy products (mainly milk and ice cream), edible oils, wheat flour and canned tuna.

The cement and iron/steel products industries declined in output. These are energy-intensive and have been adversely affected by the last energy crisis.

Ghana used to have a smelter for producing alumina by processing imported alumina. In 2003, the company (the Volta Aluminium Company) stopped its operations due to lack of reliable electricity supply. It re-opened its operations in 2005, but shut down again in 2007.

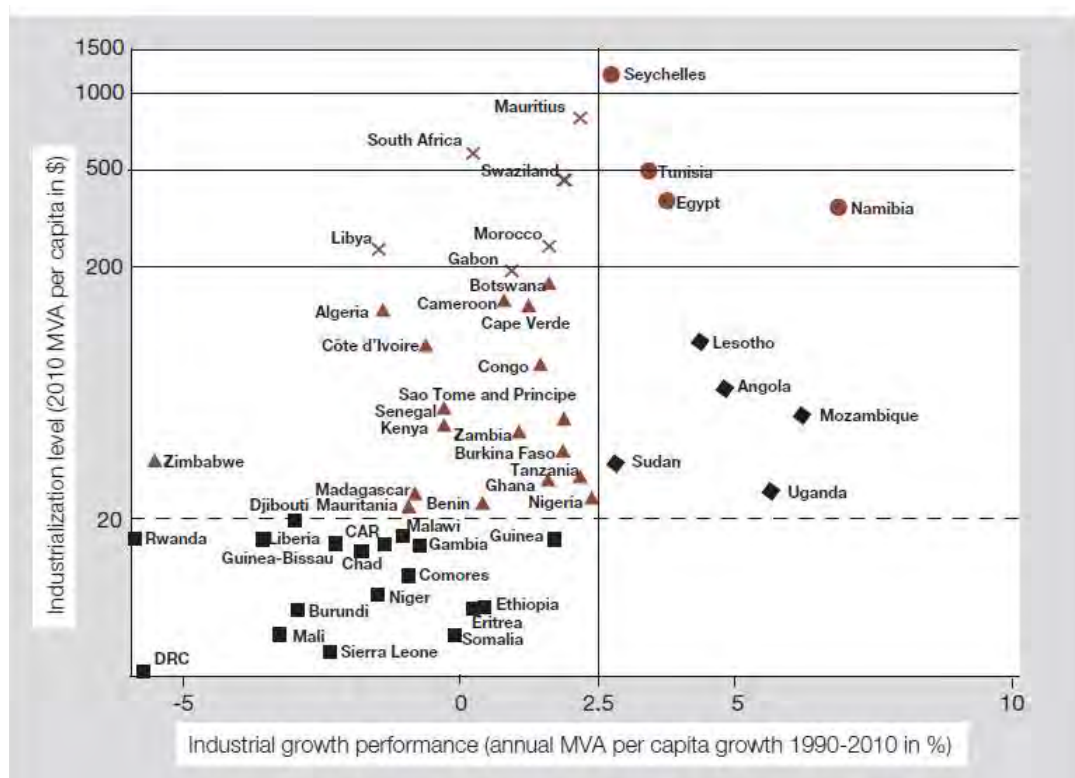
### 1.1.3 Characteristics of Manufacturing in Africa, including Ghana

“Economic Development in Africa Report 2011: Fostering Industrial Development in Africa in the New Global Environment”, a special issue report prepared jointly by UNIDO and UNCTAD in July 2011, quotes an argument that the Structural Adjustment Programme weakened the industrial base of Africa. According to the argument, trade liberalization under the Structural Adjustment Programme exposed domestic firms to import competition and led to closure of some manufacturing firms including those in Ghana. The argument seems to emphasize the importance of roles to be properly played by governments for industrial development.

Some of the characteristics of manufacturing in Africa pointed out by the report are the small scale and informality, the losing ground in labour-intensive manufacturing, and the heavy dependence on resource-based manufacturing. In Ghana, its share in the total manufacturing value added was 86%

while the low technology manufacturing share was 7% and the medium and high technology 6% in 2009. It is also emphasized that industrial clusters play an important role in African manufacturing because they reduce geographical and informational costs for the located firms, especially small and medium scale firms. One example is the Suame Manufacturing Cluster.

African countries are classified by industrialization level (2010 manufacturing value added per capita over \$200, or between \$20 and \$200, or less than \$20) and growth performance (annual manufacturing value added per capita growth 1990-2000 over 2.5% or less than 2.5%) Ghana was classified as falling behind because its 2010 manufacturing value added per capita was between \$20 and \$200, and the growth rate was less than 2.5%.



Source: UNIDO/ UNCTAD, 2011, Economic Development in Africa Report 2011 Fostering Industrial Development in Africa in the New Global Environment, UN

**Figure 1.1.8 An Overview of African Countries’ Industrialization Level and Growth Performance**

### 1.1.4 Oil and Gas in Ghana<sup>4</sup>

Reserves, supply and consumption of oil of Ghana rank 41st (not including US), 55th, and 93rd respectively in the world as shown in Table 1.1.10 and Table 1.1.11. The crude oil proved reserves jumped to 0.66 billion barrels in 2011 as they are being explored. The total oil supply had been far below the total petroleum consumption before 2011 when the former jumped and surpassed the latter. In 2011, the reserves and ranks in the world (not including US) of some selected countries for comparison are as follows.

Reserves of natural gas of Ghana are 0.8 trillion cubic feet, ranking 71st in the world not including

<sup>4</sup> U.S. Energy Information Administration (EIA) International Energy Statistics, Others

US as shown in Table 1.1.11. By 2011, however, no dry natural gas was produced yet. Its consumption was also zero before 2011 when 4.2 billion cubic feet of dry natural gas was consumed. It was imported from Nigeria through a pipeline. In 2011, the reserves and ranks in the world (not including US) of some selected countries for comparison are as follows.

**Table 1.1.9 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
<b>Total Petroleum Consumption (Thousand Barrels per Day)</b>	<b>47.66</b>	<b>44.37</b>	<b>47.00</b>	<b>60.00</b>	<b>64.00</b>	<b>93</b>
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

**Table 1.1.10 Crude Oil Proved Reserves**

Country	Reserves (billion barrels)	World ranking not including US
Nigeria	37.20	10
Malaysia	4.00	25
Indonesia	3.99	26
Ghana	0.66	41
Vietnam	0.60	44
Japan	0.04	77

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

**Table 1.1.11 Proved Reserves of Natural Gas**

Country	Reserves (trillion cubic feet)	World ranking not including US
Nigeria	186.88	7
Indonesia	106.00	13
Malaysia	83.00	15
Vietnam	6.80	44
Ghana	0.80	71
Japan	0.74	72

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

## 1.1.5 Poverty Situation

### (1) Poverty Reduction in Ghana

Ghana has experienced significant poverty reduction in 1990s and 2000s. The poverty rate has declined from 51.7% in 1991/92 to 39.5% in 1998/99 and further to 28.5% in 2005/06. Similarly, the proportion of population living under extreme poverty line declined from 36.5% in 1991/92 to 18.2% in 2005/06 (See Table 1.1.12). Ghana will achieve the 2015 targets of the Millennium Development Goals, halving the proportion of those in extreme poverty<sup>5</sup>.

<sup>5</sup> Target poverty rates of MDG are expected to be 26% (upper poverty line) and 19% (extreme poverty line) in 2015.

However, the poverty reduction has not happened equally across the regions and the districts. Inequality indicated by Gini coefficient has increased from 0.373 in 1991/92 to 0.404 in 2005/06 at the national level. Inequality of each region has also increased in the same period except the Volta Region and Northern Region (See Table 1.1.12 and Figure 1.1.9).

Three northern regions, Northern, Upper West and Upper East Regions, have held the highest poverty incidence throughout the period. Among them, the Upper West and Upper East regions continue to have very high rates of extreme poverty, 79.0% and 60.1% in 2005/06 respectively.

The poverty reduction in the 1990s was concentrated in Greater Accra and the rural forest zone where cocoa, gold, and timber are produced.<sup>6</sup> Further decline of poverty in the period of 1998/99-2005/06 happened more evenly in all regions except the Greater Accra and Upper West regions (See Figure 1.1.9). The Western, Central and Eastern regions achieved significant poverty reduction, of which the poverty rates fell to the lowest level among the regions in 2005/06. Increase of cocoa production and increase of the international price of cocoa brought a large impact to poverty reduction in this period. In Greater Accra, urban poverty started to increase, although the poverty incidence is still kept at the lowest rank among the regions.

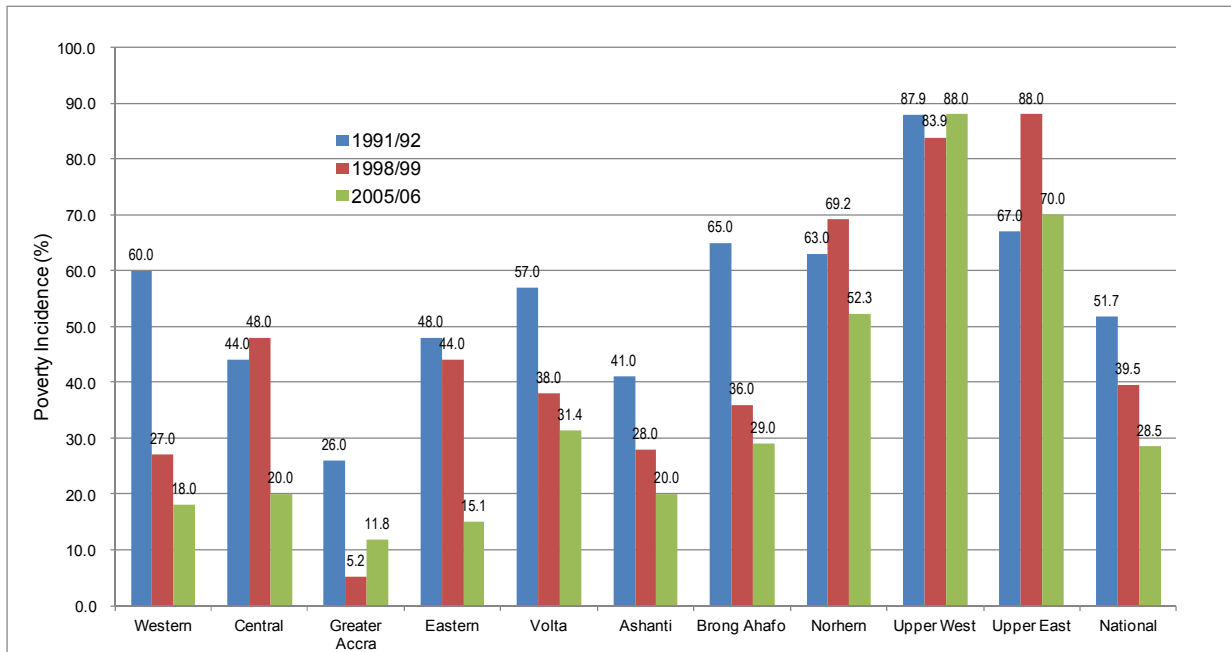
Poverty incidence in rural areas is much higher than in urban areas. Although the poverty incidence fell significantly from 63.6% in 1991/92 to 39.2% in 2005/06 in rural areas, it is considered that the impact has been made mainly by export farming, and the farmers cultivating food crops remain poor. Still 25.6% of the rural population (65% of rural poor) live under the extreme poverty line.

**Table 1.1.12 Poverty Incidence and Inequality by Region**

Region	Poverty Incidence (Upper Poverty Line)			Poverty Incidence (Extreme Poverty Line)			Inequality (Gini Coefficient)		
	1991/92	1998/99	2005/06	1991/92	1998/99	2005/06	1991/92	1998/99	2005/06
Western	60.0	27.0	18.0	42.0	14.0	7.9	0.326	0.324	0.355
Central	44.0	48.0	20.0	24.0	31.0	9.7	0.338	0.332	0.388
Greater Accra	26.0	5.2	11.8	13.0	2.4	6.2	0.354	0.300	0.410
Eastern	48.0	44.0	15.1	35.0	30.4	6.6	0.339	0.346	0.345
Volta	57.0	38.0	31.4	42.0	20.4	15.2	0.327	0.304	0.319
Ashanti	41.0	28.0	20.0	25.0	16.4	11.2	0.376	0.380	0.377
Brong Ahafo	65.0	36.0	29.0	46.0	18.8	14.9	0.349	0.333	0.359
Northern	63.0	69.2	52.3	54.0	57.4	38.7	0.400	0.389	0.391
Upper West	87.9	83.9	88.0	74.0	68.3	79.0	0.346	0.316	0.399
Upper East	67.0	88.0	70.0	53.0	88.0	60.1	0.326	0.316	0.430
Urban	27.7	19.4	10.8	15.1	11.6	5.7	0.347	0.349	0.374
Rural	63.6	49.6	39.2	47.2	34.4	25.6	0.341	0.369	0.407
<b>National</b>	<b>51.7</b>	<b>39.5</b>	<b>28.5</b>	<b>36.5</b>	<b>26.8</b>	<b>18.2</b>	<b>0.373</b>	<b>0.388</b>	<b>0.404</b>

Source: Harold Coulombe and Quentin Wodon, 2008, Millennium Development Goals Report Poverty, Livelihoods, and Access to Basic Services in Ghana

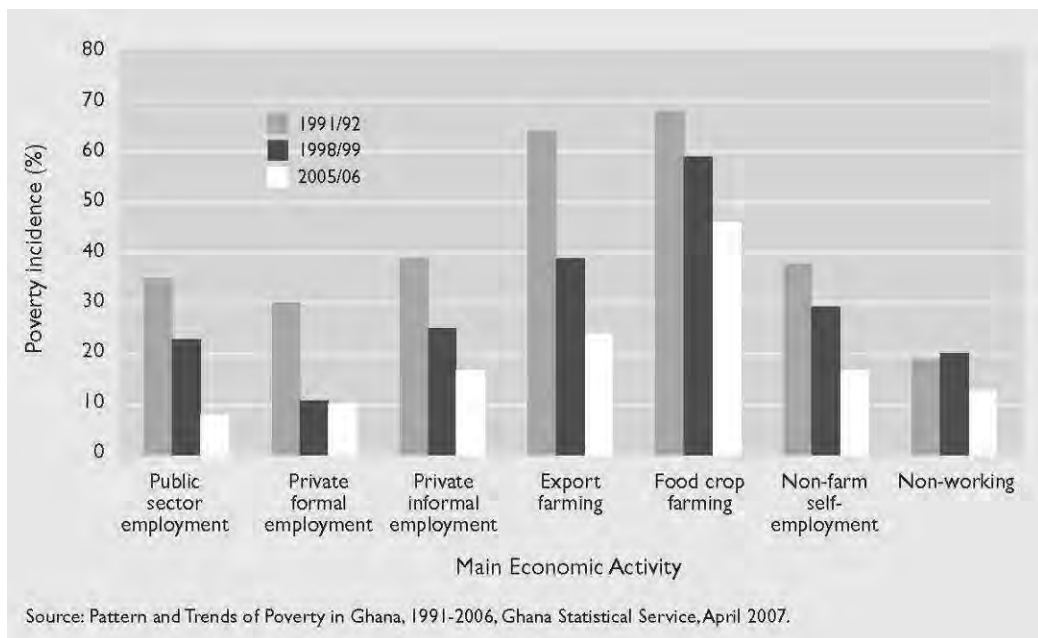
<sup>6</sup> The new 'New Poverty Agenda' in Ghana: what impact? Lindsay Whitfield, DIIS Working Paper 2009: 15



Source: Harold Coulombe and Quentin Wodon, 2008, Millennium Development Goals Report: Poverty, Livelihoods, and Access to Basic Services in Ghana

**Figure 1.1.9 Poverty Incidence by Administrative Region (Upper Poverty Line)**

Figure 1.1.10 shows the trend of poverty incidence by economic activity. While export farming experienced a sharp decline in poverty incidence, food crop farming has the highest poverty incidence. Poverty incidence for public sector employment fell to the lowest level among the economic activities in 2005/06.



Source: Pattern and Trends of Poverty in Ghana, 1991-2006, Ghana Statistical Service, April 2007.

Source: Lindsay Whitfield, 2009, The new 'New Poverty Agenda' in Ghana: what impact? Lindsay Whitfield, DIIS Working Paper 2009: 15

**Figure 1.1.10 Poverty Incidence by Main Economic Activity**

## **1.2 Review of Policies and Plans for Future Socio-Economic Development of Ghana**

### **1.2.1 Long-term Vision 2020**

In 1995, long-term national objectives for 2020 were presented in Ghana – Vision 2020. They consisted of five pillars, namely human development, economic development, rural development, urban development, and creation of an enabling environment.

The basic goal of economic development was to establish an open and liberal market economy for optimizing the rate of economic development and ensuring the maximum welfare and material well-being of all Ghanaians.

In the production side, an average overall growth rate in agricultural production was set at 4% per annum, while 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%. The service sector featured 4 types of activities, namely (1) storage, transportation and distribution of goods, (2) international tourism, (3) cultural and sport activities, and (4) private sector financial systems. Important roles of the micro, small and medium-scale enterprises and science and technology were also emphasized.

### **1.2.2 Shared Growth and Development Policy Frameworks**

Following the above mentioned “Ghana – Vision 2020”, several policy papers have been formulated as below:

- The First Step (1996-2000) included in the Ghana – Vision 2020 paper
- The First Medium-term Plan (1997-2000)
- Ghana Poverty Reduction Strategy (2003-2005)
- The Growth and Poverty Reduction Strategy (2006-2009)
- Ghana Shared Growth and Development Agenda (GSGDA) (2010-2013)
- The Coordinated Programme of Economic and Social Development Policies (2010-2016)

The last of the above with the subtitle “An Agenda for Shared Growth and Accelerated Development for a Better Ghana” was presented by the President to the parliament in December 2010. The paper presents a per capita GDP target of US\$3,000. The target requires a national GDP growth rate of 11.0% per annum starting in 2010, when the per capita GDP was US\$1,318, assuming the national population growth rate at 2.2%. On the other hand, considering the impact of oil and gas development, the average real GDP growth rate is projected at 11.3% per annum over the medium term, therefore the target is expected to be hit.

The paper also presents 8 strategic elements driving the transformation for a Better Ghana. It was emphasized 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.

#### **(1) Environment for Accelerated Employment Creation**

The government has to prepare an environment for job creation particularly for the youth as its priority task.



(Implications to Greater Kumasi Sub-Region: Not only private investment promotion for formal industrial sector development, but also modernization of traditional Suame Magazine type of car repairing & manufacturing should be promoted for job creation.)

**(2) Accelerated Agricultural Modernisation**

Natural gas will be used to produce fertilizer to improve agricultural productivity. Then opportunities for large scale production and value-added agro-processing will be created.

(Implications to Greater Kumasi Sub-Region: Modernization of small-scale agriculture should be promoted by promoting the utilization of chemical fertilisers, and furthermore, agro-processing capacity should be developed for utilizing increased agricultural production.)

**(3) Integrated Industrial Development**

Emphasis is on agro-based manufacturing, down-stream of oil and gas industries, and value-added mineral processing and manufacturing. A proactive local content policy will ensure that Ghanaians can participate in and benefit from the industrialization (if the policy measures do not impede FDI).

Special strategic industrial estates together with relevant industrial laws will be developed. Industrial processing value chains and seed industrial champions will be promoted. Particular attention will be paid to utilization of gas for electric and heat generation and as raw material.

(Implications to Greater Kumasi Sub-Region: Greater Kumasi Sub-Region needs to emphasize agro-based manufacturing by utilizing agricultural produce from Ashanti Region, and Greater Kumasi Sub-Region should compete with other regions' investment opportunities.)

**(4) Infrastructure Development**

For attracting investment, infrastructure is one thing and institutional setups conducive to investment attraction are another thing.

Science and technology facilities need to be strengthened. Culture and tourism will also be promoted.

(Implications to Greater Kumasi Sub-Region: Infrastructure development, as well as institutional frameworks should be promoted for attracting investments, and science & technology should be promoted for furthermore strengthening economic development.)

**(5) Human Development**

Innovative people need to be fostered for an innovative country.

(Implications to Greater Kumasi Sub-Region: Greater Kumasi Sub-Region is an educational capital. Higher education can also be an industry for Greater Kumasi Sub-Region. Furthermore, educational/research institutes and their graduates can be resources for industrial development and knowledge-based economic development.)

**(6) Private Sector Development**

Liberalization and restructuring of the national economy as well as strengthening the financial sector will assist the private sector.

(Implications to Greater Kumasi Sub-Region: Concerted efforts of one-stop procedures (for Greater

Kumasi Sub-Region), institutional restructuring and infrastructure development promote Foreign Direct Investment and Domestic Direct Investment. The land system should be streamlined, or if that is too difficult, special zones free from such problems should be prepared for investors.)

**(7) Transparent and Accountable Governance**

Local governance and decentralization will be strengthened in order to promote increased citizens' participation, including that of women, the youth and the disabled.

(Implications to Greater Kumasi Sub-Region: An inclusive and participatory development planning and development management should be actively promoted for Greater Kumasi Sub-Region.)

**(8) Financial Mobilisation including Public-Private Partnerships (PPPs)**

Public-private partnerships, state-state partnerships, and financial sector reform are promoted.

(Implications to Greater Kumasi Sub-Region: PPP and local development funds for Greater Kumasi Sub-Region should be promoted.)

### **1.2.3 Industrial Sector Support Programme (ISSP)**

The Industrial Development Policy of Ghana was prepared by the Ministry of Trade and Industry in 2011. It has 4 components: (1) production and distribution, (2) technology and innovation, (3) incentives and regulatory regime, and (4) cross-cutting issues. The policies of each of the four components are explained as below:

**(1) Production and Distribution**

- As non-agro-based local raw materials to be extensively exploited, limestone, kaolin, iron ore, clay, salt, aluminium sulphate, oil and gas are emphasized. (Gold should be added.)
- The government will strengthen training institutes, encourage industry to provide necessary training, and promote investment in training, by providing incentives.
- Labor productivity should be raised. (Industrial relations, 5S, Kaizen)
- To finance industrial development, the government will establish an industrial fund to provide long-term financing for industry based on clear and transparent criteria.
- Access to land for industrial development is largely determined by traditional practices, resulting in fragmented and inefficient land administration. Therefore, one-stop functions and industrial estates for investors are required.
- Infrastructure development and operation should involve the private sector.
- Industrial subcontracting should be encouraged for technical and financial improvement. (also in other sectors like dairy and agro-processing) The local content issue needs to be studied from various viewpoints.

**(2) Technology and Innovation**

- Collaboration between industries and universities/research institutes should be strengthened.
- ICT should be promoted by providing infrastructure and an enabling environment for the private sector.

**(3) Incentives and Regulatory Regime**

- IFC's Doing Business ranking should be raised from 63rd in 2011.
- One-stop functions and industrial estates including procedures, institutional systems and

infrastructure are a set of two pillars for overall improvement of the investment climate.

- Labor and industrial relations should be improved by changing the work culture if necessary.
- It is important to discuss and act toward optimal spatial distribution of industries. The best and most realistic industrial distribution should be sought by utilizing various policy tools such as industrial estates, logistic parks, incubators, cluster initiatives for SMEs, incentive measures, MMDA's development plans, new land measures, etc.
- Strategic intervention for industrial development should be based on careful discussions on the balance between government initiatives and market mechanism.

**(4) Cross-cutting Issues**

- Workplace HIV/AIDS programmes are encouraged.
- Environmental sustainability is required. One way is to introduce accreditation for good environmental management.
- Industrial data and information should be built up and maintained.
- Gender conscious measures should be taken at various levels such as government policies and job place programmes.

### **1.2.4 ECOWAS's West African Common Industrial Policy (WACIP)**

For regional integration, the Economic Community of West African States (ECOWAS) Council of Ministers adopted the West African Common Industrial Policy (WACIP) in 2010 with the following specific objectives<sup>7</sup>:

- To deliver and broaden the region's industrial production by progressively raising the processing of export products by an average of 30% by 2030;
- To progressively increase the manufacturing industry's contribution to regional GDP to an average of over 20% in 2030, from its current average of between 6% and 7%. (Ghana's current figure is between 8% and 9%.);
- To improve intra-community trade from the present 13% to 40% by 2030; and
- To expand the volume of exports of manufactured goods from West Africa to the global market from the current 0.1% to 1% by 2030.

### **1.2.5 National ICT Policy and Plan Development Committee**

The National ICT Policy and Plan Development Committee set up by the Government under the Chairmanship of Professor Clement Dzidonu is tasked to develop for Ghana an ICT-led Socio-economic Development Policy and the corresponding Plan on the basis of an extensive national consultative exercise.

#### The ICT for Accelerated Development (ICT4AD) Process

This process is to develop an ICT-driven socio-economic development policy and plan that will aid Ghana's developmental effort and move the economy and society towards a knowledge based information society and economy in the shortest possible time. The process is being carried out in three phases:

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<sup>7</sup> Economic Development in Africa Report 2011: Fostering Industrial Development in Africa in the New Global Environment, by UNIDO and UNCTAD.

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Phase 1: The first phase will concentrate on the development of an Integrated ICT-led Socio-Economic Development Framework for Ghana (The Framework Document).

Phase 2: This phase of the Process will concentrate on the development of an Integrated ICT-led Socio-Economic Development Policy and Strategies for Ghana (The Policy Document).

Phase 3: The Plan, to be developed in the 3rd Phase will provide details of HOW the policy commitments of the Government (contained in the Policy document) can be translated into concrete programmes and initiatives for implementation.

### **1.2.6 Medium Term Agriculture Sector Investment Plan (METASIP)**

According to the plan prepared by MOFA in September 2010, Ghana's agriculture is dominated by small scale producers with average farm size of about 1.2 ha. Small farmers account for about 80% of domestic production. They are mostly resource-poor and use little fertilizer, insecticide, high yielding varieties or irrigation-based cultivation. Most farmers also lack knowledge about seed technology. As a result, yields of most crops are generally low and most yields are about 60% of achievable yields.

The plan summarizes factors contributing to low agricultural productivity as follows:

#### Crop production

- Reliance on rain fed agriculture and low level irrigated agriculture
- Low level of mechanization in production and processing
- High post-harvest losses as a result of poor post-harvest management (e.g. storage, transportation, processing)
- Low level and inefficient agricultural finance
- Poor extension services due to institutional and structural inefficiencies.
- Inadequate markets and processing facilities

#### Livestock Production

- Low performing breeds of livestock
- Poor feeding of livestock
- High cost of feed for poultry
- Poor livestock housing and husbandry management
- Poor post-production management of livestock products
- Competition with imports

#### Fish Production

- Over-fishing of natural water bodies
- Undeveloped fish value chain (e.g. inadequate supply systems for fingerlings and feed)
- Lack of skills in aquaculture

In order to address the above issues, the plan presents the following programmes to be implemented during the 2011-2015 period.

- Programme 1: Food Security and Emergency Preparedness
- Programme 2: Increased Growth in Incomes
- Programme 3: Increased Competitiveness and Enhanced Integration into Domestic and

International Markets

- Programme 6: Improved Institutional Coordination

It is noted that Programme 6 emphasizes among other things the importance of partnership with private sector and civil society organizations. For private sector and civil societies to enter into the sector, an enabling environment needs to be provided by MOFA and other related organizations such as the Ghana Investment Promotion Centre (GIPC) and local MDAs.

Moreover, it is noticeable that this investment plan for agriculture does not emphasize the importance of foreign and/or domestic private investments.

## **1.3 Review of Spatial Development Policies of Ghana**

### **1.3.1 National Urban Policy (NUP)**

The Ministry of Local Government and Rural Development embarked on development of a National Urban Policy by setting up a functional technical working group in April 2010. Through various consultative meetings, a final draft was completed for the National Urban Policy (NUP) in June 2011.

In the First Medium-Term Development Plan (1997-2000), the absence of a national human settlements strategy was pointed out as one of the major issues.

The goal of the National Urban Policy (NUP) is “to promote a sustainable, spatially integrated and orderly development of urban settlements with adequate housing, infrastructure and services, efficient institutions, and a sound living and working environment for all people to support the rapid socio-economic development of Ghana”.

#### **(1) Objectives of the National Urban Policy**

The objectives of the NUP are as follows:

1. To facilitate balanced re-distribution of urban population
2. To promote a spatially integrated hierarchy of urban centres
3. To promote urban economic development
4. To improve the environmental quality of urban life
5. To ensure effective planning and management of urban growth and sprawl, especially of the primate cities and other large urban centres
6. To ensure efficient urban infrastructure and service delivery
7. To improve access to adequate and affordable low-income housing
8. To promote urban safety and security
9. To strengthen urban governance
10. To promote climate change adaptation and mitigation mechanisms
11. To strengthen applied research in urban and regional development
12. To expand sources of funding for urban development and strengthen urban financial management

#### **(2) Initiatives to Achieve the Objectives of NUP**

In order to achieve the above policy objectives, initiatives have been formulated in response to each of these objectives.

Items under these initiatives have various implications to the formulation of the Greater Kumasi Sub-Regional Spatial Development Framework and Structure Plan, as well as the formulation of Ashanti Regional spatial development policies.

### **1.3.2 Area-Based Development Policies and Programmes**

For many years, Ghana has suffered geographical disparities of development between the northern part and the southern part of the country. In any past national development plan documents, such regional disparities were part of the important issues and challenges. However, no substantial

geographically-oriented or spatially-oriented policies or programmes had been formulated or implemented until the current Ghana Shared Growth and Development Agenda (GSGDA) was published.

In contrast to the past governments, the current government's national development policies and programmes are different in their focus on spatial orientation in development.

In a speech delivered in December 2010, the president of Ghana announced the implementation of the following four area-based development initiatives/programmes, in addition to the existing Savannah Accelerated Development initiatives<sup>8</sup>.

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

**(1) Western Corridor Development Initiative and Western Corridor Development Authority**

The Western Corridor Development initiatives and the Western Corridor Development Authority will cover the Western and Central Regions, and subsume the Central Region Development Commission (CEDECOM).

The Western Corridor Development Initiatives focus on two areas. One is upgrading the existing road sections of the Western Corridor, from Ehibu, Asemkrom, Enchi, Goaso, Sunyani, Bamboe, Bole, Wa to Hamile. See Figure 1.3.1.

The other area is closely related to mineral resources development (including oil & gas and bauxite) and their downstream industries, as well as rail and port infrastructure rehabilitation, including the following projects:

- Western Corridor Infrastructure Renewal Project - Railway Rehabilitation and Modernization Component
- Western Corridor Infrastructure Renewal Project – Takoradi Port Phase 1: Retrofit/ Rehabilitation
- Sekondi Free Zone Project
- Western Corridor Gas Infrastructure Project
- Western Corridor Petroleum Terminal (Pumpuni), and
- Western Corridor “Oil Enclave” Roads Project

These projects are to be financed by the China Development Bank Corporation (CDB) in agreement with the Ghana government.

**(2) Eastern Corridor Development Initiative and Eastern Corridor Development Authority**

The Eastern Corridor Development initiatives and the Eastern Corridor Development Authority will cover the southern and middle belts of the Volta Region and the Accra and Afram Plains. This initiative focuses on road upgrading from Tema, Asikuma, Hohoe, Jasikan, Yendi, and Nalerigu to Kulungugu. See Figure 1.3.1.

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<sup>8</sup> Northern Savannah includes the northern parts of the Volta and Brong Ahafo Regions and other parts of the country.

The European Union is providing funds for the Dodo Pepesu-Nkwanta section of the Eastern Corridor roads. JICA is also considering technical and financial assistance to upgrade some road sections on the Eastern Corridor. The road upgrading is expected to provide an alternative road transport route connecting Tema Port with Burkina Faso.

**(3) Capital City Development Initiative and Capital City Development Authority**

The Capital City Development Initiative and the Capital City Development Authority will be for a Special Development Zone covering the metropolitan, municipal and district assemblies within the Greater Accra Metropolitan Area including Accra and Tema and their surrounding districts.



Source: JICA Study Team

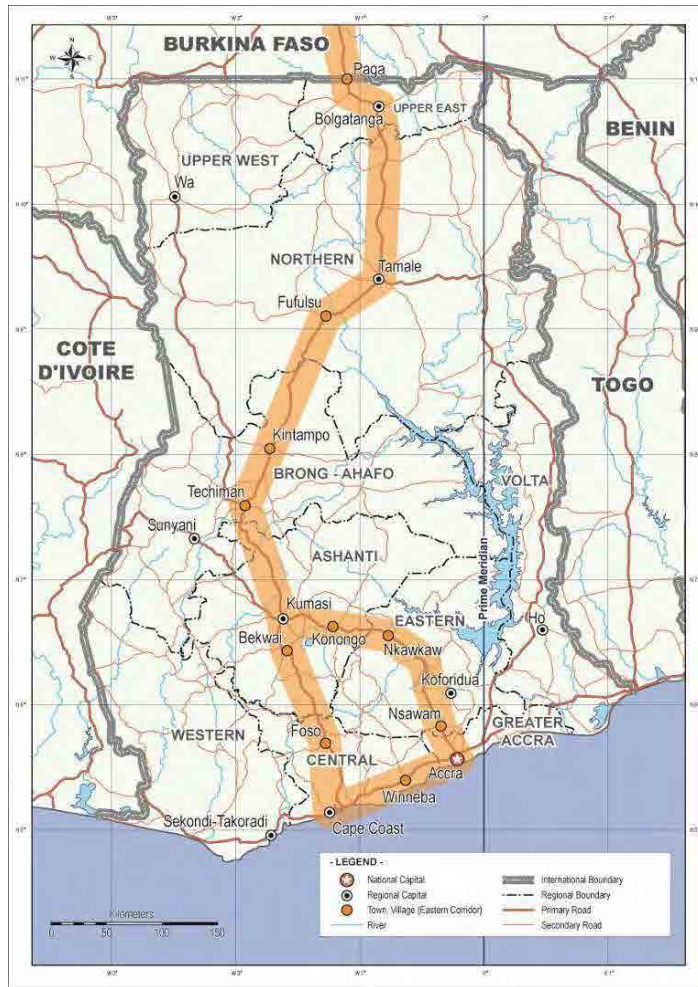
**Figure 1.3.1 Road Connections to be Upgraded in Western Corridor and Eastern Corridor**

**(4) Forest Belt Development Initiative and Forest Belt Development Authority**

The Forest Belt Development Initiative and its Authority will cover the forest zones in the Eastern, Ashanti and Brong Ahafo Regions. Ashanti Region and Greater Kumasi Sub-Region are part of the Forest Belt Development Initiative. Forest and timber resources are faced with risks of depletion. Timber processing industries are collapsing in response to the greatly decreased availability of timber resources. This initiative is still at the early stage of conceptual planning. The contents of the initiative are not yet clear.



See Figure 1.3.2 for the Central Corridor through Kumasi.



Source: JICA Study Team

**Figure 1.3.2 Central Corridor through Kumasi**

## 1.4 Review of Institutional Aspects of Development of Ghana

### 1.4.1 Government Administration System of Ghana

The administration system of government of Ghana consists of four level structures as shown in Figure 1.4.1: 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. 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. Metropolitan Assemblies are divided into Sub-Metropolitan District Councils. Under sub-metropolitan district councils, municipal assemblies and district assemblies, there are town/zonal/urban/area councils as shown in Figure 1.4.1. They are the implementing agencies of the districts. Town and zonal councils are established for settlements with populations between 5,000 and 15,000. Urban councils and area councils represent population over 15,000 and less than 5,000 respectively. At the bottom, there are Unit Committees that also act as implementing agencies of districts, covering 500-1000 population in the rural areas and 1500 in the urban areas.

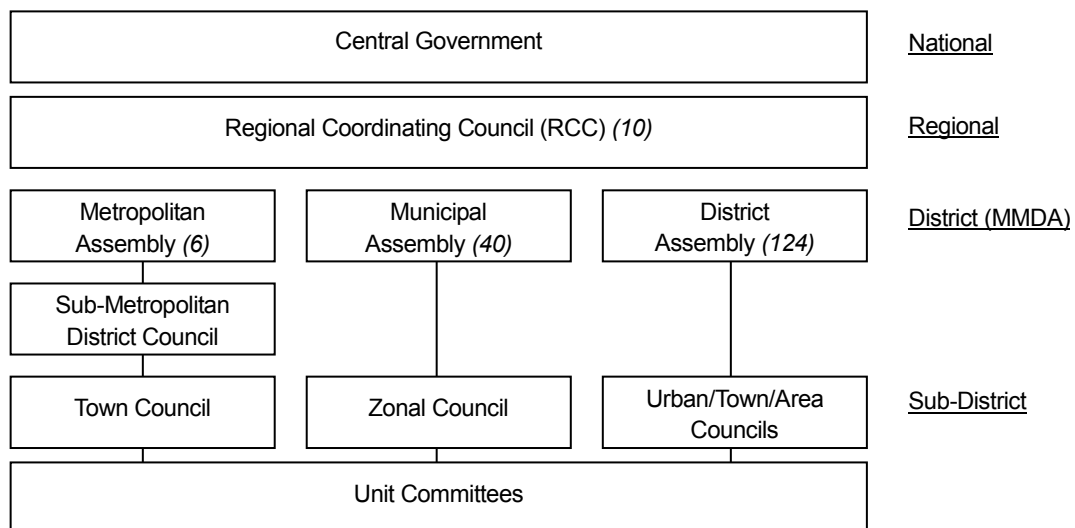


Figure 1.4.1 Local Government System in Ghana

### 1.4.2 Decentralization Policy and Current Status of Decentralization of Ghana

A Regional Co-ordinating Council (RCC) is an administrative and coordinating body, headed by the Regional Minister appointed by the President. An RCC does not have any development budget and its functions as prescribed in Section 142 of Local Government Act are to: monitor, co-ordinate and evaluate the performance of the District Assemblies in the Region; monitor the use of the moneys allocated to the District Assemblies; and review and co-ordinate public services generally in the Region. Section 141 of the Local Government Act prescribes the composition of an RCC: (a) Regional Minister and the deputies, (b) District Chief Executive of each district in the Regions, (c) two chiefs elected at a meeting of the regional House of Chiefs, and (d) regional heads of the

Ministries (without the right to vote). The Regional Co-ordinating director is the secretary to RCC. It should be noted that the Regional offices of the Ministries, in principle, report to their respective head offices in Accra while the RCC is mandated to “review and co-ordinate” their activities.

As opposed to RCCs, metropolitan, municipal and district assemblies (MMDAs) are administrative and development decision-making bodies, having their own development budget although its amount is substantially limited. Members of the District Assembly are elected from each electoral area in the district and a District Chief Executive is appointed by the President with the prior approval of not less than two-thirds majority of the District Assembly members. A District Assembly’s general functions and responsibilities outlined under Section 10 of Local Government Act are: (a) responsibility for overall development of the district and preparation of development plans and budgets; (b) revenue mobilization; (c) supporting productive activities, infrastructure development, management of human settlements and the environment; and (d) maintaining security and public safety.

In order to enable an MMDA to execute the above-mentioned mandates, Section 38 of the Local Government Act prescribes a MMDA’s requirement to establish the following eight departments and to take responsibility for the preparation, administration and control of their budgetary allocation: (1) central administration and finance; (2) education, youth and sports; (3) health; (4) waste management; (5) agriculture; (6) physical planning; (7) social welfare; and (8) community development. Until the completion of the establishment of these departments, planning and implementation of sector programmes and projects are undertaken by “decentralized departments”, i.e. district-level departments of sector ministries, while an MMDA is mandated to “co-ordinate, integrate and harmonize the execution of programmes and projects” (Section 10 of the Local Government Act) of these departments. Similar to the regional offices of sector ministries, the staffs of these decentralized departments are civil servants whose salaries are paid by the central Government and thus, they report primarily to their respective ministries in Accra, not to the MMDA where their offices are located. Moreover, a majority of the nation’s development budget is directly managed and disbursed by the head offices of the ministries while a very limited amount of the development budget is delegated to the decentralized departments.

The “District Assembly Common Fund (DACF)” and “District Development Fund (DDF)” (a fund created in 2010) represent MMDA’s development budgets allocated by the central Government while MMDAs also have an “Internally Generate Fund (IGF)” collected from the businesses and individuals in their jurisdictions. Although these funds provide MMDA with autonomy in fulfilling some of these mandates, only 7.5 percent of the national income is allocated to DACF while the total amount of DDF is even smaller.

In summary, local autonomy in Ghana has been significantly restricted; most MMDAs have had only a limited size of staff and budget under their power, while decentralized departments have only been given a limited amount of budget and accompanying responsibilities from their parent Ministries.

The Ghanaian Government has recently undertaken a series of important steps to reinvigorate its planned decentralization of functions to local governments, as envisaged by the Local Government Act. A new Decentralization Policy Framework was finalized in 2010, recognizing the need to accelerate the decentralization process in a coordinated and holistic manner.

Section 92 of the Local Government Act institutes the composite budgeting system: an integrated budget that synthesizes and harmonizes all revenue and expenditure estimates of the plans and programmes of all decentralized departments under the District Assembly. The 2012 national budget has marked a significant development in the introduction of the composite budget. It was stated in the Budget Speech 2012 that the “government will strengthen the fiscal decentralization process, by transferring resource allocation functions to the local authorities as a way of deepening democratic governance at the grass root”. The budgets of the following departments are now placed in the budgets of the district (composite budget) and accordingly the affiliation of the officials in these departments will soon be transferred from the National Government to the local governments.

- Department of Parks and Gardens;
- Department of Community Development;
- Department of Social Welfare
- Department of Rural Housing and Cottage Industries
- Public Works Department;
- Department of Agricultural Engineering;
- Crop Services Department
- Agricultural Extension Services Department;
- Department of Animal Health and Production;
- Department of Feeder Roads;
- Department of Urban Roads; and
- Town and Country Planning Department.

### 1.4.3 MMDA’s Budgets in Greater Kumasi Sub-Region

There is a large difference in the scale of the budget between KMA and other districts, although the scale of the budget is more or less proportional to that of the population. The total annual budget of KMA is in the order of 100 million GHC, while that of the surrounding six districts ranges from 4 million to 6 million GHC. KMA has the largest capacity in generating its own revenue, which represents 19% of its total revenue, while the said capacity of the surrounding districts is more limited, from 5% to 13% of their total budget. A total of 57% of KMA’s budget is funded by international donors, which indicates both the metropolis’ dependency on external funding and its relatively high fiscal management capacity.

**Table 1.4.1 Revenues of MMDAs in Greater Kumasi Sub-Region**

	KMA	Afigya Kwabre	Atwima Kwanwoma	Atwima Nwabiagya	Bosomtwe	Ejisu- Juaben	Kwabre East
Total Revenue ('000 GHC)	97,304	4,419	4,006	5,264	4,068	5,502	5,776
Of which							
Internally Generated Revenue	19%	12%	11%	12%	5%	14%	13%
Donor support’s share	57%	0%	1%	8%	1%	16%	28%
Transfer from Central Gov.	24%	88%	88%	80%	94%	70%	59%

Source: Each MMDA’s composite budget 2012

Since public administration in Ghana is currently undergoing a decentralization process as discussed above, the degree of transfer of the budget from the central government to the local governments significantly varies among MMDAs and among ministries. The following table shows the share of each item of fiscal expenditures by MMDA’s departments. It should be noted that due to the difference in the progress of fiscal decentralization, some departmental budgets include

personnel cost and some do not; a large share in a particular sector does not necessarily mean a large budget expenditure but rather a large degree of fiscal decentralization in that sector.

**Table 1.4.2 Share of Fiscal Expenditures by MMDA’s Departments in Greater Kumasi Sub-Region**

	KMA	Afigya Kwabre	Atwima Kwanwoma	Atwima Nwabiagya	Bosomtwe	Ejisu-Juaben	Kwabre East
Central Administration	15.4%	62.8%	57.0%	41.8%	36.3%	37.6%	31.4%
Education	10.6%	14.6%	25.5%	26.2%	31.3%	36.4%	38.6%
Health	3.5%	4.0%	4.6%	8.4%	9.3%	12.6%	14.8%
Agriculture	16.6%	9.8%	10.1%	8.3%	0.4%	1.9%	6.5%
Physical Planning, Town and Country Planning	1.5%	0.3%	1.6%	1.2%	1.1%	0.1%	1.2%
Social welfare and community development	0.6%	0.1%		0.8%	0.6%	0.1%	0.8%
Works	33.2%	7.3%	1.2%	5.4%	13.4%	6.7%	4.9%
Trade, industry and tourism				5.3%	7.3%	0.9%	1.7%
Disaster Prevention		1.0%		2.4%	0.2%	0.4%	0.2%
Waste Management	11.2%						
Urban Roads	5.4%					2.9%	
Natural Resource Conservation				0.1%	0.1%	0.2%	
Transport	1.1%			0.1%		0.2%	
Finance, Budget and Rating, Legal, Birth and Death	1.0%						

Source: Each MMDA’s composite budget 2012

It can be generally said that fiscal decentralization is relatively more advanced in the education, health and agriculture sectors than in other sectors, although personnel cost has been only partially transferred to the local governments.

The smaller share of central administration expenditure in KMA compared to that of other MMDAs implies the metropolis’ relatively advanced level of fiscal management capacity. Agence Francaise de Development’s contribution to the upgrading of drains in Kumasi’s slum areas accounts for a majority of the KMA budget for works and waste management in 2012. Construction of markets accounts for a majority of the KMA budget for agriculture, while construction of boreholes explains Bosomtwe’s relatively large expenditure in works.

#### **1.4.4 Organizations of the Town and Country Planning Department<sup>9</sup>**

##### **(1) Town and Country Planning Department**

The Town and Country Planning Department has existed since the enactment of the 1945 Town and Country Planning Department Ordinance.

##### **(2) Objective of the Department**

The objective of the Department is to formulate effective policies and strategies for the socio-economic and physical development at the national, regional and local levels to ensure the

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<sup>9</sup> This section is written based on the draft document “Scheme of Service, Town and Country Planning Department”, which was prepared when the Department was still under the Ministry of Local Government, since many descriptions of the document are still valid at present.

proper use of land and the exploitation of natural resources for the benefits of the people.

**(3) Composition**

The Department is currently located under the Ministry of Environment, Science, Technology and Innovation (MESTI).

**1) Head Office (National Office)**

The Head Office is concerned with the organization and management of the Department in financial control, personnel, spatial development planning and development control and land surveying and research.

With the current decentralization policy, the Head Office is required to assist Regional, Metropolitan and District Offices by establishing an efficient spatial planning system. The Head Office is also responsible in assisting in the recruitment, training and manpower development of various offices and personnel, providing guidelines for spatial planning and development control and assist in the preparation of Structure Plans when the need arises.

Last year, the Head Office re-started to recruit new staff to strengthen the manpower of the Regional Offices, Metropolitan Offices and District Offices of the Department. In the context of the current decentralization policy, staffs assigned to Metropolitan Offices and District Offices are to be under local governments (MMDAs).

**2) Regional Office**

The Regional Office is responsible for implementing national policies as they affect the regions, and providing the basis for major decisions on development by the regional authorities. The Regional Office is also supposed to provide frameworks for structure planning in the districts.

The Regional Office also plays a coordinating role by assisting and facilitating the smooth operation of the District Offices within the Region, particularly those with fewer personnel. Additionally the Regional Office is to be instrumental in developing a regional framework for the region's overall development.

**3) Metropolitan Office**

The Metropolitan Office is to assist the Metropolitan Assembly to collect, collate, analyse and produce reports for identifying metropolitan area's potentials with regard to the development of urbanization, industrialization, commerce, mining and to some extent agriculture and to design action programmes for the Assembly.

The Metropolitan Office is to advice on all development issues and to prepare a Metropolitan Structure Plan to guide urban development by undertaking planning schemes for towns and villages within the Metropolis.

At present, the Metropolitan Office is in the transition from part of the national department of Town and Country Planning to a division under the Metropolitan Assembly.

**4) District Office**

The District Office of the Town and Country Planning is one of the decentralized departments

under the District Assembly.

The District Office is to assist the District Assembly to collect, collate, analyse and produce reports on physical development of the District and to identify the District's potentials with regard to the development of agriculture, mining, industries and commerce and to design action programmes.

It is to advise on all development issues and to prepare a District Structure Plan as a framework for development of towns and villages in the District and to prepare town and village planning schemes at the local level.

#### (4) Personnel

**Table 1.4.3 Number of Staff by Category in MMDAs of Ashanti Region**

No.	Region, Metropolis, Municipality and District		Director	Town Planning Officers	Technical Officers	Accountants	Secretaries, Typists	Others
1	Regional Office*	Region	1	2	10	1	2	10
2	KMA	Metropolis	1	2	9	2	1	3
3	Afigya- Kwabre	District	0	1	4	0	0	0
4	Kwabre East	District	0	0	5	0	1	0
5	Sekyere South	District	0	0	4	0	0	0
6	Mampong Municipal	Municipal	0	1	3	0	1	1
7	Ejura Sekyere	District	0	0	2	0	0	0
8	Sekyere Central	District	0	0	2	0	0	0
9	Ejisu-Juaben	District	0	2	4	0	1	1
10	Sekyere East	District	0	0	2	0	0	0
11	Sekyere Afram Plains	District	0	0	2	0	0	0
12	Kumawu	District	0	0	2	0	0	0
13	Bosomtwe	District	0	1	4	0	1	0
14	Atwima Kwanwoma	District	0	1	4	0	1	0
15	Atwima Nwabiagya	District	0	1	5	0	1	0
16	Atwima Mponua	District	0	1	4	0	0	0
17	Obuasi Municipal	Municipal	0	1	5	0	1	0
18	Bekwai Municipal	Municipal	0	1	4	0	0	0
19	Bosome Freho	District	0	0	1	0	0	0
20	Amansie Central	District	0	0	2	0	0	0
21	Amansie West	District	0	0	2	0	0	0
22	Adansi North	District	0	0	3	0	1	0
23	Adansi South	District	0	0	2	0	0	0
24	Asante Akim South	District	0	0	1	0	0	0
25	Asante Akim North	District	0	0	2	0	0	0
26	Asante Akim Central	District	0	1	5	0	1	0
27	Ahafo Ano North	District	0	0	3	0	1	0
28	Ahafo Ano South	District	0	1	2	0	0	0
29	Asokore Mampong	District	0	0	2	0	0	0
30	Offinso North	District	0	0	3	0	0	0
31	Offinso Municipal	Municipal	0	1	4	0	0	0
	<b>Total</b>		<b>2</b>	<b>17</b>	<b>107</b>	<b>3</b>	<b>13</b>	<b>15</b>

Note\* Three Assistant Town Planning Officers are currently affiliated to the Regional Office.

However, soon after getting training, they are to be transferred to district assemblies.

Source: Regional Office of TCPD, Ashanti Region, 2013

For the Department, the following four categories of staff are present:

- Professional category, including Director-General, Director, Deputy Director, Principal Town Planning Officer, Town Planning Officer and Assistant Town Planning Officer
- Sub-professional category, including Principal Town Planning Assistant, Senior Town Planning Assistant and Town Planning Assistant

- Technical category, including Chief Technologist, Technologist, Chief Technical Officer, Assistant Chief Technical Officer, Principal Technical Officer, Senior Technical Officer, Technical Officer
- General services category, including Accounting/Auditing Staff, Executive Class, Procurement/Store Staff, Clerical Staff, Secretarial Staff and Telephonists

Each District Office of TCPD is to have at least one town planning officer. However, out of 30 MMDAs, only 13 MMDAs have town planning officers. The other 17 districts do not have any town planning officers.

At the Regional Office, there are three (3) town planning officers, including one Regional Director. Under the current decentralization context, the Regional Office is functioning as a place of training newly recruited town planning officers before moving to district offices of TCPD.



## 1.5 Review of Environmental Policies concerning Spatial Development

### 1.5.1 Protected Area System in Ghana

The classification of protect areas in Ghana is based on that of the International Union of Conservation of Nature (IUCN), as shown in Table 1.5.1.

Forest reserves are managed by the government of Ghana. The government pays royalty for timber extraction to the land owners or communities of forest reserves monthly or quarterly.

Wildlife reserves are managed by the government. The government pays compensation money to land owners of the wildlife reserves. It is a one time payment.

**Table 1.5.1 Classification of Protected Areas**

Classification	Sub-classification	Zone or Type	Human activities
Protected Area	Forest Reserve	Protected Area	No-timber activities
		Hill Sanctuary	No-timber activities
		Production Area	Timber production area
		Swamp Area	No-timber activities
		Fallow Area	In the cycle of plantation and logging, a fallow area is recovering for the next plantation
	Wildlife Reserve	Resource Reserve	Protected area with suitable use for production. Hunting activities are prohibited. Like wild animal farm areas, animals are brought from another area for propagation
		Wildlife Sanctuary	Area to protect particular species or habitats as a sanctuary for the animals that can escape from surrounding areas that are in a bad condition
		National Park	Large natural or near natural areas set aside to protect large-scale ecological processes along with the complement of species and ecosystems characteristic of the area
		Strict Nature Reserve	No-human activity including amenities, visiting is also strictly controlled.
	Ramsar site	Ramsar Site	Protection of wetland

Source: Forestry Commission of Ghana and IUCN Classification

### 1.5.2 Forestry Reserves and Wildlife Protected Areas

In the 1980's, Ghana was faced with increasing demand for taking over forest land for agricultural purposes due to population pressure, however, advances in science and technology, the growing ecological importance of the forest in terms of genetic bio diversity and wildlife, institutional changes, and the increasing need for popular participation in resource management, it was decided that the underlying justification for the earlier policy no longer appeared applicable. Consequently, the government introduced remedial measures to strengthen forestry sector institutions and to reform policies. The new forest policy provides an additional basis to develop a national forest estate and a timber industry that provides the full range of benefits required by society in a manner that is ecologically sustainable and that conserves the environmental and cultural heritage. The new policy promotes public participation in the share of benefits and responsibilities in forest management and encourages integrated coordinated research in forest-related issues. It also provides for conservation of all valuable wildlife habitats and communities.

**Table 1.5.2 Policies of Forestry and Wildlife Protection**

The Forest and Wild life Policy,1994	This policy aims at conservation and sustainable development of the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society
Timber Resource Management Act, 547, 1998	This mandate allows the Timber Rights Evaluation Board to grant timber rights that ensure sustainable utilization of timber resources
Timber Resources Management Regulations, LI 1649, 1999	This regulation provides guides for registration procedures and permitting requirements for timber operations
Forest Plantation Development Fund Act 583, 2000	The act is to provide financial assistance for the development of forest plantations, manage these funds and also provide research and technical advice to persons involved in plantation forestry on specified conditions.
Timber Industry And Ghana Timber Marketing Board (Amendment) Act, 1977	The act mandates the board to provide for the sole exporters by land of timber and timber products and for related matters
National Wildlife Management Policy, 2006	The Policy seeks to promote effective and efficient management of wild Life for the sustainable management of natural resources.
Wildlife reserves (amendment) regulations, L.I.710, 1971	This regulation provides for the establishment of reserves, authorization of entry, and protection of animals and amenities.
Wetland Management (Ramsar Sites) Regulations, LI 1659, 1999	This seeks to regulate the protection and management of Ramsar sites

Source: JICA Study Team

### **1.5.3 Public Open Space Zone and Conservation Zone**

The Planning Standards and Zoning Regulations have been prepared under the Land Use Planning and Management Project, a sub component of the Land Administration Project. These will replace all earlier Zoning regulations and Planning Standards and will be issued by the proposed Town and Country Planning Authority as mandated under the proposed new Land Use and Planning Law, which is also being developed as part of the project.

#### **(1) Zoning Regulations**

Public Open Space Zone (POS), Protected Coastal Zone (CZ) and Conservation Zone (CA) are prescribed in the Zoning Regulations for the first volume (Fourth Draft) of the Planning Standards and Zoning Regulations. The intent of these zones is shown in Table 1.5.3. Zoning defines the use category of the land, prescribing allowable and non-allowable activities and developments on a parcel of land within a zone.

#### **(2) Planning Standards**

The Planning Standards for passive recreational facilities such as public open spaces for parks and gardens, children's play grounds and public speaking grounds or durbar grounds are prescribed in the Planning Standards for the second volume (Fourth Draft) of the Planning Standards and Zoning Regulations. See Table 1.5.4. These requirements are mandatory. Furthermore, the plot dimensions for Public Open space and the landscaping such as tree planting are stated as the Development Standards.

**Table 1.5.3 Intent of Public Open Space Zone, Protected Coastal Zone and Conservation Zone**

Public Open Space Zone (POS)	Land included in the Public open Space Zone is primarily intended for informal or casual recreation pursuits. Public Open Spaces include parks and gardens, small play areas for children, and open areas used for buffers between industrial and other land use activities. Most areas adjacent to streams and major drains will be zoned public open space and remain free of development. All land proposed for urban development which is below the 1 in 20 year flood level will be zoned public open space or other appropriate zone.
Protected Coastal Zone (CZ)	Lands in the Protected Coastal Zone are to be used for activities that reflect on the physical and environmental conditions of coastal areas, banks of rivers, lakes and other water bodies. All of the coastal line which may be affected by coastal erosion or a future rise in sea level will form part of a Protected Coastal Zone to ensure that no development occurs.
Conservation Zone (CA)	Conservation zones generally are located in rural areas. They are different from Special Development Zones, which cover areas with qualities that are to be preserved. Land in a conservation zone is intended to be retained in its natural or modified state for conservation purposes. A conservation zone may include areas of outstanding natural beauty, areas of religious, cultural or archaeological importance, important forests, wild life and estuarine habitats, land in water supply catchment areas endangered hills, slopes, fault lines, etc.  It is not intended to exclude development from a conservation zone. Activities which are incompatible with the intent of the zone will be prohibited, especially urban development and industry. Access to a conservation zone will be restricted to selective areas where the intensity of use can be more effectively managed. Developers are required to provide public places of convenience in recreational and tourist sites.

Source: The Planning Standards and Zoning Regulations — Zoning Regulations for the first volume (Fourth Draft)

**Table 1.5.4 Planning Standards for Passive Recreational Facilities**

Public Open Space	Population to be served	Minimum of 2,500 persons at 0.5 ha per 1000 persons or not less than 10% of development area.
	Site facilities	An adequate number of public seats at appropriate locations
	General Location	Equally distributed over settlement area
Durbar Ground	Population to be served	Up to 35,000 people
	Site size	from 0.2 ha to 1 ha
	Site facilities	Adequate public seats at appropriate locations
	General location	In settlement centre with good access to public transport terminal. Site could be part of a public open space

Source: The Planning Standards and Zoning Regulations — Planning Standards for the second volume (Fourth Draft)





# PART II

## Present Situation of Ashanti Region and Greater Kumasi Sub-Region





## Chapter 2 Present Characteristics of Ashanti Region

### 2.1 Locational Characteristics of Ashanti Region

#### 2.1.1 Local Characteristics of Ashanti Region within Western Africa Region

##### (1) Ghana within Africa and Western Africa

Ghana is located on the coast of the Gulf of Guinea in Western Africa. In the Western African Region, Burkina Faso, Niger and Mali are landlocked countries. Ghana shares its borders with Burkina Faso, which shares its borders with Mali and Niger. Table 2.1.1 shows 15 member states of the Economic Community of West African States (ECOWAS).

While most of the Western African countries use French as their official language, Ghana along with Nigeria are the major English speaking countries in the region.

**Table 2.1.1 Western African Nations – ECOWAS Nations**

Nations of Western Africa	Capital City	Population of Capital City	Official Language	National Population
Benin	Porto-Novo	263,616 (2013)	French	9,983,884 (2013)
Burkina Faso	Ouagadougou	1,475,223 (2006)	French	14,017,262 (2006)
Cape Verde	Praia	127,832 (2010)	Portuguese	491,875 (2010)
Cote d'Ivoire	Yamoussoukro	299,243 (1998)	French	15,366,672 (1998)
Gambia	Banjul	35,061 (2003)	English	1,360,681 (2003)
Ghana	Accra	1,848,614 (2010)	English	24,223,431 (2010)
Guinea	Conakry	1,092,936 (1996)	French	7,156,406 (2009)
Guinea Bissau	Bissau	387,909 (2009)	Portuguese	1,520,830 (2009)
Liberia	Monrovia	1,021,762 (2008)	English	3,476,608 (2008)
Mali	Bamako	1,809,108 (2009)	French	14,528,662 (2009)
Niger	Niamey	1,302,910 (2011)	French	17,129,076 (2012)
Nigeria	Abuja	1,406,239 (2006)	English	140,431,790 (2006)
Senegal	Dakar	2,740,200 (2010)	French	9,858,482 (2002)
Sierra Leone	Freetown	772,873 (2004)	English	4,976,871 (2004)
Togo	Lomé	837,437 (2010)	French	6,191,155 (2010)

Source: City Population HP (<http://www.citypopulation.de/index.html>)

Having the advantage of population size, Ghana and Nigeria are also the international gateways from the other English speaking countries in Africa such as South Africa and Egypt as well as countries in Europe, United States and Middle East. On the other hand the surrounding French speaking countries are the gateways to countries such as France and Belgium, where French is the

official language. Table 2.1.2 shows the flight destinations of the flights to and from Ghana and its neighbouring countries.

**Table 2.1.2 International Flights from Cities of Western Africa**

Cities with International Airports		Destinations outside Western Africa				
Country	City	Region	Country	City	Country	City
Benin	Conotou	Africa	Morocco	Casablanca	Congo	Pointe Noir
			Kenya	Nairobi	Gabon	Libreville
			Cameroon	Douala	Equatorial Guinea	Malabo
		Europe	France	Paris		
Burkina Faso	Ouagadougou	Africa	Ethiopia	Addis Ababa	Morocco	Casablanca
		Europe	Belgium	Brussels	France	Paris
Cote d'Ivoire	Abidjan	Africa	Ethiopia	Addis Ababa	Kenya	Nairobi
			Tunisia	Tunis	Morocco	Casablanca
		Middle East	Lebanon	Beirut	UAE	Dubai
		Europe	Belgium	Brussels	France	Paris
Ghana	Accra	Africa	Ethiopia	Addis Ababa	Kenya	Nairobi
			South Africa	Johannesburg	Morocco	Casablanca
		Middle East	Egypt	Cairo	UAE	Dubai
		Europe	Germany	Frankfurt	Netherlands	Amsterdam
			Italy	Rome	UK	London
			Turkey	Istanbul	Portugal	Lisbon
		North America	USA	New York	USA	Washington D.C.
USA	Atlanta					
Liberia	Monrovia	Africa	Kenya	Nairobi	Morocco	Casablanca
		Europe	Belgium	Brussels	France	Paris
		USA	USA	Atlanta		
Mali	Bamako	Africa	Algeria	Algiers	Ethiopia	Addis Ababa
			Kenya	Nairobi	Morocco	Casablanca
		Europe	Belgium	Brussels	France	Paris
			Portugal	Lisbon		
Niger	Niamey	Africa	Algeria	Algiers	Morocco	Casablanca
		Europe	France	Paris		
Nigeria	Lagos	Africa	Cameroon	Douala	Cameroon	Douala
			Ethiopia	Addis Ababa	Congo	Brazzaville
			Angola	Angola	Rwanda	Kigali
			Morocco	Casablanca	Kenya	Nairobi
			South Africa	Johannesburg		
	Middle East	Qatar	Doha	UAE	Dubai	
	Europe	Germany	Frankfurt	Turkey	Istanbul	
		Netherlands	Amsterdam	UK	London	
	North America	USA	Atlanta	USA	Houston	
		USA	New York			
	Abuja	Africa	Ethiopia	Addis Ababa		
			UK	London	Germany	Frankfurt
		Europe	France	Paris		
North America			USA	New York		
Kano	Africa	Sudan	Khartoum			
	Middle East	Saudi Arabia	Jeddah			

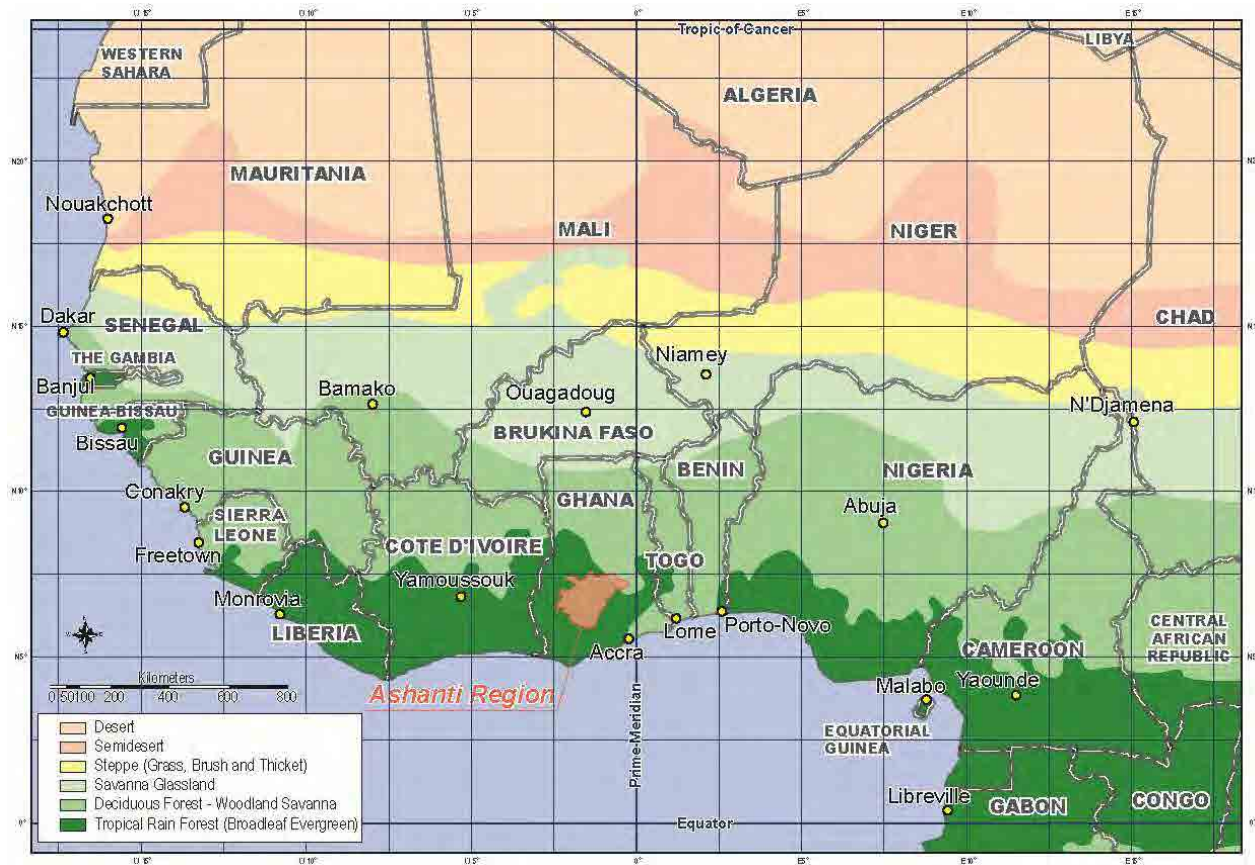
Source: JICA Study Team

Comparing the international flights in Ghana and Nigeria, since Nigeria has three international airports and a wider range of flights, it is clear that Nigeria currently has the advantage as the international gateway.



## (2) Ashanti Region within Western Africa

Ashanti Region is located between longitude 0.15°W and 2.25°W, and latitude 5.50°N and 7.46°N. The region lies mostly within the tropical rain forest zone. The northern part of the region is in the ecological zone of woodland savanna. (See Figure 2.1.1)



Source: JICA Study Team

Figure 2.1.1 Ashanti Region within Western Africa

### 2.1.2 Locational Characteristics of Ashanti Region within Ghana

Ashanti Region is located 90-250 km inland from the sea. Ashanti Region shares its administrative boundary with the Eastern, Central, Western and Brong-Ahafo Regions. (See Figure 2.1.2) The region is divided by Manpong-Gambaga scarp, which runs from the eastern side of the region to the north-west side. Most of the region lies within altitude 150-300 m. Ashanti Region has the advantage having 6 of the regional capitals of Ghana close to its boarder.



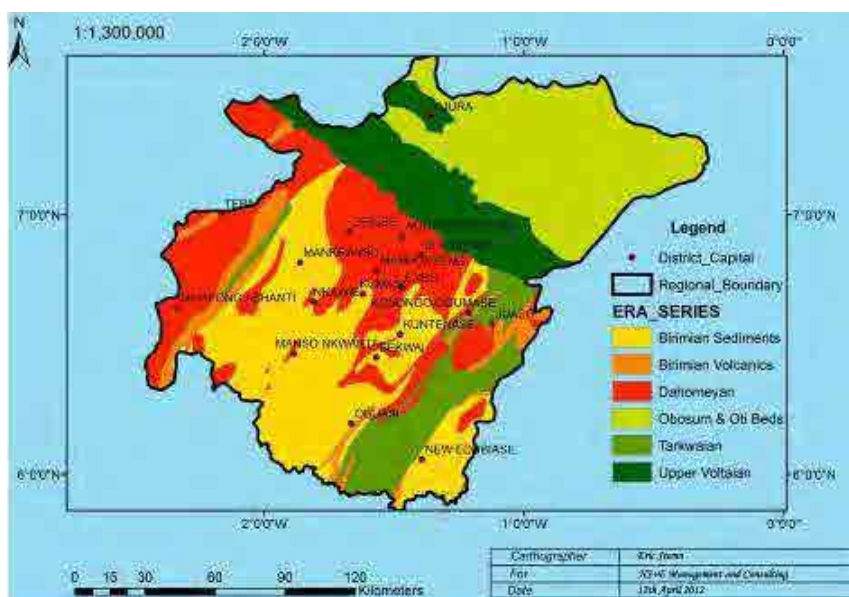
Source: JICA Study Team

**Figure 2.1.2 Ashanti Region in Ghana**

## 2.2 Natural Conditions of Ashanti Region

### 2.2.1 Geological Condition of Ashanti Region

Ashanti Region is composed of six geological types, namely Birimian Sediment, Birimian Volcanics, Dahomeyan, Obosum Oti Beds, Tarkwaian and Upper Voltaian. The Birimian Sediment, Dahomeyan and Obosum Oti Beds are predominant in the region. The rock types found in the region are phyllite, schist, tuff, greywacke, metamorphosed lava, and pyroclastic rock among others. Figure 2.2.1 shows the geological map of Ashanti Region.



Source: Database Ghana-at-a-glance

**Figure 2.2.1 Geological Map of Ashanti Region**

As a result of the unique geological type in the region, the region happens to accommodate the largest underground mining company in the country (AngloGold Ashanti found in Obuasi). Apart from the Obuasi gold mine there are several small scale mining activities scattered throughout the region especially in the Amansie East and West Districts. Gold deposits are located in Adjuamong, Ampabame No. 1, Ahenema Kokoben, Nkoranza, Trede, Beposo, and Nyameani within Lake Bosomtwe, Trabuom, Kyekyebon and Adu-Wamase. Diamond deposits are also located in River Afoa, Atasuo, Atetesua, and Obo.

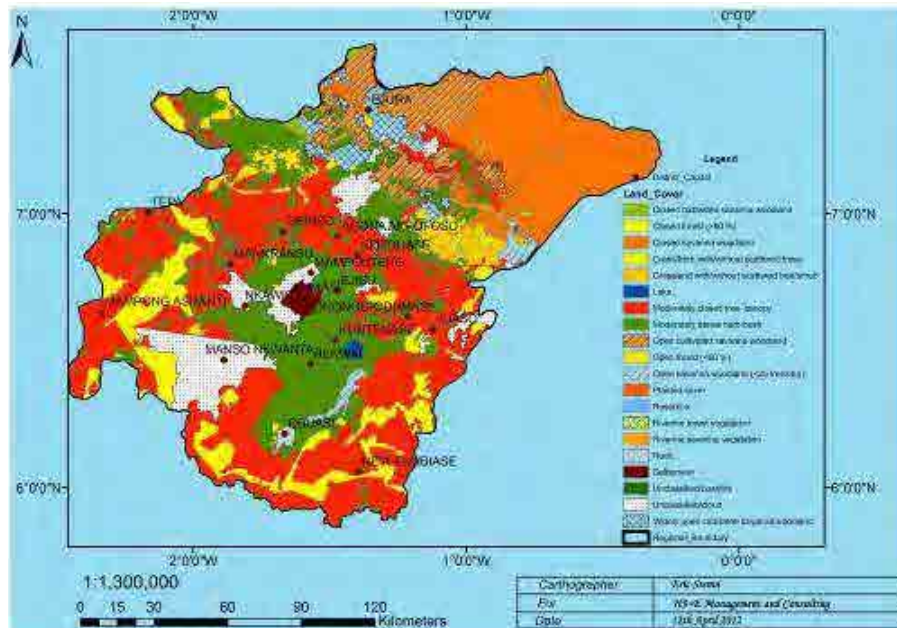
There is also the proliferation of stone quarries and sand winning industries in the region as a result of the rock types found in the region. The sand winning activities are coordinated by an association of Sand Winners and the Mineral Commission.

### 2.2.2 Vegetation and Land Cover of Ashanti Region

Ashanti Region falls within the Moist Semi-Deciduous South East Ecological Zone. The region is characterized by several vegetation and land cover types. Predominate among them is the moderately closed tree canopy with herb and bush consisting of about 15 trees per hectare. The moist semi-deciduous forest is the most extensive closed canopy forest type in Ghana (14.1 %). Other vegetation types found in the region are moderately dense herb or bush with scattered trees,

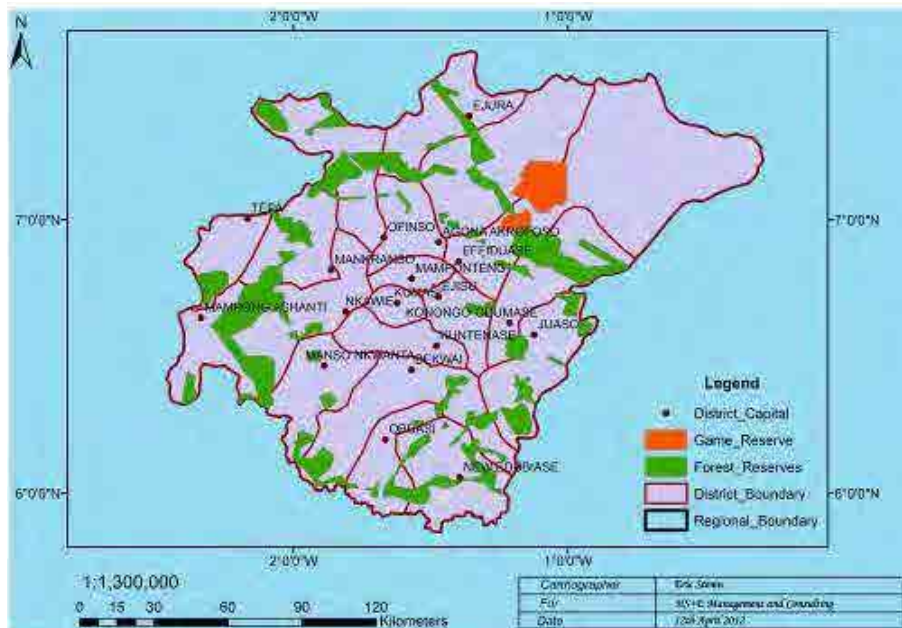


open cultivated savanna woodland consisting of about 11 to 20 trees per hectare, open forest with less than 60% trees and closed forest with more than 60% trees.



Source: Database Ghana-at-a-glance

**Figure 2.2.2 Vegetation of Ashanti Region**



Source: Database Ghana-at-a-glance

**Figure 2.2.3 Forest Reserves and Game Reserves in Ashanti Region**

As a result of the rich vegetation types found in the region, the region holds about 69 of the countries reserves, out of these, two are game reserves, namely the Kogyae Strict National Reserve and the Bomfobiri Wildlife Sanctuary located at Kumawu. Predominate among the forest reserves are the Bobiri Forest Reserve which also has a Butterfly Sanctuary, Tano Offin Reserve, Anwiaso East Reserve, and the Bomfoun Reserve.

## (1) Flora Species

The rich biodiversity of Ghana is presently under threat from both natural and human influences. There are over 3600 plant species found in Ghana (MES, 2002). These represent three major taxonomic groups, which comprise over 2900 indigenous and 250 introduced species. Forty-three species are endemic in the country in general.

The Ashanti region is characterized by moist semi-deciduous forest type. The tree species found in this forest type is classified into five main conservation ratings; thus

- Black star- species that are globally rare or endangered and high priorities for careful management
- Pink star- species those are globally restricted
- Red Star –Heavily exploited in Ghana
- Scarlet star- Species that are threatened in Ghana by over exploitation

## (2) Reserves or Protected Areas

There are two game reserves in the region with animal species such as the buffalo, antelopes and elephants found in the Kogyae Strict National Reserve which was gazetted as a reserve in 1971 while animal species such as duikers and red river hog are also found in the Bomfobiri Wildlife Sanctuary gazetted as a reserve in 1975. To add to the above, a patch of vegetation within the city of Kumasi also led to the establishment of the Kumasi Zoological Center opposite the Kejetia Lorry Station and adjacent the Ghana National Cultural Center.

**Table 2.2.1 Protected Areas and Reserves in Ashanti Region**

Protected Area	Management Type	Area (hectare)	District
Aboma	Forest Reserve	4,558	Sekyere West
Abrimasu	Forest Reserve	2,616	Ejura Sekyeredumase
Afia Shelterbelt	Forest Reserve	2,100	Amansie East
Afram dawa	Forest Reserve	20,124	Atwima
Afram Headwaters	Forest Reserve	20,124	Offinso
Afrensu Brohuma	Forest Reserve	7,252	Offinso
Anumso North	Forest Reserve	4,377	Asante Akyem North
Anumso South	Forest Reserve	1,269	Asante Akyem North
Anwiaso East	Forest Reserve	12,432	Atwima
Aparabi Shelterbelt	Forest Reserve	1,917	Offinso
Asubima	Forest Reserve	7,374	Offinso
Awura	Forest Reserve	13,390	Sekyere West
Bandai Hills	Forest Reserve	16,084	Asante Akyem North
Bobiri	Forest Reserve	5,465	Ejisu-Juaben
Bomfobiri	Wildlife Sanctuary	5,310	Sekyere East
Bomfoun	Forest Reserve	29,474	Sekyere East
Bosumtwi Range	Forest Reserve	7,870	Amansie East
Chiremoasi	Forest Reserve	600	Adansi East
Chirimfa	Forest Reserve	11,396	Sekyere West
Dampia Range	Forest Reserve	8,030	Adansi East
Denyau Shelterbelt	Forest Reserve	1,240	Adansi West
Desiri	Forest Reserve	15,100	Ahafo Ano North
Dome River	Forest Reserve	8,055	Asante Akyem North
Fum Headwaters	Forest Reserve	7,252	Amansie East

Protected Area	Management Type	Area (hectare)	District
Gianima	Forest Reserve	1,709	Afigya Sekyere
Jeni river	Forest Reserve	2,150	Amansie West
Jimira	Forest Reserve	6,294	Atwima
Kogyae Strict Nat. Reserve	Strict Nature Reserve	38,570	Sekyere East
Kokotintin Shelterbelt	Forest Reserve	910	Adansi East
Krowam	Forest Reserve	570	Sekyere East
Kumawu Waters	Forest Reserve	96	Sekyere East
Mankrang	Forest Reserve	18,547	Offinso
Mirasa hills	Forest Reserve	6,734	Asante Akyem South
Nkrabia	Forest Reserve	10,020	Adansi East
North Bandai Hills	Forest Reserve	7,280	Asante Akyem North
North fomangsi	Forest Reserve	4,275	Asante Akyem South
Numia	Forest Reserve	5,020	Adansi East
Nyamibe Bepo	Forest Reserve	2,230	Adansi East
Oda River	Forest Reserve	16,420	Amansie East
Ofin Shelterbelt Headwaters	Forest Reserve	1,295	Sekyere West
Ongwam	Forest Reserve	13,134	Sekyere East
Ongwam Blk I, II & III	Forest Reserve	3,134	Sekyere East
Onuem Bepo	Forest Reserve	3,440	Adansi East
Onuem Nyamibe Shelterbelt	Forest Reserve	2,490	Adansi East
Onyimsu	Forest Reserve	855	Asante Akyem South
Pompo Headwaters	Forest Reserve	1,220	Adansi West
Prakaw	Forest Reserve	984	Asante Akyem South
Pru Shelterbelt	Forest Reserve	9,272	Ejura Sekyeredumase
Southern Scarp	Forest Reserve	15,462	Asante Akyem South
Subin Shelterbelt	Forest Reserve	2,253	Amansie East
Supuma Shelterbelt	Forest Reserve	2,512	Adansi West
Tano Ofin	Forest Reserve	40,223	Atwima
Tano Suraw	Forest Reserve	2,849	Atwima
Tano Suraw Extension	Forest Reserve	7,511	Atwima
Yaya	Forest Reserve	5,128	Offinso

Source: Forestry Commission, Ashanti Region

### 2.2.3 Hydrology of Ashanti Region

Seven main river basins cut across the Ashanti Region, namely the Pra River Basin, Afram River Basin, Akobra River Basin, Obosum River Basin, Pru River Basin, Sene River Basin and the Tano River Basin. Predominate among the seven river basins is the Pra River Basin which cuts across about 40% of the region. There are also about 178 major rivers and streams in the Ashanti Region. The only natural lake in Ghana, Lake Bosomtwe, is also located in the Ashanti Region.



Source: Database Ghana-at-a-glance

**Figure 2.2.4 Water Bodies in Ashanti Region**

## 2.2.4 Climate of Ashanti Region

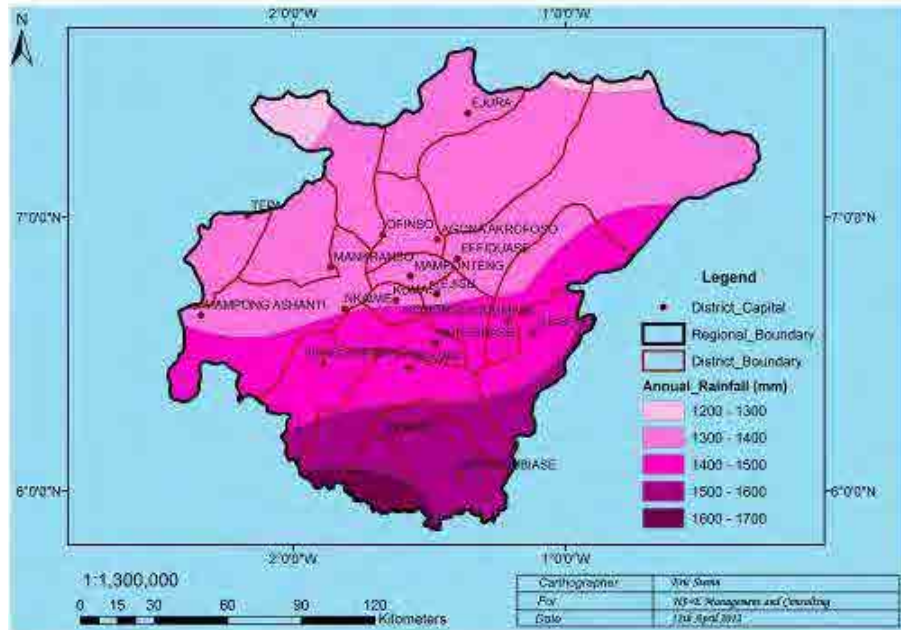
### (1) Rainfall

Ashanti Region is characterized by two well defined rainfall seasons, a major season and a minor season. The major rainfall season begins in March and ends in July with the month of June experiencing the highest rainfall in the year. The minor rainfall season commences in September and ends in November, with a peak rainfall in the month of October. The main dry season, having been desiccated by the harmattan wind, occurs in December to March.

The annual rainfalls within the Ashanti are spatially distributed over 5 distinct zones generally decreasing towards the savannah grassland. The northern parts of Ashanti Region have the least annual rainfalls between 1200-1300mm. In the most southern parts, annual rainfall values are much higher, usually in 1600-1700mm. A major part of the study area falls within an annual rainfall range of 1300-1500mm with the Lake Bosomtwe among the areas of highest rainfalls.

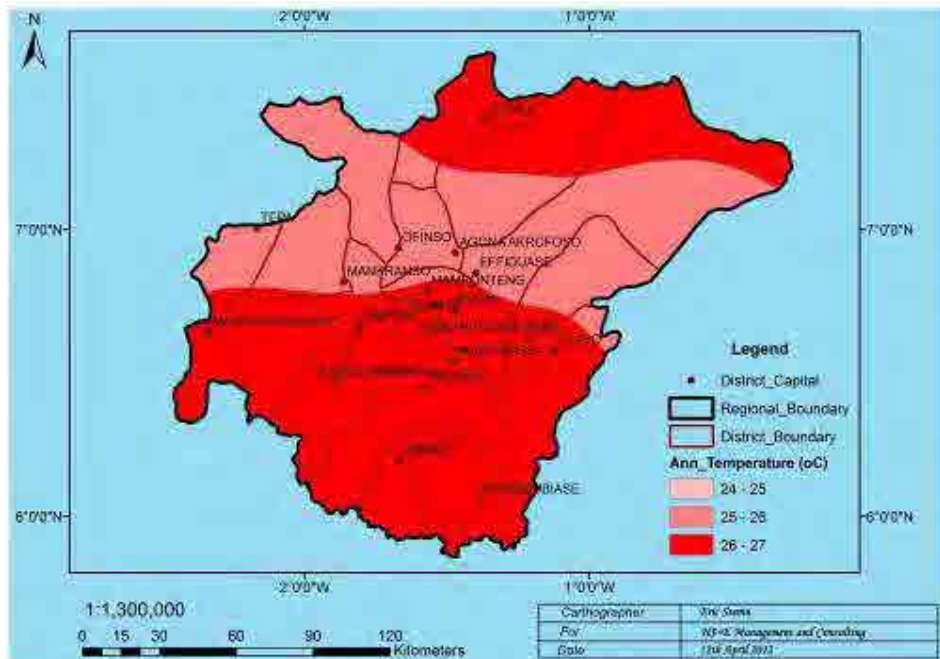
### (2) Temperature

The temperature of the region seems to be uniformly high throughout the year with a mean temperature of about 24°C. The highest average temperature recorded in the region is 30.5°C and this is recorded normally in February just before the major wet season. The minimum temperature is usually recorded in during the minor wet season.



Source: Database Ghana-at-a-glance

**Figure 2.2.5 Spatial Distribution of Average Annual Rainfall in the Region**



Source: Database Ghana-at-a-glance

**Figure 2.2.6 Average Annual Temperatures in Ashanti Region**



## 2.3 Socio-Economy of Ashanti Region

### 2.3.1 Population

#### (1) Population of Ghana

Ghana has been growing its population steadily at approximately 2.5% per annum since the first post-independence population census in 1960 with some increase in growth between 1970 and 2000 as shown in Table 2.3.1. However, the annual growth rate of the national population has decreased slightly to 2.69% between 2000 and 2010.

**Table 2.3.1 Trend of Population in Ghana, 1960-2010**

	1960	1970	1984	2000	2010
Population of Ghana	6,726,815	8,559,313	12,296,081	18,912,079	24,658,823
Population Annual Growth Rate	-	2.4%	2.62%	2.73%	2.69%

Source: Population and Housing Census 1960, 1970, 1984, 2000 and 2010

#### (2) Regional Population

##### 1) Population Growth

Focusing on the population annual growth of each region between 1960 and 2010, the change of population annual growth among the regions has been dramatic in the 50 year period compared with the national population growth. In the 1960s the population was concentrating greatly towards Greater Accra Region and the Northern Region with annual growth rates of 5.2% and 3.2% respectively. From the 1970s till 1984, the population growth within the country became more balanced compared with the past decade with less concentration towards the Greater Accra Region. Between 1984 and 2000 the population grew largely in the Greater Accra Region (4.53% per annum), Ashanti Region (3.48% per annum) and the Western Region (3.23% per annum). In the decade from 2000 to 2010, the population concentration has eased again with the Central Region, which always had a population growth rate below the national rate till 2000 taking over the highest population growth rate from the Greater Accra Region.

**Table 2.3.2 Trend of Population by Region, 1960-2010**

Region	Population					Population Annual Growth			
	1960	1970	1984	2000	2010	1960-1970	1970-1984	1984-2000	2000-2010
Ashanti	1,109,133	1,481,698	2,090,100	3,612,950	4,780,380	2.9%	2.49%	3.48%	2.84%
Greater Accra	541,933	903,447	1,431,099	2,905,726	4,010,054	5.2%	3.34%	4.53%	3.27%
Eastern	1,044,080	1,209,828	1,680,890	2,106,696	2,633,154	1.5%	2.38%	1.42%	2.26%
Northern	531,573	727,618	1,164,583	1,820,806	2,479,461	3.2%	3.42%	2.83%	3.14%
Western	626,155	770,087	1,157,807	1,924,577	2,376,021	2.1%	2.96%	3.23%	2.13%
Brong Ahafo	587,920	766,509	1,206,608	1,815,408	2,310,983	2.7%	3.29%	2.59%	2.44%
Volta	777,285	947,268	1,211,907	1,635,421	2,118,252	2.0%	1.78%	1.89%	2.62%
Central	751,392	890,135	1,142,335	1,593,823	2,201,863	1.7%	1.80%	2.10%	3.28%
Upper East	468,638	542,858	772,744	920,089	1,046,545	1.5%	2.55%	1.10%	1.30%
Upper West	288,706	319,865	438,008	576,583	702,110	1.0%	2.27%	1.73%	1.99%
Total	6,726,815	8,559,313	12,296,081	18,912,079	24,658,823	2.4%	2.62%	2.73%	2.69%

Source: 1960, 1970, 1984, 2000 and 2010 Population and Housing Census

Despite the population growth that has been continuously occurring in the Greater Accra Region and the Northern Region, Ashanti Region has always been the most populous region in Ghana for the last fifty years. The greatest population growth in Ashanti Region occurred between 1984 and 2000.

## 2) Population of Ashanti Region

The population of Ashanti Region reached 4,789,380 in 2010 according to the 2010 Population and Housing Census. Its share in national population is 19.4%, which is the highest among the 10 administrative regions.

Population distribution in Ghana is extremely unbalanced with Greater Accra Region having almost six times higher population density compared with the second most dense region, the Central Region. Ashanti Region is the third most dense region in Ghana with the population density of 196.0 person/km<sup>2</sup>. (See Table 2.3.3)

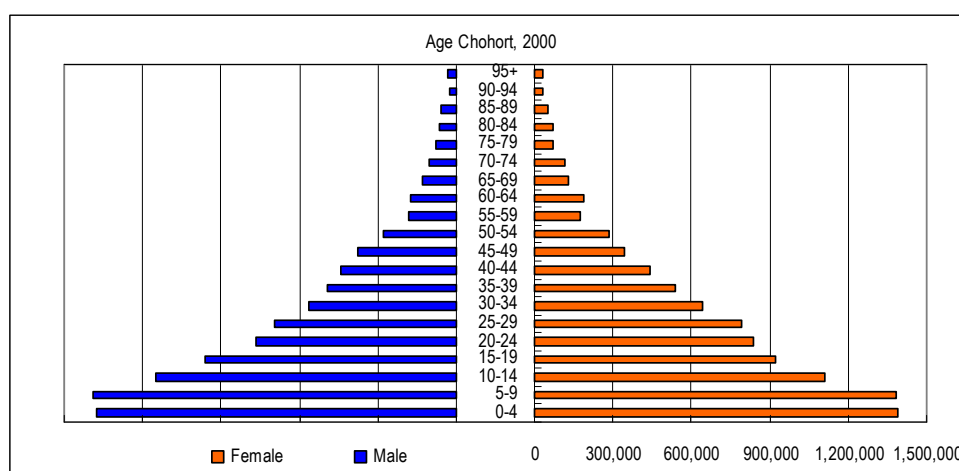
**Table 2.3.3 Population by Region in Ghana, 2010**

Region	Population	Share in National Pop.	Area (km <sup>2</sup> )	Population Density (person/km <sup>2</sup> )
Ashanti	4,780,380	19.4%	24,389	196.0
Greater Accra	4,010,054	16.3 %	3,245	1,235.8
Eastern	2,633,154	10.7 %	19,323	136.3
North	2,479,461	10.1 %	70,384	35.2
Western	2,376,021	9.6 %	23,921	99.3
Brong Ahafo	2,310,983	9.4 %	39,557	58.4
Volta	2,118,252	8.6 %	20,570	103.0
Central	2,201,863	8.9 %	9,826	224.1
Upper East	1,046,545	4.2 %	8,842	118.4
Upper West	702,110	2.8 %	18,476	38.0
Total	24,658,823	100.0 %	238,533	103.4

Source: Population and Housing Census 2010

## 3) Age Cohort

The distribution of age groups in population of Ghana has not changed greatly from 1984 to 2000. The age cohort of Ghana in 2000 shows an expansive pyramid shape as shown in Figure 2.3.1.

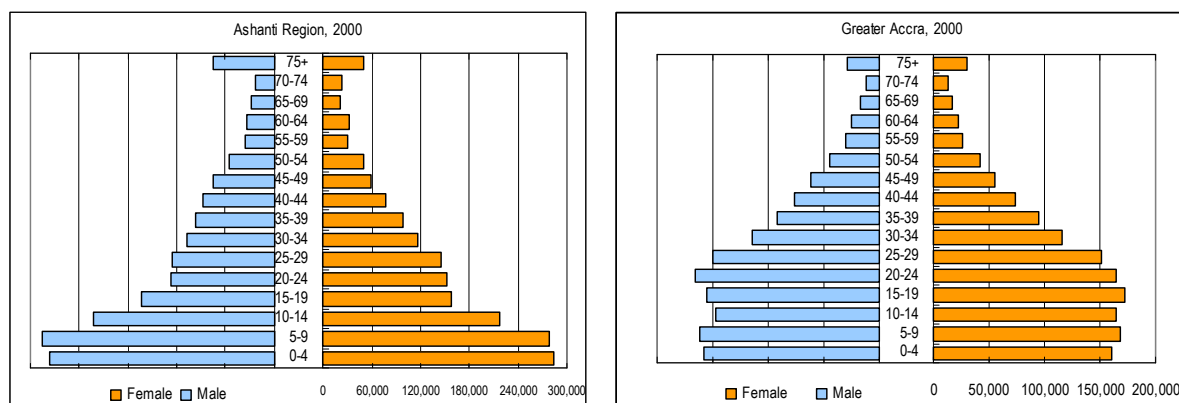


Source: GSS, 2000 Population and Housing Census of Ghana

**Figure 2.3.1 Age Cohort of Ghana, 2000**

On the other hand, population distributions in two regions, Ashanti Region and Greater Accra

Region look differently. In Ashanti Region, the population of the productive age group is small compared with the youth age group. Additionally, the population of males in the main productive age group (20-39) is less than the females. It can be assumed that the large portion of population in the productive age move from Ashanti to Greater Accra for economic activities. In the Greater Accra Region, the population pyramid shows a common stationary pyramid, which is typical in many major cities around the world. Another aspect is the population of males in the teenage years, which is less than that of females.



Source: GSS, 2000 Population and Housing Census of Ghana

**Figure 2.3.2 Age Cohort of Ashanti Region and Greater Accra Region, 2000**

### (3) Population Trend within Ashanti Region

The annual population growth rate between 1984-2000 and 2000-2010 of Ashanti Region dropped from 3.48% to 2.84% while the national growth rate only dropped slightly within the same period as already mentioned in the previous section. However, the most significant change in population growth is seen outside Greater Kumasi Sub-Region as shown in Table 2.3.4. While the annual population growth rate of Greater Kumasi Sub-Region maintained its growth rate of 4.62%, which is much higher than the growth rate of Ashanti Region, that of the areas outside the Sub-Region dropped to 0.84% indicating a great portion of the population has moved to KMA in that decade.

**Table 2.3.4 Population Growth Rate of Greater Kumasi and Ashanti Region, 1984-2010**

	Population			Annual Population Growth Rate (%)	
	1984	2000	2010	1984-2000	2000-2010
Greater Kumasi Sub-Region	790,374 *2	1,758,741 *2	2,764,091 *1	5.13%	4.62%
Outside Greater Kumasi Sub-Region	1,299,726 *2	1,854,209 *2	2,016,289 *1	2.25%	0.84%
Ashanti Region	2,090,100 *1	3,612,950 *1	4,780,380 *1	3.48%	2.84%
Ghana	12,296,081 *1	18,912,079 *1	24,658,823 *1	2.73%	2.69%

Source 1: 1984, 2000 and 2010 Population and Housing Census

Source 2: Estimation based on population of localities from 2000 Population and Housing Census

## 2.3.2 Economy of Ashanti Region

### (1) Type of Economic Activities in Ashanti Region

The economically active population (EAP) in Ashanti Region is the largest among the ten regions in Ghana as shown in Table 2.3.5, due to its large population as mentioned in the previous section, Ashanti Region has the largest EAP for the primary industry sector in the country, with 16.8% of the national share followed by the Northern and Brong Ahafo Regions. Greater Accra on the other hand has the largest share in secondary and tertiary industry sectors with 25.7% and 32.4% respectively, followed by Ashanti Region with 21.0% and 22.3%. These two regions compose approximately 50% of the national EAP in these two industry sectors.

**Table 2.3.5 Composition of Economical Active Population (over 7 years old) by Industry in 2000**

Region	Primary Industry		Secondary Industry		Tertiary Industry		Total	
	EAP	%	EAP	%	EAP	%	EAP	%
Ashanti Region	<b>826,929</b>	<b>16.8%</b>	<b>262,820</b>	<b>21.0%</b>	<b>641,381</b>	<b>22.3%</b>	<b>1,731,131</b>	<b>19.2%</b>
Western Region	578,004	11.7%	<b>116,624</b>	<b>9.3%</b>	219,164	7.6%	913,793	10.1%
Central Region	407,800	8.3%	102,551	8.2%	194,347	6.8%	704,699	7.8%
Greater Accra Region	188,327	3.8%	<b>321,563</b>	<b>25.7%</b>	<b>929,493</b>	<b>32.4%</b>	<b>1,439,383</b>	<b>15.9%</b>
Volta Region	476,135	9.7%	96,332	7.7%	182,176	6.3%	754,644	8.3%
Eastern Region	587,848	11.9%	113,938	9.1%	<b>276,934</b>	<b>9.6%</b>	<b>978,721</b>	<b>10.8%</b>
Brong Ahafo Region	640,214	13.0%	80,372	6.4%	169,821	5.9%	890,408	9.9%
Northern Region	<b>682,327</b>	<b>13.9%</b>	76,517	6.1%	138,665	4.8%	897,510	9.9%
Upper East Region	302,014	6.1%	50,472	4.0%	77,389	2.7%	429,876	4.8%
Upper West Region	230,116	4.7%	28,521	2.3%	40,797	1.4%	299,435	3.3%
Ghana	4,919,714	100.0%	1,249,710	100.0%	2,870,167	100.0%	9,039,598	100.0%

Source: GSS, 2000 Population and Housing Census

According to the 2010 Population and Housing Census, approximately 30% of the working population were engaged in the primary industry while 16% were in the secondary and 53% in the tertiary industry in Ashanti Region.

**Table 2.3.6 Composition of Economical Active Population (over 15 years old) by Industry in 2010**

	Primary Industry	Secondary Industry	Tertiary Industry	Total
<b>Ashanti Region</b>	<b>30%</b>	<b>16%</b>	<b>53%</b>	<b>100%</b>
Western Region	47%	17%	36%	100%
Central Region	42%	16%	41%	100%
Greater Accra Region	5%	22%	73%	100%
Volta Region	50%	17%	33%	100%
Eastern Region	45%	15%	40%	100%
Brong Ahafo Region	61%	10%	29%	100%
Northern Region	73%	7%	19%	100%
Upper East Region	69%	10%	21%	100%
Upper West Region	72%	11%	17%	100%
Ghana	41%	15%	43%	100%

Source: GSS, 2010 Population and Housing Census

According to the 2000 Population and Housing Census, approximately 45% of the working population were engaged in the primary industry while 19% were in the secondary and 37% in the tertiary industry. Comparing working population in the urban areas (localities with population of over 5,000) and the rural areas (localities with population below 5,000), the character of economic activities undertaken in each area differs as can be seen from Table 2.3.7.

**Table 2.3.7 Estimated Composition of Working Population (over 15 years old) in Ashanti Region by Area, 2000**

	Primary Industry	Secondary Industry	Tertiary Industry	Total
Urban	18%	27%	56%	100%
Rural	73%	11%	16%	100%
Total	45%	19%	37%	100%

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

While the main economic activity in the rural area is in the primary industry sector with approximately 73% of the total working population, the main economic activity in the urban area is tertiary industry sharing approximately 56% of the working population. Despite the fact that the EAP of the secondary industry sector in Ashanti Region is relatively high compared with the other regions in Ghana, only 27% of the urban population and 11% of the rural population are engaged in this sector.

**Table 2.3.8 Composition of EAP (over 15 years old) in Ashanti Region by District, 2000**

	District	Primary Industry		Secondary Industry		Tertiary Industry		Total	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1	Atwima	31.1	72.0	23.4	11.0	45.6	17.1	100.0	100.0
2	Amansie West	0.0	82.9	0.0	7.8	0.0	9.3	0.0	100.0
3	Amansie East	27.3	79.3	22.8	8.7	49.8	12.0	100.0	100.0
4	Adansi West	11.8	69.3	<b>36.4</b>	11.8	51.8	18.9	100.0	100.0
5	Adansi East	28.6	84.1	17.2	5.7	54.2	10.2	100.0	100.0
6	Asante Akim South	56.2	77.6	13.7	7.7	30.1	14.7	100.0	100.0
7	Asante Akim North	40.2	78.7	21.2	9.5	38.6	11.8	100.0	100.0
8	Ejisu-Juaben	26.6	60.8	<b>27.5</b>	13.9	46.0	25.3	100.0	100.0
9	Bosomtwe-Kwanwoma	45.1	54.2	21.3	18.3	33.5	27.5	100.0	100.0
10	Kumasi	7.2	0.0	<b>26.3</b>	0.0	66.5	0.0	100.0	0.0
11	Kwabre	14.7	39.7	<b>29.5</b>	<b>24.8</b>	55.8	35.5	100.0	100.0
12	Afigya Sekyere	47.7	72.7	17.3	10.6	34.9	16.7	100.0	100.0
13	Sekyere East	39.6	72.9	22.9	13.5	37.4	13.5	100.0	100.0
14	Sekyere West	39.7	80.9	18.1	7.6	42.2	11.5	100.0	100.0
15	Ejura Sekyedumase	46.8	85.5	12.7	5.5	40.5	9.0	100.0	100.0
16	Offinso	70.7	75.2	8.9	6.9	20.4	17.9	100.0	100.0
17	Ahafo Ano South	54.0	67.2	18.9	17.2	27.1	15.6	100.0	100.0
18	Ahafo Ano North	33.9	79.2	22.7	8.8	43.4	12.0	100.0	100.0

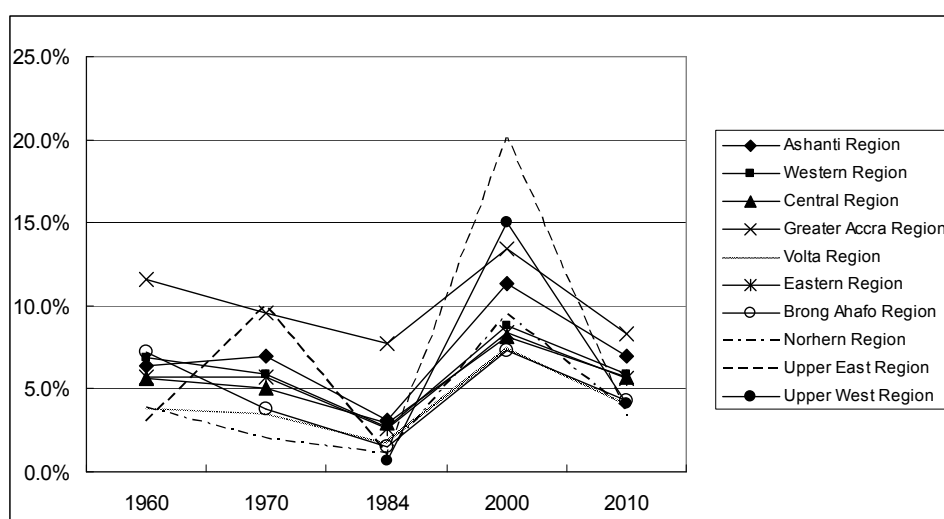
Source: GSS, 2000 Population and Housing Census

The area with the highest secondary industry engagement in Ashanti Region is the urban area of Adansi West District (currently separated into Obuasi Municipality and Adansi North District) which had Obuasi, the gold mining city as the district capital sharing 36.4% of the urban EAP.

Kwabre has the second highest engagement rate in the secondary industry, well known for its kente textile and woodcraft. Kwabre is one of the districts in the region that also has a relatively high secondary industry engagement in the rural areas. Other areas that also have high engagement rates in the secondary industry are the urban areas in Ejusu-Juaben Municipality and Kumasi Metropolitan Assembly.

## (2) Employment Status in Ashanti Region

The unemployment rate in Ghana had been decreasing as a whole from 1960 until 1984. However in 2000 all regions except the Upper West Region increased its unemployment rate. The three regions with the highest unemployment rate in 2000 were the Upper East Region (20.1%), Greater Accra Region (13.4%) and Ashanti Region (11.3%). This can be due to the sudden population increase in Kumasi, which has not been able to provide enough jobs.



Source: GSS, 2005, Population Data Analysis Report Volume 1 Socio-Economic and Demographic Trends Analysis  
Note: 2010 rate is from 2010 Population and Housing Census

Figure 2.3.3 Trend of Unemployment Rate in Ghana, 1960-2000

## 2.3.3 Agriculture and Forestry Sector of Ashanti Region

### (1) Overview of Agriculture of Ashanti Region

#### 1) Major Crops

Table 2.3.9 shows each Region's share of the production volumes of staple food. Main products produced in Ashanti Region are cocoyam and plantain. The climate and soil of Ashanti Region is capable of producing a wide range of crops as can be seen from Table 2.3.9.

Table 2.3.9 Shares of Staple Food Production by Region in 2010

	Maize	Rice	Cassava	Yam	Cocoyam	Plantain	G`nuts	Cowpea
Western	4%	5%	5%	1%	17%	16%	0%	0%
Central	10%	1%	14%	0%	7%	4%	0%	0%
Greater Accra	0%	3%	1%	0%	0%	0%	n.a.	0%
Volta	5%	14%	11%	6%	3%	2%	n.a.	1%
Eastern	20%	4%	27%	12%	19%	24%	2%	1%
Ashanti	14%	6%	14%	8%	30%	26%	2%	2%

Brong Ahafo	27%	1%	20%	39%	25%	28%	3%	3%
Northern	11%	38%	8%	25%	n.a.	n.a.	43%	48%
Upper East	3%	28%	0%	0%	0%	0%	14%	10%
Upper West	5%	1%	0%	9%	0%	0%	37%	35%

Source: Consolidated from MOFA Homepage

## 2) Cocoa Production

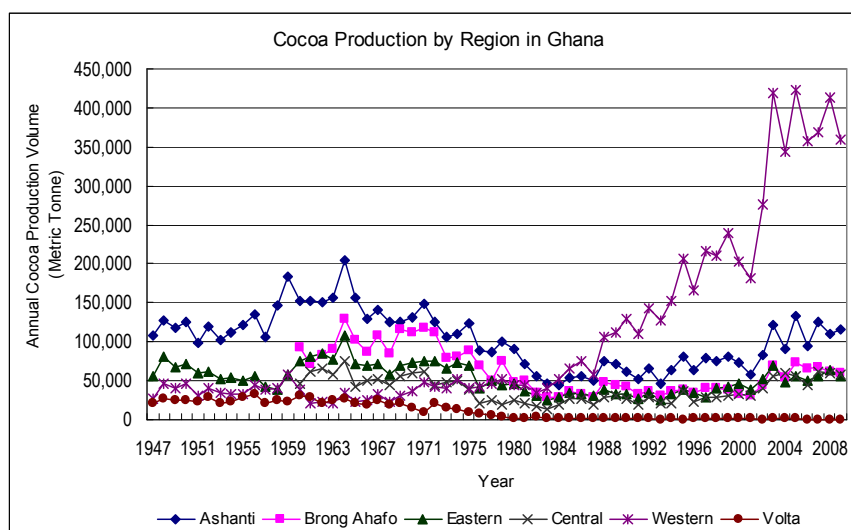
Cocoa is Ghana's major foreign currency earner, next to gold. The country produced 15% of the cocoa production of the entire world in 2010 (FAOSTAT). Cocoa represented 18% of Ghana's merchandise export value in 2009 (World Bank), with Ashanti Region accounting for 18% of all production in the country, as shown in Table 2.3.9.

Ashanti Region was by far the top producer of cocoa beans until the middle 1960s. By the middle 1980s, the Western Region caught up with Ashanti Region in cocoa bean production. At present, the Western Region accounts for over 50% of Ghana's total in cocoa bean production, which is far beyond that of Ashanti Region (18%).

**Table 2.3.10 Volumes and Shares of Cocoa Production by Region, 2010**

Region	Volume (MT)	Share
Western	497,005	55%
Central	81,328	9%
Eastern	77,713	9%
Ashanti	162,656	18%
Brong Ahafo	79,520	9%
Total	899,126	100%

Source: Ghana Cocoa Board



Source: Ghana Cocoa Board

**Figure 2.3.4 Historical Trend of Cocoa Bean Production by Region in Ghana**

## (2) Agricultural Practice in Districts of Ashanti Region

### 1) Current Situation

Slash and burn methods are practiced in many areas. Major staple crops grown in the region are

cassava, plantain, yam, cocoyam, maize, and rice. They are grown mostly for subsistence. The most important cash crop is cocoa and other major cash crops are citrus and oil palm. Other crops like groundnuts, beans and vegetables may also be for commercial purposes.

Poultry and other livestock like goats, sheep, and cattle are reared mostly on a small scale. Typically, the livestock is kept on free range. In addition, some farmers rear grass cutters, rabbits, and snails on a small scale.

Logging (eg teak) both legal and illegal is operated. Currently fish farming is not actively operated.

## **2) Key Problems**

### **a) Market Conditions**

- High cost of labor and farming inputs
- Low price for farm produce

### **b) Natural Conditions and Infrastructure**

- Erratic rainfall pattern and low level irrigation development
- Inadequate water for domestic and agricultural purposes
- Poor road network and transport means for marketing the produce
- Illegal logging destroying forest and other environmental resources

### **c) Operation and Management**

- High post-harvest losses
- Lack of storage facilities
- Lack of appropriate agro-processing machinery
- Low adoption of advanced agricultural technologies by farmers
- Late reporting of animal ill health
- Misuse of agro-chemicals by farmers
- Poor linkage of farmers to buyers, processors and other stakeholders

### **d) Support Measures**

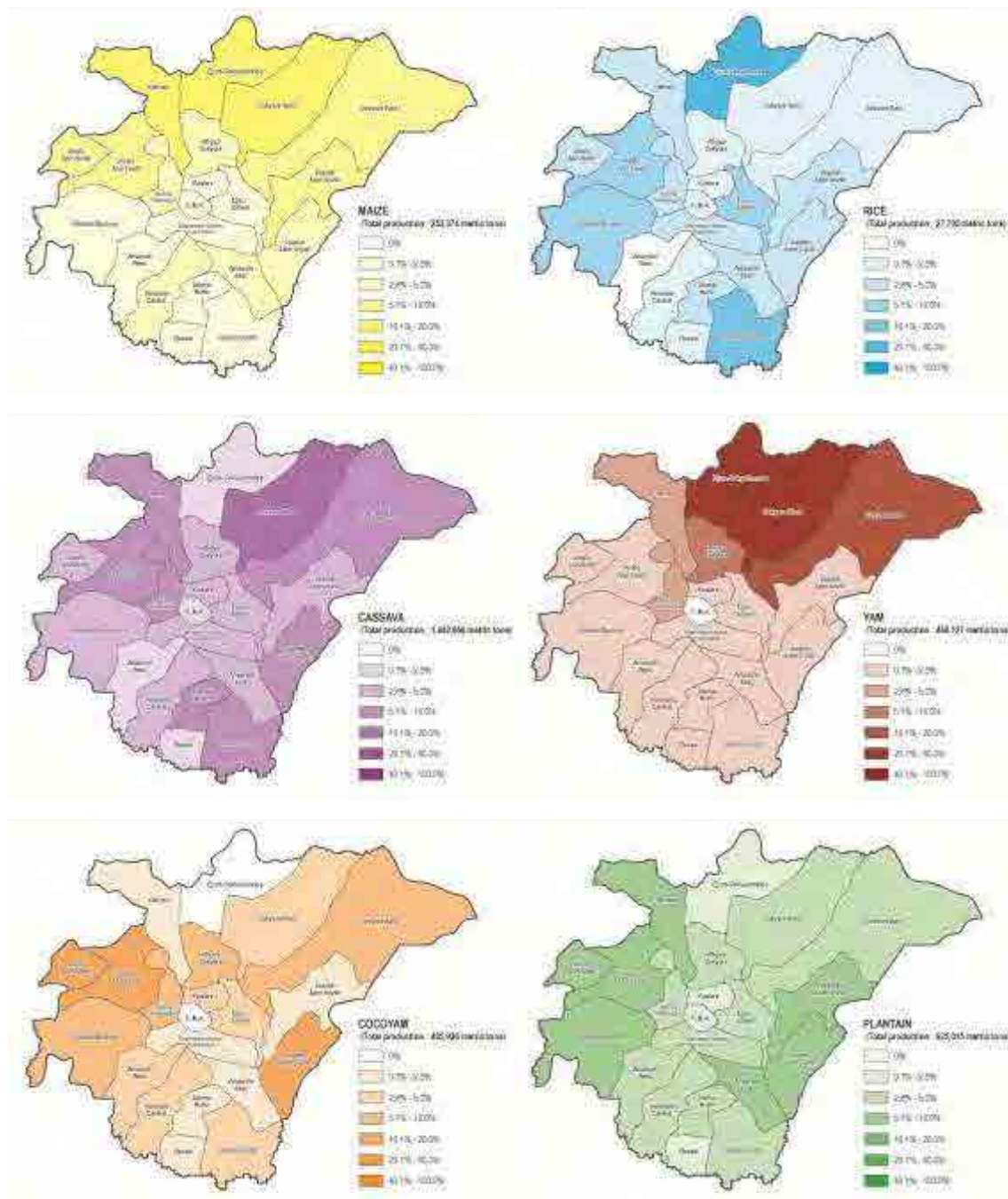
- Low ratio of the number of extension staff as well as veterinary staff to a farmer
- Lack of transport for agricultural technical staff
- Lack of credit facilities for farmers
- Untimely funding of agricultural activities

## **3) Characteristics of Districts of Food Crop Agriculture**

The data on major food crop production in 2010 of the whole Ashanti Region (Table 2.3.11 and Figure 2.3.5) shows the following characteristics:

- The majority of each of the 6 major crops (maize, rice, cassava, yam, cocoyam, and plantain) are produced in the 13 districts which rank at first, second or third in any of these crops. All of them are located outside of Greater Kumasi Sub-Region.
- The northern districts, namely Ejura Sekyedumase, Sekyere West (current Mampong Municipality and Sekyere Central), Offinso (current Offinso Municipality and Offinso North) rank high in production of yams, maize, rice, and cassava.
- The western districts, namely Ahafo Ano South and Ahafo Ano North rank high in cocoyam.
- The eastern districts, namely Asante Akim South and Asante Akim North rank high in plantain.





Source: JICA Study Team based on data from Ministry of Food and Agriculture

**Figure 2.3.5 Production of Major Crops in Ashanti Region**

**Table 2.3.11 Production of Major Food Crops by District in Ashanti Region in 2010**

Current Administrative Districts	Maize		Rice		Cassava		Yam		Cocoyam		Plantain	
	Metric tons	%	Metric tons	%	Metric tons	%	Metric tons	%	Metric tons	%	Metric tons	%
Ejura Sekyedumae	35,575	14.0	7,840	28.3	39,600	2.1	160,000	34.3	150	0.0	6,885	0.7
Monpong / Sekyere Central	32,469	12.8	200	0.7	207,000	11.2	108,750	23.3	14,700	3.6	42,000	4.5
Sekyere East / Sekyere Afram Plains	19,040	7.5	468	1.7	97,600	5.3	47,250	10.1	22,820	5.6	40,600	4.4
Asante Akim North	19,278	7.6	936	3.4	82,800	4.5	10,063	2.2	9,036	2.2	82,060	8.9
Asante Akim South	8,550	3.4	864	3.1	113,600	6.2	3,300	0.7	42,500	10.5	86,095	9.3
Adansi South	5,505	2.2	4,250	15.3	110,500	6.0	8,635	1.9	16,368	4.0	29,400	3.2
Atwima Mponua	5,550	2.2	1,937	7.0	76,506	4.2	6,624	1.4	37,800	9.3	76,000	8.2
Ahafo Ano South	18,307	7.2	2,450	8.8	168,000	9.1	5,400	1.2	61,750	15.2	71,250	7.7
Ahafo Ano North	19,200	7.6	1,110	4.0	92,800	5.0	10,000	2.1	45,500	11.2	74,550	8.1
Offinso / Offinso North	28,170	11.1	806	2.9	120,000	6.5	14,700	3.2	9,450	2.3	61,200	6.6
Others	61,730	24.4	6,844	24.7	734,260	39.8	91,405	19.6	145,862	35.9	354,975	38.4
Ashanti Region	253,374	100.0	27,705	100.0	1,842,666	100.0	466,127	100.0	405,936	100.0	925,015	100.0

Source: Ministry of Food and Agriculture

The following table shows some features on food crop agriculture of each district outside Greater Kumasi Sub-Region (The numbers are for reference to respective districts).

**Table 2.3.12 Features on Food Crop Agriculture of each District Outside Greater Kumasi**

	District	Oil Palm	Citrus	Pepper	Tomato	Egg Plant	Okra	Other Major Products
8	Ejura Sekyedumase							Ground nut, Watermelon, Beans
		Ejura Farm has over 4,000 ha of arable land expected to lead the district's agriculture						
9	Sekyere South			*	*	*		Onion
		High investment capital is required for improvement of the livestock sub-sector, which has been recording remarkable improvement.						
10	Mampong	*	*					Mango, Cashew
		Cassava is processed into flour, industrial starch, gari, and chips at Mampong, Adidwan, and Kwamang.						
11	Sekyere Central	*	*					
		Large scale / commercial farmers are located across the district.						
12	Sekyere East			*	*	*		Soya bean
		The district has been selected as one of the pilot districts in Ashanti Region to embark on agro-processing.						
13	Sekyere Afram Plains	*		*	*	*		
		It is required to restore, enhance and utilize the district's environment especially Bomfobiri Wildlife Sanctuary and Bonfuom Forest Reserve.						
14	Asante Akim North							
		High level of post harvest losses due to poor access to land for agric and inadequate storage facilities						
15	Asante Akim South	*	*		*	*		
		Migrants tend to send their earnings to their hometowns and leave very little for the development of the area. Fish farming is an opportunity that needs to be revitalized.						
16	Bosome Freho	*	*					Cabbage
		Population increase and out migration of the youth are two contradictory issues of the district.						
17	Bekwai	*	*					Pineapple

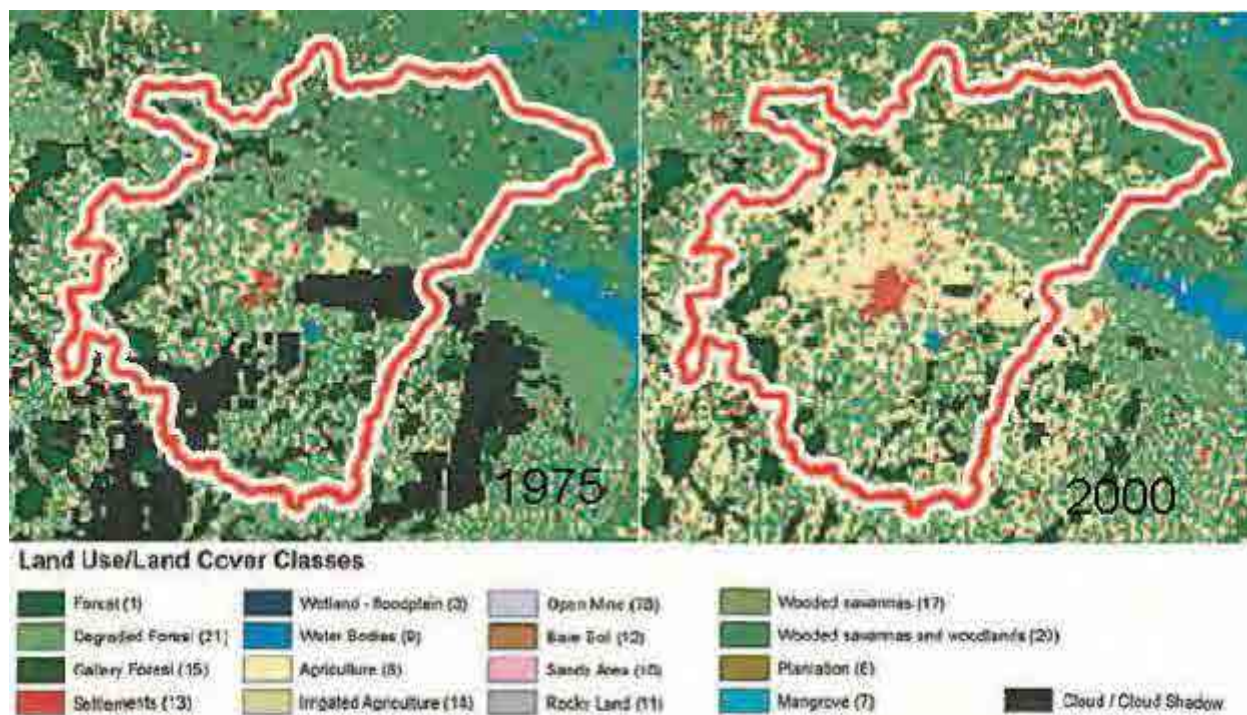
	District	Oil Palm	Citrus	Pepper	Tomato	Egg Plant	Okra	Other Major Products
		Potential areas include poultry, livestock (eg sheep and goats), grass-cutter rearing, snail rearing, as well as mushroom farming and aquaculture.						
18	Adansi North	*	*	*				
		Potential for orange processing plant and to promote orange as its famous local product.						
19	Adansi South	*		*				
		Agricultural technology and land tenure system require improvement.						
20	Obuasi	*	*	*	*	*	*	
		Pollution and other negative effects from the mines need to be addressed.						
21	Amansie Central	*	*					
		Necessary to address disasters such as bush fires, rain storms, the high rate of timber extraction through destructive logging techniques, and negative effects of mining on the environment.						
22	Amansie West	*						
		Cocoa production ranked third in the nation. Promotion of plant oils and cocoa are needed						
23	Atwima Mponua	*	*					
		High post-harvest losses due to lack of post-harvest facilities, difficult access to storage points and markets, and lack of agro-processing equipment.						
24	Ahafo Ano South			*	*	*	*	Onion
		Potential for fish farming						
25	Ahafo Ano North	*	*		*	*		Cabbage
		Out migration of youth to urban centres is affencting agriculture						
26	Offinso	*		*	*	*		
		Teak is promoted by the Forestry Division for re-forestation in the depleted forest reserves.						
27	Offinso North			*	*	*	*	Cowpeas
		Important measures are restarting repaired irrigation works, strengthening extension services, and agricultural data collection and management.						

Source: MOFA, 2019, Medium Term Development Plan 2010-2013, NDPC

### (3) Agricultural Expansion

In Ashanti Region, agricultural land expanded very largely by slashing forests, both degraded forests and good forests, as shown in Figure 2.3.6.



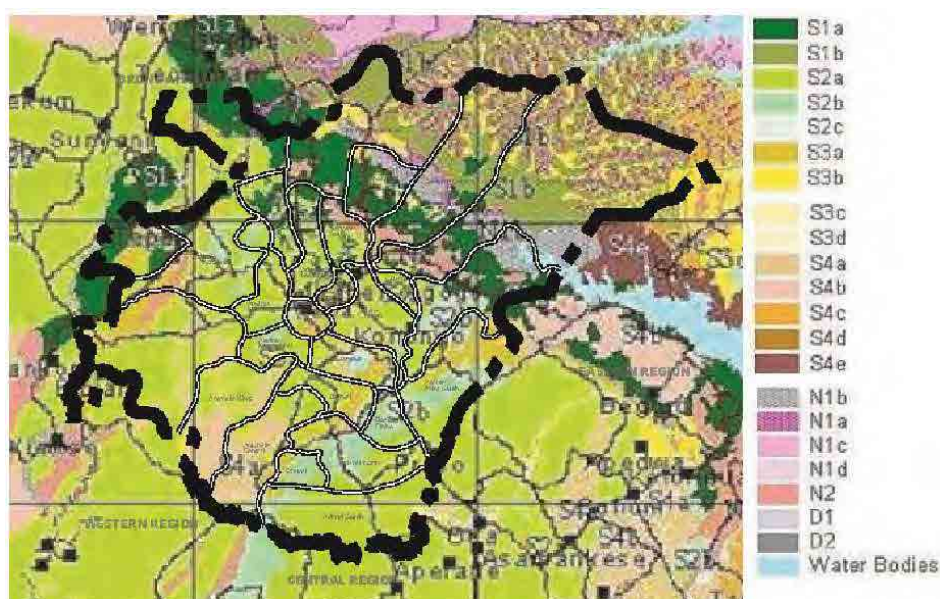


Source: West Africa Land Use and Land Cover Trends Project, US Geological Survey

**Figure 2.3.6 Agricultural Land Expansion in Ashanti Region, 1975-2000**

**(4) Agricultural Development Potential in Ashanti Region**

The soil-crop suitability map (Figure 2.3.7) reveals that the north-eastern part of Ashanti Region still has vast land suitable for crop cultivation. The soil in the area is highly suitable for agriculture, with non-gravelly medium to moderately heavy texture. This type of soil is suitable for cocoa, coffee, black pepper, sweet berry, ginger, citrus, cocoyam, banana, rice, sugarcane and vegetables. In addition to the soil, annual average rainfall of 1,300mm in this area provides 200-220 days of major season and 60 days of minor season for crop growing. The districts such as Sekyere Afram Plains District, Sekyere Central District and Ejura Sekyeredumase District belong to this area.



Source: CSIR Soil Research Institute, Accra Centre

**Figure 2.3.7 Crop Suitability Map of Ghana**

**Table 2.3.13 Categories of Crop Suitability in Ghana for Figure 5.3.7**

<p>S1 Highly suitable areas for extensive mechanized cultivation of export and food crops, (cashew nut, sunflower, pineapples, maize corn, guinea corn, soybeans, cassava, yams, cocoyam, plantain, beans etc.).</p> <p>S1a Highly suitable soils, non-gravelly medium to moderately heavy texture. Suitable for cocoa, coffee, black pepper, sweet berry, ginger, citrus, cocoyam, banana, rice, sugarcane and vegetables.</p> <p>S1b Have same characteristics as S1a above, but are situated in Savannah-transition vegetation zone. These areas are suitable for soybeans, maize, yams, guinea corn, millet and groundnuts.</p> <p>S2 Suitable areas for extensive mechanical cultivation of export and food crops.</p> <p>S2a Crop suitability same as S1. Limitation to crop production may be due to gravelly subsoil horizons.</p> <p>S2b Crop suitability same as S2a above. Limitation to crop production may be due to either light or heavy texture soils.</p> <p>S3 Fairly suitable areas for the cultivation of crops such as maize, cassava, vegetables etc.</p> <p>S3a May consist of heavy plastic clays mostly imperfectly to poorly drained soils good for mechanized irrigation of rice, sugarcane, vegetables, maize and millet.</p> <p>S3b Mostly alluvial soils suitable for maize, guinea corn and vegetables.</p> <p>S3c Includes gravelly and moderately shallow soils. Could be hand cultivated for cassava, vegetables and maize.</p> <p>S4 Fairly to marginally suitable areas for the cultivation of crops.</p> <p>S4a Consists of gravelly, moderately shallow to shallow, imperfectly drained soils. Limited to hand cultivation of cassava, citrus, palm oil and mangoes.</p>	<p>S4b Soils may occur on upland or undulating land with very steep slopes. Problem of soil erosion is predominant.</p> <p>S4c Soil may be imperfectly drained sands to loamy sands developed over beach sand or may have clay pan beneath the topsoil. Sandy areas may be used for groundnut and tiger nut cultivation.</p> <p>S4d Soils are mainly loose sands developed on coastal sand dunes. Suitable for coconut cultivation. May be mixed with organic manure for vegetable cultivation as in Anloga areas.</p> <p>N1 Unsuitable areas for upland arable and tree crops.</p> <p>N1a Predominantly poor to very poorly drained soils, which may be developed for rice, sugarcane and vegetables.</p> <p>N1b Terrace derived alluvial soils, which are dominated by rounded pebbles rendering them unsuitable for mechanized agriculture. May be suitable for maize, cassava, pepper cultivation.</p> <p>N1c Terrace derived soils, which contain surface pebbles and an undulated subsoil horizon. Soils may be left to prevailing grass vegetation for rough grazing of livestock.</p> <p>N1d Soils dominated by ground water laterites rendering them imperfectly to poorly drained. May be developed for paddy rice cultivation or vegetation could be left for rough grazing by livestock.</p> <p>N2 Very unsuitable areas for crop production. Soils are very shallow, gravelly, occurring on steep to very slopes. Should be reserved for forestry, wildlife and watershed protection.</p> <p>D Very unsuitable areas for crop production. Soils are very saline and may be utilized for mining of edible salt.</p>
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## (5) Forest / Timber Sector

Forest products represent 5% of Ghana's merchandise export value in 2009 (World Bank), and forestry and wood production are also important economic activities in Ashanti Region. Apart from illegal logging, logs are harvested from production forests located in the southern part of the country, 18% of which are found in Ashanti Region. Lumbering activities take place in almost all the districts in the Region.

**Table 2.3.14 Total Area Sizes and Shares of Production Forests (2002)**

Region	Total Area (ha)	Share
Western	323,000	45%
Central	73,400	10%
Eastern	70,200	10%
Ashanti	126,400	18%
Brong Ahafo	126,300	18%
Total	719,300	100%

Source: Boakye, K.A & Bafoe, K.A (2006), Trends in Forest Ownership, Forest Resource Tenure and Institutional Arrangements: Case Study from Ghana, Resource Management Support Centre, Ghana.

## 2.3.4 Manufacturing and Mining / Quarrying Sectors

### (1) Manufacturing Sector

The following table presents the regional distribution of establishments and persons engaged in

industry (mining and quarrying, manufacturing, and the production and distribution of electricity and water) as of 2003. Ashanti Region provided the second largest number of establishments and persons engaged in manufacturing, next to Greater Accra, accounting for 24.3% and 24.7% of the national total, respectively. The following table shows the number and share of the establishments and persons engaged in manufacturing by region.

**Table 2.3.15 Establishments and Persons Engaged in Manufacturing by Region**

Region	Establishments		Persons Engaged	
	Number	Percentage	Number	Percentage
Western	1,922	7.4	27,409	11.3
Central	2,498	9.6	16,824	6.9
Greater Accra	6,708	25.7	67,992	27.9
Volta	1,312	5.0	14,148	5.8
Eastern	2,975	5.0	21,316	8.8
Ashanti	6,440	24.7	59,157	24.3
Brong Ahafo	1,754	6.7	14,631	6.0
Northern	1,232	4.7	13,652	5.6
Upper East	839	3.2	5,572	2.3
Upper West	408	1.6	2,815	1.2
<b>Total Country</b>	<b>26,088</b>	<b>100.0</b>	<b>243,516</b>	<b>100.0</b>

Source: National Industrial Census 2003

While the industry sector is dominated by small establishments in terms of number, large companies in Ghana also employ a significantly large number of persons; as a result, the size of the companies to which a majority of people belong is either small or large due to the absence of medium-sized companies. This tendency is observed throughout the country. The following table shows the number of establishments and persons engaged in industry (Kumasi and national total) by size of the establishment.

**Table 2.3.16 Share of Establishments and Persons Engaged in Industry by Size of Establishment**

Persons	1-4	5-9	10-19	20-29	30-49	50-99	100-199	200-499	500	Total
Establishments										
Ashanti	47.0%	36.5%	11.2%	2.4%	1.3%	0.8%	0.4%	0.4%	0.2%	100.0%
National Total	54.5%	29.8%	9.4%	2.3%	1.7%	1.2%	0.5%	0.4%	0.2%	100.0%
Persons Engaged										
Ashanti	11.7%	21.2%	13.2%	5.1%	4.2%	4.4%	5.0%	10.7%	24.5%	100.0%
National Total	13.1%	17.9%	11.5%	5.0%	5.8%	7.4%	7.0%	11.9%	20.3%	100.0%

Source: GSS, National Industrial Census 2003

## (2) Mining / Quarrying Sector

As opposed to the manufacturing sector, the mining and quarrying businesses in Ghana, which require a large capital investment, is mostly operated by large companies. Mining and quarrying is an important economic activity in Ashanti, employing 43.3 % of the number of the persons engaged in this sector in all of Ghana in 2003, while accounting for 14.5% of the number of establishments as shown in the table below. This implies that the size of the mining and quarrying companies operating in Ashanti Region is far larger than those operating in other regions.

**Table 2.3.17 Establishments and Persons Engaged in Mining and Quarrying by Region**

Region	Establishments		Persons Engaged	
	Number	Percentage	Number	Percentage
Western	22	13.3	4,484	22.8
Central	39	23.5	1,855	9.4
Greater Accra	39	23.5	1,758	8.9
Volta	21	12.7	1,008	5.1
Eastern	16	9.6	1,762	8.9
Ashanti	24	14.5	8,538	43.3
Brong Ahafo	4	2.4	247	1.3
Northern	-	-	-	-
Upper East	1	0.6	51	0.3
Upper West	-	-	-	-
<b>Total Country</b>	<b>166</b>	<b>100.0</b>	<b>19,703</b>	<b>100.0</b>

Source: GSS, National Industrial Census 2003

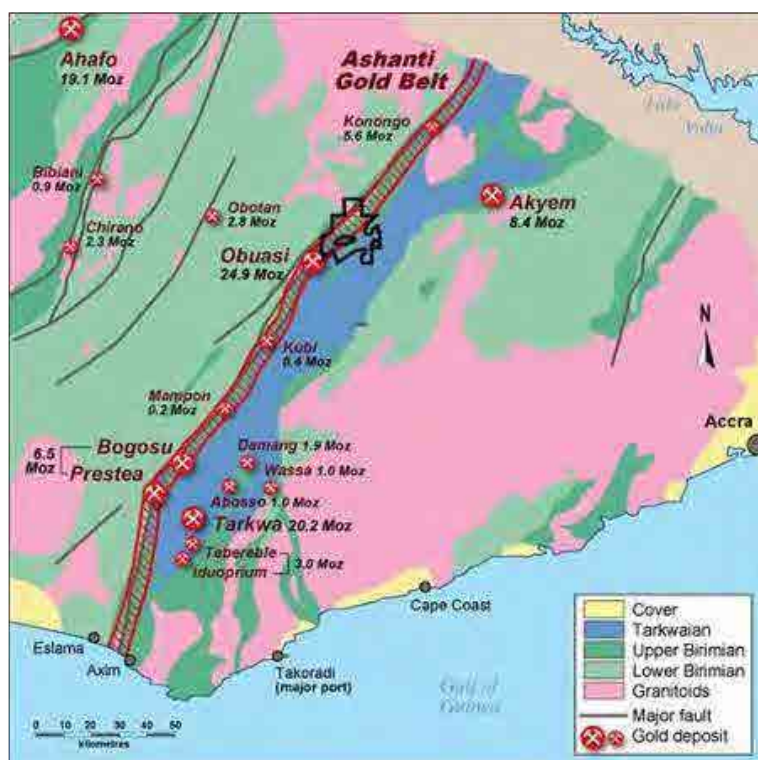
A gold belt, called the Ashanti Gold Belt, runs through Ashanti Region. On this gold belt, Obuasi Mine, Konongo Mine and Obotan Mine are located. See Figure 2.3.8.

The Obuasi Municipality where the Ashanti Goldfields Company has its largest operational mine in Ghana has a relatively high proportion of its population engaged in mining / quarrying, with the company employing approximately 6,000 workers. Obuasi produced 381,000 ounces of gold in 2009 (Ashanti Goldfields Company Annual Financial Statements 2009). This volume of gold mined accounts for about 14% of the total gold export of Ghana 2,658,758 ounce in 2009.

Additionally, informal gold mining activities are found in various districts.

There is also the proliferation of stone quarrying and sand winning industries in the region as a result of the rock types found in the regions which are suitable for the building and construction industries. Most of the sand winning activities are registered with the Mineral Commission. Under the regulation of the Sand Winners Association who acts as watchdog, illegal sand winners are prohibited from operating in these zones. However illegal sand winners are said to be operating in the region.





Source: Mineral Commission of Ghana

**Figure 2.3.8 Ashanti Gold Belt**

### (3) Industry in Districts of Ashanti Region

The industry sector outside Greater Kumasi Sub-Region, excluding Obuasi Municipality and some areas of Amansie Central District, can be outlined as follows.

#### 1) Current Situation

The industries are mostly informal, under-developed and on a small scale. They are categorized into agro-based industries, wood-based industries, textile / leather industries, metal works, clay-based industries, mining and quarrying, and construction.

Industry types	Commonly existing industries
Agro-based industries	palm oil and palm kernel oil extraction, rice mill, corn mill, flour mill, bakery, cassava processing into dough and gari, soap making, Akpeteshie distilling, Pito brewing
Wood-based industries	saw milling, wood working, carpentry, charcoal burning
Textile/leather industries	dressmaker, shoe/sandal maker, weaving (including kente), batik tie and dye production, basket weaving
Metal works	blacksmith, mechanic
Clay-based industries	pottery, brick production
Mining and quarrying	small-scale gold mining, sand winning
Construction	Various construction works



## 2) Key Problems

- Inadequate market
- Small scale, informal, and under-developed nature
- Low skills
- Lack of production facilities
- Limited availability of raw materials, for example wood
- Lack of infrastructure such as water, electricity and roads
- Limited finance and lack of saving for capital investment
- Not forming clusters
- Problems of illegal mining and environmental hazards
- Lack of private-public partnerships

## 3) Characteristics of Districts

The table below shows major industries in each districts outside Greater Kumasi as well as districts, which have special characteristics within this sector.

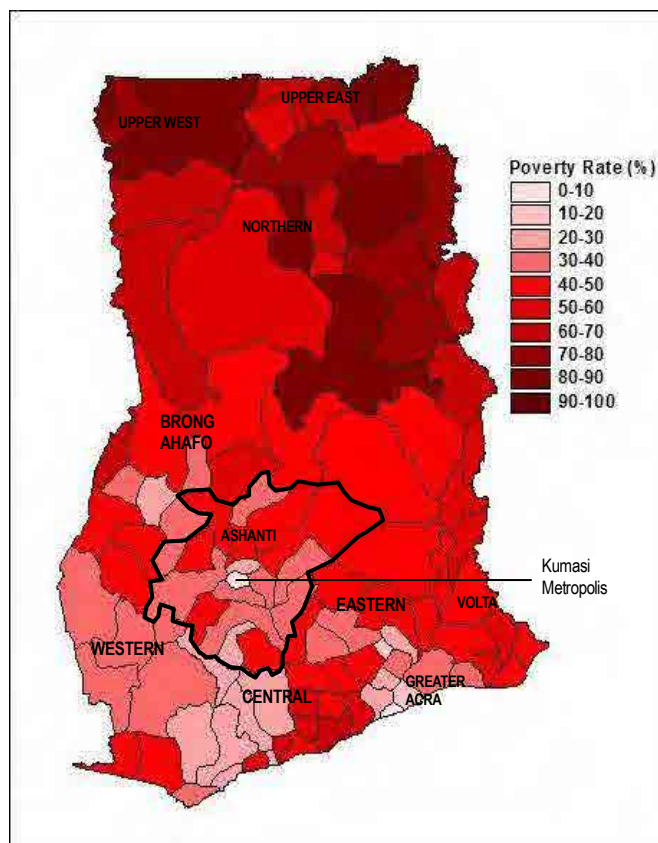
**Table 2.3.18 Features on Industry Sector of each District Outside Greater Kumasi**

	District	Agro-based	Wood-based	Textile / Leather	Metal	Clay-based	Mining / Quarrying	Construction
8	Ejura Sekyedumase	*	*		*	*		*
9	Sekyere South	*		*	*			*
		They produce indigenous kente and other products which are sold mostly in Kumasi. The clothes are bought by traders from all parts of Ghana and other West African countries.						
10	Mampong	*	*		*			
11	Sekyere Central	*	*	*	*			
12	Sekyere East	*						
13	Sekyere Afram Plains	*		*	*		*	
14	Asante Akim North							
15	Asante Akim South						*	
		Mining activities have considerable negative impacts on the environment of the district.						
16	Bosome Freho							
17	Bekwai	*	*	*	*		*	*
18	Adansi North	*	*	*				
19	Adansi South	*	*	*				
20	Obuasi	*	*		*		*	*
		AngloGold Ashanti employs 4,500-6,000 workers (down from 22,000) and indirectly supports 50,000-60,000 people. Blacksmithing and metal-based industries are rapidly expanding. For example, used metal scraps from AngloGold Ashanti are used for manufacturing farm equipment. On the other hand, pollution and other negative effects from the mines should be addressed and it is expected that the industry of the municipality will be diversified centering on the mining.						
21	Amansie Central	*						
		It is necessary to address the negative effects on the environment caused by both timber extraction through destructive logging techniques and activities of AngloGold Ashanti and other small scale mining operations.						
22	Amansie West	*	*	*	*		*	
23	Atwima Mponua	*	*		*	*	*	
24	Ahafo Ano South	*	*		*			
25	Ahafo Ano North	*	*		*			
26	Offinso	*	*				*	*
27	Offinso North	*	*	*			*	

Source: MOFA, 2009, Medium Term Development Plan 2010-2013, NDPC

### 2.3.5 Poverty Situation of Ashanti Region

Ashanti Region ranked the second lowest in poverty incidence in 1991/92, but the rank fell to fourth in 2005/06. The reasons can be considered that, in Ashanti region, numbers of farmers not involved in export farming remain poor in rural districts, and industry has not created many job opportunities for the population.



Source: NKONSONKONSON The Dignity Chain

**Figure 2.3.9 Poverty Incidence by District, 2000**

Figure 2.3.9 shows the poverty incidence by district in 2000. In Ashanti Region, Kumasi Metropolis had the lowest poverty incidence, and the surrounding districts as well as Adansi West where Ashanti Mine was located had comparatively lower poverty incidence. Districts having higher rate of poverty were concentrated in northern part of Ashanti Region.

## 2.4 Spatial Characteristics of Ashanti Region

### 2.4.1 Population Distribution in Ashanti Region

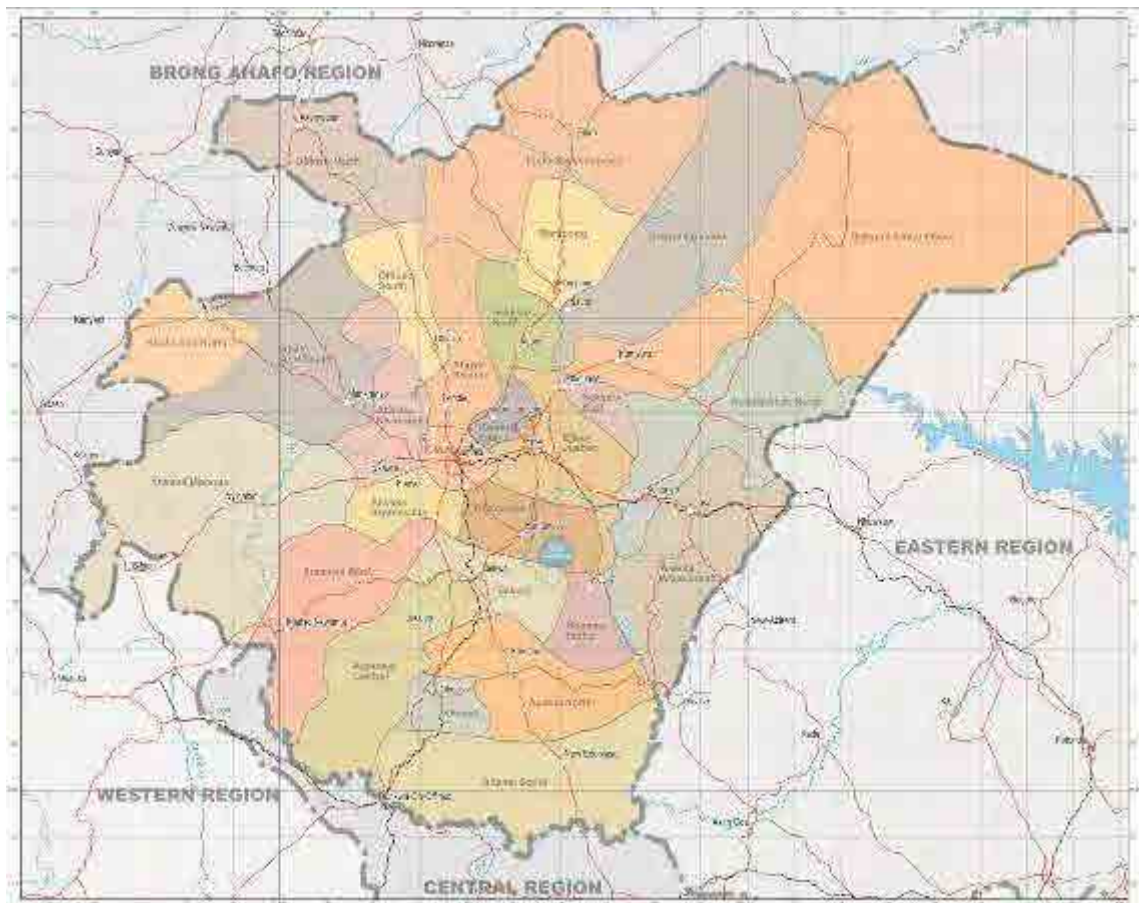
Table 2.4.1 shows the population distribution among districts in Ashanti Region. Kumasi Metropolis has a population of 2,035,064, accounting for 42.6% of the total population of Ashanti Region. The total population of the seven districts in Greater Kumasi adds up to 2,764,091, which accounts for 57.8% of the population of Ashanti Region. Population density of Kumasi Metropolis is very high among the districts, 8,012 persons/km<sup>2</sup>. Obuasi Municipality, where the Ashanti Goldfields Company has its largest operational mine in Ghana, has a population of 168,641, and the second highest population density of 1,038 person/km<sup>2</sup>. The six districts where Greater Kumasi is located have higher population density compared with other districts.

**Table 2.4.1 Population and Population Density of Districts, 2010**

District	Population	Share in Regional Population	Area (km <sup>2</sup> )	Population Density (person/km <sup>2</sup> )
<b>Ashanti Region</b>	<b>4,780,380</b>	<b>100.0%</b>	<b>24,948</b>	<b>192</b>
<b>Greater Kumasi (7 MMDAs)</b>	<b>2,764,091</b>	<b>57.8%</b>	<b>2,481</b>	<b>1,085</b>
KUMASI METROPOLIS ( <i>Greater Kumasi</i> )	2,035,064	42.6%	254	8,012
OBUASI MUNICIPALITY	168,641	3.5%	162	1,038
KWABRE EAST ( <i>Greater Kumasi</i> )	115,556	2.4%	148	781
ATWIMA NWABIAGYA ( <i>Greater Kumasi</i> )	149,025	3.1%	295	505
AFIGYA KWABRE ( <i>Greater Kumasi</i> )	136,140	2.8%	342	398
ATWIMA KWANWOMA ( <i>Greater Kumasi</i> )	90,634	1.9%	305	297
EJISU JUABEN MUNICIPALITY ( <i>Greater Kumasi</i> )	143,762	3.0%	637	226
BOSOMTWE ( <i>Greater Kumasi</i> )	93,910	2.0%	500	188
BEKWAI MUNICIPALITY	118,024	2.5%	633	186
AHAFO ANO NORTH	94,285	2.0%	567	166
AFIGYA SEKYERE	94,009	2.0%	584	161
ATWIMA MPONUA	119,180	2.5%	894	133
ADANSI SOUTH	115,378	2.4%	899	128
OFFINSO MUNICIPAL	76,895	1.6%	600	128
AMANSIE CENTRAL	90,741	1.9%	710	128
ASANTE AKIM NORTH MUNICIPALITY	140,694	2.9%	1,160	121
AMANSIE WEST	134,331	2.8%	1,364	98
AHAFO ANO SOUTH	121,659	2.5%	1,241	98
ASANTE AKIM SOUTH	117,245	2.5%	1,218	96
BOSOME FREHO	60,397	1.3%	630	96
ADANSI NORTH	107,091	2.2%	1,140	94
SEKYERE EAST	62,172	1.3%	731	85
OFFINSO NORTH	56,881	1.2%	741	77
EJURA SEKYE DUMASI	85,446	1.8%	1,782	48
SEKYERE CENTRAL	71,232	1.5%	1,564	46
MAMPONG MUNICIPAL	88,051	1.8%	2,346	38
SEKYERE AFRAM PLAINS	93,937	2.0%	3,501	27

Source: GSS, 2010 Population and Housing Census

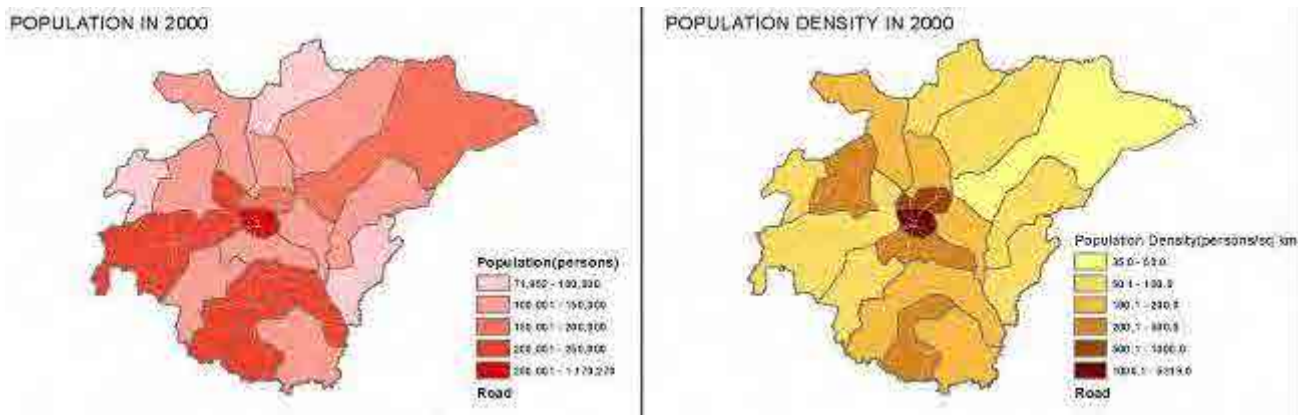
Figure 2.4.1 shows the current district boundary of Ashanti Region.



Source: JICA Study Team, 2012

**Figure 2.4.1 Districts of Ashanti Region**

Figure 2.4.2 and Table 2.4.2 shows the population distribution of Ashanti Region in 2000. Although the district boundary has changed in some parts of Ashanti Region between 2000 and 2010, the figure shows the high population density in KMA, Kwabre (current Kwabre East and southern part of Afigya Kwabre), Bosomtwe/Atwima Kwanwoma (current Bosomtwe and Atwima Kwanwoma), Adansi West (current Obwasi and part of Adansi North and Adansi South) and Ahafo Ano South.



**Figure 2.4.2 Population Distribution in Ashanti Region, 2000**

**Table 2.4.2 Population and Population Density of Districts, 2000**

District	Population	Population Density (person/km <sup>2</sup> )
Atwima	237,610	97
Amansie West	108,726	85
Amansie East	225,309	120
Adansi West	238,440	251
Adansi East	129,308	127
Asante Akim South	96,868	90
Asante Akim North	126,477	100
Ejisu-Juaben	124,176	191
Bosomtwe-Kwanwoma	146,028	236
Kumasi	1,170,270	5,319
Kwabre	164,668	659
Afigya Sekyere	119,085	153
Sekyere East	157,396	35
Sekyere West	143,206	60
Ejura Sekyedumase	81,115	60
Offinso	138,676	103
Ahafo Ano South	133,632	234
Ahafo Ano North	71,952	59

Source: 2000 Population and Housing Census

## 2.4.2 Urbanization

Table 2.4.3 shows the trend of urban population increase<sup>1</sup> according to the Population Census. The urbanization rates of Ashanti Region increased from 25 per cent in 1960 to 51 per cent in 2000. The urbanization rate of Ashanti Region is the second highest next to the Greater Accra Region. The average annual growth rate from 1984 to 2000 (6.3%) was particularly high, exceeding the national average (4.6%).

**Table 2.4.3 Urban Proportion Rates and Annual Growth Rates of Ghana, Greater Accra Region and Ashanti Region**

	Urban Population (%)				Annual Growth Rate (%)			
	1960	1970	1984	2000	1960-1970	1970-1984	1984-2000	1960-2000
All Regions	23.1	28.9	32.0	43.8	4.7	3.3	4.6	4.2
Greater Accra	72.6	85.3	83.0	87.7	6.1	3.5	4.8	4.7
Ashanti	25.0	29.7	32.5	51.3	4.6	3.1	6.3	4.8

Source: 1960, 1970, 1984 and 2000 Population Censuses of Ghana

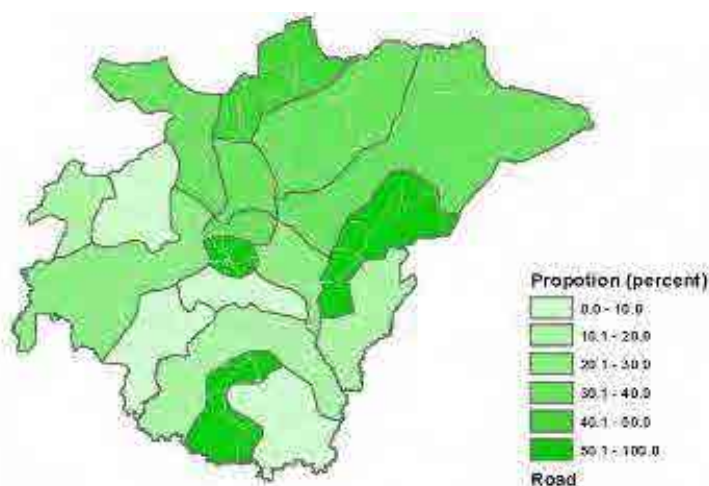
The rates of urban population of the districts in Ashanti Region in 2000 are shown in Table 2.4.4 and Figure 2.4.3. The whole area in Kumasi Metropolitan is urbanized, and also two districts, Adansi West District and Asante Akim North District exceeded the average urbanization rate of Ashanti Region, and it is comparatively high in the northeast part of the region.

<sup>1</sup> The classification of urban and rural areas is based on population sizes of localities. A locality with a population of 5,000 or more is classified as urban, and less than 5,000 as rural.

**Table 2.4.4 Demographics by District in Ashanti Region, 2000**

	Total Population	Population Increase			Urban Population (%)	Population Density (persons/km <sup>2</sup> )	Number of Households	Average Household Size (persons)
		1970	1984	2000				
All Districts	3,612,950	100	160	317	51.3	148	682,759	5.3
Atwima	237,610	100	157	345	20.7	97	43,525	5.5
Amansie West	108,726	100	143	234	0.0	85	21,383	5.1
Amansie East	225,309	100	143	208	12.2	120	42,694	5.3
Adansi West	238,440	100	182	400	61.1	251	49,947	4.8
Adansi East	129,308	100	186	589	7.5	127	23,743	5.4
Asante Akim South	96,868	100	157	215	16.5	90	19,037	5.1
Asante Akim North	126,477	100	141	235	55.9	100	22,876	5.5
Ejisu Juaben	124,176	100	130	205	26.5	191	26,462	4.7
Bosomtwe/Atwima/Kwanwoma	146,028	100	148	253	5.0	236	26,088	5.6
Kumasi Metropolitan	1,170,270	100	190	456	100.0	5,319	231,653	5.1
Kwabre	164,668	100	144	366	38.9	659	30,988	5.3
Afigya Sekyere	119,093	100	144	232	35.6	153	22,253	5.4
Sekyere East	157,396	100	139	284	33.7	35	24,141	6.5
Sekyere West	143,206	100	147	201	39.0	60	26,885	5.3
Ejura Sekyedumase	81,115	100	182	279	48.8	60	14,148	5.7
Offinso	138,676	100	175	270	31.0	103	25,163	5.5
Ahafo Ano South	133,632	100	144	385	9.2	234	19,204	7.0
Ahafo Ano North	71,952	100	144	305	19.2	59	12,569	5.7

Source: GSS, 2000 Population and Housing Census



**Figure 2.4.3 Urban Population Rate in Ashanti Region, 2000**

### 2.4.3 Urban Centres

Based on the population data of the 2000 Census, localities with a population of 5,000 or more and the capital towns of all districts in Ashanti Region are identified in Table 2.4.5 and Figure 2.4.4. In Ashanti Region, there was one large town with a population of 250,000 or more (Kumasi Metropolitan), one medium town with a population of 50,000 or more (Obuasi), and 55 small towns with a population of 5,000 or more. Among those 55 towns, 19 towns have a population of 10,000 or more and 36 towns have a population less than 10,000. In addition, there are six towns designated as the capital of the district, although population is less than 5,000 persons.

**Table 2.4.5 Large Town, Medium Town and Small Towns in Ashanti Region, Year 2000**

No	Towns	2000 Population	No	Towns	2000 Population
1	Kumasi Metropolitan	1,170,270	33	Obogu	7,565
2	Obuasi (Capital)	115,564	34	Nyinahin (Capital)	7,544
3	Konongo-Odumase (Capital)	37,317	35	Aboaso	7,493
4	Mampong (Capital)	31,740	36	Ntonso	7,489
5	Ejura (Capital)	29,478	37	Barekese	7,400
6	Agogo	28,271	38	Gyakyi (Jachie)	7,368
7	Ahwiaa	19,729	39	Sabronum	7,299
8	Bekwai (Capital)	19,679	40	Akrokerry	6,858
9	Effiduase (Capital)	18,700	41	Kwamang	6,643
10	Abuakwa	16,582	42	Atwima Koforidua	6,626
11	Akomadan (Capital)	16,562	43	Nsuta (Capital)	6,460
12	Kumawu (Capital)	15,634	44	Akrofuom	6,377
13	Atimatim	14,017	45	Kenyasi	6,193
14	Tepa (Capital)	13,826	46	Asuofua	5,878
15	Wiamoase	12,651	47	Kona	5,853
16	Offinso New Town (Capital)	12,327	48	Beposo	5,827
17	Juaben	11,425	49	Dwinyama	5,602
18	Abofour	11,177	50	Kwamo	5,470
19	Ejisu (Capital)	10,923	51	Asamang	5,277
20	Sekodumasi	10,085	52	Kofiase	5,113
21	Nkenkaasu	10,014	53	Asenemaso	5,109
22	Asokore	9,969	54	Bonwire	5,085
23	New Edubiase (Capital)	9,664	55	Patriensa	5,068
24	Agona Ashanti (Capital)	9,321	56	Mankranso (Capital)	5,044
25	Mampong (Capital)	9,121	57	Foase (Capital)	5,023
26	Jamasi	9,096	58	Nkawie (Capital)	4,836
27	Bodomase	8,756	59	Fomena (Capital)	3,675
28	Akaporiso	8,735	60	Kuntanase (Capital)	3,024
29	Juaso (Capital)	8,421	61	Manso-Nkwanta (Capital)	2,591
30	Brahabeome	8,132	62	Kodie (Capital)	2,286
31	Jacobu (Capital)	7,825	63	Asiwa (Capital)	1,245
32	Afrancho	7,727			

Source: GSS, 2000 Population and Housing Census

In Ashanti Region, 18 towns are located within a radius of 20 km of the Kumasi Metropolitan area, 18 towns are within 20-30 km, 19 towns are within 40-60 km, and 8 towns are more than 60 km away. While comparatively many towns are distributed to the northeast of Kumasi Metropolitan area, there are fewer towns to the southwest of Kumasi Metropolitan area. These towns have some functions as urban centres for their surrounding areas in the region.







## 2.4.4 Land Use

As reviewed in an earlier section of this chapter, Ashanti Region is characterized by several types of vegetation and land cover. Moderately dense herbs or bushes spread in the central part of the region, and moderately closed tree canopies enclose their surroundings. Among the moderately closed tree canopies, open forests with less than 60% trees and closed forests with more than 60% trees are scattered. The types of vegetation and land cover of the northeast part of the region are of closed savannah woodland and of open cultivated savannah woodland.

Many portions of the open forest and the closed forest are protected as forest reserves in Ashanti Region. In addition, two game reserves are designated. The total area of these protected areas is 4,460 square kilometres, and accounts for 18% of that of the whole region.

According to the Ministry of Food and Agriculture, about 60% of the whole region is arable, and 81% of the arable lands are cultivated.

Urban settlements are spreading centering on Kumasi Metropolitan area toward surrounding districts, and urban land uses are also significant in and around the medium towns and small towns.

## 2.4.5 Transportation Patterns

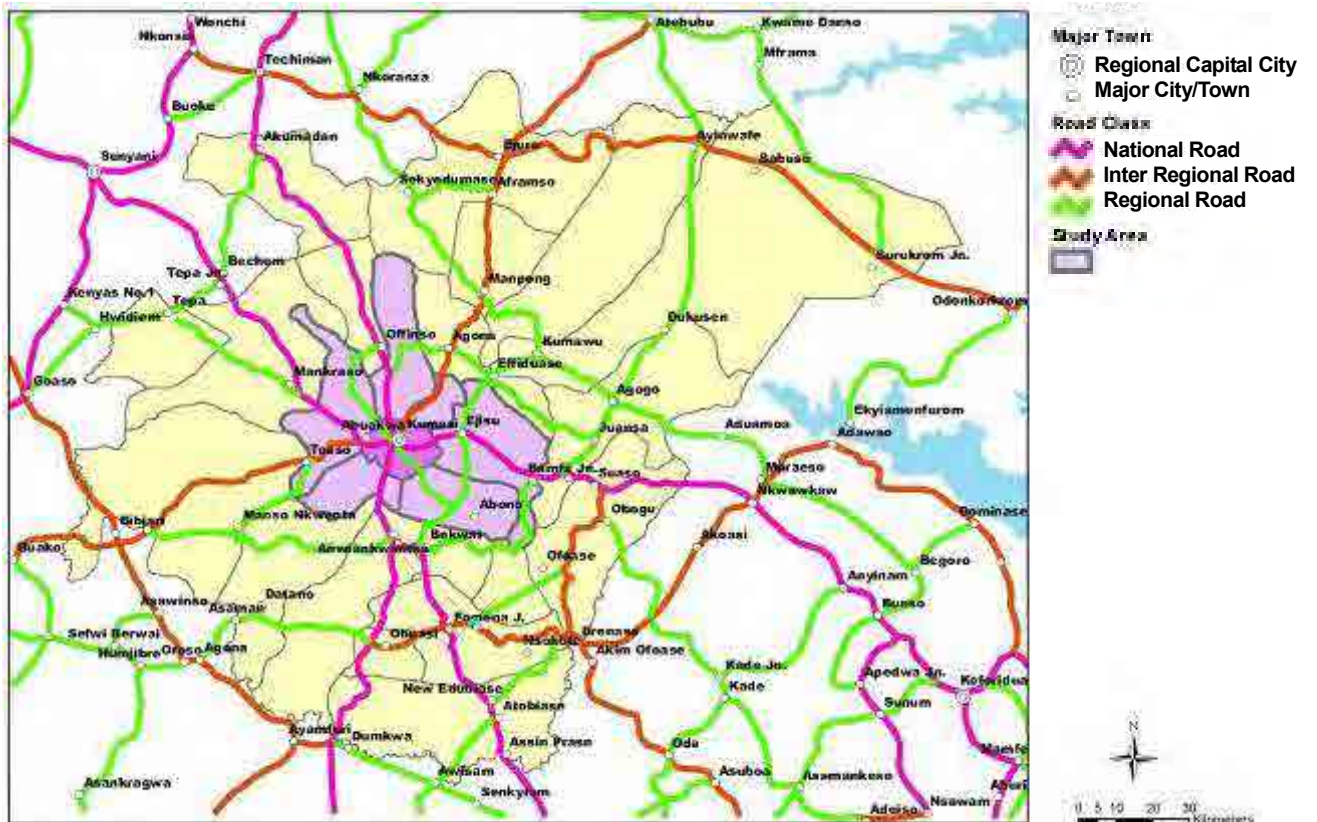
### (1) Transportation Network

Ashanti Region is served by five national roads and two inter-regional roads which make Kumasi Metropolitan area a pivotal point of national and inter-regional transportation, and 13 regional roads connect to Kumasi Metropolitan area.

**Table 2.4.6 National Roads and Inter-Regional Roads in Ashanti Region**

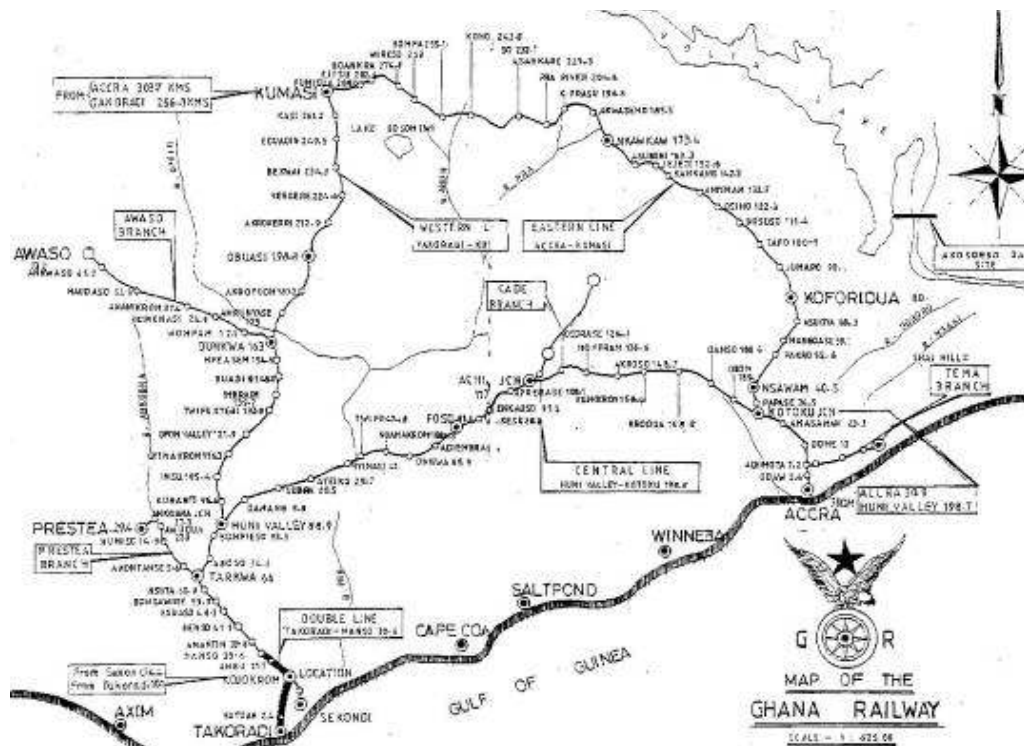
National Roads	N4	Accra (Greater Accra Region) – Tetteh Quarshie Interchange – Koforidua – Kumasi
	N6	Accra (Greater Accra Region) – Nsawam – Suhum – Nkawkaw – Kumasi – Sunyani – Gonokrom (Brong-Ahafo Region)
	N8	Yemorasa (Central Region) – Assin Praso – New Edubiase – Bekwai – Kumasi
	N10	Daboase (Western Region) – Dunkwa – Obuasi – Kumasi – Offinso – Techiman – Tamale – Bolgatanga – Paga (Upper East Region)
Inter-Regional Roads	IR2	Oda (Eastern Region) – Akim Ofoase – Ofoase – Juaso
	IR3	Mpraeso (Eastern Region) – Nkawkaw – Akoasi – Brenase – Fomena Jn. – Obuasi
	IR4	Kumasi – Mampong – Atebubu – Chambuligu (Northern Region)
	IR5	Abuakwa – Bibiani – Benchema – Osei Kojokrom (Western Region)
	IR7	Amankwakrom (Eastern Region) – Surukrom – Sabuso – Ejura – Nkoranza (Brong Ahafo Region) – Techiman

Source: Ghana Highway Authority



Source: Study Team based on the data from Ghana Highway Authority

**Figure 2.4.5 Road Links in Ashanti Region**



Source: Ghana Railway Company Ltd (GRCL)

**Figure 2.4.6 Network of the Ghana Railway**

The railroad construction in Ghana started at the end of the 19th century. The west line was opened for traffic to Kumasi in 1903, the east line was opened for traffic to Kumasi in 1923, and transportation of passengers and cargos was carried out. A railroad network was built in the southern part of Ghana, which had higher economic production and a large population. However, the Eastern Line stopped its long-distance operation in 2002 and the Western Line in 2007 because of the frequent occurrence of accidents.

**(2) Passenger and Cargo Traffic Patterns**

Since the railroad operation has been suspended for many years, the passenger transport is dependent on private cars, taxis, trotros, and buses, and the cargo transport is dependent on trucks in Ashanti Region. Therefore, networks of trotros and buses are well developed connecting Kumasi's downtown area with Kumasi's suburbs and major cities/towns inside and outside of the region.

Long-distance routes of trotro start from the bus terminals of Asafo Market and Kejetia, for Bogoso, Tarkwa and Takoradi of the Western Region, Mankessim and Cape Coast of the Central Region, Koforidua of the Eastern Region, Accra and Tema of the Greater Accra Region, Buiepe, Yapei and Tamale of the Northern Region, etc. Additionally, middle distance routes in the region arrive and depart at the bus terminals of Kejetia and Dunkerk, and short distance routes around Kumasi start from Kejetia and travel towards many destinations.

## **2.5 Major Concerns and Issues for Development and the Environment of Ashanti Region**

### **2.5.1 Major Concerns and Issues**

This section summarises major concerns and issues on development and the environment of Ashanti Region, based on the present situations described in Sections 5.1 through 5.4.

#### **(1) Economic Development**

##### Agriculture

- Ashanti Region used to be the largest producer of cacao beans in Ghana. Since the middle of the 1980s, Ashanti Region became the second largest producer next to the Western Region. Since year 2000, the Ashanti Region's cacao production has been far behind that of the Western Region. At present, the share of cacao production of Ashanti Region is only 18% of the total cacao production of Ghana, while the Western Region's production accounts for 45%. In recent years, the growth of cacao production was stagnant in Ashanti Region.
- In the last two decades, agricultural production has increased in Ashanti Region by expanding agricultural land into forest areas rather than by improving the productivity of the agriculture. There are no more forest areas. However, Ashanti's agriculture remains of low productivity.
- Investment in and production of orange, guava and other fruits have been active for supply to urban consumers in Kumasi. However, there is a limit to how large an increase such fruit production is possible because the demand for fruits is not very large when there are not many agro-processing factories requiring a large amount of those fruits as raw material.

##### Industry

- Kumasi City was the second most important industrial base in Ghana. However, many state companies lost their industrial businesses in Kumasi. Moreover, Ashanti Region is far behind the Greater Accra Region in attracting foreign direct investment in the manufacturing sectors.
- Timber processing industries in Kumasi and its surrounding areas used to flourish; however, now they are on the decline because there is not enough timber.
- Although cacao processing industries have been promoted and supported by the government of Ghana, their development has been slow, even though world market prices of cacao beans are higher than local prices.
- In Ashanti Region, many SMEs are active in the manufacturing sectors. However, in Ashanti Region, very few manufacturing companies could grow beyond the middle size so as to export their products.

#### **(2) Social Development**

- In the 1990s, Ashanti Region's poverty rates declined largely, partly due to the rises of crop prices of cacao and other cash crops. However, since then in the last ten years, the improvement of poverty rates has stagnated in Ashanti Region. Out of 10 regions, Ashanti Region's poverty rate was ranked as the fifth position from the best-off region with the lowest poverty incidence (Greater Accra Region).
- Moreover, the income disparity between rural and urban areas has become large, due to slow

growth of agricultural productivity not only in food crops but also in cash crops including cacao.

**(3) Physical Development**

- Trunk roads (national roads, inter-regional roads and regional roads) have been relatively well developed in Ashanti Region. As a result, all district capitals are connected by at least one regional road, and some district capitals are served by inter-regional roads. 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.
- Electricity supply in the districts is not always available and stable, causing difficulties in the economic sector development.

**(4) Environment**

Forestry

- Ashanti Region has maintained many forest reserves, in which forestry resources have been conserved and timber resources have been extracted in a planned manner. However, at present, Ashanti Region is seriously faced with depletion of timber resources.
- The government of Ghana could not supervise forest reserves well. As a result, in some forest reserves of Ashanti Region, small farmers have encroached into forest reserves to expand their farms.

Bosomtwe Lake

- Bosomtwe Lake is expected to be developed as an attractive tourist destination. However, local people live near the lake shore, and their waste discharge goes into the lake.

**2.5.2 SWOT Analysis for Ashanti Region**

The summary of the major concerns and issues in the previous section shows the understanding of the past and present situation. In this section, these major concerns and issues are analyzed (SWOT analysis) by looking at strength (S) and weakness (W) of Ashanti Region from internal factors and at opportunities (O) and threats (T) from external factors.

**(1) Internal Factor: Strength (S)**

- 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: Weakness (W)**

- 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: Opportunities (O)**

- 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: Threat (T)**

- 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.

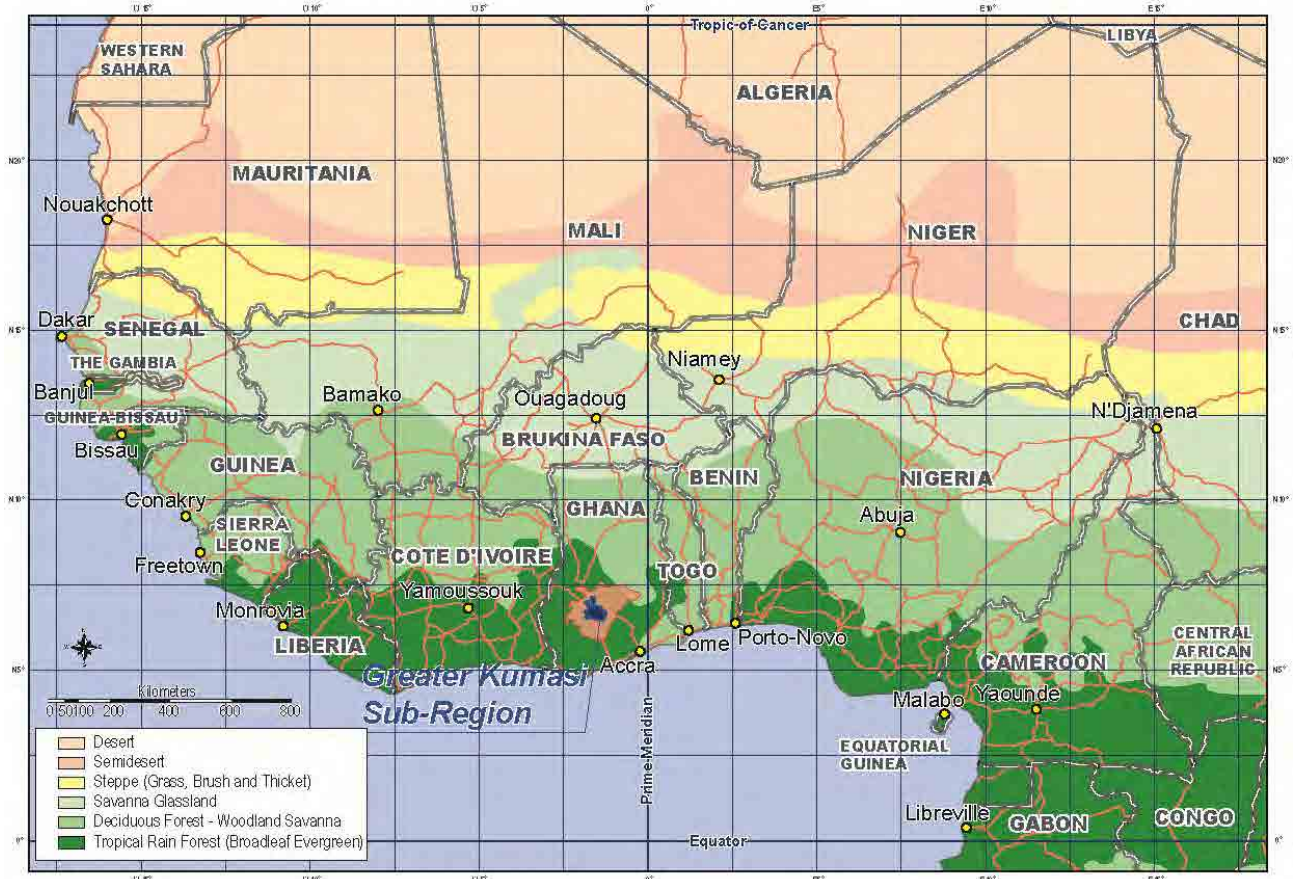


## Chapter 3 Present Characteristics of Greater Kumasi Sub-Region

### 3.1 Locational Characteristics of Greater Kumasi Sub-Region

#### 3.1.1 Locational Characteristics of Greater Kumasi within Western African Region

Greater Kumasi Sub-Region is located between longitude 1°15'W and 2°00'W, and latitude 6°15'N and 7°10'N. The whole area lies in the Tropical Rain Forest Zone, approximately 250km inland from the coast.



Source: JICA Study Team

Figure 3.1.1 Greater Kumasi Sub-Region within Western Africa



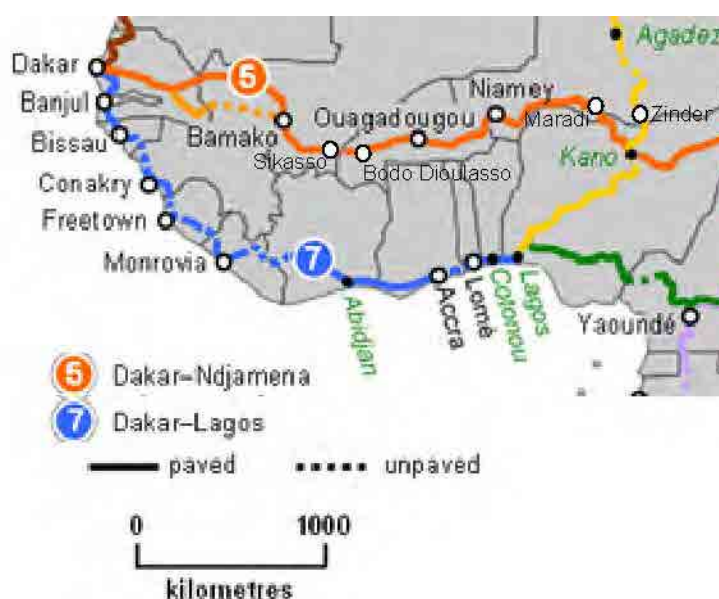
The population of the major cities in the neighbouring landlocked countries as shown in Table 3.1.1, gives Ghana an advantage as a coastal country. As for Greater Kumasi Sub-Region, Kumasi being the intersection point of the major roads connecting Ouagadougou, the capital city of Burkina Faso with the coastal cities such as Accra and Takoradi, Kumasi has been attracting people as the centre of commerce with one of the largest open markets in Western Africa. From Ouagadougou, Trans-Sahelian Highway connects the major cities in Mali, Burkina Faso and Niger.

**Table 3.1.1 Population of Major Cities in the Neighbouring Landlocked Countries**

Country	City	Population
Mali	Bamako	1,809,106* <sup>1</sup>
	Sikasso	225,753* <sup>1</sup>
Burkina Faso	Ouagadougou	1,475,223* <sup>2</sup>
	Bobo Dioulasso	489,967* <sup>2</sup>
Niger	Niamey	1,302,910* <sup>3</sup>
	Zinder	274,530* <sup>3</sup>
	Maradi	274,530* <sup>3</sup>

Source: City Population HP (<http://www.citypopulation.de/>)

Note: \*<sup>1</sup> 2009, \*<sup>2</sup> 2006, \*<sup>3</sup> 2011



**Figure 3.1.2 Trans-African Highway Network in Western Africa**

The railway network in Western Africa was mostly constructed during the colonial time and therefore the current condition of the railway network in the region faces issues as a means of transportation. Major issues are the railroad gauge width and rehabilitation for the existing railway. The railroad gauge width of each railway in the region is shown in Figure 3.1.3. While the English colonized countries have 1,067mm gauge width, the French colonized countries have 1,000mm.

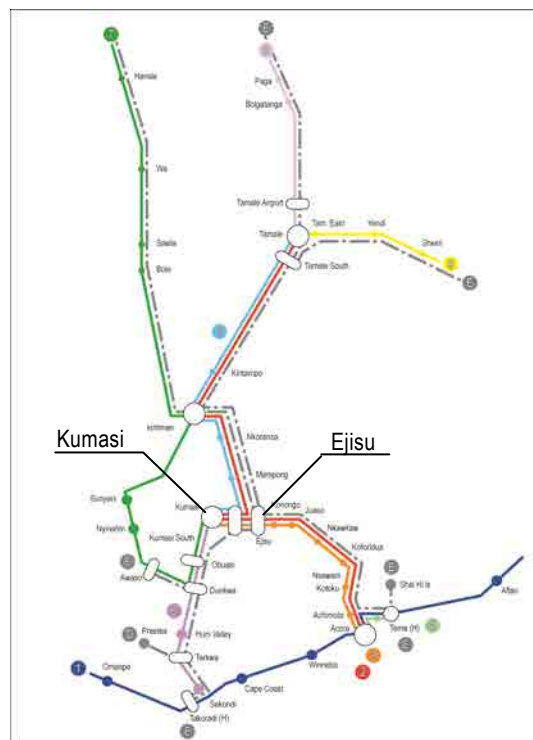


Source: By Joost Bensen based on Atlas de la zone franc en Afrique subsaharienne (1995) and Japan Railway & Transport Review (March 2000)

**Figure 3.1.3 Existing and Planned Railway Network in Western Africa, 2005**

Unfortunately most of Ghana’s railway network is currently not functioning. As for the railway line that runs through Kumasi, it stopped running in 2006 due to lack of maintenance and funding.

However, if the expansion plan of the new railway network is realized, Greater Kumasi Sub-Region will be able to take advantage of the railway connection with major cities in Ghana, such as Accra, Takoradi and Tamale, and further to Burkina Faso. See Figure 3.1.4.



**Figure 3.1.4 Expansion Plan for Railway Network in Ghana**

### 3.1.2 Locational Characteristics of Greater Kumasi within Ghana

Greater Kumasi lies on the southern side of Manpong-Gambaga scarp, which splits the region into two different environments.



Source: JICA Study Team

**Figure 3.1.5 Greater Kumasi Sub-Region in Ghana**

The city of Kumasi is in the intersection of routes which connects the north and south of the country. All cities in Ghana can be reached from Kumasi within one day by road including the major regional capital cities. See Figure 3.1.5. Despite the fact that Kumasi does not lie in the coastal area, the road network has contributed in many ways to attract people to Kumasi.

## 3.2 Urban Environment of Greater Kumasi Sub-Region

### (1) Urban Environmental Problems

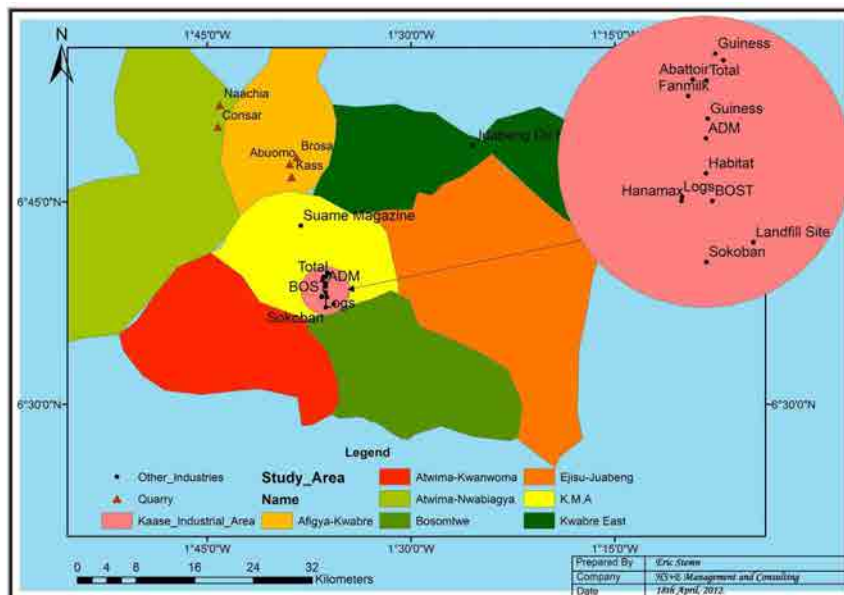
Greater Kumasi Sub-Region is faced with several environmental challenges that include pollution of water bodies, poor waste management, risk from chemical use, indoor and outdoor air pollution, and land degradation as well as improper management of large-scale development.

Chemical use which results in pollution of the natural and urban environment is also a risk. The main causes of the chemical use risks include use of chemicals in hunting and agrochemical / pesticides use. Additionally, chemicals for industrial use and spillage from mining activities all contribute to chemical pollution of the environment.

Large-scale development in the Greater Kumasi Sub-Region, such as mining activities, factories near rivers or waterways and building on waterways are also major causes of pollution. The effects of large-scale development are loss of arable land, waste generation and flooding in urban areas.

The principal problems affecting water resources include river water pollution, especially within and downstream from urbanized areas due to the issues shown below:

- Untreated sewage and other domestic waste
- Hospital waste
- Industrial waste, including an assortment of chemicals and possibly heavy metals; oils from informal car repairs shops (Suame Magazine), Sawmills, Brewery and abattoir
- Urban and rural runoff including agricultural chemicals and residues
- Leachate from groundwater into river systems of any of the above pollutants
- Contamination of boreholes and wells situated close to polluted watercourses



Source: JICA Study Team

Figure 3.2.1 Point and Non-Point Sources of Pollution in Greater Kumasi Sub-Region



**Table 3.2.1 Major Sources of Pollution in Greater Kumasi Sub-Region**

Pollution Source	Type of Activity	Pollution Parameter
Naachia Quarry (Point Source)	Quarry	Dust, noise, particulate matter, oil spillage, vehicular emission
Consar Granite and Quarry Limited (Point Source)	Quarry	Dust, noise, particulate matter, oil spillage, vehicular emission
Abuom Quarry Limited (Point Source)	Quarry	Dust, noise, particulate matter, oil spillage, vehicular emission
Brosa Quarry Limited (Point Source)	Quarry	Dust, noise, particulate matter, oil spillage, vehicular emission
KASS Quarry Limited (Point Source)	Quarry	Dust, noise, particulate matter, oil spillage, vehicular emission
Timber Firms (Point Source)	Wood Processing and Manufacturing	Dust, particulate matter, oil spillage, vehicular emission
Sokoban Wood Village (Point Source)	Wood Processing and Manufacturing	Dust, particulate matter, oil spillage, vehicular emission
Suame Magazine (Non-Point Source)	Mechanical Workshops	Oil spills, leachate, waste oil, solid waste
Guinness Ghana Limited (Point Source)	Manufacturing of drinks	Sludge, waste water, solid waste and sewage
ADM Cocoa Processing Limited (Point Source)	Processing of cocoa	Sludge, waste water, solid waste and sewage
Fanmilk Ghana Limited (Point Source)	Manufacturing	Sludge, waste water, solid waste and sewage
BOST Oil (Point Source)	Storage of oil	Oil spills, leachate, vehicular emission
Juabeng Oil Mill (Point Source)	Manufacturing	Sludge, smoke, waste water and leachate
Kumasi Abattoir (Point Source)	Meat Production	Smoke, particulate matter, solid waste and waste water

## (2) Water Quality

### a) General

The water sources in the Greater Kumasi Sub-Region have been under increasing threat of deterioration in quality in recent years due to rapid demographic changes. The evaluation of collected data on water quality infers that most of the water bodies, especially south of the Kumasi Metropolitan Assembly, are polluted.

The principal problems affecting water sources include river water pollution, especially within and downstream from urban Kumasi due to the issues shown below:

- Untreated sewage and other domestic waste
- Hospital waste
- Industrial waste, including an assortment of chemicals and possibly heavy metals; oils from informal car repairs shops (Suame Magazine), Sawmills, Brewery and abattoir
- Urban and rural runoff; including agricultural chemicals and residues
- Leachate from groundwater into river systems of any of the above pollutants
- Contamination of boreholes and wells situated close to polluted watercourses

The quality of the water bodies (rivers and streams) running through the northern environs of KMA, specifically the city of Kumasi, is of good quality. This is because these river

bodies are far from industrial activities and have, therefore, not been greatly affected by either significant human or industrial activities. A Specific example of such a river is the Oda River.

Rivers such as Rivers Subin, Daban and Akosua are highly polluted as a result of several human activities and industrial activities. For instance, River Subin originates from the Kumasi Zoo, passes through the Kejetia Lorry Park and meanders through the Central Market and the Asafo Market. This same river enters the Kaase Industrial Area. As a result of the immense human activities that go on in these areas, such as indiscriminate disposal of waste, buying and selling and the industrial activities that go on in the Kaase area, the quality of River Subin have been greatly affected. Also River Akosua flows through the Suame community and enters through the sprawling light industrial area of mechanical workshops. The oil spills and discharge of dirty oil from the Suame Magazine are largely responsible for the pollution of the Akosua River. Again, River Daban takes its source from Bantama via numerous drains through several neighbourhoods and finally empties into the Subin River at the Kaase Industrial Area. As a result of the densely populated nature of Bantama, several domestic and commercial activities could be responsible for the pollution in the Daban River.

The three mentioned rivers also carry the greater bulk of liquid waste in the KMA composed of industrial waste, refuse, sewage, leachate, domestic waste, night soil, grease and oil, storm water and agrochemical wash offs. These solid and liquid wastes could be said to be responsible for the pollution of these three rivers.

**b) Suame Magazine**

The Suame Magazine could be largely responsible for the pollution of the Akosua River. This is because the waste generated from the various and several mechanical workshops ultimately ends up in this river polluting it since there is no treatment of the waste oil or other waste that is generated from the activities. Also, fuel and oil leaking from car wreckers ultimately ends up in the surrounding soil polluting the soil in the area and also contributing to the pollution of the River Akosua when the oil is washed into the river through runoff in heavy down pours.

**c) Solid Waste Final Disposal Sites**

The Greater Kumasi Sub-Region has only one engineered landfill site located at Sokoban, which acts as the final disposal site for all the solid waste generated from the zone. One major challenge being faced is the fact that not all the waste that is generated ends up at the landfill sites; for instance in 2009, an average of 1,500 tones of solid waste was generated per day within the KMA but only 1,200 tones was collected, meaning that about 300 tones of the waste generated was uncollected. (Source: Public speech of Mayor of KMA, 2009). This means that a large percentage of the waste generated within the KMA ends up in other receiving mediums such as water bodies and drains. A typical example is the case of the drain close to Anloga junction which in recent time is hugely polluted with municipal solid waste.

**d) Water Quality Data**

Data for the water quality of major rivers within the Greater Kumasi Sub-Region were collected and tabulated per river. The water bodies for which data was available included Rivers Oda, Daban, Sisa, Wiwi, and Subin and the two reservoirs of Barekese and Owabi.

The available data indicated that most rivers north of the Greater Kumasi Sub-Region are relatively clean compared to the rivers down stream (southern section) of the Greater Kumasi Sub-Region. The indications are that the downstream water bodies are heavily influenced by urban and peri-urban activities leading to an increase in pollution loads.

Generally, there is a lack of consistent monitoring data of the water bodies, and data collection was largely dependent on a sponsored research conducted by the Department for International Development (DFID) between September, 1999 and December, 2000. The Environmental Protection Agency currently lacks the requisite capacity in terms of suitable equipment, logistics and technical skills to implement consistent monitoring programmes.

For underground water sources, the limited data indicates that underground water quality is not seriously threatened and data fall within standard guidelines of the World Health Organization.

**Table 3.2.2 Results of Physical-Chemical Analyses of Water Samples (mg/l) in Kaase Industrial Zone (KMA)**

Description	pH (pH unit)	Conductivity	Total Hardness	Alkalinity	Calcium (Ca++)	Magnesium (Mg++)	Sodium (Na)	Potassium (K)	Chloride	Nitrate	Nitrite	Phosphate	Sulphate	Ammonia
1	5.4	0.3	2.7	1.1	0.9	0.1	0.2	0.1	0.2	0.29	0.02	<0.01	<10	0.12
(B1)	5.3	7.2	13.6	25.8	3.3	1.3	6.9	1.8	4.7	0.21	0.01	<0.01	<1.0	0.05
(B2)	5.5	21.4	20.2	12.4	6.1	1.2	28	5.9	28.2	47.3	0.07	<0.01	<1.0	0.3
(B3)	4.8	13	8.5	3	1.9	0.9	21	2.4	16.7	36.5	0.01	0.03	<10	0.04
IFC/WB	6.0-9.0	-	-	-	-	-	200	-	250	50	3	-	250	-

Source: ADM Cocoa BV Environmental site Assessment Report conducted by SGS Environment

**Table 3.2.3 Results of Heavy Metals (Total) Concentration in Water Samples (mg/l) in Kaase Industrial Zone (KMA)**

Description	Iron (Fe)	Manganese (Mn)	Copper (Cu)	Zinc (Zn)	Lead (Pb)	Mercury (Hg)	Chromium (Cr)	Nickel (Ni)	Arsenic (As)	Aluminium (Al)	Bismuth (Bi)	Silver (Ag)	Antimony (Sb)	Cobalt (Co)	Selenium (Se)	Tin (Sn)	Cadmium (Cd)
1	0.02	<0.01	<0.01	0.06	<0.01	<0.001	<0.01	<0.01	<0.001	<0.1	<0.1	<0.01	<0.1	<0.01	<0.001	<0.1	<0.01
(B1)	2.07	0.1	<0.01	0.21	<0.01	<0.001	<0.01	<0.01	<0.001	<0.1	<0.1	<0.01	<0.1	<0.01	<0.001	<0.1	<0.01
(B2)	0.1	0.03	<0.01	0.1	<0.01	<0.001	<0.01	<0.01	<0.001	0.1	<0.1	<0.01	<0.1	<0.01	<0.001	<0.1	<0.01
(B3)	<0.01	<0.01	<0.01	0.03	<0.01	<0.001	<0.01	<0.01	<0.001	<0.1	<0.1	<0.01	<0.1	<0.01	<0.001	<0.1	<0.01
IFC/WB	3.5	-	0.5	2	0.1	0.01	0.1	0.5	0.1	-	-	0.5	-	-	0.01	-	0.01

Source: ADM Cocoa BV Environmental site Assessment Report conducted by SGS Environment

**Table 3.2.4 Results of Microbial Quality Tests of Sampled Water in Kaase Industrial Zone (KMA)**

Description	Total Coliforms	Faecal Coliforms	Total Plate Count	Salmonella	Escherichia Coli
1	<1	<1	<1	Absent	Absent
(B1)	11	<1	590	Absent	Absent
(B2)	<1	<1	200	Absent	Absent
(B3)	<1	<1	460	Absent	Absent
IFC/WB	-	-	-	-	-

Source: ADM Cocoa BV Environmental site Assessment Report conducted by SGS Environment



### (3) Ambient Air Quality

Air quality is good in most peri-urban and rural environments even though concentrations of dust, smoke, and particulate matter are sometimes high in city centres. In Kumasi, where traffic is high, vehicular emissions producing carbon monoxide, carbon dioxide and sulphur dioxide causes air quality pollution.

Air pollution in Greater Kumasi Sub-Region is predominantly due to Kaase industrial activities and vehicular traffic in the central area of KMA. This is largely due to the smoke and other gaseous emissions coming from the chimneys installed by the industries. Also, construction and building activities result in particulate matter suspension in the air.

With increased industrialization and urbanization in areas such as Kumasi and mining communities air quality is becoming a source of concern. The main issues related to air quality are:

- Inefficient utilization of fuels
- Poorly planned modes of transport
- Poorly serviced motor vehicles
- Insufficient cook-stoves and fireplaces
- Charcoal production
- Widespread bush burning

This guideline provides advice on maximum permissible levels of a variety of air pollutants.

**Table 3.2.5 Ambient Air Quality Guidelines of EPA**

Permissible Maximum Level of Ambient Air Quality	
NO <sub>x</sub> -24 hr (ug/m <sup>3</sup> )	150
PM <sub>10</sub> -24 hr (ug/m <sup>3</sup> )	70
SO <sub>x</sub> -24 hr ((ug/m <sup>3</sup> )	150
TSP-24 hr (ug/m <sup>3</sup> )	230

Source: EPA Ghana

While the air quality standard guidelines require companies to conduct monthly monitoring on air quality and to submit the results on a quarterly basis to EPA for evaluation and analysis, there is no systematic environmental monitoring system in Kumasi.

**Table 3.2.6 Total Suspended Particulate (TSP) Values measured at the BaBa Yaro Sport Stadium**

Location	Total Suspended Particulate (µg/m <sup>2</sup> )	Permissible Maximum Level (Time Weighted Average, 24hrs/µg/m <sup>2</sup> )
Northern End of Stadium (N.E)	93.0	230
Southern End of Stadium (S.E)	99.0	230
Eastern End of the Stadium (E.E)	88.0	230
Western End of the stadium (W.E)	85.0	230

### 3.3 Socio-Economy of Greater Kumasi Sub-Region

#### 3.3.1 Population

##### (1) Population of KMA and Greater Kumasi Sub-Region within Ghana

Kumasi has previously been known as the second largest city in Ghana, attracting many immigrants not only from Ghana but from other countries as well. As in many African countries, urbanization has been taking place in Ghana causing an extreme population increase in Kumasi Metropolitan Assembly (KMA) in the past quarter-century. During the same period, the population increase of the capital city of Ghana (Accra Metropolitan Assembly) has been steady but not as high as KMA thus turning KMA the well-known second largest city into the largest city in the nation in 2010 with the population of 2,035,064. KMA (254 km<sup>2</sup>) now accounts for 8% of the national population while Accra Metropolitan Assembly (AMA, 166 km<sup>2</sup>) decreased its share to 7%.

The now most populous city, KMA has also attracted people to the surrounding districts forming Greater Kumasi Sub-Region (GKSR) bringing an increase of approximately one million inhabitants during the last decade from 2000 to 2010. During the same period, Greater Accra Metropolitan Area (GAMA) has also increased by approximately one million inhabitants. However out of the one million, less than 15% actually moved into the districts surrounding KMA while over 80% of the population increase in GAMA moved into the districts surrounding AMA. As a result, GAMA (1,482km<sup>2</sup>) reached 3.7 million population in 2010, while GKSR (2,870 km<sup>2</sup>) accommodated 2.8 million population. See Table 3.3.1.

**Table 3.3.1 Population of Kumasi and Accra**

	Population / Share in National Population						Population Increase	
	1984		2000		2010		1984-2000	2000-2010
Kumasi Metropolitan Assembly	487,504	*1 4%	1,170,270	*1 6%	2,035,064	*1 8%	682,766	864,794
Greater Kumasi Sub-Region	790,374	*2 6%	1,758,741	*2 9%	2,764,091	*2 11%	968,367	1,005,350
Ashanti Region	2,090,100	*1 17%	3,612,950	*1 19%	4,780,380	*1 19%	1,522,850	1,167,430
Accra Metropolitan Assembly	987,290	*1 8%	1,658,937	*1 9%	1,848,614	*1 7%	671,647	189,677
Greater Accra Metropolitan Area	1,289,180	*1 10%	2,715,805	*1 14%	3,756,423	*1 15%	1,426,625	1,040,618
Greater Accra Region	1,431,099	*1 12%	2,905,726	*1 15%	4,010,054	*1 16%	1,474,627	1,104,328
Ghana	12,296,081	*1 100%	18,912,079	*1 100%	24,658,823	*1 100%	6,615,998	5,746,744

Source 1: 1984, 2000 and 2010 Population and Housing Census

Source 2: Estimation based on 2010 district boundary and community population of 1984 and 2000

##### (2) Population Growth

Population of Greater Kumasi Sub-Region has been increasing rapidly with annual population growth of 5.13% between 1984 and 2000, and 4.62% between 2000 and 2010 which is much larger than the growth rate of Ashanti Region as well as of Ghana. On the other hand the population growth rate outside KMA within the Sub-Region has dropped

greatly from 4.24% to 2.16% while that of KMA increased slightly from 5.63% to 5.69% which is a high rate to continue for over quarter-century.

**Table 3.3.2 Population of Greater Kumasi Sub-Region and Ashanti Region**

	Population			Annual Population Growth Rate (%)	
	1984	2000	2010	1984-2000	2000-2010
KMA	487,504 *1	1,170,270 *1	2,035,064 *1	5.63%	5.69%
Outside KMA	302,870 *2	588,471 *2	729,027 *2	4.24%	2.16%
Greater Kumasi Sub-Region	790,374 *2	1,758,741 *2	2,764,091 *2	5.13%	4.62%
Ashanti Region	2,090,100 *1	3,612,950 *1	4,780,380 *1	3.48%	2.84%

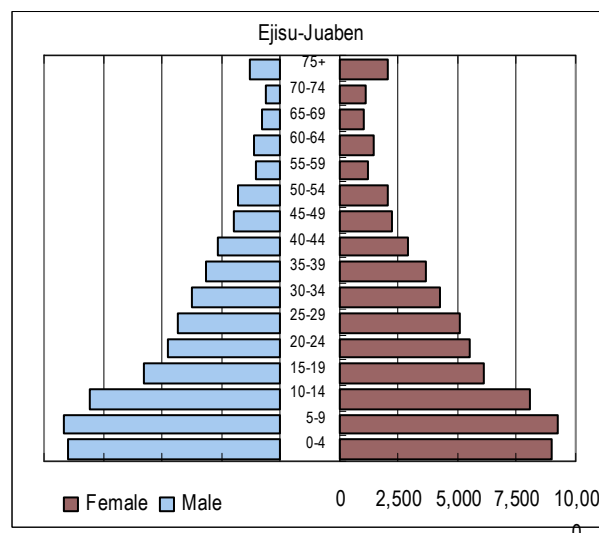
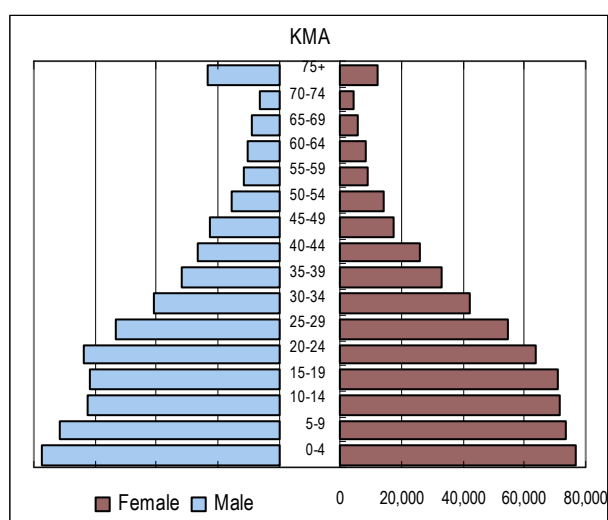
Source 1: 1984, 2000 and 2010 Population and Housing Census

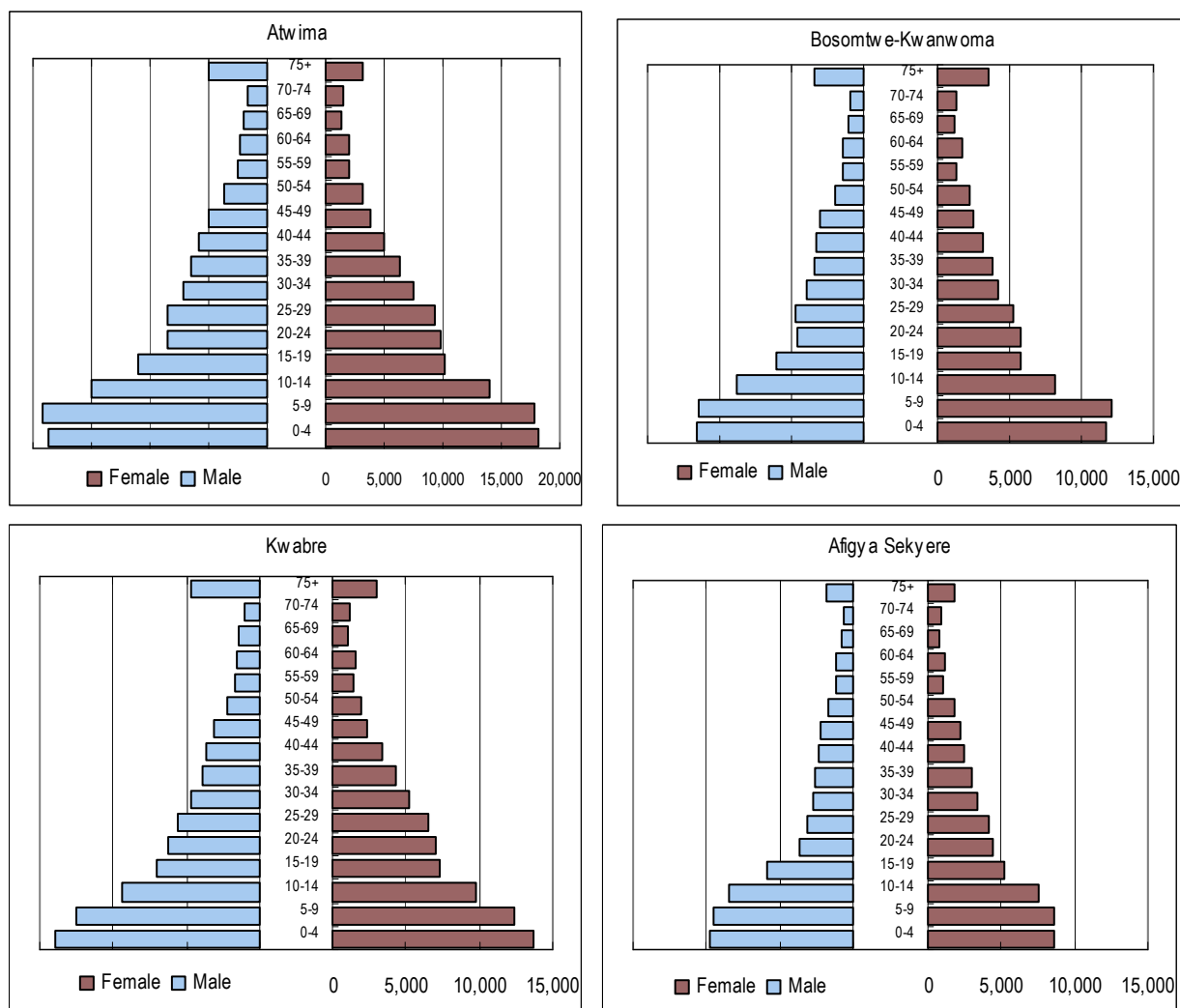
Source 2: Estimation based on 2010 district boundary and community population of 1984 and 2000

### (3) Age Structure

The distributions of age groups in Greater Kumasi Sub-Region by districts within the boundaries of 2000 are shown in Figure 3.3.1. The population pyramid of KMA shows a common stationary pyramid while the other five districts show an expansive pyramid shape with the portion of population age above 15 much less in comparison to the youth population. The sudden decrease of population in this age group demonstrates that the productive age group are moving to KMA and other cities for economic activities.

In some districts such as Ejisu-Juaben, Atwima and Bosomtwe-Kwanwoma, the population of age group 0-4 is less than the age group 5-9. This can mean that the birth rate in these districts is starting to decline which may have contributed to the low annual population growth rate between 2000 and 2010.





Source: 2000 Population and Housing Census

**Figure 3.3.1 Age Cohort of Districts composing Greater Kumasi, 2000**

### 3.3.2 Housing

#### (1) Housing Development 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 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 3.3.3 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
Total	100.0	100.0	100.0	100.0

Source: GSS, 2000 and 2010 Population and Housing Census

**Table 3.3.4 Number of Rooms Occupied by Household (2010)**

Unit: %

Number of Rooms	Percentage of Household			
	Greater Kumasi Sub-Region	Rural Area in Greater Kumasi Sub-Region	Urban Area in the adjoining Districts of KMA	KMA
<b>One room</b>	<b>63.0</b>	<b>57.9</b>	<b>60.9</b>	<b>64.4</b>
<b>Two rooms</b>	<b>16.4</b>	<b>18.8</b>	<b>16.1</b>	<b>16.0</b>
Three rooms	7.5	9.0	7.7	7.2
Four rooms	4.7	5.3	5.4	4.4
Five rooms	2.8	3.2	3.6	2.7
Six rooms +	5.6	5.7	6.3	5.5
Total	100.0%	100%	100.0%	100.0%

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.

## **(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.

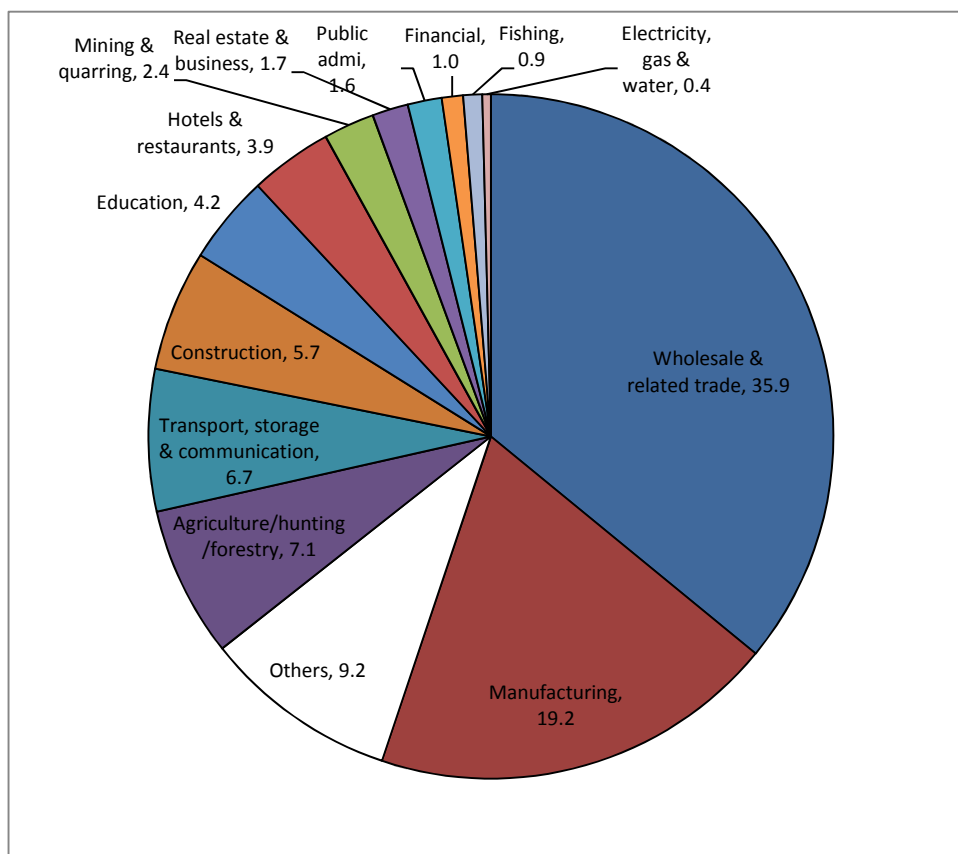
### **3.3.3 Economy of Greater Kumasi Sub-Region**

Greater Kumasi Sub-Region consists of Kumasi Metropolis and the neighboring 6 districts including Ejisu-Juaben Municipality.

The surrounding districts are mostly of rural nature except certain areas having commuters to Kumasi due to their good access to the metropolis. Here, therefore, Kumasi and the other districts are described separately.

#### **(1) Current Situation of Industries in Kumasi Metropolis**

According to the 2000 Population and Housing Census, the share of agriculture including fishing in the active labor force was 8.0%, the industry sector accounted for 27.7%, and the services 64.2%. Sub-sectors with large shares are (1) wholesale and related trade (35.9%), (2) manufacturing (19.2%), (3) agriculture/hunting/forestry (7.1%), and (4) transport, storage and communication (6.7%). See Figure 3.3.2.



Source: GSS, 2000 Population and Housing Census

Unit: %

**Figure 3.3.2 Share of Industries in Economically Active Population (15 years and older) of Residents of Kumasi Metropolis**

**a) Agriculture**

Although Kumasi is said to have about 120 km<sup>2</sup> of irrigable lands consisting of swampy and marshy areas, which account for 47% of the total area, rural area accounts for only 6% as compared to urban 48% and peri-urban 46%. Moreover, only 5% of the active work force is engaged in agriculture.

Kumasi's agriculture is limited to small scale staple crop production including maize, plantain, cocoyam, cassava and traditional (tomatoes, peppers, etc) and non-traditional (carrots, cabbage, etc) vegetables. Also, a total of 165 fishponds are said to be functioning.

Considering the strong urbanization pressure on the metropolis, expansion of agriculture in Kumasi is neither recommendable nor realistic.

The only way to sustaining agriculture is its integration with urban recreation taking advantage of the precious open space with semi-natural setting. Protecting open spaces is an important issue because they have various functions such as conservation of sound living environment and protecting areas from various disasters.

**b) Industry**

Kumasi's industry employs 23% of its active labor force and the metropolis is the industrial centre while Obuasi Municipality is the mining center.

The sector's activities can be categorized as follows.

### Mechanical Workshops

Suame Magazine and Asafo mechanical garages are mostly informal mechanical workshops (Table 3.3.5). They serve not only the local demands but also vehicle-related needs of other West African countries.

**Table 3.3.5 Products and Services of Suame Magazine**

Major Fields	Products and Services
Manufacturing	Food-processing equipment and farm implements; cooking stoves and utensils; foundry products
Vehicle repair and maintenance	Engine overhauling; auto electric works; vehicle interior upholstery; auto body work (straightening and painting)
Metalworking	Metal fabrication and plant construction; angle irons, channel iron bars
Sales of engineering materials and accessories	Sheet metal, bars, iron rods, steel sections, hand tools, fasteners, electric motors, pumps
Sales of spare automobile parts	Second-hand engines and parts; car-decorating materials
Sales of food	Foods and beverages of all kinds
Communication and business centers	Telephone and fax services, photocopying, computer typesetting; Internet and e-mail services; sales of mobile phone cards and videocassettes; barbering and sales of soft drinks

Source: Knowledge, Technology, and Cluster-based Growth in Africa, World Bank 2008

### Food and Beverages

A beverage cluster at Asokwa-Ahinsan-Kaase Stretch consists of Guinness Ghana Brewer Limited (GGBL), Coca Cola Bottling Company, and micro, small and medium scale enterprises of fruit juice, yoghurt, etc. In addition, Kumasi has scattered informal small scale agro-processing businesses (sausages, bacon, plantain chips, cassava flour, gari, dairy beverages).

### Wood Processing

Timber processing and plywood manufacturing companies are located at Asokwa-Ahinsan-Kaasa Stretch. Woodworking businesses formerly located at Anloga Junction relocated to Sokoban Wood Village.

### Handicrafts

Handicraft manufacturing such as basket weaving, potteries, wood carving, cane weaving all over the metropolitan area, although majority are concentrated at Ahwiaa of Kwabre East District.

## **c) Services**

The service sector including commercial activities employs 72% of the active labor force.

### Wholesale and Retail

Kumasi has wholesale and retail functions of almost all kinds of commodities such as foodstuffs, clothing, building materials, office and educational stationeries, herbal and



orthodox medicines. There are many informal petty traders.

### Services

Services also cover almost all kinds such as banking, insurance, planning, medicine, engineering, teaching, law practice, telecommunication, traditional caterers (chop bars), hairdressers, dressmakers and tailors, transportation, tour agents, tour guides, hotels and restaurants, and night clubs.

For telecommunication services, Kumasi has a fixed line system (Vodafone Ghana Ltd.) and five mobile network companies (Vodafone, Tigo, Kasapa, Airtel, and MTN). The mobile companies are providing various services and much easier access. There are many business and communication centers offering telephone calls, fax transmissions, and data-processing services on a fee basis. However, the current telecommunication services have frequent call cut and inability to get calls through.

### Tourism

Tourism is a combination of various industrial activities mentioned above. It relies on a number of industrial and other factors, and in the other way round it has impacts on various socio-economic sectors. Kumasi, the capital of the Golden Kingdom of Ashanti and once called “Garden City of West Africa” has a variety of tourist attractions. However, its attractiveness is decaying due to poor maintenance culture, outmoded materials and equipment, poor publicity and underutilization.

Kumasi has the following tourist attractions.

- Manhyia Palace with Royal Museum and holding Akwasidae Festival
- National Culture Centre with Prempeh II Museum, a craft centre, cultural displays and tutorials, and a gift shop
- Okomfo Anokye Sword (a sword believed to have been pushed by Okomfo Anokye 300 years ago and to be unmovable in the ground of the Okomfo Anokye Teaching Hospital)
- Fort St. George War Museum
- Kumasi Zoological Gardens
- Handicrafts such as basket weaving, potteries, wood carving, cane weaving (eg at Ahwiaa of Kwabre East District)

In addition to the above, there are a variety of potential tourist attractions around Kumasi. An example of natural attractions is the Lake Bosomtwe. While, cultural attractions include Ashanti Traditional Buildings, one of the two properties of the UNESCO World Heritage in Ghana. To the north-east of Kumasi are the last material remains of the great Asante civilization, which reached its high point in the 18th century. Since the dwellings are made of earth, wood and straw, they are vulnerable to the onslaught of time and weather. The other property is the Forts and Castles in Volta, Greater Accra, Central and Western Regions. They are the remains of fortified trading-posts along the coast of Ghana between Keta and Beyin. For promotion of international tourism, the two properties may well be integrated into one route.

Kumasi has a number of tourism related businesses such as transportation, tour agents, tour guides, hotels, restaurants, and night clubs, and can be a tourist base to visit the above

attractions.

**d) Commercial Centres and Industrial Zones**

The commercial centers and industrial zones in Kumasi can be summarized as follows.

- Kumasi Central Market (largest single open-air market in Ghana)
- Kumasi Race Course (marketing mostly foodstuffs at a defunct race course)
- Kejetia Terminal (marketing mostly non-consumable goods at a parking facility for the central market)
- Adum Shopping Centre (main commercial center of non-consumable goods and also accommodating government and private offices)
- Suame Magazine (mechanical workshop cluster serving needs beyond Ghana)
- Asafo Magazine (mechanical workshop cluster)
- Kaase-Asokwa Industrial Enclave (including a beverage cluster and a woodworking cluster)
- Sokoban Wood Village (woodworking cluster relocated from Anloga Junction areas)

**(2) Major Problems and Potential of Industries in Kumasi Metropolis**

**a) Major Problems**

The key development issues identified in the Medium Term Development Plan are as follows:

- Lack of data on the informal sector
- Underdeveloped small scale industries
- Inadequate access to credit facilities/start-up capital
- Low entrepreneurial skills
- Inadequate skill training centres
- Inadequate market infrastructure
- Undeveloped market places
- Non-utilization of existing markets
- Haphazard organization of economic activities at the Central Business District
- Congestion at the Central Business District
- Limited market for SSEs products
- High competition of SSEs products with foreign imported ones
- High cost of production inputs
- High transport cost
- Low coordination between the private and the public sector
- Weak institutional linkages between the mechanical garages and the tertiary institutions (KNUST and Kumasi Polytechnic)

Complementing the above, the following problems can be identified.

- Lack of maintenance culture is in various aspects including slashing and burning fields, over-felling trees, deteriorating public facilities, infrastructure, land use, and other natural and man-made resources. Proper maintenance and management of the region's assets are as important as development of new ones.

- The prevailing land tenure system is impeding economic development in most sectors. For the region’s economic development, domestic and foreign investment in industries and infrastructure is essential. According to the International Finance Corporation, Ghana ranks 63rd on the ease of doing business among 183 countries in 2012. However, it ranks 156th on the category of dealing with construction permits, which includes the land registry and the cadaster, among others. The ranking indicates that improvement of the land system is an urgent issue.
- The Central Business District is too small to support the present zone of influence. Kumasi is no longer a local center. As its influence expands, the CBD needs to be expanded or decentralized

**b) Development Potential**

Kumasi has the following potential for industrial development.

**Table 3.3.6 Potential for Industrial Development**

<p><b><u>Agriculture, Forestry and Fishing</u></b></p> <ul style="list-style-type: none"> <li>• Agriculture-related R&amp;D functions can be mobilized for economic development.</li> </ul>
<p><b><u>Industry</u></b></p> <ul style="list-style-type: none"> <li>• Accumulation of mechanical skills and entrepreneurship as wells a number of supporting organizations are the base for further development.</li> <li>• The local agricultural produce can form agro-processing supply chains such as orange juice, ginger products, and essential oils.</li> <li>• Existing beverage factories can be integrated into tourist routs by providing restaurants and pubs.</li> <li>• Reforestation can revitalize woodworking industry.</li> <li>• Local herbs and essential oils can be applied to pharmaceutical industry</li> <li>• Tradition of handicrafts culture such as Kente, Adinkra, and carving can be promoted. (eg at Kwabre East District)</li> </ul>
<p><b><u>Services</u></b></p> <ul style="list-style-type: none"> <li>• Natural and cultural resources including festivals coupled with beautification of central districts can help develop commercial and hospitality activities.</li> <li>• Accumulation of transportation related businesses coupled with the advantageous location of Kumasi is a potential for logistics industry integrating transport, storage, market operation, trade, financial business, telecommunication, internet, and accommodation.</li> <li>• There are potentials for grade-up of the airport and revitalization of the railway service.</li> <li>• Rapidly expanding demand for telecommunication ion is promoting private businesses to expand services such as more business and communication centers.</li> <li>• There is a possibility for Kumasi to be an enhanced center of education by promoting various education institutes (eg private pre-schools, schools, universities, vocational institutes, and education-related companies).</li> <li>• Accumulation of higher education facilities, TVET facilities, and other research institutes such as KNUST and Kumasi Polytechnic can promote industry-university-R&amp;D institute collaboration in all industrial fields.</li> </ul>

### **(3) Summary of Industries in Neighboring Districts of Kumasi Metropolis**

Industries in neighboring districts of Kumasi Metropolis are shown in Table 3.3.5. One key issue for each district is tentatively selected as follows:

#### Afigya Kwabre District

- Create an enabling environment for the private sector to invest, including speedy land registration.
- Promote agro-forestry and wood-based small scale industries in such a way to restore forests.

#### Kwabre East District

- Create a cultural area as a pilot project including cleanliness, beautification, townscape, land scape, etc.

#### Ejisu Juaben Municipality

- Address properly the conceived large projects namely Boankra Inland Port, the Free Industrial Zone, and the Outer Ring Road.

#### Bosomtwe District

- Promote Lake Bosomtwe as a major attraction in Ashanti tour routes involving local agriculture, fishing and manufacturing.

#### Atwima Kwanwoma District

- Dormitory town development should be accompanied with infrastructure development.

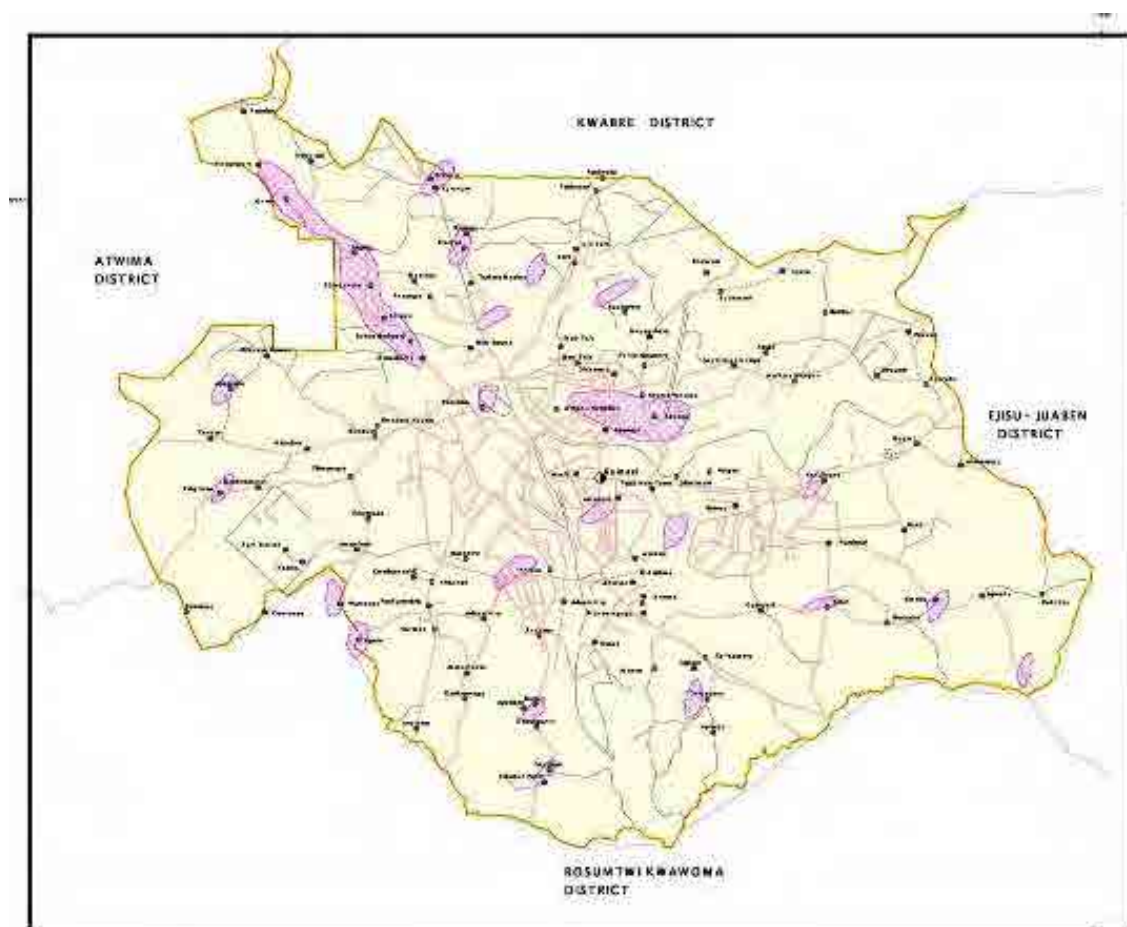
#### Atwima Nwabiagya District

- Become a leading district of agro-processing of orange and ginger with support of the District Business Advisory Center and Rural Enterprise Project (REP).

### **3.3.4 Poverty in KMA**

Although the poverty rate of KMA was less than 10% in 2000, according to the Development Plan for Kumasi Metropolitan Area (2010-2013), urban poverty has emerged in the peri-urban and slum communities. It is said that they are characterized with either inadequate or non-existent facilities / opportunities, poor housing, road network and educational facilities, inadequate access to quality health care, poor environmental sanitation, high illiteracy rates, relatively low incomes and high unemployment levels among others. A tentative poverty map of Kumasi Metropolitan Area is shown in Figure 3.3.3.

These poverty areas coincide with high population density areas (as shown in Figure 3.4.2), where very high numbers of people live in a house with limited facilities.



Source: Local Governance Poverty Reduction Support Programme

**Figure 3.3.3 Poverty Map (Tentative) of Kumasi Metropolitan Area**

### **3.4 Spatial Development of Greater Kumasi Sub-Region**

#### **3.4.1 Population Distribution**

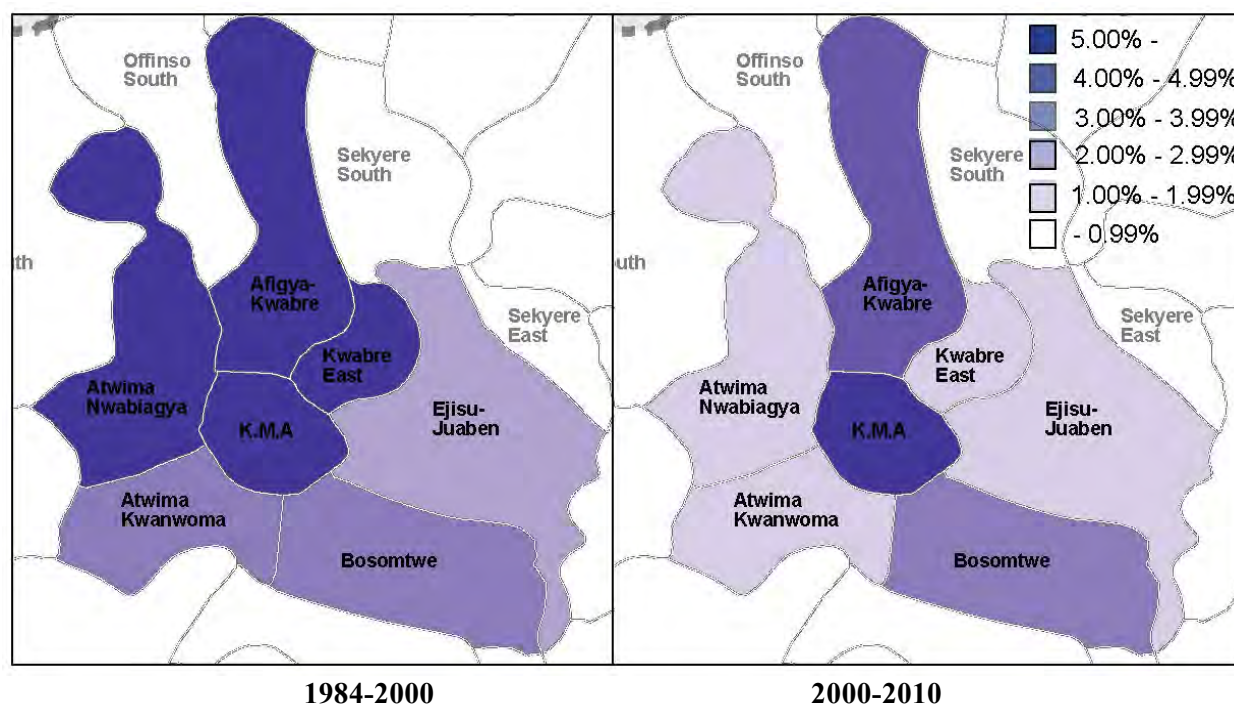
##### **(1) Population Change in Greater Kumasi Sub-Region**

The current most populous city in Ghana, Kumasi has continued to increase its population rapidly, expanding its residential area causing urbanization to the surrounding districts as well. All the MMDAs in Greater Kumasi Sub-Region have doubled its population within the last quarter-century. As for KMA the population has quadrupled, which shows the extreme concentration occurring towards KMA.

During the period of 1984-2000, social increase of population in Greater Kumasi Sub-Region concentrated to four districts, namely KMA, Kwabre East, Afigya Kwabre and Atwima Nwabiagya as shown in Figure 3.4.1 and

Table 3.4.1. However in the following period 2000-2010, four districts in Greater Kumasi including Kwabre East experienced a sudden drop in this number, which is assumed to have contributed to the population increase in KMA. Districts which are continuously growing its population above the national population increase rate of 2.69% beside KMA in the decade

of 2000-2010 are Afigya Kwabre and Bosomtwe which is also assumed to be caused by in-migrant.



Source: JICA Study Team based on 1984, 2000 and 2010 Population and Housing Census

**Figure 3.4.1 Population Increase Trend in Greater Kumasi**

**Table 3.4.1 Population of Greater Kumasi Sub-Region and Ashanti Region**

	Population			Annual Population Growth Rate (%)	
	1984	2000	2010	1984-2000	2000-2010
KMA	487,504 *1	1,170,270 *3	2,035,064 *5	5.63%	5.69%
Afigya-Kwabre	39,971 *2	89,358 *4	136,140 *5	5.16%	4.30%
Kwabre East	42,044 *2	101,100 *4	115,556 *5	5.64%	1.35%
Ejisu-Juaben	78,783 *1	124,176 *3	143,762 *5	2.88%	1.48%
Bosomtwe	41,283 *2	66,788 *4	93,910 *5	3.05%	3.47%
Atwima Kwanwoma	44,437 *2	79,240 *4	90,634 *5	3.68%	1.35%
Atwima-Nwabiagya	56,352 *2	127,809 *4	149,025 *5	5.25%	1.55%
Outside KMA	302,870	588,471	729,027	4.24%	2.16%
Greater Kumasi Sub-Region	790,374	1,758,741	2,764,091	5.13%	4.62%
Outside Greater Kumasi Sub-Region	1,299,726	1,854,209	2,016,289	2.25%	0.84%
Ashanti Region	2,090,100 *1	3,612,950 *3	4,780,380 *5	3.48%	2.84%
Ghana	12,296,081 *1	18,912,079 *3	24,658,823 *5	2.73%	2.69%

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

## (2) Population Density

Population density differs greatly among the seven MMDAs in Greater Kumasi Sub-Region. The population density of KMA in 2010 is 8,012 persons/km<sup>2</sup>, which is as high as cities such as Accra (8,967 persons/km<sup>2</sup>), Singapore (7,022 persons/km<sup>2</sup>) and Brussels (7,025 persons/km<sup>2</sup>) as shown in Table 3.4.2. In areas such as Bremen, Brokrom, New Tafo, Ofonkrom and Kaase, the population density was already higher than 15,000 persons/km<sup>2</sup> in 2000 as shown in Figure 3.4.2. Between 1984 and 2000 the population within KMA had shifted from the centre (Adum, Asafo and Bantama) towards the north west and south west of KMA leaving the city centre as a less residential area.

Out of the six adjoining districts of KMA, Kwabre East has the highest population density with 857/km<sup>2</sup> however approximately only one tenth of that of KMA. See Table 3.4.2. In the surrounding districts the most of the urbanized area is limited within 10-15 km radius from the centre of KMA and otherwise along the major roads.

**Table 3.4.2 Population Density of Greater Kumasi Sub-Region and Ashanti Region**

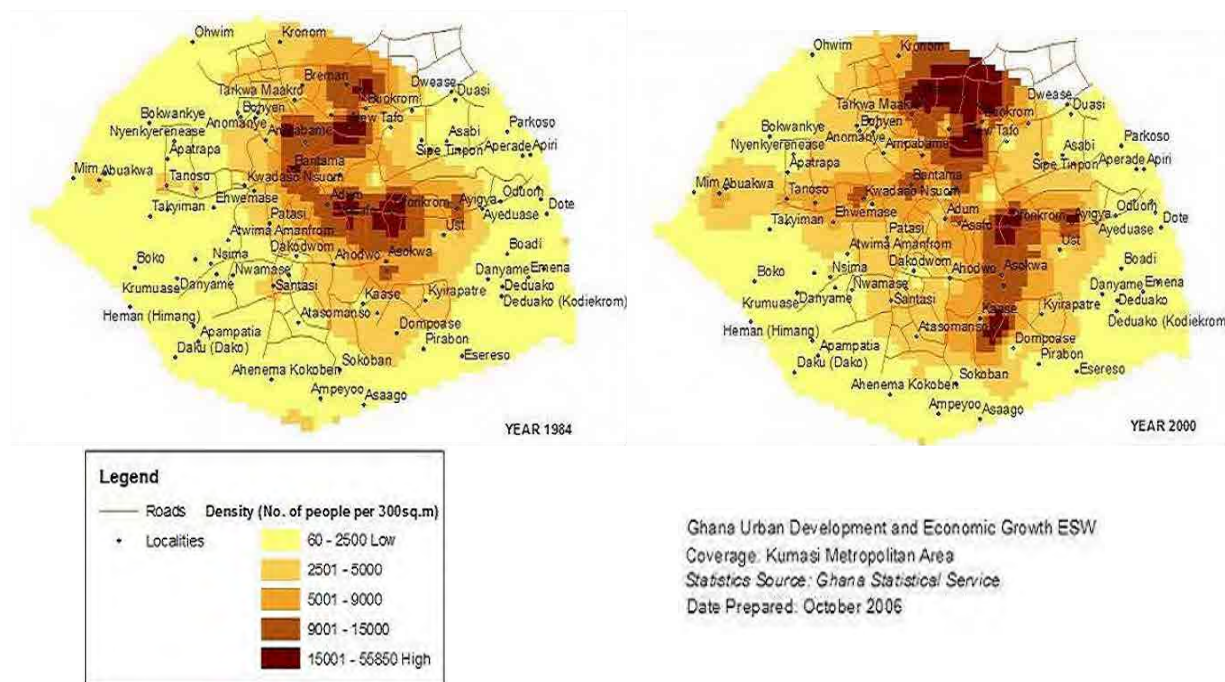
	Population		Area (km <sup>2</sup> )	Population Density (persons/km <sup>2</sup> )	
	2000	2010		2000	2010
KMA	1,170,270 *1	2,035,064 *1	254 *3	4,607	8,012
Afigya-Kwabre	89,358 *2	136,140 *1	517 *3	173	263
Kwabre East	101,100 *2	115,556 *1	135 *3	750	857
Ejisu-Juaben	124,176 *1	143,762 *1	723 *3	172	199
Bosomtwe	66,788 *2	93,910 *1	353 *3	189	266
Atwima Kwanwoma	79,240 *2	90,634 *1	291 *3	273	312
Atwima-Nwabiagya	127,809 *2	149,025 *1	597 *3	214	250
Outside KMA	588,471	729,027	2,616	225	279
Greater Kumasi Sub-Region	1,758,741	2,764,091	2,870	613	963
Ashanti Region	3,612,950 *1	4,780,380 *1	24,389	148	196

Source 1: 1984, 2000 and 2010 Population and Housing Census

Source 2: Estimation based on 2010 district boundary and community population of 1984 and 2000

Source 3: Area measured based on the District Boundary Maps by TCPD Ashanti Region Office





Source: C. Farvacque-Vitkovic et. al, 2008, Development of the Cities of Ghana, The World Bank

**Figure 3.4.2 Population Distribution in KMA, 1984 and 2000**

### (3) Urban Population

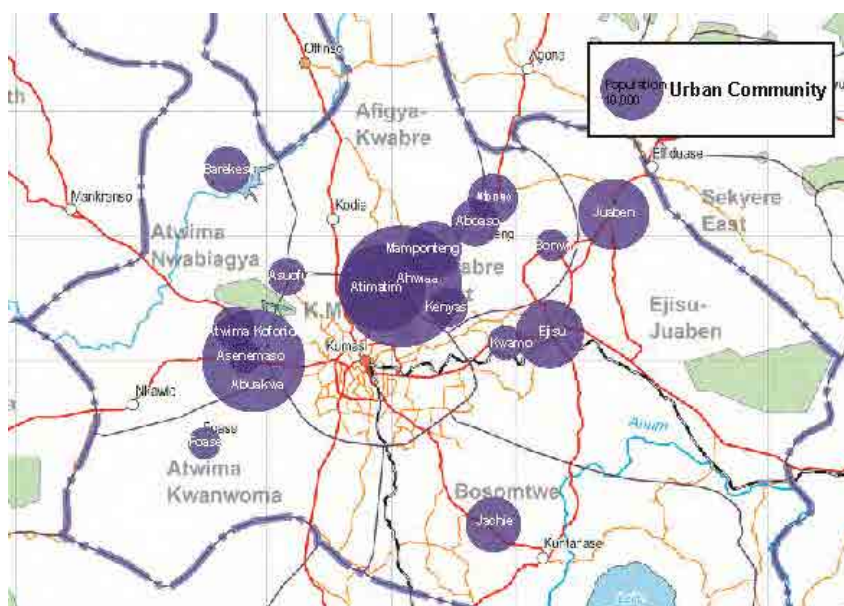
As the population increased in the last quarter-century in Kumasi and its neighbouring districts, communities in each MMDA grew their population. Less than three decades ago there were no urban communities in five districts within Greater Kumasi Sub-Region. By the year 2000, neighbouring communities of KMA and other communities along the major roads transferred into urban communities as shown in Figure 3.4.3. The dense urbanization especially occurred in Kwabre East along Mampong Road that connects Kumasi and Manpong, and also in Atwima Nwabiagya along Sunyani Road that connects Kumasi via Nkawie with Nynahin.

**Table 3.4.3 Urban Population of Greater Kumasi Sub-Region, 1984 and 2000**

Year	1984		2000	
	Urban Population	Share in GKSR	Urban Population	Share in GKSR
Kumasi	496,628	97.49%	1,170,270	88.15%
Ejisu-Juaben	12,791	2.51%	32,903	2.48%
Bosomtwe	0	0.00%	7,368	0.56%
Afigya-Kwabre	0	0.00%	14,017	1.06%
Atwima Nwabiagya	0	0.00%	67,679	5.10%
Kwabre East	0	0.00%	30,296	2.28%
Atwima Kwanwoma	0	0.00%	5,023	0.38%
Greater Kumasi Sub-Region	509,419	100%	1,327,556	100%
Ashanti Region	774,444	-	1,884,760	-

Source: 1984 and 2000 Population and Housing Census and community list from the seven MMDAs of Greater Kumasi Sub-Region





Source: 1984 and 2000 Population and Housing Census and community list from the seven MMDAs of Greater Kumasi Sub-Region

**Figure 3.4.3 Distribution of Urban Communities in Greater Kumasi Sub-Region (excluding KMA)**

With the urbanization between 1984 and 2000, Atwima Nwabiagya which was 100% rural district in 1984 became 53% urban. Kwabre East which also increased its population along the trunk road had 30% of its population in urban area in 2000. On the other hand, Atwima Kwanwoma stayed as rural district in 2000 with only 4% of its population inhabiting in urban communities. See Table 3.4.4.

**Table 3.4.4 Urban and Rural Population Ratio of Greater Kumasi Sub-Region, 2000**

	Urban	Rural
Kumasi	100%	0%
Ejisu-Juaben	26%	74%
Bosomtwe	11%	89%
Afigya-Kwabre	16%	84%
Atwima Nwabiagya	53%	47%
Kwabre East	30%	70%
Atwima Kwanwoma	4%	96%
Greater Kumasi	73%	27%
Ashanti Region	52%	48%

Source: 2000 Population and Housing Census and community list from the seven MMDAs

As already mentioned in Section 3.3.1, population increase in Greater Kumasi Sub-Region concentrated in KMA, Afigya Kwabre and Bosomtwe in the last decade. This is considered to have increased the urban population of these two districts (Afigya Kwabre and Bosomtwe) leaving Atwima Kwanwoma the most rural district in the Sub-Region.

#### (4) Economically Active Population

Urbanization and economic activities have strong relationship. Initially as industrialization occurred in Europe in the mid 19<sup>th</sup> century, along with urbanization the population of the primary industry decreased taken over by the secondary and tertiary industry.

In the case of Greater Kumasi Sub-Region, as Kumasi expanded its urbanized area and increased its population, the population of tertiary industry grew as the centre of commerce. However this shift of economic activities has not yet occurred in the surrounding districts. In all the surrounding districts except Kwabre (current Kwabre East and Afigya Kwabre) primary industry still has the largest share of economically active population as of year 2000. See Table 3.4.5.

With the small scale industry such as agro-processing and weaving scattered in the communities, the population engaged in secondary industry is limited in all districts including KMA.

**Table 3.4.5 Share of Economically Active Population in Greater Kumasi Sub-Region, 2000**

Previous Districts	Primary industry	Secondary industry	Tertiary industry	Total
Atwima	64.7%	13.6%	21.7%	100%
Ejisu-Juaben	53.1%	17.5%	29.4%	100%
Bosomtwe-Kwanwoma	55.0%	18.1%	26.9%	100%
Kumasi	8.5%	28.0%	63.5%	100%
Kwabre	32.1%	26.9%	41.0%	100%
Afigya Sekyere	65.1%	12.4%	22.5%	100%
Ashanti Region	45.4%	18.9%	35.7%	100%

Source: 2000 Population and Housing Census

### 3.4.2 Land Use in Greater Kumasi Sub-Region and Kumasi Metropolis

#### (1) Land Cover within Greater Kumasi Sub-Region

Over 90% of land areas of the six surrounding districts of Greater Kumasi Sub-Region are covered by forests and agricultural lands. The remaining areas are urbanized areas, which are located adjacent to Kumasi City and along trunk roads.

Forest reserves are designated in Kumasi Metropolis and the three districts of Afigya Kwabre, Atwima Nwabiagya and Ejisu Juaben, the gross area is about 94 square kilometres, and constitutes about 3.3% of the total land area.

Six districts surrounding Kumasi Metropolis have uniformly described degradation of the forest in their medium term development plan. The original vegetation has been degraded by human activities such as logging for timber and fuel wood, sand winning, farming, expansion of settlements, and incidents of bush burning.

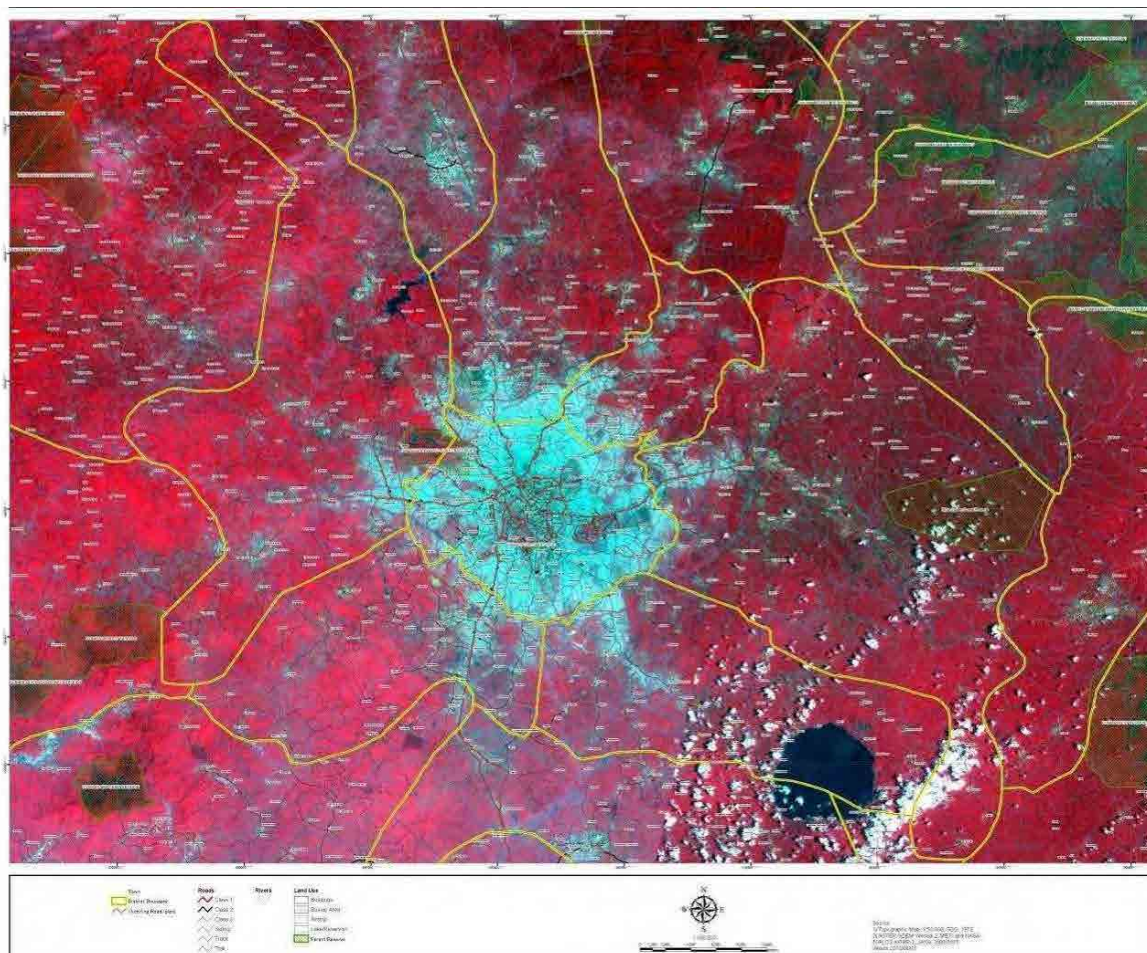
In the false colour imagery of ALOS satellite taken in 2008 and 2011, the light-blue colour areas shown in Figure 3.4.4 are interpreted as urbanized areas. The urbanized areas covered about 92% of Kumasi Metropolis, and also spread out into its surrounding districts. The

urbanized areas of Bosomtwe (39 km<sup>2</sup>, 11% of the total land area) is the second largest next to Kumasi. Bosomtwe is followed by Atwima Kwanwoma (35 km<sup>2</sup>, 12%) and Afigya Kwabre (33 km<sup>2</sup>, 6%). In Greater Kumasi Sub-Region, approximately 403 square kilometres, 14 percent, of the total land area are currently urbanized.

**Table 3.4.6 Total Land Area, Urbanized Area and Forest Reserve Area of Districts in Greater Kumasi Sub-Region**

	Total Land Area (km <sup>2</sup> )	Forest Reserve Area		Urbanized Area	
		(km <sup>2</sup> )	%	(km <sup>2</sup> )	%
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%
<b>Total Land Area</b>	<b>2,849.93</b>	<b>93.51</b>	<b>3.3%</b>	<b>403.20</b>	<b>14.1%</b>

Source: JICA Study Team, based on the ALOS satellite imagery taken in 2008 and 2011.



Source: 1) Topographic Map 1:50,000 SDG 1972, 2) ASTER GDEM Version 2 METI and NASA, 3) ALOS AVNIR-2 JAXA 2008/2011

**Figure 3.4.4 Expanding Urbanized Areas in Greater Kumasi Sub-Region**



**(2) Distribution and Changes of Land Use within KMA**

The dominant land use in KMA is residential. It is followed by educational use, followed by circulation (transportation etc.) and by open space, as shown in Table 3.4.7 and Figure 3.4.5. The general pattern of land use has not changed much, while the percentages of undeveloped lands have been gradually reduced.

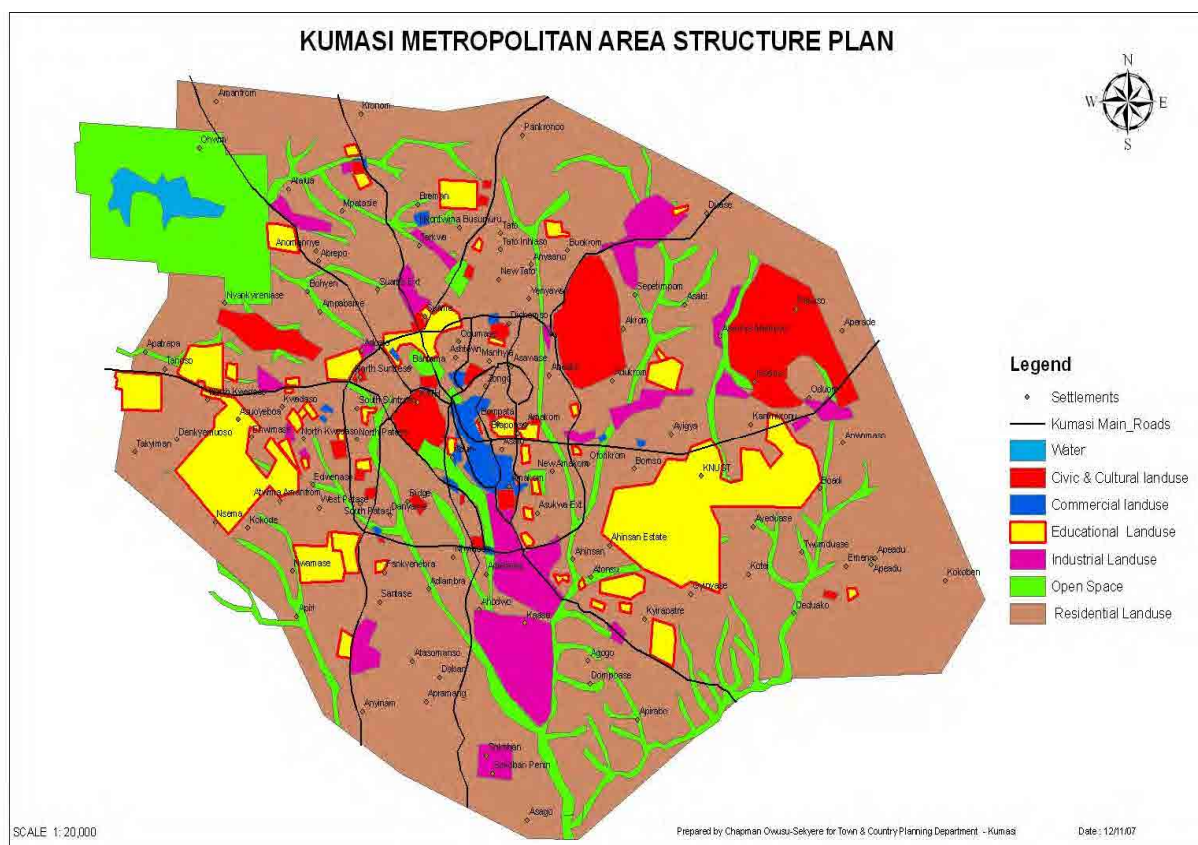
**Table 3.4.7 Changes of Land Use in Kumasi Metropolis**

Land Use	1988		1995		2000		2005		2010*	
	Area (km <sup>2</sup> )	%	Area (km <sup>2</sup> )	%	Area (km <sup>2</sup> )	%	Area (km <sup>2</sup> )	%	Area (km <sup>2</sup> )	%
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



Source: Town and Country Planning Department, 2007

**Figure 3.4.5 Land Use of Kumasi Metropolis in the Year 2007**

Educational use covers pre-school to primary school, junior high school, senior high school, vocational/technical, training colleges and tertiary institutions. The largest educational land user is the Kwame Nkrumah University of Science and Technology (KNUST) located in the eastern section of Kumasi. Five other tertiary educational institutions also occupy a significant amount of educational land.

Public and private offices, including the offices of financial and insurance companies, health facilities, security establishments and centres for religious and socio-cultural functions such as churches, mosques and shrines, are categorized as civic and cultural land use. Manhyia Palace, the Centre for National Culture, Komfo Anokye Teaching Hospital (KATH) and five other major Polyclinics are the prominent architectural edifices that occupy a significant amount of the civic and culture land.

Industrial land accommodates facilities for processing and manufacturing consumable and non-consumable goods. With regards to consumable goods manufacturing, in KMA, a notable area is the Ahinsan-Kaase enclave, a home for Guinness Ghana Brewery Limited and the Coca Cola Bottling Plant, as well as other small-scale industries. Suame Magazine, Asafo Magazine and the Sokoban Wood Village are also well-known industrial areas that occupy a significant amount of the industrial land in KMA.

Commercial land, such as Adum shopping area, the Central Market, Asafo Market, Kejetia and Asafo transportation terminals, is mainly concentrated in the centre of Kumasi. In addition, new commercial activities are emerging along arterial roads because of the limited space in those central areas.

The cropped areas for the major crops in Kumasi Metropolis decreased sharply by 82.5% in the last ten years from 2001 to 2011, as shown in Table 3.4.8.

**Table 3.4.8 Cropped Areas for Major Crops in Kumasi Metropolis 2001-2011**

Unit: hectares

YEAR	MAIZE	RICE	CASSAVA	YAM	COCOYAM	PLANTAIN	TOTAL	
2001	3,626	21	4,865	439	254	1,126	10,331	100.0
2002	3,630	20	4,870	439	253	1,127	10,339	100.1
2003	3,630	20	4,870	440	250	1,130	10,340	100.1
2004	3,449	19	4,773	449	238	1,116	10,044	97.2
2005	3,005	10	3,829	25	16	942	7,827	75.8
2006	2,466	25	3,283	240	221	1,795	8,030	77.7
2007	1,242	12	3,003	22	21	1,205	5,505	53.3
2008	1,002	10	2,500	20	18	1,008	4,558	44.1
2009	820	15	1,766	21	15	1,038	3,675	35.6
2010	382	15	468	10	10	950	1,835	17.8
2011	344	16	445	10	10	983	1,808	17.5

Source: Kumasi Metropolitan Assembly

### (3) Urban Facilities

In terms of number of facilities, the concentration of health and educational facilities is much higher in Kumasi Metropolis than in the surrounding districts. This is partly because many health and educational facilities and services are actively run and are provided by the private sectors in Kumasi Metropolis. Their involvement is overwhelmingly large compared with the surrounding districts.

However, when it comes to the number of facilities per person, their concentration in Kumasi is not so large. See Table 3.4.9.

**Table 3.4.9 Number of Educational Facilities and Health Facilities  
in Greater Kumasi Sub-Region**

	Population (2010)	No. of Educational Facilities			No. of Health Facilities			
		Primary School	Junior High School	Senior High School	Hospital	Health Centre	Clinic	Maternity Home
Kumasi	2,035,064	978	568	53	45	1	90	48
Afigya Kwabre	136,140	71	68	6	2	13	0	16
Kwabre East	115,556	141	96	8	1	5	4	4
Ejisu Juaben	143,762	136	75	6	7	4	11	5
Bosomtwe	93,910	102	67	7	4	2	7	3
Atwima Kwanwoma	90,634	66	44	3	0	4	2	1
Atwima Nwabiagya	149,025	95	70	5	0	0	0	0

Source: Population; 2010 Population and Housing Census  
Educational Facilities and Health Facilities; JICA Study Team base on the data from the districts

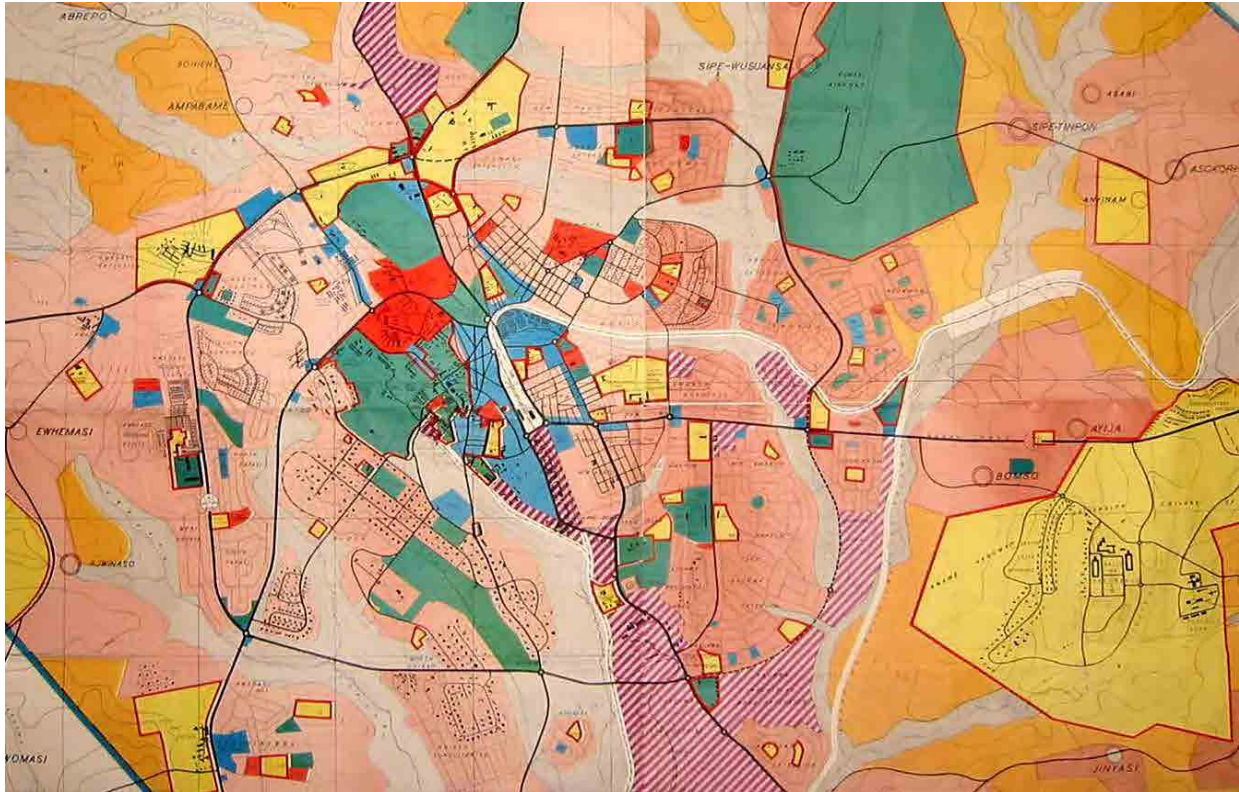
### 3.4.3 Land Use Plan and Development Control

The planning scheme prepared for Kumasi Metropolis in 1962 had been functional in guiding development of major urban facilities and land use. In fact, an inner ring road was planned and constructed in accordance with this planning scheme. Just outside the inner ring road, major urban facilities, such as the Kumasi Airport, KNUST and the Agricultural College were spatially arranged. See Figure 3.4.10. However, since then, for many years, no revision has been made to the planning scheme.

Based on the 1962 Planning Scheme and the present land use, the current zoning plan was prepared, as shown in Figure 3.4.6.

Based on these plans, many layout plans were prepared for guiding actual land development and construction, as shown in Figure 3.4.7 and Figure 3.4.8. See Figure 3.4.9 for an example of the layout plans.

In the surrounding districts, many layout plans have also been prepared mainly for promoting the development and subdivision of housing areas. As shown in Figure 3.4.10, layout plans have been prepared in parallel with suburbanization.



Source: Kumasi – Outline Town Planning Scheme 1963, Ministry of Works and Housing

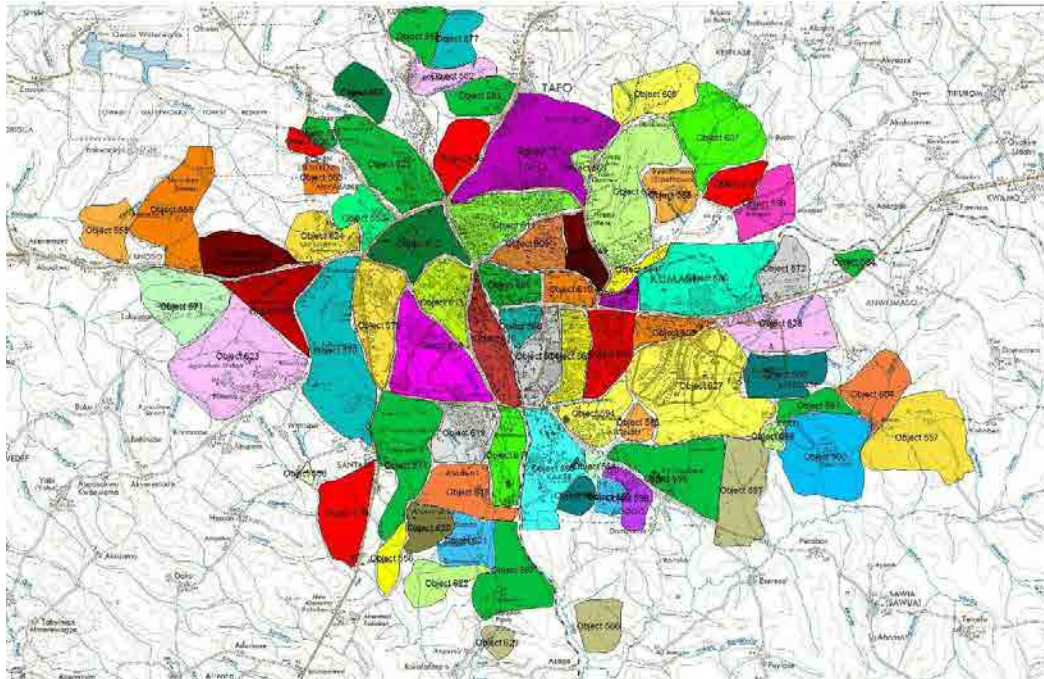
**Figure 3.4.6 Planning Scheme for Kumasi City established in 1962**



Source: Town and Country Planning Department

**Figure 3.4.7 Zoning Plan for the Central Area of KMA**





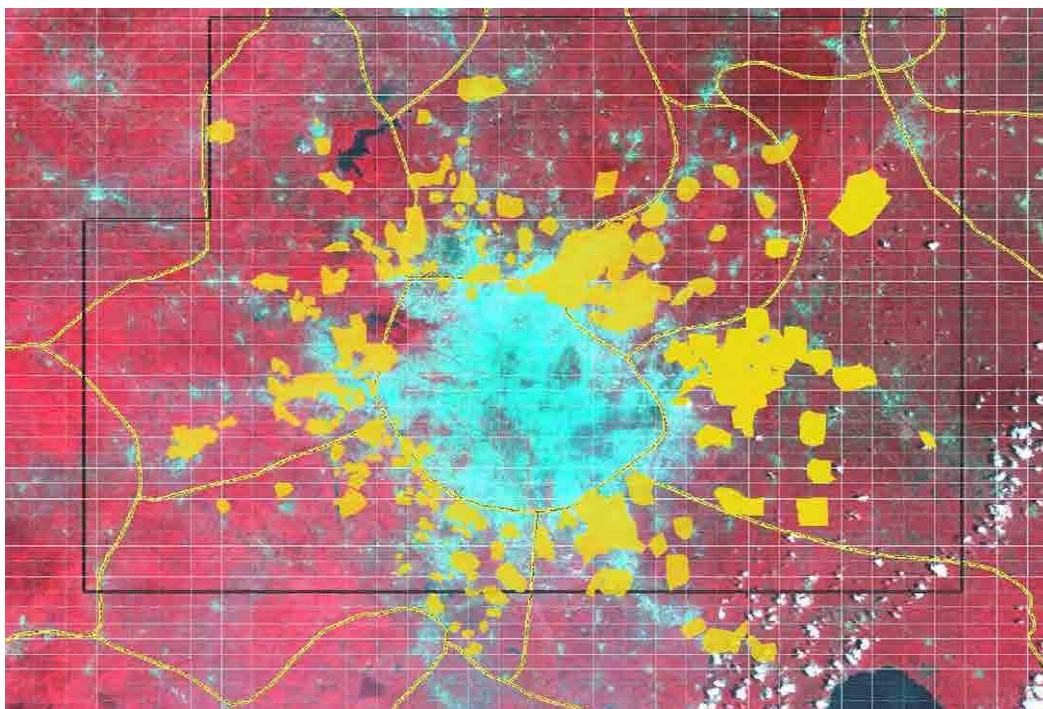
Source: Town and Country Planning Department, 2012

**Figure 3.4.8 Distribution of Layout Plans Prepared for KMA**



**Figure 3.4.9 Example of Layout Plan**





Source: JICA Study Team based on the layout plan data of TCPD 2012

**Figure 3.4.10 Distribution of Layout Plans within Greater Kumasi Sub-Region  
(excluding KMA)**

### **3.4.4 Spatial Characteristics of Transportation in Greater Kumasi Sub-Region**

This section describes the major spatial characteristics of transportation in Greater Kumasi Sub-Region.

#### **(1) Spatial Structure and Transportation Network**

- The spatial structure of the Greater Kumasi Sub-Region concerned with road infrastructure is a spoke and wheel arrangement with arterial roads radiating from the centre towards the outskirts where the inner ring road is located. The spatial structure outside of the inner ring road spreads along the six radial arterial roads.
- The future spatial structure of Greater Kumasi Sub-Region will be influenced by the development policy and the patterns of road development

#### **(2) Hierarchy of Road Network**

- The Greater Kumasi Sub-Region has an extensive network of roads, which can be classified by their function, consisting of arterial, distributors or collectors and local roads. These three classes of functional roads compose the hierarchy of the road network.
- The rapid urbanization of the Greater Kumasi Sub-Region has been taking place in the form of unordered settlements expanding along arterial roads, which disturbs and causes dysfunction in the hierarchy of the functional road network because the collector roads from the new settlements connect directly to the arterial roads. This type of development is called ribbon development.
- This situation causes severe traffic congestion, because through traffic and local traffic are mixed on the same road.

**(3) Public Transportation Initiative**

- Even though the economic activities and urbanization have been expanding spatially toward suburban areas, the function of business and commerce has been still heavily concentrated in the central area of Kumasi.
- This functional concentration in the central area causes severe traffic congestion.
- To mitigate the traffic situation, the public transport services are covered mainly by the trotro and taxi, informal sectors so far, but the government introduced a new project, namely the Urban Transportation Project. This project plans to introduce the Type B bus system (Large size Bus) and BRT system.

**(4) Traffic Concentration to the Central Area of Kumasi and Long Travel Time for People within Greater Kumasi**

- In the future, more traffic concentration to the central area of Kumasi will take place if effective measures are not taken.
- The total amount of travel time of people who live, work or study in the Greater Kumasi Sub-Region will increase so much that people will not be able to endure their very long travel times.
- As a result, if this situation continues, the viability for economic sectors and liveability for people within the Greater Kumasi Sub-Region would deteriorate so much that people would not be able to endure living, working or studying in Greater Kumasi Sub-Region.

### **3.4.5 Spatial Characteristics of Water Supply**

The pipe-born water from the two dams and water treatment plants is mainly supplied to those areas within 5-7km from the city centre within KMA, as well as those areas near the two water treatment plants. Outside the 5-7 km radial from the city centre, ground water or tanker supply is used for water supply. See Figure 5.2.6 for details.

### **3.4.6 Spatial Characteristics of Electricity Supply**

While there are not many small communities (of less than 500 populations) which do not have access to electricity in KMA, there are many families who do not have electricity supply in their residences. The number of electricity subscribers has been increasing at an annual average rate of 5.4% in the last 11 years in KMA and its surrounding areas. On the other hand the number of electricity subscribers has been on the increase in the Ashanti Region, excluding Kumasi, at higher rates (over 8% per annum), as shown in Table 3.4.10.

**Table 3.4.10 Electricity Customer Population in Kumasi and its Surrounding Areas and Ashanti Region**

	2000	2006	2010	2000-2010 Average Annual Growth Rates
Kumasi West (Suwame, Danyame, Abuakwa, Offinso, New Edubiase)	40,105	65,044	80,508	6.5%
Kumasi East (Menhyia, Ayigya, Asokwa, Kwabre)	47,314	69,221	74,637	4.2%
<b>Kumasi Total</b>	<b>87,419</b>	<b>134,265</b>	<b>155,145</b>	<b>5.4%</b>
Ashanti West except for Kumasi West (Dunkwa, Obuasi, Bekwai)	21,508	37,303	52,936	8.5%
Ashanti East except for Kumasi East (Konongo, Effiduase, Mampong)	20,486	40,797	51,558	8.8%
<b>Ashanti Total except for Kumasi</b>	<b>41,994</b>	<b>78,100</b>	<b>104,494</b>	<b>8.6%</b>

Source: ECG Ashanti West Office

### 3.4.7 Spatial Characteristics of Health Facilities in Greater Kumasi Sub-Region

Despite the number of health facilities in Greater Kumasi Sub-Region as a whole, there are areas in Kumasi and its surrounding districts where accessibility to a health facility is low. See Chapter 10 of the Supporting Document for detail.

### 3.4.8 Spatial Characteristics of Education Facilities in Greater Kumasi Sub-Region

The education facilities are concentrated in KMA within Greater Kumasi Sub-Region, however student school ratio is much higher in KMA at all education level. As for the distribution of senior high school, it is rather located along the major roads outside the suburban area of KMA. See Chapter 11 of the Supporting Document for detail.

## 3.5 Current Policies, Development Plans and On-Going Projects

### 3.5.1 Current Policies and Development Plan

#### (1) Current Policies

Due to Ghana's decentralization policies, decision-making and programming are highly focused at the MMDA level, rather than at the regional level. The Regional Planning and Co-ordination Unit (RPCU) is tasked only with harmonization of the programmes of MMDAs in the region, collection of data and monitoring and evaluation. Development plans and projects are therefore prepared largely at district, or national, rather than regional level.

## **(2) Development Plans**

Medium Term Development Plans (MTDPs) are prepared in each MMDA within the National Development Policy Framework (NDPF). The MTDP 2007-2009 of each MMDA was prepared within the NDPF - Growth and Poverty Reduction Strategy (GPRSII) and MTDP 2010-2013 within the NDPF - Ghana Shared Growth and Development Agenda (GSGDA 2010-2013).

The seven goals in which the MMDAs of Greater Kumasi have focused based on GSGDA 2010-2013 are:

- Ensuring and Sustaining Macro Economic Stability,
- Enhancing Competitiveness in Ghana's Private Sector,
- Accelerated Agricultural Modernization and Sustainable Natural Resource Management,
- Oil and Gas Development,
- Infrastructure, Energy and Human Settlements Development,
- Human development, employment and productivity, and
- Transparent and accountable governance.

### **3.5.2 On-going Projects in Greater Kumasi**

#### **(1) Land Administration Project (LAP)**

LAP I (2003-12) was the first part of a 25 year Programme to address the general lack of discipline and order in the land market. Its components included legal and public sector institution reforms, support to the judiciary, inventory of state lands, support for customary land administration including demarcation of boundaries, land titling, revaluation and reform of the land use planning system.

The Ejisu-Juaben Municipality in Greater Kumasi was selected as one of the pilot areas for testing the new land use planning system. An SDF, a Structure Plan and a Local Plan were prepared for Ejisu in 2010-11 under LAP I.

LAP II comprises four components:

- a) Component 1: Strengthening the Policy, Legal and Regulatory Framework for Land Administration**
- b) Component 2: Decentralizing and improving business and service delivery**
- c) Component 3: Improving Maps and Spatial Data for Land Administration**
- d) Component 4: Human Resource Development and project Management**

Component 3.5 focuses on preparation of Land Use Plans comprising Spatial Development Frameworks, Structure Plans and Local Plans. Included in this is the preparation of a National Spatial Development Framework which is to begin in late 2012 and take 30 months. Also included are four Regional Spatial Development Frameworks, one being for Ashanti Region and Structure Plans for 20 Districts, five of which are to be in the Ashanti Region. The Districts which are to be supported are yet to be selected.

**(2) Millennium Cities Initiative in Kumasi**

The Millennium Cities Initiative (MCI) is a project of the Earth Institute, which was founded in 2006 by Columbia University and is assisting 11 medium sized sub-Saharan cities including Kumasi.

The goal of the project is to attain the Millennium Development Goals by 2015. In order to achieve this goal in Kumasi, MDG-based integrated city development strategy for Kumasi includes the city's strategy to attract more investment. In 2008 "Invest in Ghana: Focus Kumasi" was prepared by the project as a guide for investors.

Four investment projects are moving in Kumasi as a result of MCI. They are as follows:

- Palm oil project,
- Bamboo bike production,
- Hostel at the Kwame Nkrumah University of Science and Technology (KNUST), and
- Reconstruction of the children's park.

In addition to the strategy to attract investment, other social sector activities in the field of education and public health have been conducted.

**(3) Ghana Urban Management Pilot Project (GUMPP)**

The Ghana Urban Management Pilot Project (GUMPP) is funded by the Agence Francaise de Development (AFD) and the selected technical assistants, the Institute of Housing Studies (HIS), Rotterdam. It is now just starting in four cities in Ghana including Kumasi, and aims to improve the living conditions of the populace of the city while at the same time reinforce the local capacities for better service delivery and accountability.

The total fund which is relevant to Kumasi is €8.8M, of which "Priority Investment Projects" comprise €8.3M and "Support Measures" €0.5M (applicable to all four cities).

The GUMPP aims to improve the KMA's performance in service delivery including fiscal and management aspects, cost recovery in provision of services, improved civic engagement in decision making, and strategic urban planning of services, including spatial planning. It will implement this in a series of Priority Investment Projects. Those which were initially earmarked for Kumasi in the audit findings of each MMDA, which established benchmarks for programme monitoring and implementation, include redevelopment of satellite markets (New Agogo (Atonsu), Old Tafo and Asawase) and extension of Oti landfill site.

The Capacity Building Programme (Support Measures) will train MMDAs involved in Integrated Urban Development and Governance; Information Systems, Databases and GIS; Social Accountability; Financial Management; and Project Cycle Management. All of these are related to improvement of performance in service delivery, in particular the P.I.P.s.

### **3.6 Major Concerns and Issues for Development and the Environment of Greater Kumasi Sub-Region**

This section summarises major concerns and issues on development and the environment of Greater Kumasi Sub-Region, based on the present situational analysis described in Sections 3.1 through 3.5.

#### **3.6.1 Major Concerns and Issues: Views from KMA and Urbanizing Greater Kumasi**

A variety of problems are identified in KMA and its surrounding districts. These problems are inter-related in a complex manner. The following are some of those problems:

- Explosive population increase in KMA
- Lack of economic development and lack of creation of employment opportunities
- Shortage of formal jobs (shortage of increase of formal jobs)
- Shortage of informal jobs (shortage of increase of informal jobs)
- Shortage of peoples' capacity to buy houses
- Shortage of supply of houses
- Increase of slum communities, increase of poorly equipped housing units and increasing concentration of residential populations in slum communities and poorly equipped housing units
- High concentration of government functions in the city centre of KMA
- High concentration of health and education facilities (both public and private) in KMA in terms of number
- Traffic congestion in the city centre during the entire daytime
- Shortage of investment in public infrastructure for people's lives
- Shortage of investment in economic infrastructure for economic sectors
- 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
- Shortage of urban amenities including open spaces both in KMA and surrounding districts
- Decrease of agricultural lands in surrounding districts

#### **3.6.2 Major Concerns and Issues: Views from Surrounding Districts**

The problems shown in the above section are recognized within KMA and are also due to urbanizing Greater Kumasi rather than recognized by surrounding districts. On the other hand, the surrounding districts have different types of problems as shown in Tables 3.6.1 through Table 3.6.6.

**Table 3.6.1 Potentials and Constraints of Ejisu-Juaben**

Agriculture	<ul style="list-style-type: none"> <li>• Endowed with rich soil for the cultivation of food crops (including oil palm, cassava, maize, plantain and orange) in large areas which can serve Kumasi and other districts</li> <li>• Low agricultural productivity because of the outmoded ways of farming and due to problems of land ownership</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• Ejisu-Juaben can boast of small scale industrial activities .e.g. steel fabricating companies, traditional textile industry (kente weaving, oil palm processing etc.)</li> <li>• The final output of these industries is sold to tourists and local people along road sides on retail and wholesale basis</li> <li>• The small-scale does not make it possible to export much to the outside world.</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>• There is a lot of tourism potential that the municipality can take advantage of. However, these tourist sites have been left undeveloped. e.g. Yaa Asantewaa Mausoleum.</li> <li>• Most of the tourist sites should be developed to attract more tourists.</li> </ul>
Social Development	<ul style="list-style-type: none"> <li>• The Municipal Assembly in collaboration with Zoom Lion is doing well in terms of solid waste management. However, there is difficulty in acquiring a final disposal site</li> <li>• On the issue of housing, rent and land acquisition has become expensive because people are now moving from Kumasi to settle in the municipality.</li> </ul>
Physical development	<ul style="list-style-type: none"> <li>• The Municipality has a fairly well spatially distributed road network.</li> <li>• There are a number of feeder roads that branch off the main network to the various towns.</li> <li>• The majority of the roads are motorable all year round and can therefore be classified as good roads.</li> <li>• Roads that lead to most of the rural areas that produce foodstuff are in a very bad state.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Human activities have altered the natural environment, especially the forests that were found originally along water courses</li> <li>• Illegal mining is a major problem in the district e.g. Bomfa Achiase, Wabiri etc</li> </ul>

**Table 3.6.2 Potentials and Challenges of Bosomtwe**

	Potential	Challenges
Agriculture	<ul style="list-style-type: none"> <li>• Potential for Vegetables, rice &amp; large scale cassava (Aduaden, Tetrefu, Sawuah...)</li> <li>• High Productivity Potential (Maize, Rice, cassava, plantain, oil palm, cocoa &amp; citrus) district wide</li> </ul>	<ul style="list-style-type: none"> <li>• Low production (output per acre)</li> <li>• Low capacity for agro processing</li> <li>• Reduction in agriculture land</li> <li>• Production areas are expanding to south east areas (Pease, Nyameani )</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• Pease (palm oil extraction)</li> <li>• Worakose (palm oil extraction)</li> <li>• Abuontem (cassava processing)</li> <li>• Jachie–Krofrom (basketry/carpentry)</li> <li>• Esereso (wood processing factory)</li> <li>• Jachie (tie &amp; dye batik, fashion design, tailoring)</li> <li>• Jachie, Feyiase, Esereso (traditional sandal making, shoe making &amp; repair)</li> <li>• Krom-Adwafo, Onwe, Kokobriko (kenkey making/bakeries)</li> </ul>	<ul style="list-style-type: none"> <li>• Currently the existing manufacturing industry in the District has not been able to grow beyond its small size so as to think of serving areas beyond Greater Kumasi</li> </ul>
Solid Waste	<ul style="list-style-type: none"> <li>• Zoom Lion Waste Disposal Site</li> </ul>	<ul style="list-style-type: none"> <li>• Waste management control</li> <li>• No final disposal site for waste management</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Tourism to improve district economy and standard of living</li> <li>• Kokoado (hiking route)-Steps from Kokoado to Abono</li> <li>• ICT Centre for Tourists &amp; marketing district tourism</li> <li>• Foreign direct investment or public private partnership for lake-based tourism development</li> </ul>	<ul style="list-style-type: none"> <li>• Activities of communities along Bosomtwe Lake.</li> <li>• Illegal gold mining at Beposo causing environmental hazard</li> <li>• Promoting district specific focus on tourism</li> </ul>
Physical Development	<ul style="list-style-type: none"> <li>• Plans for Modern Market at Aputuogya</li> <li>• Relatively good access to potable water through borehole/small town water system/wells</li> </ul>	<ul style="list-style-type: none"> <li>• Road Improvement necessary for supporting agricultural production &amp; marketing</li> <li>• Difficult economic sector development</li> </ul>



**Table 3.6.3 Potential and Challenges of Atwima Kwanwoma**

	Potential	Challenges
Agriculture	<ul style="list-style-type: none"> <li>Deikrom, Amoaful, Boadikrom, Nweneso No.1, Nweneso No.2 have soils that support the growth of cocoa, plantain, oil palm, citrus fruits, etc.</li> <li>The presence of West Africa Agricultural Productivity Program (WAAPP)</li> </ul>	<ul style="list-style-type: none"> <li>Low productivity</li> <li>Lack of agro processing industries.</li> </ul>
Industry	<ul style="list-style-type: none"> <li>Brass ornament processing activities at Ampeyoo and Krofrom,</li> <li>Wood working and carving activities at Foase, Trabuom and Nweneso, which are not well developed.</li> </ul>	<ul style="list-style-type: none"> <li>Low productivity: The sector consists of individual or small scale informal activities scattered all over the district.</li> <li>Operators in the sector lack the requisite management skills and capacity to be competitive in the sector.</li> </ul>
Social Development		<ul style="list-style-type: none"> <li>About forty-five percent of the communities in the district are classified based on their access to social services to be poor.</li> <li>Most deprived communities in the district include Akuamansakrom, Dentekrom, Oseikofikrom, Nkwanta, Boadikrom Deikrom, Winsa and Amofo which are predominantly farming communities.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>Sand deposits at Konkori, Trabuom, Twedie, Adumwamase, Dida</li> <li>Gold deposits are located in Adwuampong, Ampabame No. 1, Ahenema Kokoben, Nkoranza</li> </ul>	<ul style="list-style-type: none"> <li>Deforestation: degraded areas include Deikrom, Chichibong, Nweneso 1, 2 &amp; 3, Hwidiem, Foase and Twedie.</li> <li>Sand Winning and illegal mining activities by sand, stone and road contractors</li> <li>Bush Fires have resulted in the depletion of the vegetative cover in most places such as Techiman Mmerewadwa, Apemanim, Hemang and Kokoben.</li> </ul>
Physical Development	<ul style="list-style-type: none"> <li>Availability of land for development</li> </ul>	<ul style="list-style-type: none"> <li>Poor surface quality of road network and bridges poses a major challenge to production activities and businesses.</li> <li>Absence of alternative development nodes or growth centres within the district puts extra pressure on the capital Foase with its limited facilities.</li> <li>Uncontrolled or haphazard rural and peri-urban development.</li> </ul>

**Table 3.6.4 Potentials and Challenges of Atwima Nwabiagya**

	Potential	Challenges
Agriculture	<ul style="list-style-type: none"> <li>• High Productivity Potential rice, maize, ginger, cassava, Citrus (Gyankobaa, Adankwame, Asakraka, Mfensi, Fufuo)</li> <li>• JIRCA (rice processing)</li> <li>• Root and Tuber Improvement programme</li> </ul>	<ul style="list-style-type: none"> <li>• Low production (output per acre)</li> <li>• Low capacity for agro processing</li> <li>• Reduction in agriculture land</li> <li>• Low prices</li> </ul>
Industry	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Low capacity for agro processing (cassava, ginger citrus)</li> <li>• Currently the existing manufacturing industry in the District has not been able to grow beyond its small size so as to think of serving areas beyond Greater Kumasi</li> </ul>
Solid Waste	<ul style="list-style-type: none"> <li>• Available land</li> <li>• Existence of Zoomlion Company Limited</li> </ul>	<ul style="list-style-type: none"> <li>• Waste Management Control</li> <li>• No final disposal site for waste management</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>• Komfo Anokye footprint (Nkakom)</li> <li>• Horizontal site (Barekese)</li> <li>• Barekese dam &amp; forest reserve</li> <li>• Owabi dam</li> <li>• Bamboo &amp; bird sanctuary</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate basic infrastructure &amp; support services</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Two forest reserves (Owabi &amp; Barekese forest reserves)</li> <li>• Barekese stone quarry</li> </ul>	<ul style="list-style-type: none"> <li>• Illegal felling of timber in the forest</li> <li>• Farming &amp; sand wining activities</li> </ul>
Social and Physical Development	<ul style="list-style-type: none"> <li>• Relatively good access to potable water through borehole water system and pipe borne water</li> <li>• Development of modern market at Abuakwa</li> <li>• Existence of financial institution</li> </ul>	<ul style="list-style-type: none"> <li>• Income disparity between rural &amp; urban dwellers</li> <li>• Road Improvement necessary for supporting agricultural production &amp; marketing</li> <li>• Difficult economic development due to unstable electricity</li> </ul>

**Table 3.6.5 Potentials and Challenges of Afigya-Kwabre**

	Potential	Challenges
Agriculture	<ul style="list-style-type: none"> <li>• High Productivity Potential in vegetables, rice &amp; oil palm, cocoa, citrus (Tetrem, Kyekyewere, Boamang)</li> </ul>	<ul style="list-style-type: none"> <li>• Low production (output per acre)</li> <li>• Low capacity for agro processing</li> <li>• Reduction in agriculture land</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• Quarry Industry at Buoho Area, Ankaase</li> </ul>	<ul style="list-style-type: none"> <li>• Encroachment along the quarry areas</li> </ul>
Solid Waste	<ul style="list-style-type: none"> <li>• Zoom Lion (covering 29 communities)</li> </ul>	<ul style="list-style-type: none"> <li>• Waste management control</li> <li>• No final disposal site for waste management</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Two forest reserves(Asufu &amp; Gianima) in the north</li> <li>• Timber and Teak Farm Production at Tetrem, Kyekyewere</li> </ul>	<ul style="list-style-type: none"> <li>• Illegal sand winning and illegal mining destroying the environment</li> </ul>
Social and Physical Development	<ul style="list-style-type: none"> <li>• Relatively good access to potable water through borehole/small town water system</li> <li>• Catholic Grotto</li> <li>• Development of government hospital</li> </ul>	<ul style="list-style-type: none"> <li>• Income disparity between rural &amp; urban dwellers</li> <li>• Difficult economic development</li> </ul>

**Table 3.6.6 Potentials and Challenges of Kwabre East**

Agriculture	<ul style="list-style-type: none"> <li>• Low productivity of farmers because of the rudimentary ways of farming/issue of land ownership and in effect produce at a subsistence level</li> <li>• Endowment of rich soil for the cultivation of food crops on a large scale which can serve Kumasi and other districts, eg. Cassava, maize, plantain and oil palm</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• Kwabre East can boast of small scale industrial activities eg traditional textile industry (kente weaving, wood carving, bead making, cassava processing, soap making etc)</li> <li>• The final output of these industries is sold to tourists and local people along road sides on retail and wholesale basis, especially the textiles.</li> <li>• The small scale does not make it possible to export much to the outside world.</li> <li>• The sawmill industry at Ahwiaa has collapsed; previously it was employing most of the people.</li> </ul>
Tourism	<ul style="list-style-type: none"> <li>• There is a lot of tourism potential that the district can take advantage of</li> <li>• Currently there is the Adanwomase Tourism Management Organization, Adinkra craft village and a receptive facility at Ntonso.</li> <li>• However, hotels, guest houses and restaurants to accommodate these tourists are lacking</li> </ul>
Social Development	<ul style="list-style-type: none"> <li>• The District Assembly in collaboration with Zoom Lion is doing well in terms of solid waste management.</li> <li>• However there is difficulty in acquiring a final disposal site</li> <li>• On the issue of housing, rent and land acquisition has become expensive because people are now moving from Kumasi to settle in the district.</li> </ul>
Physical development	<ul style="list-style-type: none"> <li>• The district has a fairly well spatially distributed road network, eg. Ahwiaa-Mamponteng-New Asonomaso road</li> <li>• There are a number of feeder roads that branch off the main network to the various towns as Sakora Wonoo, Amape and Wadie Adwumakase.</li> <li>• The majority of the roads are motorable all year round and can therefore be classified as good roads. Such roads include the Ahwiaa-Mamponteng-Dumanafo road</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Human activities have altered the natural environment, especially forests that were found originally along water courses</li> <li>• Clay deposits are available, diamond deposits have been found at Safo, gold deposits at Sakora Wonoo and the banks of Bomonwe stream (Adanwomase)</li> <li>• Sand winning is a major problem in the district</li> </ul>

### **3.6.3 SWOT Analysis for Greater Kumasi Sub-Region**

The summary of the major concerns and issues in the previous section shows the understanding of the past and present situation. In this section, these 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 Factor: Strength (S)**

- 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: Weakness (W)**

- 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: Opportunities (O)**

- 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: Threat (T)**

- 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 3.6.7 Summary of Industries in Neighbouring Districts of Kumasi Metropolis**

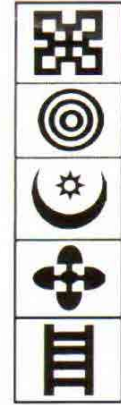
<b>2 Afigya Kwabre District</b>		
Agriculture	Industry	Services
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 61% of employment</li> <li>- Net exporter of food products</li> <li>- Major food crops: plantain, cassava, cocoyam, maize (small amount of rice)</li> <li>- Major cash crops: cocoa</li> <li>- Vegetables: tomatoes, garden eggs, pepper, onions</li> <li>- Under-developed livestock (sheep, goats, cattle, poultry as well as rabbits and grass-cutters)</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- High post-harvest losses</li> <li>- Lack of credit</li> <li>- Poor transportation systems</li> <li>- Low prices</li> <li>- Farms are becoming far from homes due to expansion of settlements</li> <li>- Livestock faces high cost of investment, input and labor, lack of extension support</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 9% of employment</li> <li>- Mostly small scale and labor intensive</li> <li>- Agro-based: cassava processing (gari), oil and palm kernel extraction, akpeteshie distilling</li> <li>- Wood-based: furniture, woodcarving, carpenters, saw mills</li> <li>- Textile-based: dressmakers, kente weavers, cloth dying, tailors</li> <li>- Metal-based: blacksmiths, metal fabricators</li> <li>- Quarrying: sand and stone winning (Some quarrying activities are capital intensive.)</li> <li>- Others: leather works, cane weaving</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Even though chainsaw activities are banned, some people still operate at night)</li> <li>- Poor road conditions</li> <li>- Inadequate capital support</li> <li>- Poor management skills</li> <li>- Poor transportation facilities</li> <li>- Poor industrial infrastructure</li> <li>- Poor environmental sanitation</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 28% of employment (plus others 2%)</li> <li>- Mostly informal sector complemented by government sector</li> <li>- Informal service sector: hairdressers, barbers, drivers, painters at rented kiosks and stores</li> <li>- Formal service sector: health, education, postal agencies, banking, telecommunication (3 internet facilities, 20 community information centers, 2 functional ICT centers)</li> <li>- Retail: consumables and non-consumables at markets and any other places</li> <li>- Wholesale: business activities in larger settlements like Afranso and Buoho</li> <li>- Telecommunication businesses include mobile phone repairs and sales of top-up (prepaid) cards.</li> <li>- No major tourist attractions</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Due to improved access, a considerable number of people in the district acquire manufactured goods in Kumasi. No key periodic markets are located in the proximity of Kumasi. (This may not be a problem.)</li> </ul>
<p><b>Key issues:</b> Create an enabling environment for the private sector to invest, including speedy land registration. Promote agro-forestry and wood-based small scale industries in such a way to restore forests.</p>		
<b>3 Kwabre East District</b>		
<p>Most parts of this small district are becoming urbanized and a lot of people commute to work in Kumasi.</p>		
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 41% of employment</li> <li>- Rain-fed agriculture</li> <li>- Major food crops: cassava, cocoyam, plantain, maize (small amount of yam and rice)</li> <li>- Major cash crops: cocoa on a small scale</li> <li>- Vegetables and fruits:</li> <li>- Poultry is popular but cattle production is unpopular due to tsetse fly and other diseases</li> <li>- Many farmers are not food-sufficient.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Soil infertility and low yield of crop varieties;</li> <li>- Crop and livestock pests and disease;</li> <li>- Farmers inability to expand due to financial and other resources;</li> <li>- Low productivity of labor, due to use of rudimentary tools</li> <li>- Unfavorable climate, reduction in annual rains;</li> <li>- Farmers limited access to technical advice and extension service</li> <li>- Persistent use of traditional system of crop and livestock production ; and</li> <li>- Marketing of farm produce.</li> <li>- Urbanization and agriculture as a second job</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 7% of employment</li> <li>- Mostly small scale</li> </ul> <p>Types of industries</p> <ul style="list-style-type: none"> <li>- Traditional textile industry</li> <li>- Forest/wood- based related industries (eg furniture)</li> <li>- Blacksmithing and metal based industries</li> <li>- Dressmaking/tailoring industries</li> <li>- Auto mechanics and technicians</li> <li>- Others (cassava processing, soap making, leather works,</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- The only saw mill in the district with about 150 employees in Ahwiaa has collapsed. The wood industry is now left with some few individuals who sell the less processed wood.</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 52% of employment</li> <li>- Mostly commodities are brought from Kumasi.</li> <li>- Local products like kente and adinkra cloths are sold in Kumasi and other owns.</li> <li>- There 3 branches of a bank in the district but many residents get financial services from Kumasi.</li> <li>- The district is famous for its traditional textiles such as kente and adinkra, woodcraft and artifacts.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- In spite of the cultural tourism potential, basic infrastructure is lacking.</li> </ul>
<p><b>A key issue:</b> Create a cultural area as a pilot project including cleanliness, beautification, townscape, land scape, etc.</p>		



4 Ejisu Juaben Municipality				
Outcome of the Socio-economic Survey 2009				
Sector	Respondents (400)	(%)	Household income share (%)	Income share/ respondents' share
Agriculture	238	59.5	33	0.55
Industry	31	7.75	21	2.71
Services	131	32.75	46	1.40
- The simple calculation compares apparent labor productivity in the order of industry, services and agriculture. It should be noted that the calculation neglects many factors like cost for operation and transaction without money.				
Agriculture		Industry		Services
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 62.5% of employment</li> <li>- Crop farming (food and cash crops) dominates livestock.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Difficult or expensive access to credit to buy agricultural input, pay for farm labor and expand farms</li> <li>- Agriculture has become unattractive to the youth.</li> </ul>		<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 6.8% of employment</li> <li>- Mostly small scale</li> </ul> <p>Typical types of industry</p> <ul style="list-style-type: none"> <li>- Agro-processing</li> <li>- Wood-based including sawmilling and carpentry</li> <li>- Kente weaving</li> <li>- Metal-based manufacturing including steel bending and welding</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Production level is low.</li> </ul>		<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 31.7% of employment</li> <li>- Majority in the service (excluding commerce) sector employees are in the formal sector.</li> <li>- Mostly informal sector complemented by government sector, 40% of which are public servants.</li> <li>- Self-employed service providers are mostly self-financed.</li> <li>- Commerce sector consists of wholesale (&lt;5%), retail (&gt;80%) and petty traders (15%).</li> </ul> <p>Potential tourist attractions</p> <ul style="list-style-type: none"> <li>- Bobiri Forest Reserve now famous for its butterfly sanctuary</li> <li>- Ejisu-Besease Shrine</li> <li>- Yaa Asantewaa Museum and festival</li> <li>- Kente weaving at Bonwire</li> <li>- Bafoso River sacred fishes</li> <li>- Anyano sacred tree at the frontage of the Palace in Akyawkrom</li> <li>- Tano Shrine (declared a national monument) in Asawasi</li> <li>- Ntonti Rocks in Okyerekrom</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Some traders do not pay tax.</li> <li>- The tourism development potential remains untapped.</li> </ul>
<b>A key issue:</b> Address properly the conceived large projects namely Boankra Inland Port, the Free Industrial Zone, and the Outer Ring Road.				
5 Bosomtwe District				
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 62.6% of employment (57.4% of crop farming and 5.2% of fishing)</li> <li>- There are people who are engaged in agriculture as a minor occupation.</li> <li>- Crop farming is on a large scale (maize, cassava, vegetables, yam, and plantain)</li> <li>- Kumasi provides good market of the agricultural produce such as vegetables and cassava.</li> <li>- Fishing on is a small scale</li> </ul>		<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 16.7% of employment</li> <li>- Most of the larger scale industry is not agro-based and so has weak linkages with agriculture.</li> <li>- Small scale industry includes pottery, soap making, leather works (eg traditional sandals, shoe making), kente making, and dressmaking.</li> <li>- Medium scale industry includes cassava processing, oil extraction, carpenters, corn mills, tie and dye, and bakeries.</li> <li>- Kumasi provides market.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Lack of capital</li> <li>- Inadequate raw materials</li> <li>- High cost of inputs</li> <li>- Lack of modern facilities</li> <li>- Lack of skill training</li> </ul>		<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 19.1% of employment (plus others 1.6%)</li> </ul> <p>Tourism</p> <ul style="list-style-type: none"> <li>- At the Lake Bosomtwe, only one settlement (Abono) has its tourism potential relatively developed. There is a first class road leading to Abono from Kumasi. There is also the availability of 24-hour electricity, lake transport, telecommunication and toilet facilities. Currently, hotels, restaurants, summer huts, and open terraces are springing up throughout the district. On average, 41 foreigners visit the lakeside on a week day and 72 on weekend, while an average of 36 Ghanaians visit the place every week. On public holidays, thousands of foreigners and Ghanaian citizens visit the resort.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- The major problems are the poor roads to other 23 surrounding villages along the lake except Abono and lack of security guards to protect tourists.</li> </ul>
<b>A key issue:</b> Promote Lake Bosomtwe as a major attraction in Ashanti tour routes involving local agriculture, fishing and manufacturing.				

6 Atwima Kwanwoma District		
Agriculture	Industry	Services
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 62.6% of employment</li> <li>- Small holder farmers with traditional methods dominate (eg slash and burn)</li> <li>- Major food crops: maize, cassava, vegetables, yam, and plantain</li> <li>- Commercial crops/tree crops: citrus, cocoa, and oil palm</li> <li>- Kumasi is the ready market.</li> <li>- Majority of livestock farmers practice semi-intensive system mainly for sheep, goats, and poultry. All livestock farmers practice crop farming.</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- With increasing demand for land for building, there has been mounting tension between the farmers and the care-taker chiefs. This impedes effort to enter large scale production. The average farm size is as low as 1.5 acres (0.61ha) per farmer.</li> <li>- Low production/productivity</li> <li>- Over – dependence on rain-fed agriculture</li> <li>- Limited access to credit</li> <li>- Lack of storage facilities</li> <li>- Inadequate number of Agriculture Extension Agents (AEAs)</li> <li>- Limited access to market (Kumasi is close but road conditions are poor.)</li> <li>- High cost of farming inputs</li> <li>- Pollution of water bodies by the use of chemicals especially by vegetable farmers</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 16.7% of employment</li> <li>- Small scale cottage industries</li> <li>- Agro-based (eg. soap making, oil extraction)</li> <li>- Metal-based (eg. brass ornaments)</li> <li>- Wood-based (eg. wood carving, carpentry)</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Poor management skills</li> <li>- Inadequate financial capital</li> <li>- Limited access to credit</li> <li>- High cost of inputs</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 20.7% of employment</li> <li>- Informal sector: majority</li> <li>- Formal sector: teaching, health services, banking, security, tourism, telecommunication (including mobile phone repair and sale of top-up (prepaid) units), etc</li> <li>- Tourism is under-developed.</li> </ul> <p>Potential tourist attractions</p> <ul style="list-style-type: none"> <li>- Wood and bras carvings of traditional artifacts at Foase and Krofrom may well be properly organized and assisted.</li> </ul>
<p><b>A key issue:</b> Dormitory town development should be accompanied with infrastructure development.</p>		
7 Atwima Nwabiagya District		
<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 50.8% of employment</li> <li>- Crop farming and livestock rearing (Fishing on a very limited scale)</li> <li>- Common crop farming mostly on a small scale: cassava, plantain, cocoyam, maize, ginger, rice, yam, oil palm, citrus, cocoa</li> <li>- Some larger scale farming: vegetables for Kumasi market (tomatoes, garden eggs, cabbage, carrots, cucumber, green pepper, and okra)</li> <li>- The district is one of the leading producers of citrus in Ghana.</li> <li>- The district is also well-known for cultivation of ginger.</li> <li>- Large scale poultry farms</li> <li>- Small scale livestock farms as side jobs (goats, sheep, pigs, cattle, grass-cutters, etc )</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- There is no facility to process raw oranges and so most of the fruits go waste since the existing market is unable to absorb all the supplies of the raw fruits.</li> <li>- All the ginger produced is still being sold in their raw form. Despite various initiatives to add value to ginger, not much success has been achieved.</li> <li>- High cost of inputs and outbreak of diseases/pest of poultry and goat production</li> <li>- The land right system including land cost and tenure uncertainty is a serious disincentive to agricultural development and the landownership is fragmented</li> <li>- Bureaucratic credit procedure on one hand and low level of banking culture and poor credit management on the other hand</li> <li>- Poor post-harvest practices (poor handling, poor storage, poor post-harvest management, poor harvesting methods, and lack of processing facilities)</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 17.4% of employment</li> <li>- Manufacturing is mainly micro and small-scale enterprises without permanent: dressmaking, carpentry, metal fabrication, distillation of alcoholic beverages (akpeteshie and pito), leather works, ceramics, baking, milling, wood processing (saw mills) and batik / tie and dye making</li> <li>- There are two quarry companies.</li> </ul>	<p><b>Outline</b></p> <ul style="list-style-type: none"> <li>- 31.8% of employment</li> <li>- Commerce subsector employs 14.4% of the active workforce. They are mostly small scale traders on streets, creating traffic and sanitation problems.</li> <li>- Services sub-sector employs 17.4% of the active workforce. They are also mostly informal.</li> </ul> <p>Potential tourist attractions</p> <ul style="list-style-type: none"> <li>- Owabi and Barekese Dams attracting a large number of tourists</li> <li>- Gyamera Forest Reserve</li> <li>- Owabi and Barekese Water Works Forest Reserve</li> <li>- Komfo Anokye footprints at Nkakom</li> <li>- Agriculture Fair site with conference, restaurant and bar facilities at Nkawie</li> <li>- Cave located at Barekese (There, the ‘Golden Stool is believed to have been hidden at the time the whites wanted to seize it. It is also believed to be the place where war guns of the Asantes were stored in the olden days.)</li> </ul> <p><b>Problems</b></p> <ul style="list-style-type: none"> <li>- Informal business activities occupy streets, creating and facing a lot of inconveniences.</li> <li>- All the potential tourist attractions are not yet developed.</li> </ul>
<p><b>A key issue:</b> Become a leading district of agro-processing of orange and ginger with support of the District Business Advisory Center and Rural Enterprise Project (REP).</p>		

Sources: District Medium Term Development Plans



# PART III

## Present Situation of Infrastructure and Service Sectors of Greater Kumasi Sub-Region





# **Chapter 4      Transport Sector of Greater Kumasi Sub-Region**

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## **4.1 Present Situation in the Transport Sector**

### **4.1.1 Road Transport**

#### **(1) National Transport Policy Plan**

##### **1) Transport Sector in the Ghana Shared Growth and Development Agenda (GSGDA)**

In the country's national development policy framework plan entitled Ghana Shared Growth and Development Agenda (2010-2013), the crucial role of transportation in propelling the country's economic growth and development is acknowledged. Likewise, the plan admits that there is a need for massive infusion of resources and policy interventions to enable transportation to support national development. To address the constraints in the transportation sector, the plan has the following objectives over the medium term.

- Establishing Ghana as a transportation hub for the West African Subregion
- Creating and sustaining an efficient transport system that meets user needs
- Integrating land use, transport planning, development planning and service provision
- Creating a vibrant investment and performance-based management environment that maximizes benefits for public and private sector investors
- Developing and implementing comprehensive and integrated policy, governance and institutional frameworks
- Ensuring sustainable development in the transport sector
- Developing adequate human resources and applying new technology

##### **2) Policy Objectives of the Ministry of Roads and Highways**

The Ministry of Roads and Highways stated the following: The policy objectives of the Road sector outlined in its Medium Term Development Plan (SMTDP) are in conformity with the thematic areas of the Ghana Shared Growth Development Agenda (GSGDA), the national medium term plan for 2010-2013. The thematic areas are:

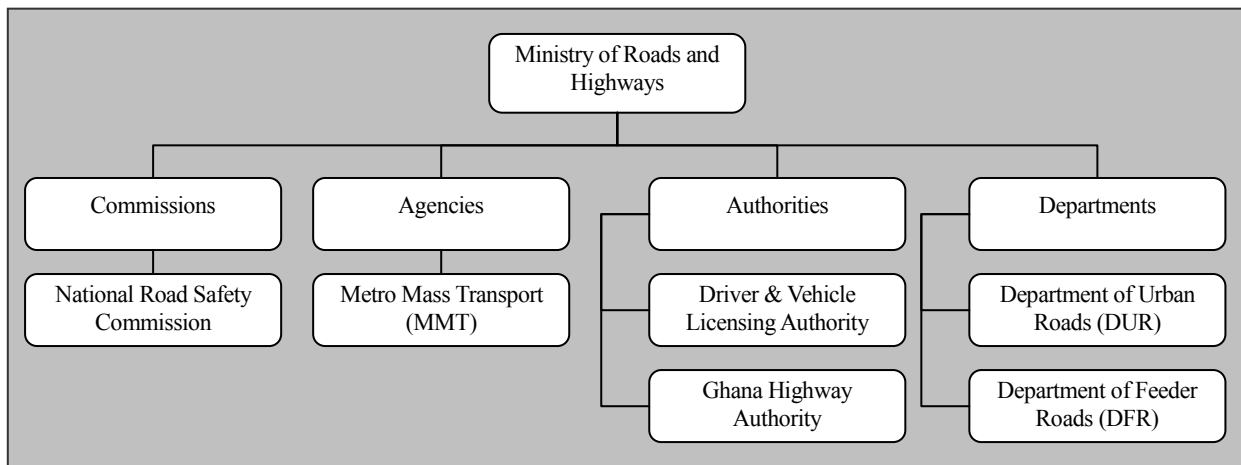
- Create and sustain an accessible, effective and efficient transport network that meets user needs
  - Integrate land use, transport planning, development planning and service provision
  - Create a vibrant investment and performance-based management environment that maximizes benefits for public and private sector investors
  - Develop and implement comprehensive and integrated Policy, Governance and Institutional Frameworks
-

- Ensure Sustainable Development in the Roads Sub-sector
- Develop a multi-disciplinary human resource base to facilitate the implementation of programmes.

It should be noted that the missing objective in the GSGDA, which is “Establishing Ghana as a transportation hub for the West African Sub-Region”, is programmed for aviation.

## (2) Concerned Agencies for Road Transport

The Ministry of Roads and Highways (MRH) is responsible for policy development, coordination and oversight of road infrastructure including oversight of the Department of Urban Roads (DUR), Department of Feeder Roads (DFR), The Ghana Road Fund (GRF) and Ghana Highways Authority (GHA)<sup>1</sup>. Other authorities regulating the road transport sector are shown in Figure 4.1.1.



Source 1: Ministry of Roads and Highways ([www.mrt.gov.gh](http://www.mrt.gov.gh)), Ministry of Finance and Economic Planning, 2010

Source 2: Egis Bceom International, 2010, Integrated Transport Plan for Ghana, MoFEP

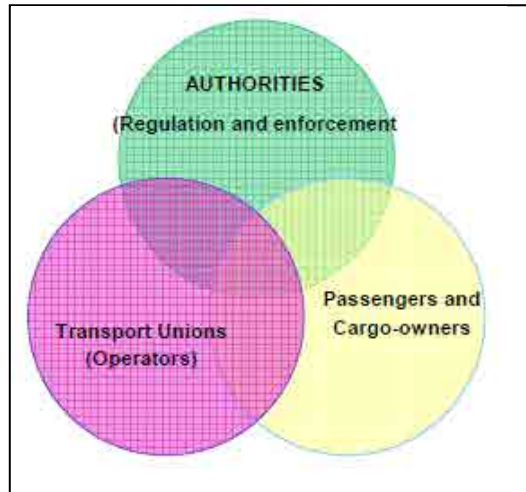
**Figure 4.1.1 Authorities for Road Transport**

The ministry has a vision which states “To provide and maintain an integrated, cost-effective and sustainable road transport network responsive to the needs of users, supporting growth and poverty reduction”

Likewise, its mission reads “To formulate the requisite policies, monitor and evaluate programmes and projects to ensure the provision of an affordable, integrated, safe, responsive and sustainable road transport network that will meet the economic, social and environmental needs as well as national and international standards”

The road transport sector is organized as depicted in the figure below. The government serves as regulator and enforcer of rules and regulations; transport unions are the operators; and the passengers and freight owners are the users of the transport services.

<sup>1</sup> Egis Bceom International, 2010, Integrated Transport Plan for Ghana Volume 1: Integrated Transport Plan 2011-2015, MoFEP, pp.32



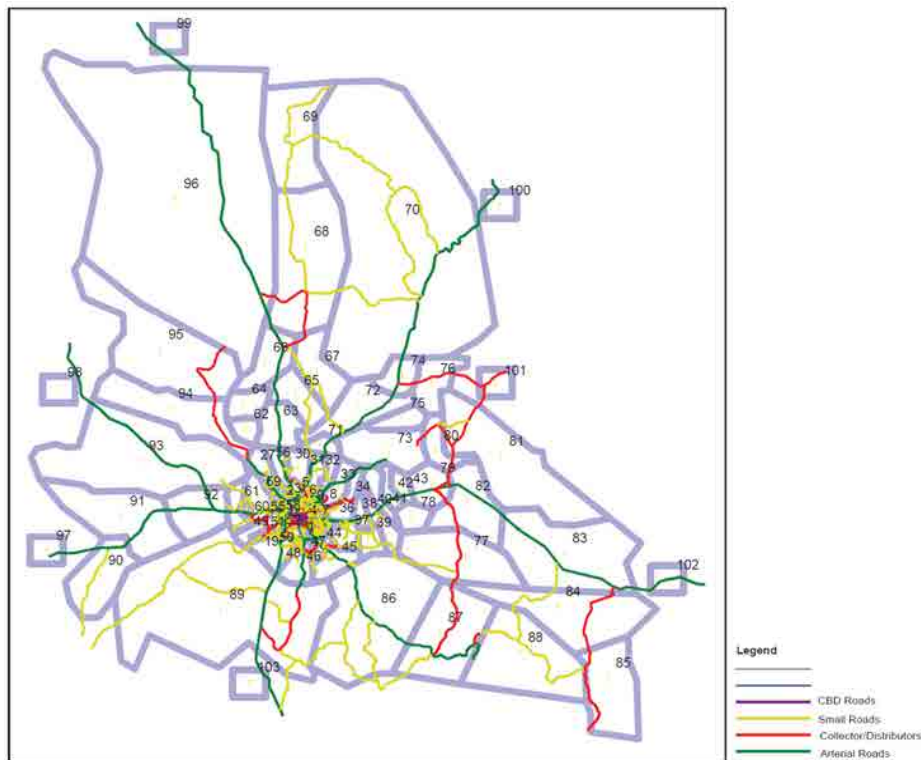
Source: Egis Bceom International, 2010, Integrated Transport Plan for Ghana, Ministry of Finance and Economic Planning

**Figure 4.1.2 Institutional Structure of Road Transport**

### (3) Greater Kumasi Road Network

#### 1) Road Network, Road Classification and Road Surface Condition

The road network of the country is composed of major arterial, minor arterial, distributor / collector and local roads. In the on-going WB-assisted study, the "Kumasi Transport Plan", the road network of Greater Kumasi is further simplified by the following classification: arterial road, distributor / collector road, and CBD road.



Source: Integrated Transport Planning Ltd. Transport Plans for Kumasi, 2012, WB

**Figure 4.1.3 Road Network and Road Type in Greater Kumasi Sub-Region**

Table 4.1.1 reveals that Kumasi has the third longest road network in Ghana. The total length of arterial, distributor/collector and local roads reaches almost 250 km, 100 km and 1,590 km respectively. In Ashanti Region, the total length of roads classified as arterial, distributor, and collector reaches almost 1,000 km based on the survey carried out by the WB-assisted study.

**Table 4.1.1 Road Type and Length in Major Cities**

Unit: km

City	Major Arterial	Minor Arterial	Distributor / Collector	Local	Total
Accra	198.20	103.08	233.00	1,749.22	2,283.5
Ga	119.72	19.86	180.90	1,833.70	2,154.2
Tema	173.00	19.62	154.98	1,495.55	1,843.1
Sunyani	64.10	61.21	25.19	272.99	423.5
Techiman	103.11	N.A.	24.19	345.90	473.2
<b>Kumasi</b>	<b>136.40</b>	<b>110.39</b>	<b>90.61</b>	<b>1,589.74</b>	<b>1,927.1</b>
Tamale	68.54	56.22	89.74	238.61	453.1
Cape coast	34.01	32.15	39.86	207.98	314.0
Sekondi Takoradi	82.00	55.00	30.00	502.38	669.4
Koforidua	52.79	17.50	83.12	142.68	296.1
Obuasi	38.74	4.10	20.33	183.80	247.0
Bolga	39.18	11.14	31.93	92.39	174.6
Bawku	42.17	32.85	7.83	135.35	218.2
Wa	29.70	84.18	6.41	256.12	376.4
Ho	125.49	34.10	19.12	320.00	498.7
Total	1,307.15	641.39	1,037.20	9,374.71	12,360.5

Source: Department of Urban Roads, 2008, Annual reports

Note: 2011 Annual Report of DUR indicated the total length of inventoried road of Kumasi is 1,931 km.

In terms of road surface, Kumasi's road network of close to 200 km has the following characteristics: 8% are asphalt mix, 30% surface dressed, 46% gravel and 15% earth.

**Table 4.1.2 Road Surface Type in Major Cities**

Unit: km

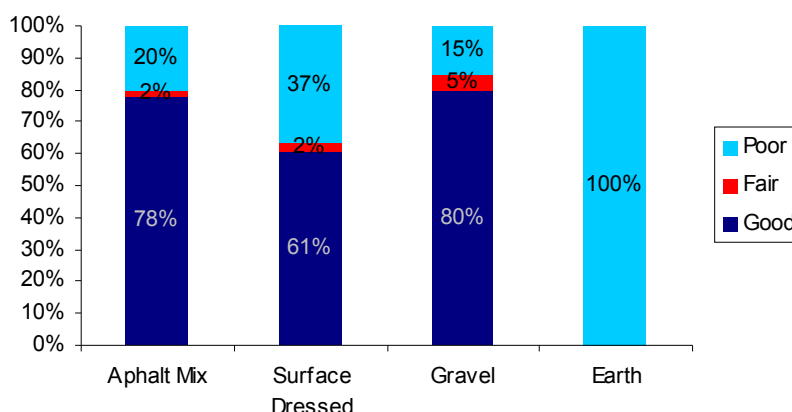
City	Pavement Type (km)					Total
	Asphalt Mix	Surface Dressed	Gravel	Earth	Concrete	
Accra	286.82	1,230.49	473.98	304.25	0.05	2,295.59
Ga	92.64	262.86	945.51	859.86	1.63	2,162.51
Tema	86.48	591.87	695.13	473.97	1.60	1,849.05
Sunyani	29.50	170.51	119.34	104.36		423.71
Techiman	9.61	93.68	255.49	103.95	10.56	473.29
<b>Kumasi</b>	<b>159.02</b>	<b>588.38</b>	<b>890.16</b>	<b>293.62</b>		<b>1,931.18</b>
Tamale	67.29	175.28	141.21	67.10	2.24	453.12
Cape Coast	22.04	179.23	104.50	10.34		316.11
Sekondi Takoradi	62.07	318.78	268.52	40.27	0.68	690.32
Koforidua	11.52	144.90	108.86	58.90		324.19
Obuasi	7.62	101.63	113.72	23.99		246.96
Bolga	28.52	53.63	46.94	45.54		174.63
Bawku		38.01	109.78	70.79		218.58
Wa	1.47	121.63	143.75	125.35	0.02	392.22
Ho	15.38	246.93	178.69	57.71		498.71
Total	879.98	4,317.83	4,595.58	2,639.98	16.78	12,450.16

Source: Department of Urban Roads, 2008, Annual Reports



Most of the asphalt mix road surface is in good condition at about 80% and the remaining in poor condition. Likewise, roads with dressed surface and gravel surface are also in good condition with the exception of some kilometers which are in poor condition. The serious issue is the condition of roads with earth surface. As seen in Table 4.1.2, the 293 km of earth roads are in bad shape.

In general, the total length of roads in good condition (all surface types) is about 1,195.08 km (61.8%). Roads in fair condition totaled 59.46 km (3.07%) and roads in bad condition which are mostly earth surfaced reached 676.65 km (35.04%). This means that close to 700 km of roads are in need of intervention.



Source: Department of Urban Roads, 2008, Annual Reports

**Figure 4.1.4 Road Surface Condition**

## 2) Feeder Road in Ashanti Region

The feeder roads in Ashanti Region total 5,557.97 km. Of these, about 67% are engineered, partially engineered are around 16% and the remaining length are un-engineered. Most of the un-engineered roads are normally not motorable during the rainy season.

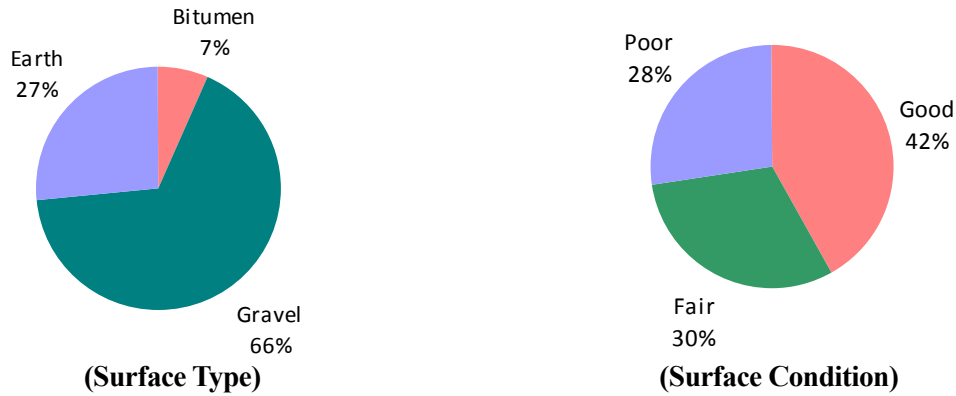
**Table 4.1.3 Road Classification**

Classification	Length (km)	Share (%)
Engineered	3,736.02	67.23
Partially Engineered	869.21	15.64
Un-Engineered	952.74	17.13
Total	5,557.97	100

Source: Department of Feeder Roads, 2010 Annual Reports

Note: Engineered roads normally have bitumen and gravel surface; un-engineered roads normally have earth surface

Road surface type of the region's feeder roads is mostly gravel at 3,700 km, which represents around 66%. Roads with earth surfaces have a length of 1,484 km (27%) while the remaining roads have a road surface of bitumen (7%) as presented in Table 4.1.5. Meanwhile, roads in good condition are around 42% of the entire region's feeder road network. Roads in fair condition are 30% while the remaining 28% are in poor condition.

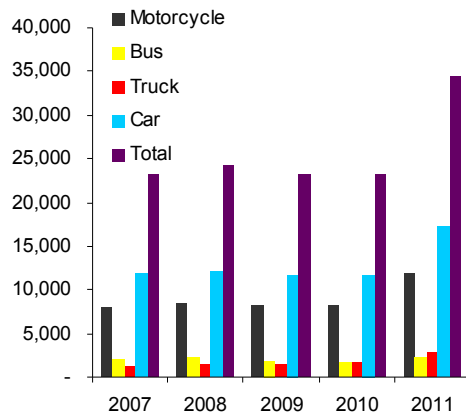


Source: Department of Feeder Roads, 2010, Annual Reports

**Figure 4.1.5 Road Surface Type and Surface Condition**

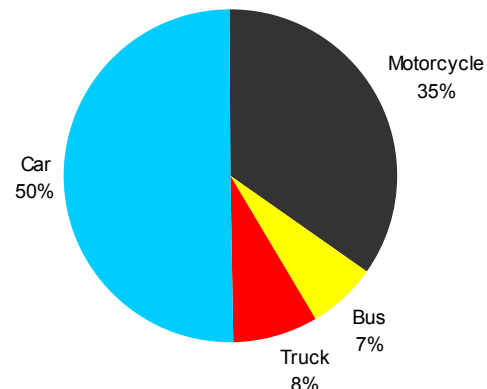
#### (4) Number of Registered Vehicles

The number of registered vehicles is presented in Figure 4.1.6. The average annual growth rate for the last five years is 9.6%. However, between 2010 and 2011, the growth rate reached a staggering 48%. The distribution of registered vehicles is shown in Figure 4.1.7. Half of the vehicles are cars. Motorcycles have also a substantial share at 35% and the remaining is shared by trucks and buses.



Source: Driver and Vehicle Licensing Authority, 2012, Vehicle Registration Records

**Figure 4.1.6 No. of Registered Vehicles in Kumasi**



Source: Driver and Vehicle Licensing Authority, 2012, Vehicle Registration Records

**Figure 4.1.7 Registered Vehicles in 2011**

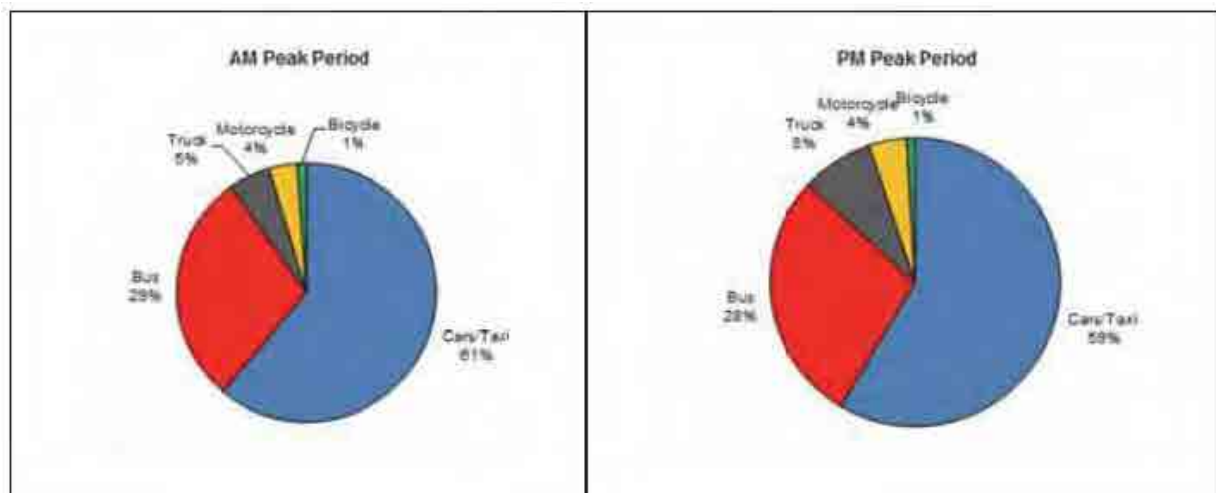
#### (5) Characteristics of Road Vehicle Usage

##### 1) Vehicle Modal Share

A 2009 survey conducted by the WB-assisted study entitled the "Transport Plans for Kumasi" captured a clear picture of the population of vehicles on the road network from 6am to 10pm. The most dominant in terms of number is cars and taxis which have a share of about 60% (of which approximately 45% are cars and 55% are taxis) in the all-day count (6 am - 10 pm). Around 30% of all vehicles are buses (of which around 45% trotros, 50% medium buses, and 5% large buses). The

remaining numbers are distributed as follows: 8% are trucks, 4% are motorcycles and 1% bicycles.

The figure below shows the modal split in peak periods in the morning and afternoon. The composition of vehicles in these peak periods is comparatively similar with the all day vehicles composition. As noted by the WB-report, trucks' share however decreases in the AM peak from 8% to 5% compared to the all-day traffic.



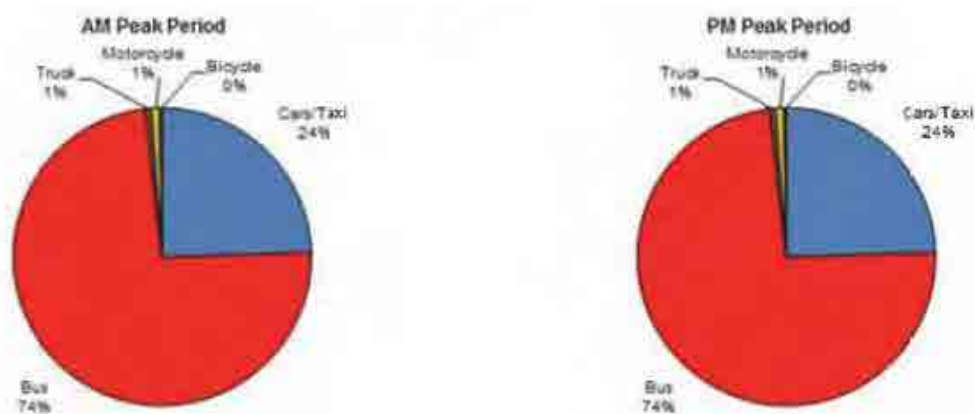
Source: World Bank, 2012, Transport Plans for Kumasi

**Figure 4.1.8 Vehicles Modal Split (morning and afternoon peak periods)**

## 2) Passenger Modal Share

The same survey by the WB-assisted study revealed that around 75% of passenger volumes are traveling using buses (of which approximately 30% were trotro passengers, 60% were medium buses travelers, and 10% were passengers of high capacity buses). Around 25% of all passengers are using cars and taxis. The above data comes from a 16-hour count (6 am to 10 pm) in all survey locations.

During morning peak and afternoon peak period as shown in the figure below, the passenger modal split in all stations remains almost the same as the all-day (16-hour count) modal split.



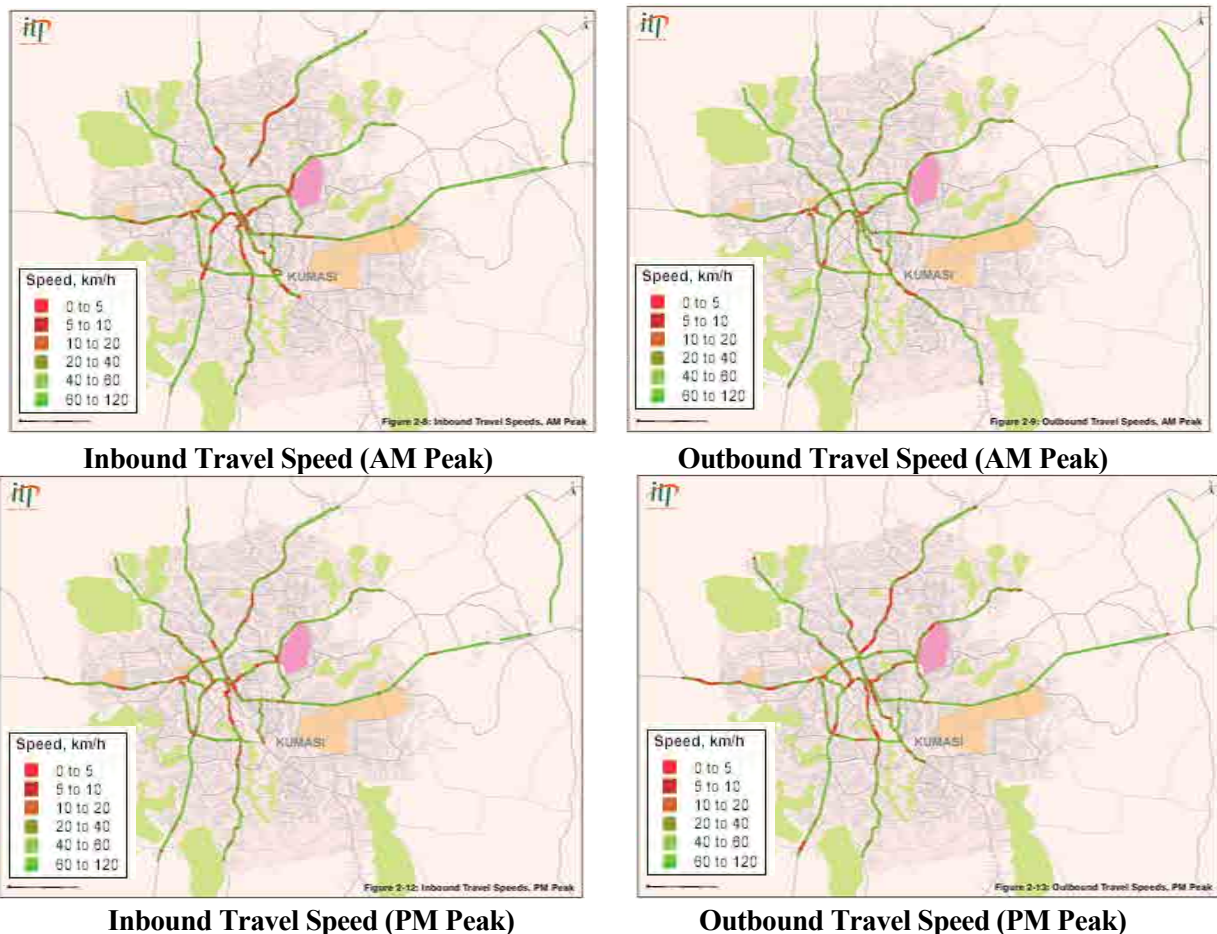
Source: World Bank, 2012, Transport Plans for Kumasi

**Figure 4.1.9 Passenger Modal Split (morning and afternoon peak periods)**

## (6) Travel Speed

The WB-assisted study also carried out a car travel time survey to observe the existing travel speed in the road network. The figures are presented in Figure 4.1.10. Based on these four figures, the following were observed.

- Travel speed of the cars is slowest during the AM peak inbound and PM peak outbound. This pattern follows the natural trend where in the morning, a high volume of vehicles is coming into the city to transport commuters to their work. Then in the afternoon, the volume of outbound vehicles is very high to service commuters returning to their homes.
- Influence of major junctions is clearly apparent where vehicle speed under 10km/h is common. Severe congestion is experienced at the approach road to junctions.
- The city center is characterized by heavy congestion where travel speed below 10km/h is observed in many sections of the road in the vicinity of Kejetia and the Central Market.
- Mampong road has a 4 km section with speeds of under 20 km in the AM peak period, inbound. The same is true on the other arterial roads such as Sunyani Road, Offinso Road, Antoa Road, Accra Road, Lake Road, Old Bekwai Road and New Bekwai Road.
- Travel speeds in the neighboring districts are generally high but many residents in these areas travel to Kumasi, thus congestion in Kumasi has a significant impact on these residents as well.



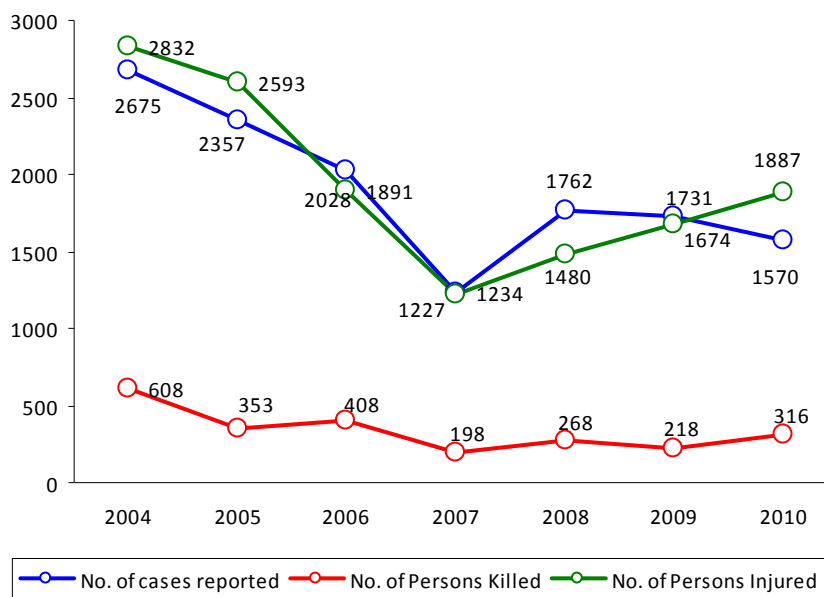
Source: Integrated Transport Planning Ltd., 2012, Transport Plans for Kumasi, WB (on-going)

**Figure 4.1.10 Travel Speed of Existing Road Network in Kumasi**

**(7) Road Accidents**

In the national scale, the country has a vibrant campaign to improve traffic safety. The country’s national vision for road safety is “Ghana, a country with the safest road transportation system in Africa” which is stated in the National Road Safety Strategy III (2011-2020) produced by the National Road Safety Commission (NRSC). This report rolled out the country’s strategy to halt the unacceptable levels of road traffic fatalities and injuries by 2015 and aims to reduce the accident rate by 50% in 2020. National data shows that on the average, there are about 1,800 deaths and 14,500 injuries annually caused by road traffic accidents.

Moving to the regional scale, the state of road accidents in Ashanti Region can be gleaned from the figure below. The highest recorded number of accidents in the last seven years was in 2004 which reached 2,675. From then on, the number of accidents gradually decreased and this is perhaps partly due to the road safety programs and activities by the government spearheaded by the National Road Safety Commission (NRSC). These programs include a Child Road Safety Programme which aims at instilling positive road user behavior among young ones. Children up to the age of 16 constitute 23% of the pedestrian fatalities in road traffic crash fatalities in Ghana. Likewise, the NRSC also collaborated with the private sector in several programs aims to promote road safety. For instance, Fitting of Retro-reflective Tapes on vehicles weighing 3.5 tonnes Gross Vehicle Weight (GVW) and above to enhance visibility of the vehicle, especially during the night time.



Source: National Road Safety Commission, 2010, National Road Safety Strategy III (2011-2020)

**Figure 4.1.11 Accident Record in Ashanti Region**

**Table 4.1.4 District Trend of Fatalities and Injuries by Traffic Accidents**

District	Year	Casualty Severity			
		Fatal	Serious	Slight	Total
Kumasi	1998	119	295	632	1046
	2009	102	251	481	834
	2010	74	220	450	744
Atwima	1998	8	35	47	90
	2009	69	179	235	483
	2010	44	131	259	434
Ejisu Juaben	1998	35	56	68	159
	2009	31	94	168	293
	2010	20	84	65	169
Bosomtwe / Atwima-Kwanwoma	1998	4	28	23	55
	2009	6	7	9	22
	2010	17	64	106	187
Kwabre	1998	4	32	27	63
	2009	19	27	35	81
	2010	21	15	13	49
Afigya Sekyere	1998	16	44	43	103
	2009	6	73	91	170
	2010	14	63	63	140

Source: National Road Safety Commission, 2010, National Road Safety Strategy III (2011-2020)

### (8) Parking Situation in KMA CBD

With all the roads and commerce in the CBD, traffic and parking is problematic. This situation is worsened by the fact that there is a lack of good public transport and off-street parking. In order to discourage people from parking in the CBD, a GHC 0.3 hourly paid parking scheme was introduced in June 2006. KMA CBD has now 4 off street car parking lots with 793 spaces and on-street parking with 1278 capacity.

**Table 4.1.5 KMA CBD Parking Facilities**

Location		Capacity
Off Street Car park	Prison Car Park	78
	KMA Car Park	65
	Prempeh Assembly Hall	200
	Central Car Park	450
	Total	793
CBD On Street Car Parking		1278

Source: Department of Urban Roads, 2011, Kumasi CBD Traffic Management Project report,

### (9) On-going Road Project

#### 1) Road Projects under DUR

The following road projects are currently on-going in Kumasi and will have a positive impact on

travel in Kumasi, when completed.

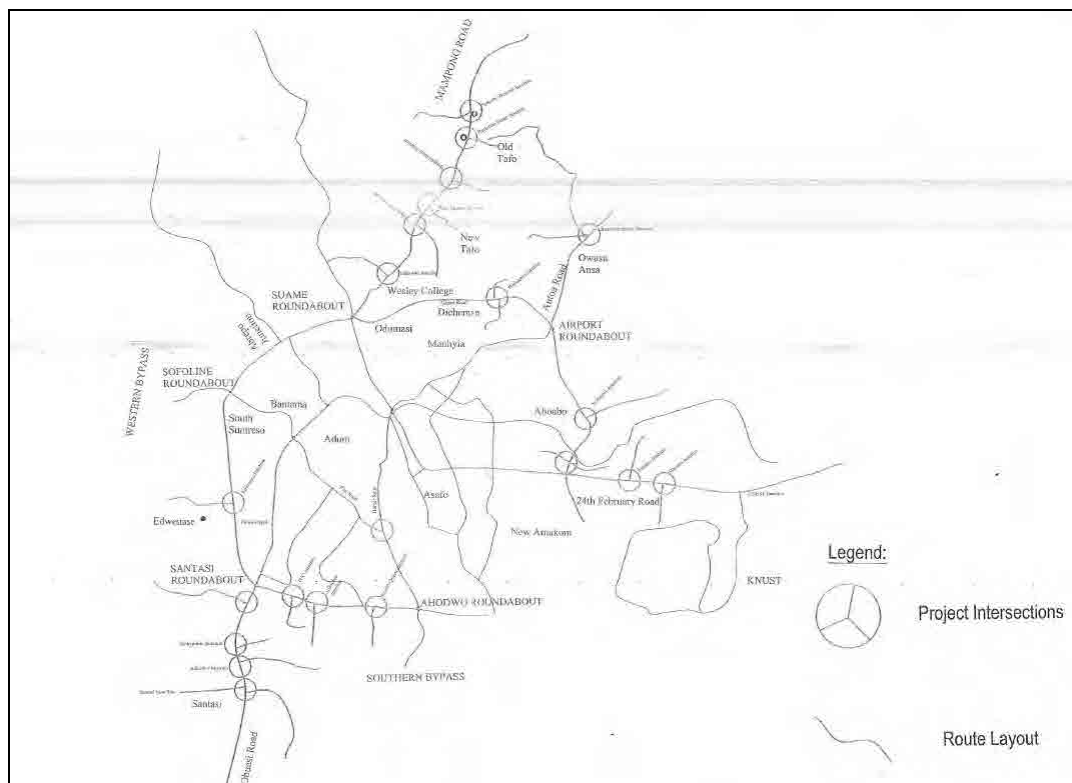
- Widening of Lake Road
- Construction of Eastern Bypass of the Ring Road (partially opened for traffic)
- Widening of Sunyani Road

Likewise, two major junctions are undergoing development with the assistance of China. These junctions are:

- Sofoline Roundabout (detailed design is being prepared)
- KATH Roundabout (yet to start but already awarded)

## 2) KMA Intersection Improvement Project under Kumasi DUR

KMA DUR has been studying the improvement of intersections. The table explains the candidate list of intersections and recommended countermeasures for each intersection. The listed intersections are not duplicates of those in the transportation masterplan study by WB 2011.



Source: Department of Urban Roads, 2009, Urban Transport Project Consultancy Service for Detailed Design and Supervision of Traffic Management Works, 2<sup>nd</sup> Batch. Kumasi Metropolitan Area

**Figure 4.1.12 Locations of KMA Intersection Improvement Projects**

**Table 4.1.6 Countermeasures in the KMA Intersection Improvement Projects**

No	Location	Countermeasures						
		Signal	Round -about	Pedestrian Walkway	Road line Markings	Road Signs	U-Turns	Others
1	Osei Tutu II Blvd. at KNUST			⊙	⊙	⊙		Pedestrian Overpass
2	Harper Road / James E. Bando Drive	⊙		⊙	⊙	⊙	⊙	
3	Southern Bypass / Adiembra Road		⊙	⊙	⊙	⊙		
4	Western Bypass / Edwenase Road		⊙	⊙	⊙	⊙		
5	Atoa Road / Buokrom Estate Road		⊙	⊙	⊙	⊙		
6	Aboabo / St. Patrick Road	⊙		⊙	⊙	⊙	⊙	
7	Mampong Road / Cemetery Road	⊙		⊙	⊙	⊙	⊙	
8	Mampong Road / New Suame Road		⊙	⊙	⊙	⊙		
9	Mampong Road / Tafo Hospital Road	⊙		⊙	⊙	⊙		
10	Mampong Road / Pankrono Estate Road	⊙		⊙	⊙	⊙	⊙	
11	Obuasi Road / Odeneho Kwadaso	⊙		⊙	⊙	⊙	⊙	
12	Obuasi Road / Fankyenbra Road	⊙		⊙	⊙	⊙	⊙	
13	Obuasi Road / Adiembra Road	⊙		⊙	⊙	⊙	⊙	
14	Obuasi Road / Santasi New Site	⊙		⊙	⊙	⊙	⊙	

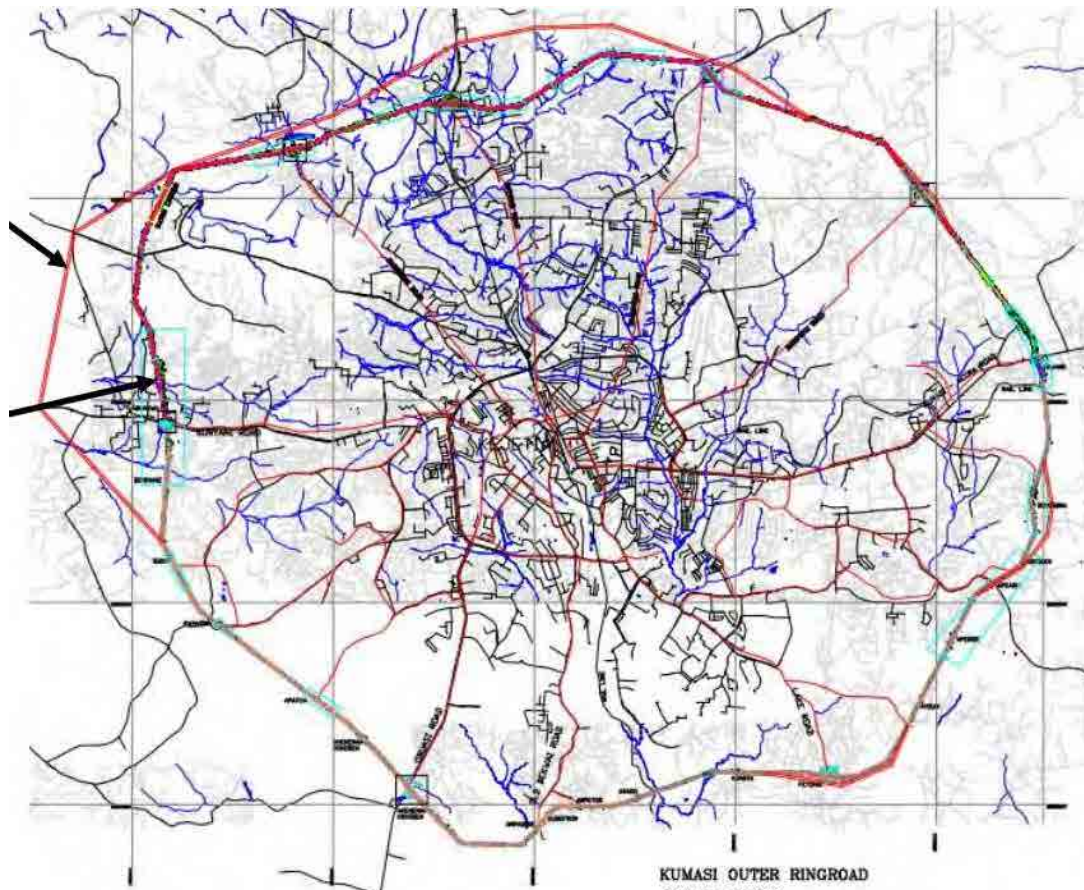
Source: Department of Urban Roads, 2011, Kumasi CBD Traffic Management Project report

### 3) Kumasi Outer Ring Road Project

The Kumasi Outer Ring Road which was originally planned was an approximately 70 km length road as shown in Figure 4.1.13 which starts from Afrantwo and runs through Asensua, Akyease, Kwamo, Kokiben, Esereso, Adagya, Brofoyedru, Akyeremade, Abuakwa, Koforidua, Owabi and back to Afrantwo.

The development of Kumasi Outer Ring Road aims at reducing the congestion on the road network in Kumasi Metropolitan Assembly area, provide smooth and comfortable riding surface and facilitate the free movement of people and goods by providing alternative routes, increased mobility and accessibility in support of accelerated economic growth and poverty reduction. The DUR of the Ministry of Transportation is the project's implementing agency.





Source: Ministry of Roads and Highways, 2011, Kumasi Outer Ring Road Preparatory Survey

**Figure 4.1.13 Plan of Kumasi Outer Ring Road**

## **4.1.2 Public Transportation Services**

### **(1) Current Public Transportation**

#### **1) Public Transport Terminals and Route Services in KMA**

A report prepared by the Department of Urban Roads for Kumasi Metropolitan Road Assembly entitled the “Terminals and Routes Identification Report” in 2009 revealed that there are 121 passenger transport stations in Kumasi Metropolis. Almost 60% of these stations are located in the seven major terminals presented in Table 4.1.7. In general, the report noted that the network of public transportation in Kumasi is quite extensive. The report has the following notable findings:

- There are about 47 stations situated at various locations which are not designated as a transport terminal / station.
- Of the 10 Sub-Metros in Kumasi, only Asawasi has no terminal / station.
- Most transport routes follow the main arterial and collector roads hence transport services do not effectively penetrate into the community areas.
- Most routes do not have properly designated bus stops along them.
- The general state of transport terminals in the city is sub-standard.

**Table 4.1.7 Major Terminals in Kumasi**

Terminal Name	Location	No. of Stations	User Vehicles	No. of user vehicles	No. of Routes
1. Kejetia	Subin	32	Taxi, Trotro Mini-bus	1,572	51
2. Roman Hill	Subin	5	Taxi, Trotro	565	14
3. Dr. Mensah	Manhyia	18	Taxi, Trotro Mini-bus	683	49
4. Alabar	Manhyia	3	Taxi, Trotro	150	7
5. Tech Junction	Oforikrom	5	Taxi, Trotro	200	17
6. Tafo	Tafo	1	Trotro	45	1
7. K.O.	Subin	6	Trotro, Mini-bus	303	16
Total		70		3518	155

Source: Department of Urban Roads, 2009, Terminals and Routes Identification Survey,

## 2) Metro Mass Transit Limited (MMT)

The Metro Mass Transit Limited (MMT) was established by the government in 2002 to ensure that public transport is accessible to all and that the pedestrian and traffic environments are designed and managed to enable people to reach and use public transport safely and with confidence. There are three types of operation under this scheme as shown in the table below:

**Table 4.1.8 Type of Operation by MMT**

Operation	Description
Intra-city bus service	<ul style="list-style-type: none"> <li>• City routes with high frequency and many stops</li> <li>• Not extending beyond 39 km</li> <li>• Almost 42% of MMT's operation</li> </ul>
Inter-urban or rural urban service	<ul style="list-style-type: none"> <li>• Links rural areas to urban centres (usually on rough roads) with low frequency and distances of 40 – 139 km.</li> <li>• Service is meant to open up villages and districts for socio-economic activities.</li> <li>• Covers about 30% of MMT's operations.</li> </ul>
Inter-city bus service on limited scale	<ul style="list-style-type: none"> <li>• Connects two cities/towns extending over a distance of 140 km and more like Kumasi - Sefwi Asawinso; Sunyani - Hamile; Tamale - Kpandai; Bolga - Tumu; Wa - Funsu/Kundugu; Tamale - Kumasi; Accra - Ho and Cape Coast - Accra.</li> <li>• This service accounts for about 28% of the Company's operations.</li> </ul>

Source: Metro Mass Transit Limited, 2011, Overview of Metro Mass Transit

In terms of passenger volumes carried by the MMT, more than 36 million passengers were served by the different operations of MMT. Of these, 47% were covered by the Intra-city operation with Inter-urban getting a share of 30% and the rest belongs to Inter-city operation. Table 4.1.9 shows the exact number for each operation.

**Table 4.1.9 Passenger Volume by MMT (2011)**

Operation	Number of passengers
Intra city	17,326,089
Inter urban / rural urban	11,293,694
Inter city	7,882,339
Total	36,502,122

Source: Metro Mass Transit Limited, 2011, Overview of Metro Mass Transit

### 3) Terminals and Routes of Public Transportation in the Six Neighboring Districts

#### a) Ejisu-Juaben Municipality

A report prepared by the Urban Passenger Transport Unit of the Department of Urban Roads (DUR) entitled the “Urban Transport Project in the Ejisu-Juaben Municipality: Action Plan” in 2009 noted that there are no terminals in the said municipality. However, there are a couple of stations located in various areas of the municipality which are currently functioning as terminals for the operators. These terminals are owned and managed by various operators such as PROTOA and GPRTU. The table below shows the names of the stations and their current characteristics.

**Table 4.1.10 Names of Public Stations in Ejisu-Juaben District**

No	Station	Type of station
1	PROTOA - Ejisu market	Open space
2	PROTOA - Ejisu Assembly entrance	Walkway
3	PROTOA - in front of the Information Services Department	Open space
4	PROTOA - opposite Komfo Serwaa	Lay by
5	Zongo junction station	Open space
6	King Jesus station	Open space
7	Bomfa junction station	Open space
8	Boamadumase station	Car par
9	Positive transport station	Car park
10	Fumesua Taxi station	Open space
11	Jachie junction Taxi station	Open space
12	Kwaso GPRTU station	On-street
13	Kwaso Taxi Station	On-street
14	Besease station	Road side
15	Juaben Apemso station	Open space
16	Bonwire station	Open space
17	Onwe station	On-street
18	Achiase station	On-street
19	Achinakrom station	On-street
20	Donyina station	On-street
21	Adumasa station	On-street
22	Bomfa station	On-street
23	Apromase station	On-street

Source: Department of Urban Roads, 2009, Terminal and Route Identification Survey

In terms of the number of vehicles operating in the district, there are a total of 428 vehicles comprised of 93 mini-buses and 345 taxis. These operate in 23 routes currently used by transport unions in the municipality. Names of operators and their routes are presented in Table 4.1.11.

**Table 4.1.11 Unions and their Respective Routes**

Union Name	Routes
PROTOA - Ejisu branch	Ejisu – Kubaase
	Ejisu – Kumasi
	Ejisu – Konongo
GPRTU - Kwaso branch	Kwaso – Kumasi
Kwaso Taxi Union	Kwaso – Korase
	Kwaso – Deduako
GPRTU - Bomfa Local	Bomfa Junction – Achiase
GPRTU - Juaben branch	Juaben – Dwabenma
GPRTU - Juaben local	Apemso
GPRTU - Boamadumase local	Duampompo - Boamadumase
Positive transport	Ejisu - New Bomfa
King Jesus Transport Union	Ejisu – Kubaase
CONCERN	Ejisu – Kwaso
	Ejisu – Achinakrom
	Ejisu – Edwinase
Freedom Taxi Union	Ejisu – Bonwire
	Ejisu – Abankro
	Bonwire - Adanwomase
Tikrom - Jachie Transport Union	Jachie Junction - Baworo
Fumesua Taxi Union	Fumesua – Okyerekrom
Nana Yaw Boakye Transport Union	Juaben - Juaben Hospital
	Juaben – Bonwire
	Juaben – Domakwai

Source: Feeder Roads Office, Ejisu Juaben Municipal Assembly, 2009, Ejisu District Union Records

## (2) **Public Transport Project**

### 1) **Urban Transport Project with AFD, IDA Funds**

#### a) **Objectives**

To improve mobility in selected Metropolitan, Municipal and District Assemblies through a combination of:

- traffic management measures including area traffic signal control;
- regulation of urban passenger transport in four stages over a period of years; and
- implementation of a pilot bus rapid transit line in Accra.

To promote a shift to more environmentally sustainable transport modes and lower transport-related greenhouse gas emissions along the pilot bus rapid transit corridor.

#### b) **Project Components**

The overarching goal of the Ghana Urban Transport Project is to improve public transport in the Urban Metropolitan Area by providing more and better public transit service to meet the needs of this growing region. Among the means chosen to achieve this goal are the development of a bus rapid transit system and the regularization of transit service throughout the area.

The efficient development, maintenance and administration of transport infrastructure and services are recognized as being critical to the socio-economic development of any country. The project's

five main components are:

- Institutional development aimed at strengthening capacity of those Government Ministries and Agencies concerned with urban transport; transport operators; and the six participating Municipal and Metropolitan District Assemblies. (This component also supports the work of the Project Advisory Office, as well as the institutional design and financial study required to transform it into a permanent “Center for Urban Transportation”.)
- Traffic engineering, management and safety includes the following sub-components;
  - traffic management in the Accra Metropolitan Assembly area
  - area-wide traffic signal control in the Accra Metropolitan Assembly area
  - traffic management in the Kumasi Metropolitan Assembly area
  - area-wide traffic signal control in the Kumasi Metropolitan Assembly area
  - enforcement of traffic rules and education
  - the design and supervision of works under sub-components
- Development of a bus rapid transit service that provides “rail-like” service using specialized vehicles, designated stations, frequent scheduled service, segregated bus-ways, interchange facilities, terminals and facilities for pedestrians and non-motorized transport; and improved passenger comfort and amenities;
- Integration of urban development planning and transport planning for better environmental management; and
- Monitoring and evaluation which includes the studies required to support the monitoring of project outcomes through the evaluation of transport and social impact indicators, environmental impact indicators, and capacity development indicators.

## **2) Establishment of the Urban Passenger Transport Unit – UPTU**

### **a) Role of UTPU**

Regulation of passenger transport has been a major challenge for most parts of Kumasi. This has contributed to congestion in the CBD and the major urban roads in the various parts of Kumasi. The Government of Ghana, the World Bank (WB), Francaise de Development (AFD) have prepared the Urban Transport Project to address some of the numerous urban transportation problems.

On July 8th, 2008, KMA, through the empowerment of the Local Government Act, Act 462, passed the Urban Passenger Transport by-laws to regulate urban passenger transport in its area of jurisdiction. The KMA-UPTU was established through the KMA urban passenger transport services and began operational activities from October 2008.

### **b) Major Activities Undertaken by the UPTU**

The UPTU has undertaken several exercises and activities aimed at improving the transport system in the metropolis since its inception. Below are the major activities undertaken by the UPTU.

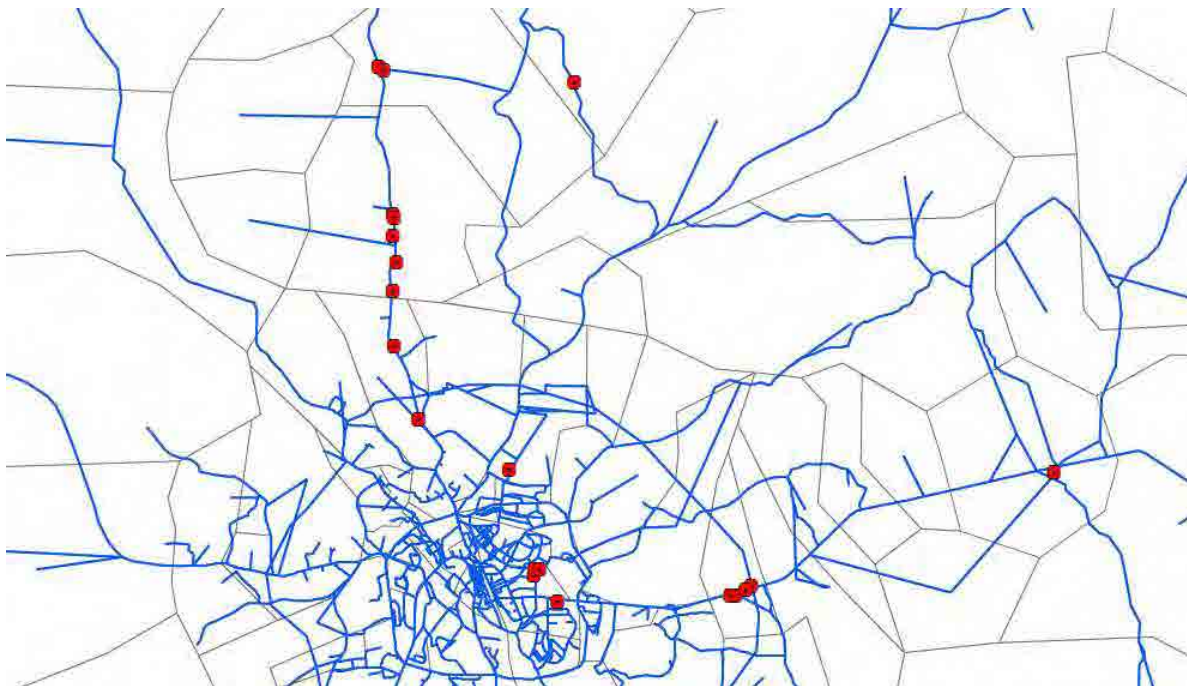
- Route and Terminal surveys
- Enforcement challenge surveys
- Transport station survey at the Kejetia Terminal
- Route registration exercise (on-going)
- Greater Kumasi Transport Plan study on-going by ITP / Delin consult
- Pilot Bus Route Type B Design for Kumasi on-going by ITP

- Consultancy services for the development of Permit Fees on-going by F. Afukaar Consultant
- Development of Area Wide Traffic signal Control System, not commenced yet
- Junction improvement and Traffic Management programme, not commenced yet

### 4.1.3 Cargo Transport

#### (1) Existing Truck Terminals

Interviews with concerned government officials disclosed that there are currently no truck terminals in the region. This resulted in trucks being parked in big empty spaces including filling stations. They are also sighted at various locations forming a single line at the roadside of Accra-Kumasi corridor and Kumasi-Tamale corridor. Location of these temporary truck stations as well as other relevant information such as problems encountered by the drivers will be appreciated after analysis of the transportation survey.



Source: JICA Study Team

**Figure 4.1.14 Location of Truck Stations**

#### (2) Boankra Dry Port Project

Construction of a dry port located at Boankra in Ejisu-Juaben Municipality Assembly of Ashanti Region is on-going. The main proponent of the project is the Ghana Shippers Council (GSC) with the strong support from the government. The plot of land earmarked for the port is 400 acres (161 hectares) which was obtained by government through compensating the original owners. From central Kumasi, the facility is about 28 km. A pre-feasibility study was carried out in Volume 11 of the Integrated Transport Plan prepared in 2010. This study was carried out by the team of Egis and BCEOM International for the Ministry of Finance and Economic Planning.

Accordingly, the main objectives of Boankra dry port are:

- To participate in the reduction of congestion at Takoradi and Tema ports;



- To reduce the aggregate transport cost of international cargo to importers and exporters from the middle and northern parts of Ghana as well as from landlocked countries; and
- To promote the establishment of export zones in the vicinity of the dry Port and to create job opportunities for unemployed youth living in and around Boankra.

The pre-feasibility study concluded that construction of the facility is likely to be economically viable and recommended the conduct of a full scale feasibility study. The study also suggested including possible alternative locations aside from Boankra in Ejisu-Juaben. The study noted that one of the most critical issues surrounding this project is the decision of the government to rehabilitate the railway lines between Kumasi and the ports of Tema and Takoradi. Without this important link, success of this project is less likely. Figure 4.1.15 shows the gate of the port and the administration building.



Source: Photo by JICA Study Team, 2012,

**Figure 4.1.15 Boankra Dry Port (left: gate of the port, right: administrative building)**

### **(3) New F/S of Boankra and Rail Line from Tema to Kumasi**

Further feasibility study for development of an integrated transport and logistics corridor including Boankra port and the Eastern rail line from Tema to Kumasi is now on-going as of May 2012.

The overall objective of the project is to improve the rail and logistics infrastructure as a part of an integrated transport network in Ghana, helping to improve services to customers and reduce the cost of transport, especially in trade to and from the hinterland and the Ashanti Region of Ghana.

The purpose of this project is to prepare a multi-criteria evaluation report on the development potential for an integrated transport and logistics corridor including Boankra Inland Port and the Eastern Rail line from Tema to Kumasi.

### **(4) Rest Stops along Tema-Accra-Kumasi-Paga Road – IDA Funded**

The World Bank is providing funds for the design and construction of four rest stops to be located at Konongo, Sakamkrom, Kintampo and Savelugu on Tema-Accra-Kumasi Road. It is expected that safety along the road corridor would be improved once these facilities are completed. These also have the function of truck terminals. The procurement process for acquisition of the services of a consultant for the design of these facilities was initiated in 2010.

#### 4.1.4 Rail Transport

##### (1) National Plan for Railways

The GSGDA clearly stated the government plan to rehabilitate the railway network of the country to play an important role in shaping the economic growth, particularly industrial development. Similarly, the railway's important role in moving mass commuters in urban centers to decongest urban roads is highlighted. Below is the plan for the railways based on the GSGDA.

“In the rail sector, the existing railway network will be rehabilitated in some cases, and totally rebuilt in others, and upgraded, modernized and expanded to support accelerated industrial growth.”

“This will reduce the increasing pressure on urban transportation in the major metropolitan areas of Accra, Kumasi, Tema and Sekondi-Takoradi and provide industrial freight haulage to the new oil and gas-driven industries anticipated to spearhead accelerated growth. A general result will be to ease pressure and congestion on the roads and highways.”

##### (2) Concerned Agencies for Rail Transport

There are two authorities involved in railway operation in the country.

- Ghana Railway Company Ltd. is a public sector body established in 2001 with a mission to provide safe, comfortable and reliable transport services. Its predecessor is the Ghana Railway Corporation.
- The Ghana Railway Development Authority was established in 2008 to administer railway assets. This authority is in charge of (i) promotion of development of railways and railways services, (ii) hold, administer and improve the railway assets and (iii) promotion of the development and management of sub-urban railways.

##### (3) Current Status of Railways

In the past, there was a daily railway passenger service between Ejisu and Kumasi, and Takoradi and Kumasi. Passenger service was also available between Kumasi and Accra. An interview with railway's Area Manager in Kumasi revealed that the only passenger lines still in operation are Accra - Tema and Accra - Nsawam.

The passenger line serving Kumasi - Accra stopped operating in 2004 and the freight line stopped much earlier. Passenger and freight services between Kumasi and Dunkwa ceased operation in 2007 and Dunkwa to Takoradi stopped operating in 2011.



Source: Photo by JICA Study Team, 2012

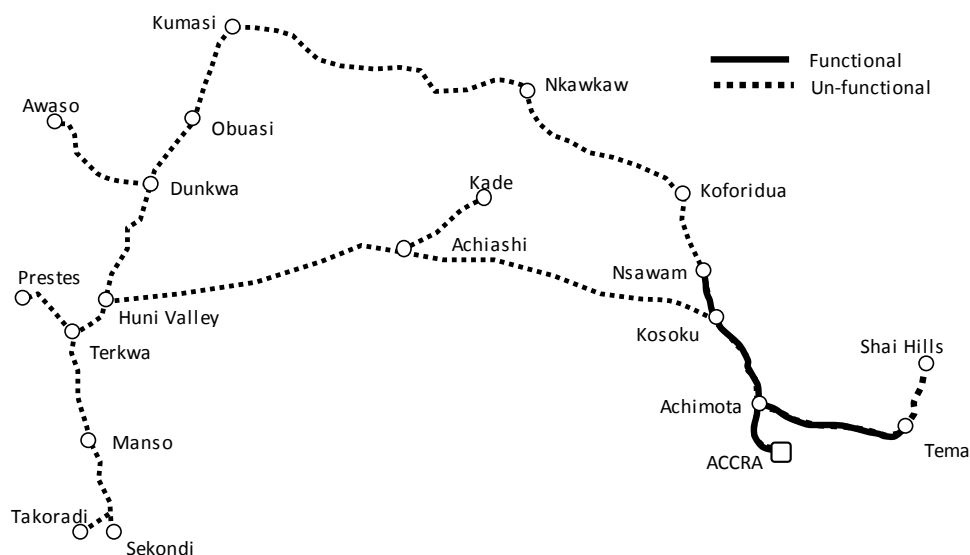
**Figure 4.1.16 Railway Terminal in Kumasi (left: condition of rail track, right: terminal building)**



According to the Area Manager, the authorities decided to stop train services due to concern for safety from lack of secure signaling and since many trains were running off the track. This frequent train derailment was caused by the very poor condition of the rail tracks or poorly-maintained vacuum brakes and running gear. As a result, the cost of repair was sometimes taking the entire fund generated by the operation. In the Western line, train services are primarily for freight and this operation required a much higher standard of maintenance. In short, train operation was stopped because it was not profitable according to the Area Manager. The condition of the rail tracks in Kumasi is shown in Figure 4.1.16 and the railway network of the country is presented in Figure 4.1.17.

The dilapidation of the tracks was largely due to lack of funds for maintenance. Also to blame was the lack of a systematic training program for personnel to keep trains running smoothly. The report prepared by the Kumasi Metropolitan Assembly entitled the “Development Plan for Kumasi Metropolitan (2010-2013)” mentioned the below.

“This collapse has been attributed partly to the obsolete nature and poor conditions of infrastructure facilities. Coupled with this problem that has led to the collapse of the Kumasi rail station are the poor maintenance culture and the insobriety of rail workers in the Metropolis.”



Source: Prepared by the JICA Study Team based on map from Ghana Railway Development Authority (<http://grda.gov.gh/>)

**Figure 4.1.17 Railway Network of Ghana**

#### **(4) Railway Rehabilitation Plan**

There appears to be a firm commitment by the government to rehabilitate the railway system based on the various accords and financing agreements between the government and other actors. As a first step in this direction, the government recently overhauled the management of the railways by separating asset management and operation services. Assets are supervised by the newly created authority, the Ghana Railway Development Authority, which was established in 2008 and operation is handled by Ghana Railway Company Limited. In the past, there was only a single entity responsible for the entire railway system, which was the Ghana Railway Corporation.

According to the interviewed Area Manager in Kumasi, the rehabilitation plan has been accelerated by the USD 500 million loan from the Government of China. This fund will be utilized to rehabilitate Takoradi - Kumasi railway line which includes replacement of obsolete tracks and

conversion of narrow gauge into standard gauge. Likewise, there are also plans to acquire new locomotives and coaches that fit the new standard gauge.

Realization of this project is critical support to mineral export in the Western Region. In the past, there were several train trips daily carrying mineral exports to Takoradi Harbour from Awaso carrying bauxite and from Nsuta carrying manganese ore. Likewise, this project is essential for successful operation of Bonakra Dry Port as discussed in the succeeding section.

#### 4.1.5 Sea Transport

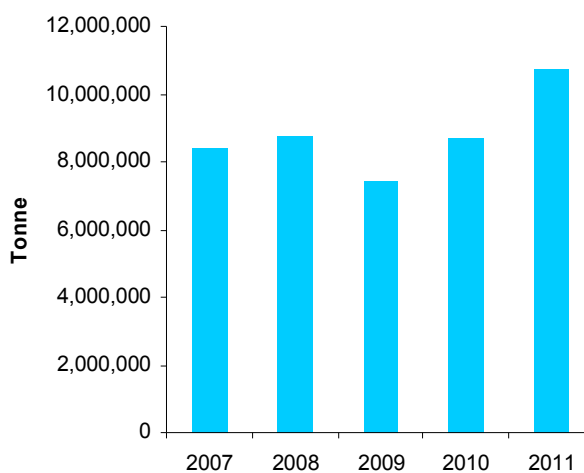
##### (1) Concerned Agencies for Sea Transport

The Ghana Ports and Harbors Authority (GPHA) is responsible for planning, building, managing, maintaining and operating the seaports of Ghana.

##### (2) Tema Port

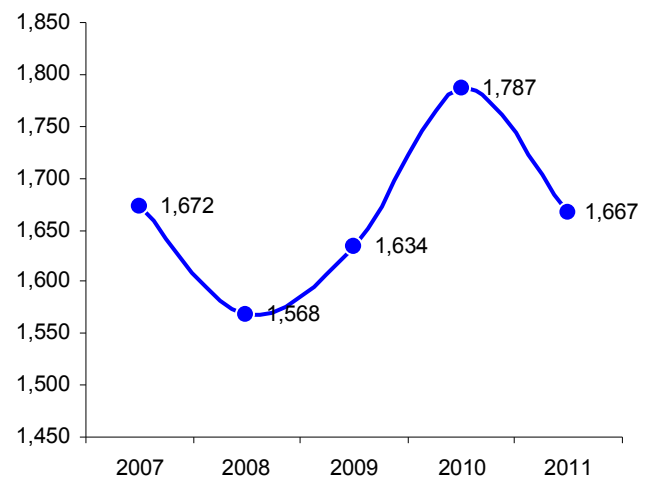
The Tema Port located near the capital Accra is the country's main gateway to international trade and the most important port for transit traffic to Sahelian landlocked countries. The port authority, GPHA, has invested to promote transit trade, conducted marketing campaigns in the landlocked countries and even opening an office in Burkina Faso. Likewise, it has also leased port land to landlocked countries to develop their own storage facilities, and has been building transit sheds and truck parking facilities.

The port recorded a steady growth of cargo traffic. In 2011, more than 10 million tonnes of cargo were recorded. This is the highest volume of cargo recorded for more than 10 years and testament to the growing important role of the facility not only for the country but also for the nearby landlocked countries like Burkina Faso, Niger and Mali. There are no significant changes to the number of vessel calls as presented in Figure 4.1.19.



Source: Ghana Ports and Harbours Authority, 2012, Tema Port Record

**Figure 4.1.18 Cargo Traffic at Tema Port**

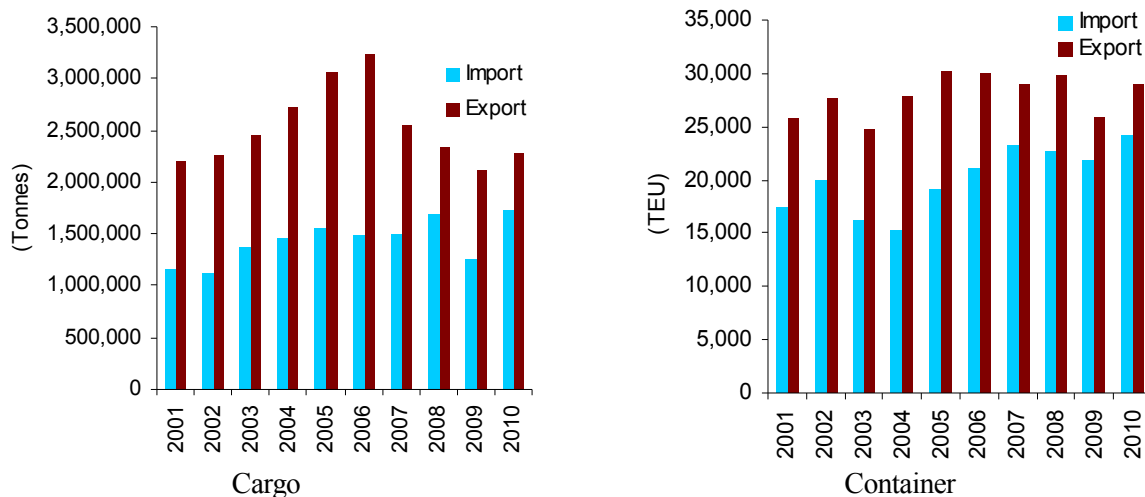


Source: Ghana Ports and Harbours Authority, 2012, Tema Port Record

**Figure 4.1.19 Number of Vessel Calls at Tema Port**

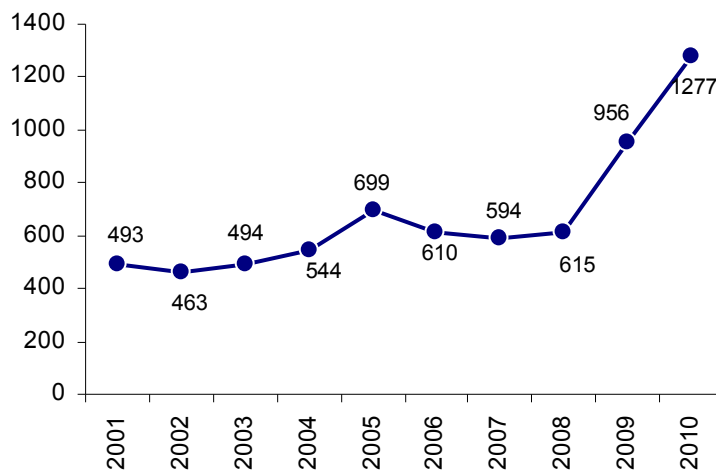
### (3) Takoradi Port

The Port of Takoradi located at the twin cities of Sekondi-Takoradi is an important transshipment area for Sahelian landlocked countries. Except in 2010 where there was a dip in cargo traffic to 3.4 million tonnes (total of import and export), cargo volume is at an average of 4.0 million tonnes for four years. Highest registered cargo volume was in 2006. Figure 4.1.20 presents the cargo traffic and container traffic. Container traffic also follows the trend in cargo traffic where there was an observed decrease of volume in 2010 (52,372 TEU in 2009, 47,828 TEU in 2010 and 53,041 TEU in 2011). On the other hand, the number of vessel calls continues to rise as shown in Figure 4.1.21.



Source: Ghana Ports and Harbors Authority, 2011, Takoradi Port Record

**Figure 4.1.20 Cargo and Container Traffic at Takoradi Port**



Source: Ghana Ports and Harbors Authority, 2011, Takoradi Port Record

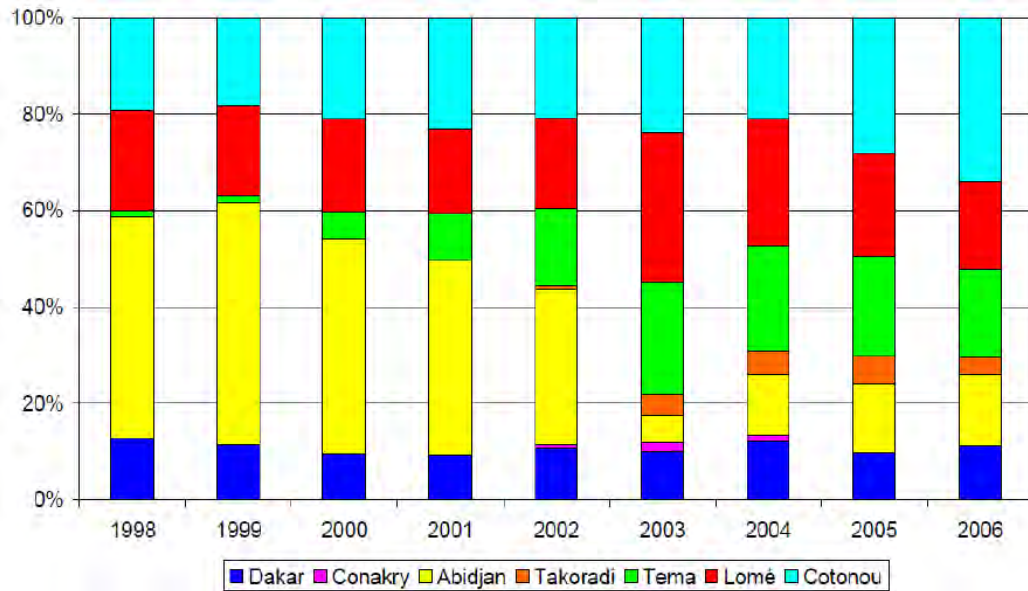
**Figure 4.1.21 Number of Vessel Calls at Takoradi Port**

### (4) Transit Traffic

The ports competing for transit traffic to the Sahelian landlocked countries include Dakar in Senegal, Conakry in Guinea, Abidjan in Côte d'Ivoire, Lomé in Togo, Cotonou in Benin, and Tema and Takoradi in Ghana. Figure 4.1.22 presents the distribution of the Sahelian transit traffic among

these ports.

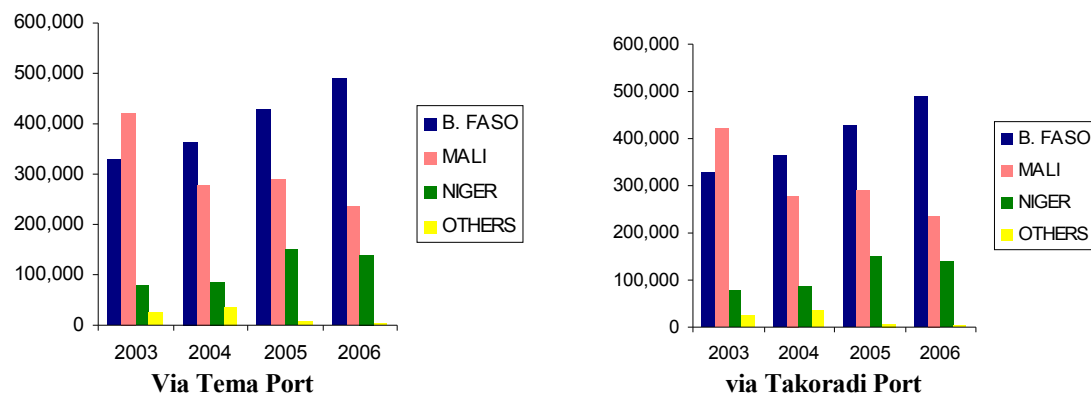
During the civil unrest in Côte d'Ivoire from 2002 to 2004, when road and rail transport was interrupted, significant transit traffic was diverted to other ports, particularly to Lomé and Tema. Since security has improved in Côte d'Ivoire, some of the traffic diverted to Tema, however, has returned to Abidjan.



Source: West African Road Transport and Transit Facilitation Strategy, ECOWAS& UEMOA, Zerelli et al, 2008

**Figure 4.1.22 Distribution of Transit Traffic among Ports**

The countries of destination of transit traffic in the two ports are shown in Figure 4.1.23. Transit cargoes to Burkina Faso have the highest number for both ports followed by Mali and Niger.



Source: Zerelli et al, (ECOWAS), 2008, West African Road Transport and Transit Facilitation Strategy

**Figure 4.1.23 Traffic Volume and Transit Destination of Ports in Ghana**

## 4.1.6 Air Transport

### (1) Concerned Agencies for Air Transport

#### 1) Ghana Airport Company Limited (GACL)

Established in 2006, the GACL is responsible for planning, development, management and

maintenance of all public airports / airstrips in Ghana.

## 2) Ghana Civil Aviation Authority (GCAA)

The Ghana Civil Aviation Authority (GCAA) is the regulatory agency of the Republic of Ghana for air transportation in the country.

## 3) Air Navigation Service

GCAA also provides air navigation services within the Accra Flight Information Region (FIR), which comprises the airspace over the Republics of Ghana, Togo and Benin and a large area over the Atlantic Ocean in the Gulf of Guinea.

## (2) Air Transport Service Routes

Kumasi has one airport located in Manhyia. It serves two domestic routes which are Kumasi - Accra and Kumasi - Sunyani as shown in the table below. Presently, there are four private airline companies operating domestic passenger services for people traveling to and from Kumasi. International flight is not yet available. Work to get passenger and freight data of the airport is currently underway.

The report prepared by the Kumasi Metropolitan Assembly entitled the “Development Plan for Kumasi Metropolitan (2010-2013)” enumerated some of the problems encountered by the airport.

- Failure to upgrade its facilities. This has deprived the facility the opportunity to expand its operation which could increase the level of accessibility to Kumasi via air.
- Encroachment on the airport lands by private residential properties is another problem that has bedeviled the facility.

**Table 4.1.12 Names of Airlines Operating in Kumasi and their Routes**

Airline Name	Frequency	Fare (Cedi)	Origin – Destination
Antrak	Daily	93	Kumasi – Accra
	Monday to Friday	40	Kumasi - Sunyani
Citilink	Daily	193	Kumasi – Accra
Fly 540	Daily	100	Kumasi – Accra
Starbow	Daily	115	Kumasi – Accra

Source: Antrak Air ([www.antrakair.com](http://www.antrakair.com)), City link, Fly 540, Starbow, viewed in August 2013

## (3) Kumasi Airport Improvement Projects

The objective for investing in the Kumasi Airport is to provide a more effective mode of transportation for connecting directly to the second largest city of Ghana. This will enhance the economic viability of Kumasi and its environs in the Ashanti Region where Kumasi Airport is located. Kumasi airport has a 1,981-meter runway and serves domestic carriers- Antrak, CTK and Starbow. Recently, the terminal building and fire station were rehabilitated and a new VIP lounge constructed. However, major outstanding works include resurfacing of the runway and installation of runway lights to facilitate night operations. A total amount of 173 million US Dollars have been budgeted for the rehabilitation works.

The New Kumasi International Airport Project also has been planned in 2006. The Ghana Civil

Aviation Authority (GCAA) has acquired 6516 hectares of land at Ankaase and Kwaman in the Ashanti Region to construct the country's second international airport. The project is to be financed by the private sector under a Build-Operate-Transfer (BOT) system and is expected to begin within the next six years. A public forum on the project's master plan studies was held in Kumasi in February 2006 to provide an opportunity for people to express their views and make suggestions on the project. The new airport has become necessary due to the inability to develop, extend or improve on the existing aerodrome in Kumasi as a result of the topography and urban structures within the vicinity.

## **4.2 Review of Past and Existing Development Plans and Projects for the Transport Sector**

There are several useful transportation-related studies currently being conducted for Kumasi and surrounding areas. A review of these studies was carried out to identify available useful data, policy directions in the sector, and findings which could aid in shaping the plan for the sector under this study. In particular, the following studies were found to be very relevant:

- Integrated Transport Plan for Ghana
- Urban and Transport Planning and Traffic Management Studies for Kumasi and Tamale
- Traffic Data Collection (Kumasi and Obuasi)
- Transport Plans for Kumasi

### **4.2.1 Integrated Transport Plan for Ghana**

#### **(1) Brief Background and Objective**

This study, completed in June 2010 and financed by the 9th European Development Fund, is the first in Ghana to utilize an integrated economic and transport planning methodology to identify investment priorities based on the future demand for transport. It covers all modes of transportation, i.e. road, rail, waterway, port, dry port and airport. The Plan aims to support the Government's strategy-lead approach to development planning. As a background, the Government has identified the importance of the transport sector in providing strategic support to the productive sectors of the economy and the measures set out in this Plan aim to support the attainment of the National Transport Plan (NTP) Goals. It, therefore, becomes the primary implementation plan for the transport sector and it is hoped that the Plan will inform Government's budgetary allocations to the sector from 2011 onwards.

There are three main outputs from the process undertaken:

- Integrated Transport Plan – proposing a range of infrastructure developments, and institutional and regulatory measures aimed at improving the effectiveness of Ghana's transport system. Investments in infrastructure have been prioritized for the plan period and targeted at locations to overcome capacity constraints and where economic viability has been proven.
- Decision making tools and procedures to carry out the forecasting, modeling and evaluation necessary to implement a strategy-led approach to transport planning; identifying strategic investments and measures that inculcate a more integrated approach to policy formulation, planning and delivery.
- Knowledge and understanding of how the transport planning framework needs to be changed and improved with recommendations.

**(2) Output**

**a) Projects Identified by Multi-Criteria Analysis**

The evaluation process is aimed at showing whether the proposed projects, based upon the model outcome, are viable or not. The model was developed using CUBE software. CUBE is a very flexible and complete suite of modules dedicated to transport modeling. The network analysis and the transport model calibration are based on GIS for 2008 provided by Ghana Highway Authority (GHA). It integrates data regarding the roads as well as the rail links and stations and airports. Since the first year of the project evaluation was defined as 2015 (considering that this would be the first year of operation for new projects), the “without project situation” should not be the network today, but what the network will be in 2015, integrating all the on-going and planned activities. Identification of which projects to integrate into the network was done in collaboration with the government transport agencies.

The following projects shown in the table below were the outcome of the model and were then subjected to multi-criteria analysis. They have been chosen on the basis of the comparison of the forecast demand and the current capacity. Network sections with potential capacity problems are included as potential projects.

**Table 4.2.1 List of Projects Included in the Evaluation**

No	Route	Length (km)	Transport Mode	Nature of Works	Type of Work in the Scenario
1	N1 Aflao - Tema	170.0	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
2	N1 Tema - Accra	21.0	Road	Road Capacity & Conditions Improvement	Widening Adding 4 Lanes
3	N1 Tema - Accra	21.0	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
4	N1 Accra - Kasoa	17.1	Road	Road Capacity & Conditions Improvement	Widening Adding 4 Lanes
5	N1 Accra - Kasoa	17.1	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
6	N1 Kasoa - Jct N8	104.8	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
7	N1 Jct N8 - Takoradi	87.5	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
8	R28 Sogakope - Ho	86.6	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
9	N5 (all of it)	48.4	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
10	N2 Jct N1 - Asikuma Nkwanta (Jct N5)	90.9	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
11	N2 Asikuma Nkwanta (Jct N5) - Hohoe	126.6	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
12	N4 Jct N1 - Kukurantumi Jct	120.2	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
13	N6 Apedwa - Kukurantumi Jct	22.3	Road	Road Capacity & Conditions Improvement	Widening Adding 2 lanes
14	N6 Accra - Kukurantumi Jct	87.8	Road	Road Capacity & Conditions Improvement	Widening Adding 4 Lanes
15	N6 Kukurantumi Jct - Kumasi	153.5	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
16	N6 Kumasi - Berekum	211.5	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
17	N10 Kumasi - Paga	577.5	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
18	N10 Takoradi - Kumasi	201.7	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes

No	Route	Length (km)	Transport Mode	Nature of Works	Type of Work in the Scenario
19	N8 (all of it)	184.3	Road	Road Capacity & Conditions Improvement	Widening Adding 2 Lanes
20	N12 Elubo- Hamile	593.7	Road	Road Conditions Improvement	Upgrading / Reconstruction 2 Lanes
21	N2 Hohoe - Kulungugu	475.8	Road	Road Conditions Improvement	Upgrading / Reconstruction 2 Lanes
22	N13/N11 Lawra - Pulimakomo	335.1	Road	Road Conditions Improvement	Upgrading Reconstruction 2 Lanes
23	Tema - Kumasi	303.9	Rail	Upgrade	
24	Aflao - Tema	150.0	Rail	New Construction	
25	Accra - Takoradi	112.0	Rail	New Construction	
26	Kumasi - Paga	617.8	Rail	New Construction	

Source: Egis Bceom International, 2010, Integrated Transport Plan for Ghana, MoFEP

The economic analysis of the projects takes into account, explicitly or implicitly, a number of parameters such as:

- the population and the type and level of economic activities in the project's zone of influence (through the demand analysis and traffic projections);
- the transport costs (e.g. vehicle operating costs); and
- the investment and recurrent maintenance costs.

The projects identified as economically viable and with their optimal year for beginning operation during this plan period are presented in the table below:

**Table 4.2.2 Economically Viable Projects**

Section	Sector	Length	Main Works	NPV / Disc. Inv.	Multi-criteria Score	Optimum Year
1. N1 Aflao - Tema	Road	170.0	Widening Adding 2 Lanes	0.66	7.18	2015
2. N1 Tema - Accra	Road	21.0	Widening Adding 2 Lanes	0.62	5.64	2018
3. N1 Accra - Kasoa	Road	17.1	Widening Adding 2 Lanes	0.43	5.20	2017
4. N1 Kasoa - Jct N8	Road	104.8	Widening Adding 2 Lanes	0.31	6.12	2017
5. N2 Asikuma Nkwanta (Jct N5) - Hohoe	Road	126.6	Widening Adding 2 Lanes	0.20	5.34	2016
6. N4 Jct N1 - Kukurantumi Jct	Road	120.2	Widening Adding 2 Lanes	0.60	6.16	2015
7. N6 Apedwa - Kukurantumi Jct	Road	22.3	Widening Adding 2 Lanes	1.61	7.34	2015
8. N6 Kukurantumi Jct - Kumasi	Road	153.5	Widening Adding 2 Lanes	0.20	4.90	2019
9. Eastern Rail Line (Tema - Kumasi)	Rail	303.9	Construction / Rehabilitation	0.15	5.72	2016

Source: Ministry of Finance and Economic Planning, 2010, Integrated Transport Plan for Ghana

Of the nine recommended projects, two particular projects, i.e. projects 8 and 9, would have substantial impact on the transportation services of Kumasi City and surrounding areas.

The study also found that the construction of the Boankra Dry Port can be financially viable with a relatively modest traffic diversion from the road. The analysis shows that while environmental impacts are foreseen, they can be minimized and a number of social benefits can be generated by the project. The said study recommended that a comprehensive feasibility study of the dry port should be carried out. However, the report highlights that the construction of a dry port near Kumasi should only be envisaged once definite decisions have been taken in order to rehabilitate -- reconstruct the railway lines between Kumasi and Ghanaian seaports (Tema and Takoradi).



## **4.2.2 Urban Transport Planning and Traffic Management Studies for Kumasi and Tamale (2005)**

### **(1) Brief Background**

This study, financed by the Agence Francaise de Development (AFD) of France, was started in October 2003 and completed in February 2005. The counterpart is the Ministry of Roads and Highways, through its Department of Urban Roads (DUR), which has a mission to assist the Metropolitan, Municipal and District Assemblies in developing their capacity to provide quality service for the safe movement of people and goods within the cities. One of the objectives of this mission is develop and update transport plans for each of the cities under DUR's jurisdiction every five years. This study (Urban Transport Planning and Traffic Management Studies for the cities of Kumasi and Tamale) was carried out as assistance to DUR to fulfill its mission. The study is part of the Road Sector Development Program.

The study provides information and tools to assist in the decision making process aimed at implementing, in the short, medium and long-terms, integral solutions to the urban transport deficiencies of Kumasi Metropolitan Area and Tamale Municipal Area.

### **(2) Objectives**

The three main objectives of the study are:

- Agree on a set of medium to long-range transport policy objectives;
- Recommend measures (public transport, traffic management and infrastructure development) to meet these objectives; and
- Draw up five and ten year investment plans.

### **(3) Output**

The final report of the study is comprised of the following three volumes: Volume 1: Overview Report, Volume 2: Kumasi Report, and Volume 3: Tamale Report. Volume 2 documents the results for the Kumasi Metropolitan Assembly. The following were prepared in Volume 2.

#### **1) Transport Plans**

This section presents the medium and long-term transport plan proposals. It describes the transport demand features of KMA; presents the transport model and future demand and supply scenarios developed for KMA; and presents the transport plan proposals.

In preparing the plan, two main scenarios were considered which are (i) Road Expansion and (ii) Public Transport Scenario.

##### **a) Scenario 0 - Base**

This scenario does not include the projects. It is the Base Scenario, with which all other scenarios are compared.

##### **b) Scenario 1 - Road Expansion Scenario**

This scenario continues to apply traffic management measures and construct new road capacity. In this scenario, public transport services would continue to be delivered by small-scale private

operators, maintaining service on existing roads.

**c) Scenario 2 - Public Transport Scenario**

In this second scenario, traffic management measures are continued, but new road capacity is reduced, focusing on missing links and new links to newly developed areas, rather than expanding existing links. To meet demand, public transport services are reorganized in higher-capacity buses. Dedicated facilities for public transport would be identified for corridors with high public transport demand and space availability

**d) Simulation Results of the Scenarios**

- Scenario 1 will bring improvement to transport conditions compared with doing nothing, but it will not be sufficient to reverse the deteriorating transport conditions.
- Scenario 2 will bring more positive impacts than Scenario 1, however, it is not sufficient to avoid urban sprawl and gridlock congestion, or to reverse the deteriorating transport conditions. At the end, more than only public transport improvement needs to be done.
- The study recommended the adaptation of combining Scenario 1 and Scenario 2. This scenario would reduce the total PCU hours in 2024 to less than a third when compared with the Base Scenario and to less than half when compared with Scenario 1. The PCU-km would also be reduced by almost 20% and more than 25% respectively. The total performance of the transport system would also be improved; increasing the average system speed to 15 km/h. The table below shows the summary.

**Table 4.2.3 Summary of Simulation Results**

Scenario	Total PCU Hour			Total PCU-Km			Km/h		
	2004	2014	2024	2004	2014	2024	2004	2014	2024
Scenario 0 – Base	10,053	41,706	112,622	193,032	308,185	448,078	19	7	4
Scenario 1 – Road Expansion	6,845	21,090	67,154	193,204	331,882	506,525	28	16	8
Scenario 2 – Public Transport	4,855	11,042	37,074	160,428	247,420	394,979	33	22	11
Scenario 3 – Road Expansion + Public Transport	3,702	8,807	25,450	138,510	229,725	372,673	37	26	15

**2) Traffic Management and Improvement Plans**

This section presents the traffic management and improvement program proposals. It provides a proposal for road classification for KMA; identifies road bottlenecks; identifies traffic issues in the Central Business District and Kejetia areas and proposes remedial actions; determines accident prone and conflictive spots in the road network; and presents cost effective traffic management and improvement plan proposals.

**3) Pre-Feasibility Assessment of Projects and Programs**

Economic, socio-economic and environmental evaluation of the selected projects was carried out. The economic evaluation of selected projects is divided into three sections:

- Analysis of medium and long terms of link (widening of roads or new roads) projects;
- Analysis of proposed public transport improvements; and
- Analysis of intersection improvements (traffic management proposals)

#### **4) Investment Program**

The study has prepared five-year (2005-2009) and ten-year (2005-2014) investment programs. For the ten-year period (2005 - 2014), a total of over US\$267.3 million are required, US\$150.8 million in 2005-2009 and US\$116.5 million in 2010-2014. The study proposed distribution of investment, by the main programs, as follows.

- Traffic Management 4.5%
- Minor Rehabilitation and Reconstruction 22.5%
- Major Rehabilitation and Upgrading 33.5%
- Public Transport Support 39.5%

#### **5) Progress of the Recommended Projects**

The WB-assisted study made a review of the progress on implementation of the recommended projects. The following were their findings:

- The proposals to limit and control on street parking and increase the availability of off-street parking within Kumasi have been taken on board by KMA, and controls have been applied, leading to observable improvements.
- The Asafo Market - UTC Interchange was completed and opened to traffic in 2008. This has removed the bottleneck that existed then and reduced congestion here considerably.
- Construction of the Eastern Bypass and Widening of Lake Road. Large scale road building is underway on this alignment. When complete, this will provide a means of bypassing the city centre to the south-eastern side of the City and in doing so, alleviate the congestion on the city centre radials and the western bypass.
- Widening of Sunyani Road. Similar massive road upgrading is also progressing along this corridor. This, when completed, will improve the capacity of the road.
- Kumasi outer Ring Road project. A feasibility study was conducted under the supervision of Department of Urban Roads. The Study Team is still making an effort to get a copy of the report.

#### **6) Recommended projects but not yet implemented**

- Widening of Western Bypass to 4 lanes in certain sections
- Widening of southern Bypass to 4 lanes in certain sections
- Widening of Lake Road to 4 lanes (Phase 2)
- Widening of Mampong Road to 4 lanes in certain sections
- Widening of Harper Road to 4 lanes from Ahodwo RB to Prempeh I Street
- Widening of New Bekwai Road to 4 lanes from Santasi RB to Bekwai RB
- Widening of Old Bekwai Road to 4 lanes from Ahodwo RB to Daban
- Widening of Antoa Road to 4 lanes from Airport RB to Buokrom estate
- New link connection of Lake Road and Century Hall Road, 4 lanes
- New link Old Bekwai Road and New Bekwai Road, 2 lanes
- New Outer Ring Road (see below)
- Yaa Asantewaa Road widening to 4 lanes in certain sections
- Bantama Road widening to 6 lanes in certain sections
- Eastern bypass widening to 6 lanes in certain sections

- Offinso Road widening to 6 lanes from Suame RB to New Magazine Road
- Kwadaso Road widening to 4 lanes from Sunyani Rd to Ohwimase Road
- Maxwell Road and Zongo Rd widening to 4 lanes
- Guggisberg Road widening to 4 lanes
- Government Road widening to 4 lanes

### **4.2.3 Transport Plan for Kumasi (WB Assistance Study Project)**

#### **(1) Brief Background**

This study is expected to be completed in April 2012 with WB finance. The study area is the Greater Kumasi area, and the core city, KMA is the second largest city in Ghana with an urban sprawl into its neighboring municipalities and districts. The population in KMA is currently estimated around 2 million, growing at a rate of 5.2% per annum. The day time population is however estimated at 2.5 million. This indicates a fast growing city with massive day time influx for commerce and business from the neighboring Assemblies. These Assemblies include: Ejisu Juaben Municipality Assembly (EJMA); Kwabre East District Assembly (KEDA); Atwima Nwabeagya District Assembly (ANDA); and Atwima Kwawoma District Assembly (AKDA).

Travel in Kumasi for daily activities is associated with congestion, especially during the morning and evening peak periods. The last transport planning report prepared for the city in 2004 concluded that most of the major arterials were congested and this would not improve even if all the major routes were expanded. The recommendation was for a shift to mass movement modes coupled with improved regulations, to be implemented in the city.

The Government of Ghana is implementing the UTP (Urban Transport Planning Project) with the overarching objectives of improving urban passenger mobility, and reducing the emission of transport related greenhouse gases in eight assemblies in the Greater Accra Region; and in KMA and the adjacent Ejusu Juaben Municipal area. The five components of the project focus on: developing the institutional and regulatory framework for urban passenger transportation; improving traffic management; developing a pilot Bus Rapid Transit (BRT) operation along the CBD to Kasoa corridor in Accra; improving coordination between transportation and land use management; and monitoring and evaluation of project outcomes. Transport Plans for Kumasi form part of the UTP.

#### **(2) Objectives**

The main objective of the study is to prepare a comprehensive transportation plan for the city of Kumasi which is complementary to the vision of the city, appropriate in its scale and recommendations and realistically achievable within the constraints faced. The specific objectives of the study are to:

- Review the 2005 Urban Transport Planning and Traffic Management Study for Kumasi;
- Undertake a socio-economic assessment of urban travel in Kumasi;
- Prepare a medium to long range transport plan for Kumasi; and
- Prepare a five year urban transport strategic action plan for Kumasi.

#### **(3) Outputs**

The study is now in the final phase and the draft final report is expected to be produced within April

2012. Based on the latest report, February 2012, produced by the consultant and documents obtained during their 6th Steering Committee Meeting in March 23, the following were recommended (Type B is an initial code by the WB Team for bus public transport which operates in mixed traffic):

- 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 implementation schedule and cost of each measure is shown in Table 4.2.4. Implementation schedules for the Highway Scheme are presented in Table 4.2.5. Implementations of other measures are shown in Table 4.2.6 and

Table 4.2.7.

**Table 4.2.4 Timeline for Implementation**

No.	Measures	\$M in 2010 Prices	Short Term (by 2016)	Medium Term (by 2021)	Long Term (by 2031)
1	Widening of Western Bypass to 4 lanes in certain sections	5.59			
2	Widening of Southern Bypass to 4 lanes in certain sections	6.89			
3	Widening of Lake Rd to 4 lanes (Phase 2)	5.56			
4	Widening of Mampong Rd to 4 lanes in certain sections	9.03			
5	Widening of Harper Rd to 4 lanes from Ahodwo RB to Prempeh I St	3.61			
6	Widening of New Bekwai Rd to 4 lanes from Santasi RB to Bekwai RB	4.61			
7	Widening of Old Bekwai Rd to 4 lanes from Ahodwo RB to Daban	5.43			
8	Widening of Antoa Rd to 4 lanes from Airport RB to Buokrom Estate	8.21			
9	New link connection of Lake Rd and Century Hall Rd, 4 lanes	0.82			
10	New link Old Bekwai Rd and New Bekwai Rd, 2 lanes	4.61			
11	New Outer Ring Rd	150.00*			
12	Yaa Asantewaa Rd widening to 4 lanes in certain sections	2.46			
13	Bantama Rd widening to 6 lanes in certain sections	0.66			
14	Eastern Bypass widening to 6 lanes in certain sections	3.29			
15	Offinso Rd widening to 6 lanes from Suame RB to New Magazine Rd	5.43			
16	Kwadaso Rd widening to 4 lanes from Sunyani Rd to Ohwimase Rd	2.14			
17	Maxwell Rd and Zongo Rd widening to 4 lanes	1.64			
18	Guggisberg Rd widening to 4 lanes	1.64			
19	Government Rd widening to 4 lanes	1.48			
20	Signal optimization – Zoo junction				
21	Signal optimization – Abrepo junction				
22	Signal optimization – Kroform junction				
23	Signal optimization – Top High junction				
24	Signal optimization – Anloga junction				
P1	Antoa Road Type B Routes	32.3			
P2	Mampong Road Type B Routes				
P3	Offinso Road B Routes				
P4	Abrepo Road B Routes				
P5	Sunyani Road B Routes				
P6	Bekwai Road B Routes				
P7	Old Bekwai B Routes				

No.	Measures	\$M in 2010 Prices	Short Term (by 2016)	Medium Term (by 2021)	Long Term (by 2031)
P8	Lake Road B Routes				
P9	Accra Road B Routes				
P10	Orbital Route Type B Route				
P11	Interchange Hubs				
P12	Park & Ride (7 sites)	4.9			
P13	BRT Mampong Road	135.9			
P14	BRT Offinso Road				
P15	BRT Sunyani Road				
P16	BRT Bekwai Road				
P17	BRT Accra Road				

Note 1: \*Indicative cost since alignment is not determined

Note 2: Not in the table but recommended by the study is the “Sustainable Transit Corridor” with the cost of 1.6 \$M

**Table 4.2.5 Implementation Programme for Highway Scheme**

No.	Measure	2012	2013	2014	2015	2016
1	Widening of Western Bypass to 4 lanes in certain sections	DD	CS			
2	Widening of southern Bypass to 4 lanes in certain sections	DD	CS			
3	Widening of Lake Road to 4 lanes (Phase 2)	DD	CS			
4	Widening of Mampong Road to 4 lanes in certain sections	DD	CS			
5	Widening of Harper Road to 4 lanes from Ahodwo RB to Prempeh I Street	DD	CS	CS		
6	Widening of New Bekwai Road to 4 lanes from Santasi RB to Bekwai RB		DD	CS		
7	Widening of Old Bekwai Road to 4 lanes from Ahodwo RB to Daban				DD	CS
8	Widening of Antoa Road to 4 lanes from Airport RB to Buokrom estate				DD	CS
9	New link connection of Lake Road and Century Hall Road, 4 lanes					
10	New link Old Bekwai Road and New Bekwai Road, 2 lanes					
11	New Outer Ring Road					DD
12	Yaa Asantewaa Rd widening to 4 lanes in certain sections					DD
13	Bantama Road widening to 6 lanes in certain sections			DD	CS	
14	Eastern bypass widening to 6 lanes in certain sections					
15	Offinso Road widening to 6 lanes from Suame RB to New Magazine Rd					
16	Kwadaso Road widening to 4 lanes from Sunyani Rd to Ohwimase Road				DD	CS
17	Maxwell Rd and Zongo Rd widening to 4 lanes		DD	CS		
18	Guggisberg Road widening to 4 lanes		DD	CS		
19	Government Road widening to 4 lanes		DD	CS		

Source: World Bank, 2012, Transport Plan for Kumasi

Note: DD – Detailed Engineering Design Study; CS- Construction begins

**Table 4.2.6 Implementation Programme for Junction Signalization Scheme**

No.	Measure	2012	2013	2014	2015	2016
20	Signal optimization – Zoo junction	Review modeling; Further investigation if required; Effect Changes; Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact
		DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants
21	Signal optimization – Abrepo junction	Review modeling, Further investigation if required Effect Changes Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact

		DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants
22	Signal optimization – Kroform junction	Review modeling, Further investigation if required Effect Changes Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact
		DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants
23	Signal optimization – Top High junction	Review modeling, Further investigation if required Effect Changes Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact
		DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants
24	Signal optimization – Anloga junction	Review modeling, Further investigation if required Effect Changes Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact	Review and monitoring of impact
		DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants	DUR / gKMA / Traffic Management Consultants

Source : World Bank, 2012, Transport Plan for Kumasi

**Table 4.2.7 Implementation Programme for Type B Transit Routes Scheme**

No.	Measure	2012	2013	2014	2015	2016
P1	Antoa Rd Type B Routes	Engagement with operators; Detailed design of infrastructure measures; Identification of land for Depot	Completion of infrastructure; Construction of depot; Issuing of Type B Permits; Commence Operation			
P2	Mamong Rd Type B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P3	Offinso Rd B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P4	Abrepo Rd B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P5	Sunyani Rd B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P6	Bekwai Rd B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P7	Old Bekwai B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes	Commence Operation	
P8	Lake Rd B Routes		Feasibility design work on priority infrastructure	Engagement with operators on the issuing of Type B permits for these routes		

Source: World Bank. 2012, Transport Plan for Kumasi

Note: Type B is an initial code by the WB Team for bus public transport which operate in mixed traffic

## 4.2.4 Traffic Data Collection (Kumasi and Obuasi)

### (1) Brief Background

This study was completed in 2010 with AFD assistance. In this study, the Department of Urban Roads (DUR) has a mission to assist the MMDAs in developing their capacity to provide quality services for the safe movement of people and goods within the cities.

The DUR through the Planning Division has been undertaking classified Traffic Volume Counts periodically to grasp traffic volume in the road network of their respective areas. In this survey, the DUR tapped the services of Goal Associates, Ltd. Consultant.

### (2) Objectives

The main objectives are to obtain traffic volume as well as vehicle classification counts on Urban Roads in the Kumasi Metropolitan and Obuasi Municipal areas.

### (3) Output

Table 4.2.8 shows the count type, survey location and average daily traffic (24-hrs) per location. This number is reflected in the road network map together with other data collected by other studies such as the Transport Plan for Kumasi.

**Table 4.2.8 Count Location and Average Traffic Volume**

Unit: vehicles

Count No.	Count Type	Station ID	Road Section	Counting Location	Ave. Daily Traffic
1	24 hr (7 days)	MCS-1	24th February Road	Asafo Market Area	31,824
2	24 hr (7 days)	MCS-2	Maxwell Road	Prempeh Assembly Halla	14,929
3	24 hr (7 days)	MCS-3	Western By-Pass	Abrepoh (Shell Filling Station)	46,022
4	24 hr (7 days)	MCS-4	Odumase Road	St. Louis JSS	17,727
5	13 hrs (3 days)	NCS-I-1	Fuller Road	Simple Mans Art	32,172
6	13 hrs (3 days)	NCS-I-2	Mampong Road	Wesley College	19,998
7	13 hrs (3 days)	NCS-I-3	Sunyani Road	SSNIT Flat	25,458
8	13 hrs (3 days)	NCS-I-4	Haper Road	Behind Golden Tulip	22,797
9	13 hrs (2 days)	NCS-II-1	Offinso Road	Suame Post Office	24,269
10	13 hrs (2 days)	NCS-II-2	Okomfo Anokye Road	Plaza Hotel	30,396
11	13 hrs (2 days)	NCS-II-3	Boadi-Ayiduase Road	Tech Swimming Pool	10,833
12	13 hrs (2 days)	NCS-II-4	Nhyiaseso Road	Happy Int Sch	12,263
13	13 hrs (2 days)	NCS-II-5	Obuasi Road	Sarfo Hotel	27,453
14	13 hrs (2 days)	NCS-II-6	Southern By-Pass	British Embassy	18,327
15	13 hrs (2 days)	NCS-II-7	Lake Road	LLL	19,160
16	13 hrs (2 days)	NCS-II-8	Denchemusuo Road	St. Peters	12,848
17	13 hrs (2 days)	NCS-II-9	Nyankyerenease Road	Nyenkyenase Township	5,718
18	13 hrs (2 days)	NCS-II-10	Agric Road	Wamasi Jin	10,719
19	13 hrs (2 days)	NCS-II-11	Antoa Road	Obinim Church	14,816
20	13 hrs (2 days)	NCS-II-12	Yaa Asantewaa Road	Briginia Spot	8,666
21	13 hrs (2 days)	NCS-II-13	Barekese Road	County Hospital	13,397
22	13 hrs (2 days)	NCS-II-14	Antoa Road	Manhyia Hospital	17,205
23	13 hrs (2 days)	NCS-II-15	Fuller Road	Statue	25,433
24	13 hrs (2 days)	NCS-II-16	Hudson Road	Ash FM	16,907
25	13 hrs (2 days)	NCS-II-17	Western By-Pass	Brotherman Spot	17,457
26	13 hrs (2 days)	NCS-II-18	24th February Road	Susuanso	43,403

Source: Department of Urban Roads, 2010, Traffic Survey on Urban Roads in Kumasi and Obuasi

Note: the count type 13 hrs (6:00 to 18:00) survey date was in November 2009.





Source: DUR, 2010, Traffic Survey on Urban Roads in Kumasi and Obuasi Unit: vehicles

**Figure 4.2.1 Traffic Count Locations and Average Traffic Volume**

## 4.3 Issues in the Transport Sector

### 4.3.1 Traffic within CBD

The Central Business District (CBD) of KMA covers the land area including the Central Market, Adum, the Asafo Market and its lorry park, the Kejetia Lorry Park, the National Cultural Centre, and the Post Office/Ministry Area. The Central Market and the Kejetia Lorry Park constitute the heart of the CBD and together they generate huge amounts of traffic that traverse not only beyond the Metropolitan area but the region as well. Recent studies allude to the fact that more than half of all trips undertaken in Kumasi end at Kejetia.

The CBD is characterized by too many taxis and too few large buses. For example, cars and taxis together form about 70% of the traffic mix, yet they account for less than 30% of all person trips. In comparison, though trotro / light buses and heavy buses together constitute about 23% of the traffic mix, they cater for about 62% of all person trips to and from the CBD.

There is, therefore, the general uneconomic use of road space by low occupancy vehicles (LOVs) in the transportation of persons to and from the CBD and this significantly contributes to the high traffic congestion levels in the CBD. Over 90% of the traffic in Kumasi is made up of taxis, private cars and mini-buses / trotro. Pedestrian-vehicular conflicts are high within the CBD, producing in their wake a large number of pedestrian accidents and severe traffic congestion. Long vehicular queues at intersections are common place during the peak traffic periods of the day. These are exemplified at the Asafo Market Roundabout area along the Accra Road, the UTC Overhead Bridge, the Museum Junction, KMA Junction and Bantama Junction near the Zoo.

Parking demand within the CBD far exceeds supply leading to indiscriminate parking unlike the Prempeh II Street at Adum where most vehicles are seen parked in an orderly manner, there is the general uncontrolled on-street parking on most of the roads around the Central Market along the

Fuller Road in front of the market and along Odumasi Road at Alabar. Since June 2006 parking within the Adum CBD is regulated and fees are charged three thousand cedis (¢3,000.00) on an hourly basis from 7.00 am to 6.00 pm

### **4.3.2 Surrounding Area Outside CBD**

The traffic and transportation situation outside the CBD is completely different from within the CBD. Generally, the road network outside the CBD is characterized by missing road links, badly deteriorated paved local roads, lack of interconnecting road links imposed by major streams, intersection capacity restraints and lack of an outer by-pass to take extraneous and through traffic away from the city centre so as to reduce congestion and improve traffic operations within Kumasi.

Most of the local paved roads in the suburbs such as Old Amakom, North and South Suntreso, Asawase, Suame and the like, have badly deteriorated simply because the roads have exceeded their physical and economic life spans and also because there has been a general lack of systematic maintenance of such roads. Recent traffic studies carried out by the Building and Road Research Institute (BRRI) for the Department of Urban Roads (DUR) gave credence to the rather high peak-hour traffic flows on road links and intersections outside the CBD.

### **4.3.3 New Residential Areas**

The road and traffic conditions in most of the new residential areas in Kumasi such as Atimatim, Buokrom, Odeneho Kwadaso, TUC, and Pankrono Estate are generally poor. The road networks have not been engineered and are characterized by badly deteriorated unpaved roads and poor drainage conditions. Although traffic is generally light on these roads, the travel speeds are unacceptably low (i.e. less than 10 km/hr), stemming from the poor nature of the roads. The riding surface is usually laterite that had developed potholes, gullies and depressions. The transportation system within the metropolis will thus get a boost if the major collectors/distributors of the road network in the outlying and newly developed residential areas are improved upon to raise the level of accessibility to such areas.

### **4.3.4 Urban Public Transport**

In KMA, public transportation is currently offered by trotros (mini-buses) and taxis for people without private means of transport. The trotros are the major carriers of passengers accounting for more than 60% of the passenger-kilometers within KMA. The services rendered by the trotros are, however, perceived to be generally poor in quality. Meanwhile, the use of large buses for passenger transportation in Kumasi is virtually absent.

However, under the Government's Mass Transportation policy a number of high capacity buses have been introduced under the MMT They mostly ply from the Kejetia Transport Terminal to the outlying settlements as well as the adjoining districts.

### **4.3.5 Traffic Safety**

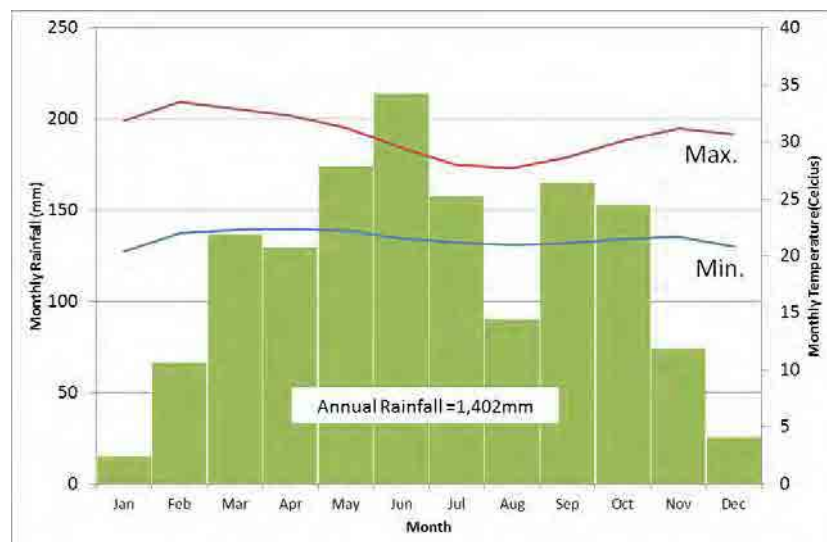
Pedestrians are indeed vulnerable, since over 75% of all road users killed in road traffic accidents in Kumasi were pedestrians, of which 30% were children below the age of 16 years. An efficient and systematic approach to accident prevention and mitigation is therefore clearly desirable. The object must be to improve pedestrian safety in general and child pedestrian safety in particular.

## Chapter 5 Water Resources and Water Supply Sector of Greater Kumasi Sub-Region

### 5.1 Present Situation of Water Resources Development

#### 5.1.1 Surface Water Resource

The climate of Kumasi area is wet, semi equatorial and has a mean annual rainfall of 1402 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 rainfall is recorded in the seven months of the two wet seasons (from March to July and September to October). Therefore, Kumasi has comparatively advantageous climate conditions in terms of surface water resources in West Africa.

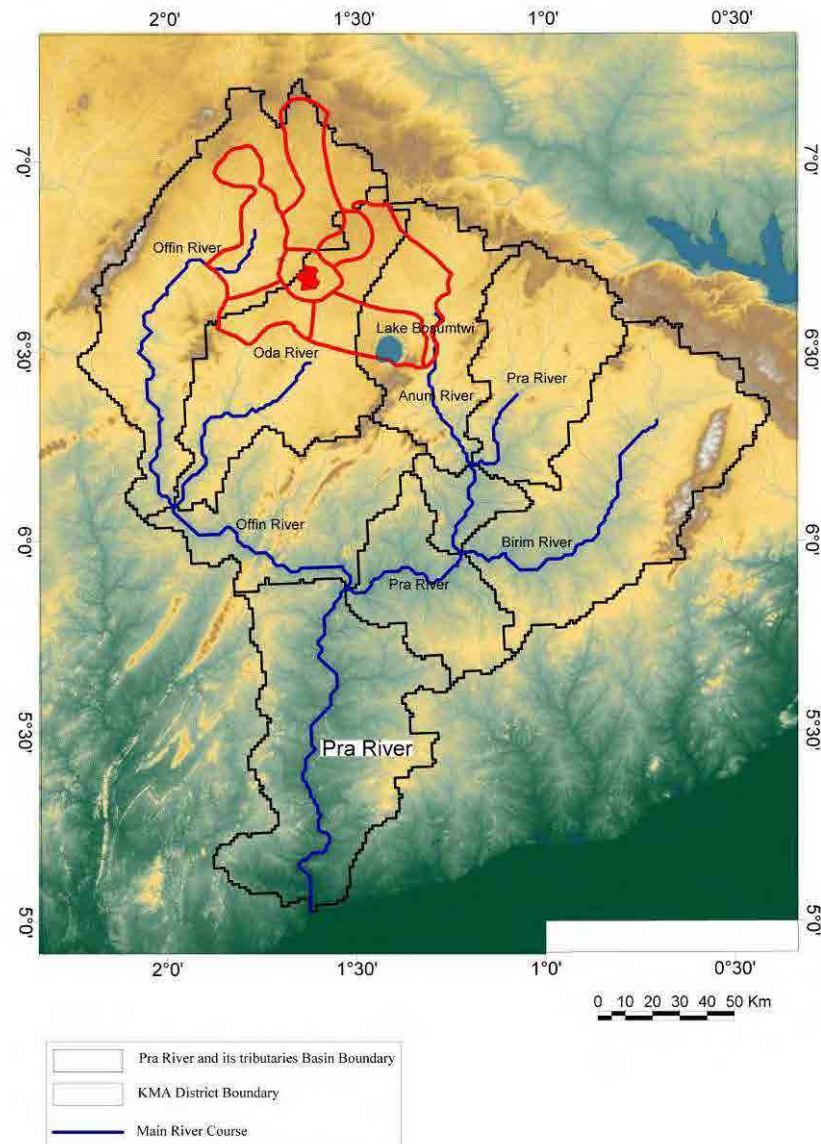


Source: WMO, 2012 (<http://worldweather.wmo.int/151/c00922.htm>)

**Figure 5.1.1 Monthly Rainfall and Temperature in Kumasi (1961-1990)**

However, the more significant feature for Kumasi surface water resources can be derived from its hydrological location.

Kumasi is located on the most upper part of the Pra River Basin as shown in Figure 5.1.2.



Source: JICA Study Team

Note: Background image of topographical relief made from SRTM3

**Figure 5.1.2 Location of Kumasi and its surrounding Districts 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<sup>2</sup>. 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<sup>2</sup>. The catchment area of the Oda River is 2,800 km<sup>2</sup>.

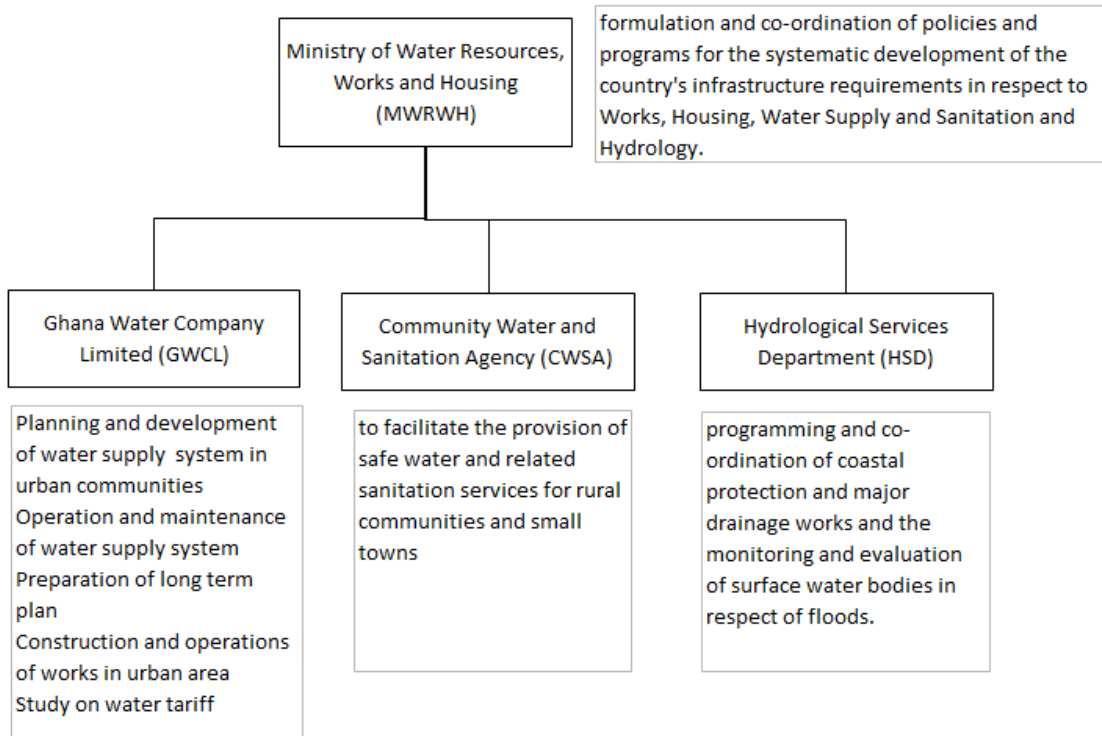
Since Kumasi is located in the most upper part of the Pra River system, the effect on the downstream area due to any development in Kumasi should be taken into consideration in terms of the surface water related environment.

Kumasi is located on the 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 south of the city.

**(1) Organizations**

In Ghana, as well as in Kumasi, the primary organization for the water resources is the Ministry of Water Resources, Works and Housing (MWRWH). Under the general directions of the Ministry, three main organizations are responsible for surface / ground water resources as shown in Figure 5.1.3. The detailed functions of GWCL and CWSA are described in the next section.



Source: Descriptions of each organization from Royal Haskoning, 2009, Water Resource Study Kumasi, GWCL

**Figure 5.1.3 Main Organization under MWRWH for Water Resources**

Also the Water Resource Commission (WRC) regulates and manages Ghana’s water resources and coordinates related government policies. WRC is the overall body responsible for water resources management in Ghana. The WRC is in the process of setting up ‘Basin Offices’ in all major river basins. A Basin Office has been established in one basin as a pilot operation. Other Basin Offices are to follow soon.

**(2) Hydrological Measurements**

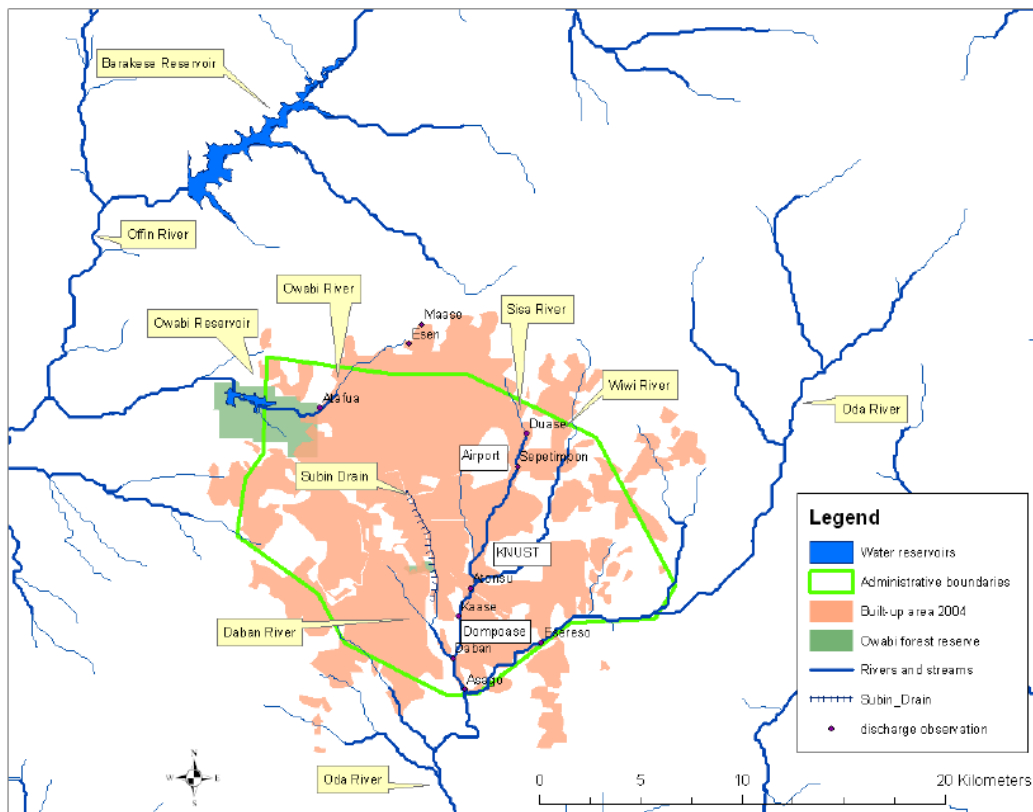
The hydrological measurements have been undertaken by HSD in and around the KMA. According to WRS (2009), there are seven hydrological stations in the Offin and the Oda river catchment, however, the water level-discharge curve is only available for four stations such as Offinso, Mfensi, Adiembra in the Offin river system and Bekwai in the Oda river system. It should be noted that there was no discharge measurement downstream of Barekese Dam before the WRS (2007).

### (3) Meteorological Measurements

During the WRS it appeared that rainfall stations monitored by GMA have also been operating in the premises of GWCL at Owabi and Barekese since 1947 and 1965, respectively. At these rainfall stations, rainfall was also measured on a daily basis, but data had not been computerized. During the WRS, those rainfall data were computerized for further study through the great efforts of the Ghana Government and the consultants.

### (4) Surface Water Sources

Currently, the Kumasi area is dependent on reservoirs (dams) and groundwater for its water supply. As surface water sources, there are two water intake points: one at Owabi (located 10 km from the city); the other at Barekese (located 19 km from the city).



Source: Royal Haskoning, 2009, Water Resource Study Kumasi, GWCL, pp. 7 Figure 2.3

**Figure 5.1.4 Location of Surface Water Sources for Greater Kumasi**

#### 1) Salient Features of Owabi Dam

Dam Completion Year	1928
River Name	Owabi
Catchment Area	69 km <sup>2</sup>
Altitude	229 MSL as Crest Level
Dam Type	Composite. Central concrete gravity spillway with earthfill embankment
Dam Height	7.4 m
Dam Length	135 m



Reservoir Storage Capacity	Not known, but 6.2 million m <sup>3</sup> usable in Design
Spillway Type	Mass concrete free overflow (80 m long)
Spillway Crest Level	MSL 227.5 m
Normal Retention Water Level	MSL 227.5 m
Maximum Flood Water Level	MSL 228.3 m
Draw-off/Intake/Outlet Pipework	7.3 m deep 1.2 m by 2.4 m wet well with 3 draw-offs into 2.9 m by 2.4 m dry well valve shaft
Installed Treatment Capacity	13,636 m <sup>3</sup> /day

**2) Salient Features of Barekese Dam**

Dam Completion Year	1971
River Name	Offin
Catchment Area	906 km <sup>2</sup>
Altitude	MSL 223.69 m as Crest Level
Dam Type	Composite. Central concrete spillway (14 siphons & free overflow) with earth-filled embankments
Dam Height	15 m (MCI 2009)
Dam Length	603 m (including spillway)
Reservoir Storage Capacity	35.3 million m <sup>3</sup> as initial value and 22 million m <sup>3</sup> in 2005
Spillway Type	Mass concrete gravity block incorporating 14 air regulated siphons (each 4.6 m long) and central open spillway (6.1 m long)
Spillway Crest Level	MSL 220.9 m
Normal Retention Water Level	MSL 220.9 m
Maximum Flood Water Level	MSL 222.4 m
Draw-off/Intake/Outlet Pipework	Draw-off tower adjacent to spillway section
Installed Raw Water Intake Capacity	218,000 m <sup>3</sup> /day as design (refer from Water Resource Kumasi, 2009 p. 37)

It should be noted that in Barekese Dam the reservoir sedimentation should be taken into account. The annual sedimentation is estimated at about 0.33 million m<sup>3</sup> (WRS pp.38)

**(5) Potentials**

The document “ASHANTI REGION – BAREKESE System Profile System R02/S01 No 6” states the capacity of the Barekese Dam is 181,000m<sup>3</sup>/day and that of Owabi is 13,636m<sup>3</sup>/day resulting in a combined capacity of 194,636m<sup>3</sup>/day. This will be sufficient to meet the 2015 water demand of 144,868 m<sup>3</sup>/day but not that of 2025, which is 212,479 m<sup>3</sup>/day. It is recommended that studies towards the construction of a new dam downstream of the Barekese Dam on Offin River commences immediately to meet the raw water demands of 2025.

On the other hand, MCI (2009) states that average water production at Owabi and Barekese headworks is 122,638 m<sup>3</sup>/day, or 27 million gallons per day (GWCL, 2010). However, given that the design capacity of Bakerese is about 220,000 m<sup>3</sup>/day and that of Owabi is 13,600 m<sup>3</sup>/day, the total water produced by the two waterworks amounts to just over half the design

capacity. Low electrical power voltage is a factor contributing to this deficit in water production.

The dam yield potential should be evaluated based on more hydrological data such as inflow discharge and outflow discharge through the intake and over the spillway. The consolidation of the hydrological monitoring network is required at present. In the short term, while the urban water supply is expanded for KMA, the hydrological monitoring system should be developed and the dam capacity be re-evaluated based on the actually measured data in order to decide the future action.

### 5.1.2 Ground Water Resources

Another major source of water supply in the area is groundwater. The following 6 paragraphs are quoted from WRS (2009) page 40. Also refer to Figure 5.1.5.

*Ghana can be divided into two main hydro-geologic structures. These are the Basement Complex comprising the Precambrian crystalline igneous and metamorphic rocks and the Paleozoic consolidated sedimentary formations or Voltaian System. The boundary between the two structures is running from North-West to South-East and is located some 50km North-East from Kumasi town. The main part of the KMA is located on the Basement Complex and the North-Eastern part of KMA might be located on the Voltaian System formations.*

*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 aquifer 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 meters 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.

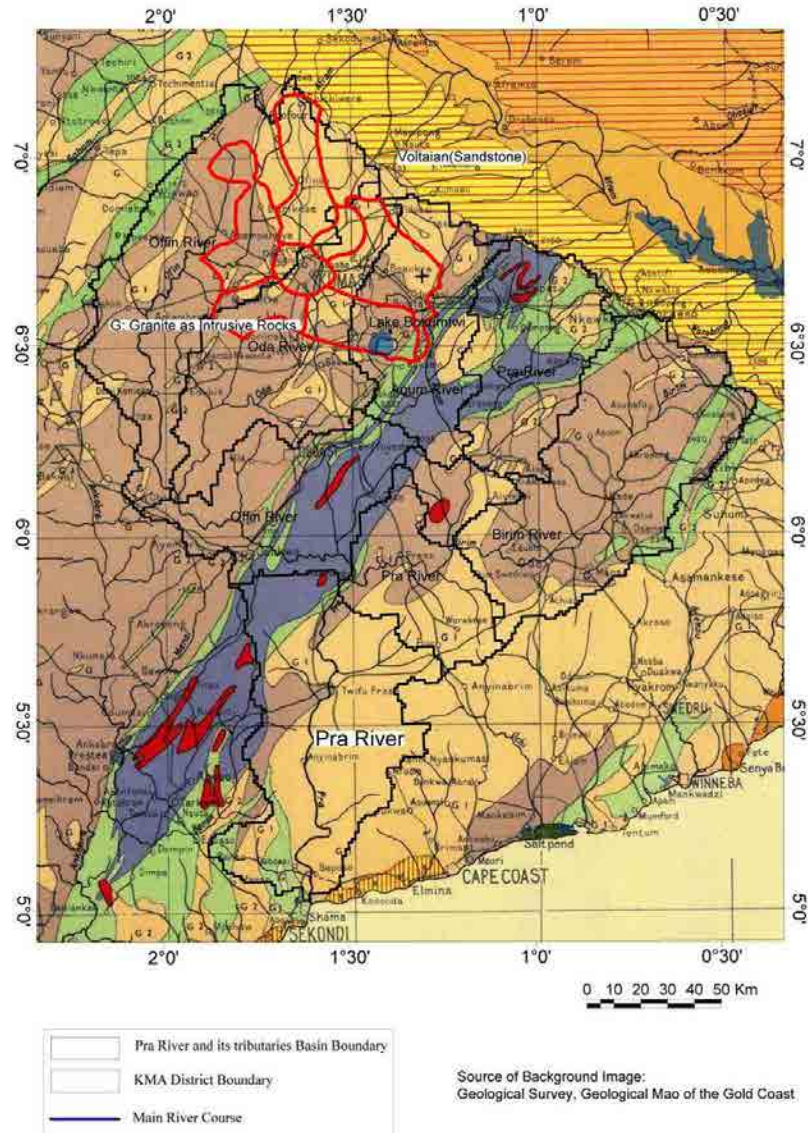
It is reported that the boreholes tapping the Birimian formations around Kumasi have an average yield between 7.4 and 12.7 m<sup>3</sup>/h and the average yield for boreholes in the Voltarian System is between 6.2 and 8.5 m<sup>3</sup>/h. The reported success rate in the Birimian formations is 75% and in the Voltarian System 55%.

Boreholes and hand dug wells provide water for domestic as well as commercial uses. Both GWCL and a number of private companies drill boreholes in Kumasi to abstract groundwater. Most boreholes drilled by GWCL do not provide water to the distribution system operated by GWCL, but are drilled for private or institutional customers on a



commercial basis. At the moment it is not possible to make a reliable estimate of the volume of groundwater that is actually used.

WRS (2009) page 43 states the surroundings of Kumasi are generally not very suitable for groundwater exploitation, certainly not for large volume pumping. The well yield encountered is usually low (<60 L/min). Best results have been obtained in the Santasi area (southwest part of town), where a yield of 400 L/min has been achieved in one borehole.



Source: JICA Study Team

**Figure 5.1.5 Geology in and around Greater Kumasi Sub-Region**

## 5.2 Present Situation of Water Supply

Ghana Water Company Limited (GWCL) and the Community Water and Sanitation Agency (CWSA) are in charge of the water supply in Greater Kumasi. Both GWCL and CWSA are subsidiary organizations of the Ministry of Water Resources, Works and Housing (MWRWH).

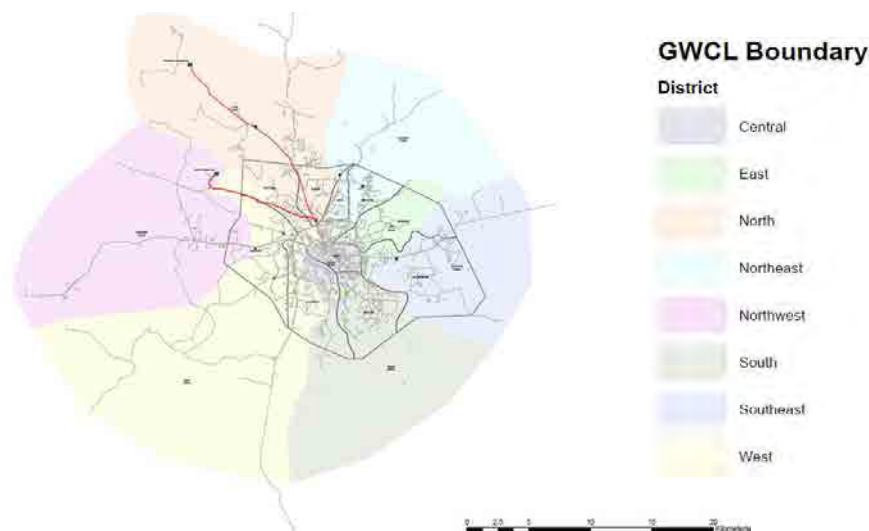
GWCL supplies water to the urban areas, which are the Kumasi Metropolitan area and some districts surrounding it. On the other hand, CWSA constructs water supply facilities such as wells, boreholes, and small scale distribution networks, in the rural area based on the requests from the rural communities.

In this section, the present situation of water supply in Greater Kumasi is explained based on the urban water supply (GWCL water supply area) and the rural water supply (CWSA's facility construction area).

### 5.2.1 Urban Water Supply

#### (1) Water Supply Area and Organization (GWCL / GURL)

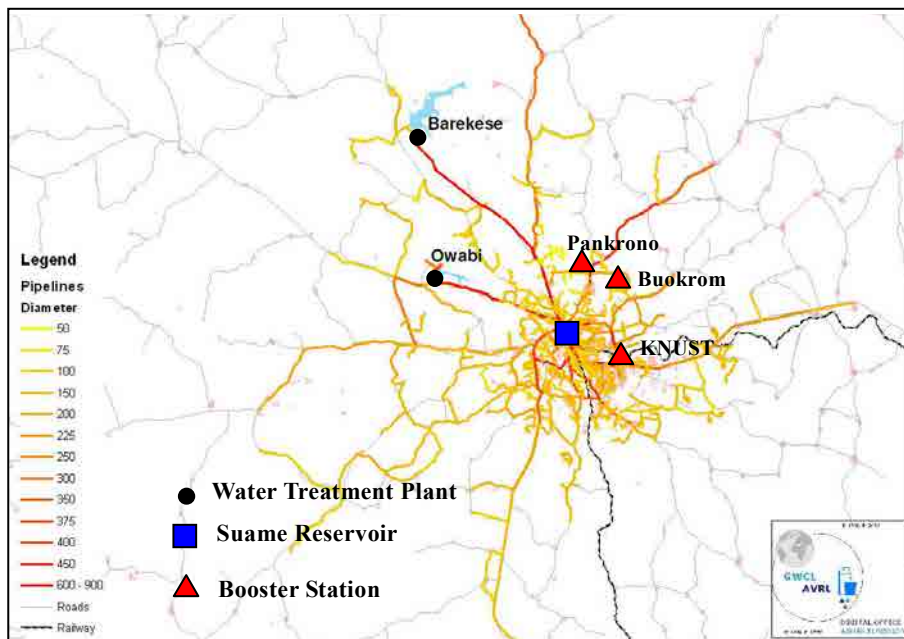
The service area of GWCL in Greater Kumasi is divided into eight areas as shown in Figure 5.2.1. The water supply facilities shown in this area are owned by GWCL. Aqua Vitens Rand Water Limited (AVRL), a joint venture of the public Dutch company Vitens International and the public South African company Rand Water Services Ltd. They have been conducting the water supply operation and maintenance (O&M) based on the 5 year contract signed with GWCL on June 2006. Due to the expiry of the term of the contract, GWCL has newly established Ghana Urban Water Limited (GUWL) for the O&M. The 9 departments of the GUWL that are in charge of the Greater Kumasi (and also Ashanti region) are, (1) Production Department, (2) Project Department, (3) Human Resources Department, (4) Distribution Department, (5) Commercial Department, (6) Water Quality Department, (7) Public Relations Department, (8) Material / Financial Department, and (9) Audit Department.



Source: GUWL Digital GIS Office, 2012

**Figure 5.2.1 GWCL Service Area (and Distribution Network)**

## (2) Water Supply Facilities



Source of Background Image: Royal Haskoning, 2009, Water Resource Study Kumasi, GWCL

Source: JICA Study Team

Note: Pipes below 50 mm diameter are not shown in this figure

**Figure 5.2.2 Water Supply System of Kumasi**

### 1) Water Treatment Plant

Barekese Water Treatment Plant and Owabi Water Treatment Plant are the waterworks which produce piped water for the GWCL area. These high capacity conventional treatment plants collect raw water from intake facilities located on the Offin and Owabi Rivers (dams). An overview of each water treatment plant is shown below. This is based on the presentation material (Kumasi Water Supply Master Plan) of GWCL.

#### a) Barekese Water Treatment Plant (110,000m<sup>3</sup>/d)

- Intake Facility
  - An intake chamber with 3 draw offs (at 214m, 217m and 218.8m)
  - 1,200 mm steel pipe for normal raw water abstraction
  - 1,500mm × 900mm taper steel pipe for scouring and for emergency draw off
  - A raw water pumping station with 4 pumps on VSD (@ 1556 m<sup>3</sup>/h, 35 m)
  - Two 1,000 KVA transformers for the RWPS (3.3 KV/415 V)
  - Two 750mm steel pipe lines for raw water transmission
- Process Plant
  - Four Aerators
  - Distribution Chamber
  - Four Clarifiers
  - Twenty four Gravity sand filters
  - Two Filtered water sumps for Backwash water and 2 Air Blower stations
  - A 900 m<sup>3</sup> capacity concrete clear water tank

- A Chemical house with Alum, Lime, Potassium permanganate and chlorine gas dispensing facilities
- A chemical storage house
- Control Laboratory
- High Lift Pumping Station
  - Four newly installed vertical pumps (3 × 1)
  - A 900 mm suction pipeline
  - A 900 mm transmission main with surge vessels
  - Two 2,500 KVA transformers
- Booster Stations
  - Six Booster Stations (4 Active, 2 inoperative)

**b) Owabi Water Treatment Plant (13,500m<sup>3</sup>/d)**

- A 900 mm raw water gravity steel pipeline.
- An aerator.
- Flocculator and sedimentation tanks.
- Gravity sand filters with air blowers and gravity wash water system.
- Chemical houses for dosing activated carbon, alum, lime and chlorine gas.
- Three horizontal pump sets (2 × 1).
- One 700 KVA transformer.
- A control laboratory.



Source: JICA Study Team, 1<sup>st</sup> March 2012

**Figure 5.2.3 Barekese Water Treatment Plant (Left) and Owabi Water Treatment Plant (Right)**

**2) Water Tank in Suame**

Treated water is pumped from Barekese and Owabi Water Treatment Plant through steel and iron mains for 22 km and 14 km respectively to Suame where the water distribution is centrally monitored. The storage capacity at Suame is shown in the table below.

**Table 5.2.1 Storage Capacity of Water Tanks at Suame**

	Capacity m <sup>3</sup>
Tank #1	10,000
Tank #2	4,545
Tank #3	4,545
Total	19,090

Source: GWCL/AVRL (Abstracted from the Colombia University Working Paper<sup>1</sup>)

### 3) Pipeline

According to GWCL, the total length of the water distribution network is about 1,050 km (pipeline diameter range: 13 mm – 900 mm). The service lines (below 50 mm) have a higher frequency of breaks compared to the larger diameter distribution lines because they are buried nearer the surface and are therefore easily ruptured (Kuma et al., 2010)<sup>2</sup>. The distribution system is relatively old and rehabilitation or replacement is partially required, especially for those pipes made of cast iron, asbestos cement and ductile iron (totaling about 450 km).

**Table 5.2.2 Pipe Lengths and Materials of Distribution Network**

Pipe Diameter (mm)	Lengths (km)						Total
	Asbestos cement	Cast iron	Other materials	HDPE	PVC	Steel	
75	10.8	4.7	0.2		27.2	0.1	43.0
100	78.0	2.0	0.0	63.3	259.4	0.6	403.4
150	149.5	2.2	0.0	16.4	104.8		273.0
200	40.3	0.1	0.0		41.2		81.6
225	4.2	18.2	0.0		0.2		22.6
250	18.9	0.3	0.0		24.8		44.0
300	33.2	3.5	0.0		7.6	0.1	44.4
350		1.7	0.0			8.8	10.5
375	1.7	2.2	0.0			0.0	4.0
400	16.5	6.0	0.0		5.2	0.4	28.1
450		6.6	0.0	0.1		7.5	14.2
600	0.3	6.5	0.3	0.2			7.3
630			0.0	0.4			0.4
800			0.0	0.1			0.1
900			0.0	0.0		17.4	17.4
Grand Total	353.4	54.1	0.6	80.6	470.4	35.1	994.0

Source: Royal Hskoning, 2010, Master Plan for Kumasi Water Supply Capacity Extension, GWCL

### 4) Booster Station

According to the Master Plan for Kumasi Water Capacity Extension (2010), at several

<sup>1</sup> Maoulidi M., 2010, MCI Social Sector Working Paper Series No. 16/2010, A Water and Sanitation Needs Assessment for Kumasi, Ghana, Colombia University (hereinafter Colombia University Working Paper)

<sup>2</sup> Jerry S. Kuma et al., (2010) Evaluating the Water Supply System in Kumasi, Ghana, European Journal of Scientific Research



locations in the distribution system, additional water tanks and booster stations have been installed in order to increase the pressure to supply higher situated and more remote areas.

With data from GWCL, the capacity of each booster station is shown in the table below.

**Table 5.2.3 Capacity of Booster Station**

	Capacity (m <sup>3</sup> /h)
Pankrono	205.20
Buokrom	205.20
KNUST	300.00

Source: GWCL, 2012

### 5) Telemetry

In order to monitor water flows in isolated water supply zones, 60 new zonal water meters were installed. Through this measure, non-revenue water (NRW) can be determined more accurately, which will contribute to eventually reducing NRW. In addition to the water meters, a number of pressure sensors and level sensors are proposed for installation to monitor network pressures and water tank levels remotely.

### (3) Water Quality

GWCL has three laboratories in Kumasi to monitor and analyse the water quality. At both Barekese and Owabi Water Treatment Plants, laboratory staff continuously monitor raw water, settled water and final treated water to operate and adjust the treatment process as required. In Kumasi, city water quality is monitored in a central laboratory at Suame. The treated water quality is showed in the table below. The water varies in quality and does not always comply with Ghana's standards.

**Table 5.2.4 Treated Water Quality**

Parameters	Unit	Ghana Standards Treated water	Raw water Barekese	Raw water Owabi	Treated Water Barekese	Treated Water Owabi
pH	(-)	6.5-8.5	6.4-8.2	5.2-7.2	6.0-8.8	6.3-7.7
Colour	HZ	<15	98-400	7-1250	1-22	2-13
Turbidity	NTU	<5	13-72	5.1-1041	0.0-12.0	0.2-11.7
Total iron	mg/l	<0.3	1.2-7.8	0.4-1.6	0-0.3	0-0.4

Source: Royal Haskoning, 2010, Master Plan for Kumasi Water Supply Capacity Extension, GWCL

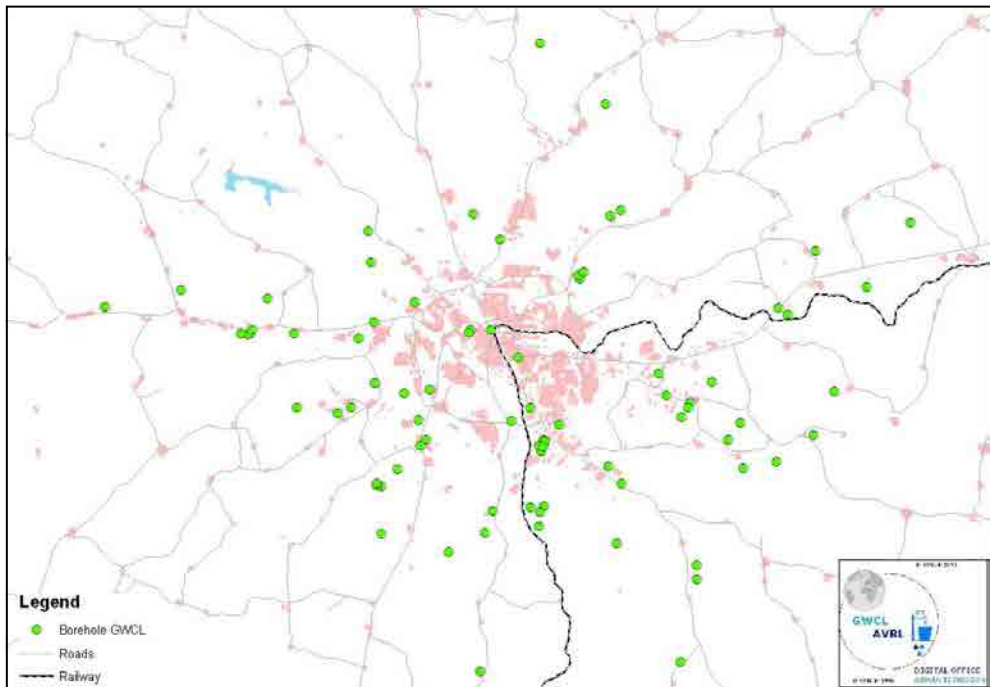
### (4) Groundwater

In addition to the use of water treated at both water treatment plants as mentioned above, the use of groundwater is widely spread in the GWCL area. In the Water Resources Study Kumasi (2009), the following items were mentioned.

- Boreholes and hand-dug wells provide water for domestic as well as commercial use.
- Both GWCL and a number of private companies drill boreholes in Kumasi to abstract groundwater.
- Most boreholes drilled by GWCL do not provide water to the distribution system

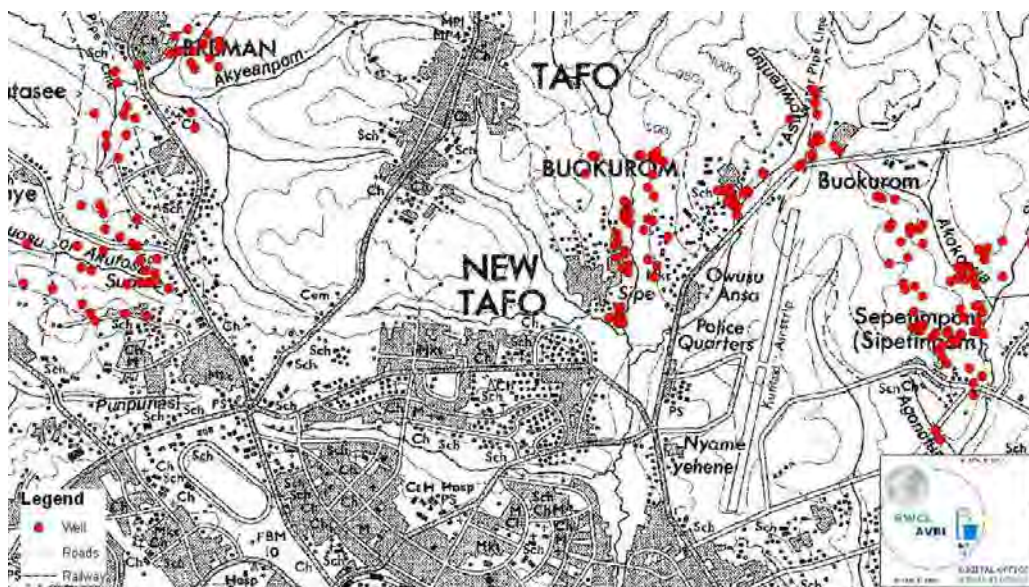
operated by GWCL, but are drilled for private or institutional customers on a commercial basis. At the moment it is not possible to make a reliable estimate of the volume of groundwater that is actually used.

- Boreholes drilled by the GWCL Drilling Unit and existing wells at Old Suame, New Suame, Suame Magazine, Moshi Zongo, Buokrom and Sepentimpon are shown in Figure 5.2.4 and Figure 5.2.5.



Source: Royal Haskoning, 2009, Water Resources Study Kumasi GWCL

**Figure 5.2.4 Location of the Boreholes Installed by GWCL Drilling Unit**



Source: Royal Haskoning, 2009, Water Resources Study Kumasi GWCL

Note: Not all wells are shown in the figure

**Figure 5.2.5 Results of the Well Inventory**

In the Master Plan for Kumasi Water Capacity Extension (2010), the items below were

mentioned.

- The yield of 36 boreholes drilled by GWCL in Kumasi is between 9 and 400 L/min. Only 9 out of 36 boreholes have a yield exceeding 100 L/min, which is in line with national hydro-geological studies indicating a borehole yield in the range of 1–3 m<sup>3</sup>/hr. Most boreholes are between 20 and 65 metres deep.
- The deeper parts (beyond approximately 60 metres in depth) likely have only limited potential for large-scale water abstraction due to the local geology (deeper part: granite hardrock without main aquifer; hence, there is an expected low success rate of drilled deep wells) .

#### (5) Current Water Demands

The table below provides details on the water consumption by user groups for 2006 and 2008. The commercial, industrial and governmental sectors each consumed over 1 million m<sup>3</sup> of water in 2008. Compared to domestic consumption of almost 10 million m<sup>3</sup>, it is clear that the non-domestic water use is much smaller. Furthermore, based on these data it is evident that there has been a huge increase in water consumption from water tanker services.

**Table 5.2.5 GWCL Water Consumption by User Group**

Unit: m<sup>3</sup>

	Total consumption 2006	Total consumption 2008	% Increase
Domestic (metered)	8,836,281	9,638,600	109%
Commercial	1,105,897	1,749,053	158%
Industrial	1,460,113	1,175,455	80%
Private institutions	110,757	161,598	146%
Government	792,669	1,138,844	144%
District assemblies	27,345	64,190	235%
2 <sup>nd</sup> Cycle institutions	301,988	959,179	318%
Post & telecom	1537	7,347	478%
3 <sup>rd</sup> Cycle institutions	952,565	1,067,897	112%
Metered stand pipes	88,727	82,048	92%
Tanker service	79,416	8,266,977	10,410%
Sachet water	0	18,629	-
<b>Total</b>	<b>13,757,294</b>	<b>24,329,816</b>	<b>177%</b>

Source: Royal Haskoning, 2009, Water Resources Study Kumasi, GWCL

Note: This table includes only GWCL customers

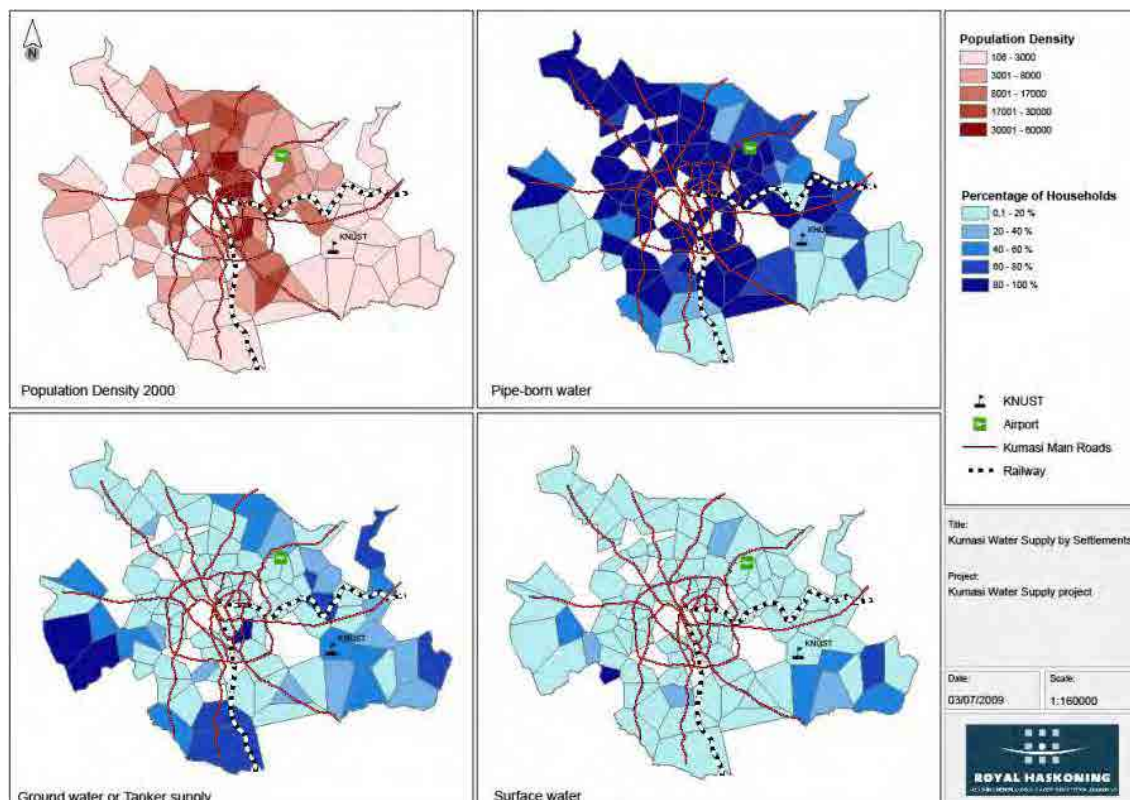
#### 1) Water for Domestic Use

The figure below presents the percentage of households using (i) pipe-borne water, (ii) groundwater or tanker supply, and (iii) surface water. Furthermore, a map is included of the population densities by settlement as estimated during the 2000 Census.

As mentioned in the Water Resource Study Kumasi (2009), the maps give a clear picture of the spatial distribution of the use of the water supply in KMA. The use of groundwater and surface water mostly occurs in the settlements in the outer areas of the KMA, and is most important in the southwestern and southeastern parts of the city. This can be explained by the fact that piped water enters the city from the northeast (location of the Barekese and Owabi reservoirs), and is gradually consumed through the city. Fewer pipelines are present in the southern part of the city, the pressure in the pipelines is low, and accordingly,



households in this part of the city are forced to use other means of water supply to meet their water demand.



Source: Royal Haskoning, 2009, Water Resources Study Kumasi, GWCL

**Figure 5.2.6 Spatial Distribution of the Type of Water Supply used by Settlements in the Kumasi Metropolitan Area in 2000**

The table below presents the percentage of households using pipe-borne water, groundwater, and others in Greater Kumasi Sub-Region in 2010.

**Table 5.2.6 Percentage of Main Source of Water for Domestic Use, 2010**

		Rate (%)					
		Pipe supply			Protected well		Others
		Insid-Pipe	Out-Pipe	Stand-Pipe	Borehole	Well	
KMA	Urban	42.3	24.8	8.0	12.2	6.2	6.5
A figya-Kwabre	Urban	4.0	4.7	2.6	8.2	5.9	74.6
	Rural	6.2	14.9	6.6	35.8	4.1	32.5
Kwabre East	Urban	2.0	8.6	8.2	24.3	10.9	46.1
	Rural	1.2	3.7	2.7	24.8	7.3	60.3
Ejisu-Juaben	Urban	1.1	4.1	3.6	15.9	2.8	72.5
	Rural	0.8	5.4	9.2	45.0	4.9	34.7
Bosomtwe	Urban	0.5	1.4	0.4	13.5	13.2	70.9
	Rural	0.9	4.8	13.0	40.6	4.9	35.8
Atwima Kwanwoma	Urban	0.5	2.6	3.2	8.5	3.8	81.4
	Rural	0.8	3.8	4.7	52.0	11.7	27.0
Atwima-Nwabiagya	Urban	7.3	7.3	2.7	5.1	7.0	70.6
	Rural	9.2	15.8	5.0	24.7	9.1	36.2
Total	Urban	38.1	22.8	7.6	12.4	6.4	12.8
	Rural	3.7	9.0	7.0	37.3	6.8	36.1
Greater Kumasi Sub-Region		32.1	20.3	7.5	16.8	6.5	16.9
		59.9			23.3		16.9

Source: GSS, 2010 Population and Housing Census

## 2) Water for Non-Domestic Use

The tables below show the overview of (1) the major commercial and industrial costumers, and (2) the top 10 public institutional costumers of GWCL for the first quarter of 2009. It can be said that large scale commercial and industrial activities in the Kumasi area are limited to two breweries (Guinness and KBL), a Coca-Cola bottling plant, gold mining activities, and an abattoir. Furthermore, the largest institution consumer is the Kwame Nkrumah University of Science and Technology.

**Table 5.2.7 Top 10 Commercial and Industrial Costumers of GWCL in First Quarter of 2009**

No.	Name of Costumer	Location	Consumption ( $m^3$ )
1	Guinness Ghana Ltd	Kaase	23,750
2	K.B.L. Brewery	Ahinsan	12,208
3	Guinness Ghana Ltd	Kaasi	10,290
4	AngloGold Ashanti	Bedieso	6,537
5	Coca Cola Co. Ltd	Ahinsan	5,176
6	K.B.L. Brewery	Ahinsan	2,362
7	Abattoir Kumasi	-	2,344
8	Coca Cola Co. Ltd	Ahinsan	2,016
9	J.G. Sarkis C/O L.L.L.	-	1,815
10	Ministry of Energy and Mines	Kaasi	1,630

Source: Royal Haskoning, 2009, Water Resources Study Kumasi, GWCL

**Table 5.2.8 Top 10 Public Institutional Costumers of GWCL in First Quarter of 2009**

No.	Name of Costumer	Location	Consumption ( $m^3$ )
1	KNUST Campus Accra Road	Bomso	33,270
2	KNUST Booster Accra Road	Bomso	14,371
3	Ghana Police Service	Police Depot - Patasi	7,000
4	Ministry of Defence	Patasi	7,000
5	Ministry of Defence	Zone 4 Block 1	7,000
6	Ministry of Defence	Bantama	7,000
7	Kumasi Girls Secondary School	Abrepo	7,000
8	Head Master Asanteman	Near Odeom	7,000
9	Ministry of Defence	Kwadaso	6,000
10	School of Medical Science	S.M.S. (Kath)	5,895

Source: Royal Haskoning, 2009, Water Resources Study Kumasi, GWCL

### 5.2.2 Rural Water Supply

In KMA, people in the area in which piped urban water supply is not available are generally using wells (groundwater). Wells are constructed by a Committee of the Water and Sanitation Agency (the Agency) based on requests from the district of KMA.

Regarding the maintenance of the constructed wells, a people's participation scheme has been introduced. For example, when a hand pump is broken, the user of the well shall provide the funds and repair the pump. If the repair scale is beyond the people's capacity, they can ask the district to repair it. In most cases, the district will request that the Agency perform the repair work. The personal expense for the daily management of the well is shared by the users of the well.

Also, the user of a well must provide approximately 5% of the construction cost of the well in advance. This system was introduced in order to stimulate the people's ownership of wells.

In the Small Communities Water & Sanitation Policy (SCWSP), the following basic standards are mentioned.

- Each person in a served community has access to no less than 20 litres of water per day.
- The maximum walking distance to a water facility does not exceed 500 metres.
- Each spout of a borehole hand pump or standpipe of a piped system serves no more than 300 persons, and for a hand-dug well hand pump, no more than 150 persons.

For a larger community in a small town or rural area, elevated water storage tanks are common for distributing the abstracted water from the well to the people.

According to SCWSP, water quality should meet the Ghana Standards Board criteria for drinking water. If at all possible, no treatment systems shall be required for groundwater. Where necessary, a simple iron (Fe) and manganese (Mn) removal system such as Mwacafe filters, may be provided. Such systems shall have minimal operation and maintenance requirements. Chlorination shall be provided for rural piped schemes.

SCWSP also mentions the following about design. Water sources shall be protected by prohibiting human activities within a 50-metre radius of groundwater sources, and 100 metres from surface water sources.

**Table 5.2.9 Water Coverage in Rural and Small Towns (2006)**

	Communities	Projected Relevant Population	Boreholes	Hand-Dug Wells	Pipe Systems	Below 75 Served	75 -300 Served	301 - 2000 Served	2001 - 5000 Served	Over 5000 Served	Population Served	Coverage (%)
Rural	2,369	1,772,003	3,235	774	50	1,742	78,753	696,533	361,660	-	1,138,688	64.3
Small Towns	59	593,241	248	56	23	-	-	-	-	352,931	352,931	59.5

Source: CWSA, 2007, Update of the Strategic Investment Plan, 2008-2015 & The Medium-Term Plan, 2008-2012

Kumasi City and its surrounding six districts are principally underlain by granite geological formation. The granite has moderate groundwater potential with a success rate in the range of 60–70 %. The average depth of drilling is about 50 m and the average yield is in the range of 20–50 litres per minute in the case of Afigaya Kwabre District.

## 5.3 Review of Past and Existing Development Plans and Projects for Water Resources and Water Supply and Development Projects

### 5.3.1 Kumasi Water Supply Project

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 outline of the project is as follows.

#### (1) Rehabilitation of the Water Treatment Plant

The rehabilitation of the Kumasi Water Supply Project comprises: (i) the rehabilitation of the existing facilities of the water treatment plant at Barekese, (ii) the construction of an additional water treatment module at Barekese to increase the nominal production capacity, (iii) installment of sludge treatment facilities to minimize the amount of residue from the treatment process, and (iv) rehabilitation of the treatment works at Owabi to improve the quality of water produced.

These activities are completed, thus the total capacity of both water treatment plants is now 123,500 m<sup>3</sup>/d (110,000 m<sup>3</sup>/d + 13,500 m<sup>3</sup>/d).

<b>Water Supply:</b>	
<i>Barekese</i>	
Installed capacity of treated water at Barekese before the project:	81,000m <sup>3</sup> /day
Installed capacity of treated water at Barekese after the project:	110,000m <sup>3</sup> /day
<i>Owabi</i>	
Installed capacity of treated water:	13,500m <sup>3</sup> /day

Source: Abstracted from the report of “GWCL, 2009, Water Resource Study Kumasi”

**Figure 5.3.1 Water Treatment Plant Capacity after Kumasi Water Supply Project**

#### (2) Technical Assistance

In addition to the above activities, the Kumasi Water Supply Project encompasses a technical assistance component. This includes (i) network modeling and asset management, (ii) strategic master planning, (iii) reduction of unaccounted for water, and (iv) training.

##### 1) Per Capita Water Demand

In the Master Plan for Kumasi Water Capacity Extension, future water demand was calculated by applying per capita water demand as shown in Table 5.3.1 below. In another report, the “Strategic Investment Programme (SIP) (2008),” the expected level of per capita water demand in Kumasi in 2020 is 120 L/capita/day (see Table 8.3.2). Comparing the per capita demands, it can be said that the Water Supply Master Plan for Kumasi applies a lower per capita demand than the SIP demand. The Master Plan noted that the per capita water demand of SIP indicates that quadrupling the capacity in production and distribution will be necessary in 20 years time. The investments for such an exercise are prohibitive. Therefore, a consumption pattern between 30–45 lcd and 130 lcd is proposed.

**Table 5.3.1 Per Capita Demand applied to Calculate the Future Demand in the Draft Master Plan**

	Unit	situation 2010	demand 2030
Per Capita Consumption/demand	lcd	45	60
In KMA and periphery	lcd	30	30
Population KMA	Nr	1,188,000	1,765,000
Population periphery	Nr	827,000	1,409,000
Industrial/Commercial consumption	%	35.5	35.5
Nett water consumption	m <sup>3</sup> /day	48,000	233,000
Production efficiency	%	60	100
NRW	%	35	15
Required Water production in 2030	m <sup>3</sup> /day	122,800	274,000

Source: GWCL, 2010, Master Plan for Kumasi Water Capacity Extension

**Table 5.3.2 Per Capita Water Demand for the Regional Capitals Adopted in the SIP 1998 Study**

Regional Capital	1995	2005	2020
Accra-Tema	80	138	146
Kumasi	85	115	130
Cape Coast	85	105	120
Sekondi-Takoradi	85	115	130
Tamale	85	105	120
Sunyani	85	105	120
Koforidua	85	105	120
Ho	85	105	120
Wa	85	105	120
Bolgataga	85	105	120

Source: GWCL, 1998, Strategic Investment Programme

## 2) Water Demand and Water Supply

Table 5.3.3 shows the current water balance. As shown in the table, it can be said that (1) the major water use is domestic use, (2) the percentage of commercial/industrial use is limited, and (3) the Non Revenue Water (NRW) percentage is very high. According to GWCL (2009) Water Resource Study Kumasi, the NRW is mainly caused by three factors: (i) losses of treated water in the system due to the poor condition of the pipelines, (ii) large administrative losses, and (iii) frequent problems with the headworks of the water treatment plants.

**Table 5.3.3 Current Water Balance**

Category	2008			2009			2010		
	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)
Domestic	70,051	25,972	61 %	58,924	24,011	63 %	70,166	25,561	62 %
Commercial		5,108	12 %		4,582	12 %		5,543	14 %
Industrial		2,684	6 %		2,629	7 %		3,184	8 %
Government		8,480	20 %		6,832	18 %		6,620	16 %
Total	70,051	42,244	100 %	58,924	38,054	100 %	70,166	40,908	100 %
NRW	27,807 (39.7%)			27,807 (35.4%)			29,258 (41.7%)		

Source: GWCL, Power Point Material on Kumasi Water Supply Master Plan (Draft)

Note: As of 2010, the rehabilitation activities mentioned above were not completed. Thus, both water treatment plants capacities were below 94,500 m<sup>3</sup>/day

The table below shows the estimated water balance. Comparing this table with the one above, the assumptions that are remarkably different are (1) the percentage of domestic usage decreases and commercial/industrial usage increases, and (2) NRW percentage decreases.

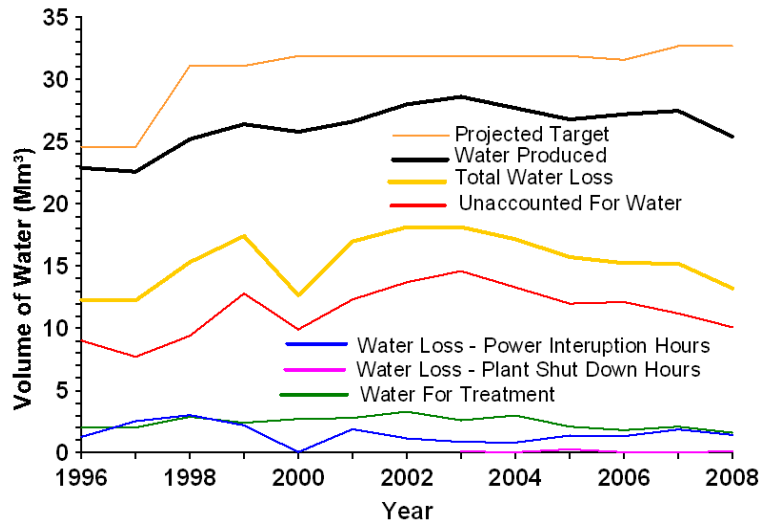
**Table 5.3.4 Forecast Water Balance**

Category	2015			2020			2025		
	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)	Production (m <sup>3</sup> /day)	Usage (m <sup>3</sup> /day)	Usage (%)
Domestic	218,000	100,220	55 %	270,000	123,872	55 %	333,000	152,517	55 %
Commercial		27,333	15 %		33,783	15 %		41,596	15 %
Industrial		18,222	10 %		22,522	10 %		27,730	10 %
Government		36,444	20 %		45,044	20 %		55,461	20 %
Total	218,000	182,218	100 %	270,000	225,222	100 %	333,000	277,304	100 %
NRW	35,782 (16%)			44,778 (16%)			55,696 (16%)		

Source: GWCL, Power Point Material on Kumasi Water Supply Master Plan (Draft)

### (3) NRW Measures

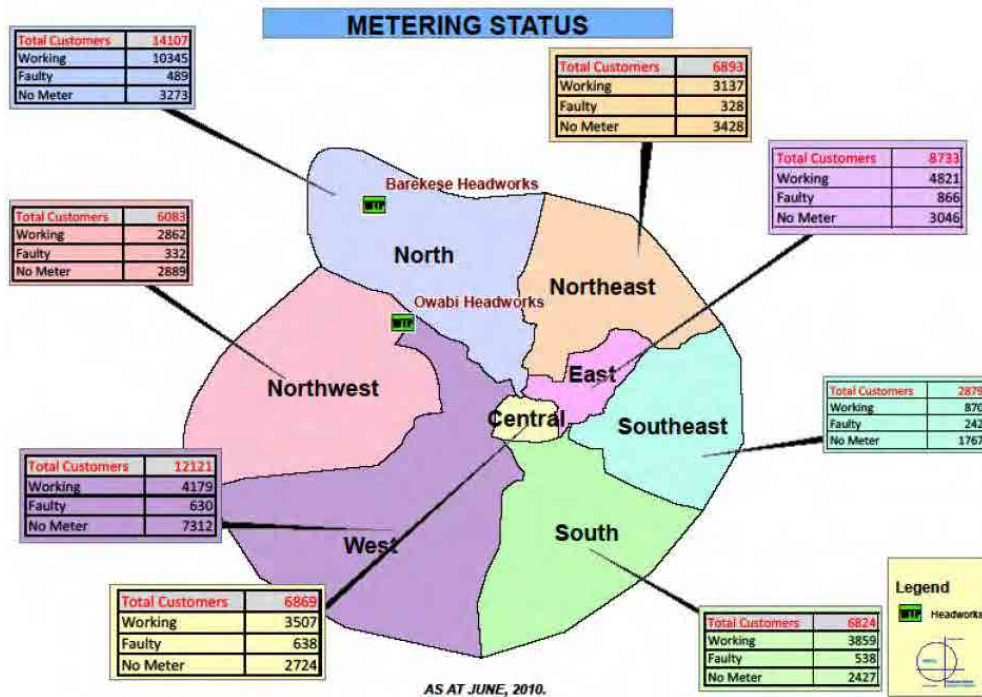
Figure 5.3.2 shows the volume of yearly projected target, water produced and unaccounted for water among others for the Kumasi water supply system from 1996 to 2008. Unaccounted for water ranges from 34% to 51% and from 2003, the value decreased from a high of 51% to 40% in 2008 attributed to regular maintenance of equipment and effective monitoring.



Source: Kuma J S et al, 2010, Evaluating the Water Supply System in Kumasi, Ghana, European Journal of Scientific Research

**Figure 5.3.2 Figure Breakdown of Water Treatment Plant**

As mentioned in the Colombia University Working Paper, GWCL has been installing 20,000 new meters and replacing 1,776 existing ones, as part of the Kumasi Water Supply Rehabilitation Project to reduce the number of unbilled customers. This initiative will ensure that households with access to piped water would pay, which is important because many Kumasi houses (Compound Type House) are built as rows of rooms around a central courtyard, where the water taps tend to be located. Figure 5.3.3 shows the metering status in 2010 in the Kumasi metropolis and the surrounding peri-urban areas. As can readily be seen, each area includes a substantial number of customers still without meters.



Source: Maoulidi M., 2010, MCI Social Sector Working Paper Series No. 16/2010, A Water and Sanitation Needs Assessment for Kumasi, Ghana, Colombia University

**Figure 5.3.3 Metering Status**

**(4) Additional Works for the Kumasi Water Supply Project**

According to GWCL, additional works for the Kumasi Water Supply Project are on going as following.

- Capacity increase of the existing Barekese Water Treatment Plant from 110,000 m<sup>3</sup>/d to 137,000 m<sup>3</sup>/d.
- Improvement to the existing sludge treatment facilities at Barekese.
- Improvement to the KNUST booster station including the supply and installation of a transformer.
- Reforestation of the Barekese Water Basin.
- Fencing of the future reservoir site near Prempeh College.
- Improvement of the water supply to Achiase, Adankwame, Ohwin etc
- Supply and Installation of a 400mm dia. HDPE pipe from Santasi round about to Oforikrom Police station.
- Replacement of weak pipelines on the Offinso lines.
- Replacement of 50mm dia. Cast iron pipeline between Suame round about and Komfo Anokye Hospital

This project was commenced in December 2011. As of January 2012, the progress of the works was 42%. When the Barekese Water Treatment Plant is completed, the total capacity of both water treatment plantss will be 150,500m<sup>3</sup>/d (Barekese Water Treatment Plant 137,000 m<sup>3</sup>/d + Owabi Water Treatment Plant 13,500 m<sup>3</sup>/d).

**5.3.2 Surface Water Resources Development**

In terms of surface water resources development, in the short term, the following actions are envisaged.

- Annual maintenance dredging for both Barekese Reservoir and Owabi Reservoir to recover the original storage volume
- Rehabilitation of the Intakes of both Barekese Reservoir and Owabi Reservoir
- Consolidation of hydrological monitoring of inflow and outflow (discharge) of both Barekese Reservoir and Owabi Reservoir
- Enhancement of meteorological measurements in the Offin and Oda River basins

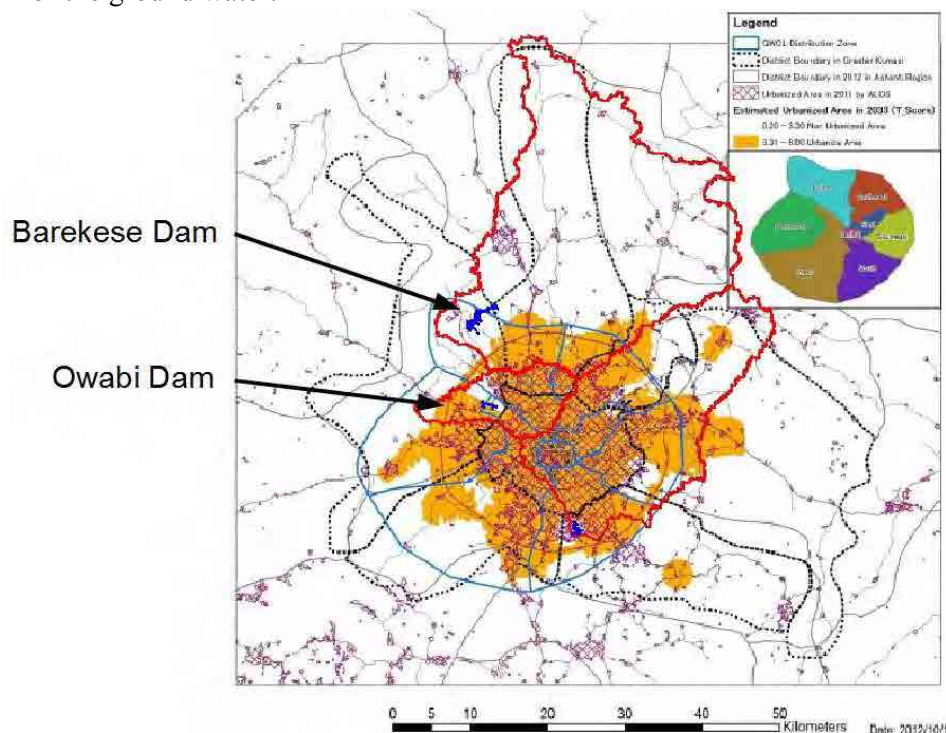


## 5.4 Issues on Water Resources Development and Water Supply

### 5.4.1 Issues on Water Resources Development

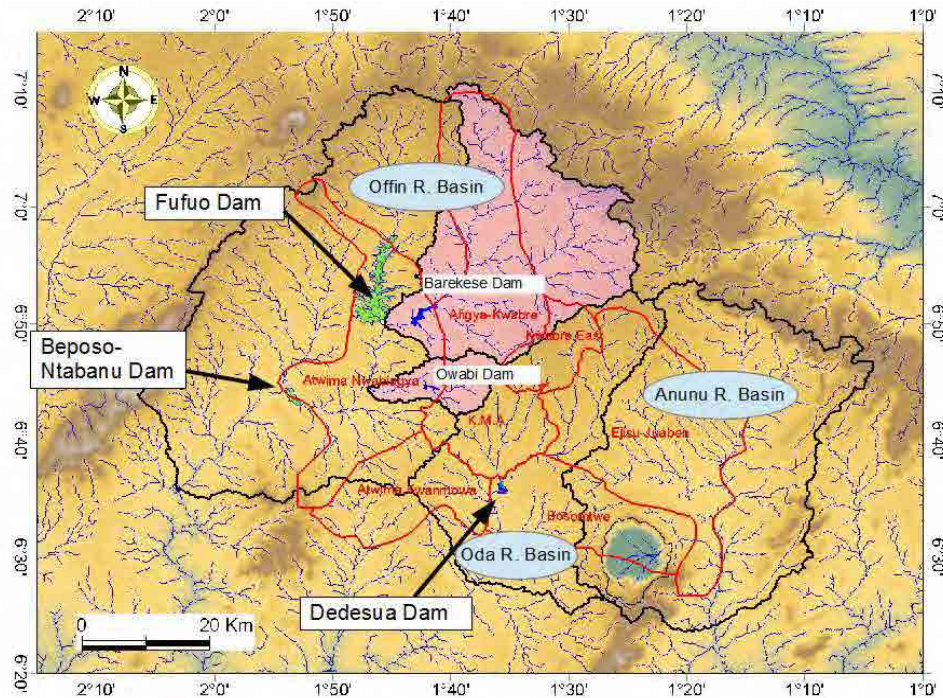
The following issues on water resources development are identified for Greater Kumasi Sub-Region:

- 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 5.4.1. 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 5.4.1 Location of Water Supply Dam Basins and Future Urban Areas of Greater Kumasi Conurbation**



Source: JICA Study Team

**Figure 5.4.2 Location of New Water Sources Studied by GWCL**

## 5.4.2 Issues on Water Supply

### (1) Insufficient Water Supply

As mentioned in the Water Resources Study Kumasi (2009), the present daily treated water demand is estimated to be 304,000 m<sup>3</sup>/d (SIP, 2008). At this moment, the total capacity of both water treatment plants is 123,500 m<sup>3</sup>/d. When the project to expand Barekese Water Treatment Plant is complete, the water treatment plants' capacity will be 150,500 m<sup>3</sup>/d. Even without considering the NRW, the water supply (150,500 m<sup>3</sup>/d) is only about half of the water demand (304,000 m<sup>3</sup>/d).

**Table 5.4.1 Insufficient Water Supply**

Demand		304,000 m <sup>3</sup> /d		
Supply	Existing Barekese Water Treatment Plant	110,000 m <sup>3</sup> /d	123,500 m <sup>3</sup> /d	150,500 m <sup>3</sup> /d
	Existing Owabi Water Treatment Plant	13,500 m <sup>3</sup> /d		
	Barekese Water Treatment Plant (under construction)	27,000 m <sup>3</sup> /d		
	Ground Water	N/A		

Source 1: <Demand> GWCL, 2008, Strategic Investment Plan

Source 2: <Supply> GWCL, 2009, Water Resources Study Kumasi

As a result, people in Kumasi are not able to consume as much water as they need. As mentioned in “Evaluating the Water Supply System in Kumasi, Ghana” (Kuma et al., 2010) the per capita consumption rate should have been 94 L/capita/day but it was only 66 L/capita/day in 1996 and this amount has steadily decreased to 39 L/capita/day 2008 due to

the population growth.

It is clear that water supply at this moment is insufficient. According to the draft master plan, items below are (and will be) the issues causing insufficient water supply.

- Encroachment and destruction of the catchment areas of both dams.
- Pollution and siltation of both dams, especially Owabi
- Faulty scour valves at both intakes
- Unreliable High lift pumps at Owabi
- Unreliable power supply to Owabi
- Lack of isolation valves on raw water lines at Barekese
- Lack of isolation system between the filters, the wash water sump and the clear water well at Barekese
- Inadequate capacity of Owabi plant as a standby for Barekese Plant

**(2) 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 keep rehabilitating of water supply facilities and to upgrade the capacity of water supply in response to increasing water demand. In this sense, it is essential to substantially reduce NRW as low as 10-15% by 2033.

**(3) Numerous Old Pipelines of Distribution System**

The present water distribution system is relatively old. Therefore, rehabilitation or replacement of water pipelines is substantially necessary. It is especially necessary to replace those pipes made of asbestos cement in order to prevent pipes from bursting and leakage.

**(4) 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.

**(5) Rural Water Supply**

Kumasi City and its surrounding 6 Districts are principally underlain by granite geological formation. The granites have moderate groundwater potential with a success rate in the range of 60-70 %. Average depth of drilling is about 50 m and average yield is in the range of 20-50 litres per minute in the case of Afigaya Kwabre District.

In reality, rural water supply has been implemented by groundwater development. Shallow wells with hand pumps are the most popular, while an elevated tank with an electrical well pump system is used in larger communities.

A management system including the rule for cost allocation among the community and district has been practical in some areas.

On the other hand, the groundwater potential has not been investigated in detail and

borehole inventory system is not adequately sufficient from the viewpoint of water supply system planning and management. Also it is reportedly said that there is concern regarding groundwater pollution because of mining and wastewater. Therefore, the following issues are envisaged for rural water supply:

- Groundwater potential study (hydrogeological aspect, water quantity and water quality)
- Consolidation of groundwater water level monitoring systems
- Consolidation of borehole inventory
- Enhancement of well construction monitoring in each district by the respective Government